



A Year of National Military Service Can Be An Asset to America

By ROBERT A. MILLIKAN

WISE men, wise universities, and wise nations build their advances upon the foundation of the past. If they do not they violate the most fundamental law of evolutionary progress. Obviously, then, we want to go back to much, indeed to most, of the good life we had before the war. For what is the reason we all give for having entered this most terrible war in history? What is our reason for continuing to fight on with every ounce of strength we possess? Does not every one answer: "To preserve our great inheritance from the past, the free American way of life, characterized, first, by free representative local self-government, as distinguished from centralized control, political or economic, i.e., totalitarianism; and, second, by the opportunity to rise through individual initiative, energy and ability, as distinguished from equalitarianism, a philosophy which stands condemned by its historic failures as well as by the great Teacher in His parable of the talents."

We knew we were obliged temporarily to relinquish our freedom in order to fight totalitarian states. We decided to do it because we believe Americans have the capacity to go back to the American way of life after victory. Otherwise we should have joined Hitler at the start and let freedom go forever. It is now our job to recapture our freedom.

But what I am saying now is that we will not, we cannot, after victory recapture that life completely. For every intelligent American learned from Pearl Harbor, if he did not know it before, that our fancied security behind our two oceans was an illusion and that henceforth we must keep ourselves prepared and so organized as to enable us to meet possible external aggression. At a terrible price we have at last learned our lesson, namely, that isolationism and pacificism (in effect these two, despite their philosophical differences, are identical) only breed more wars.

If we are very foolish we will try to defend ourselves alone. If we are intelligent we will in some way combine our forces with those of other peace-loving people for the purpose of defending ourselves against the attacks of the international bandits. This amounts to nothing more than extending the policing type of function which every civilized nation on earth has found that it had to

adopt, and to practice within its own borders, as the only historically justified way to hold in check the depredations of its internal bandits. We have now got to do the same to defend ourselves from the external bandit nations. This latter method should cost us much less than would any plan for going it alone.

But simply because we are one of the earth's richest and most powerful nations, our share in that policing, whatever form it takes, is not going to be small. Hence, after this war the United States cannot return to its former undefended condition. It must train and keep trained for service on land, on the sea, and in the air many more fighting men than it has ever had to maintain in the past.

In view of this situation, a bill is now before Congress that attempts to meet this imperative need by requiring of every American boy one year of military service, either in the Army or the Navy.

If this bill, sponsored by the secretaries of the Army and Navy, and vigorously supported, too, by General Marshall and Admiral King, becomes a law, there will be here one very important particular in which the life of every American boy will be notably different after the war from what it has been in the past. Further, this change would have significant repercussions upon undergraduate life at the California Institute of Technology. It is some of these repercussions that I should like to point out and discuss.

Admiral Jacobs, in charge of personnel for the whole Navy, told us here some time ago that so far as the Navy is concerned—and our part in this program is likely to be with the Navy—this year of military service would in general come immediately after completion of the 12th grade, i.e., at the graduation from the high school. This normally comes on the average a little after the passage of a boy's 17th birthday.

The boy to be trained by the Navy would be sent to one of the already existing naval training posts, like the Great Lakes Training Station, just north of Chicago. The first four months of his Navy service would be devoted to naval indoctrination, including discipline, drill, physical training, etc.; in Navy parlance it would be "boot camp" training. The second four months would

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the weakest spot in the whole American educational system, namely, the lack of any sort of an apprenticeship system for providing the country with its own skilled workers rather than forcing us to import most of our skilled artisans from abroad, as we have done in the past.

I leave your imagination to fill out the picture. Great possibilities are certainly ahead. Will we have the intelligence to grasp and make the most of them? I should like to come back to this campus 20 years from today to find out.

Citrus Products

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industrial research program either on the so-called fundamental or the so-called practical side.

Pectate pulp is a product that resulted from research discoveries; after discovery uses had to be found for it. Sodium pectate, made by neutralizing pectic acid, has been known since 1825, as has pectin. They had similar colloidal properties, the pectic acid being perhaps less satisfactory for most purposes than the now highly successful pectin. By a simple change of process the Exchange found a pectate having much higher molecular weight which makes film-forming, viscous solutions. Moreover, it was possible to process the material without separating the cellulose, and the finished low cost material, when dispersed at the point of use, embodies both a highly colloidal sodium pectate and very finely divided cellulose.

