

A HISTORY OF THE

NORTHERN CALIFORNIA SECTION

MATHEMATICAL ASSOCIATION OF AMERICA

1939 - 1988

Gerald L. Alexanderson
Leonard F. Klosinski



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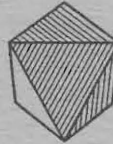
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PREFACE

In putting together this short history of the Northern California Section we have had the advantage of having at hand the history of the Section prepared by Roy Dubisch in 1960. This has been helpful in many ways. We have also consulted Harold Bacon, one of the charter members of the Section. He has been helpful without fail. We appreciate his willingness to have us publish here his comments on the founding of the Section, delivered at the Davis meeting in 1986. In addition, we have depended on all of the following for information on a number of different questions: Henry L. Alder, David Barnette, E. Maurice Beesley, William Chinn, Alice Kelly, D. H. Lehmer, John Mitchem and Don Pfaff. Beverly Ruedi of the Washington office of the MAA provided us with information from the MAA archives. We are grateful to C. M. Fulton and Constance Reid for pictures. We could locate only a poor group photograph showing A. L. McCarty, taken from a Lowell High School yearbook, so we had a drawing made from that by Sandra Kelly. The photograph of Sophia Levy was provided by the Archives of the University of California, Berkeley. On the technical side we have had the assistance of Madeline Borges, Dave Jackson, and Mary Jackson. We are grateful to all of these.

One quickly learns when looking up the records of the Section that there was a time not too long ago when "University of California" meant "University of California at Berkeley." And there was a time when the names of the institutions in the California State University system changed, it seems, every few years. We have tried to stick with the name current at the time referred to, even though this sometimes results in several names for the same school. For example, over the last fifty years, San Jose State has gone by at

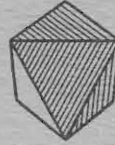
least three names--San Jose State College; California State University, San Jose; and San Jose State University. (There may even be a fourth if one counts the period during which the "e" in "Jose" was given an accent!) We hope no one finds our convention for dealing with this confusing.

We are sure there are errors and omissions. The present records of the Section, largely in the hands of the Secretary-Treasurer, are far from complete, particularly in the early years, so on occasion we have had to rely on memory or on a variety of records and accounts, some of which are sketchy. We would appreciate hearing from readers about any errors they may discover.


G. L. Alexanderson
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Santa Clara, California

November 14, 1988

A HISTORY OF THE NORTHERN CALIFORNIA SECTION



THE NORTHERN CALIFORNIA SECTION OF THE MAA

 f all the sections of The Mathematical Association of America, surely the Northern California Section covers the most territory. The Pacific Northwest Section is proud of its wide geographical spread and it probably does include more square miles of dry land than any other section: Oregon, Washington, parts of Idaho and Montana, Alberta, British Columbia, Yukon, Northwest Territories, and Alaska. But the Northern California Section takes in that part of California north of San Luis Obispo on the coast and south of the Oregon border, including Fresno and Bakersfield in the San Joaquin Valley, all of Nevada, Hawaii, Guam, American Samoa and American protectorates in the South Pacific. Representatives from the latter are rarely seen at Section meetings, of course.

It was not until 1987 that a meeting of the Section was actually held in Hawaii. Even then it was an added meeting for the year, not the principal one. No meeting has ever been held in Nevada, though in 1941 the officers decided the annual meeting should be on the home campus of the Chair of the Section. Since Fredrick Wood, then Chair of the Section, was from the University of Nevada, where he was Dean of Arts and Sciences and Chair of the Department of Mathematics, the 1942 Section meeting would have been held in Reno. But in the aftermath of Pearl Harbor the plan was abandoned and the meeting was held at Berkeley instead. Most section meetings have been held in the San Francisco Bay Area, with occasional moves into California's Central Valley and to Monterey.

• *Origins of the Section*

The organizational meeting of the Section took place at Galileo High School in San Francisco on January 28, 1939. It was the 22nd section of the Association to be formed, though that number is somewhat misleading. There are currently only 29 sections, but a number of the sections have been reorganized over the years and now include different regions from what they did in 1939. Nevertheless, Northern California appeared rather late on the scene. As Harold Bacon pointed out in his luncheon talk at the 1986 Section meeting (reproduced elsewhere in this history) the Southern California Section had been organized 14 years earlier, largely through the efforts of E. R. Hedrick, first president of the MAA, who had moved to Los Angeles in 1924.

With only 30 members of the Association spread from Atascadero to Chico, California, and to Reno, Nevada, however, it took courage to try to

organize a section of the Association in Northern California even in 1939. But even more remarkable than the determination of that hardy band of 30 is the fact that 12 members of the Association actually managed to attend the first meeting. Were the same proportion of members to attend the Section meetings today, when we have over 1500 MAA members in the Section, we would have 630 members attending, rather than the usual 150-200. The Section officers would have to look for host institutions with larger meeting facilities! Among all the sections, the Northern California Section currently ranks fifth in the number of MAA members, behind the Northeastern, Southeastern, Dis-



A. L. McCarty

trict of Columbia/Maryland/Virginia, and Southern California Sections.

Remarkable too was the overall attendance at that first meeting, 60. The program attracted a number of high school teachers in addition to college and university faculty. Largely pedagogical, the program contained some mathematics as well and was clearly designed to appeal to a wide audience. It is interesting that Professor Lenzen's talk on physical geometry was published as an article in the *Monthly* in the same issue as the report of the organizational meeting.

Sophia Levy of the University of California, Berkeley, served as Secretary *pro tem* at the first meeting, where A. L. McCarty of San Francisco Junior College was elected Chairman. McCarty had been a teacher at Lowell High School before he joined the faculty of the junior college in 1936. William Chinn, who took mathematics courses from him at Lowell, recalls that "he was known as a taskmaster and hard grader." Bill remembers him "shuttling between classes at Berkeley with his briefcase and shining pate." From McCarty's presentations at early meetings of the Section, one could conclude that he had an interest in Diophantine problems.

Sophia Levy was elected Vice-Chair. She was a member of the Mathematics faculty at Berkeley and eventually married John McDonald of that faculty. It was not until McDonald's retirement that she could marry him, due to the nepotism rules in effect at that time. She took a leading role in the Section and served on a number of committees concerned with mathematical education.

Harold Bacon had received his Ph.D. from Stanford in 1933 and had joined the Stanford faculty that same year. He was



Sophia H. Levy

elected to the office of Secretary, a position he held for the next six years. He was later to serve the Section and the national organization in many ways, on a number of committees and as a member of the Board of Governors, both as a regional governor and as a governor-at-large.



Harold M. Bacon

and Emma V. Hesse of University High School, Oakland.

Among those who were active in getting the Section started was Griffith Evans, the Chair of the Mathematics Department at Berkeley who had done a great deal to build the Berkeley department. Evans had moved to Berkeley from Rice in 1934 and, in the words of Garrett Birkhoff, "built it up into one of our 'big four' mathematical centers." At the time the Section was founded Evans was President of the American Mathematical Society.

The by-laws for the Section were prepared by a Committee consisting of Evans, McCarty,

- *Structure of the Section*

The original by-laws of the Section served for a number of years, but in 1959 the present system of electing only a secretary-treasurer and a vice-chairman was introduced into the by-laws after being recommended by the Committee to Study the Affairs of the Section, chaired by David W. Blakeslee (San Francisco State). Other members of the Committee were: Henry L. Alder (University of California, Davis), Roy Dubisch (Fresno State), Harley Flanders (University of California, Berkeley), John G. Herriot (Stanford), Marjorie L. Hoffman (College of San Mateo), Stanley Hughart (Sacramento State), Gerald

C. Preston (San Jose State), Kenneth Skeen (Diablo Valley College) and E. Hargrave Swift (El Cerrito High School). The same Committee made other recommendations, such as the appointment of standing committees (1) on the high school contest, (2) on visiting lecturers, and (3) on mathematics teaching. The last was intended to be set up jointly with the California Mathematics Council. These last recommendations, though accepted by the Executive Committee, did not involve by-laws changes.



Griffith C. Evans

In 1972 the national office of the MAA suggested revisions of section by-laws for all sections.

A model was sent out to section secretaries outlining recommended organizational details. The Northern California Section formed a Committee on the By-laws, consisting of W. Rollin Hanson (City College of San Francisco), William H. Landis (Contra Costa County Department of Education), and Thomas Southard (California State, Hayward), Chair. The end result indicated either conservatism or a conviction that things were going well for the Section as they were, because the recommendation of the Committee was that the system of electing officers not be changed even though the system did not fit the standard structure suggested by the national office. The Executive Committee and the membership accepted the Committee's recommendation. (The by-laws approved at that time are still in effect and appear elsewhere in this history.)

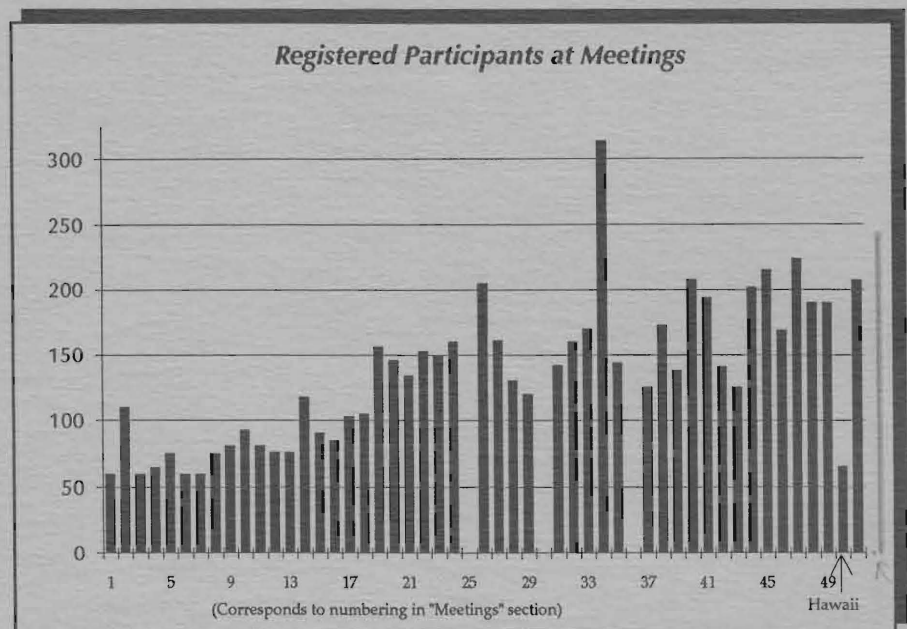
• Meetings

Though there were 60 at the first meeting of the Section, by the time of the second meeting the total attendance had gone up to 110, only 20 of whom

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were MAA members. Clearly the Section was already meeting a need in Northern California. Of course, at that time there was no California Mathematics Council, no American Mathematical Association of Two-Year Colleges, nor any other of the specialized mathematical organizations we have today. There was the American Mathematical Society, which held occasional regional meetings in California, the Mathematical Association of America and the National Council of Teachers of Mathematics.

Attendance at meetings settled to figures in the range 60-100 until 1952 when at a meeting at Stanford total attendance hit 118 with 51 members of the MAA. That year there were 133 MAA members living in the Section. By the late 50's attendance consistently ran approximately 150, but again at a Stanford meeting a new record was set in 1964, 205, of whom 162 were members of



the MAA. In 1972 an all-time record attendance of 313 turned out for the meeting at California State, Hayward, but the figure reflected an extraordinary effort to get students to attend, so 96 of those registered were students. The next peak in attendance came in 1978 when 208 attended a meeting in the elegant ballroom of the Ralston house on the campus of the College of Notre

Dame in Belmont. This may have been the most star-studded program of the Northern California Section, with speakers Hans Samelson, Ronald L. Graham, Constance Reid, Edward Teller, and Stephen Smale!

The Belmont figure was not matched or exceeded until 1985 when the meeting at Menlo College drew 225. The speakers were David Barnette, George Dantzig, Constance Reid, Bradley Efron, and Paul Halmos, again a star-studded cast. But one also notes the mid-Peninsula location--and the presence of Constance Reid! At St. Mary's College in 1988, 207 attended the 50th meeting of the Section.

Over the past 30 years or so the officers of the Section have tried to adhere to a system of cycling the meetings of the Section through campuses of various types of institutions. Occasionally the pattern has been broken due to various problems such as changes of site resulting from a breakdown in negotiations with the administration on a campus. But generally meetings have been cycled through institutions by category: (1) campuses of the University of California (for these purposes the Naval Postgraduate School has been included in this group), (2) those of the California State University system, (3) the private colleges and universities, and (4) the two-year colleges. (A similar scheme is used in selecting nominees for officers, so that all the collegiate institutions in the region can be, in time, represented.) In recent years scheduling on two-year college campuses has become more difficult because of use fees imposed. Unless there are changes we will probably see few if any future meetings on these campuses.

Elsewhere in this short history are found complete programs for all the meetings of the Section. As one can see, there have been various formats used over the years. Occasionally simultaneous sessions have been held, with one session devoted to talks about teaching, the other to talks about mathematics, for example. Meetings in recent years have consisted of series of invited talks only, often with a national officer and other major figures talking usually on mathematical topics. This format makes the Section unique among MAA sections. Most are offering programs with a mix of invited and contributed papers, often with student papers as well.

