

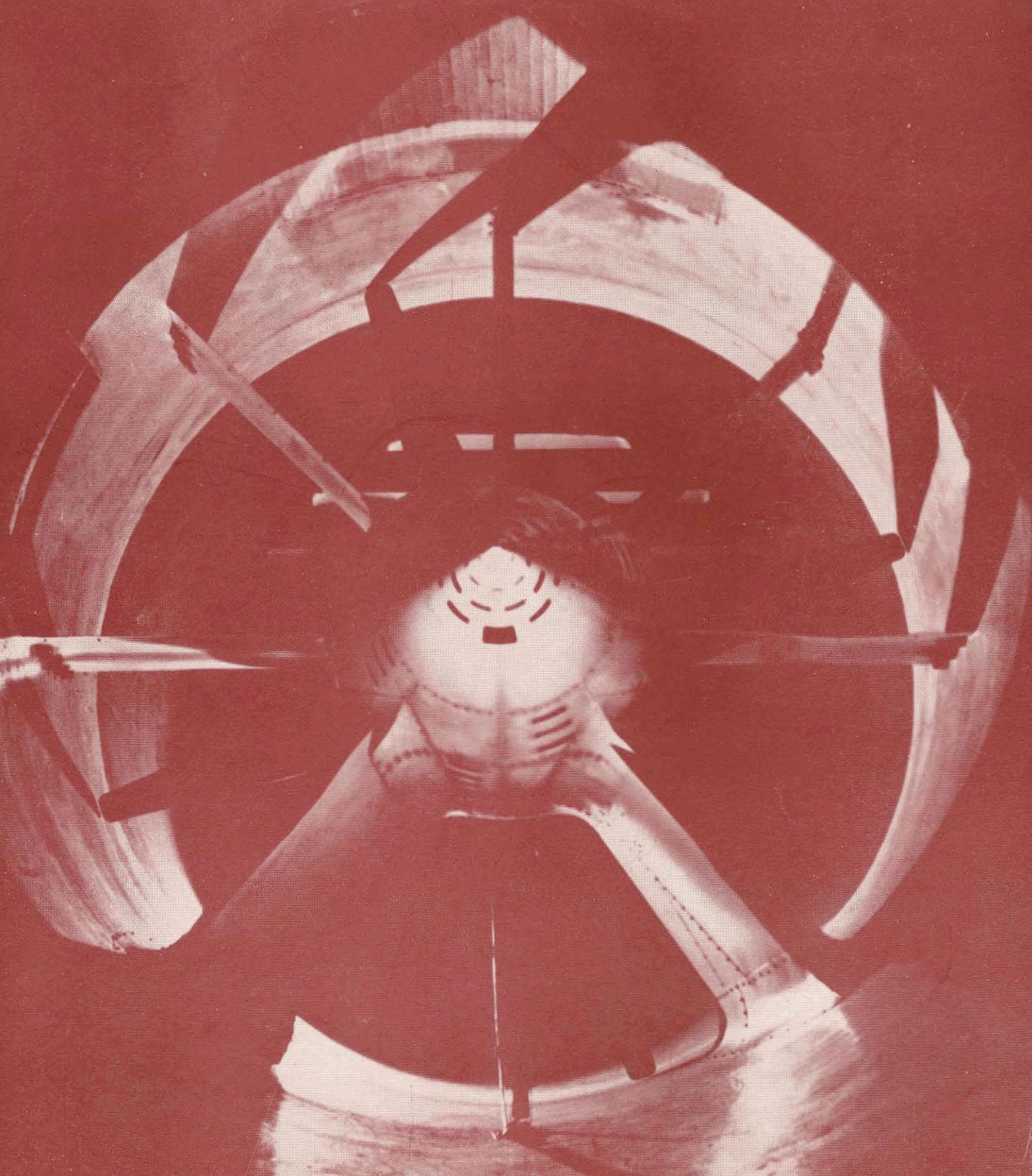
IN THIS ISSUE — *"The Institute and National Defense"*

ALUMNI REVIEW

CALIFORNIA INSTITUTE OF TECHNOLOGY

Vol. 4 No. 1

September, 1940





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PRESIDENT'S MESSAGE

The Alumni Association and the Institute are opening their new years in a critical time in the history of our nation and our civilization, a time when the values of personal liberty and freedom of thought that we have cherished so much in the past are being challenged both in the world as a whole and within our own communities. More than ever educated men, scientists, engineers, and thinkers, must stand together and strive to insure the progress of civilization.

We Alumni of the California Institute have a great heritage, and we believe that one of the best ways to preserve that heritage is through continued cooperation and interest in the Alumni Association. No longer the struggling youngster that it was a few years ago, the Association is now a vigorous organization with much to offer its members. In fact we may boast with pride and with fairness that our Alumni Association offers more real benefits and more real opportunities in social and other activities than any other alumni body in the country — and at less cost.

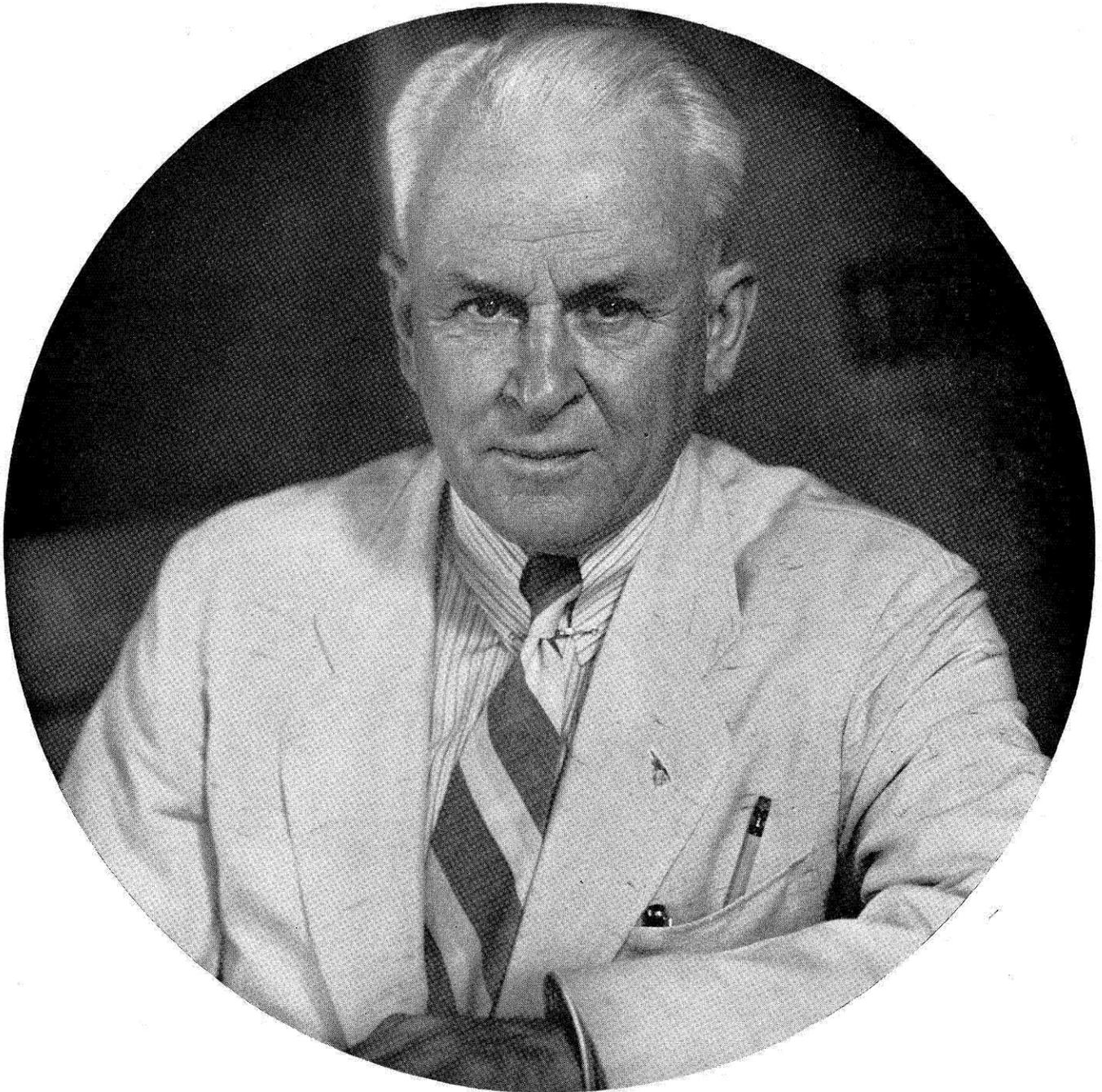
This year we expect to have the largest membership in our history, and of course the larger the membership and the greater the extent of cooperation, the more successful our program will be. May we call to your attention some of the things we have in store.

1. A larger and more interesting Alumni Review. More Alumni comment on this phase of our Association's program than on any other, and interest is continually evidenced by readers and contributors alike. Increased revenues make possible more pages and better articles.
2. Monthly meetings, featuring subjects and speakers of great interest to Alumni in scientific and other fields.
3. The annual dance, featuring outstanding orchestras and held for the last two years at the Biltmore Hotel in Los Angeles.
4. The annual stag and field day. A day of recreation and fun, and a chance to renew old friendships.
5. The Seminar Week-End. This is another outstanding accomplishment of your Association and one almost without parallel among other American colleges. Over 500 Alumni and their guests attended the 1940 Seminar.
6. Alumni Directory. A new directory is scheduled to come off the presses this year, with complete data on all Tech graduates and degree-holders. This is another unique service of your Association.
7. Enlarged placement service. With the fame of the Institute constantly spreading, better positions are available for Tech Alumni, and the Association-sponsored Placement Office under the capable direction of Professor Clark and Miss Dierkes is always at your call.

We are sure that the above summary of Association activities, to mention none of our services to undergraduates, to the Institute's athletic teams, or to the Institute itself, will give you a picture of the considerable task we are carrying through, and suggest possibilities for even greater achievements.

Here's to a successful year!

THEODORE C. COMBS, 27, President.



Alumni of The California Institute:

National Defense has of course brought up the necessity of solving many new problems, and the Institute, its personnel, its laboratories, and its shops have been placed at the disposal of the government to the fullest extent that is consistent with the maintenance of the big educational job which the Institute has on hand, — a job which is of itself the most vital of all possible defense activities. For competent and adequately trained personnel is the key to the solution of practically all of the world's problems.

Some of the special emergency activities which we have been asked to undertake represent merely the expansion and intensification of our regular educational work. Thus, one of these is the transformation during the summer of 125 mechanical engineers into aeronautical engineers to meet the extreme emergency demands of the aeronautical industry. Similarly, under the auspices of the aeronautical department a group of 60 prospective fliers have been given during the summer ground school and flying training, and a repetition of this type of work is called for during the school year.

Again, the emergency is demanding the training of a large number of skilled meteorologists, and the Weather Bureau, the Army and the Navy have between them asked to be permitted to send not less than 100 graduate students to take a year of intensive training with Dr. Krick and his associates in meteorology.

These are but three of at least a dozen emergency defense problems which have been assigned to the Institute for solution.

Robert A. Millikan

THE CALIFORNIA INSTITUTE AND NATIONAL DEFENSE



RICHARD C. TOLMAN
Chairman, Council on Defense Cooperation

What can the California Institute do for national defense?

That question became of paramount importance in the minds of the staff last spring when President Roosevelt called for a greatly enlarged and accelerated program of national defense. The experience of 1917-1918 had already shown that the best scientific, engineering, and technical skill of the country must be called on in such an emergency. On the Institute faculty were men who were well qualified to undertake the research and invention necessary in developing new offensive weapons. There were others, equally well qualified to deal with the related problems of material resources, communications, economic coordination, etc. The Institute laboratories and shops provided the necessary equipment and trained personnel for research and developmental work.

The problem, then, was how to make these resources of men and equipment available for the most effective use. If the matter was left to individual initiative, there was bound to be waste of time, difficulty in deciding what problems should be undertaken first, and possibly duplication of effort.

