

simultaneous studies on the effects of tryptophane in reducing tooth decay.

Best dosage and best way of giving the

chemical will also have to be determined in future studies.

Science News Letter, March 17, 1945

GENERAL SCIENCE

Future of Science

The development of the study of man depends upon the younger generation whose minds are the least touched by the psychoses of the war.

By MAJ. GEN. F. H. OSBORN

Director, Information and Education Division, Army Service Forces

Address given before the Awards Dinner of the Fourth Annual Science Talent Institute, March 6, 1945.

► WE ARE meeting here tonight during one of the critical periods of the life of man on earth. For the first time in human history the cultures of the races and nations of men are merging into one great human culture. This process began some hundreds of years ago with the voyages of Marco Polo. Then India became accessible, North and South America were discovered and colonized, and finally in the lifetime of living men Japan was broken open, the islands and peoples of the Pacific became known, North Africa was explored and Old China began to turn in her century old sleep. The land of the world could be put down on maps and charts. The people of the world could be studied and described by anthropologists. But in vast areas the people retained their old cultures, unaware of other ways of living of the men in other lands.

Now the most terrible of all wars has hastened this change to one world. Using all the technical advances of our scientific age, the war has linked the nations of the globe with air routes, with radio, with the rapidly distributed printed word; men travel by plane today from any spot in the world to any other spot in 60 hours. By the end of this year it may be 40 hours. The voice of Stalin or Roosevelt or Churchill or Hitler is heard instantaneously in any corner of the globe where man has a good enough receiving set. *Yank*, the Army weekly, the first global publication, is printed simultaneously in 20 different spots clear round the world. Never again will any people on this earth be out of touch with what is going on concerning the people in the rest of the world. Not unless we fail.

Unless we fail? Who, we, Americans, we, of the United States, of my generation and of your generation? Are we so important in these critical times? Yes, by a strange turn of fortune, and not at all by our own desires, that is just how important we are. The people of the world are at one of the great cross roads of history. One road leads to a new dark age. The other road leads to a new and better world. And because for the first time we are living in one world, it is no longer possible for different nations to take different roads. Whichever road is chosen, all the people of the world will have to follow it. The choice of roads is hanging in the balance. Many people will wait on the decision of the United States, in many respects the most powerful nation in the world. Our weight, thrown in the balance, will be a mighty factor in deciding which road mankind will follow for a long time to come.

So, now, let us look into the minds and hearts and experience of we the people of the United States, in order to see how qualified we are to make such a choice.

We have some bad handicaps. We must be very frank with ourselves about that. We have lived our whole life as a nation in a very self-contained continent whose vast natural riches have provided materials for the good life without trading with other lands. So we are less conscious than other people of our ultimate dependence, on the rest of the world. Because we haven't had to live on world trade, we don't know the rest of the world as the British and many countries of Europe do. Until just recently we have been isolated or protected by two great oceans, so we haven't had the experience of having to live with our neighbors. Many people actually came to this country in order to get away from oppression in other countries, so many in fact that

it became one of our national principles that we could and should live apart from other peoples. But that was before radio and airplanes and robot bombs and rockets.

Finally, and worst perhaps of all, life has been very easy for us compared to the life other peoples have had to live. We've had more land, more food, more roads, more cars, more telephones, more bathtubs, more central heating, more margin of wealth to devote to science, education, music and art, than any other people, though other people worked as hard or harder than we did. Let's be very honest with ourselves,

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Westinghouse Science Scholarships Winners

GRAND SCHOLARSHIPS OF \$2,400

Joswick, Marion Cecile, Brooklyn, N. Y.
Kosower, Edward Malcolm, New York, N. Y.

ALTERNATES

Stafford, Nancy Jeannette, Watertown, N. Y.
Hall, Robert Leonard, Green Bay, Wis.

SCHOLARSHIPS OF \$400

Stafford, Nancy Jeannette, Watertown, N. Y.
Hall, Robert Leonard, Green Bay, Wis.
Blackman, Jerome, Far Rockaway, N. Y.
Clark, George Whipple, Harvey, Ill.
Kravetz, Saul, Brooklyn, N. Y.
Milburn, Richard Henry, Newark, N. J.
Streitwieser, Andrew, New York, N. Y.
Tinkham, Michael, Ripon, Wis.

ALTERNATES

Parker, Edythe Wilma, Evanston, Ill.
Sessler, Andrew M., Forest Hills, N. Y.
Spink, Walter Milton, Wakefield, R. I.