Perhaps the format of the Northern California Section meeting is to some extent influenced by geography. In many sections the institutions are

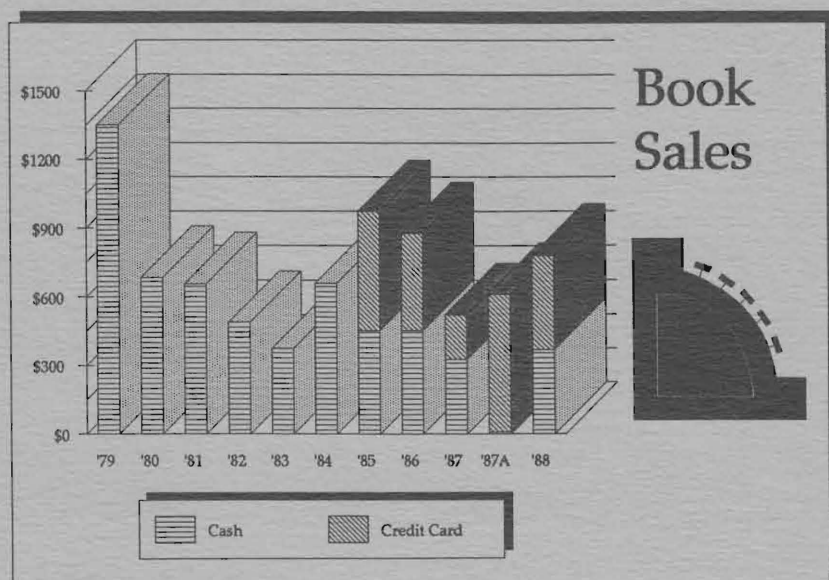
fairly uniformly distributed throughout the section so almost all of the people attending a meeting have to drive considerable distances. This is particularly true in the southwest and mountain states. In these sections two-day meetings are common. Population in the Northern California Section is heavily concentrated in the San Francisco Bay Area, however, so the officers have been reluctant to risk having a meeting too far removed from the heaviest concentration of members. Our members drive to the meeting for the day; few, other than those from Nevada or the north coast counties, would find it necessary to stay overnight.

Earlier meetings seem to have had more strictly pedagogical sessions, and there have been from time to time panel discussions on timely issues. There have been fewer of these in recent years, possibly because there has been less excitement about curricular changes and such. Certainly in the 1950's and 1960's one can find evidence in the programs of the work of the School Mathematics Study Group and the Committee on the Undergraduate Program in Mathematics, both generously funded and influential at that time.

In 1977, at the meeting at San Francisco State, the Section began to sponsor meetings of Department Chairs and MAA Departmental Representatives immediately following the final session of the day. These have been continued. They have been organized by the Section Governor and usually there has been some formal discussion of topics of current interest. Refreshments are served. These meetings have been highly successful and are well-attended. Also in 1977 the Executive Committee decided to have a panel discussion immediately following lunch. This proved popular so in subsequent years up to the present time, there have been luncheon speakers, usually talking on subjects a bit lighter than those of regular hour talks.

Kenneth Rebman when he was Section Governor organized an MAA book sale at the meeting in 1979 and these have continued to the present time. In 1984 Alice Kelly of Santa Clara University took over the organization of book sales at meetings. The number of MAA books sold at our one-day meetings has been surprisingly large.

The programs themselves have reflected the times. In the early years of the Section, one sees the effects of the war, with talks entitled "Mathematics in our schools and its contribution to war" (1943) and "The new military training



programs in colleges and universities" (1943). After the war we find "Refresher courses for returning students" (1947). And fashions in the mathematical community at large are reflected in the programs of the Section. There were early talks on computing: "The impact of high speed computing on mathematics" (1947), "Electronic digital computers" (1953), and, eventually, "Some observations on teaching mathematics for the computer age" (1957). During the late 1960's and the 1970's, applications were often featured in the *Monthly*; they also appeared in the programs of the Section: "Mathematical foundations for national economic planning" (1966), "Some mathematical problems associated with the study of elections" (1971), "Artificial intelligence and robots" (1972), and "A recent example of applied mathematics" (1975), among others. And in 1988 the President-Elect of the Association, Lida K. Barrett, spoke on "Calculus for a new century."

Concern for the applications of mathematics may have been strengthened by the arrangement the Section had with the local section of the Society for Industrial and Applied Mathematics between 1972 and 1981. During that period the meetings were held jointly with the SIAM section, though most of the arrangements were the responsibility of the MAA Section and by far the



George Pólya

larger number of those attending were members of the MAA.

Among those who have spoken to the Section over the years, George Pólya wins the prize for the most presentations: 15 appearances, the first in 1943, the last in 1979. Between 1946 and 1952 he spoke at every meeting of the Section. A number of these were previews of books yet to come--one talk had the title "How to solve it"--but his talk in 1969 entitled "Some mathematicians I have known" was possibly the most popular of all and was later published in the *Monthly*. There is a tie for the position of runner-up: C. M. Ful-

ton of the University of California, Davis, and Raphael M. Robinson of the University of California at Berkeley. Both have appeared 8 times before the Section.

The list of speakers over the 50 years has represented the best in mathematical exposition and has included some of the truly great names of American mathematics. There were Fields medalists, many members of the National Academy of Sciences and, occasionally, distinguished foreign visitors. Some reported on their own spectacular achievements: Paul Cohen on his work on the continuum hypothesis, Julia Robinson on Hilbert's Tenth Problem, among others.

In 1987 a Section meeting was held at the Manoa campus of the University of Hawaii, as part of a meeting of the American Mathematical Society. The Section obtained a special grant of \$1670 from the national office of the MAA to cover some of the expenses of the meeting. There was some discussion about the possibility that Hawaii (the Pacific Rim) might now have enough members to justify the organization of a separate MAA Section. There are 80



C. M. Fulton



Raphael M. Robinson

MAA members in Hawaii alone. Attendance at the Hawaii meeting indicated, however, that a separate section is not a practical possibility at this time. The Northern California Section may continue to hold occasional joint meetings there with the AMS.

- *Influence on Education*

Over the many years the Section has been concerned with curricular matters at the college and university level but also in the preparation of high school students for college level mathematics. At the second meeting of the Section, the following resolution was passed: "The Northern California Section of the Mathematical Association of America and those in attendance at the meeting of the Section wish to go on record as favoring that a program of mathematics be provided in the secondary schools, beginning normally with algebra in the ninth year, to be available for those who wish to elect it or who otherwise need it in preparation for college work. It is felt that a capable student should be able to secure solid geometry and trigonometry in the

secondary school." With perhaps a few changes in the names of courses and the years referred to, one could imagine such a resolution being passed at meetings throughout the Section's history.

For a number of years there was a Committee on Mathematical Education sponsored jointly by the Northern and Southern California Sections. Established in 1941, Sophia Levy was the first chair. The membership of that first committee was distinguished: C. G. Jaeger (Pomona College), E. B. Roessler (University of California, Davis), S. E. Uner (Los Angeles City College), W. M. Whyburn (U.C.L.A.), H. M. Bacon (Stanford) (*ex-officio*), and G. C. Evans (University of California, Berkeley) (*ex-officio*). The second chair was F. R. Morris (Fresno State). During his chairmanship the Committee worked to raise the requirements for the state general secondary credential. Roy Dubisch wrote in his history of 1960, "These requirements certainly provide that the holder of a credential with a major or minor in mathematics would at least be fairly adequately prepared. In 1952, however, the committee pointed out the system was not working very well in practice, since far too many of the mathematics teachers had a general secondary credential but lacked even a minor in mathematics. A resolution was then passed urging that all candidates for the general secondary credential be provided with at least enough mathematical training to insure competence in the teaching of arithmetic. Now after some years of inactivity, the committee, with H. Stewart Moredock (Sacramento State) as chairman, has recently been reactivated as a standing committee of the Section, with its immediate problem that of the latest credential reform movement of the State Department of Education."

In 1957 Robert Herrera, Secretary of the Southern California Section, wrote to Professor Dubisch to inquire about the members of the Northern California Section on the Joint Committee on Mathematical Education. He pointed out that the representatives from the Southern California Section were Paul B. Johnson (Occidental College), Frederick A. Valentine (U.C.L.A.) and May M. Beenken (Immaculate Heart College). Professor Dubisch had to write that as far as he could tell, the terms of all the Northern California representatives had been allowed to expire. He did, however, write to a recent member of the Committee, Charles A. Hayes (U.C. Davis), to inquire whether he knew the names of the other members. Professor Hayes admitted he did not know who the other members were because the Committee had never met during the time he was on it. At that point the Chair of the Section did

appoint representatives to the Committee: Harold M. Bacon, G. C. Preston (San Jose State), and D. H. Lehmer (U.C. Berkeley). The Committee immediately began discussions of the proposed revisions of the California Teaching Credential then pending. The Committee was also charged with finding liaison officers to work with the Academy of Sciences on programs that were to receive NSF support.

Kenneth C. Skeen, then President of the California Mathematics Council, approached the Section in 1960 about setting up a joint Committee on Mathematics Education to look at questions of credentials, accreditation of high schools and such. The Committee was formed and met for the first time in Berkeley in October of 1960. The Section representatives on the Committee were H. Stewart Moredock (Sacramento State College), Chair, Harold M. Bacon, and Albert Burdette (U.C. Davis).

In 1969 a Teacher Education Committee was again formed to monitor "all questions affecting mathematical education in California." Appointed by the Chair of the Section, Mary V. Sunseri (Stanford), the Committee consisted of H. Stewart Moredock, Chair, David W. Blakeslee (San Francisco State), David G. Mead (University of California, Davis), Henry J. Osner (Modesto Junior College), and Glenn L. Reynolds (Berkeley High School).

In the 60's the Section may have turned its attention more to what was happening in undergraduate education. In 1963 the Section "adopted a resolution authorizing its officers to cooperate with the Southern California Section in holding meetings involving all mathematics and education departments of teacher training institutions in the two sections for the purpose of implementing the CUPM recommendations for mathematical education of prospective elementary teachers. It is hoped that every school will be able to introduce all of the four recommended courses proposed in the CUPM reports." In 1966 the Section formed a committee to evaluate the CUPM Report on "A General Curriculum in Mathematics for Colleges." The committee consisted of E. Maurice Beesley (University of Nevada, Reno), David W. Blakeslee, Charles A. Hayes, C. B. Morrey, Jr. (University of California, Berkeley), Irving Sussman (Santa Clara University), George Wallace (College of San Mateo), and L. H. Lange (San Jose State) as Chair. The report was forwarded by the Section to the Board of Governors following the meeting at Davis in February, 1967.

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Though there was no direct involvement by the Northern California Section, it is worth noting here that one of the first areas (one of three) to be covered by the Women and Mathematics program of the MAA was the San Francisco Bay Area, with the local program being directed by Jean Pedersen (Santa Clara University). The first program was held in 1975-76. In 1980 responsibility was taken over by Alice Kelly (Santa Clara University), who expanded the program to include all of Northern California. She continued in this role until she was made associate national director in 1985, at which time Ann Preston (Santa Clara University) became coordinator for Northern California. In 1988, Alice Kelly became national director, and that same year Jean Chan (Sonoma State University) became coordinator for Northern California. Women and Mathematics sends women mathematicians (and other scientists using mathematics) from academe and industry to schools to speak to students and consult with faculty and students in order to encourage wider interest in mathematics among high school and middle school students, especially girls. In 1987 the program sponsored 101 visits reaching approximately 5400 students and roughly 400 teachers in Northern California. It is interesting to note that the national program with 16 regions covered 400 schools, 25,700 students, and 2900 teachers, making the Northern California part of the program very roughly 1/5 of the whole program. There are 60 professional scientists making the visits in this area.

The Section organized a joint effort between the Northern and Southern California Sections in 1978 to distribute approximately 50,000 copies of the brochure "The Math You Need in High School for College" to the high schools in the Section. A grant of \$300 from the national office of the MAA was received to support this project. The project was initiated by Jane Day of the College of Notre Dame, later of San Jose State.

In 1980 the Section, at the urging of Professor Day, initiated a "Math Blitz," the aim of which was to send to every high school in the Section a mathematician sometime during the year. The object was to encourage students to take as much mathematics in high school as possible in order to increase the variety of career options they would have open to them. A section grant was requested and received from the national office of the MAA. Professor Day coordinated the program, assigning high schools to colleges in the region. The project fell short of initial expectations, but 152 high schools were visited and 75 talks were given by the visitors. The reports from the

schools were very favorable. In some areas there was considerable publicity on local television and in the newspapers. The project was continued into 1981 but was discontinued in 1982.

Upon a request for sponsorship from R. S. Cunningham (California State University, Stanislaus), the Executive Committee of the Section decided to sponsor a three-week summer course entitled "Computer Graphics for Mathematicians," held at Stanislaus between July 28 and August 15, 1986. No financial commitment was involved. It was the first such course sponsored by the Section; 15 people attended.

- *High School Contest*

The first high school contest sponsored by the Northern California Section was held in 1956. The test prepared by the Metropolitan New York Section was used and this procedure was repeated in 1957, but in 1958 the contest prepared by the national committee of the MAA was used. In 1957 the Section had voted unanimously at a business meeting to encourage the establishment of a national high school mathematics contest.

David W. Blakeslee (San Francisco State) was the first Contest Chair for the Section and continued in this role until 1964, when he resigned because of poor health--he had experienced a severe heart attack in November of 1963. John Hancock (California State College, Hayward) took over direction of the contest for a year. Jesse K. Peckenham of the Oakland Public Schools succeeded him and served until 1966, when he was replaced by William H. Landis of the Contra Costa County Department of Education.

During the early years Blakeslee oversaw an enormous growth of the Contest. In 1956 there were 72 schools and 2100 participants, but by 1960 this had grown to 257 schools and 10,165 participants. By 1963 Professor Blakeslee was reporting over 15,000 participants. Currently approximately 17,000 students from roughly 185 schools are taking the contest.