DEFENSE COUNCIL FORMED

Consequently, early in June the Trustees, by faculty request, authorized the formation of a Council on Defense Cooperation whose activities were to be directed by an executive committee of three. The chairman of this committee was Richard C. Tolman, Dean of the Graduate School, who in 1918 was Chief of the Dispersoid Section of the Chemical Warfare Service, with the rank of major. The second member, Max Mason, Chairman of the Observatory Council, was engaged on research on submarine detection at the Naval Experiment Station at New London during the last war. The third member, Earnest C. Watson, Chairman of the Faculty Board, also worked on the submarine detection problem at New London in 1917-18.

Professor Watson has been chairman of the executive committee since Dean Tolman's departure to Washington in June.

The first work of the Council was to make a detailed survey of the contributions which the Institute could make to national defense through the individual members of the staff and through special laboratory facilities. This survey was completed by the end of June, and a report embodying the results was sent to the proper authorities in Washington.

This report is too long and detailed to be summarized here. In general, however, it covers the Institute department by department, listing the staff members with their special fields of competence. Special laboratory equipment and trained technical personnel are detailed. And finally, suggestions are made as to special problems which could profitably be undertaken, special knowledge which could be used in advisory capacity, and present lines of work which could well be enlarged and extended.

RUBBER FROM GUAYULE

A few examples can be cited at random. The Plant Physiology department, for instance, calls attention to the importance of developing a source of rubber in the United States. One plant, the guayule, which yields rubber, is already under limited cultivation here, but considerable work remains to be done in determining the optimum conditions under which it could be grown. There is also the possibility that its rubber yield could be increased by genetic and physiological means. Such research problems the plant physiologists would be ready to undertake if called on to do so. The geology department could conduct mineral surveys, to determine where strategic minerals might be secured in emergency quantities or under emergency conditions. In astrophysics the mechanical and optical shop equipment and staff could undertake the design and construction of almost any type of optical instrument, or of driving or automatic control mechanisms required by army, navy, or air force. The department of business administration could aid in the organization of industrial control, especially in the problems of coordinating production.

COOPERATIVE RESEARCH STRESSED

Perhaps the most interesting feature of the report is its emphasis on the possibilities of cooperative research:

Conditions are especially good at the Institute for the cooperative attack on problems involving the services and knowledge of specialists in various fields and with varying degrees of analytical and experimental abilities. It is suggested that the type of problem which could most profitably be given for solution to the staff of the Institute is that in which the problem itself is posed, but for which no solution has been found or perhaps even indicated. Problems of this general type could be attacked from all sides by a group of chosen men representing various fields of experience, with considerable hope of successful solution.

The committee has also set up the necessary channels of communication with Washington, so that suggestions from the Institute can go direct to the proper authorities, and problems can be allocated to the Institute without loss of time. As a result, several problems suggested by the Institute are now

being pursued, and various assignments have been received from the government for work here.

The committee has also undertaken to winnow out ideas for weapons, etc., which are constantly being presented by the public. When someone writes the Institute asking for advice about such an invention, the faculty member best qualified to pass on its value is assigned to interview him. Most of the material presented is valueless, but under present circumstances it is worth spending considerable time if only a small number of profitable ideas are thus salvaged and sent on to the proper authorities in Washington.

So far, the most vigorous national defense activity has been in the Guggenheim Aeronautical Laboratory. The training of army and navy officers detailed there for special work in aeronautics and meteorology is already an old story. So is the wind tunnel testing carried on for Southern California airplane manufacturers. Both of these are now greatly intensified. In meteorology, the number of army, navy, and weather bureau men for 1940-41 will greatly exceed any previous year.

CIVILIAN PILOTS TRAINED

But in the past few months the laboratory has engaged in two new activities. The first of these is participation in the Civil Aeronautics Board's program of civilian pilot training. In this, members of the laboratory staff give the ground school courses, while the flying school is held at an airport nearby. The first group of students under this training program received their private pilot's certificate of competency in June. A second group will finish their training about the middle of September; and the training will be offered a third group during the fall term.

The Civil Aeronautics Board's program of pilot training was not of course designed as a defense measure, nor has it been so carried through. The certificate of competency is very far from qualifying its holder for army or navy aviation. Nevertheless, the training is creating a great reservoir of men who have had experience flying, and who, if need arose, could be given further training. In this respect, then, the Guggenheim Laboratory, along with many other colleges and universities, has been helping to meet a genuine need as far as increasing the number of civilian pilots is concerned.

The other new activity of the laboratory is a short course in aeronautical engineering given this summer in cooperation with the Lockheed Aircraft Corporation. With the increase in the air force playing such a vital role in national defense, the rapid expansion of the aircraft industry becomes an immediate necessity. One of the impediments to such an expansion, however, is the lack of trained aeronautical engineers. This threatens to be one of the most serious bottle necks in the industry.

But Mr. Robert Gross, the president of Lockheed, saw a potential supply in men who were trained and had had successful practical experience in other engineering fields—for instance, mechanical, structural, hydraulic engineering. With some additional training, they could apply their skills to some of the special problems involved in airplane design and construction. So the following arrangement was worked out. From a large

group of applicants, Lockheed selected about 120 such men, particularly well qualified by past training and professional experience. For them the members of the laboratory staff worked out a special short course in the essentials of aeronautical engineering. Upon completion of this work at the Institute, the group will have a supplementary course in the Lockheed plant. The Lockheed Aircraft Corporation is paying the tuition of these men at the Institute, paying them a salary while both parts of the training course are in progress, and is guaranteeing them employment upon successful completion of the course.

EXPLOSIVES AND ORDNANCE

Still other lines of service by the Institute have been recently indicated by Dr. Millikan after conferences with Army and Navy officials, although details of these must be withheld. An acre plot in the upper Arroyo Seco has been leased from the City of Pasadena for experiments on explosives, and work will start immediately on this phase.

Firearms and machinery problems will also be on the research list to some extent. Here much of the work will be done on small scale models, with which the Institute has achieved effective results in many past instances.

EFFECT ON INSTITUTE

Already the necessities of the national defense program have made demands on the Institute staff. Besides those who have been called to Washington from time to time for consultation and advice, several will be missing from the campus when the fall term opens. Dean Tolman is in Washington indefinitely as vice-chairman of the National Defense Research Committee, which was appointed by President Roosevelt last June. Professor A. E. Lombard, Jr., is also in Washington, serving as assistant to the head of the Aeronautical Section of the Advisory Commission to the Council of National Defense. Professor Horace Gilbert has been granted leave of absence for 1940-41 to join the staff of the Harvard Business School. There he will take part in the instruction of a group of army officers detailed there for special work in industrial procurement and coordination.

Dr. Millikan and Dr. Max Mason are both discharging important duties in connection with national defense, though fortunately for the Institute, these do not demand their continued absence from Pasadena. Dr. Millikan, besides being a member of Governor Olson's state defense committee, is also a member of the National Academy of Sciences' Navy Department Advisory Committee for Research. Dr. Mason is chairman of this committee, and is also chairman of the committee of the National Academy on Army Air Corps research.

What further demands will be made upon the Institute, no one can say. It is a safe guess, however, that these demands will increase. Nevertheless, it is the feeling of the Institute authorities that national defense involves not only solving special problems, but also continuing the supply of well trained scientists and engineers. Consequently, however much the Institute is called upon to supply specialists and to undertake the solution of special problems, no one contemplates any curtailment of the regular undergraduate and graduate instruction.

THE EFFECT OF THE DEFENSE PROGRAM ON SCIENTIFIC RESEARCH

By MAX MASON

*Member Council on Defense Cooperation, Chairman
Observatory Council, Former President University of Chicago*



MAX MASON

Chairman of the Observatory Council, C.I.T., formerly
President of the University of Chicago and of the
Rockefeller Foundation

The sudden awakening of America to its danger and to its responsibility for preserving human decency in the world was a startling phenomenon. No group has been more vitally affected in its thinking and planning than the scientific research workers of the country. They believed with all their hearts in a world of continuous human betterment and conceived of their efforts in understanding of the laws of nature and the behavior of man as progress in the enrichment and rationalization of life.

A philosophy of life sets the goal of endeavor, and progress toward that goal—whatever it be—is obtained by the application of knowledge. We see today the menace of catastrophe to the great human adventure of self-mastery and evolution of the good life. Great nations have had their ideals perverted, and their efforts turned to mass murder for the sake of national aggrandizement by ruthless dictatorships. As they have devoted all their technical skill and scientific knowledge to an assault on human decency, we must give an equal or greater devotion of our skills to defense.

The scientific workers of our country were not slow in comparison with the rest of the country in recognizing these facts, and are not being slow in organizing for and entering into the new direction of effort.

RESEARCH POWER INCREASED

In the years since the previous world war, America has increased its research power very greatly. Powerful research

laboratories are today the rule rather than the exception, in the more important industries. In addition to carrying on research under their own organizations, both the Navy and the Army in recent years have called upon the research groups in the industries and in the academic institutions to a much greater degree than before 1917. In pure science, America stands second to no other nation today.

Shortly before we entered the previous world war, the National Research Council was organized, under the National Academy of Sciences. Dr. George E. Hale played the leading role in producing this body, and Dr. Robert A. Millikan directed the efforts of its division of physical sciences. The scientific force of the country was rapidly mobilized by the National Research Council, and individuals and groups were soon working on a vast number of problems for the Army and Navy.

The lessons of that period were not forgotten. The Army and Navy have kept contact with civilian science. In recent years they, and the National Advisory Committee for Aeronautics, in addition to carrying on their own research, and supporting research by individuals and institutions, have used the National Academy of Sciences and the National Research Council for the study of basic questions, and for organizing active research groups. The Navy has recently formed a Central Body of Control of all of its research, which consults with an Advisory Committee of the National Academy. Direction and support of defense research has been greatly stimulated by a newly formed National Defense Research Committee. These groups and committees keep in close correlation. The California Institute of Technology is well represented in all of these groups and the Institute as a whole is exceedingly active in the defense program.

There is no field of scientific activity which has not contributions of importance to make in this emergency for national defense. The country has been late in understanding its danger, but as far as the research phase of defense is concerned, the speed of organization and initiation of intensive effort have been satisfactory and heartening.

A grim and distasteful task is before us, and it may absorb our thoughts for years to come. But the better it is done the sooner can we return to a life of sane and wholesome endeavor in a world of hope.

RECORD NEW SUPERNOVA

As much light as several hundred suns is given off by a giant exploding star recently discovered between the North Star and the Dipper by Dr. Joseph J. Johnston, Caltech astrophysicist. He spotted the new star from Palomar Mountain with an 18-inch Schmidt telescope, which has been instrumental in discovery of 16 exploding stars since 1936.

AN APPROACH TO THE HOME BUILDING PROBLEM

AUBREY HORN '31, *Architect*

Building a home may well be considered as one of the first important personal problems of investment, planning, and maintenance which the professional and technical man desires to undertake. It is with the hope that the elements of the problem may be more clearly defined that this article is submitted.

1. BUDGET

The total expenditure naturally relates to present income and assured future income. Many lending institutions assume that total monthly payments should be from 20% to 25% of the applicant's monthly income, less if possible, and assuming this amount to include principal, interest and taxes. In addition to this a definite allowance should be made for maintenance of the improved property.

When the amount of the budget is established, the items to be covered by it should then be determined. These include the cost of the lot and subsequent survey locating property lines, contours, trees, easements, set-back lines and utilities, all as a first item. Second, the cost of the plans, supervision and financing of loans. Third, the contract cost for the construction of the building complete and ready for occupancy. Fourth, the cost of additional furniture, rugs, drapes, and equipment not now owned. Fifth, the landscaping and improvement of the grounds. And sixth, an item for moving charges, initial deposits, and miscellaneous costs incidental to actual occupancy.

The relationship and importance of these individual items may well be considered with your architect prior to any actual financial steps being taken.

2. TECHNICAL SERVICES

To insure complete satisfaction and protection it is almost mandatory to have as instruments of service complete plans, specifications and written agreements. These documents are required by all construction lending agencies, the size of loan the project will support being largely determined by them.

An architect prepares this information and supervises construction for a stipulated fee, usually a percentage of the cost of construction, while some contractors provide this information through their own affiliations, adding the charges to the contract sum.

To aid in selecting an architect or contractor, the prospective builder should check with two or three recent clients and examine their buildings. Further checks may be made through the State Architectural Board, the State Contractor's License Board or bank references.

3. CONSTRUCTION LOANS

These are available through banks, insurance companies, mortgage companies, Federal savings and loan associations, building and loan associations and other private sources.

The Federal Housing Administration only insures loans, and this only through certain accepted lending institutions.

