

Chicago	5½
Massachusetts Institute	6
Michigan	7½
Columbia	8
Stanford	9
Wisconsin	9
Illinois	12

On whatever basis the comparisons are made, the California Institute emerges in a very gratifying position. This is the more apparent when it is remembered that the development of research in the pure and exact sciences began at the Institute only a little over twenty years ago.

EDITOR'S NOTE: The June issue of the Alumni Review will contain names of men listed in "American Men of Science," together with a detailed analysis by individuals.

ENGINEERING COMMITTEES APPOINTED BY TRUSTEES

An Engineering Committee composed of men having a special interest in engineering education and research has been appointed by the Board of Trustees of the Institute. Its first meeting was held on January 20, 1939.

At this meeting which lasted throughout the weekend, the Committee made a complete tour of the engineering facilities on the campus and then proceeded to Palomar Mountain to view progress on the Observatory. After dinner at Warner's Hot Springs a round table discussion was held in which members of the Institute faculty participated.

The members of the Committee are as follows:

- Garner A. Beckett, President, Riverside Portland Cement Co.
 Scott Brown, Member Pasadena Advisory Board, Security-First National Bank of Los Angeles; formerly Vice-President and General Counsel Studebaker Corporation.
 R.R. Bush, President, R. R. Bush Oil Company.
 Thomas Fleming, Retired Consultant in Water Supply Engineering.
 E. T. Foley, Member, Foley Brothers, Inc., St. Paul, Minn., Pacific Constructors, Inc., contractors on the Shasta Dam.
 George G. Hoag, Retired, formerly with J. C. Penney Co.
 Herbert Holt, '15, Manager, Bekins Van and Storage Company, Los Angeles.
 Ralph B. Lloyd, Independent Oil Operator, Director, Security-First National Bank of Los Angeles.
 Fred S. Markham, Capitalist.
 Reese Taylor, President, Union Oil Company of California; formerly President, Consolidated Steel Corporation of Los Angeles.
 William C. Mullendore, Chairman of Committee, Executive Vice-President, Southern California Edison Company.

ROUSE AWARD

Dr. Hunter Rouse, assistant professor of fluid mechanics, has been awarded the Norman medal of the American Society of Civil Engineers for his paper, "Modern Conceptions of the Mechanics of Fluid Turbulence," which appeared in the Proceedings of the Society. The Norman medal is the foremost award of the American Society of Civil Engineers, and is given each year for the most outstanding paper presented in the Proceedings.

COSMOCHRON

An interesting exhibit to be found in the Science Hall of the Golden Gate International Exposition is a Cosmochron, or geologic clock. The bronze hand on the face of the clock makes the circuit of "time" divisions, representing geologic periods. While it is ticking, the recorded voice of Dr. Chester Stock, professor of paleontology at Caltech, is heard describing the history of the cosmos, and a series of 42 slides is shown depicting what is known of the appearance of the world, animals and trees in the remotely past eras.

The cosmochron was built at the Griffith Park Planetarium in Los Angeles and will be on exhibition there at the close of the Exposition.

NEW ADVISER CHOSEN

Dr. Vannevar Bush, president of the Carnegie Institution of Washington, recently accepted an invitation to become a member of the Advisory Council of the Institute. Doctor Bush was formerly dean of engineering and vice-president of the Massachusetts Institute of Technology.

Another recent change was the election of Albert B. Ruddock to the Board of Trustees to fill the vacancy created by the death of Dr. George E. Hale. Mr. Ruddock is president of the California Institute Associates.

COLONEL LEEDS

Col. Charles T. Leeds, who was Professor of Military Science and Tactics at the Institute in 1917 and 1918, was recently elected a director of the American Society of Civil Engineers, representing the Southwest district for the three year term starting January, 1939.

EARTHQUAKE EFFECTS STUDIED

The Board of Supervisors of Los Angeles County recently voted an appropriation of \$4,000 to help finance continued research in detailed studies of various types of buildings subjected to earthquake shock. The work which is under the direction of Prof. R. R. Martel, will attempt to determine if present building code requirements should be modified to achieve a uniformity in protection for all kinds of buildings.

ALUMNI MEETINGS

By JOHN E. SHIELD, '22, and GEORGE LANGSNER, '31

TECHNICOLOR-N.B.C. MEETING

One of the most interesting and well attended meetings of the Alumni Association was held on Friday evening, January 20, 1939, when Mr. J. A. Ball, vice-president and technical director of the Technicolor Motion Picture Corporation, spoke on the Technicolor process to one group of members, while another group of members visited the new Hollywood studios of the National Broadcasting Co.