Bill Landis retired as Contest Chair in 1977 and was succeeded in 1978 by Robert McFarland of the Alameda County Office. McFarland, though no longer with the Alameda County Office, continues to act as Contest Chair for

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Northern California.

In 1966, when Peckenham was Contest Chair for the Section, the Hawaii group decided to run the Contest separately under the direction of R. K. Coburn (Church College of Hawaii). He was succeeded in 1975 by M. Watabe (Brigham Young University) in Hawaii, who served one year and was succeeded by Jack V. Johnson of BYU. At that point the Hawaii coordinator assumed responsibility for Guam as well, though Guam got its own coordinator in 1984 when Gail Mullen took over for Guam. Elaine Spendlove has served as Hawaii coordinator since 1986. Nevada remained as part of the Northern California region until 1985 when Donald Pfaff (University of Nevada, Reno) took over responsibility for that state.

Fund raising for the High School Contest has generally been done independently of the Contest Chairman. The financial support for prizes comes from industrial and insurance firms in the area. At the beginning of the contest the fund raising was coordinated by David Blakeslee, working with people in the Society of Actuaries, represented at the beginning by A. C. Olshen of the West Coast Life Insurance Company and, later, during the 60's by Barrett N. Coates, Jr., a consulting actuary in San Francisco. In 1964 the fund raising was taken over by Lester H. Lange. Charles Hayes of the University of California, Davis, succeeded Lange in 1966 and in 1978 this fund-raising responsibility was passed along to David Barnette of Davis, who has continued until the present.

- *Visiting Lecture Program*

In 1957-58 the Section started a Visiting Lecture Program that sponsored lectures in the high schools by college and university level mathematicians or mathematicians from industry. In that first year 23 high schools were visited. In 1958 the MAA set up a committee on high school lectures and received a grant from the National Science Foundation. These grants continued for some years and provided for fairly extensive visits in Northern California. During this time Roy Dubisch (Fresno State) coordinated the program for the Northern California Section, except for 1958-59 when C. M. Larsen (San Jose State) served as coordinator and 1961-62 when responsibility for the program was taken on by Max Kramer, also of San Jose State. At this point Professor Kramer coordinated visits in Northern California and Nevada, with

the help of local coordinators at institutions scattered through the two areas. This pattern continued with subsequent directors of the program. In 1961, a visiting lecture program was run for the first time in Hawaii. The director there was Ruth E. M. Wong.

During the period of NSF funding through the MAA, Maurice Beesley (University of Nevada, Reno) directed the lecture program for Nevada. And because of the difficulty involved in getting lecturers from California institutions to high schools in California on the eastern slopes of the Sierra Nevada, lecturers from Nevada were often called on to visit those schools. Similarly, on occasion, faculty from Southern Oregon College in Ashland were asked to visit high schools in the extreme northeastern corner of California, places not easily accessible even to lecturers from Humboldt State.

In 1963 Professor Larsen, who was then coordinating the program, could report visits to 63 high schools by faculty from 11 colleges and universities in the Section. Until 1964 the National Science Foundation continued to support the program through grants to the Buffalo office of the MAA, which then distributed the funds to individual programs in the Sections. In 1964 the Foundation announced plans to organize the lecturer programs along other lines. Rather than fund a national organization in one discipline, the Foundation proposed to fund local academies of sciences so that the grant would be made to a regional organization, which would sponsor lectures in a wide range of the sciences. This was not good news for the mathematics programs since the mathematical community has not generally been strongly represented in the state academies of sciences.

The Secretary-Treasurer of the Section at that time, Joel Brenner of Stanford Research Institute, along with the chair of the MAA Committee on Visiting Lectures, Harvey M. Gelder, met with officials of NSF in Washington. They argued long and hard for continuing the national program through the central office of the MAA, but the best they could get was a concession from the Foundation, that a local section of the MAA (through a university in the section) could propose a lecture program, even though it would be in one discipline. G. L. Alexanderson (Santa Clara University) had become director of the lecture program for the Section in 1964. Under the new guidelines, Alexanderson wrote a proposal for a grant from the Foundation, to be administered through Santa Clara University. The grant was received for 1965-66,

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and such grants continued for the next year. During this time a member of the Section, Harold Bacon, chaired the national Committee on Secondary School Lectures. There were many discussions with the Foundation on ways of continuing NSF support for these programs. Nevertheless, by 1967 the National Science Foundation withdrew all support from visiting secondary school lecture programs.

The Section, convinced that the lecture programs had value, continued to support the program on a much reduced scale using some Section funds and money from the Contest Committee. Each year the Contest Committee had some funds left over after expenses from sales of the contests to the schools. When this surplus would build up, an allocation of funds was made to the Visiting Lecture Program. This method of funding continues to this day.

Alexanderson continued to direct the lecture program for the Section until 1970, when responsibility for it was assumed by Leonard F. Klosinski (Santa Clara University). Alexanderson later resumed direction for a short time, before turning it over to Donald Pfaff (University of Nevada, Reno) in 1986. With NSF funding many visits could be made--in 1964-65, for example, 42 lecturers visited 87 schools widely separated geographically in the Section. A lecturer could even go out for a whole week, sometimes visiting two schools a day. With the new guidelines from NSF in 1965, there was an emphasis on sending lecturers from nearby colleges if possible in order to encourage closer future contact between the high school and the college. With the departure of NSF from the scene and very limited funding available from the Section and the Contest Committee, naturally the program was much curtailed. Because schools in large metropolitan areas generally have access to a wide range of speakers and visitors, those who directed the lecture program in later years concentrated on sending speakers out to the more remote parts of the Section. In a typical year, say 1971-72, 12 speakers were sent on visits to 19 schools. The program has been kept alive, though getting together funds has been a constant problem.

- *Section Newsletter*

In the early 60's the Secretary-Treasurer produced a one-page newsletter for the members of the Section, but this was discontinued by the mid-60's.

It wasn't until 1976 that the Executive Committee began discussions on establishing a more formal Section newsletter with a separate editor. The following year the newsletter appeared with Henry Osner (Modesto Junior College) as editor. William Chinn (City College of San Francisco) succeeded him in 1981 and has continued to edit the Newsletter up to the present time. The Newsletter (in recent years called "MAA Nor-Cal Mini-Focus") comes out in the fall, prior to the annual meeting.

● *Awards and Resolutions*

Over the years the Section has made a number of awards or presentations at its annual business meetings. Winners of the William Lowell Putnam Competition residing in the Section have often been recognized at the Section meetings and awarded memberships in the MAA.

In 1960 Roy Dubisch of Fresno State had written a short history of the Section. Long active in all aspects of the Section's work, in 1961 Professor Dubisch decided to leave the Section to take a position at the University of Washington. At the January meeting that year the Section passed the following:



Roy Dubisch

"BE IT RESOLVED: That the Northern California Section of the Mathematical Association of America express its sincere appreciation to Professor Dubisch for his numerous efficient and effective activities for the improvement of this section, these having been carried out as Chairman and Secretary-Treasurer of the section, as Chairman of the Visiting Lectureship Committee of the section, and as an active, concerned member of the section."

At the 1969 meeting at Santa Clara, the First Vice-President of the MAA, Victor Klee, presented to George Pólya the Blue Ribbon Award (in the category 'Mathematics and Physics') of the 1968 American Film Festival of the Educational Film Library Association for his film "Let Us Teach Guessing."



Henry L. Alder

his long and devoted service to the Northern California Section and as Secretary" of the MAA. The presentation was made by Harold M. Bacon.

In 1979 Professor Bacon delivered a eulogy for Karel de Leeuw who had been killed in August, 1978, in his office at Stanford.

The Section designated George Pólya "Honorary Chairperson of the Section Meetings of the Northern California Section of the MAA" at its meeting in 1980. An appropriate citation was presented to Pólya at that time.

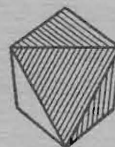
Franklin Sheehan, Executive Dean at San Francisco State, presented at the meeting at California State College, Hayward, in 1972, a tribute to David W. Blakeslee who had served the Section in many capacities, but not least as High School Contest Chair for a number of years. Professor Blakeslee had died in 1971 after a series of heart attacks.

In 1973 C. D. Olds (San Jose State) was recognized by the Section for his having been awarded the Chauvenet Prize by the MAA.

At the 1975 meeting at Menlo College, a gift and tribute were accorded Henry Alder "for

At the summer meetings in Providence in 1988, Harold M. Bacon was awarded the first Certificate of Meritorious Service for a member of the Northern California Section. Professor Bacon was a charter member of the Section, served as Secretary and Chair, and also served two terms on the Board of Governors of the MAA.

At the February, 1989 meeting of the Section, an award for outstanding service to the Section will be made to E. Maurice Beesley of the University of Nevada, Reno. Professor Beesley was Chair of the Section in 1965 and served for many years as the Nevada representative to the Executive Committee.



ORGANIZING THE NORTHERN CALIFORNIA SECTION, 1939 LIFE AND TIMES BEFORE AND AFTER

by Harold M. Bacon
Stanford University

When I was asked if I would make a little talk at this luncheon, it was suggested that, perhaps, I might tell you something about what mathematics was like at Stanford "in the olden days," or that I might give you a brief account of the organizing of our Northern California Section. It occurred to me that I might do a little of both, so I shall take the liberty of "setting the stage" of the early thirties as a background for the organization of the Section in 1939. As a start I checked the *Monthly* for 1933 and found in the membership list of the Association that there were 31 individual members and 1 institutional member (St. Ignatius College) in Northern California and Nevada as follows: Atascadero 1, Berkeley 12, Chico 1, Davis 1, Fresno 2, Morgan Hill 1, Oakland 1, San Francisco 3, Stanford-Palo Alto 6, Stockton 1, and Reno, Nevada, 2. A similar check in the 1939 *Monthly* shows a total of 30 individual members (similarly distributed) and no institutional members. Clearly, this was not a period of spectacular growth! In fact, our mathematical community was pretty much scattered with a concentration in the San Francisco Bay Area. There were occasional regional meetings of the American Mathematical Society in the neighborhood, but even these were not heavily attended. Our situation is illustrated by a remark made by Stanford's Professor Uspensky.

He, Professor Blichfeldt, Max Heaslet, and I were riding in Blichfeldt's car to one of these mid-thirties meetings in Berkeley. We speculated upon the number of colleges, universities, other organizations, that would have members at the meeting. One of us guessed ten, another a dozen. It was remarked that, if the meeting were in New York, there would be a hundred or so. Whereupon Uspensky said very solemnly, "Yes. We must recognize that we live in a remote province."

But, to look ahead for a moment, I can tell you that in 1949 there were 91 individual members of the Association in our area, and by 1960 there were 500.

Stanford in the 1930's was Stanford during the Great Depression, and funds were hard to get to finance such things as visiting lecturers, faculty and conferences. All of our educational institutions were on short rations. But some skillful and sympathetic administrators somehow managed to squeeze out some modest sums for such purposes. For instance, at Stanford we were fortunate to have Harald Bohr for the full year 1930-31, and in the summer quarters we were able to have as visiting faculty Edmund Landau (1931), Gordon Whyburn (1932), Marshall Stone and George Pólya (1933), Dunham Jackson and Dick Lehmer (1934), Gábor Szegő (1935), Rudolph Langer (1936), Lawrence Graves (1937), Gordon Whyburn (1938), Emil Artin and Arnold Dresden (1939). Our regular full-time mathematics faculty was 9 in 1930-31 and 7 in 1938-39; last year (1984-85) it was 31. In these pre-war depression years times were tough, but we had good work and good fun just the same. I could tell you dozens of stories, but I shall spare you all but a few. I intend to break the rule that a professor always talks for at least 50 minutes.

I mentioned our Professor Uspensky a moment ago. He was a kind and gentle, soft-spoken man; quite formal in manner. But he liked to seem to be quite "tough"--once I was at his home at a small gathering of graduate students, and he was making a vigorous argument upon some political theme. Suddenly he drew himself up and announced, "I have Tartar blood in my veins. That is why I am so fierce!" And once he gave me reprints of two of his papers that he had written in Spanish and published in an Argentine journal. I thanked him, but had to confess that I could not read Spanish. "Well", said he sternly, "Learn it!"

Bohr was a very kind man. For instance, I remember my being in Professor Blichfeldt's office shortly after I returned to Stanford in 1930 to continue my graduate work after my master's degree and a year's absence working for an insurance company under the mistaken impression that I wanted to become an actuary. Blichfeldt and I were discussing my getting started on work that might lead to a dissertation. Just then Bohr came into the office. Blichfeldt turned to him and, indicating me, said "Here's a man who is looking for a thesis topic. How would you like to suggest one, and then be his adviser?" Bohr bowed, smiled and very courteously replied, "I should be honored." He generously acted as my supervisor for the remainder of the year he was at Stanford. When he left, I was most fortunate to have Uspensky take over and see me through the completion of my work on the dissertation. It was indeed a great privilege to have two such inspiring men as my friends and advisers at the beginning of my career. You may sense that in those days procedures and academic "red tape" were minimal!

