ALUMNI REVIEW

CALIFORNIA INSTITUTE OF TECHNOLOGY

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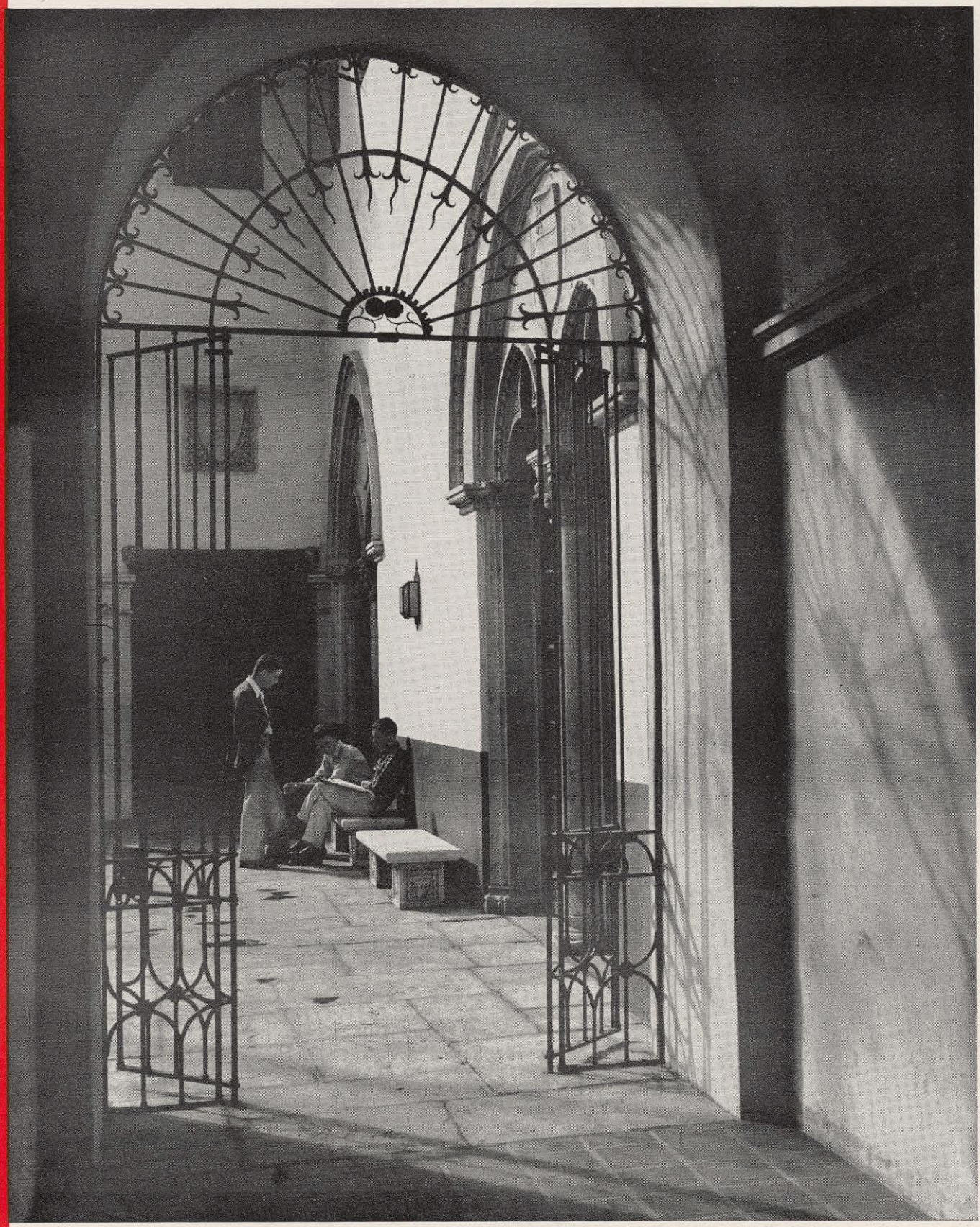

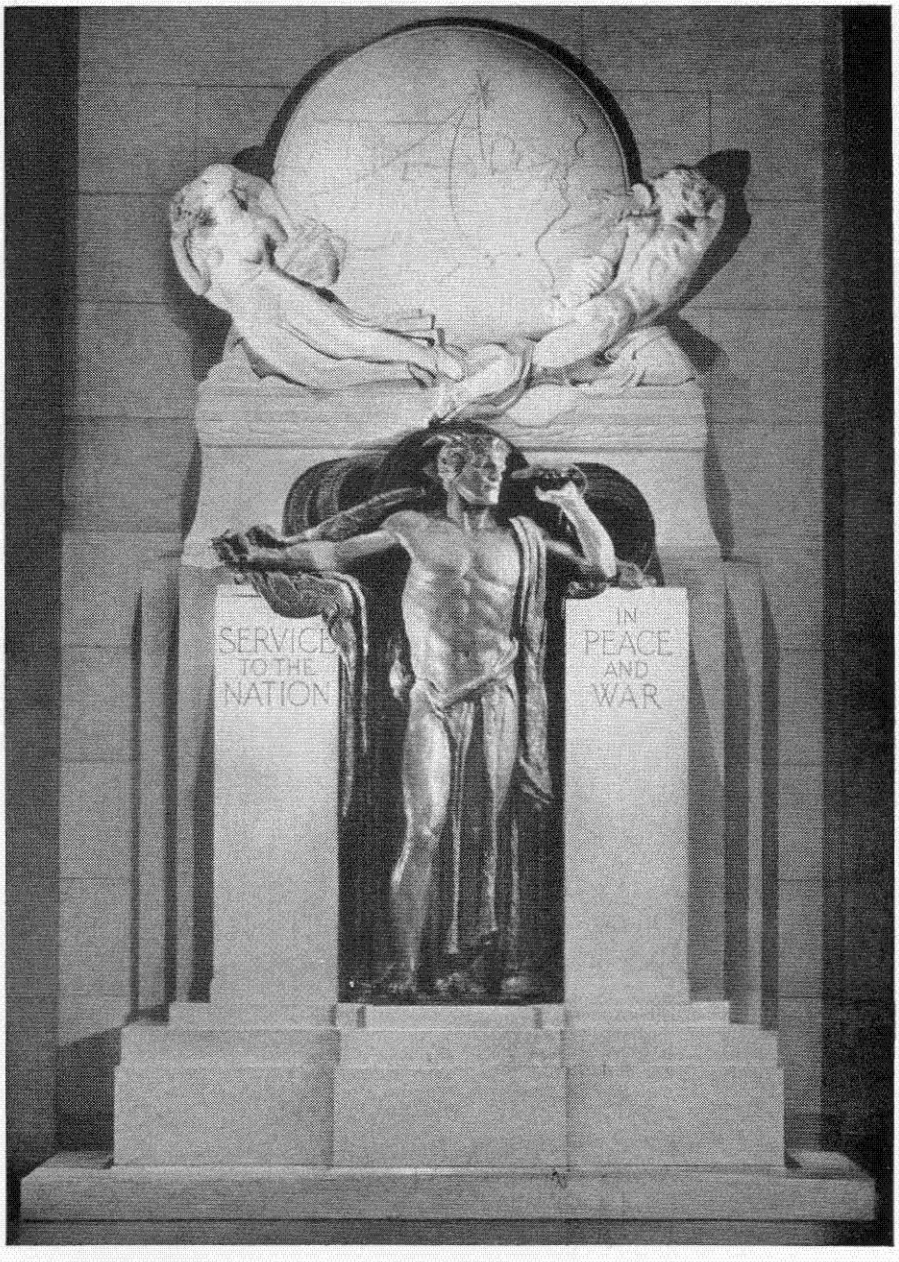

"Service to the nation in peace and war"

Following the last World War a bronze and marble group was placed in the lobby of the American Telephone and Telegraph Company building in New York. On it are inscribed these words, "Service to the nation in peace and war."

They are more than words. They are the very spirit of the entire Bell System organization. In these stirring days, we pledge ourselves again to the service of the nation . . . so that "Government of the people, by the people, for the people, shall not perish from the earth."

BELL TELEPHONE SYSTEM

ALUMNI REVIEW

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CALIFORNIA INSTITUTE
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JANUARY, 1942

IT'S A DATE!
Fifth Annual Alumni Dance
SATURDAY, FEBRUARY 7
ELKS CLUB LOS ANGELES

THE EDITOR'S COLUMN

APOLOGIES . . . are in order to those who have waited overly long for this issue of the Alumni Review to reach them. As you will note by the cover, it was necessary to change the dating of the issue from December, 1941, to January, 1942. The reason — unusual demands created by the outbreak of war have compelled members of the staff to put in much overtime at their regular work, thus cutting down on the amount of spare time available for publishing the Review.

This brings up two important questions which must be answered in the near future — namely articles for the Review, and the optimum size of the publication. We have been very fortunate in securing interesting feature articles from various sources and it is likely that this will continue so. However, short news articles, personals, items of interest, and other types of material seem difficult to obtain, principally because of lack of cooperation —or more especially the willingness to take time to send in these items. The Editor again renews his request for editorial assistance along this line and implores all interested Alumni who could devote about nine or ten hours of work for each of the quarterly issues to write him at once..

Failing a reply to this entreaty, it appears quite possible that the Review must be curtailed in size and quality in the future. We hope that this will not be necessary, rather that we may continue to increase the number of pages and the interest of the contents. But the verdict rests with you.

DEADLINES . . . for the March issue are March 1 for all articles, personals, news items, etc., and March 7 for announcements.

PHOTO CONTEST . . . To secure a photogenic cover for coming issues of the Alumni Review, announcement is hereby made of a photo contest, open to all Alumni. Photographs must be submitted as glossy prints, larger than 3 by 3 inches. Subject matter should concern either the Institute or science and engineering in general. Mail or bring entries to the Alumni office; all entries will be returned after judging. First prize 5 dollars; second prize 3 dollars. Decision of judges final.

COMING EVENTS . . .

April 12—Alumni Seminar Weekend. Curtailed to one day this year because of defense demands.