It is suggested that an advance check-up on the complete charges incidental to making a loan, be made prior to final budget set-up. These charges may amount to approximately 3% of the amount of the loan, varying either way with the

size of the project, type of loan, the lending agency and whether or not F.H.A. insurance is used. The exact figures on these total charges will not be obtainable until plans and specifications are filed for appraisal and a commitment is obtained.

4. BUYING A LOT

Convenience of access to work, schools, stores, and transportation will usually determine the general location of the lot, but it is suggested that prior to actual purchase the architect be requested to check over the site. His comments as to type of house, location, view, sun exposure, prevailing wind, drainage, type of soil, fill and general adaptability to the problem will be a valuable addition to the information which the owner should acquire regarding deed restrictions, zoning, traffic, utilities and neighborhood.

In nearly all instances the presence of trees on the lot will add definitely to the use and appearance of the finished product, as well as reducing the time and cost of landscaping.

5. THE HOUSE

The cost of the house and garage should, naturally, bear a just relationship to the lot cost and the total budget, provided a maximum investment value for the total improvement is to be expected. Furthermore, since this is the major item of the whole budget, ample time and thought should be given its design, both for utility and desired appearance.

In function the house should accommodate the present family, giving consideration to space for adults and children of both sexes as well as considering the possible need for future expansion.

In establishing the present and future needs, such items as work and study space, recreation areas, sleeping, cooking, eating and loafing areas, as well as spaces which can be used for more than one function, should be given careful thought.

In the light of these general considerations and combined with the style or type of architectural appearance desired, a fairly comprehensive problem may be presented for solution. A suggestion in this line is to make a list of rooms needed and note therewith the desirable requirements of each. These might be tabulated under the headings of Size, Exposure to Sun, Relationship to Other Rooms, Special Features, and View.

As soon as these items are presented and the preliminary sketches begin to take shape, the questions of wall space and furniture arrangement naturally must be considered, and, as always, the important factor of budget will appear.

It is at the stage when the preliminary sketches are being completed that so many of the little items of convenience must be considered. Here is the time when the prospective home owner who has kept a scrap-book of desired features such as special shelves, closets, drawers, kitchen arrangements, built-in features, and miscellaneous accessories will feel repaid for the hours of cutting and pasting.

A list of a few of these conveniences would include mail box, illuminated house number, medicine cabinets, book cases, shoe racks, door grilles, milk and package receivers, iron recep-

tacles, fans, garbage disposal units, towel racks, ironing boards, mirrors, awnings, bath accessories, light fixtures, hardware, wall paper styles, heat registers and many others.

To effectively combine these desires into a usable form again a schedule would be a most practical reference form. The following illustrates one such type:

Room Name	Wood Work	Floor	Wainscot or Paneling	Walls	Ceilings	Special Features or Notes

With the approval of the sketches and starting of the working drawings and specifications further decisions must be made regarding plumbing fixtures, quality of plumbing, heating and electrical work, roof materials, exterior wall materials and extent of ground improvement desired. This latter could include walks, walls, driveways, steps, fences, service yard, incinerator, sprinkling system, yard piping, noiseless couplers or separate meters for yard lines, lattice work, drainage, grading, lawns, trees and shrubs, all of these elements being generally considered by and provided for under the landscape architect's contract if such services have been retained, or else under the general contract.

In this latter consideration it might be well to say that if the budget can possibly stand it, the services of a landscape architect will be many times repaid in the enjoyment and satisfaction derived from well landscaped grounds.

The next step in our sequence is the preparation of the working drawings and specifications, on the completion of which the bids are taken. Before the bids are taken, however, it is important to read carefully and understand completely the drawings and specifications. As in the case of any contract document, you get only what is included therein, and no more except at an extra charge.

6. CONSTRUCTION

After the bids are taken and the loan applied for and committed, the most interesting and exciting stage of the development begins with the start of actual construction. This period can be most pleasant or unpleasant depending upon how complete is the written and verified information with which the job is undertaken. Generally, the more information, the less misunderstanding and extra charges, and vice versa.

During this period the building will be inspected by City or County Building Inspectors who check only to see if all local and state fire, health, and safety ordinances are complied with. These ordinances are minimums only for material, structure, and workmanship.

Furthermore, if a lending agency is involved, its inspector will check the job on three or four occasions to see that the value of the loan goes into the job. These inspections, however, do not assure that all of your desires are included, except where they coincide with the certain minimum requirements of the ordinances or lending institutions' construction standards. For example, colors, painting, wall papering, light fixtures, hardware, and general interior finish are often left to the owner or his agent.

7. COMPLETION

There are certain laws relative to building completion which are designed to protect all concerned. With this in mind the payments on the contract should be so made that upon completion a balance of 15% to 20% should remain unpaid, this balance not to be paid until 35 days after acceptance of the building and filing of notice of completion, which date will follow the closing of the mechanics' lien period.

A completion date should be included in the contract to prevent loss to the owner due to unnecessary delay on the job, and in some cases a completion bond or a joint control bank account may be necessary.

Fire insurance should be carried on the house by the owner during construction, as loss by fire to materials incorporated into the structure will be the owner's loss unless protected as above mentioned.

Another safeguard is to check the contractor's insurance policies before signing the contract. See if his compensation as well as liability insurance policies are paid up. Also verify whether or not he carries owner's contingent liability insurance to protect you from damage by law-suit, even though caused by his carelessness.

Space has not permitted a more than casual glance at the home builder's problem, yet it is hoped that this outline of the problem will help to clarify the situation for many who are about to build. A more technical discussion of available and proposed construction methods for residential work is being considered for a future issue.

For further information on this subject many valuable pamphlets are published by both government and private agencies, one of the best obtainable in brief and outlined form is entitled "So You're Going To Build", prepared by the Building Research Sub-Committee of the Building Industries Committee of the Los Angeles Chamber of Commerce, and available through local material and supply dealers.

— T —

JOIN ILLINOIS TECH STAFF

Two former Institute research workers are among the new professors appointed to the staff of the Illinois Institute of Technology, recently formed by the merger of Armour Institute of Technology and Lewis Institute, in Chicago. Announcement was made by President H. T. Heald of the Illinois school.

Dr. Saul Winstein, Ph.D., '38, is joining the chemistry department. He has studied under a National Research Fellowship at Harvard, after doing graduate work at Caltech and U.C.L.A.

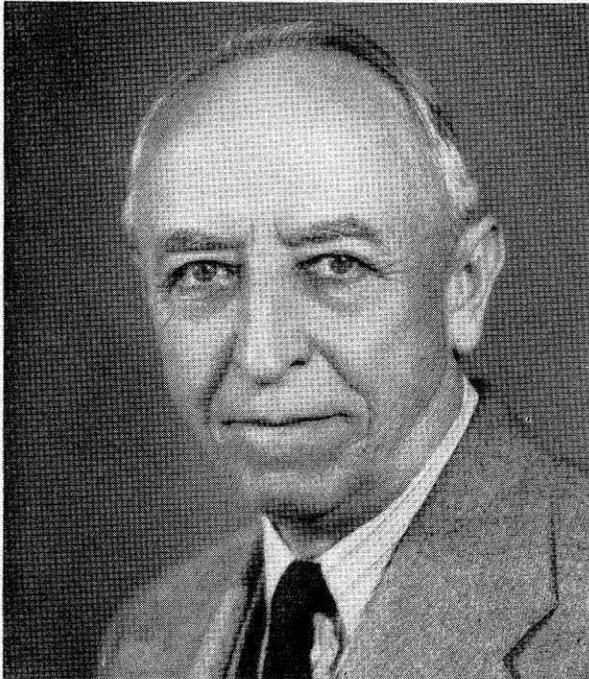
Dr. R. A. Budenholzer, Ph.D., '39, will be in the mechanical engineering department. Budenholzer graduated from New Meico State College, and after taking his degree at Tech was an assistant in mechanical engineering and a research fellow. Much of his work was in connection with American Petroleum Institute projects.

Both men will assume their new duties this September.

THE INSTITUTE AND THE FIRST WORLD WAR

By H. C. VAN BUSKIRK

Professor of Mathematics, Former Registrar



Credit Ray Huff Studios

HARRY CLARKE VAN BUSKIRK

What follows should not be looked upon as a historical treatise but rather as the random recollections of a staff member.

The college department of Throop Polytechnic Institute moved to the present campus in September, 1910, and after the excitement and bustle of registration were over it was found that we had twenty-seven students. Later registrations swelled the grand total to thirty-one for the year. Attendance increased steadily and for the year 1914-15, following the outbreak of war in Europe, had reached ninety-one.

As the European war progressed it became increasingly evident that sooner or later the United States would be drawn into the conflict. In April, 1916, President Scherer announced that a system of voluntary military training would be introduced the following September. Upon petition by the students the military training was made a part of the required curriculum. The same spring President Scherer advised the students who could afford it to take the citizens' summer training course at Monterey, and followed up this advice by taking the course himself. With the opening of college in the fall a unit of the R.O.T.C. was established with Captain Louis R. Ball, U.S.A. (ret.) as Commandant. In March, 1917, before war was declared, the first volunteers, Bruce Burns and Frank R. Mosher, juniors, and Paul A. Scherer, a sophomore, left the college to join the U.S. Navy.

Shortly after the United States entered the war plans were made to hold a training camp on the campus west of Throop Hall, but the war department finally decided to concentrate efforts on the Presidio camp at San Francisco and the plan was abandoned.

MID-YEAR CLASS ADMITTED

Because of the need for engineers it was decided to admit a freshman class at the mid-year. An invitation was extended to high school students who completed their courses at the mid-year and to a selected group of seniors who would normally have graduated from high school the following June. On this basis a class of thirty-one students was admitted in February, 1918. They continued their work during the summer and entered the regular sophomore class the following fall. The tempo for the juniors and seniors was also increased and the seniors were graduated April 7, 1918. The juniors continued their work during the summer and were graduated in September.

By the summer of 1918 the Federal Government had plans completed to use the colleges and universities for army training purposes. Under this plan the Reserve Officers Training Corps (R.O.T.C.) was replaced by the Student Army Training Corps (S.A.T.C.), translated by some scoffers as "Safe At The College." The S.A.T.C. was part of the United States Army. For the accommodation of these young soldiers the Federal Government built three barracks buildings and a mess hall on the campus. The barracks buildings, now rather frayed and minus their original glamour, are still standing. Scholastic requirements for admission were somewhat "simplified" and while the number of freshmen admitted in the fall of 1917 was sixty-six, in 1918 it increased to about 190, the largest freshman class ever admitted to the Institute. The total registration jumped from 193 to 340. One small neighboring college, without a military department, sent a large part of its students to the Institute; and after the war was over and the students were mustered out of the service, the college head came over to Pasadena and took them all back again, except for a couple who decided to remain.

CURRICULUM LITTLE CHANGED

The Institute was then practically under military control, but due to the fact that it was an engineering and scientific institution the curriculum was not seriously interfered with. As I remember it, the principal change consisted in the substitution of military subjects for modern foreign languages previously required. Two hours of military drill were required each day, but it is doubtful if this interfered with scholastic work. It was during this term that the country had its first epidemic of influenza, and the Institute lost four students. I shall never forget how funny we looked and how uncomfortable we felt wearing the "flu" masks prescribed for us. Twice during the term work was suspended because of the flu.

Army officers contended that good food, plenty of exercise and regular habits as required by military discipline would more than make up for the time required for military purposes. As far as my own classes were concerned, I do not recall that the slump in scholarship was more than could be accounted for by the flu and the previously mentioned simplification of entrance



Credit Curtis Wilshire Studios, Los Angeles

DEDICATION OF COLORS

President James A. B. Scherer presenting colors to the color-bearer. Throop College of Technology, Pasadena.

requirements. Of one thing I feel quite certain—that in spite of the flu, when the boys were mustered out at the end of the term they were the plumpest, healthiest looking student body we have ever had.

Another thing seems to me to be worth noting. The armistice was signed November 11, and the boys were practically all mustered out of the service by Christmas. A rather embarrassing incident occurred when, on mustering out, a boy was found with only one hand. The enlistment papers provided no explanation and there had been no report of armed conflict on the campus. The boy had been very much surprised at being accepted for military service and had been used for office work.