Landau was a man of commanding presence with a real sense of humor, an enthusiastic lecturer, meticulously dressed in a somewhat formal fashion. He was particularly annoyed by chalk dust. In those days the blackboards in our Department classrooms were of black slate, and we had rather soft chalk--white, yellow, red, green and other colors. Landau would write in unusually large script, quickly filling the front blackboards. He would sometimes dart about the room and write on the sidewall blackboard--once he even clambered over a couple of chairs to get to the board on the back wall. But then, the boards must needs be erased so that the writing could go on. Landau abhorred the usual felt erasers--too much dust. So, on the first day of his 8:00 and 9:00 o'clock classes, his assistant brought in a granite-ware kettle in which were a sponge and some water. Since she adamantly refused to use the sponge on the blackboard, Landau himself (shades of Göttingen with assistants who did the erasing!) would grasp the sponge, wring the water out onto the floor, make some passes at the board, and then call upon one or two students or visitors to his lecture to come up and dry off the slate with paper towels. A very ineffective method of drying! The lecture would continue. But the slate was still slightly wet, so half of the chalk marks didn't show. However, eventually the board dried, and normal conditions returned. But, the paper towels usually got onto the floor where they mingled with water and various scraps of white, yellow and red chalk. After two hours of being walked on, these additions to the bare wood floors produced a, shall we

say, somewhat cluttered appearance. As it happened the 10:00 o'clock class that followed these first two classes in this classroom was a course in Education--something like "The Administration and Care of the School Building and Classrooms". I fear that those students had a rather spectacular illustration of the neat and orderly classroom! Incidentally, on the last day of classes, Landau made a graceful and humorous farewell speech in his heavily accented English. His last "Goodbye" ended with the request, "Please preserve the sponge to remember me by!"

Landau's MWF 8:00 o'clock class was a graduate level course, "Selected Topics from the Theory of Functions," while the MTWThF 9:00 o'clock class was primarily intended for high school teachers and other interested students on "Foundations of Arithmetic"--essentially Landau's *Grundlagen der Analysis*. Toward the end of the quarter Landau and his wife gave an evening party to all of his students in the faculty home they had rented on the campus. It began at about 8:00 p.m., and there were excellent and bountiful refreshments, good conversation, amusing "parlor games", good fun. As time passed rapidly, and the clock neared midnight, and even after, people decided that they really ought to go home, so they gradually said their thanks and goodbyes. It turned out that Landau feared that people had not had a good time because they did not stay on until 4:00 a.m. or thereabouts--that seems to have been the time the Göttingen parties usually broke up.

Besides being a distinguished mathematician and teacher, Dunham Jackson (University of Minnesota) was an inspired composer of limericks of the quite respectable sort! In fact, he and I had a fairly extensive correspondence in limerick form, each limerick written and mailed on what we used to call a "penny postcard". I had purchased Jackson's book, *The Theory of Approximations*, Vol. XI of the American Mathematical Society Colloquium Publications, and I took it into his office and asked him to autograph it. I suggested that, in doing so, he write a limerick for me. He immediately picked up the book and without lengthy cogitation wrote on the flyleaf:

There was a young fellow named Bacon
Whose judgement of books was mistaken
In a moment too rash
He relinquished some cash
And his faith in the author was shaken (Aug. 17, 1934)

I must add that my faith in the author was by no means shaken; it was greatly reinforced!

I remind you that the thirties were years of depression and shortage of funds. They were times when prices, as viewed today, were not up to our present-day inflated terms. I give you one illustration--this is, of course, the sort of thing we "old-timers" enjoy talking about. It happened that my undergraduate class in Non-Euclidean Geometry in the spring quarter of 1936-37 decided it would be fun to have a picnic at the beach. The class consisted of ten students, mostly juniors and seniors. I agreed to cook the meat over a wood fire on the beach at Aptos, and our department secretary, Mrs. Boles, and I went to the meat market to buy lamb chops for the lunch. We bought the very best lamb chops available, and the price per chop was 15 cents...the other day such lamb chops cost my wife \$6.00 per pound (including the bone!). I am reminded of this, because one of the students in that class is now an Emeritus Professor in Stanford's School of Engineering, and he and I were talking about that picnic and old times just a few weeks ago.

I should now like to give you a brief sketch of the organizing of the Northern California Section. We have been talking of the 1930's and a rather scattered mathematical community here in the northern and central part of the state, and the perception was growing of the need for a more closely organized group of those interested in the particular concerns of the Association. The Southern California Section had been organized in Los Angeles on Saturday, February 28, 1925. I quote from the report of that meeting that appeared in the *Monthly*: "There were forty-six present...A constitution was adopted and the following officers elected: Professor Harry Bateman, California Institute of Technology, *Chairman*; Professor H. C. Willett, University of Southern California, *Vice-Chairman*; Professor P. H. Daus, University of California, Southern Branch, *Secretary-Treasurer*; Professor Daus, Professor W. P. Russell, Pomona College, and Mr. G. R. Livingston, San Diego Junior College, *Program Committee*..." So the Southern California Section had been in existence and, with its able leadership and interested constituency, had been thriving for several years. I suppose some of us thought that what Los Angeles could do, San Francisco could do--and maybe do better!

If I were asked to suggest three or four individuals who supplied much

of the impetus for starting the organization of the Northern California Section, I should mention Professors Sophia Levy (later Sophia Levy McDonald) and G. C. Evans of the University of California, Mr. A. L. McCarty of San Francisco Junior College, and Professor Gábor Szegő of Stanford University. On Saturday, January 28, 1939, twelve members of the Association met with forty-eight other interested persons at Galileo High School in San Francisco to establish the Section. These twelve members were: H. M. Bacon, Stanford; C. E. Corbin, College of the Pacific; G. C. Evans, University of California; Emma V. Hesse, University High School, Oakland; R. D. James, University of Saskatchewan; Sophia H. Levy, University of California; A. L. McCarty, San Francisco Junior College; F. R. Morris, Fresno State College; Falka G. Sturges, San Francisco Schools; Gábor Szegő, Stanford; R. K. Wakerling, Texas Tech, Lubbock; Harriet A. Welch, Lowell High School, San Francisco. By-laws had been prepared and were duly adopted and later approved by the Board of Governors. Officers elected for the first year were A. L. McCarty, *Chairman*; Sophia H. Levy, *Vice-Chairman*; H. M. Bacon, *Secretary-Treasurer*. You will be interested to note that "On presentation of a request that the Section name a person to serve as associate editor of the *California Journal of Secondary Education*, the Secretary was instructed to cast a ballot for Mrs. Ruth G. Sumner, Oakland High School". She was at that time an applicant for membership in the Association, and she served very effectively for many years as an associate editor of the *Journal*.

Perhaps you will be interested in the formal program presented at this first meeting. Here it is

1. "Some adventures in teaching mathematics to freshmen" by M. J. Polissar, San Francisco Junior College
2. "Physical geometry" by Prof. V. F. Lenzen, University of California
3. "Some qualitative properties of the solution of linear differential equations of the second order" by Prof. G. Szegő, Stanford University
4. "Contemporary viewpoints in the teaching of plane geometry" by J. W. Hoge, University High School, Oakland
5. "The place of mathematics in secondary education" by Adeline Scandrett, Mission High School, San Francisco.

I certainly shall try to avoid reducing my audience to a state of post-prandial somnolence by listing the programs of all the subsequent meetings of

the Section, but, possibly a few "highlights" from programs of two or three of the early meetings may prove of interest. For instance, at the 1940 meeting, in addition to the regular program, Prof. C. B. Morrey of the University of California "described the new publication, *Mathematical Reviews*." Also at this meeting we adopted the first of a number of resolutions urging the strengthening of mathematics programs in our schools.

The years just preceding the formation of our Section were, as already noted, years of the great depression. Then, shortly before our fourth meeting the United States entered World War II. We succeeded in keeping the Section active and, of course, our programs exhibited the concerns and activities connected with the war. Here is part of the report of the fifth meeting held at the University of San Francisco on Saturday, January 30, 1943. (I quote from the *Monthly*.) "Professor E. B. Roessler, Vice-Chairman of the Section, presided at both morning and afternoon sessions in the absence of Dean Fredrick Wood, the chairman, who was unable to be present. During the noon recess, members and visitors were the guests of the University of San Francisco at a luncheon served in 'The Lounge' of the University..." The attendance at the two sessions was 75, including 24 members of the Association. Travel was not so easy during war time as now, and I remember Dean Wood found it impractical to come from Reno at that particular date. Incidentally, the luncheon mentioned was served by the Mother's Club of the University of San Francisco--and putting together such an excellent repast was not a simple matter during those days of rationing and shortages. Among the 8 papers presented were the two "Mathematics in our schools and its contribution to the war" (Sophia Levy) and "The new military training programs in colleges and universities" (Frank Morris). The other papers were on more conventional subjects and were by George Pólya, K. J. Waider, J. H. McDonald, W. P. Berggren, A. L. McCarty and J. V. Uspensky.

Also at this meeting, the Section passed a resolution endorsing a statement that had been adopted and circulated by the Subcommittee on Mathematics of the California Committee for the Study of Education. This had fairly wide circulation and it called for, among other things, (and I quote) schools to continue to place "emphasis on basic and fundamental parts of the subject treated. Such applications as are given, and there should be as many as possible, should be primarily for the purpose of illustrating and giving training in the basic mathematics," and so on. You probably have noted that this is

a recurrent theme in resolutions of this sort, and it is one that many of us, I am sure, believe needs continual emphasis. I mention this item to underline the fact that our Section has been, and remains, vitally interested in fostering sound instruction at all stages of mathematics education.

In this last connection, let me quote from *The Mathematics Teacher*, the official publication of the National Council of Teachers of Mathematics, Vol. 36 (1943), pp. 326 ff. "In December 1942 at a meeting of County Representatives of the National Council of Teachers of Mathematics held at Stanford University, a state organization of teachers of mathematics was formed. Its purposes are to supplement and extend the work of the National Council, and disseminate the news and progress reports of what is being done in California, as well as to sponsor studies on the improvement of the teaching of mathematics to meet the crisis (i.e., World War II)." This was the genesis of the California Mathematics Council. Later on with its steady growth it was subdivided into the present Northern, Central, and Southern California divisions. This lively and influential organization, primarily but certainly not solely concerned with secondary school mathematics, is a valued collaborator with our California Sections of the Association. The first president of the group was our Mrs. Ruth Sumner, and she and many members of the Association were and are associated with this fine organization.

As early as 1941, a joint committee on mathematical education was established with the Southern California Section under the chairmanship of Sophia Levy. Its purpose was "to study means of strengthening the program of mathematics in schools and colleges." I do not wish to give you the impression that the major effort of our Section was to view with alarm the inadequacies of the mathematical competency of the general population as strikingly illuminated by wartime needs. We did what we could to call attention to such problems, but the main emphasis in our programs was always on mathematics, the enhancement of knowledge, appreciation and enjoyment of it. By 1950 the Section was well established, the rigors of the war years were replaced by a rapid and continually increasing realization of the importance of our subject. It is not my intention to attempt to give a history of the Section beyond these first few years--there is far too much to be said! Perhaps a quick glance at the program presented at the January 28, 1950 meeting of the Section at the University of California, Berkeley will be of interest as indicating the kind of programs we have had, and continue to have to this day. Seventy-six people

attended including 47 members of the Association. Here is the program:

1. "On the birectangular quadrilateral" by Prof. Fulton, U.C. Davis;
2. "The M.A. degree in mathematics as offered at San Jose State College" by Prof. Myers, San Jose State;
3. "Let us teach guessing" by Prof. Pólya, Stanford;
4. "Games of strategy" by Prof. Tucker, Princeton (one-hour invited address);
5. "Note on elementary function theory" by Prof. Kelley, U.C. Berkeley;
6. "A classroom note" (about E. T. Whittaker's method for finding the roots of power series) by Prof. Olds, San Jose State;
7. "A slant on the problem of crossed ladders" by Prof. Arnold, U.C. Davis.

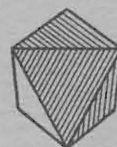
I have brought you up to 1950 and I shall stop there, although there are a great many things that should be said if this talk were to try to give a reasonably complete history of the Section up to the present time. But such is, of course, not my purpose. I hope these few remarks may have been of some interest to you. I recall that our Section Newsletter, in noting that this February 22nd meeting would be here at Davis, included (in very small print) the words, "*Bacon* for lunch, anyone?" Well, the rest of the lunch was very good, and I hope you also enjoyed the Bacon part! So thank you very much for your patience and your kind attention. Cheerio!

Presented at the meeting of the Northern California Section of The Mathematical Association of America at the University of California at Davis, February 22, 1986.