SCIENCE IN THE DEFENSE PROGRAM

By FRANK B. JEWETT, '98

President, National Academy of Sciences

For fifteen years following the first World War there were frequent articles on the probable role of science in future warfare. While this was quite natural in view of the part played by the airplane, the tank, and lethal gas in the titanic struggle of 1914-1918, the articles in the main evoked interest rather than concerted action directed toward full employment of science in preparation for more widespread and more deadly warfare.

Despite the fact that the decade and a half following the war was a period of the most productive activity in fundamental science research and of intense effort to apply old and new knowledge promptly in industry, this *laissez-faire* attitude in the military sector was largely a reflection of men's attitude generally toward war. The weariness of the struggle and the distaste for carnage and destruction, coupled with a naive faith that men had learned finally the lesson of war's futility, gave rise to the era of small appropriations to the military, to disarmament conferences, and to the League of Nations and similar efforts to organize the world for a settlement of international controversies by reasonable methods rather than by recourse to mass murder.

DEFENSE SCIENCE RETARDED

In the United States particularly, the decade of the 1920's saw this carried to the extreme. Warships were taken to sea and sunk or were laid up and the Army was reduced to the status of a moderate-sized police force—a force so small and scattered that no really effective training or development of radically new implements could be had. Appropriations were cut to the irreducible minimum of maintaining a national agency which the country would have liked to abolish entirely had it quite dared. In this atmosphere and under these handicaps it is to the credit of the Army and Navy that they did as well as they did. There was little money to spend on development and less still for research to produce entirely new instruments of war.

When the storm clouds of another world war began to form in the middle 1930's, the volume of articles on the place and importance of modern science in warfare increased enormously in both the scientific and lay press. So, too, did discussion of the need for insuring that scientific and technical men should be utilized in the fields of their competence and not inducted indiscriminately into the combat services where men of less specialized training could serve equally well.

So far as lay discussion was concerned, it was largely emotional, frequently ill-informed, and sometimes fantastic. Naturally, discussion among technical people was more realistic, but on the whole was mainly related to applying newly acquired knowledge and techniques to the improvement of existing military implements. The idea of organizing scientific research on a huge industrial scale, where the ultimate end of "all-out war" was the industry to be served, was slow to emerge.

Probably the most difficult hurdle every industry has had to get over in the effective introduction of scientific research as a powerful tool in its operation has been to realize that the most profitable research is that which is carried on with the least restraint imposed by current practice. Practice can be adapted to radically new ideas, but radical ideas rarely, if ever, evolve from mere improvements in current practice.

Research in military matters is no exception. War being a very ancient art, military men are on the whole extremely conservative as to new tools. Like doctors, long experience has made them cautious and with possibly a more than ordinary tendency to impose on a research project requirements of current practice which, in fact, hamper rather than help. Against this tendency is the fact that they are quick to adopt the radically new once its utility is demonstrated. War more than any other of man's activities puts a high premium on being in the lead.

TECHNICAL RESOURCES

As soon as war in Europe on a vast scale was seen to be imminent, the nations there commenced frantically to mobilize and organize their scientific and technical men and resources, and to establish effective liaison between them and the combat services. For more than a year after this movement was in full swing across the Atlantic, our aloofness from the struggle and our ardent desire to keep from being sucked into the tragic maelstrom operated to prevent any effective step in the direction of mobilizing our vast scientific resources for total war. The military services endeavored to strengthen their scientific branches and here and there enlisted the aid of civilian science. They were hampered by inadequate funds, by the pattern of years of a starved organization imposed by an antiwar philosophy, and by the fact that civilian sciences, both fundamental and applied, were built up on a basis of operation in a slow-moving peace economy. The latter had no machinery for marshaling its forces for war and, in the main, it knew little of war's requirements and frequently preferred to follow the courses it understood and liked.

MOBILIZATION OF SCIENCE

But about two years ago it became apparent to a few individuals that the *laissez-faire* approach to the mobilization of science ought to be abandoned in favor of a more direct and forceful organizational approach. At that time there existed certain technical groups and associations which, on the one hand, called for strengthening, and on the other were of suggestive value in the search for a suitable organizational setup. I have already remarked upon the scattered technical groups and laboratories within the Army and Navy which over the years had been doing commendable work, but had been given insufficient funds and encouragement. It was, of course, obvious that as the tension of the emergency increased, the responsibilities placed upon these technical groups would mount with a resultant need to augment their personnel, but it was equally apparent that they could not be expected to carry the full load of scientific development and adaptation.

Civilian participation in one way or another in the solution of military problems has come to be taken for granted. It was first given official recognition in the United States when the National Academy of Sciences was incorporated in 1863 by an act of Congress. The charter of the Academy requires that whenever called upon by any department of the government, it shall investigate, examine, experiment, and report upon any subject of science or art, the actual expenses of such investigations, experiments, and reports to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the government. The Academy is, therefore, recognized as a continuing official adviser to the federal government, and it must attempt to answer such questions of a scientific or technical nature as are officially submitted to it by members of government departments. A permanent channel of communication was thus created, but power to initiate traffic over it resides with the government and no auxiliary machinery was created whereby the Academy or any other civilian agency might take the initiative in bringing before the government matters of scientific importance.

Less than a year prior to the entry of the United States into the first World War, another step was taken designed to facilitate the use of the channel of communication between government and the National Academy. In 1916 the National Research Council was created by President Wilson, and a little later was to play a part in focusing civilian effort on the military problems then arising. The National Research Council was, and is today, a subsidiary of the National Academy of Sciences and, like the Academy, is largely an advisory body only and awaits the assignment of problems by one or another branch of the government before it can go seriously to work. Moreover, the Council, like the Academy, is not in possession of free money, a corporate laboratory, and other research facilities and is, therefore, not well constituted to conduct research work on any extensive scale.

We turn our attention, therefore, to another agency contemporaneous with the National Research Council, which was created for the express purpose of establishing cooperative effort between military and civilian groups, and which was provided by Congress with funds necessary to create research facilities and to operate them when once created. This agency is the National Advisory Committee for Aeronautics, commonly known as the N.A.C.A. The law which created the committee provides that it shall "supervise and direct scientific study of the problems of flight, with a view to their practical solution," and also "direct and conduct research and experiment in aeronautics." The committee is composed of fifteen members, including two representatives each of the War and Navy Departments. Throughout its more than twenty-five years of existence, the N.A.C.A. has given ample testimony of the fruitfulness of cooperation between military and civilian groups, and moreover has provided a prototype as to an organizational arrangement for effecting such cooperative effort successfully.

When, some two years ago, the group to whom I have already referred became convinced that broader participation by civilian scientists in the whole military program was likely to be essential, they regarded the N.A.C.A. as typifying the sort of organization they would like to see created. A plan was therefore drawn up envisaging a committee composed in part of civilian scientists and in part of Army and Navy representatives. On the one hand, the committee was charged with a broad study of the materials of warfare and, on the other, it would recommend and, if possible, initiate such research as believed to be in the national interest.

The N.A.C.A. was created in 1915 by an act of Congress. The somewhat duplicative plan just referred to was submitted to President Roosevelt for such action as he saw fit to take, be it to recommend legislation or to pursue some other course. The proposal appealed to him, with the result that he decided to create the committee by executive order. This order established the committee as a division under the Office for Emergency Management and confers upon them power to take the initiative in many scientific matters which they believed to have military significance. It also directed the committee to develop broad and coordinated plans for the conduct of scientific research in the defense program, in collaboration with the War and Navy departments; to review existing scientific-research programs formulated by these departments, as well as other agencies of the government; and advise them with respect to the relationship of their proposed activities to the total research program. Moreover, and this is especially important, the order directs them to initiate and support scientific research on the mechanisms and devices of warfare with the object of improving present ones, and creating new ones.

The order contemplated that the committee would not operate in the field already assigned to N.A.C.A., nor in the advisory field of the National Academy of Sciences and National Research Council. Parenthetically it might be noted that in this latter field the Academy and Council are currently engaged on advisory work for the government for which the out-of-pocket expenses alone are at the rate of much more than $1,000,000 a year.

ORGANIZATION OF N.D.R.C.

Thus, in June, 1940, the National Defense Research Committee, more familiarly known as the N.D.R.C., was born. It was constituted of eight members, two of these being high-ranking men from the Army and Navy, respectively, five more being civilians well known for their experience in organizing and directing both fundamental and applied scientific research, and, as an eighth member, the Commissioner of Patents.

The executive order creating the N.D.R.C. omitted any reference to the biological sciences, and in particular to the medical sciences. However, during its first year of operation, experience accumulated to the effect that a broader program of attack would not only be useful but was, in reality, urgently demanded. This realization prompted a second approach to President Roosevelt, with the result that in June, 1941, he created two new functional groups. One of these was the Committee on Medical Research, to explore its indicated territory in the same manner that the N.D.R.C. had been exploring the physical sciences. Then, over and above the N.D.R.C. and the Committee on Medical Research, there was placed the Office of Scientific Research and Development,

usually referred to as O.S.R.D. This latter office was placed in charge of Dr. Vannevar Bush, who until then had been chairman of the N.D.R.C. President Conant of Harvard was then made chairman of the N.D.R.C. and Dr. Richards of the Medical School of the University of Pennsylvania was made chairman of the C.M.R.

In order to insure complete coordination of civilian and military research and development, Dr. Bush, as director of O.S.R.D., was provided with an advisory council consisting of the chairmen of N.D.R.C., C.M.R., and N.A.C.A.; the coordinator of Naval research and the special assistant to the Secretary of War performing a somewhat similar function in that service.

The executive orders creating these various committees naturally had to leave indeterminate the question of financial support. They are all subsidiary to the Office for Emergency Management and, like this office, must look to Congress for the necessary operating appropriation. Thus far the appropriations, while not munificent, have been adequate. During its first year of existence the N.D.R.C. authorized research projects which totaled about ten million dollars. At the beginning of its second year it was granted another ten millions and this was recently augmented by several millions more. To be more specific, the O.S.R.D. during its first year of existence, will guide the expenditure of about twenty millions throughout the whole scientific field.