SCHOLARSHIPS OF \$100

Boochever, Lois Lee, Albany, N. Y.
Dale, Alice Beck, Columbia, Tenn.
Gurney, Jean Carolyn, Roslyn Heights, N. Y.
Hodgson, Margaret Joan, Belmont, Calif.
Kaufmann, Renate Mathilde, Evanston, Ill.
Levy, Madeline Lenore, New York, N. Y.
Parker, Edythe Wilma, Evanston, Ill.
Reichart, Ruth, New Rochelle, N. Y.
Wingert, Ann, Madison, Wis.
Anson, John Hahn, LaGrange, Ill.
Conroy, Harold, Brooklyn, N. Y.
Diebel, Robert Norman, Eugene, Oreg.
Dwight, Kirby, Jr., Exeter, N. H.
Ellis, Russell Ray, Neenah, Wis.
Handschumacher, Robert Edmund, Abington, Pa.
Hill, David Allen, Syracuse, N. Y.
Kauer, James Charles, Cleveland, Ohio
Kegelman, Matthew Roland, New Rochelle, N. Y.
Michel, Maynard Cornelius, University City, Mo.
Moore, John Fitzallen, Wilton, N. H.
Petersen, Frederic E'John, Minden, Nebr.
Reed, Charles Orlando, Jr., Troy, Ill.
Rich, Ronald Lee, Washington, Ill.
Royden, Halsey Lawrence, Jr., Phoenix, Ariz.
Sessler, Andrew M., Forest Hills, N. Y.
Sinclair, Robert MacKenzie, Milwaukee, Wis.
Spink, Walter Milton, Wakefield, R. I.
Wahlgren, John Howard, Valley, Nebr.
Walker, Edward John, Detroit, Mich.
Weinberger, Hans Felix, Altoona, Pa.

Judges: Dr. Harlow Shapley; Dr. Steuart Henderson Britt; Dr. Harold A. Edgerton.

these things have made us a little conceited. We think we're smarter than other people, and we don't admit how much the difference in our living is due to the vast riches of this self-contained continent we're living on and the heritage of freedom and character with which the original settlers were endowed by the culture of western Europe, rather than by any innate superiority of their own. Besides making us a little conceited and critical of other people not so well off, perhaps this comparative wealth and ease of life has

made us a little soft? I don't know about that. We can fight a war all right. But can we make sacrifices for a more distant objective such as the unity of the world? Can we refrain from criticizing others 'till we know the facts? Can we order our economic life so as to help and not hinder the economic life of other people in the world? Can we live with our minority groups successfully and yet not let any one of them swerve us from our purposes as a nation? Only time can answer these questions, which are indeed questions of our ability to choose the right road.

Against all these handicaps which have hitherto held us back from taking a full part in the world, we have some very great qualifications which may at long last move us to take a position of wise leadership.

We have the great moral heritage of the Christian religion, which has permeated our lives 'till we are almost unconscious of the sources of our strength,

which lie in respect for the individual and belief in the value of each human being, in honesty, fair play, giving the other fellow a chance, in service to others.

We have the great political heritage of the best of western Europe reaffirmed by Lincoln and by this very war, that government of the people, by the people, and for the people shall not perish from this earth.

We have the hope, confirmed by our own experience 'till it is almost a national belief, that we can by our own efforts and brains make the world a better place to live in. No other people hold this belief, this national aspiration, quite so firmly or quite in the same way as we do.

All in all, these things lead me to think that we will make the right choice at this crossroads in the long history of man on earth. Hesitatingly, slowly at first, I believe we will move and when it is clear which way we are going,



VISIT TO CAPITOL—The group of winners met Vice President Harry S. Truman at his office. Left to right standing are: Andrew Sessler, Ruth Reichart, Kirby Dwight, Jr., Lois Boochever, Saul Kravetz, George Clark, Maynard Michel, John Anson, Jerome Blackman, Charles Reed, Nancy Stafford, Andrew Streitwieser, Michael Tinkham, Vice President Truman, John Wahlgren, Edward Kosower, Marion Joswick, Robert Handschumacher, Edythe Parker, Edward Walker, Renate Kaufmann, Jean Gurney, Madeline Levy, Robert Diebel, Halsey Royden, Ann Wingert, Margaret Hodgson, Alice Dale, and James Kauer. Kneeling are: Robert Sinclair, Russell Ellis, Robert Hall, Matthew Kegelman, Frederic Petersen, John Moore, Richard Milburn, Ronald Rich, Harold Conroy, David Hill and Walter Spink.

all those others whose hopes triumph over their fears, who believe in the destiny of man, will find themselves on the same road with us.

This choice will be made by our hearts, or at least by those subconscious inner forces which determine the actions of men and of nations in their greatest moments.

But if our hearts make the right choice, then our brains will have such an opportunity for leadership as the world has never known before. What I am trying to express is best illustrated by this very meeting to honor the junior scientists brought together here.