AERONAUTICAL RESEARCH BEGUN

During the war period aeronautical research was begun, and a special war laboratory was erected for the use of Dr. H. J. Ryan of Stanford University and Dr. J. A. Anderson and Mr. H. D. Babcock of the Mount Wilson staff.

Space permits the mention of only a few of the Institute family who rendered conspicuous service during this period. Dr. George E. Hale, of the Board of Trustees, was responsible for the founding of the National Research Council and served as its chairman for three years. He devoted much of his time and wonderful ability to war work. President Scherer was granted leave of absence from the Institute and, as a dollar a year man, was Chief Field Agent, Council of National Defense and Special Representative, U.S. Shipping Board, Emergency Fleet Corporation. Dr. Robert A. Millikan was in Washington from the spring of 1917 to January, 1919. He held the rank of Lieutenant Colonel and was in charge of the Science and Research Division of the Signal Corps and the Bureau of Aircraft Production. He was also Vice-Chairman of the National Research Council. Dr. Arthur A. Noyes was for a short time Acting Chairman of the National Research Council. He was Chairman of the Committee on Nitrate Investigations of the National Research Council, Chairman of the Nitrate

Commission of the War Department, and Consulting Chemist of the Ordnance Department. More than forty per cent of the Institute staff were either in the army or in other war work. More than forty per cent of the graduates joined the army or navy. In spite of the fact that undergraduates were advised to complete their college work, eighty-three enlisted in the army or navy. When the war was all over it was found that the service record of the Institute was second to none.

— T —

DU MOND DESIGNS NEW X-RAY TUBE

A major difficulty in the operation of X-ray tubes in hospitals may be eradicated by a recent development in the Institute's laboratories by physicist Jesse W. M. Du Mond.

The difficulty, which has heretofore defied attempts at solution, arises from the fact that in medical use of the X-ray there has been a demand for more sharply focussed X-ray pictures, and for "snapshot" pictures of organs in motion.

The only tubes which will supply these demands are of such nature that intense heat is developed during their operation, and they are subject to serious damage if use too often within a given length of time.

Still in its experimental stages, Du Mond's development will, if successful, eliminate the danger that heat may destroy the tube, and at the same time will make possible finer-focus X-ray pictures.

Other X-ray experts have expressed enthusiasm and confidence in his project and believe the development will be of tremendous value to modern medicine and industry. They feel it is an important step in turning the principle of the X-ray to the greater service of man.

LARGE QUANTITY OF HEAT

X-rays are generated when high voltage electrons are shot in a vacuum at a mass of metal called a target. When the electrons strike the target, they give off tremendous energy in the form of heat, and the target's surface may become hot enough to melt. This danger becomes serious when it is realized that X-ray tubes for use in hospitals may cost as much as \$1200.

Many methods have been devised to cool the target, that longer operation time, greater power and finer-focus X-rays may be obtained. These methods have involved keeping the target in constant motion, so that the fine stream of electrons will strike a greater surface and the heat will not be so intense at any one point.

Devices to water-cool the target also have been used. But since the target must be placed in a thorough vacuum within the tube, the difficulties involved in keeping the target both water-cooled and in motion are tremendous.

ROTATE ENTIRE TUBE!

In Dr. Du Mond's proposed tube, both cooling and motion would be solved by rotating the whole tube, instead of just the target, in a bath of liquid. The target would be placed near enough to the surface of the tube to take advantage of the cooling medium.

With such an arrangement, it is hoped that nearly continuous operation and sharper-focus X-rays may be achieved.

Several advantages are anticipated in the new tube. It is

(Continued on page 14)

CALTECH'S "MEN IN WHITE"

On the afternoon of December 7, 1934, eight Tech men walked into a room in the Kerckhoff Laboratories to do something no other group from Caltech had ever done. They were to take the Medical Aptitude Tests which are given annually throughout the United States to those applying for entrance to medical schools. Preparation for the study of medicine was a new interest on the campus, but this group was determined to make a showing that would insure their selection from the large number applying for entrance to the medical schools of the country, and at the same time reflect credit on the Institute. Their success was cited by Dr. Robert A. Millikan in his commencement address of June, 1935. Of all the students in the United States who had taken this test the previous December, every one of these eight men was ranked in the highest ten per cent.

This July four of the group completed their first year of hospital internship. They had scattered throughout the country, each of the four attending a different medical school. They continued upholding Caltech standards by being elected to membership in Alpha Omega Alpha, national medical honor fraternity, which each year elects to its membership the ten per cent of the senior class with highest scholastic standing. One man even led his class throughout the entire four years of medical school.

Elsewhere on this page will be found a brief individual summary of each man's work over the past few years and his plans for the future. It is an interesting commentary on the glamor of the Southwest that no matter how far they may have separated to obtain their training they still express uniformly the desire eventually to settle down and practice near the Institute itself.

Of the original group of eight who took the test in 1934, some have found their interests leading away from medicine, but they still remain among those few who first established the excellence of the pre-medical education offered at Tech, and as such they deserve mention here.

John Lilly, '38, completed his second year at Dartmouth Medical School this spring. He was a Caltech sophomore when he took the Medical Aptitude Test in 1934. Since then he has done many things, including being out of school for a six-month period, getting married, becoming the father of John, Jr., in June, 1937, and graduating from C. I. T. with the class of '38.

Charles L. Schneider, '34, is a graduate student and research assistant in The Biological Laboratories of Harvard University, working with Prof. Kenneth V. Thimann. His interest has shifted from human physiology to plant physiology, and he expects to continue in the latter field. He is the author of several papers dealing chiefly with auxins, and published in the botanical journals.

David J. Lehmicke, '35, is a graduate student at the University of Minnesota.

Claude T. Scott, '35, is engaged in engineering work, and is completing his study of patent law in the night classes of Loyola Law School.

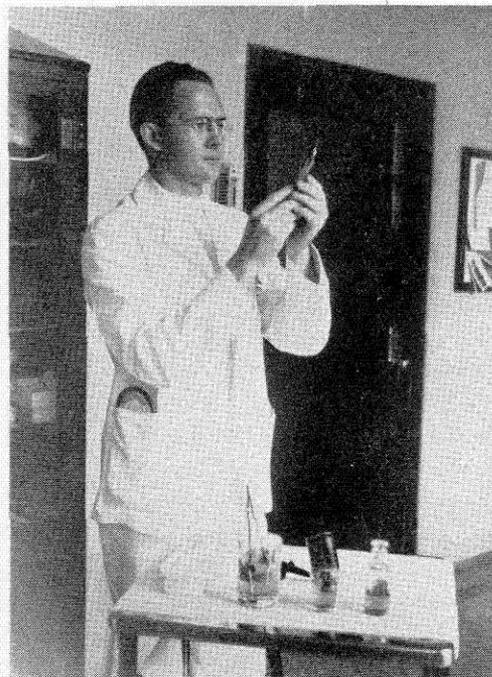
Dr. Arthur E. Engelder, '35, is interning at Baltimore City Hospitals, Baltimore, Maryland. The Hospitals are run jointly by Johns Hopkins and the University of Maryland School of Medicine. He was graduated in June, 1939, from the School of Medicine of the Johns Hopkins University.



DR. ARTHUR E. ENGELDER, '35

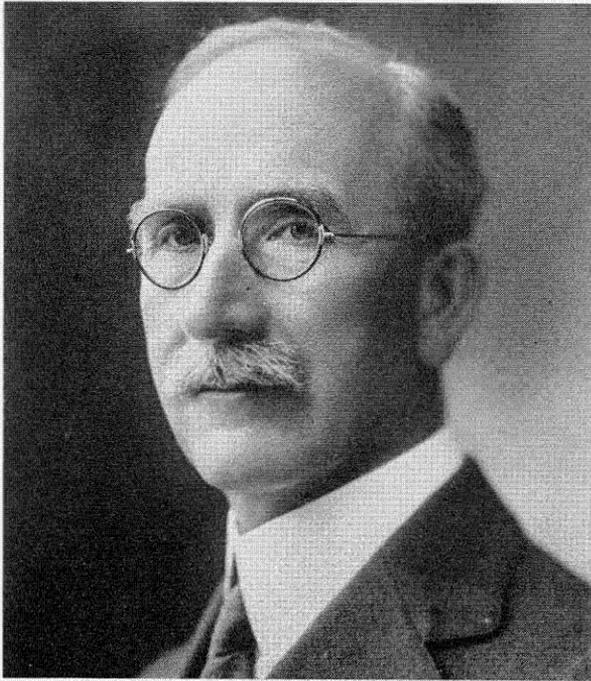
During his years in medical school he did research work in the fields of biochemistry and photoelectric spectrophotography. He also collaborated with his brother, Paul Engelder, '39, on investigations in electrocardiography with cathode-ray equipment. Following his rotating internship, Dr. Engelder plans to practice general medicine and surgery in Tucson, Arizona, where he will be associated with two prominent older physicians. He regards chemo-therapy and plastic surgery of bone with special interest. He is a member of Alpha Kappa Kappa medical fraternity, and his friends will remember that he is married and has a small daughter, Sally.

(Continued on page 14)



DR. RICHARD C. ARMSTRONG, '28

IN MEMORIAM: ARTHUR H. FLEMING



ARTHUR H. FLEMING

Arthur H. Fleming, noted Pasadena philanthropist and one of the outstanding leaders behind the development of the present Institute, passed away on August 11 at his home on Orange Grove Avenue after a long illness. His death at the age of 84 ended a full and active life, the latter part of which had been devoted almost unceasingly to philanthropic work in Southern California, in particular to the betterment of the California Institute, of which he was for many years President of the Board of Trustees. In recent years he had been named President Emeritus.

GAVE ENTIRE FORTUNE

Mr. Fleming and his daughter, who is now Mrs. Wilton Lloyd-Smith of New York, were in large measure responsible for the development of the great undergraduate engineering and postgraduate research institution that has become the California Institute of Technology. They presented the Institute with 22 acres of land which comprise a large part of the campus. The Flemings were also largely instrumental in providing the first building on the present campus, Throop Hall. In 1921 Mr. Fleming helped materially to give stability to the Institute by endowing it with his entire personal fortune, reserving to himself a modest annuity.

The interest of Mr. Fleming in the California Institute had been fired by the enthusiasm of men like Dr. George Ellery Hale. He was one of a group thus interested; notably, Dr. Norman Bridge, Henry M. Robinson, James A. Culbertson, Charles W. Gates and Hiram W. and John Wadsworth.

FLEMING HOUSE NAMED

A testimonial to his services to the Institute was the action of the board of trustees, on his 74th birthday, in naming Fleming House on the campus in his honor. On this occasion Henry W. O'Melveny said in an address that California Institute could never have come into being "save for the extra-

ordinary vision, generosity and devotion of Mr. Fleming." He saw, added Mr. O'Melveny, the "incomparable opportunity of starting a research and education center which, untrammelled by traditions and methods of the past, should grow out of and be adapted to conditions in this new Twentieth Century world."

Notwithstanding his preoccupation with Caltech, Mr. Fleming was not unmindful of other civic needs and causes. He was one of the first presidents of Pasadena Art Institute and took a keen interest in a permanent interest in art and art forms by the community. He was a giver to many other local projects.

Mr. Fleming had a brilliant business career, which provided the fortune wherewith he could carry out educational and philanthropic aims in later life.

BORN IN CANADA

The birthplace of Mr. Fleming was Halton County, Ontario, Canada. He was the son of Mr. and Mrs. Samuel Fleming. When he was 23 years old he moved to the United States and became a citizen of this country a short time afterward. He practiced law in Detroit and there he married Mrs. Fleming, the former Clara H. Fowler.

He gave up the law to become a timberman when he came to California from Detroit in 1896. Successful, he became in time the president and chief owner of many corporations: Madera Sugar Pine Company, Sugar Pine Lumber Company, Madera Land Company, Minarets & Western Railway Company, St. Anthony Mining Company, Santa Monica Mountain Park Company. He was also a director of the Southern California Edison Company.

During the Great War he served as a dollar-a-year man in Washington as chief of the State Councils Section of the Council of National Defense.

Mr. Fleming was a Chevalier of the Legion of Honor of France. This decoration was bestowed by France several years ago in grateful acknowledgment of the gift from the lumberman of a pavilion and public park in the forest of Compeigne, where the Armistice of 1918 was signed. Until France's recent defeat by Germany the pavilion provided an exhibition hall for the railroad car in which Marshal Foch received the leaders of the German Army and forced their signature to the 1918 Armistice. Hitler used the same railroad car when he made his peace terms with France, and later ordered the car taken to Berlin.