I should now like to take a few minutes of your time to explain the manner in which the expenditure of these funds is initiated and supervised. To begin with, let me point out that the work of the N.D.R.C. is divided into four major departments: Division A, of which Professor Richard C. Tolman of the California Institute of Technology is chairman, deals with armor, bombs, and ordnance, in general; Professor Roger Adams of the University of Illinois heads Division B on chemistry; Division C deals with transportation and communication, and submarine warfare, and I am its chairman; finally, Division D, which deals with instruments and numerous miscellaneous projects difficult to catalog, is headed by President Compton of M.I.T.

To expedite discussions, surveys, and the general handling of the work, a further breakdown has been found desirable, the result being that each division comprises several so-called sections. Division B on chemistry, under Professor Adams, is divided into thirty-one sections—which stands to date as a sort of record.

HOW N.D.R.C. FUNCTIONS

The work of a section is entrusted to a section chairman, who in turns calls to his aid certain individuals who become permanent members of his sectional committee and who are known technically as members. Then there are others who may be asked to render advice and assistance from time to time and hence are called consultants. Members and consultants are officially appointed by the chairman of the N.D.R.C. and are designated only after official clearance by the Army and Navy Intelligence and the F.B.I. Full consideration is therefore given to the basic requirements of the military services as regards the confidential handling of their problems.

Neither the five civilian members of the N.D.R.C. itself nor any of the section chairmen, members, or consultants are paid from public funds. Without exception, they are loaned to the government by their employing organizations and frequently the loan is complete, the work being so voluminous and detailed as to require a man's full time. Thus, when I tell you that about 500 of the leading scientists of the country are encompassed in the present N.D.R.C. organization, you will see that the federal government and even the forgotten taxpayer are getting a lot of valuable consulting talent free of charge.

So far as I have now outlined it the functioning of the N.D.R.C. requires no public money except a very small amount for paid office assistants together with the traveling expenses of members and consultants. For the most part members and consultants do not carry on the research and development projects which the N.D.R.C. decides to promote — their duties are advisory and administrative. They formulate the problems which they believe it important to have undertaken, and then arrange with various scientific institutions to carry on the work. It is this last step which brings in the need for considerable sums of money. For instance, a project assigned to a particular university may require the full time of several of its faculty together with that of numerous younger men hired specifically for the work in hand.

The number of such projects now approved and, for the most part, contracted out to universities and industrial research laboratories stands around 550 while the number of contracting institutions is over 100; and when it is stated that the total value of the project thus far determined upon is upward of twenty million dollars, you will realize at once that the monetary resources of the scientific world would not be adequate to conduct the program on a gratuitous basis. The contracts vary all the way from those involving a few hundred dollars to those calling for two to three hundred thousand dollars per month.

SCOPE OF PROGRAM

The question is frequently asked as to how many technical people have been drawn into the civilian defense effort which the N.D.R.C. directs, but obviously this is quite difficult to estimate, let alone to enumerate in detail. I have already mentioned that there are about 500 scientists in the N.D.R.C. organization serving as members, consultants, etc. It seems likely that somewhere between two and three thousand scientists are at work on defense projects as employees of contractors with about an equal number of less highly skilled individuals assisting them as laboratory assistants, technicians, etc. Then, if the situation which I know to exist at the Bell Telephone Laboratories is to be taken as a criterion, we must add to this scientific group another very considerable array of technical people who call themselves engineers as opposed to physicists and chemists — an array which if enumerated would no doubt total four to five thousand.

Recent figures from the Bell Telephone Laboratories might be of interest as perhaps typifying the situation found in a number of industrial laboratories which are fulfilling defense contracts, some for the N.D.R.C. and some directly for the

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PUTTING THE MICROSCOPE ON THE AVERAGE ALUMNUS

That favorite American pastime of recent years, the statistical poll, was recently adopted by the alumni publications of five Pacific Coast universities as part of a comprehensive survey to determine the status of the college graduate in today's world. The University of Southern California, for example, according to an article in the November issue of its Alumni Review, sent questionnaires to 1,200 graduates selected in a random manner from an alumni directory; while Stanford, California (Berkeley), University of Oregon, and Oregon State College sent similar questionnaires to random lists of their respective graduates.

Some pertinent statistics gleaned from the questionnaire returns are presented herewith in the belief that Tech Alumni will be interested in the positions of their average contemporaries from other schools. Most of the data pertain to U.S.C.

The Trojan alumnus headed the list when average incomes were figured, with a net of $5,709 a year. The Stanford average was 5,520, nearly $200 below the Trojan's, while California's was $4,544, the University of Oregon's $4,122, and Oregon State College's $3,313.

But more about this Mr. Average Trojan Alumnus —

He's 38.8 years of age and he's probably married; 78.2 per cent are. He was married 3.2 years after he graduated from the Halls of Troy and now is either a professional man (23.2 per cent) or an executive (34.4 per cent).

As to progeny, the Oregon graduates average 2.1 children, while S.C. is way down in the 1.6 class, behind Cal and Stanford (1.9 each). Oregon State grads have but 1.1 children each.

The survey showed that 46.4 per cent of those answering the questionnaire own their own home with the average value being $11,103. And this average value isn't boosted by a few extremely high priced houses either, for 29 per cent of the houses were right in that $10,000 to $20,000 range.

A tribute either to the high-powered salesmanship of insurance men, or to the far sightedness of thoughtful alumni, is the high percentage—88.5 per cent—of those carrying life insurance. The average value of the policy is $12,383 and the probabilities are that it was taken out with the New York Life, Prudential, Metropolitan or Equitable.

This highly mythical alumnus has a checking account (96.6 per cent), a savings account (76.1 per cent), and a safe deposit box (50.5 per cent) at either the Bank of America or the Security-First National Bank.

He is pretty much average in the matter of automobiles, for the 1.2 automobiles he drives—no doubt with great difficulty, for that .2 vehicle might provide complications—is either a Ford, Buick, Chevrolet, or Plymouth, in that order.

And—here's something surprising—it is a new automobile, national defense, high cost of living and such, notwithstanding. Of eighteen makes listed, there were more 1941 models owned than those of any other one year, except for Hudson, La Salle and Pierce Arrow, all way down in the total list.

The average monthly gasoline bill for these 1.2 automobiles totals up to $19.85, paid probably to Standard (40.3 per cent, Union (28.1 per cent), Shell (19.0 per cent), or Texaco (16.7 per cent).

Despite the widely prevalent bite of the amateur movie bug, apparently the accompanying heavy bite on the pocketbook keeps the alumnus away from the motion picture hobby. Only 29.6 per cent indulge. By those who do, an average $194.00 was spent for equipment.

This Trojan Alumnus owns at least one radio, and it is a Philco (38.7 per cent) or an R.C.A. Victor (14.5 per cent), of either the console type (50.1 per cent) or the table model (40.3 per cent). The alumnus' own Crossley rating would put news broadcasts at the top with 128, followed by Information Please, 63, and Jack Benny, 61.

Figures, by now have probably become a bit tiresome, so here are a few generalizations to relax your weary brain. Our "guinea pig" wears glasses, has never been unemployed since graduation, prefers swimming as a sport, reads his alumni magazine regularly (adv.), is not influenced by radio commercials, buys without discrimination from either chain or independent stores.

He may, or may not have a pet around the house (Yes, 50.1 per cent; No, 49.9 per cent), but if he does, and it is a dog, it will be a cocker spaniel. If it is a cat, it is of the alley variety.

Obviously, because he owns his own home he is, perforce, an amateur gardener. He'd have to be, what with 1,164 square feet of planting space to take care of. Last year he spent $17.89 on seed, bulbs and shrubs, and $9.53 on fertilizer.

For his snails he uses Snarol, for insects Black Leaf No. 40. He definitely does not have a vegetable garden (a loud chorus of Nays to the tune of 91.8 per cent). Nor does he have a wheelbarrow, but maybe he still has a shovel so that he can qualify for WPA when he tries spending that $5,709 we insist he earns.

As to national affairs, the average alumnus believes in President Roosevelt's foreign policy (This was before the outbreak of war), favors "pay-as-you-go" Federal defense financing, and Federal price fixing.

Editor's Note: **From time to time, Tech Alumni have expressed desires to have some sort of a questionnaire study made to determine the achievements of themselves and their schoolmates. Several years ago, it will be remembered, a survey was made of the field of employment and average annual income in relation to the year of graduation and college major for Tech graduates. And the Placement Bureau under the direction of Dr. Donald S. Clark '29, has kept detailed statistics on employment for several years. But other than these, no statistics have been compiled. It is obvious that a survey, even on a poll basis, would require considerable expenditure, and much work in tabulating results; but if enough interest is expressed in a survey such as discussed in the accompanying article, the Alumni Association would consider conducting such a project, to be carried out in time to be reported in the June issue of the Alumni Review. Send comments to the Editor.**

COACH WILLIAM L. "FOX" STANTON

After 21 years of guiding Tech athletics, the beloved "Fox has decided to retire.

"FOX" STANTON RESIGNS

After 21 years of service as director of athletics and head football coach at the Institute, W. L. "Fox" Stanton brought to a close an outstanding era of Caltech athletic history when he announced his resignation from all connections with the school shortly before the start of the annual gridiron battle with Pomona November 7. The announcement, made to Professor Royal W. Sorensen, Chairman of the Physical Education Department, surprised faculty, students, and alumni alike, but it provided the spark that enabled the Engineers to bowl over the Sagehens for their first Conference win since 1934. The boys really wanted to win that one for the "Fox."

Coach Stanton, who has been a fixture of the athletic department almost since the very start of the California Institute under its present name, first came to Tech in 1921 as head football coach. During the 21 years that followed, right up to the present, he has been the constant guide of the Beavers' football destinies as well as filling the positions of track coach and director of athletics. This has earned him the distinction of having served a single school on the Pacific Coast longer than any other coach. And next to Amos Alonzo Stagg he has been connected with football longer than any other coach still active in the game.