But of what use is it? The uses are developing rapidly now, but at first considerable time was spent on some which did not materialize. One such was for quenching in heat-treating steels. Because of the low cost, controlled viscosity and non-inflammability, this appeared attractive and may yet be. However, oil well drilling mud treatment (to prevent water loss to porous strata) and paper coating (to prevent sticking of packaged synthetic rubber) have proven very much more practical than that young hopeful, the modified aqueous quenching medium.

VITAMIN P

An odd sequence of discovery occurred a few years ago regarding so-called Vitamin *P*. The Nobel Prize winner, Albert Szent-Gyorgyi, of Hungary, announced his discovery of this vitamin in lemons during 1936. Vitamin *P* was so named because it corrected excessive permeability of the capillaries and it alleviated hemorrhagic purpura. Several years earlier it had been discovered in California, in connection with spray drying of lemon juice (for cosmetic use), that an unknown constituent of the juice together with boric acid produced a brilliant yellow color. It was later found to be due to a certain group of flavones and of flavone derivatives, the same that are now considered the active materials in the Vitamin *P* substances. Here was a case of finding a color reaction for a vitamin years before the vitamin was discovered!

The research on citrus products has been accomplished in the aggregate by Government laboratories, State agencies, commercial firms, and the Exchange Research Department, which, as already stated, is the activity of a growers' cooperative and is guided by a Research Committee of grower-directors. Although the number of technically trained men employed in the Research Department has averaged about 12, and publication of results is not the objective of the work as it necessarily is in Federal and State laboratories, still the total number of publications refutes any notion that this is an

industry where secrecy may have limited the progress. The present total of technical papers, bulletins and patents published is 222, covering a wide variety of subjects. It would be difficult to prophesy the future of citrus products but it can be expected to feel the influence of the same technical and scientific advancement which will guide all postwar industry.

C. I. T. NEWS

HERBERT HOOVER, JR., TRUSTEE

The California Institute of Technology announces that *Herbert Hoover, Jr.*, has been elected to its board of trustees.

The son of Herbert Hoover and the late Lou Henry Hoover, Herbert, Jr., was born in London, England, and attended Stanford University, graduating in 1925 with a B.A. degree. In 1929 he won his M.B.A. degree at Harvard University. He was a member of the research staff of the Harvard Business School in 1928 and 1929, and from 1929 to 1931 he was communications engineer for the Western Air Express, followed by three years of service in the same position with Transcontinental and Western Air, Inc. In 1934 and 1935 Mr. Hoover was a Teaching Fellow at the California Institute of Technology.

Mr. Hoover is president of the Consolidated Engineering Corporation and the United Geophysical Company, both with offices in Pasadena, Calif. He is president of the United Engineering Company of New York and a director of the C. R. B. Educational Foundation. He also is a member of various professional societies, including the American Institute of Mining and Metallurgical Engineers, the Institute of Radio Engineers, and the Society of Exploration Geophysicists.

Mr. Hoover, a resident of San Marino, Calif., is married and has three children, Margaret Ann, Herbert, III, and Joan Leslie.

CHINA IN PEACE AND WAR

As related by E. Harrison King

THE alumni dinner meeting held at the Hotel Clark on the evening of March 8 had as its speaker E. Harrison King, instructor in hydraulics at the Institute. Mr. King vividly described China as he knew it while professor of civil engineering at St. John's University near Shanghai and as an internee in a Japanese internment camp following America's entry into the war in 1941.

Mr. King first told of the general Chinese background by comparing Chinese cities with Chicago, New York, and other American cities. The skyscrapers of Shanghai are high and numerous, reminding one of New York City. At the other extreme of comparison, Mr. King spoke of one city of 130,000 population near Shanghai which has no railroad or highway leading to or from it. The city has a wall and moat surrounding it, the moat joining with canals which permit small sailboats to reach the outskirts of the city. The only other means of transportation into the city is by cart and dirt path.

Mr. King commented that a few of the customs and methods of the Chinese are not understood and therefore not respected by many Americans. However, he stated, if these customs and methods were understood they would be recognized as effective and respectable. Mr. King explained that the attitude of the Chinese is that they can work their problems out in their own way