WON NOBLE AWARD

In 1932 Mr. Fleming was named by a committee of distinguished fellow Pasadenans to receive the Arthur Noble Civic Award for outstanding service to the community. This honor was conferred specifically in recognition of Mr. Fleming's contribution to education and arts, not only in terms of generous sums of money but also in terms of personal effort and time.

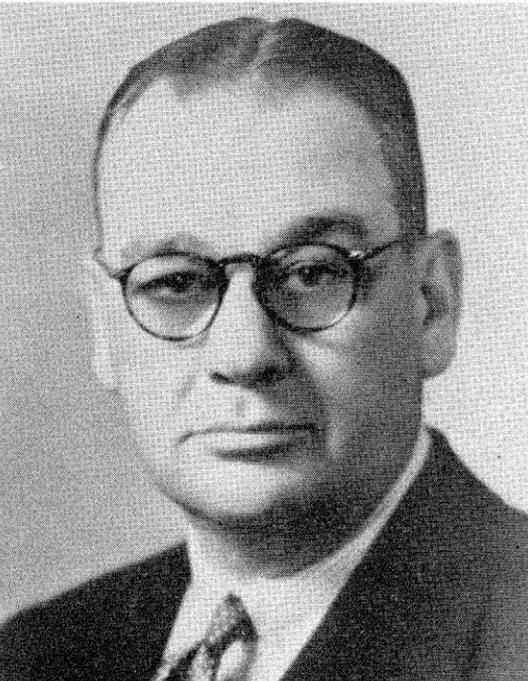
Accepting this award, he wrote to City Chairman Edward O. Nay: "This recognition I appreciate most highly. I have had a great deal of pleasure in doing what I have done for Pasadena; besides, it has enabled me to repay the Nation my obligations to it, because, as you know, I am an immigrant who, like millions of others, came to this land because of its great opportunities."

(Continued on page 14)

CHANGES IN BOARD OF TRUSTEES

At the last meeting of the Board of Trustees of the California Institute of Technology, two new members were elected to the Board and various changes were made in the personnel of the officers. All the men involved are prominent in the business, professional, and civic life of Southern California.

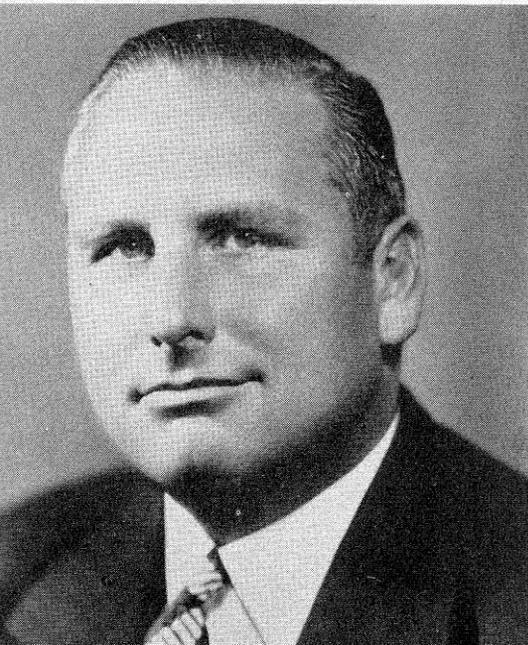
The two new trustees are John O'Melveny and Reese H. Taylor. Mr. O'Melveny is the managing partner in the law firm of O'Melveny and Myers. A native of Los Angeles, he was educated in the Los Angeles public schools, the University of California, and the Harvard Law School. During the World War, he served as an ensign in the United States Naval Reserve. He was for two years president of the Southern California Legal Aid Clinic. For the past ten years he has been a director of the Union Bank and Trust Company; and he has also served on numerous other boards of directors.



JOHN O'MELVENY
Newly elected trustee of the
California Institute of Technology

REESE H. TAYLOR
Newly elected trustee of the
California Institute of Technology

Credit Curtis Wilshire Studios, Los Angeles



Mr. Taylor is also a native of Los Angeles. He was educated in the Los Angeles public schools, Cornell University, and the University of California. His business activities include a series of administrative offices in the Llewellyn Iron Works and later the Consolidated Steel Corporation. He resigned from the presidency of the latter company in 1938, to become president of the Union Oil Company of California and its subsidiaries. He is a member of the American Institute of Metallurgical Engineers, the American Petroleum Institute, the California Oil and Gas Association, the National Association of Manufacturers, the Los Angeles Chamber of Commerce, and the All-Year Club of Southern California.

The Finance Committee of the Board of Trustees of the Institute, which manages the investment of the Institute's endowment funds, lost one of its most valuable members last winter through the death of Dr. L. D. Ricketts. Dr. Harry J. Bauer was elected to fill this vacancy. Mr. Bauer, who is the president of the Southern California Edison Company Ltd., was born in Pasadena and educated in Southern California, receiving his LL.B. degree from the University of Southern California. He is a director of the California Bank, the Title Insurance and Trust Company, the Di Giorgio Fruit Corporation, the Earl Fruit Company, and the Community Welfare Federation. In addition to heading the Southern California Edison Company, he is also president of the Long Bay Corporation, the Spring Street Realty Company, the Community Development Association, and the Automobile Club of Southern California.

Other changes in the Board involve the officers. Henry W. O'Melveny was elected First Vice-President, filling the office left vacant by the death of Dr. L. D. Ricketts. John S. Cravens was elected Second Vice-President, the office which had been filled until this meeting by Henry W. O'Melveny. And Alexander B. Macbeth was elected Third Vice-President.

Mr. Henry W. O'Melveny was born in Illinois and came to California at the age of ten. He was graduated from the University of California in 1879 and admitted to the bar two years later. He has engaged in the general practice of law ever since. In 1905 he founded his own law firm, remaining at the head of the firm to this day.

He is a director of the Farmers and Merchants National Bank, the Jotham Bixby Company, the Bixby Land Company, and the I. N. Van Nuys Building. He is president of the Barlow Sanatorium Association, and a member of the Advisory Board of the Salvation Army. In the past he was a deputy District Attorney of Los Angeles County, Los Angeles City Park Commissioner, State Park Commissioner, Civil Service Commissioner of Los Angeles, and president of the American Bar, State Bar of California, and Los Angeles Bar Associations. He has been intimately connected with the development of many of the outstanding enterprises of Southern California; and in the midst of a busy professional and civic life he has found time to pursue his hobbies of gardening and angling.

Mr. Cravens was born in Kansas City, Missouri, and was educated in the Kansas City public schools and Yale University. At Yale he was leader of the University Glee Club,

played intercollegiate tennis, and rowed on the Yale crew. He settled in Pasadena in 1897, where he has made his home ever since. Shortly after coming to California, he became president of the Edison Electric Company, predecessor of the present Southern California Edison Company. Later he became president of the Southwestern National Bank of Los Angeles, which later merged with the First National group. He is now closely interested in the Security-First National Bank of Los Angeles.

Mr. Macbeth, who is a grandson of Grover A. Trenholm, Secretary of the Treasury of the Confederate States during the last part of the Civil War, was born in South Carolina. He was educated at the Porter Military Academy and the Stevens Institute of Technology, which in 1936 conferred on him the honorary degree of Doctor of Engineering.

After filling various positions in gas companies in Philadelphia, Atlanta, and Kansas City, he came to Southern California



HENRY W. O'MELVENY
First Vice-President, Board of Trustees,
California Institute of Technology



Credit Preston Duncan, Hollywood

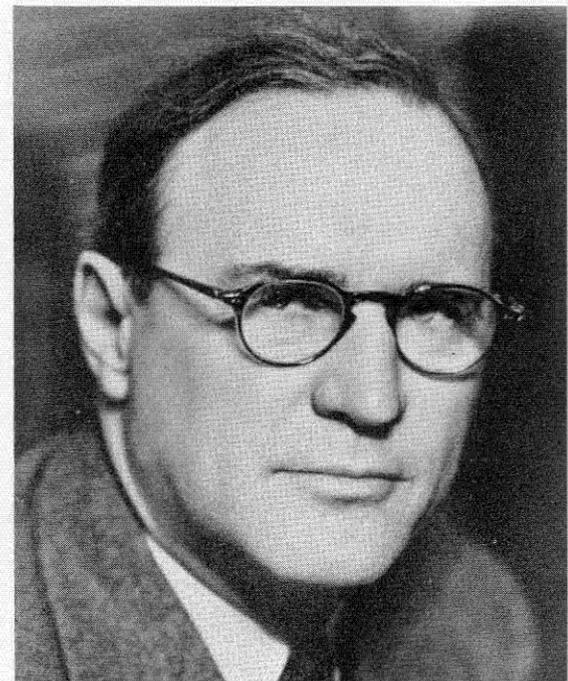
JOHN S. CRAVENS

Second Vice-President, Board of Trustees,
California Institute of Technology

in 1914 as vice-president and general manager of the Southern California Gas Company and Midway Gas Company. He became executive vice-president of the Southern California Gas Company in 1925 and president in 1927, retiring from the latter position in 1939.

He is now a director of the Union Oil Company, the Union Bank and Trust Company, the Southern California Gas Company, the Pacific Lighting Corporation, the All-Year Club of Southern California, vice-president of the Automobile Club of Southern California, and a trustee of Stevens Institute of Technology.

In the past he has been president of the Natural Gas Association of America, the American Gas Association, the Chamber of Mines and Oils, and vice-president of the American Petroleum Institute.



Credit Graystone Studios, N. Y.

ALEXANDER B. MACBETH

Third Vice-President, Board of Trustees,
California Institute of Technology

RENEW SEARCH FOR RAY SOURCE

As soon as their instruments and equipment are assembled, two Institute scientists will depart to renew one of the greatest quests of modern science—search for the source of cosmic ray energy.

The two men are Dr. H. Victor Neher, Ph.D., '31, and Dr. William Pickering, Ph.D., '36, both of whom accompanied Dr. Millikan on his cosmic ray expedition to the Orient in 1939. The pair will take ten electroscopes to record the frequency of radiation; these will be sent aloft with sounding balloons to 100,000 feet and lowered to earth by small parachutes when the balloons burst. The research work will be carried on in the Dust Bowl area in the Middle West.

CALTECH'S "MEN IN WHITE"

(Continued from page 10)

Dr. Richard C. Armstrong, '28, was graduated from the University of Michigan Medical School in June, 1939, and has received a four-year appointment in Ophthalmic Surgery at University Hospital, Ann Arbor, Michigan. The first year of this service is spent as a rotating intern, while the last three are limited to training in the diagnosis and treatment of diseases of the eye. Dr. Armstrong is a member of Nu Sigma Nu medical fraternity, and during his second year in medical school he worked as student Assistant in Bacteriology. He plans to return to Southern California to practice Ophthalmology following the completion of his service at the Michigan institution.

Dr. Laurence J. Stuppy, '35, is serving a two-year medical internship at Peter Bent Brigham Hospital, Boston, Massachusetts, following his graduation from Harvard Medical School in June, 1939. During his last two years in medical school he worked as Clinical Pathologist at the Boston Psychopathic Hospital and as Assistant in Bacteriology and Pathology. He has also spent several months in research on arthritis. Dr. Stuppy wants to settle down near Los Angeles, perhaps in academic work, but he plans first to top off his internship with a year as assistant resident in pathology in the east and some further time as a hospital resident on the Pacific Coast.

Dr. Ralph E. Homann, Jr., '35, began a two-year mixed internship at the Los Angeles County General Hospital on July 1, 1939, having received his degree from the University of Southern California School of Medicine in June. He is a member of Phi Rho Sigma medical fraternity, and has been quite active in fraternal and class affairs as well as in the Hollywood 20-30 Club. During the first six months of 1939 he served as externe at St. Vincent's Hospital, Los Angeles. Upon completing his internship, Dr. Homann plans to specialize in Internal Medicine, and to round out his training with a residency at Los Angeles County General Hospital followed by further work in Boston. He hopes finally to return to practice with two well-established internists in Los Angeles.

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DU MOND DESIGNS NEW X-RAY TUBE

(Continued from page 9)

expected that it will have a longer life than conventional tubes, since the rotating and cooling mechanism are more efficient and simple.

It will be possible to use the tube almost continuously without damage, a very practical consideration in busy hospitals where a great number of X-ray exposures may be desired within a short length of time.