Any description of his colorful career must be practically synonymous with the story of the development of football itself, so long and close has been his association with the game.

EARLY FOOTBALL EXPERIENCE

Stanton's first football experience was gained in Philadelphia, where he was captain and halfback on the Drexel Institute team in 1892. For the three years 1894-96 he played in the backfield for Pennington Seminary in New Jersey, also serving as captain and coach of the team. During the Spanish-American War he played on and coached his brigade team, which twice defeated a University of Georgia eleven.

The years intervening between the close of the War and 1908, when the "Fox" began his 33-year association with the Southern California Conference, were spent in coaching a number of Eastern college teams, except for a brief interval

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COACH STANTON AND TECH FOOTBALL

Editor's Note: **The following article, reprinted from a recent issue of the *California Tech*, is a significant tribute to the imprint of Coach Stanton on Tech athletics. It also brings up a question in which most alumni feel a keen interest; namely, whether or not intercollegiate football should be continued at the Institute. No definite decision has yet been made on either the continuance of football or the appointment of a successor to the "Fox". Comments on this situation will be warmly welcomed by the Alumni Review. Let us hear from you.**

The resignation of Coach W. L. "Fox" Stanton takes from our midst a man who has done more than any other person to maintain intercollegiate football at Caltech.

In a school which does not pick men for athletic ability he has formed championship teams. In a school where no credit is given for athletic work, where it must be carried entirely in addition to regular studies, he has developed outstanding football material.

CHAMPIONSHIP TEAMS

In 1923 his team was champion. In 1926 it tied Occidental for the championship. Again in 1930 and 1931 it forced its way to the top. And the conference was larger in that day; Redlands, San Diego, Whittier, Occidental, Pomona, La Verne, Caltech, and Santa Barbara.

Stanton wanted his men to play to win—yes, but most of all he wanted them to play football for the fun of it. He wanted to stress the special qualities of players which have most lasting effect—better called spiritual values—courage, square dealing, justice to opponents, and power within one's self.

YEARS OF GREATEST INTEREST

In the years from 1921 to 1931 he placed his best teams on the field. They won four championships. They were on a footing with such schools as UCLA, USC, and Stanford.

Behind these teams was a different student body. At that time fraternities were the coordinating force on the campus. These groups concentrated their efforts on seeing how many men they could place on scrub teams, how much support they could give every football game.

NEW ERA AFTER HOUSES

Our last conference victory came the year our student houses opened. A new era had started. The schools which Caltech rivaled were forging ahead with their athletic programs, building up their physical education departments, and attracting men interested in athletics.

Now half of the Caltech student body was concentrated on the campus. Interhouse rivalry was beginning in every sport and replacing the traditional support of the varsity teams. It was charged now and again that this or that house persuaded this or that man to remain off the varsity team so that he could strengthen his house's chance.

Some years the varsity turnout was so small that it was necessary to dissolve the scrubs to have enough men for two first-line teams. It was actually necessary for assistant coaches and graduates to scrimmage to give the regular team full practice.

The Caltech student body, to be sure, has resented the failure of their teams to win games. However, it was not until last March, faced with the prospects of abandoning football, that one large obstacle was removed—the pressure placed on the varsity team by house competition.

The time of interhouse football was moved from fall to spring, and the six man game was substituted. The renewal of interest resulted in a large turnout for spring practice, and an exceptional group for fall training.

EASY TO CRITICIZE

It is easy to blame a coach after his men have lost games year after year. There has never been a Caltech coach who has not been criticized. In fact until Coach Stanton began his 21 years of service, not one of them had remained at this school for more than two years.

But this is certain. Coach Stanton has made intercollegiate football worthwhile for the men who have played for Caltech whether or not they have won games. He has done this against odds few coaches have had to face. For this reason, and for this reason alone, collegiate football has remained at Caltech.

PROBLEMS WILL REMAIN

New blood may bring a new spirit. But the basic problems of finding football material and training it in the time available will remain.

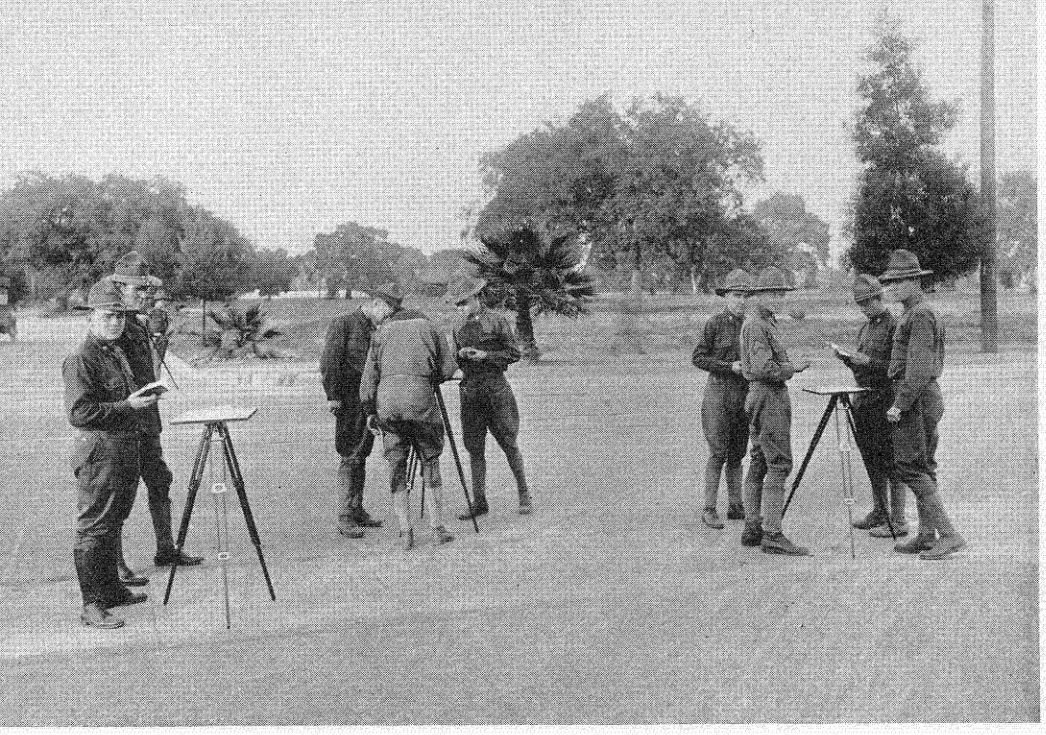
A question may easily be asked of Caltech students before this year is over. It may be asked before a new coach is appointed: "Is the interest shown and the participation given intercollegiate football by Caltech students sufficient to warrant its continuance?"

If the answer is yes, then it may be necessary for students and campus groups to extend even more conscientious support, not only in the bleachers, but on the teams. And, the school must recognize that teams in the future may not be victorious ones.

NOT FOR VICTORY ALONE

If Caltech men give up the idea that they are playing football for the fun and the love of the sport, if their main reason for intercollegiate competition ceases to be a desire in the main part for competition which they cannot receive among their own groups, if the idea becomes fixed that victories, and victories alone, count in varsity participation, the nintercollegite football might as well be given back to the Gods.

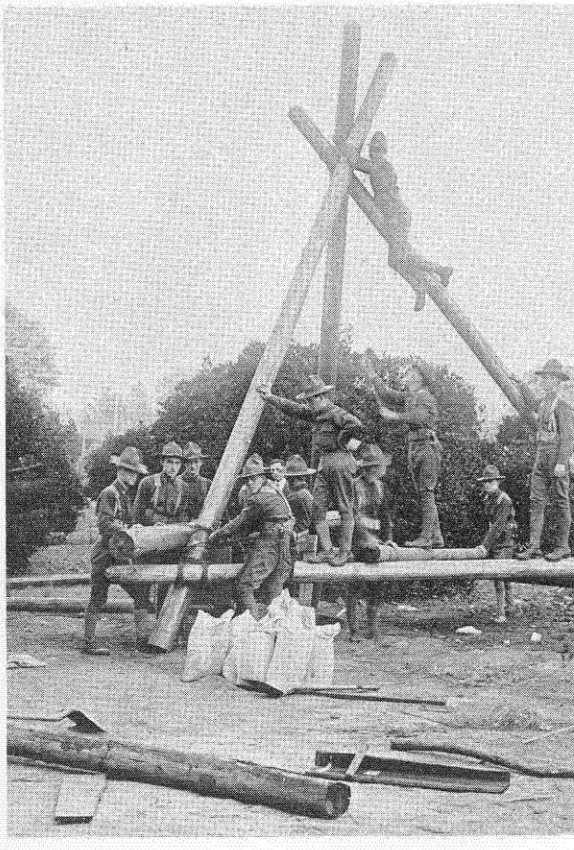
1918—1942



LEFT — Survey crew studying military topography at the corner of California and Wilson.

ANOTHER WAR

Twenty-four years have elapsed since the pictures on this page were taken. Then the Institute was little known outside the Pasadena area. Today it is acknowledged one of the world's outstanding centers of science and engineering. Spacious buildings, filled with valuable apparatus and eager researchers, occupy much of the area that was orchard and oak grove in 1918. But again the Institute is in the forefront of the battle for democracy. Not in 1942 is the undergraduate body in uniform nor the sound of military drill ringing out on the campus. But many army and navy men have been assigned to work in aeronautics and other subjects; and vital defense research in many of the laboratories is being carried on twenty-four hours a day, protected by armed guards. Thus, the shadow of another war has touched the Institute.



ABOVE — Military engineering trainees get some first-hand experience in derrick erection.

LEFT — Survey crew studying military barbed wire entanglements — apparently on the site of the present Anthenaeum.

SCIENCE AND DEFENSE

(Continued from page 4)

Army and Navy. A rough count shows that about 600 of our technical staff are now engaged directly on a full-time basis on defense propects. When I say that they are "engaged directly" on defense projects, I am excluding those who by circumstances arising out of the defense program have been forced to devote themselves to such problems as the finding of substitute materials and the engineering of emergency telephone projcts.