Past Officers

First Row: Charles A. Hayes, Ruth Anne Fish, Mary V. Sunseri, Leonard F. Klosinski, Jean J. Pedersen, Gerald C. Preston; Second Row: E. Maurice Beesley, William G. Chinn, Roseanna Torretto, Carroll O. Wilde, Stanley P. Hughart, Lester H. Lange, Hugh M.W. Edgar; Third Row: G. Thomas Sallee, Michael Thibodeaux, Kenneth R. Rebman, Henry L. Alder, Donald J. Albers, Gerald L. Alexanderson, John A. Mitchem, Howard J. Weiner



OFFICERS OF THE SECTION

- *Chairs*

1939	A. L. McCarty, San Francisco Junior College
1940	Sophia H. Levy, University of California
1941	F. R. Morris, Fresno State College
1942	Fredrick Wood, University of Nevada
1943	E. B. Roessler, University of California, Davis
1944	Gábor Szegő, Stanford University
1945	Pauline Sperry, University of California
1946	W. H. Myers, San Jose State College
1947	George Pólya, Stanford University
1948	Griffith C. Evans, University of California
1949	Harold M. Bacon, Stanford University
1950	S. A. Francis, San Mateo Junior College
1951	D. H. Lehmer, University of California C. D. Olds (Acting Chair), San Jose State College
1952	R. M. Robinson, University of California
1953	Roy Dubisch, Fresno State College
1954	John G. Herriot, Stanford University
1955	C. C. Torrance, U.S. Naval Postgraduate School
1956	Henry L. Alder, University of California, Davis
1957	Harley Flanders, University of California, Berkeley
1958	B. J. Lockhart, U.S. Naval Postgraduate School
1959	Gerald C. Preston, San Jose State College
1960	Stanley P. Hughart, Sacramento State College

A HISTORY OF THE

1961	David W. Blakeslee, San Francisco State College
1962	Gordon Latta, Stanford University
1963	Max Kramer, San Jose State College
1964	Daniel Coulter, Hartnell College
1965	E. Maurice Beesley, University of Nevada
1966	Lester H. Lange, San Jose State College
1967	Charles Hayes, University of California, Davis
1968	Henry Osner, Modesto Junior College
1969	Thomas Southard, California State College, Hayward
1970	Mary V. Sunseri, Stanford University
1971	G. L. Alexanderson, University of Santa Clara
1972	Leonard Tornheim, Chevron Laboratories
1973	Craig Comstock, Naval Postgraduate School
1974	Donald J. Albers, Menlo College
1975	Kenneth Rebman, California State University, Hayward
1976	David Barnette, University of California, Davis
1977	Jane Day, College of Notre Dame
1978	William G. Chinn, City College of San Francisco
1979	Carroll O. Wilde, Naval Postgraduate School
1980	Sr. Madeleine Rose Ashton, College of the Holy Names
1981	Hans Samelson, Stanford University
1982	Roy Ryden, Humboldt State University
1983	Michael Thibodeaux, Menlo College
1984	Howard Weiner, University of California, Davis
1985	Roseanna Torretto, State of California, Health and Welfare Data Center
1986	Jane Sanguine-Yager, St. Mary's College
1987	John Mitchem, San Jose State University
1988	Ruth Anne Fish, Foothill College

In 1960 Section by-laws were changed so that Chairs of the Section are elected Vice Chair one year prior to the year they serve as Chair. Following their year as Chair, they serve as Program Chair. Thus only one election is held each year, the election of a Vice-Chair who then succeeds to the other two offices. The exception is every third year when the Section elects a Secretary-Treasurer. G. Thomas Sallee, University of California, Davis, was elected Vice-Chair in 1988.

• *Secretary-Treasurers*

1939-45	Harold M. Bacon, Stanford University
1946-50	E. B. Roessler, University of California, Davis

1951	Marjorie Hoffman, San Mateo Junior College
1952-55	C. D. Olds, San Jose State College
1956-60	Roy Dubisch, Fresno State College
1961-63	B. J. Lockhart, U.S. Naval Postgraduate School
1964-66	Joel Brenner, Stanford Research Institute
1967-69	G. L. Alexanderson, University of Santa Clara
1970-72	Newman Fisher, San Francisco State College
1973	G. L. Alexanderson, University of Santa Clara
1974-78	Newman Fisher, San Francisco State University
1979-	Leonard F. Klosinski, University of Santa Clara

• *Section Governors*

1941-43	Harold M. Bacon, Stanford University
1945-47	Sophia Levy McDonald, University of California
1949-51	F. R. Morris, Fresno State College
1952-54	E. B. Roessler, University of California, Davis
1955-57	W. H. Myers, San Jose State College
1958-60	George Pólya, Stanford University
1961-63	C. D. Olds, San Jose State College
1964-66	Irving Sussman, University of Santa Clara
1967-69	David W. Blakeslee, San Francisco State College
1970-72	Lester H. Lange, San Jose State College
1973-75	Mary V. Sunseri, Stanford University
1976-78	G. L. Alexanderson, University of Santa Clara
1979-81	Kenneth Rebman, California State University, Hayward
1982-84	Jean Pedersen, University of Santa Clara
1985-87	Roy Ryden, Humboldt State University
1988-90	Hugh Edgar, San Jose State University

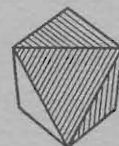
Until 1947 the Association had regional governors, not governors from sections. Those governors listed above who served prior to 1947 were, therefore, regional governors and there were years when there was no governor from the Northern California Section.

From 1939 until 1949, Ruth G. Sumner, Oakland High School, served as Section Representative and Associate Editor for the *California Journal of Secondary Education*.



Section Officers, 1988-1989

Leonard F. Klosinski (Secretary-Treasurer), G. Thomas Sallee (Vice Chair), John A. Mitchem (Program Chair), Ruth Anne Fish (Chair), Hugh M. W. Edgar (Section Governor)



BY-LAWS

NORTHERN CALIFORNIA SECTION THE MATHEMATICAL ASSOCIATION OF AMERICA

Approved by the Association

I. **NAME.** The name of this Section shall be The Northern California Section of The Mathematical Association of America.

II. **PURPOSES.** The purposes of this Section shall be to promote and conserve interest in mathematics, to provide meetings for the presentation and discussion of papers, to furnish an opportunity for fellowship to teachers of mathematics, and to carry out in this region any other purposes of the national organization.

III. **MEMBERSHIP.** The membership in this Section shall be the membership of the national organization resident in this region; but other members of the Association shall be welcome at all meetings and persons not members may be invited to attend meetings.

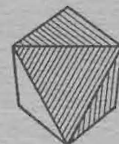
IV. **OFFICERS.** The officers of this Section shall be a Chairman, a Vice-Chairman, a Secretary-Treasurer, and a Program Chairman. The Executive Committee shall consist of the above named officers together with the Sectional Governor. The Chairman shall be the Vice-Chairman of the previous year and the Program Chairman shall be the Chairman of the previous year. The tenure of office shall be three years for the Secretary-Treasurer and one

year for the Vice-Chairman, Chairman and Program Chairman. The Secretary-Treasurer shall be elected every three years and the Vice-Chairman each year at the first meeting of the calendar year. The new officers shall assume office upon adjournment of the first meeting of the year. Nominations may be made by a nominating committee appointed by the Chairman, but this shall not prevent other nominations being made by any member at the time of the election. The officers are empowered to fill any vacancy which may occur. Officers other than the Secretary-Treasurer shall not be eligible to succeed themselves after a full term of office.

V. *USE OF ASSETS.* The assets of the Northern California Section shall be used exclusively to further the purposes of the Section, and in the event of dissolution of the Section the remaining assets will be returned to the national organization to be used for a purpose consistent with the purposes of the national organization.

VI. *MEETINGS.* Meetings may be called at any time by a vote of the officers, or by resolution by the members at a previous meeting. There shall be at least one meeting, and preferably two or more, each year. The places, times, and programs for the meetings are to be arranged by the officers of the section.

VII. *AMENDMENTS.* These By-Laws may be amended by a majority vote of the members present at any regular meeting.



NORTHERN CALIFORNIA SECTION--MEETINGS

* Denotes invited presentation

† Denotes luncheon presentation

1. Galileo High School, San Francisco (January 28, 1939)

"Some adventures in teaching mathematics to freshmen," M. J. Polissar, San Francisco Junior College

"Physical geometry," V. F. Lenzen, University of California*

"Some qualitative properties of the solution of linear differential equations of the second order," Gábor Szegő, Stanford University

"Contemporary viewpoints in the teaching of plane geometry," J. W. Hoge, University High School, Oakland

"The place of mathematics in secondary education," Adeline M. Scandrett, Mission High School, San Francisco

2. University of California, Berkeley (January 27, 1940)

"A simple mathematical theory of economic relief," G. C. Evans, University of California

"Mathematics and the constructive arts," W. F. Durand, Stanford University*

"Geometric representation of certain magnetic fields," F. R. Morris, Fresno State College

"Shall we defer the teaching of algebra to the tenth grade?" Harriet A. Welch, Lowell High School, San Francisco

"Some difficulties with mathematics in a core curriculum," Vern James, Menlo Junior College

"A general solution of $x_1^2 + x_2^2 + \dots + x_n^2 = m^2$," A. L. McCarty, San Francisco Junior College

3. San Francisco Junior College (January 25, 1941)

"On a local solution of a differential equation of infinite order," A. C. Burdette, University of California, Davis

"A college course in survey of elementary mathematics," W. H. Myers, San Jose State College

"The gyroscope and its uses in aviation and navigation," Pauline Sperry, University of California*

"On Descartes's rule of signs," J. V. Uspensky, Stanford University

"Mathematics in Civil Service examinations," Falka G. Sturges, Humboldt Evening School, San Francisco

"On certain equations all of whose roots are real," J. H. McDonald, University of California

4. University of California, Berkeley (January 31, 1942)

"Theory of budgets based on parabolic Engel curves," G. A. Baker, University of California, Davis

"Concerning the altitudes of a tetrahedron," J. H. McDonald, University of California

"Recent developments in engineering," H. C. Burbridge, Fresno State College*

"Senior mathematics: a semester course in algebra and geometry designed for students without previous high school mathematics," L. J. Hill, San Jose High School

"On conjugate trigonometric polynomials," Gábor Szegő, Stanford University

"On unbounded solutions of linear second order differential equations," Einar Hille, Yale University

5. University of San Francisco (January 30, 1943)

"Analogy, a course in discovery," George Pólya, Stanford University

"The mathematical requirements of a course in college physics," K. J. Waider, University of San Francisco

"Conformal mapping," J. H. McDonald, University of California*

"Mathematics in our schools and its contribution to war," Sophia H. Levy, University of California

"The difference-equation method in heat conduction problems," W. P. Berggren, University of California, Davis

"A solution of $x^2 + y^2 + z^2 = w^2$," by A. L. McCarty, San Francisco Junior College

"Elementary derivation of series for $\sin x$ and $\cos x$," by J. V. Uspensky, Stanford University

"The new military training programs in colleges and universities," F. R. Morris, Fresno State College

6. University of California, Berkeley (January 29, 1944)

"Euclidean metric invariants of conics by tensor algebra," T. C. Doyle, Stanford University

"Solutions of several problems in heat transfer," L. M. K. Boelter, University of California

"Present trends in secondary school mathematics," L. B. Kinney, Stanford University

"Some problems connected with discordant permutations," D. H. Lehmer, University of California

"An application of conformal mapping to aeronautical engineering," H. J. Shaw, Stanford University

"Graphical methods in exterior ballistics," L. H. Swinford, University of California

"Solution of cubic and quartic equations by the method of identities," V. F. Ivanoff, San Francisco

7. University of San Francisco (January 27, 1945)

"An application of the conchoid of Nicomedes," F. R. Morris, Fresno State College

"Heat conduction problems and the Laplace transform," S. A. Schaaf, University of California

- "Differentiable functions," A. C. Schaeffer, Stanford University*
- "Combinatory analysis in electronics," H. W. Becker, Mare Island Fire Control School
- "Constructions of triangles under certain conditions," A. R. Williams, University of California
- "Teacher's organizations, their place in the school program," Ruth G. Sumner, Oakland High School
- "Recursive functions," by R. M. Robinson, University of California

8. University of California, Berkeley (January 26, 1946)

- "Embedding a Desarguesian plane in projective 3-space," A. Seidenberg, University of California
- "Capacity and space curves," G. C. Evans, University of California
- "Some observations on the mathematical preparation of college students," Sophia Levy McDonald, University of California
- "Mathematical reasoning and the teacher," George Pólya, Stanford University*
- "The application of symbolic logic to the teaching of calculus," František Wolf, University of California
- "A general method of variation in conformal mapping," A. C. Schaeffer, Stanford University
- "An asymmetric diophantine inequality," C. D. Olds, San Jose State College
- "On sets of distances of n points," Paul Erdős, Guggenheim Fellow, Stanford University

9. University of San Francisco (January 25, 1947)

- "Vibration modes of tapered beams," Edmund Pinney, University of California
- "Estimating electrostatic capacity from geometric data," George Pólya, Stanford University
- "Electronics in our modern world," L. E. Reukema, University of California*
- "The impact of high speed computing on mathematics," D. H. Lehmer, University of California
- "Refresher courses for returning students," S. A. Francis, San Mateo Junior College
- "Some problems in aerodynamics," J. G. Herriot, Stanford University
- "Some remarks on mathematical education," Sophia L. McDonald, University of California

10. University of California, Berkeley (January 24, 1948)

- "A matrix arising in correlation theory," H. M. Bacon, Stanford University
- "Treatment of trigonometric functions in calculus," C. M. Fulton, University of California, Davis
- "The geometry of numbers," Harold Davenport, University College, London, and Stanford University*
- "How to solve it," George Pólya, Stanford University
- "A problem in calculus," M. T. Bird, San Jose State College
- "The variance of the proportions of samples falling within a fixed interval for a normal population," G. A. Baker, University of California, Davis
- "The Banach-Tarski paradox," R. M. Robinson, University of California

11. University of San Francisco (January 29, 1949)

- "The irrationality of a class of numbers," H. L. Alder, University of California, Davis
- "With, or without, motivation?" George Pólya, Stanford University
- "Newton's 'mathematical way'," E. W. Strong, University of California*
- "Probability and nature," Michel Loève, University of California

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"Cayley arrays and multiplication matrices of an algebra," Roy Dubisch, Fresno State College

"A note on linear equations," R. M. Robinson, University of California

"Geometrical optics and the calculus of variations," Robert Weinstock, Stanford University

12. University of California, Berkeley (January 28, 1950)

"On the birectangular quadrilateral," C. M. Fulton, University of California, Davis

"The M.A. degree in mathematics as offered at San Jose State College," W. H. Myers, San Jose State College

"Let us teach guessing," George Pólya, Stanford University

"Games of strategy," A. W. Tucker, Princeton University*

"Note on elementary function theory," J. L. Kelley, University of California, Berkeley

"A classroom note" (about E. T. Whittaker's method for finding the roots of power series), C. D. Olds, San Jose State College

"A slant on the problem of crossed ladders," H. A. Arnold, University of California, Davis.