The new tube should make possible more sharply focussed pictures. This advantage will be effected because the target can be more easily cooled, and therefore a finer stream of electrons, with much greater power, can be aimed at it. The added power would make possible the "snapshots" of moving subjects, much as the fast films and lenses of modern cameras make possible unslurred action photos of the fastest types of sports.

RECENTLY GRANTED PATENT

Dr. Du Mond recently was granted United States Patent No. 2,209,963 for his tube. He assigned the patent to the Institute. Within the next few months he hopes to build half a dozen or more working models of the tube to develop it practically.

ARTHUR H. FLEMING

(Continued from page 11)

Dr. Millikan made the following statement when informed of Mr. Fleming's death.

"The death of Arthur H. Fleming removes one of the most active, devoted and influential of the early creators of the California Institute of Technology — a man who literally gave all he had of energy and substance that there might rise on the Pacific Coast an educational and research center of the highest quality having the ideals and purposes first formulated in 1908 by George E. Hale.

MAKE VISION REALITY

"It is one thing, however, to realize a great need, to see a great opportunity and to formulate what ought to be done to meet it, but quite another thing to command the influence and the resources necessary to put the plan into execution. Mr. Fleming was a devoted and indefatigable leader of the group of men who gave themselves and their substance to begin to make it possible to realize some day the vision which they had seen. Arthur H. Fleming, Henry M. Robinson, Robert R. Blacker, James A. Culbertson, John Wadsworth, Norman Bridge, Charles W. Gates, Harry Chandler, George E. Hale, Robert C. Gillis, and James A. Scherer were foremost among those early pioneers on whom the responsibility fell of laying the foundation of a great structure when there was little more than an ideal and faith to build upon.

"In 1910 Mr. Fleming and his daughter Marjorie bought the 32 acres which is now the site of the California Institute of Technology, and with the aid of many citizens erected on it in that year the first building on this campus now known as Throop Hall in honor of the original founder of the old Throop Polytechnic Institute, started in 1891.

"From 1910 until 1921 Arthur H. Fleming, president of the board of trustees, met from his own resources the annual deficit of the struggling institution known in that period as the "Throop College of Technology; and in 1921, in order that the college in the next stage of its metamorphosis into the California Institute of Technology might have the beginnings of an endowment to grow upon, Mr. Fleming made a trust in which the whole of his property was turned over to that purpose.

"Arthur H. Fleming, born a Canadian, thus made the greatest gift that any man can make, namely himself and his all, for the development of his adopted home and country, Southern California and the United States of America."

SKF puts the right bearing
in the right place."



1114 S. Hope St. PR-3168 Los Angeles

. . . OF INTEREST

ENGINEER GRID SEASON HOPEFUL

With bright new uniforms of royal blue and orange, three Rose Bowl games on schedule, and prospects as good as any in the past decade, Caltech's grid machine this year will bear a little watching on the part of Alumni. Coach Fox Stanton is starting his twentieth year at the Institute with favorable spirit and greater interest by public and Alumni than in many years. And unhampered by charges of "paid" athletes and squabbles with football czars over eligibility and player salaries the Beaver eleven may really accomplish something this fall.

As usual the team will be lighter than the average. But Stanton has ten returning lettermen, and thirteen players who received frosh numerals last year ready to start carrying the ball. Among the returning lettermen are Captain Stan Sohler, all-conference fullback, Henry Roesse, 1940 conference baseball batting champ, Tom Elliott, whose promising start last year was interrupted by injuries, Bob Cooper, Merritt Eusey, George Lind, John Small, Stan Stroud, and Larry Widdoes. Eleven men on the squad weigh in at over 180 pounds, so the Beavers will not be too much handicapped by lack of beef.

The complete schedule is shown at the bottom of the page. The key game with Oxy will come on November 8, and special Alumni activities are already being planned for the traditional affair.

Make A Date for November 8
CALTECH vs. OXY
Rose Bowl 8:00 P.M.
Frosh Preliminary

Borsook Urges Government To Set Up Nutrition Board At Once

Citing the importance of nutrition to defense and the general health of the Nation, Dr. Henry Borsook, professor of biochemistry at the Institute, recently stressed the need to authorize a Federal body to be concerned solely with nutrition. Addressing the health officer's division of the 42nd annual convention of the League of California Cities, Dr. Borsook in his talk on "Nutrition and the National Defense" made the following recommendations:

1. A commission of competent nutrition experts and scientific representatives of the military services and of the different government departments concerned should be established. This commission would set up standards to determine the extent to which vitamins should be added to foods and deal with related matters.

2. The administrative division should be headed by a qualified executive director with the power to carry out the policy of the commission.

Dr. Borsook cited the need for improved nutrition of the people in peacetime as well as in war or defense time.

"AVIATORS' DIET"

"Our military forces should be given a diet that will afford optimum health," he said. "It is reported aviators of the Royal Air force are given large amounts of vitamins A and D in the form of concentrates, presumably to make certain their vision will be as good as it can be made. These young men report that they enjoy a general tonic effect, their appetites are better, they feel better.

"Our nutrition group has been able to make some study of the cost, and it appears that if the program were carried through on a national basis in this country the vitamins would cost approximately

COMING EVENTS

MONTHLY DINNER MEETING, featuring a talk by Judge LeRoy Dawson of the Los Angeles Municipal Court . . . authentic pictures of "The Second World War" showing the preliminary phases and newsreel shots of current military operations . . . and outline of plans for future meetings. Mary Louise Tea Room atop Barker Brothers, October 1st, dinner at 8:00 p.m.

OXY GAME OPEN HOUSE, with dancing and refreshments at the student houses on the campus after the Big Game with Occidental, Friday evening, November 8.

\$1 per person per year. This figure is so low I have reason to believe that the food industries could absorb the cost without passing it on to the customer."

Dr. Borsook recommended study of the British Scientific Food Committee accomplishments and policy of food fortification.

WOULD STUDY BRITISH

"The policy of the fortification of a staple food for the whole nation recently adopted by the British government is an historic event in public health," Dr. Borsook continued. "It is highly desirable that we send competent nutrition observers abroad so we may have the benefit of a close, continuous and objective study from the very beginning of the operation of this undertaking, first of its kind in which the government of a great country by deliberate plan and measure seeks to improve the nutrition of the whole nation, without calling on the individuals of that nation to do anything.

"The stress of the demand for increased production will grow on workers, executives and government officials. We can put to good use, in the building of our national defenses, all our reserves of health and strength.

"Is it not time then for a national nutrition policy for the United States, for a competent government body to be concerned solely with nutrition? So, just as we are now organized to use all our

(Continued on page 16)

1940 FOOTBALL SCHEDULE

DAY	DATE	TIME	OPPONENT	PLACE
Friday	Sept. 20	8:00 P.M.	Cal. Poly	San Luis Obispo
Saturday	Sept. 28	8:00 P.M.	Glendale J. C.	Rose Bowl
Friday	Oct. 4	8:00 P.M.	Whittier	Rose Bowl
Saturday	Oct. 12	2:15 P.M.	Arizona State	Flagstaff
Saturday	Oct. 19	2:15 P.M.	Pomona	Claremont
Friday	Oct. 25	8:00 P.M.	LaVerne	LaVerne
Friday	Nov. 8	8:00 P.M.	Occidental	Rose Bowl
Friday	Nov. 15	8:00 P.M.	Redlands	Redlands

Institute Sponsors Industrial Relations Seminar for Alumni

Intense Alumni interest in the new Industrial Relations Division of the Institute, and the current importance of better understanding of the entire problem of labor relations and labor laws have led to the establishment of a special seminar course by the Institute for Alumni only. This course, officially called Seminar in Industrial Relations for Caltech Alumni (Economics 110, a,b,c), will be held every Wednesday evening for the coming school year for a period of two hours.

Registration for the course will be Wednesday, September 25, with the class limited to twenty-five men. Tuition will be at the nominal fee of ten dollars per term.

OUTSTANDING DISCUSSIONS

Under the direction of Robert D. Gray and Arthur H. Young, nationally known industrial relations experts now on the Institute staff, the course will feature down-to-earth discussions of labor and employment problems with outstanding personnel directors and labor union officials invited to participate. The seminar itself will be coordinated with the general program of the Industrial Relations Division as outlined in previous issues of the Alumni Review, and Alumni who take part in the discussions are expected to derive much that will be of value to the practical business executive.

The tentative outline of the course is shown below. It has been stressed by the sponsors that the content will be flexible enough to meet the needs and wishes of the men, and that a rigid program will not be adhered to for the year.

FIRST TERM: BUILDING A PERSONNEL PROGRAM — (A)

- Sept. 25—Organization meeting of class. At this time the program for the year will be discussed. It is possible that changes in the content of the course will be made if the majority of those registering for it so desire.
- Oct. 2—What does a worker want in his job?
- Oct. 9—What does the employer expect of a worker?
- Oct. 16—
 - (a) Conflict of interest between employer and employee.
 - (b) Mutuality of interest between employer and employee.
 - (c) Organization and function of Personnel Department.
 - (d) Role of supervisor.
- Oct. 23—Beginning of discussion and non-financial incentives; wage payment plans; criteria for choosing financial incentives; guaranteed annual wage plans.
- Oct. 30—Measuring output of workers; employee rating.
- Nov. 6—Factors affecting base rates and differentials.
- Nov. 13—Job analysis.
- Nov. 27—Job evaluation.

Borsook Urges Government Nutrition Board

(Continued from page 15)

knowledge of science and technology in the construction of engines of warfare, we shall also use modern science and technology for the lasting improvement of the health of the men and women of America."

"I have good reason to believe from a personal communication that the diet of the German army has been designed by nutrition experts, that modern scientific knowledge of nutrition has been used and

- Dec. 4—Non-financial incentives.
- Dec. 11—Final examination.

SECOND TERM: BUILDING A PERSONNEL PROGRAM — (B)

- Jan. 8—Profit sharing and employee stock ownership.
- Jan. 15—Hours of work. How long should a man work; effects of rest periods; Wages and Hours Act.
- Jan. 22—Working conditions: light, heat, ventilation.
- Jan. 29—Working conditions, continued: accident prevention and workmen's compensation.
- Feb. 5—Selection of employees: sources of labor.
- Feb. 12—Selection of employees, continued: testing and interviewing of applicants.
- Feb. 19—Training of employees.
- Feb. 26—Training of supervisors.
- Mar. 5—Elements of a personnel program — summary.
- Mar. 12—Limits to a personnel program — critical analysis.
- Mar. 19—Final Examination.

THIRD TERM: COLLECTIVE BARGAINING

- Apr. 2—Trade unions in the United States.
- Apr. 9—Trade unions abroad.
- Apr. 16—Employee representation.
- Apr. 23—Present status of trade unions in the United States.
- Apr. 30—Economic weapons of labor; how to conduct a strike.
- May 7—Content of union agreement.
- May 14—Arbitration and mediation of labor disputes.
- May 21—National Labor Relations Board; organization, powers, procedures.
- May 28—Selected cases before National Labor Relations Board.
- June 4—Suggested changes in National Labor Relations Board.
- June 11—Final examination.

that it is fortified with vitamins.

Dr. Borsook declared the cheapest and easiest way to improve nutrition of Americans is to add vitamins and minerals to such staples as flour, corn, and sugar and to some canned and bottled foods, at the source where these foods are processed. These, he said, must be added in measured amounts, under government regulation, and subject to government inspection.

WOULD EXTEND PLAN

The scientist held that the Food Stamps Plan, if extended "as it should be, can go far toward preventing serious nutritional diseases such as pellagra and scurvy among the poor by providing enough to eat and improving the quality somewhat."

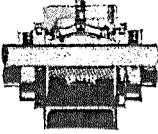
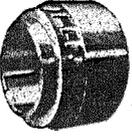
He added that the Food Stamps Plan alone will not insure an optimum diet for the whole Nation, declaring that "the policy of fortification of foods which our group has recommended to Washington would not interfere with the Food Stamps Plan, but would make it an even more effective measure in improving the diet of those who use it.

"We are confident that an effective national nutrition program based on fortification of foods with vitamins and minerals, supplemented by such measures as the Food Stamps Plan, could, for example, bring about the eradication of pellagra in the South within a year of its full operation."