"NO PROFIT" FEATURE

Another aspect of the N.D.R.C. plan of operation which I should like to stress is its "no profit" feature. This applies alike to contractors and to employees of contractors. Perhaps this point can be brought out most clearly by reference to a specific situation. The University of California is acting as a contractor to the N.D.R.C. on a large project whch involves an annual expenditure of around one million dollars. Certain members of the California faculty are employed on a full-time basis on the project and in switching from teaching to defense work have incurred no change in rates of pay. The university has also hired from other faculties certain individuals to augment the defense staff and they, likewise, have gone over without change of salary, although a payment is made to compensate for the cost of moving in the case of both single and married men. It is also stipulated explicitly that the university, as contractor, will derive no monetary profit from the work and the same requirement is exacted of industrial laboratories and other types of contractors.

The "no-profit no-loss" proposition has involved the adoption of certain more or less arbitrary but seemingly equitable rules of accounting. Thus a university is usually allowed an overhead payment amounting to 50 per cent of the salaries which it pays to its members employed on a defense project. Similarly, an industrial laboratory, by virtue of the fact that it has to operate with commercial capital and is subject to a variety of forms of taxation from which the university is exampt, as well as other expenses, is allowed an overhead of 100 per cent of the salary item.

I suppose it depends upon one's point of view as to whether the effort I have just outlined appears large or small. On the one hand, it seems fairly certain that it is only a beginning and must expand further. On the other hand, it is certainly large already when contrasted with any civilian effort which was able to assert itself during the last war. And looking back to the situation which existed a quarter of a century ago, it is difficult to understand why the then available civilian agencies were not unleashed to an extent commensurate with their obvious capabilities. True, the National Research Council was operated to assist with the solution of defense problems, but it was, as I have pointed out, in the position of a doctor waiting for clients; it could not adopt the attitude of an aggressive salesman and initiate attacks on what it regarded to be important military problems. Hence we can declare that as regards organization notable progress has been made.

As to future expansion of our civilian defense effort, it is becoming increasingly essential to bear in mind the potential shortage of trained personnel. Without insinuating anything as to guilt, the chemists declare that this is a physicist's war. With about equal justice one might say that it is a mathematician's war. The visible supply of both physicists and mathematicians has dwindled to near the vanishing point, consistent with the maintenance of anything like adequate teaching staffs in our universities. If this civilian-defense effort is to expand, and such indeed now seems imperative, the limiting factor may therefore be a shortage of highly trained individuals and not a shortage of financial aid.

CONCENTRATION OF EFFORT

This leads me to state a few general observations concerning the past and future of our work. It is quite apparent that to date the burden of N.D.R.C. contracts bears much more heavily upon some institutions than upon others. At the outset this has necessarily been the case. While serious attention has at all times been given to the subdivision of projects so that they could be farmed out as widely as possible, a limit is frequently reached beyond which it is not practicable to go in the matter of division. In many cases, no division at all could be entertained, a situation that has given rise to a few large contractors, of which I cited the University of California as an example.

In the assignment of the early contracts it has been natural, in fact essential, to lean heavily upon these institutions, both academic and industrial, which for one reason or another have been peculiarly fitted to transfer quickly from peacetime to wartime problems. This has been done with a view to conserving time. But the stages of the program to follow will doubtless involve a broader survey of the situation to find locations where new problems can be lodged with a minimum of interference to essential defense work and teaching now in progress. In this survey a guiding principle will be to utilize men and facilities in situ whenever possible, thus preserving the "going value" of groups who are accustomed to working together. In the face of crises, the human tendency is usually to do the reverse, it being so easy for central agencies to ignore established but not well-known organizations, and attempt to cope with an emergency by calling workers from right and left to some new location. As a matter of fact, this tendency was beginning to make an appearance even as long as two years ago when the fundamental plan of the N.D.R.C. was under discussion. Had the tide then setting in been allowed to run on for some months unimpeded, the result would inevitably have been a literal army of uprooted scientists in Washington and other central points, sitting around idly waiting for vast amounts of research equipment which had been placed on order, but was not much nearer materialization than that, to be installed in hastily constructed laboratories. This would have been the easy and disastrous way. Fortunately, the creation of the N.D.R.C. came in time to stem such a tide.

Another present problem, and it is the last with which I shall trouble you, is one which by its existence supplies evidence that real progress has already been made in some of the research programs thus far initiated. It has to do with shortening the time gap between proved laboratory-research results and

(Continued on next page)

the stage where mass production can be undertaken. Some of the laboratory results already achieved hold such promise that every day which intervenes before their widespread utilization becomes a serious matter. Obviously the problems to be met here cover a wide range of equipment and materials — as wide as that marked out by the scientific results themselves — and since they involve large-scale manufacture, the whole plan must be carefully worked out with other official agencies. I am sure, however, that we are prepared to meet and solve these problems, and rather than be concerned with the difficulty of making progress along this avenue, I think all who are guiding the work of the N.D.R.C. would exclaim to the ranks of scientists and technicians, "Bring on your results, the more the better, and we will guarantee them a speedy passage to the firing line."

Editor's Note: This paper by Dr. Jewett was presented at the Session on National Defense at the 1941 Annual Meeting of the American Society of Mechanical Engineers in New York. December 1-5. It was also printed in the January, 1942, issue of Mechanical Engineering, official publication of the A.S.M.E.

Don't Miss The

ALUMNI DANCE

Saturday February 7 — $1.50 — Elks Club Los Angeles

STANTON RESIGNS

(Continued from page 6)

when Stanton essayed to display his talents on the legitimate stage.

Arriving in California in 1908, Stanton's first connection was with the Pomona College Sagehens. In the eight years from 1908 to 1915, he coached Pomona to four conference championships, developing several famous players during the period. In 1916 he became coach at Oxy, conference champions for that year.

Interrupted by the war, he spent the first year, before going overseas, as coach with the Camp Lewis team. The war over, he coached Oxy for two more years, up until 1921, when he first began his long association with Tech football.

SORENSEN PAYS TRIBUTE

Prof. Sorensen, closely associated with Coach Stanton for a number of years, says, "Our relations with him have always been good. He has always been interested in what the Institute is doing and has never made football take so much time of the men to interfere with satisfactory college work."

"I know of no other man around that could have done as well under the same conditions."

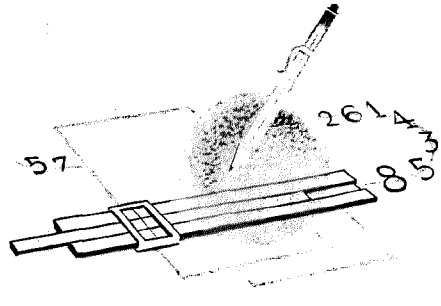
Continuing, "Mr. Stanton in the past has said several times he was ready to retire but at our request he has continued on. His family has also been after him to quit. Although he is director of athletics, the coach will probably resign that position as well."

At present, it has been established that Coach Stanton will not officially sever his connections with the Institute until the end of the 1941-42 school year. This means that the promising-looking 1942 track squad will still perform under his tutelage.

MILLIKAN'S STATEMENT

Dr. Robert A. Millikan also paid high tribute to Coach Stanton's position in the Institute's job of training men for life in these words: "Fox Stanton, as he has been familiarly called for the last thirty-three years in which he has been coaching football in Southern California, has one of the most enviable records ever won by any football coach—enviable because, unlike some successful coaches, he has never tolerated in himself, or in any member of his team, dirty football.

"He has realized, to an extent that not all coaches have done, that the greatest value of competitive athletics is in learning the lessons of real sportsmanship and spreading the spirit of sportsmanship throughout our American life. No finer tribute to him could be paid than the tribute of maintaining on the campus of the California Institute the spirit of sportsmanship which he has spent his life in fostering here."



. . . . . OF INTEREST

TECH ANNIVERSARY PASSES QUIETLY

Almost unnoticed in the midst of war news and defense activities, October 24 marked the 50th anniversary of the official opening of the doors of Throop Polytechnic Institute, forerunner of the present-day California Institute of Technology. On that day in 1891, Amos G. Throop, president, and Lewis F. Andrews, secretary, were in charge of registration of new students, some of whom under the original coeducational policy were girls.

"Father" Throop passed away many years ago after seeing the institution launched and on its way toward success. Mr. Andrews, however, is living and practicing law in Los Angeles.

OPENED WITH ENDOWMENT

With an endowment of $200,000, Throop Polytechnic Institute was able to secure a five-year lease on Wooster Hall, in the old Wooster Building, Kansas Street (now Fair Oaks Avenue) and Green Street. Larger quarters were secured later for the institution at Chestnut Street and Fair Oaks Avenue.

In 1913 the name of the school was changed to Throop College of Technology and in 1919 became the California Institute of Technology.

Mr. Andrews recalls the names of the original trustees who served on that opening day 50 years ago. Besides Father Throop and himself, there were: P. M. Green, treasurer; the Rev. E. L. Conger, Mrs. Jeanne Carr, member of the family that gave Carmelita Gardens its name; Prof. J. D. Yocum, Prof. C. H. Keyes, Mrs. L. T. W. Conger, W. E. Arthur, Enoch Knight, J. W. Scoville and E. E. Spalding.

INCORPORATORS RECALLED

Incorporators included the names of some of the men who helped to make Southern California. Two of these, T. P. Lukens and Prof. T. S. C. Lowe, have mountains named after them nearby to perpetuate their memories. The incorporators were: H. W. Magee, W. A. Masters, Maj. George H. Bonebrake, Mr. Lukens, Professor Lowe, F. C. Howes, "Father" Throop, Dr. J. C. Michener, Dr. J. S. Hodge, Sen. Delos Arnold, E. F. Hurlhut, P. M. Green, Milton D. Painter and Ex-Gov. Lionel A. Sheldon.

"Father" Throop was in his 80th year when he founded the institution which was destined to become one of the best known centers for scientific research in the country and dwelling place of several Nobel Prize winners. During the three years that he lived, following the opening of the school, he had the satisfaction of knowing that his final effort toward bettering mankind had been well founded.