13. University of San Francisco (January 27, 1951)

"Integral solutions of $x^2 + y^2 = z^2$ in quadratic fields," C. D. Olds, San Jose State College

"On plausible reasoning," George Pólya, Stanford University

"The second pearl of the theory of numbers," J. G. van der Corput, University of Amsterdam*

"General mathematics in the college," Arthur J. Hall, San Francisco State College

"Calculation of moments for a Cantor-Vitali function," G. C. Evans, University of California

"Representation of the integers by positive integers," Roy Dubisch, Fresno State College

14. Stanford University (January 26, 1952)

"Mathematics and science," M. M. Schiffer, Institute for Advanced Study and Stanford University*

"The volume of the sphere and Archimedes's discovery of the integral calculus," George Pólya, Stanford University

"An essentially undecidable axiom system," Raphael M. Robinson, University of California, Berkeley

"A simple proof of the binomial theorem," C. M. Fulton, University of California, Davis

"The unexpected in mathematics—a museum of pathology," J. G. Herriot, Stanford University

"Logarithms are exponents," M. T. Bird, San Jose State College

"A generalization of the game of Nim," D. C. Benson, Stanford University

"On the k -ality theory of rings," Irving Sussman, University of San Francisco

15. San Francisco State College (January 31, 1953)

"Electronic digital computers," P. L. Morton, University of California, Berkeley*

"Some remarks on The Faculty Fellowship Program of the Fund for the Advancement of Education," Roy Dubisch, Fresno State College

"On the geometry of approach for maxima of functions of two variables," G. C. Evans, University of California, Berkeley

"Perfect numbers," R. M. Robinson, University of California, Berkeley

"Modification of the Graeffe method for obtaining the roots of a polynomial," F. M. Pulliam, U.S. Naval Postgraduate School

- "Inequalities in the theory of partitions," by H. L. Alder, University of California, Davis
 "Useful exercises connected with the ellipse and hyperbola," A. R. Williams, University of California, Berkeley

16. University of San Francisco (January 16, 1954)

- "Singular problems for differential equations," G. E. Latta, Stanford University*
 "Some remarks on the Lindberg case," Free Jamison, San Jose State College
 "Differentiation of logarithms," C. M. Fulton, University of California, Davis
 "Some models and demonstrators for engineering mathematics," A. B. Mewborn, U.S. Naval Postgraduate School
 "A simple minimum problem," F. R. Morris, Fresno State College
 "An undergraduate mathematics seminar," E. J. Farrell, University of San Francisco
 "An introduction to determinants," C. H. Rawlins, Jr., U.S. Naval Postgraduate School
 "An isoperimetric inequality," Robert Weinstock, Stanford University

17. University of California, Berkeley (January 15, 1955)

- "Free surface flows," David Gilbarg, Indiana University and Stanford University*
 "On mean values and harmonic polynomials," C. L. Perry, Jr., U.S. Naval Postgraduate School
 "A classroom note on the carpenter's square," M. T. Bird, San Jose State College
 "A remark on Hilbert's nullstellensatz," Abraham Seidenberg, University of California, Berkeley
 "Dyadic treatment of rotation," F. M. Pulliam, U.S. Naval Postgraduate School
 "Analytic geometry from the vector point of view," S. G. Bourne, University of California, Berkeley
 "Fourier kinematic analysis of the reciprocating engine by contour integration," W. E. Bleick, U.S. Naval Postgraduate School
 "On the reduction of a matrix to diagonal form," M. P. Epstein and Harley Flanders, University of California, Berkeley
 "The classification of problems in the calculus of variations," F. D. Faulkner, U.S. Naval Postgraduate School

18. Stanford University (January 14, 1956)

- "Irrational numbers," Ivan Niven, University of Oregon and University of California, Berkeley*
 "A curious trigonometric identity," Raphael M. Robinson, University of California, Berkeley
 "Calculations with random digits," C. L. Perry, U.S. Naval Postgraduate School
 "Closed level curves," H. A. Arnold, University of California, Davis
 "A remark on the axiom of continuity," C. M. Fulton, University of California, Davis
 "Psychological factors in attitudes towards mathematics," D. A. Norton and T. M. Poffenberger, University of California, Davis
 "Formation of probability concepts," C. C. Torrance, U.S. Naval Postgraduate School
 "Some heuristic opportunities in the teaching of analytic geometry," C. M. Larsen, San Jose State College
 "Regular polygons with an odd number of sides," V. E. Hoggatt, Jr., San Jose State College
 "The solution of simultaneous algebraic equations on an automatic digital computer," B. J. Lockhart, U.S. Naval Postgraduate School
 "Unknowns, variables, and indeterminates," Leonard Tornheim, University of California, Berkeley

19. University of California, Berkeley (January 12, 1957)

- "Statistical prediction of sequences," David Blackwell, University of California, Berkeley*
- "An approximation to the equally tempered musical scale," I. J. Schoenberg, University of Pennsylvania and Stanford University
- "The Mathematical Association of America high school contest," D. W. Blakeslee, San Francisco State College
- "The visiting-lectureship program for high schools," H. L. Alder, University of California, Davis
- "Reflecting chess bishops," Sherman Stein, University of California, Davis
- "On picture-writing," George Pólya, Stanford University
- "Factors of Fermat numbers," R. M. Robinson, University of California, Berkeley
- "An eigenvalue problem for ordinary differential equations," S. P. Diliberto, University of California, Berkeley
- "A note on Rouché's theorem," C. L. Clark, Oregon State College
- "The teaching of interpolation," H. A. Arnold, University of California, Davis
- "A heuristic outlook in checking," C. M. Larsen, San Jose State College
- "Some observations on teaching mathematics for the computer age," Irving Sussman, University of Santa Clara

20. San Francisco State College (January 18, 1958)

- "Computers and numerical analysis in mathematics education," George Forsythe, Stanford University*
- "An objectionable quadrangle theorem," C. M. Fulton, University of California, Davis
- "On the Brocard points of a triangle," P. Yff, Fresno State College
- "Reports on contests and lectureships," E. M. Beesley, University of Nevada; D. W. Blakeslee, San Francisco State College; Roy Dubisch, Fresno State College
- "Some properties of a generalized Euler ϕ -function," H. L. Alder, University of California, Davis
- "On the digital control of machine tools," H. D. Huskey, University of California, Berkeley
- "On the curriculum for prospective high school teachers," George Pólya, Stanford University
- "Geometry as a way of thinking," E. Greer, Lockheed Aircraft Corporation
- "On looking backward at solutions--some remarks and examples," C. M. Larsen, San Jose State College

21. Stanford University (January 17, 1959)

- "Markov chains and their applications," J. L. Snell, Dartmouth College and Stanford University*
- "Acceptability in mathematics," C. C. Torrance, U.S. Naval Postgraduate School
- "Medial quasigroups," D. A. Norton, University of California, Davis
- "Roots and canonical forms of compound matrices," C. M. Ablow and J. L. Brenner, Stanford Research Institute
- "Strategies and learning models," S. J. Bryant, Fresno State College
- "Some recent changes in the undergraduate mathematics program at the University of California, Berkeley," Harley Flanders, University of California, Berkeley

22. University of California, Berkeley (January 16, 1960)

- "The heat equation," A. N. Milgram, University of Minnesota and University of California, Berkeley*
- "Generalized area and certain formulas in calculus," G. B. Price, University of Kansas and California Institute of Technology*
- "The centroid in absolute geometry," C. M. Fulton, University of California, Davis
- "Remarks on the S.M.S.G. Program in Northern California," Bernard Friedman, University of California, Berkeley, and Robert Starkey, Cubberley Senior High School, Palo Alto
- "An integral inequality derived from convexity," Albert Novikoff, Stanford Research Institute
- "Satellite orbits," J. L. Brenner, Stanford Research Institute

23. San Jose State College (January 14, 1961)

- "Functors," Daniel Zelinsky, Northwestern University and University of California, Berkeley*
- "Differential equations: heuristics and modern methods," Günter Lumer, Stanford University*
- "On the construction of T-forms," Dmitri Thoro, San Jose State College
- "On a semantic construction of intuitionistic logic," V. H. Dyson, San Jose State College
- "The Diophantine equation $x^2 + y^2 + z^2 = m^2$," R. S. Spira, University of California, Berkeley
- "An experimental test of an heuristic suggestion due to Pólya," C. M. Larsen, San Jose State College
- "Some remarks on definition by induction," C. A. Hayes, University of California, Davis
- "Inequalities in calculus," L. H. Lange, San Jose State College
- "Change in student attitudes towards mathematics in the last five years," D. A. Norton, University of California, Davis
- "The formula for inverting a matrix, or, when is an adjoint not an adjoint," A. B. Novikoff, Stanford Research Institute

24. University of California, Davis (January 13, 1962)

- "The panels of CUPM," R. J. Wisner, Michigan State University, Oakland, Executive Director of the Committee on the Undergraduate Program in Mathematics, and Murray Protter, University of California, Berkeley
- "The impact of S.M.S.G. on the colleges," P. W. Berg, Stanford University*
- "What should be true, but isn't—how distribution calculus helps," Jacob Korevaar, University of Wisconsin and Stanford University*
- "Cylindrical projections and double integrals," John Hwang, Sacramento State College
- "Area bounded by a simple closed curve," A. E. Labarre, Fresno State College
- "Hexagonal geometry," Verner Hoggatt, Jr., San Jose State College
- "Directed distance geometry," Curtis Fulton, University of California, Davis
- "Extremum problems associated with triangles," Lester Lange, San Jose State College
- "Some mathematics the children did not learn," Colbert Purvis, Alameda State College
- "Some innovations in mathematical education in British universities due to the impact of digital computers," D. G. Williams, University of Glasgow and U.S. Naval Postgraduate School
- "The bottleneck in the preparation of mathematics teachers—a way out," Stephen Bryant, University of California, Berkeley

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"Bounds for pairs of quadratic and cubic residues," Marguerite Dunton, Sacramento State College

"A method of matrix inversion," Thomas Kipps, Fresno State College

"A simple interpretation of a degenerate Euler equation arising in the ship routing problem," Frank Faulkner, U.S. Naval Postgraduate School

"Chebyshev type inequalities for distributions with monotone hazard rate," R. E. Barlow, San Jose State College

25. There was no full Section meeting since the Annual Meetings of the MAA were held in Berkeley in 1963. A business meeting was held on January 27 as part of the Annual Meetings.

26. Stanford University (February 1, 1964)

"The independence of the axiom of choice," Paul Cohen, Stanford University*

"Future goals for school mathematics," E. G. Begle, Stanford University, with panel George Pólya, Stanford University; C. M. Larsen, San Jose State College; Sarah Herriot, Cubberley Senior High School; Martin J. Dreyfuss, San Jose City College*

"A Diophantine algorithm," Dmitri Thoro, San Jose State College

"A composite generator," R. C. Orr, Humboldt State College

"Some new Fibonacci identities," V. E. Hoggatt, Jr., San Jose State College

"An algorithm for finding certain partial fraction expansions," Martin Blumberg, Stanford Linear Accelerator Center

"A technique for solving a type of integral equation," Richard Bellman, RAND Corporation, and Paul Brock, Hughes Aircraft Corporation

27. College of San Mateo (February 6, 1965)

"The role of the axiomatic method," R. L. Wilder, University of Michigan*

"Mathematics for the non-mathematics major," Sherman Stein, University of California, Davis*

"Generating functions," Ivan Niven, University of Oregon*

"A note on a property of periodic decimals," B. Zane, Fresno State College

"A set of convergent series with asymptotic properties," R. E. Shafer, University of California Radiation Laboratory, Livermore

"Polynomials with real zeros in a fixed interval," Leonard Tornheim, California Research Corporation

"The N -reflections of light in two parallel plates," Ron Weinshenk, San Jose State College

"The solution of a model for warehouse location," D. A. D'Esopo, Stanford Research Institute

"Essential cluster sets," Ulysses Hunter, California State College, Hayward

"The Freshman-Sophomore Mathematics Curriculum," George Wallace, College of San Mateo; C. B. Morrey, University of California, Berkeley; T. H. Southard, California State College at Hayward; B. E. Rhoades, Associate Director, CUPM, Berkeley

28. University of California, Berkeley (February 5, 1966)

"Mathematical foundations for national economic planning," David Gale, Brown University*

"The Heawood map-coloring conjecture," J. W. T. Youngs, University of California, Santa Cruz*

- "Sets of constant width," G. D. Chakerian, University of California, Davis*
 "CUPM `General curriculum in mathematics for colleges,'" R. H. McDowell, CUPM, Berkeley; Martin J. Dreyfuss, San Jose City College; and Leon Henkin, University of California, Berkeley*

29. University of California, Davis (February 4, 1967)

- "Some results of Sturm-Liouville differential systems defined on continua and discrete sets," J. F. Schipper, Sacramento State College
 "Some properties of Hahn polynomials," R. J. Levit, San Francisco State College
 "Nonroutine problems for naive programmers," Dmitri Thoro, San Jose State College
 "Sifting for answers," D. H. Lehmer, University of California, Berkeley*
 "Predicativity: mathematics of the definable," Solomon Feferman, Stanford University*
 "The role of axiomatics and problem solving," E. G. Begle, Stanford University; H. M. Bacon, Stanford University; C. M. Larsen, San Jose State College; L. D. Hawkinson, Gunn High School, Palo Alto; Leon Henkin, University of California, Berkeley.