The meeting, as originally planned, was to be held in the Review Room of the Electrical Research Products, Inc., in Hollywood, which has a seating capacity of 110 persons. Because of the enthusiastic response to the reservation request, the Social Committee was in a quandary because of its inability to secure a larger meeting place on such short notice, which was solved by Mr. Ball consenting to present his talk to two separate audiences, and the Committee then made arrangements for one group to visit the broadcasting studio, while the other listened to him.

Mr. Ball, who is a graduate of the Massachusetts Institute of Technology, gave a very interesting resume of the historical background of the Technicolor process, and a general description of the methods and problems facing the process today. At the conclusion of his talk several reels of Technicolor motion pictures were shown which provided the lighter part of the program.

The conducted tour of the new National Broadcasting Company studio was enjoyed by those attending, as they were permitted to learn and see at first hand the last word in radio broadcast facilities, with its specially designed and acoustically treated walls, cork insulated floors, and the latest engineering equipment. Another feature was the exhibition of sound effects.

The arrangements for the meeting were made by Sidney Zipsner, '30, of the Technicolor Motion Picture Company.

ANNUAL DANCE

Only once in a while — once a year lately — do the erstwhile students of The Institute get together with their ladies to trip the light fantastic. The latest such occasion was on February 4th at the Biltmore Ballroom in Los Angeles. 433 couples were enthusiastically present, included among whom were 72 Seniors, who attended as guests. Music was provided by Larry Kent's Orchestra, and entertainment during intermissions by sad-faced Boothe Bertram. The performance of the latter certainly seemed to intrigue those who were close enough to see his numerous styles of headgear and facial expression.

Faculty members present were Prof. and Mrs. Franklin Thomas, Prof. and Mrs. Philip Fogg, and Prof. and Mrs. Ray Untereiner. The success of the affair was largely due to Clarence Kiech '26, Mr. and Mrs. Lawrence K. Gould '33, and Paul C. Schaffner '37.

MEMBERSHIP EXCEEDS 1,000

By WILLIAM H. MOHR, '29, *Membership Chairman*

The Membership Committee is very happy to announce that there are now over 1,000 members of the California Institute of Technology Alumni Association. Our Association has grown a little each year until this year we have been able to reach our goal.

The activity of all members and their cooperation in making this year a successful one is sincerely appreciated by your Board of Directors. We have endeavored to please you by publishing a Directory of Alumni this year in addition to the quarterly Alumni Review and the numerous meetings that are held for your benefit.

A membership of over 1,000 in an Institution that has less than 2,500 graduates is a record that others might well envy.

PLACEMENTS

Hal Hill, '11, chairman of the Placements Committee, has recently addressed groups of seniors and a few underclassmen on the essentials of interviews. He has endeavored to prepare these men for personal contacts with potential employers and their representatives, through pointing out good and bad features of appearance and demeanor. Interviews are now being held on the campus by personnel agents of several large firms. It is reported that Hal's advice to some 150 men is standing in good stead.

To alumni, the Placements Committee would like it known that excellent positions are sometimes lost to Tech men just because the right candidate's application card is not on file at the time the call is received. Several openings have gone begging during the past several weeks. If you are interested in improved employment, send your credentials to the Alumni office on the campus, together with mention of salary and type of work desired.

DIRECTORY

By now you have perused the pages of the 1939 Directory. You have checked your own listings. You have probably discovered that several alumni live or work near you. Perhaps you have already looked up some of them. You have spent some time learning what your classmates are doing. You have probably saved your copy for constant reference.

According to early reports, the Directory is being found of inestimable value, has been studied for an average of about two hours per man. Two thousand man-hours of scrutiny!

The Directory committee tried diligently to provide completeness, accuracy and useability. Since it was impossible to obtain all desired data, due to time and financial limitations, it is now urged that members aid in filling in addresses and affiliations or reporting errors. It is hoped that the Directory can be issued biannually. Meantime, the Alumni Review will endeavor to report changes which qualify for the "News of Classes" department.

WHAT'S NEW ON LIFE MEMBERSHIP?