Regarding costs of fortifying food with adequate amounts of dietary essentials, Dr. Borsook illustrated the low cost by stating, "A friend of mine with relatives in England asked our nutrition group for advice on what he could send to tide his relatives over the serious food situation which is expected in England this winter.

"We drew up a small list of food materials which supplied abundant dietary essentials—first class protein, calcium, phosphate, iron, vitamins A, the B complex, C and D. These dietary essentials with some fat, any available protein, and any carbohydrates for calories will supply his relatives with a first class diet from a nutritional point of view. The essentials will cost him (without transportation) 7½ cents a day per person."

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ARMY ENGINEER BOARD

When the German army *blitzkrieged* through Flanders and Poland, the panzer (armored) divisions and dive bombers were of tremendous importance. The successful and continued advances of the medium and heavy tank divisions were possible only because of the skillful and coordinated work of the German army engineers.

Impartial observers have noted that a factor of great importance in aiding the work of the German engineers was the simplified bridges, capable of sustaining military loads, which in design, were far in advance of those of any other army.

Under the stimulus of the European War, the army of the United States is seeking to profit from the lessons so painfully demonstrated on the proving grounds in Flanders and the Low Countries.

Army engineer boards on the Pacific Coast, and elsewhere, have been working mightily to turn out simplified fixed and pontoon bridge designs.

One board, under the chairmanship of *Capt. Ted Combs*, '27, included among other officers, *Capt. Ben Benioff*, '22; *Capt. Jack Shield*, '22, and *1st. Lieut. Rolland A. Philleo*, '27.

Philleo has been working on a simplified light pontoon bridge, while the rest of the Board has already turned out a successful design for a wooden, portable, demountable and variable span bridge capable of withstanding highway loads up to 10 tons.

The latter bridge, of simple truss construction, was tried out, with gratifying results during the current 4th Field Army maneuvers at Fort Lewis, Washington.

Judging from this experience, it is probable that many Tech officers have their work cut out for them in the coming National Emergency. Design officers, in the new mechanized total war may prove to be more essential than combat officers.

This is one example of the type of contribution which Tech is making to National Defense.

See The Rose Bowl Game!
CALTECH vs. OXY
Friday, Nov. 8 — 8:00 P.M.
Frosh Preliminary

JOHN HUDSON POOLE

☆ ★ ★

Colonel John Hudson Poole, Treasurer of the Institute's Board of Trustees, and a widely known Southern California philanthropist, died at his San Rafael Avenue home September 1 after a short period of ill health.

A noted collector of American historical objects, Colonel Poole in 1939 donated a new wing to the Southwest Museum in Los Angeles, and presented the Museum with his fine collection of 2446 Indian baskets, representing the work of 112 different tribes.

AIDE TO ROOSEVELT

Colonel Poole's colorful career in the military field began during the Spanish-American war when he served as an aide to Theodore Roosevelt during the Cuban campaign. In 1918 he was on the staff of General John J. Pershing in France. He came to Pasadena in 1919 and had lived here continuously since, taking an active part in public and educational affairs, and in charitable work. He was for a long time a member of the advisory board of the Security-First National Bank of Los Angeles, Pasadena branch. He was active in club life especially in Midwick Country Club. To that club he presented an annual prize, called the J. Hudson Poole Trophy, played for by the Midwick golfers at the Memorial season, as an incitement to patriotic memories.

Colonel Poole had a deep love of country, part of his heritage. One of his ancestors, Edward poole, was a colonist from England in Massachusetts in 1635. His father, DeWitt Clinton Poole, named after New York's famed early governor, was a Union colonel from Wisconsin in the Civil War and remained in the Army for a period afterward to fight outlaw Sioux and other Indians on the plains. Colonel Poole wrote a book of recollections of his father and about his time, called "American Calvacade" in 1939.

The colonel himself grew up in the Midwest, where the family had interests. He was president of the Missabe Mineral Company, owner of iron-ore holdings on the Missabe Range in Northern Minnesota.

The December Issue of the
ALUMNI REVIEW will be
devoted to the subject of
PETROLEUM
with interesting articles by
-- Tech Alumni
Watch For It!

"NOW EMPTY, PLEASE!"

By G. AUSTIN SCHROTER

Did you ever sit in the dental chair
Fighting, and groaning, and gulping air,
While a clutching hand and a grating drill
Sent to your marrow, a nervous chill?
And the eyes of the surgeon impersonally
scan
The inner, most sacred, part of your pan?
With unfounded fears of oral disease
You sigh with relief at, "Now empty
please!"

Have you ever noted the tiny grains
Safe in the ceiling (away from your pains),
Of inanimate plaster and pallied paint,
While you lie on your back in a semi-faint?
While the Dentist suggests that you will-
ingly chew,
With your nose awry, and your lips askew,
A vile-tasting type of paraffine cheese,
While you struggle and beckon for, "Now
empty please!"

Write off your dread, as the needle you spy
When you find it's intended for some other
guy,
Who's trying without, in dumb agitation,
To settle his nerves by pure cogitation.
And efforts to focus his wandering sight,
While sinking still deeper into the fright
Brought on by the loss of everyday ease,
With eternity dragging, till, "Now empty
please."

With mirror in hand and preoccupied air,
The white-coated Doc leans over the chair.
With a quick, deft, flip, he peels back your
lip.
And the nurse, on the dot, guides in the tip
Of a coldly distasteful, fluid ejector.
With cotton and probe, and reflecting in-
spector,
He hopefully searches for dental decease
While you numbly wait for, "Now empty
please."

With your gobbling-blocks on a throbbing
spree,
Thumping and aching, in dental glee,
With cusps on edge, and pulp on fire
The one sure way to quick perspire,
Is to hie yourself to the same old seat
Prepared to beg. And to feebly bleat
About anesthetics and drugs to appease
The sporadic chances to, "Now empty
please!"

With cavity opened, you breathe in relief,
But alcohol swab soon adds to your grief.
With tightly-clenched hands and pitiful
moan,
You strain from the probe with many a
groan.
The Dentist and Nurse care never a tittle
As he softly mumbles, "I mav hurt a little."
Little indeed! As you woefully freeze
Your intent to demand a "Now empty
please."

There is no one to tell of your sad dismay
 When you lose the plug (that will never
 stay),
 Of limpid wax, from the yawning hole
 Which your tongue seeks-out as its con-
 stant goal.
 You swallow and gag on the nasty stuff,
 And with rapt concentration, the food try
 to luff
 Away from this hollowed, pre-molar frieze
 Which you hope to preserve for, "Now
 empty please!"

Your inlay is hammered with brutal pain,
 Rap-a-tap-tap, resounds in your brain.
 With drill through the ivory and into the
 soul,
 Abdomen distended, you strive to control
 Your twitching and jerking, and grim pal-
 pitation.
 Such efforts are wasted. For mental stag-
 nation

Rewards all your flinching; and you only
 tease

Your hopeful desire to, "Now empty
 please."

And just as you think that it never will end,
 With the push of a lever, you sit up and
 bend

Your expectant fixation, with squeals of
 elation,

On bridgework or filling, in grim medita-
 tion.

You gasp with dismay at your sense of
 confusion

At humbled-up, jumbled-up, lack of occlu-
 sion.

Now poets may sing and orators wheeze —
 But give me a simplified, "Now empty
 please!"

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CHAPTER NEWS

BOSTON

June 14, 1940

I have some bits of news that I thought might interest you. At the last meeting of the Boston Bean Chapter of the Caltech Alumni Association I was elected president and Ken Bragg, '39, secretary-treasurer. Also at that meeting plans were laid for the summer meeting of the Boston Chapter which meeting is to be held on some sunny California beach. The details of the plans are in the hands of Clark Goodman.

Dave Shuster just called to tell about some kind of a get-together that we are going to have with Sorensen when he is here for the AIEE convention next week.

As far as the meetings of the Boston chapter over the past year have been concerned, I think they might be called simple but successful. We have had four dinner meetings, and all have been well attended. Dr. Clark was present at one of them. I think I can report that there has been a considerable growth in the cohesiveness of this group during the past two years.

The men in the second year at the Harvard Business School made quite a record. Out of a class of 427, ten graduated with High Distinction; and of those ten, three were Caltech men, Charlie Clark, Lowell Hulbirt, and Frank Jewett. Jack McLean graduated with Distinction. Hulbirt, McLean, and I are going to be back at the school as research assistants next year.

Sincerely yours,
 Frank Jewett, Jr.

NEW YORK

The annual meeting and election of officers of the California Tech Club of New York was held Friday, June 7, 1940, at the Western Universities Club. It was one of the most sociable stag meetings of the year perhaps due in part to the "good spirits" dispensed at the club bar.

The program was furnished by members of the Club who talked on recent developments in the activities in which they are engaged. The speakers were:

Paul Ames, '22 (Fish, Richardson & Neave, Patent Attorneys), who discussed recent developments in patent law as well as several interesting and amusing patents.

Bev Fredendall, '29 (National Broadcasting Co.), who described frequency modulation and some of its probable effects on the radio industry.

Bill Hacker, '31 (American Pencil Co.), who gave some interesting sidelights on the problems of a sales manager in the South American markets.

Herb Ingham, '31 (Metallizing Engineering Co.), who described the metallizing metal spray process and its applications.

Archie Kemp, '17 (Bell Telephone Laboratories), who recalled many of his experiences and achievements in chemical work for the Laboratories.

Harry St. Clair, '20 (American Gas & Electric Co.), who discussed the activities of a large power system. Harry also brought along some very interesting sound movies of electric power system developments.

The following officers were elected for the ensuing year:

(Continued on next page)



Ever changing, but always the same

- Considered as a group, the same people who originally owned Edison Company stock still own it, but there are more of them. Californians have always owned and controlled the Edison Company, and over 80 per cent of the present 98,094 stockholders are Californians. Most of the changes in ownership have not really been changes, but *additions*, as more and more Californians shared the ownership of the company.
- Now as always, the Edison Company is an integral part of the industry and agriculture of the ten central and southern counties that make up Edison territory.
- Southern California Edison Company Ltd.



NEWS OF CLASSES

1915

Herb Holt spent this summer's vacation cruising in Alaskan waters on his yacht. Herb is the new Membership Chairman of the Alumni Association, and general manager of Bekins Van & Storage Company.

1920

George K. Whitworth besides sending his alumni dues has the following to say — "I wish to advise you of my change of address. I am now with the City of Los Angeles, serving as a Deputy City Attorney under assignment to the Department of Water and Power, where my particular work concerns the legal aspects of the development and transmission of Boulder Dam power by the City of Los Angeles."

1922

Jack Shield, vice-president of the Alumni Association, put the whole Salt Lake Valley into a dither the first week in September, when he discussed Earthquake Design and Construction at the Salt Lake meeting of the Pacific Coast Building Officials Conference.

We understand from the Ministry of Propaganda and Enlightenment, and from other sources generally considered to be reliable, that every property owner in Utah is now considering razing his residence to prevent earthquake damage.

1925

Mike Brunner, assistant to the Chief Geologist in the Los Angeles Office of the Shell Oil Company, has been transferred to the Company offices in Houston, Texas.

1926

Theodore C. Coleman on July 1st entered upon his new duties as vice-president-in-charge-of-sales and member of the finance committee of Northrup Aircraft, Inc., with headquarters in Hawthorne, California.

Before entering the employ of Northrup, Ted experienced a highly successful career in investment banking and finance. For eleven years he served as vice-president and sales manager of Banks Huntley and Company, leading underwriters and investment bankers of Los Angeles.

Ted was instrumental in securing the original financing of Northrup, and is looked upon in the local aircraft industry as an expert in aircraft-plant financing. He was

(Continued from previous page)

President: Beverly F. Fredendall '29.

Vice-President: Charles H. Bidwell '26.

Secretary-Treasurer: Chester F. Carlson '30.

Director: Frederic H. Moore '38.

Archie R. Kemp '17 also continues for another year as a director.

The club has chartered a 65-foot cruiser for a picnic trip on Long Island Sound for Sunday, September 8.

Vernon Lightning Blueprint, Inc

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NEWS

Have you any bit of news about yourself or fellow Tech men? Marriages, births, promotions, job change, papers published, or new honors received are all items of interest to the rest of us so write your information on a penny postcard and address it to the Editor,

CALTECH ALUMNI REVIEW
Pasadena, California

one of the last graduates in the old course of Engineering and Economics formerly given by the Institute under the guidance of Professor Graham Laing.