I venture that no such meeting is going on, or could go on, on such a scale at this time in any other country of the world. I feel sure that no other country in the world after what it has been through in the past six years, could produce forty human minds as unprejudiced, as unconfused, as trained in the clear thinking of the physical sciences, as are the minds of the forty young men and women here tonight, representative of many thousands of other such young and clear thinking minds almost unique to the fortunate background of our country in this period of destruction. Here lies the greatest hope that we can offer, if we move on the road of leadership.

To a very great extent it is the advance of the physical sciences which has made modern civilization possible. Through these sciences man is in a very real sense affecting the conquest of his environment. But it has been at a heavy cost. The very instruments man has devised to increase his physical comfort and security he has turned against himself in terrible destructive wars. The advance of man as a social animal has not kept pace with his advance in knowledge. If we are to use to man's advantage the products of your skills, we must learn better how to rule ourselves and how to live together. For this we must turn to the field of the social sciences.

In the past 30 years, in this country—and in no other country in the world—the social sciences have begun to emerge from arm chair philosophies to at least the rudiments of true sciences, the truth of whose findings can be demonstrated by experiment or by statistical treatment of things that can be measured. Thus for the first time we really know some things about human heredity and individual differences; we really know some things about human psychology,

and social behavior under different environments.

We have for the first time some very specific knowledge about the increase of human populations.

We have tools by which we are beginning to be able to measure the effects of social and psychological influences. In other words we are beginning to break open the most difficult, complex, and fascinating science of them all, the science of man.

Your brains of the coming generation trained in the hard close logic of modern scientific techniques; your minds of all the world least touched by the psychoses of the war; your hearts inheriting, if pray God we have properly passed on that heritage, the best in the ethical and religious experience of the race; these brains and minds and hearts may do this job. Here in this our country is the reservoir of such resources; and so I believe we can, if we will, enter into our period of leadership with good hopes that we may acquit ourselves well.

I do not think that we need to spur the coming generation to their task. The immense difficulties which have 'till recently barred access to the sciences of man now offer such a challenge that the ablest and most courageous minds can no longer resist; and only such minds should enter this field. How freely they can work there will depend on the older people of my generation. It is we who need a little heart searching advice.

For we of my generation must recognize that there has seldom been a cleaner break between two generations of scientists than the break between the younger men in the social sciences and the older men in the same field. The younger men are trained in the use of new statistical methods, they have a healthy skepticism of any finding that can't be proved up. The older men, lacking the new techniques, were trained to base their findings on their personal observations. Inevitably, they tend to differ more among themselves. Indeed the use of the word science can hardly be applied to the study of man and his social reactions under these older methods. The true science of man must be developed by the younger men trained in the use of the new tools.

Yet it is the older men who make the decisions as to who shall work and in what field. They still control most of the funds, most of the appointments. They direct the faculties and the courses

"In addition to its use in the synthesis of polycyclic aromatics, the modified Willgerodt reaction should find application in the synthesis of certain aryl-substituted aliphatic compounds. For instance, 10-Phenyl-1-Decene could be prepared from n-Octyl Phenyl Ketone via the Willgerodt, reduction to aldehyde, condensation with malonic acid, and decarboxylation.

"Because of the comparatively smooth course of the modification, I shall attempt many studies which otherwise might have failed for lack of equipment and working material. In the future, I shall try to make a comprehensive study of the method including these possible phases: mechanism of the reaction, a factor which could probably be best determined by using branched-chain aliphatic phenyl ketones and studying the acids obtained from these; use of unsaturated ketones such as those which can be derived from vinyl, allyl, crotyl, and so on; effect of the reaction on such compounds as dibenzoyl ethanes, dibenzoyl propanes, etc.; the use of selenium and tellurium, the analogues of sulfur, in the reaction; and last, but not least, the effect of organo-metallic reagents on the intermediate thiomorpholide complexes.

"It is interesting to note how the field of organic chemistry develops under scrutiny: from an extremely obscure topic, which, as yet, has occupied a total of one page in the Journal of the American Chemical Society, it expands so that a complete study such as I have outlined above would take years to complete. And, as far as possible, I will complete it."—From the essay of Edward Malcolm Kosower.

of instruction. If the older men are wise they will play the role of philosophers rather than technicians. In return for what they give up, they can share in the planning of this greatest adventure of science. They can direct the energies of the able and well-trained younger men to those fields of science in which America can best serve mankind. They can use our great ethical heritage to give the work of these younger men purpose and direction. Then, and then only, can we have faith that the weapons forged by the physical sciences can be turned to the common good, and not become again, as they have in this war, destructive forces suddenly let loose on an untutored world.