30. There was no full Section meeting since the Annual Meetings of the MAA were held in San Francisco in 1968. A business meeting was held on January 27 as part of the Annual Meetings.

31. University of Santa Clara (February 8, 1969)

- "A report on the Statewide Mathematics Advisory Committee," William Chinn, City College of San Francisco*
 "Some mathematicians I have known," George Pólya, Stanford University*
 "Shape of the future," Victor Klee, University of Washington*
 "The S.E.E.D. Program," by William Johntz, Director of Project S.E.E.D.*

32. Diablo Valley College (February 7, 1970)

- "Calculus with computers," H. J. Greenberg, University of Denver*
 "Absolute value and some of its generalizations," S. A. Jennings, University of Victoria*
 "Linear algebra--are there any applications?" David G. Mead, University of California, Davis*
 "Teaching abstract algebra by the discovery method to disadvantaged elementary school children--a live demonstration with a class," William Leffler, Project S.E.E.D.*

33. University of San Francisco (February 6, 1971)

- "Matijasevič's answer to Hilbert's 10th problem," Julia B. Robinson, University of California, Berkeley*
 "Some mathematical problems associated with the study of elections," James Dolby, San Jose State College*
 "What is computer science anyway?" G. E. Forsythe, Stanford University*
 "The junior college five-years later," R. Z. Norman, Dartmouth College*
 "Panel discussion: accreditation and certification," L. H. Lange, San Jose State College; D. W. Bushaw, Washington State University; Joseph Hashisaki, Western Washington State College; G. B. Pedrick, California State College, Hayward.*

34. California State College, Hayward (February 5, 1972)

- "Artificial intelligence and robots," Bertram Raphael, Stanford Research Institute*
- "Guessing and proving in the mathematical work of Leonhard Euler," George Pólya, Stanford University*
- "Interesting infinite series," D. H. Lehmer, University of California, Berkeley*
- "Employment picture for mathematics majors at various levels," Charles Romeset, U.S. Bureau of Labor Statistics
- "The four color problem," David Barnette, University of California, Davis
- "Tournaments," Robert Douglas, San Francisco State College
- "MAA and the two-year college: a report of current activities," William Chinn, San Francisco City College
- "Hypergeometric growth of dynamic buckling modes," A. L. Florence, Stanford Research Institute
- "Liouville and fluctuation theory," Peter C. C. Wang, U.S. Naval Postgraduate School
- "Sections in dynamical systems," William Chewning, U.S. Naval Postgraduate School
- "Foundations of absolute geometry of arbitrary dimension," James Smith, San Francisco State College
- "A new algorithm for rational approximation," Milton Green, Stanford Research Institute
- "Multiple transitivity in permutation groups," Russell Merris, California State College, Hayward

35. California State University, San Jose (February 3, 1973)

- "Continuum approximations to discrete optimization problems," Gordon Newell, University of California, Berkeley*
- "Six polygons which permit only nonperiodic tilings of the plane," R. M. Robinson, University of California, Berkeley*
- "Geometric extremum problems," G. D. Chakerian, University of California, Davis*
- "Unique representations of integers using generalized Fibonacci numbers," V. E. Hoggatt, Jr., California State University, San Jose
- "Adjoints of boundary value problems," G. B. Green, Stanislaus State College
- "Models and models and...an analogy in the theory of arts," K. L. de Bouvère, University of Santa Clara
- "Practical applications of algebraic topology," A. J. Korsak, Stanford Research Institute
- "The mathematical preparation of students planning careers in industry," Peter Szegő, Ampex.
- "The Roche Limit for a solid body," H. A. Aggarwal, Ames Research Center
- "On cutting pancakes and ham sandwiches," Estelle Goldberg, California State University, San Francisco.
- "Some applications of modern algebra," D. L. Davis, Naval Postgraduate School

36. There was no Section meeting since the Annual Meetings of the MAA were held in San Francisco in 1974.

37. Menlo College (February 8, 1975)

- "A recent example of applied mathematics," Henry Pollak, Bell Telephone Laboratories*
- "Computers, confusion and complacency," H. Peckham, Gavilan College
- "What happened--and now what? (A personalized view of mathematics in the last thirty years)," Robert Gaskell, Naval Postgraduate School
- "Star theory," R. L. Woodruff, Menlo College

- "Mathematics of discovery," Lenore Blum, Mills College
 "Discrete symmetry--groups in the plane," Frederick Luttmann, Sonoma State College
 "Hyperbolic numbers," Herbert Holden, Stanford Research Institute
 "The condition number of a matrix grows with dimension," Alan Shor, Naval Postgraduate School
 "Singular points of algebraic curves defined parametrically," H. E. Fettis, Mountain View, California

38. University of California, Davis (February 21, 1976)

- "Prime generating functions and congruences," Henry Alder, University of California, Davis*
 "Galileo Galilei," George Pólya, Stanford University*
 "Aspects of the calculus of variations," M. M. Schiffer, Stanford University*
 "The numerical range," Marvin Marcus, University of California, Santa Barbara*
 "Guessing and proving (film)," George Pólya, Stanford University

39. San Francisco State University (February 26, 1977)

- "Lattice points and convex sets," Don Chakerian, University of California, Davis*
 "Rational reciprocity laws," Emma Lehmer, Berkeley, California*
 "Non-cancellation phenomena in arithmetic and topology," Peter Hilton, Battelle Institute, Seattle*
 "Tone perception and decomposition of periodic functions," David Gale, University of California, Berkeley*
 "Panel discussion: dispelling math anxiety and getting ready for calculus fast," Jane Day, College of Notre Dame; Lenore Blum, Mills College; Karel De Leeuw and Phil Faillace, Stanford University*†

40. College of Notre Dame (February 18, 1978)

- "A short history of topology," Hans Samelson, Stanford University*
 "The Steiner tree problem," R. L. Graham, Bell Laboratories*
 "The new (?) math," Edward Teller, Lawrence Livermore Laboratory*
 "On Hilbert's Sixteenth Problem: limit cycles of polynomial differential equations," Stephen Smale, University of California, Berkeley*
 "The answer to the question that everyone asks," Constance Reid, San Francisco, California*†

41. Sonoma State University (February 24, 1979)

- "The unreasonable effectiveness of mathematics," Richard Hamming, Naval Postgraduate School*
 "Properties of the symmetric groups," Derrick Lehmer, University of California, Berkeley*
 "Isoperimetric inequalities, pure and applied," Robert Osserman, Stanford University*
 "From tiling to algebra and combinatorics," Sherman Stein, University of California, Davis*
 "Some mathematicians I have known," George Pólya, Stanford University*†

42. Naval Postgraduate School (February 23, 1980)

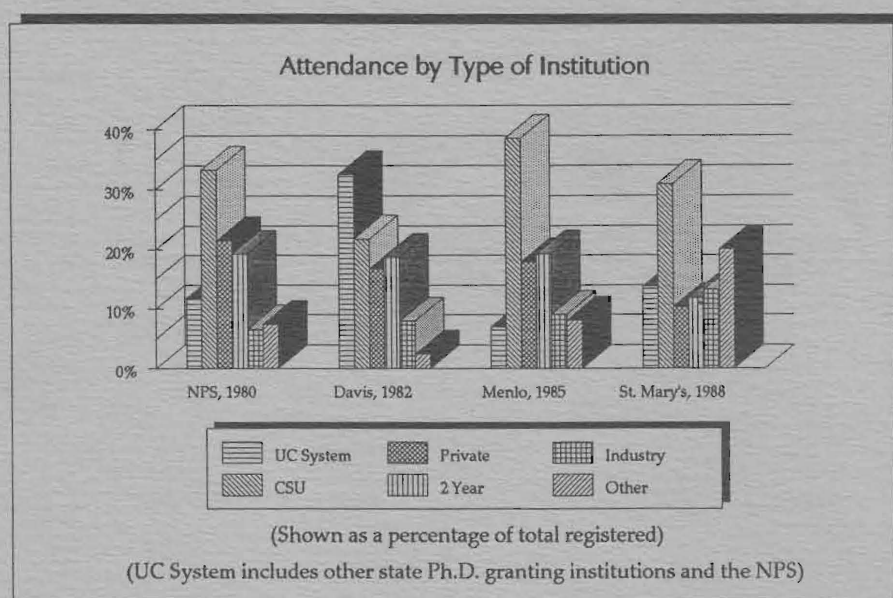
- "Borel-programmable functions," David Blackwell, University of California, Berkeley*
 "Isoperimetric results," Ivan Niven, University of Oregon*

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- "Mathematical models and existence theorems," Dorothy Bernstein, Brown University*
 "Solutions of boundary value problems via singular integral equations," Gordon E. Latta, University of Virginia*
 "Historical aspects of the beginnings of point-set topology in abstract spaces," Angus E. Taylor, University of California*†

43. University of Santa Clara (March 14, 1981)

- "Air pollution and health: acute effects," Alice S. Whittemore, Stanford University*
 "Optimal strategies in sports," Leonard Gillman, University of Texas, Austin*
 "Mathematical aspects of computerized tomography," F. Alberto Grünbaum, University of California, Berkeley*
 "The relationship between number theory and analysis," Paul J. Cohen, Stanford University*
 "Mathematics in China: a recent assessment," S. S. Chern, University of California, Berkeley*†



44. University of California, Davis (February 20, 1982)

- "Mathematics in industry: how do problems arise?" Henry O. Pollak, Bell Laboratories*
 "Orderly tessellations and their incidence symbols," Branko Grünbaum, University of Washington*
 "Some problems in applied mathematics," Joseph B. Keller, Stanford University*
 "Does mathematics have elements?" Paul R. Halmos, Indiana University*
 "My encounter with Rubik's cube," Solomon Golomb, University of Southern California*†

45. Stanford University (February 26, 1983)

- "Imagery in mathematics applications," Ross Finney, Massachusetts Institute of Technology*
- "Some paradoxical coverings of the real line," Ivan Niven, University of Oregon*
- "Mathematical analysis of decorative patterns," Dorothy Washburn, California Academy of Sciences*
- "Hilbert's *Grundlagen der Geometrie* revisited," Garrett Birkhoff, Harvard University*
- "Anecdotes from the early history of computing," Henry S. Tropp, Humboldt State University*†

46. San Francisco State University (February 25, 1984)

- "Indices of power as a measure of centrality in social networks," Guillermo Owen, University of Iowa*
- "Combinatorial problems with surprising solutions," David P. Roselle, Virginia Polytechnic Institute*
- "How large an elephant will fit in a cube?" Don Chakerian, University of California, Davis*
- "The mathematics of perfect shuffles," Persi Diaconis, Stanford University*
- "Successful education and successful life," Peter Hilton, SUNY at Binghamton*†

47. Menlo College (February 23, 1985)

- "Unsolved problems in convexity: some very easy questions with very hard answers," David Barnette, University of California, Davis*
- "Reminiscences on the origins of linear programming," George Dantzig, Stanford University*
- "Statistics, mathematics, and computers," Bradley Efron, Stanford University*
- "Cosets, spinsters, clusters, and the Schroeder-Bernstein Theorem," Paul R. Halmos, University of Santa Clara*
- "A non-mathematician's apology," Constance Reid, San Francisco, California*†

48. University of California, Davis (February 22, 1986)

- "Creating tiles using the Conway criterion," Doris Schattschneider, Moravian College*
- "Geometry lesson of Socrates," Lipman Bers, Columbia University*
- "Ramsey theory: old questions--new results," Ronald Graham, AT & T Bell Labs*
- "Uniform distribution modulo 1," Vladimir Drobot, University of Santa Clara*
- "Organizing the Northern California Section, 1939--Life and times before and after," Harold M. Bacon, Stanford University*†

49. San Jose State University (February 28, 1987)

- "Geometric applications of a matrix searching algorithm," Maria Klawe, IBM Almaden Research Center*
- "Codes from algebraic number fields," H. W. Lenstra, Jr., University of California, Berkeley*
- "Random walks on \mathbb{Z} ," Kenneth A. Ross, University of Oregon*
- "Finite functional analysis," John L. Kelley, University of California, Berkeley*
- "Reminiscences of a mathematologist," Alice C. Beckenbach, Los Angeles, California*†

49A. University of Hawaii, Manoa (March 28, 1987)

"The even cycle mystery and its relatives," Victor Klee, University of Washington*

"The loop-switching addressing problem, or how to embed an arbitrary graph in a squashed cube," Henry O. Pollak, Bell Communications Research*

"The way things were," Ivan Niven, University of Oregon*†

50. St. Mary's College (March 5, 1988)

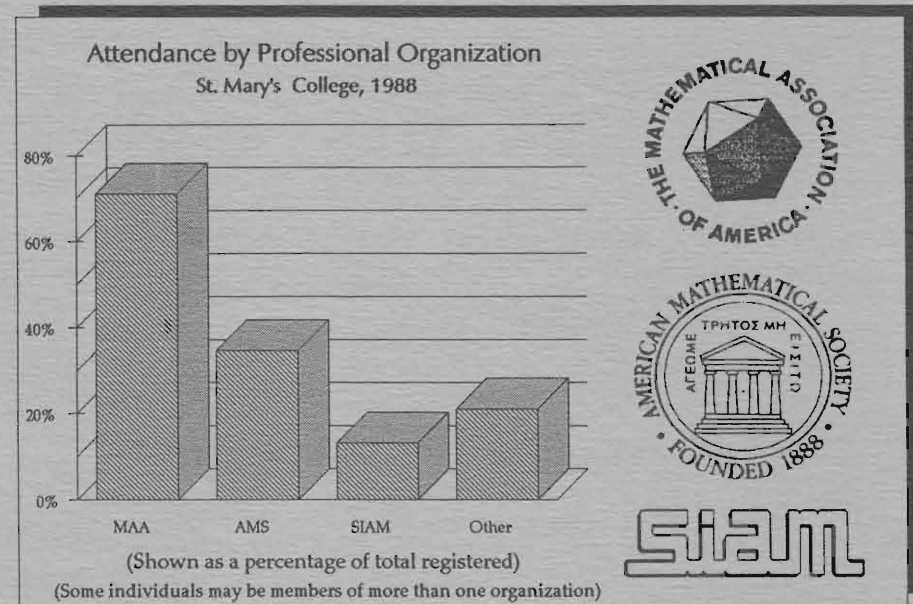
"The flowering of minimal surfaces," Robert Osserman, Stanford University*