George M. Farly is proud papa again, as announced in a personal note to the Review. The new addition is a son, Bruce G. Farly, who joins his two year old sister, Karen Ann, in bringing joy to the older members of the family.

Stuart L. Seymour will on September 26th receive the degree of Charter Life Underwriter from the American College of Life Underwriters. Mr. Seymour is employed by the New York Life Insurance Company.

1927

Carol G. Montgomery is now Assistant Professor of Physics at Yale. He received his Ph.D. at Yale in 1930.

Dr. John H. Maxson has been buying safety-pins and nursing bottles . . . probably for someone else.

Ted Combs president of the Alumni Association, decided to run the blockade around the Canal when he sailed for the Canal Zone and Panama in August for a month's business trip for the West Coast Lumberman's Association.

Lt. W. Krelle has been on thirty days active duty at Fort Lewis, Washington, where he was Assistant Post Engineer.

1928

Alex Clark, geologist-at-large for the Shell Oil Company, with headquarters in Los Angeles, spent a month's vacation in Montana pitching hay and swatting horse flies.

Kenny Crosher is now a Captain in the United States Army Air Corps, and is stationed with his wife and young daughter at Gary Field, Fort Lewis, Washington.

Lee A. DuBridge, National Research fellow at the California Institute in 1926-1928, received the Honorary Doctor of Science degree on June tenth at the 87th Commencement of Cornell College, Mt. Vernon, Iowa. Dr. DuBridge, Cornell college graduate, with M.A. and Ph.D. degrees from the University of Wisconsin, is dean of the faculty of arts and science at the University of Rochester, New York.

1929

John Warlemont Daly, geophysicist with the Shell Oil Company, left Los Angeles in June for an indefinite siege of field work in the San Joaquin Valley, with a salt ration in one pocket and a Brunton in the other.

George Lufkin spent his vacation this

year with his wife touring eastern Canada and the Gaspé Peninsula.

1930

Dr. Robert I. Stirton, who received his Ph.D. from the Institute in 1934, is now spending three months vacationing in the eastern part of the United States. He has just returned from Singapore, where he has been for the last three years as Lubrication Engineer for the Union Oil Company.

Dr. F. Dashwood Bode, Ph.D., '34, spent the early part of the summer riding herd of Tech's current crop of geologists in the vicinity of Pioche, Nevada . . . thereby reducing his winter waistline.

Bill Hacker, who is export manager for the American Pencil Company, recently flew to Mexico City on business and then on to Southern California. After spending several days visiting with friends he returned to his headquarters in New York City.

1931

George Langsner, member of the Alumni Board of Directors, is the proud papa of a baby son, Robert George Langsner, who was born on August 3, 1940.

Larry Ferguson, who is with the General Electric Company at Schenectady, New York, spent his recent vacation touring in the West Indies.

Charles K. Lewis is now working in the Panama Canal Zone.

1932

George E. Lewis, M.S., '32, is now with the Hydril Company.

Clark Goodman, Ph.D., '40, was a recent visitor to the campus. He has been appointed Research Associate in Physics at the Massachusetts Institute of Technology.

Worrell Pruden, M.S., '33, left Pasadena on September first for Orange, Texas, where he will help Uncle Sam get the Navy ready to take all comers. Worrell will be in charge of the construction of eleven destroyers. No doubt this is just a starter as eleven destroyers won't keep eleven ways busy with such a man in charge of their construction.

1933

Art Mathewson has left the Solar Aircraft Co. of San Diego, and is now Engineering Staff Cost Engineer for Lockheed in Burbank.

1934

John Cortelyou is another proud papa. His announcement is the birth of a daughter at the Taft Community Hospital. The young lady's name is Dorothy Louise, and she tipped the scales on her first attempt at 7 pounds even.

The new Secretary of the Taft Chapter of the California Natural Gasoline Association, which by the way is John's new title, is reported very happy with this new addition to the family.

Dennis A. Newcomb returned from the Altar of the Wee Kirk o' the Heather with a charming wife, the former Grace Ellis MacCue. Mrs. Newcomb is a graduate of Northwestern University.

Harrington Rice, Ph.D., '34, is in the geological department of the Canadian Civil Service. During the summer he has been stationed in British Columbia instead of in Ottawa as usual.

Dan Mathewson is in the Vega Division of Lockheed Aircraft at Burbank.

1935

Al Ray is now with the Union Oil Company at Oleum, California.

Dick Jahns is spending the summer in New England doing Geological work for the Department of Interior. During the winter he will be located in Washington, D.C.

Perry Polentz has been in California in August, vacationing from his toils in Waukegan, Ill. He is employed by The American Steel and Wire Company (a U. S. Steel subsidiary).

Alan Beerbower with his wife, the former Clarissa Howe of Washington, D.C., spent their vacation in Southern California. It was Alan's first visit in five years. He is employed as a chemist with the Standard Oil Development of Elizabeth, N. J.

1936

Walfred E. Swanson was married to Miss Jean Margaret Miller on September 3, 1940, in Los Angeles.

Hugh Colvin was married to Miss Audy Lou Holden on July 2, 1940, at the Masonic Club in Westwood. Mrs. Colvin is a graduate of the University of Southern California. The couple are living in Wyvernwood.

James Seaman recently married Miss Beth Hoyt, who is a graduate of Occidental. They are now living in Visalia where Jim works for the Edison Company.

1937

John M. Shimer was married to Miss

Corinne Perkins on May 13, 1940, at Wichita Falls, Texas. They are at home in Monahans, Texas.

Richard L. Ridgway who has been with the Union Pacific since graduation is now stationed at Omaha, Nebraska.

Edward L. Wheatfill was married to Miss Ida Wright Parkinson on July 9, 1940, at St. George, Utah.

Warren E. Fenzi was married to Miss Eleanor Huse Leeds on July 12, 1940, at Pasadena, California.

Captain Robert Losey. A service to his country even after death adds luster to the memory of Robert Losey, who was killed last April during a Nazi air raid on a Norwegian town when a bomb splinter pierced his heart. A trained meteorologist, Capt. Losey was making observations for the Army. Despite his death, the reports and data reached the United States War Department and will be used as the basis tests at the Fairbanks, Alaska, flight station next winter.

Bob Mahony is employed by the U. S. Vanadium Corp. at their vanadium property near Uravan, Colorado.

Martin Webster, having received his degree from the Harvard Law School, is now taking a review course for the California Bar Exam.

Doug Rollow is employed by Lockheed in the Vega Division.

1938

John Raymond Baker was married to the former Miss Clarabel Dougan of Occidental on August 10, 1940. They spent their honeymoon in San Francisco and the High Sierras.

Jack George is now employed by the U.

S. Vanadium Corporation. He is located at a tungsten property near Bishop, California.

John VanFleet and Fred Smith are also employed by the U. S. Vanadium Corporation, and are located at vanadium property near Uravan, Colorado.

Claude Brown and Jerry Jones are two of the many Tech men working for Lockheed. Claude is taking the Engineering Shop Training Course.

Luis Hernan Tejada was married to Miss Olive Parish on June 20, 1940, in Newman Hall Chapel at the University of California at Berkeley. Miss Parish has a Master's degree from Yale, and is working for a Ph.D. in International Relations. Their address is Casilla 675, La Paz, Bolivia.

Evan Johnson spent his vacation on the coast. He is at present employed by the Ingersoll Rand Company of New York.

Stan Wolfberg is now in the Industrial Engineering Dept. of Columbia Steel in Pittsburg, California.

Bob Barry who was formerly with Lane Wells of Vernon, is now in the Industrial Engineering department at Lockheed Aircraft, and has moved his home to Burbank.

Fred W. Llewellyn and Miss Jane Elizabeth Althouse, sister of Bill Althouse, '38, were married in the Wee Kirk o' the Heather on August 20, 1940. Fred is employed by the Forest Lawn Memorial Park Association.

Charles Clarke is now assistant works manager at the Smoot-Holman Co., Los Angeles.

Roland Stone has been temporarily transferred to the Gulf Coast by the Filtrol Corporation.

Tom Davies is now a junior layout engineer for Lockheed.

1939

Perry Brown and Dick Pond have gone in for intercollegiate athletics in East Orange, New Jersey.

Perry, who is stationed in New York for the Pomona Pump Company, and Dick, who is with Westinghouse, jointly occupy a house with three other young engineers all in the employ of Westinghouse. The latter represent M.I.T., Cornell and Iowa. The intercollegiate competition arises on housecleaning day . . . we hear that the Tech men are far ahead in broom-dodging.

Walter Diehm writes: "Since you last heard from me in Youngstown, I've spent a month in Cleveland and have been in Lynn, Mass., since the first of July.

"I am now in the planning, wage rate, and methods office of the turbine department at the river works. The work isn't bad — not particularly good either. It's another white collar job — I'm getting my share of them.

"Since our plant is important to the National Defense plan, all vacations, which were to have been during the first two weeks of July, were cancelled.

"The river works manufactures steam turbines for propulsion and auxiliary power for navy ships, also airplane superchargers. All employees wear buttons with their pictures on them.

1940

Carter Lowell spent a good part of the summer trying to learn the Navajo Indian language, and in digging up corpses on the Arizona mining property of Filtrol Corporation.

Tiring of this boisterous sport, and fearing the G-men, he is now a trainee at the Burbank plant of Lockheed.

Alumni Business and Professional Guide

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“Whose Vacation Is This, Anyway?”

CAMPING out is fun—if it doesn't last too long. We speak of “roughing it” and brag about the hardships entailed. But only a few years ago it wasn't considered a hardship to live this way. For most people, it was the only way they had to live.

The tin washtub, for instance. It did duty Monday mornings and Saturday nights, and the water was heated in the reservoir at the back of the wood-burning range. Splitting the wood was good exercise—but it was no fun to get up in the middle of cold nights to keep the fire going. And the feeble kerosene lamps, though an improvement over candles, had to be continually cleaned and filled.

Sometimes we have to “rough it” to realize the improvements time has brought—many of them through electricity. Not only electric lights, and automatic heat, and electric appliances to make housekeeping easier, but also automobiles, better roads, better coats and dresses.

Wherever electricity has been put to work in industry, it has brought us better-quality and lower-cost products. And because General Electric scientists, engineers, and workmen are finding still more ways to make electricity useful, we can look forward to still greater improvements in America's standard of living through the continued creation of More Goods for More People at Less Cost.

G-E research and engineering have saved the public from ten to one hundred dollars for every dollar they have earned for General Electric

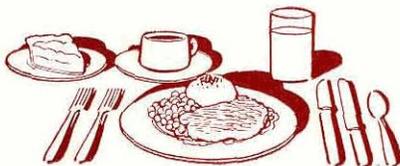
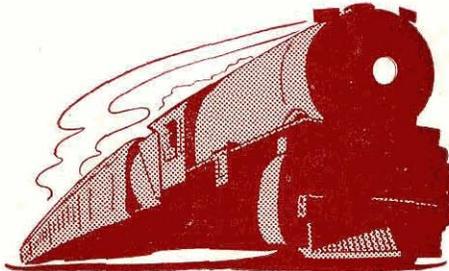
GENERAL  **ELECTRIC**

NEW YORK WORLD'S FAIR—SEE THE G-E “HOUSE OF MAGIC”—SAN FRANCISCO EXPOSITION

Quiz FOR TRAVELERS GOING EAST

Q WHAT train is designed exclusively for chair car and tourist sleeping car passengers: makes it "fun to be thrifty"?

A SP's friendly "Californian".



Q WHAT train serves delicious meals for 25c, 30c, and 35c?

A SP's friendly "Californian".

Q WHAT train provides a full size lounge car for tourist car passengers?

A SP's friendly "Californian".



Q WHAT train offers the smiling service of a nurse-stewardess, a special chair car for women and children?

A SP's friendly "Californian".

Q WHAT train speeds to Chicago over the scenic lower altitude Golden State Route—more comfort per mile?

A SP's friendly "Californian".



YES, Southern Pacific's friendly "Californian" is becoming more and more the popular way to spend less and have more fun on a trip East. Only \$39.50 from Los Angeles to Chicago in air-conditioned chair cars. \$65 roundtrip. \$74 roundtrip (plus berth) in air-conditioned tourist sleeping cars. Step into the nearest Southern Pacific ticket office and let one of our men tell you more about the friendly "Californian". Or call the office nearest your home.

Southern Pacific's

FRIENDLY

Californian