Historically speaking, our present Caltech Alumni Association LIFE MEMBERSHIP PLAN is just about four years old. The Association, by unanimous consent of its membership in 1935, voted an amendment to the then existing Constitution to permit members to buy a Life Membership. The same provision was carried over in the Articles of Incorporation.

Briefly here are the main points of this plan: By payment of \$50.00 in one sum a fully paid Life Membership card is issued. Payment of \$11.00 for five years or \$6.00 for ten years will provide the means of acquiring a Life Membership on an installment basis. Thus the plan has been made available to every Tech Alumnus regardless of his economic situation. The money received by the Association is deposited with the Institute and interest only can be used by the Association for its general expenses. On the installment plan when a member fails to meet his annual payment he merely loses his membership for that year but may resume payments in the future without penalty.

This plan was the outgrowth of lessons learned during the late unlamented depression. When times get hard members readily drop out of such organizations as Alumni Associations. However, those are the times when such Associations are needed most of all, i.e. the Placement Service work. By using this long range, reserve building program, the bump from any loss of members can be softened. It is estimated that the cost of getting each annual membership runs between 35 and 50 cents. This cost is of course lost motion for it must be repeated each year. The Life Membership plan can eliminate that loss and insure persistency of membership in the Association. In brief, the Association with a large reserve fund from Life Members, could be in an enviable position with sure economic status and effective expenditure of funds.

Results to date, we believe, have justified the wisdom of the Plan and established its practical value. At present there are forty-nine fully paid Life Members and fifty-six on the Installment Plan. The spread in classes represented runs from 1898 to 1937. In fact, every class from 1920 to 1937 has at least one Life Member. Approximately 10 per cent of the current memberships are subscribers to the plan. The results obtained thus far were mainly the efforts of solicitations made during the first two years of the plan's existence. Efforts are now being made by the Board of Directors to revive the popularity of the plan.

Naturally the Board of Directors would like to see you a Life Member if you have not already signed up. Yet what could such a plan have in it for the individual alumnus? First of all, there never would be any more duns mailed to you for dues; you're in for good. (NUISANCE VALUE). Secondly, the cost of annual membership is bound to advance as the organization grows, and by means of this plan you can peg the cost of Alumni Membership to you

at the present low level. (ECONOMIC VALUE). Thirdly, your bit toward establishing a permanent, financially sound organization that can be depended on in good and bad times is unquestionably done for all time to come. (SENTIMENTAL VALUE).

A DEPOSIT OF \$6.00 IS ALL THAT IS NECESSARY TO START — RESOLVE TO DO YOUR STARTING IN 1939.

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NEW GRADING SYSTEM

Two important changes in the grading system at the Institute have been made during the present school year. The numerical system has been replaced by the more widely used alphabetical system and the meanings of the various grades has been changed.

Whereas in the past a grade of '2' denoted average and a grade of '1' denoted below average, under the new system 'C' denotes satisfactory work though below average and a grade of 'D' denotes unsatisfactory work though still counting as '1' in the old system for computing grade points.

The main advantage in the system is that it eliminates the impression that a great number fail because of the necessarily large number of students who are below average.

Because of the almost universal use of the alphabetical system, it is more easily understood by prospective employers, as comparisons can easily be made with grades received at other colleges and universities.

Under this new system fewer blue slips at mid terms have been given students than were issued in previous years.

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STARS MAY SHINE UNSEEN

Astronomers cannot prove it, but they strongly suspect that there are stars in the sky which, although shining, cannot be seen, according to a report by Dr. Fritz Zwicky published in a recent issue of the *Astrophysical Journal*.

This seeming paradox would come about if the stars were of extreme density and so possessed an enormous gravitational force, which would act strangely on the light these stars might emit. This force would do two things, according to Doctor Zwicky. It would slow up the light from these stars so that rays would take an infinitely long time to reach an external point, and even if it did arrive, would reach the external point without energy and thus be impossible of detection.

Such stars would be of a type called collapsed neutron stars and would represent the lowest states of energy which matter could possess without turning into radiation. This concept was postulated to explain the outpouring of radiant energy which supernovae possess for their brief period of brightness.

Doctor Zwicky has discovered eight supernovae or exploding stars while working with the Schmidt telescope at Palomar Mountain, one of them being the brightest star ever observed.

THE SCHMIDT TELESCOPE

A Revolutionary New Astronomical Instrument

By ALBERT W. ATWOOD, JR., '32

One visiting Palomar Mountain's broad meadows might be amazed to discover another large telescope housing. This is the future home of the little publicized forty-eight inch Schmidt telescope which astronomers hail as the greatest advance in the past fifty years. It is likely that the Schmidt will achieve fame in advance of the 200-inch telescope itself.