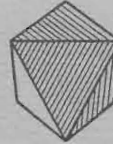
"Some offbeat representations of positive integers," Herbert Wilf, University of Pennsylvania*

"Calculus for a new century," Lida Barrett, Mississippi State University*

"Connections between orthogonal polynomials, inverse eigenvalue problems, and Toda flows," Beresford Parlett, University of California, Berkeley*

"Congratulations, mathematicians," Brother Raphael Patton, FSC, St. Mary's College*†





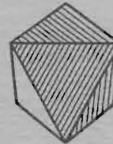
MEETING SITES FOR THE NORTHERN CALIFORNIA SECTION

California State University, Hayward--1972
College of Notre Dame--1978
College of San Mateo--1965
Diablo Valley College--1970
Galileo High School, San Francisco--1939
Menlo College--1975, 1985
Naval Postgraduate School, Monterey--1980
St. Mary's College--1988
San Francisco Junior College (City College of San Francisco)--1941
San Francisco State University--1953, 1958, 1977, 1984
San Jose State University--1961, 1973, 1987
Santa Clara University--1969, 1981
Sonoma State University--1979
Stanford University--1952, 1956, 1959, 1964, 1983
University of California, Berkeley--1940, 1942, 1944, 1946, 1948, 1950, 1955,
1957, 1960, 1966
University of California, Davis--1962, 1967, 1976, 1982, 1986
University of Hawaii, Manoa--1987
University of San Francisco--1943, 1945, 1947, 1949, 1951, 1954, 1971



Section Governors

Lester H. Lange, Hugh M. W. Edgar, Mary V. Sunseri, Gerald L. Alexanderson, Jean J. Pedersen, Kenneth R. Rebman



SPEAKERS AT SECTION MEETINGS

- | | |
|---|---|
| Ablow, Clarence M.--1959 | Bryant, Steven J.--1959, 1962 |
| Aggarwal, H.A.--1973 | Burbridge, H. C.--1942 |
| Alder, Henry L.--1949, 1953, 1957, 1958, 1976 | Burdette, Albert C.--1941 |
| Arnold, Hubert A.--1950, 1956, 1957 | Bushaw, Donald W.--1971 |
| Bacon, Harold M.--1948, 1967, 1986 | Chakerian, Gulbank D.--1966, 1973, 1977, 1984 |
| Baker, George A.--1942, 1948 | Chern, Shiing-Shen--1981 |
| Barlow, Richard E.--1962 | Chewning, William--1972 |
| Barnette, David W.--1972, 1985 | Chinn, William G.--1969, 1972 |
| Barrett, Lida K.--1988 | Clark, C. L.--1957 |
| Beckenbach, Alice C.--1987 | Cohen, Paul J.--1964, 1981 |
| Becker, H. W.--1945 | D'Esopo, Donato A.--1965 |
| Beesley, E. Maurice--1958 | Dantzig, George B.--1985 |
| Begle, Edward G.--1964, 1967 | Davenport, Harold--1948 |
| Bellman, Richard--1964 | Davis, D. L.--1973 |
| Benson, Donald C.--1952 | Day, Jane--1977 |
| Berg, Paul W.--1962 | de Bouvère, Karel L.--1973 |
| Berggren, W. P.--1943 | De Leeuw, Karel--1977 |
| Bernstein, Dorothy--1980 | Diaconis, Persi--1984 |
| Bers, Lipman--1986 | Diliberto, Stephen P.--1957 |
| Bird, Marion T.--1948, 1952, 1955 | Dolby, James L.--1971 |
| Birkhoff, Garrett--1983 | Douglas, Robert--1972 |
| Blackwell, David--1957, 1980 | Doyle, Thomas C.--1944 |
| Blakeslee, David W.--1957, 1958 | Dreyfuss, Martin J.--1964, 1966 |
| Bleick, Willard E.--1955 | Drobot, Vladimir--1986 |
| Blum, Lenore--1975, 1977 | Dubisch, Roy--1949, 1951, 1953, 1958 |
| Blumberg, Martin--1964 | Dunton, Marguerite E.--1962 |
| Boelter, L.M.K.--1944 | Durand, W. F.--1940 |
| Bourne, S.G.--1955 | Dyson, Verena H.--1961 |
| Brenner, Joel L.--1959, 1960 | Efron, Bradley--1985 |

A HISTORY OF THE

- Epstein, M.P.--1955
 Erdős, Paul--1946
 Evans, Griffith C.--1940, 1946, 1951, 1953
 Faillace, Phil--1977
 Farrell, Edward J.--1954
 Faulkner, Frank D.--1955, 1962
 Feferman, Solomon--1967
 Fettis, Henry E.--1975
 Finney, Ross--1983
 Flanders, Harley--1955, 1959
 Florence, A. L.--1972
 Forsythe, George E.--1958, 1971
 Francis, Sam A.--1947
 Friedman, Bernard--1960
 Fulton, C. M.--1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962
 Gale, David--1966, 1977
 Gaskell, Robert E.--1975
 Gilbarg, David--1955
 Gillman, Leonard--1981
 Goldberg, Estelle--1973
 Golomb, Solomon--1982
 Graham, Ronald L.--1978, 1986
 Green, G. B.--1973
 Green, Milton--1972
 Greenberg, H. J.--1970
 Greer, Edison--1958
 Grünbaum, Branko--1982
 Grünbaum, F. Alberto--1981
 Hall, Arthur J.--1951
 Halmos, Paul R.--1982, 1985
 Hamming, Richard--1979
 Hashisaki, Joseph--1971
 Hawkinson, Lawrence D.--1967
 Hayes, Charles A.--1961
 Henkin, Leon--1966, 1967
 Herriot, John G.--1947, 1952
 Herriot, Sarah--1964
 Hill, L. J.--1942
 Hille, Einar--1942
 Hilton, Peter J.--1977, 1984
 Hoge, J. W.--1939
 Hoggatt, Verner E., Jr.--1956, 1962, 1964, 1973
 Holden, Herbert--1975
 Hunter, Ulysses--1965
 Huskey, Harry D.--1958
 Hwang, John--1962
 Ivanoff, V. F.--1944
 James, Vern--1940
 Jamison, Free--1954
 Jennings, S.A.--1970
 Jontz, William--1969
 Keller, Joseph B.--1982
 Kelley, John L.--1950, 1987
 Kinney, L. B.--1944
 Kipps, Thomas--1962
 Klawe, Maria--1987
 Klee, Victor--1969, 1987A
 Korevaar, Jacob--1962
 Korsak, Andrew J.--1973
 Labarre, Anthony E., Jr.--1962
 Lange, Lester H.--1961, 1962, 1971
 Larsen, Charles M.--1956, 1957, 1958, 1961, 1964, 1967
 Latta, Gordon E.--1954, 1980
 Leffler, William--1970
 Lehmer, Derrick H.--1944, 1947, 1967, 1972, 1979
 Lehmer, Emma--1977
 Lenstra, H. W., Jr.--1987
 Lenzen, V. F.--1939
 Levit, Robert J.--1967
 Levy, Sophia H.--1943 (See McDonald, Sophia Levy)
 Lockhart, B. J.--1956
 Loève, Michel--1949
 Lumer, Günter--1961
 Luttman, Frederick--1975
 Marcus, Marvin--1976
 McCarty, A. L.--1940, 1943
 McDonald, J. H.--1941, 1942, 1943
 McDonald, Sophia Levy--1946, 1947 (See Levy, Sophia H.)
 McDowell, R. H.--1966
 Mead, David G.--1970
 Merris, Russell--1972
 Mewborn, A. B.--1954
 Milgram, A. N.--1960
 Morrey, Charles B., Jr.--1965
 Morris, F. R.--1940, 1943, 1945, 1954
 Morton, P. L.--1953
 Myers, W. H.--1941, 1950
 Newell, Gordon--1973
 Niven, Ivan--1956, 1965, 1980, 1983, 1987A
 Norman, Robert Z.--1971
 Norton, D. A.--1956, 1959, 1961
 Novikoff, Albert B.--1960, 1961
 Olds, C. Douglas--1946, 1950, 1951
 Orr, R. C.--1964

- Osserman, Robert--1979, 1988
 Owen, Guillermo--1984
 Parlett, Beresford--1988
 Patton, Brother Raphael--1988
 Peckham, H.--1975
 Pedrick, George B.--1971
 Perry, Clay L., Jr.--1955, 1956
 Pinney, Edmund--1947
 Poffenberger, T. M.--1956
 Polissar, M. J.--1939
 Pollak, Henry O.--1975, 1982, 1987A
 Pólya, George--1943, 1946, 1947, 1948, 1949,
 1950, 1951, 1952, 1957, 1958, 1964, 1969,
 1971, 1976, 1979
 Price, G. Baley--1960
 Protter, Murray--1962
 Pulliam, Francis M.--1953, 1955
 Purvis, Colbert T.--1962
 Raphael, Bertram--1972
 Rawlins, C. H., Jr.--1954
 Reid, Constance--1978, 1985
 Reukema, L. E.--1947
 Rhoades, B.E.--1965
 Robinson, Julia--1971
 Robinson, Raphael M.--1945, 1948, 1949,
 1952, 1953, 1956, 1957, 1973
 Romeset, Charles--1972
 Roselle, David P.--1984
 Ross, Kenneth A.--1987
 Samelson, Hans--1978
 Scandrett, Adeline M.--1939
 Schaaf, S. A.--1945
 Schaeffer, A. C.--1945, 1946
 Schattschneider, Doris--1986
 Schiffer, Menahem Max--1952, 1976
 Schipper, J. F.--1967
 Schoenberg, Isaac J.--1957
 Seidenberg, Abraham--1946, 1955
 Shafer, Robert E.--1965
 Shaw, H. J.--1944
 Shorb, Alan--1975
 Smale, Stephen--1978
 Smith, James--1972
 Snell, J. Laurie--1959
 Southard, Thomas H.--1965
 Sperry, Pauline--1941
 Spira, Robert S.--1961
 Starkey, Robert--1960
 Stein, Sherman--1957, 1965, 1979
 Strong, E. W.--1949
 Sturges, Falka G.--1941
 Sumner, Ruth G.--1945
 Sussman, Irving--1952, 1957
 Swinford, Lee H.--1944
 Szegő, Gábor--1939, 1942
 Szegő, Peter--1973
 Taylor, Angus E.--1980
 Teller, Edward--1978
 Thoro, Dmitri--1961, 1964, 1967
 Tornheim, Leonard--1956, 1965
 Torrance, C. C.--1956, 1959
 Tropp, Henry--1983
 Tucker, Albert W.--1950
 Uspensky, J. V.--1941, 1943
 van der Corput, Jan G.--1951
 Waider, K. J.--1943
 Wallace, George--1965
 Wang, Peter C. C.--1972
 Washburn, Dorothy--1983
 Weinschenk, Ron--1965
 Weinstock, Robert--1949, 1954
 Welch, Harriet A.--1940
 Whittemore, Alice S.--1981
 Wilder, Raymond L.--1965
 Wilf, Herbert--1988
 Williams, A. R.--1945, 1953
 Williams, D. G.--1962
 Wisner, R. J.--1962
 Wolf, František--1946
 Woodruff, R. L.--1975
 Yff, Peter--1958
 Youngs, J. W. T.--1966
 Zane, Burke--1965
 Zelinsky, Daniel--1961



Directors of the Visiting Lecturer Program

Leonard F. Klosinski, Gerald L. Alexanderson, E. Maurice Beesley, Lester H. Lange,
Donald C. Pfaff



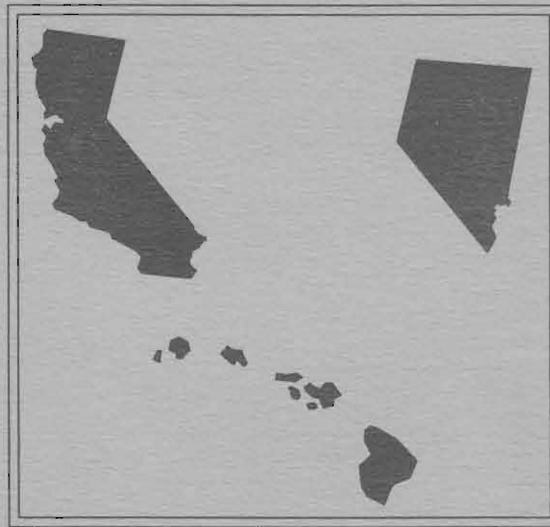
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Gerald L. Alexanderson (First Vice-President--1984-85, Secretary-Elect--1990-), Donald J. Albers (Second Vice-President--1983-84), Henry L. Alder (Secretary--1960-75, President--1977-78), William G. Chinn (Second Vice-President--1981-82)



Northern California Coordinators for Women and Mathematics

Alice J. Kelly, Jean J. Pedersen, Ann M. Preston, Jean B. Chan



Four hundred copies of this history were printed by the Section in December, 1988.