VON KARMAN WINS NEW AWARDS

Dr. Theodore von Karman, Professor of Aeronautics and Director of the Guggenheim Laboratory of Aeronautics at the Institute, was recently named recipient for two important engineering awards, the 1941 medal of the American Society of Mechanical Engineers and the Reed award of the Institute of Aeronautical Science. The presentations were made to Dr. von Karman in New York.

The Reed award, the highest recognition given by the aeronautical society, was endowed in 1933 by S. A. Reed, inventor of the metal airplane propeller, and is given each year to a scientist whom the society chooses as having contributed most to aviation progress.

Because of defense research, it was stated only that von Karman received the award for developments in "modern methods of fuselage design."

A.S.M.E. MEDAL

In announcing the A.S.M.E. award, William A. Hanley, president of the society, revealed that the award to Dr. von Karman was made in recognition of his brilliance as a teacher, researches in elasticity and many fields of physics and mechanics, and his distinguished leadership in the fields of aerodynamics and aircraft design.

Dr. von Karman has been at Caltech since 1928. He becomes the second A. S. M. E. medalist on the campus, Dr. Robert A. Millikan, chairman of the executive council, being the first.

Along with the announcement of the award, it was revealed that Dr. von Karman again is supervising the second military meteorology course to be given at Caltech at the request of the War Department.

Ten field artillery officers and two coast artillery officers have been assigned to the course, which will conclude March 16.

This course is given under the sponsorship of United States Office of Education.

The course, one of the most highly condensed educational programs in the country, has as instructors, in addition to Dr. von Karman, the following: Dr. William V. Houston, Dr. Paul S. Epstein, Dr. Beno Gutenberg, Dr. Irving P. Krick, Homer J. Stewart, Leverett Davis, Jr., Dr. Wolfgang K. Panofsky, and Dr. M. A. Biott.

PUZZLE PARADE

How is your stock of puzzles? Do your friends enjoy sharpening their wits on a good puzzle now and then? Most engineers enthusiastically accept the challenge of a tricky problem, and are soon hot on the track of the solution. If the solution to your puzzle is quickly found your friend will feel very proud of himself and ask for more. If the answer is not forthcoming he will be taken down a notch and may suffer a temporary loss of interset in puzzles

Perhaps you prefer to sit down alone with a puzzle and test your will power by seeing how long you can keep from turning to the answers.

Here are a few teasers that have been gathered from various sources to start off this department. Try your luck at them. If you have a few favorites of your own that you would like to pass on send them to the Puzzle Editor, c/o Caltech Alumni Office, and they will be considered for future issues. Don't forget to include the correct answers with all contributions.

1. Three married men are named, Davidson, Bond and Holmes. They are not preacher, not doctor and not lawyer respectively. Mrs. Davidson and the lawyer's wife attended the same college. What is the doctor's name?

2. A goat is tethered with a 31.4 ft. rope to a hook on the outside of the wall of a silo 20 ft. in diameter. If the alfalfa crop around the silo runs one bale per 100 sq. ft. and the goat eats one bale per day, how long before the goat has eaten up his available fodder?

3. A certain fisherman on a cold April morning pushed his boat away from its dock and started rowing upstream at a constant rate. He had a partly filled bottle of—shall we say Coca Cola—in his hip pocket. After rowing a mile upstream, our fisherman unknowingly pushed the bottle overboard and it started floating down the stream. Fifteen minutes after this unseemly accident occurred our hero noticed the loss, quickly deduced what had happened, turned his boat around, and started rowing downstream with the same effort he had expended in going against the current. Just as the bottle reached the dock whence the expedition had gotten under way, the fisherman caught up with it, pulled it from the water, and decided to wait until the next day for another try at his sport. It looks easy, perhaps, but how fast was the river flowing?

(Answers on page 12)

NEW RAIL COACH PUT INTO USE

An almost noiseless railway car, whose floor stays level—and consequently its passengers—even when it takes the sharper curves at high speeds, made its commerical appearance in November, according to information from the Santa Fe Railway. Idea for the new type of coach construction which made these achievements possible came largely from William Van Dorn, formerly associated with the Institute's Aeronautics Department; and Alumni Review readers will recall a detailed discussion of the technical features of this important development in railway engineering by Professor F. C. Lindvall in the June 1939 number.

In appearance conventional except for oblong windows, the coach is radically different in its method of suspension. Instead of resting on flat springs, as do railroad cars now, this car is hung on its trucks by four huge coil springs. These springs virtually eliminate sidesway, and absorb much vibration. They are hailed by railroad officials as a potent safety factor.

The first of these new cars was delivered to the Santa Fe. Hooked on behind two regular coaches and a fast engine, the car was given its final test run at speeds as high as 81 miles an hour.

William E. Van Dorn of Pasadena, from whose brain the suspension idea sprang, and Cortland T. Hill, grandson of the late J. J. Hill of the Great Northern, head the company manufacturing the cars. They have been developing the idea for several years. Two more such cars, to be delivered to the Great Northern and Burlington Railroads early next year, are under construction.

T

1164 ENROLLED IN TECH DEFENSE COURSES

Instruction received in the Institute's engineering defense training courses is speeding production in vital Southern California industries according to a survey of employers recently completed by Professor Franklin Thomas, head of the Tech program. Thomas revealed that 1164 men were currently enrolled in defense courses, or considerably more than the total in regular undergraduate and graduate studies in the daytime program. In addition, 800 have already completed courses given earlier in the year.

It was emphasized that no academic credit is given for the special defense courses, and they cannot be applied as work towards any degree. Certificates of completion are awarded, however, and these may be useful in securing employment or obtaining civil service credit.

RESEARCH FOUNDATION WILL HANDLE PATENTS

Serving a need which has long been felt at the Institute, the California Institue Research Foundation has been organized to handle patentable inventions developed by the Institute staff.

The purpose of the foundation is to defray the costs of patent applications and to make business arrangements for putting the inventions to commercial use after agreement with the inventor as to his share of possible profits.

NON-PROFIT ORGANIZATION

The Research Foundation is a non-profit organization; any net financial gain beyond the agreed percentage to the inventor which may come to the corporation will be devoted to the furtherance of scientific teaching and research at the Institute. As a legal entity, the corporation is entirely separate from the California Institute of Technology.

The problems which the Research Foundation is seeking to solve will no longer be left to handle themselves as in most important institutions. The method the Institute is using to solve these problems was first used in the relationship of the Smithsonian Institute and a New York organization, the Research Corporation, in connection with the inventions of Dr. Cotrell of Stanford. Experience in the field of patent protections indicates that this plan is the best for Institute, inventor, and public alike.

The Institute, under its character as a non-profit educational organization, cannot legally take on a business for profit.

The inventor is under the handicap of lack of knowledge of patent procedure and lack of time to handle negotiations with licencees. The Foundation plan puts the responsibility into the hands of capable patent attorneys and those who are well trained to do the job most efficiently.

T

MILLIKAN AWARDED ORDER OF JADE

Dr. Robert A. Millikan, Chairman of the Executive Council of the Institute, received the Order of the Jade of the Republic of China, highest decoration conferred by the Chinese government upon civilians for distinguished service to that country, at a banquet held in the Fiesta Room of the Ambassador Hotel Dec. 2.

Three other Southern Californians were named by the Chinese government for the honor. They were Dr. Charles Keyser Edmunds, president emeritus of Pomona College; Dr. Rufus B. von KleinSmid, president of the University of Southern California, and Harry Chandler, Los Angeles publisher.

NEWS SHORTS

Professor William E. Hocking, Alford Professor of Philosophy and Chairman of the Philosophy Department of Harvard University, will visit the Institute early in 1942. Author of several books, Hocking has been a member of the Harvard faculty since 1914. His son, Richard, took graduate work at Caltech, and is now teaching at UCLA. During his visit, Professor Hocking will give two philosophy lectures at the Athenaeum and two seminars.

* * *

Percy H. Boynton, Professor Emeritus of American Literature at the University of Chicago, will serve as a visiting professor in the Humanities Department for the second term of 1942. Professor Boynton will also deliver a series of lectures on American fiction.

* * *

The Pasadena Board of Education recently paid tribute to the late Dr. George Ellery Hale by naming one of the elementary schools in the city system in his honor. Dr. Hale was Director of the Mount Wilson Observatory from 1904 to 1923, and Honorary Director until death in 1938. During all that period he was closely associated with the Institute's activities, and also in the civic and educational life of Pasadena.

* * *

Some concern is felt for the safety of Dr. Rene Engel, former Caltech professor and at last reports engaged in chemical engineering work for the Marsman Company in Manila. Dr. Engel was active in the Free France movement in the Philippines before the outbreak of hostilities there.

* * *

Dr. Robert D. Gray, head of the Caltech Industrial Relation Department, returned to Pasadena in November after serving for several weeks in Chicago as technical advisor to the five-man fact-finding committee appointed by President Roosevelt to attempt to adjust the threatened railway strike. The original recommendation of the committee was not accepted, but certain modifications were later agreed to.

T

ANSWERS TO PUZZLES

On Page 11

1. Davidson
2. 25½ days.
3. 2 miles per hour.

SCIENTISTS PLAN NEW COSMIC RAY STUDY

Theories of Caltech scientists about the origin of cosmic rays will be further investigated in the near future by experiments in Mexico and the United States, it was revealed recently.

Dr. Robert A. Millikan, Dr. H. Victor Neher and Dr. W. H. Pickering announced plans for these additional experiments in a report to the publication, Science.

They set forth in their report that their hypothesis as to the mode of origin of cosmic rays makes it possible the prediction of five definite vertically incoming cosmic ray bands.

As the observer moves north from the magnetic equator each of these five bands should begin to reach the earth at a particular latitude and continue reaching it at all more northerly latitudes, the savants declared.

FIVE DISCOVERIES

The report sets forth five major discoveries by workers in Caltech's Norman Bridge Laboratory of Physics as follows:

1. More than 60 per cent of all incoming cosmic ray energy is of the nature of incoming charged-particle bullets, each of energy of between 2 billion electron volts and 15 billion electron volts.