The feature that makes the Schmidt telescope of such outstanding value is its wide field of vision. For example, the Schmidt will be able to photograph the entire visible heavens in about two years, requiring only about 1,000 plates to accomplish this; on the other hand, it would take the mighty 200-inch telescope more than 1,000 years and 100,000 photographic plates to make a complete map of the heavens. Hence it is readily understood that the wide-eyed Schmidt will be of inestimable value in discovering the points of interest on which to turn the penetrating eye of the 200-inch telescope. The Schmidt in its own right is expected to make many important discoveries. Even the little 18-inch Schmidt which Dr. Fritz Zwicky has been using for the past year on Palomar has made world wide headlines by its discovery of super novae. The ability of the Schmidt to photograph the entire heavens down to the 20th magnitude within a couple of years is most remarkable when one recalls that the combined efforts of the 60-inch and the 100-inch telescopes on Mt. Wilson have succeeded in mapping but 1½ per cent of the heavens in the years since they were constructed.

The Schmidt telescope is composed of a spherical mirror with a thin correcting lens and is the discovery of a one-armed German optical technician. Unfortunately, Bernhard Schmidt died in Hamburg in 1935 before discoveries were made with one of his instruments that would have made him famous.

Astronomical authorities agree that the Schmidt telescope is the greatest advance in recent years and its wide, quick eye will be of great value in permitting a highly efficient use of the great 200-inch telescope.

— T —

MOST PAINFUL NERVE DISEASE

Relief for sufferers of tic-douloureux, a nerve disease so painful that it has driven some of its victims to suicide, is in prospect as a result of an apparently successful clinic conducted at the Institute which was announced recently by Dr. Henry Borsook who has been associated with Dr. M. Y. Kremers and Dr. C. G. Wiggins in conducting the research.

The disease, one of the two most painful that ever assails mankind, is marked by excruciating pains that shoot through the face in lightning-like spasms. The treatment used is the administering of ten times the normal requirement of Vitamin B by mouth and injection. In a month patients begin to feel

relief from pains with a marked freedom from pain occurring in another month. While fine results have so far been obtained, it is not yet certain that cures are permanent.

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IN MEMORIAM

OGIER

Walter W. Ogier, Jr., '19, died suddenly on December 28, 1938, in Pleasantville, N. Y., at the age of 42, after having been ill for several days of appendicitis.

At the time of his death, Mr. Ogier was vice-president of Pure Carbonic, Inc., a subsidiary of the Air Reduction Corporation, which absorbed the Nu-Ice Company of Pasadena, owner of patents for the production of dry-ice developed by Mr. Ogier while an instructor at the Institute.

Mr. Ogier was for many years an instructor in mechanical engineering at the Institute and devoted a great deal of his time to coaching the Glee Club. While an undergraduate, he served as student body president, resigning to enlist in the United States Navy during the World War.

BRIDGES

Dr. Calvin B. Bridges, who has been doing work in genetics at the Institute for several years, died in Los Angeles on December 27, 1938. He was a biologist on the staff of the Carnegie Institution of Washington, and also worked part of the year at the Woods Hole Biological Institution in Washington.

Through Doctor Bridge's work, structural details of Chromosomes were made visible, and his technique made the mapping of genes possible. "In recent years, he spent much time in revising the genetic maps which are the standard ones where *Drosophila* is used. His work here was more than a routine job," according to Dr. Thomas Hunt Morgan, in the last issue of "Science."

INGALLS

Francis Chandler Ingalls, '39, died on February 28, 1939, as the result of an accidental fall at the Pasadena Y.M.C.A. Swimming Pool. At the time of his death he was president of Blacker House, and secretary of both Pi Kappa Delta and Tau Beta Pi chapters at the Institute.

His passing was mourned by the entire student body. Fellow members of Blacker House acted as pall-bearers, and a male chorus from the Los Angeles City College, of which his father, Dr. Roscoe Chandler Ingalls, is Director, sang at the funeral services.

MALEEV

Leonid Vladimir Maleev, '40, died on January 7, 1939, as the result of a hundred yard fall from an icy trail while on a tobogganing party. He was majoring in mechanical engineering, and was an upper class committeeman at Blacker House.