2. Dr. S. H. Neddermeyer and Dr. Carl D. Anderson's discovery of the production of nuclear impacts within the atmosphere of mesotrons which serve as the chief carriers of the cosmic-ray energy down to the lower levels of the atmosphere.

3. Dr. Ira S. Bowen's remarkable discovery that atoms, when out in interstellar space, are able to undergo atomic transformation forbidden to them within stars.

4. Dr. Bowen's and Dr. Wise's discovery that in ring nebulae, trillions of miles away from the exciting star, and therefore presumably reflecting conditions in interstellar space, there are five of the atoms: helium, carbon, nitrogen, oxygen, and silicon, each of which is 10 times more abundant than any other atom save oxygen.

5. Dr. C. C. Lauritsen's and Dr. William A. Fowler's discovery in Kellogg Radiation Laboratory that a part, at least, of the rest-mass energy of an atom has the power under suitable conditions of transforming itself directly into the creation of a positive negative charged particle pair.

Don't Forget
Fifth Annual
ALUMNI DANCE
SATURDAY, FEBRUARY 7

ASSOCIATION CRITICS GET BIG CHANCE

Stu Johnson '26, Alumni Association Membership Chairman, certainly put himself on the hot spot with a recent letter to Tech graduates who had once been members of the Association but had failed to send in 1941-42 dues, challenging them to tell what was wrong with the Alumni group, and guaranteeing a personal answer. No sooner had the letters reached the homes of the recipients than the replies started scorching back. Surprisingly enough, some of the most caustic comments were accompanied by dues, but most of them had something definite to say about what they wanted or didn't want done. Some typical replies are presented herewith, and we hope Stu will be able to find answers for them.

"Mr. F. W. B. is at this point in Honolulu (Pearl Harbor) but we are sure he wishes membership." Mrs. F. W. B. Jr.

"Why don't you offer a non-resident membership for about 50c per year. All it would cost you is the Alumni bulletin. About 50c is all it is really worth. I can't afford $2.00 for sentiment alone." K. S. P.

"Just what is an alumnus anyway? Am I really one? I am perhaps in error, but I had always supposed that a person was an alumnus of the university or college where one put in his four years of undergraduate work. That would make me an alumnus of the University of Utah. Am I also an alumnus of Cal Tech by virtue of having taken work in the graduate school (received my Ph.D. in 1930?"—and more of same— D.B.M.

"Haven't you heard about the new income taxes? Next year at this time you'll be lucky to find a man with $2.50. I was saving for Uncle Sam, but your heart-rending appeal touched me to the depths of my pocket book." D. S.

"Well? What have you to offer?"
T. G. G.

"Stu—thanks for sending me the reminder that my dues are due. Not much news up here except that we are sure of war, blackouts, death and TAXES. Best regards." M. W. E.

"I believe I missed last year because of serious illness—was laid up for a long period of time. And further believe that this was the first year I have ever been delinquent in dues—for which my apologies

(Continued on next page)

are due. Hope that this atones for past delinquencies." W. J. B.

"My son, Lieut. C. N. S., U.S.M.C., will be too busy for some time to come to do anything about your letter. Therefore, I am taking the liberty of answering for him, so that you will understand his failure to answer you." E. M. S.

"Stu Johnson '26: Still a sophomore? Nuts! Grow up!" R. W. C. (But he enclosed $6.00 for the Life Membership plan.)

"Dear Stu: Yes, you said it. It is a heluva letter! And you should be ashamed—the more so because you speak for a fine school. You base your approach on the philosophy that loyalty, regard, and appreciation are measured only in dollars!

"I disagree. Cash herewith is sent in spite of your philosophy rather than because of it. Are you hunting cover? If not, here's another shot: Why pick on us who have sometimes paid (maybe as often as we could) instead of checking your lists to get some who haven't?

"All right, I'll name one—a classmate of mine at Throop who says he isn't even honored (?) by any Alumni requests. Maybe he won't thank me for telling, but he's Professor S. B. Morris, Dean, Dept. of Engineering, Stanford University.

"Is this where you get off?" N. A. B.

"Thank you for reminding me." G. K. W.

"Have been a member of the Alumni Association as long as was possible, including 3 years in Egypt. Here is $2.50." S. U. B.

"Sorry I haven't sent it in before." C. W.

"Forgot, sorry, but don't get so tough!" D. N. C.

"With regards to membership dues I am reminded of the old adage about the turnip. All junior officers are in the same boat: If the world was on sale for a dime, none of us could buy a tin whistle," J. A. D. (Lt., U.S.A.)

"Dear Stu: You have shamed me into writing. I plead guilty to neglecting to answer your previous letters and, since you wish to know why, here is the straight dope. Last year I was out of school working and living like a Japanese to save money to come back this year. In spite of this I find it spread out pretty thin and just can't allow myself to spend even $2.50 on something not absolutely essential. This does not mean that I do not want to join the Association; quite the contrary. But it does mean that I will have to put it off till next year, at any rate, when I hope that the shoe will not pinch quite so tight. I'm sure that you will understand the situation, and I hope that you will forgive my discourtesy in neglecting to answer before. Thanking you for your patience, I remain." L. D.

"Dear Stu: I think the Alumni Association is a swell organization and as for the Alma Mater—I'm definitely prejudiced for Cal Tech in any arguments over colleges. It's tops with me.

"The reason I haven't joined the Alumni is the same old story—no time. I wish I could join and take part and help out. I'm glad to contribute money for any worthwhile causes. But my time is completely used up with research work and some outside activities that seem to me of more basic importance—putting the Alumni Association in sort of a luxury class as far as I'm concerned. I belong to a number of other organizations whose meetings more than take up all the time I have for meetings. I haven't even been able to attend the local meetings of Tech alumni although I've been receiving notices regularly. I visit Tech and renew acquaintances about twice a year as is. If it will be a worthwhile help to you for me to contribute some dues or something, I'll be glad to do it, but I'm out as far as contributing any time or going to meetings. Do you have activities like granting scholarships or loans, etc., for which you could use money and in which I could help out? Not that I'm floating in the stuff (I just have a postdoctorate fellowship at present), but I have more of it to spare than time. If you've waded this far, thanks." D. D. V.

CHAPTER NEWS

SAN FRANCISCO

November 26, 1941

Since it is about time for another issue of the Alumni Review, perhaps this report will arrive in time to get our San Francisco Chapter into print again.

Our first fall dinner meeting, planned by our President, Louis Erb, took place on October 24th at Hellwig's Restaurant in San Francisro.

After a fine dinner, there was a talk by Richard E. Hambrook '21. As General Plant Manager of the Pacific Telephone & Telegraph Company, Northern California and Nevada Area, Mr. Hambrook was able to give us much interesting information on the problems confronting the Telephone Company due to the national emergency. This work in the main consists of provision of special protection of regular and emergency equipment against any eventuality and of the planning and setting up of new equipment for defense work.

(Continued on next page)

Mr. Hambrook also provided interesting films related to his talk and which were furnished by the Telephone Company. A particularly interesting portion of these films depicted the laying of a new underground cable from the west coast to points east. The equipment used enables them to plow, lay and cover twin cables in one operation. These cables each provide sixty pairs of wires and can be made to yield twelve voice channels per pair; a height of efficiency due to equipment recently developed by the Bell Laboratories.

A general discussion followed the talk and pictures and the thirty members who attended thoroughly enjoyed the evening.

The San Francisco Chapter wishes to again extend an invitation to any Caltech men who may come to the Bay Region. We meet every Monday at twelve for lunch in the Fraternity Club dining room at the Palace Hotel at New Montgomery and Market Streets, San Francisco.

Sincerely yours,
Alex J. Hazzard '30, Secty.

HOUSTON

October 11, 1941

I am pleased to state that we had a very enjoyable and profitable meeting last Wednesday night, October 8. The moving pictures were shown and the recorded speech by Mr. Young was given. Both were well received and the following suggestions were made: (1) That Frank Capra be enlisted to direct the taking of the moving pictures next time. (2) That more persons be photographed with more captions to identify them. (3) Many of the older graduates have not been back and would like to see pictures of the new buildings which should be clearly identified by captions.

As a whole the pictures were well received and everyone was interested in the section which showed the collapse of the Tacoma, Washington bridge. Mr. Young received a well deserved round of applause and his talk was thought to be very timely.

Congratulations are in order to the Institue for organizing a Department of Industrial Relations. All of the fellows were pleased to know that the Institute is keeping abreast of the times by organizing such a department in recognition of the need for this type of training.

Our plans are to have another meeting the second Wednesday of November to again show the moving pictures and reproduce the talk by Dr. Anderson. I hope that we are not keeping the records too long.

Some of our members are employed by Shell and now the personnel department of Shell has asked to borrow the talk of Mr. Young. I have taken the liberty of turning the records over to Mr. A. C. Bulnes and trust that this will be O.K.

All persons present thought the records and the movies justified their expense and with proper use would do much toward bringing the Institute and the Alumni closer together.

Those attending the meeting were Charles F. Lewis '28, Brad Lewis '33, O. F. Sauernman '33, J. Ridgely Leggett '37, Roland F. Hodder '30, Richard Goodell '37, H. H. Farnham '24, Sidney Schafer '36, William M. Cogen '31, A. C. Bulnes '33, Ted W. Jurling '31, and W. F. Guyton '39.

Sincerely,
Roland F. Hodder '30

NEWS OF CLASSES

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

1917

Claude W. Sopp, assistant chief engineer of the Pasadena Water Department, has returned to his work after a major operation and a long siege of ill health.

1918

E. H. Imler is practicing as a civil engineer, but he is also a rancher in the Imperial Valley near Brawley, and a first lieutenant in charge of the California State Guard Company at Brawley. Imler was formerly an assistant engineer of the Pasadena Water Department.

1924

Glen I. Miller was called into active duty as a major in the Coast Artillery Corps and is stationed at Fort MacArthur.

Capt. Frank R. Lovering is in the Headquarters of the 18th Coast Artillery Training Group stationed at Camp Davis, Hollyridge, North Carolina.

The following note was received from **Captain D. Lawrence Hall,** stationed at Luke Field, Arizona:

"I wish to be included in your roster of men in service for the September issue.

"I received my commission and training in the Coast Artillery Corps (Anti-Aircraft) but when I was called to duty in April of this year, I was assigned to the Air Corps. I am now stationed at Luke Field, Phoenix, Arizona, which is an advanced single engine training school. I am a non-flying or administrative oficer and command the 330th School Squadron at this field. A school squadron consists of 200 enlisted men whose principal function is to keep planes in condition and repair for the use of the Flying Cadets."

1925

Frank C. Clayton has just been appointed Plant Engineer for the new $24,000,000 bomber assembly plant at Fort Worth, Texas, where Consolidated will build B-24's for the U. S. Army.

1928

Major Kenneth R. Crosher, with the United States Air Corps, was recently transferred to Salinas, California.

Richard C. Armstrong, M.D., sends the following note from Ann Arbor, Michigan:

"You may well get tired hearing the old saw from those of us Caltech alumni who are away from Southern California, but believe me the Alumni Review is required, cover-to-cover reading for me. Sometime when you're tearing your hair out trying to make a dead-line, just remember those copies which go the longest distances are most appreciated.

"Since no one else would be apt to send in the information, I'll have to be my own publicity agent. I'm specializing in diseases of the eye and am a resident on the eye service at University Hospital here. Starting in December, 1941, I shall spend four months as a Fellow in Residence in Ophthalmology at Johns Hopkins Hospital, Baltimore, during a leave of absence from my service here. If my present plans are not disturbed, I hope to be in practice in Southern California about July, 1943; and the day when I start west again certainly can't come too soon to suit me."

1929

The following letter was received from **Tom Evans,** now a civil engineering professor at the University of Virginia:

"Just received the September issue of your excellent magazine and thought I'd send you some alumni news before I forget it.

"Most people may not realize that the University of Virginia is right up in the hill-billy country, which is the most beautiful in the state, and we are quite isolated from all the centers of industrial activity in this part of the United States. So for the six years I've been here there have been few Tech grads show up until recently. If the emergency has done nothing else it has brought a number of fellows through here on official business. During the past year I have seen **Bill Mohr, Larry Lynn, Ed Joujon-Roche, Ted Combs, Wayne Rodgers,** and **Les Scott Schuler,** all on active duty at Fort Belvoir. Also saw **Bill Schuler** who made such a name for himself in football at West Point after getting out of Tech. He has been in the regular army for some time now and is stationed at Fort Belvoir.

"Our biggest center of defense activity in Virginia is the Newport News Shipbuilding and Dry Dock Company and the Norfolk Navy Yard. There are no Tech men there as far as I know. **Bob Coleman** and **Nathan Scudder** used to be at the N.A.C.A. laboratory at Langley Field.

"I received my captaincy in the Engineer Corps Reserve last summer and will probably be in the thick of it one of these fine days. At present my defense activities consist of running our Engineering, Science and Management Defense Training program for the state."

1931

Charles A. Wilmot is the proud father of a son, Charles Alfred Wilmot, Jr., born August 21, 1941. Wilmot is with the Ethyl Gasoline Corporation as a chemist in the manufacturing department.

Charles Lewis recently accepted employment with the Glenn L. Martin Aircraft Company in Baltimore.

Sam C. Eastman is now a member of the firm of Dozier Graham Eastman Advertising, located in the Bendix Building, Los Angeles, Calif.

Percy M. Boothe became a father for the second time on August 31 when Lorraine Marcia Booth was born. He is stationed

(Continued on next page)

at terminal as a lieutenant in the Civil Engineering Corps of the Navy in connection with some naval auxiliary equipment being built by Bethlehem Steel Co.

1932

Donald Badger Graff has been married recently and is now residing in Pasadena. His bride is the former Frances Llewellyn Terrell of South Pasadena.

Karl E. Hegardt is the proud father of a little girl, born May 13, 1941, Barbara Ann, sister of Joan, who is three years old.

1934

John D. Harshberger has been promoted to captain in the United States Marine Corps.

1935

Laurence J. Stuppy has been on active duty with the medical corps as a first lieutenant since May of this year. On June 28th he was married to Miss Mary Dorian Lissner of Los Angeles.

Word from **Albert O. Dekker,** now Associate Professor of Chemistry at Berea College, Kentucky, informs us that September 12th saw the entrance into this world of Katherine Dekker, 6 lbs., 13 oz.

1936

Raymond Boothe for the last seven months has been working on the plans for a large lift bridge to be built across Cerritos Channel to Terminal Island.

Ted Vermeulen is now with the Shell Development Company at Emeryville, and his new address is 1429 Neilson St., Berkeley, California.

Paul S. Jones has been transferred by the U. S. Engineers Office to Phoenix, Arizona. His current address is 820 N. Central Ave., Glendale, Arizona.

Howard F. Hamacher, formerly engaged in economic research for Arthur D. Little, Inc., has been appointed a Research Assistant in the Department of Production Management and Engineering at the Harvard Business School in Boston.

Mr. and Mrs. Meral W. Hinshaw announced the birth of a five pound 2 oz. baby girl the first part of October.

Ray Jensen married Miss Elizabeth Anne Klocksiem. Miss Klocksiem is a graduate of Mills College and U.C.L.A.

1937

Hugh F. Warner has left the Aluminum Company to become a lieutenant in the army. He is at present Chief of Military Personnel in the Pittsburgh Ordnance District, and is living at 6201 Fifth Ave., Pittsburgh, Pa.

Losey Field, the airport at Ponce, Puerto Rico, was named by the War Department in honor of the late **Capt. Robert M. Losey,** Air Corps officer who was killed April 21, 1940, in an air raid at Dombas, Norway, where he was an assistant military attache.

John C. Kinley is now Chief Engineer of the M. M. Kinley Company, Houston, Texas. He is living at 1922 Olympia, Houston.

Thomas Foster Strong was married to Oakalla Bellis in November. They will reside at 1791 East Mendocino St., Altadena.

1938

A new job and a new wife were both recently acquired by **Walter L. Koch.** He married Miss Lorraine H. Frederick September 12, and is now associated with Cornell University as Instructor in Aerodynamics and Airplane Design.

Frank B. Jewett, Jr., has resigned his position as a research assistant at the Harvard Business School to become treasurer of the National Research Corp., 100 Brookline Ave., Boston, Mass. He is living at 504 Beacon St., Boston.

Another recent bridegroom is **Charles Clarke** who married Miss June Lindsay of Beverly Hills. They are now living at 1509 Greenfield Avenue, Los Angeles.

Enjoying meeting many Tech men on his new job is **R. S. Custer** who now works for the Texas Company in New York City, doing engineering work in the refinery department. His home address is 334 West 12th St., New York City.

1939

The navy claims another Tech grad in the person of **Tyler Matthews** to take active duty in the Navy Supply Corps School. He gave up his position in the Stress Analysis Group, Northrop Aircraft in Burbank. His present address is Ensign Tyler Mathews, Navy Supply Corps School, Harvard University, B-21 Hamilton Hall, Soldiers Field, Boston, Mass.

An August bridegroom, **John Osborn,** took Miss Lari Hedderly as his bride. John is now membership chairman for the Pasadena Junior Chamber of Commerce.

1940

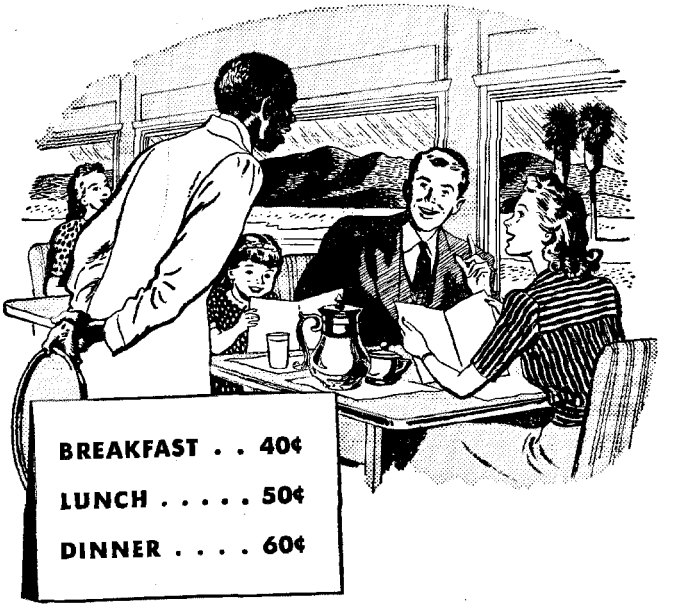
Sheldon Cyr Crane married Miss Aleta Smith and the two were living in La Jolla in our latest report.

1941

William Schubert was recently commissioned an Ensign in the U. S. Naval Reserve and reported to the United States Engineer's experimental station at Annapolis, Maryland.

Robert Severin Rasmussen is now with the Shell Development Company as a research chemist. He was married to Miss Mary Alice Gianetti on September 13 and the couple now reside at 272 Coventry Road, Berkeley, Calif.

IT ISN'T JUST ECONOMY...



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OLD AS MAN is the admonition, "Hitch your wagon to a star"; young as a child is the impulse "To wish upon a star." For all men, in all time, a star has been the bright kindling point for dreams, fixed moment in time and eternity, beacon in the night and promise of the day to come.

Something like a star is research, because it answers in the world of practical affairs to some eternal spirit in the heart of man—a perpetual restlessness with things as they are, an eternal seeking for a better way, a continual progress towards a better world. And because this thing lives more in the mind and the spirit than in the world itself, it is perpetual, everlasting, immutable, as eternal in its way as the stars themselves.

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But General Electric is not "wishing upon a star." Throughout the Company, scientists, engineers, executives, are thinking and planning and working to the end that the tomorrow which stars promise shall not simply come—but that it shall be better than today.

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