

GENERAL SCIENCE

Physics Won't Dominate

In post-war education, physical sciences will maintain advances, President Conant forecasts, but social sciences must catch up for livable world.

► THE PHYSICAL sciences, necessarily given priority in present-day training programs to meet the war emergency, will not dominate post-war education, Dr. James B. Conant, president of Harvard University, declared in addresses before the New York Academy of Public Education and the American Philosophical Society. They will maintain the gains they are making, but the social sciences and humanities will have to catch up with them, to maintain a balanced and a liveable world.

The old notion that there is a basic opposition between two kinds of training, and that one kind is parasitic on the other, was decried by the speaker. The real relation, he said, is not one of parasitism but of symbiosis—the kind of thing you have in a lichen, in which two quite different types of organism are mutually beneficial to each other.

Such a symbiosis has long obtained in human affairs, Dr. Conant continued. Historically, the system of political liberalism under which we live has made scientific advance possible; and in turn scientific advances have fed our sense of freedom.

"If we are to have a free society on this continent we must continue to have advances in the fundamental sciences, and these advances in turn can take place only if man is free," he declared. "The symbiosis must continue if this nation is to prosper. . . . Let no man who admires science or extols new industrial techniques look with favor on any abridgment of human liberty unless he wishes to encourage forces which will eventually destroy those things he values most."

While Dr. Conant declined to offer on the spot detailed plans for the post-war world, he did emphasize the necessity for such planning: "We cannot maintain a free society in a world in which we must face the terrible and disrupting burdens of modern war once every generation."

In concluding, he offered a five-point outline of a master plan for future research: (1) Provide an educational sys-

tem which offers real equality of opportunity. (2) Find the exceptional men among those given this opportunity while they are still in training. (3) Give these men every advantage and facility in the way of machines and helping hands. (4) Be certain that there are many rival and independent groups competing for scientific and technical achievement, and that no group can long perpetuate itself. And finally, (5) Beware in times of peace of coordinating agencies with dictatorial powers—of ideas of a peacetime scientific general staff.

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BIOLOGY

New Potent Anti-Disease Weapon Discovered in Mold

► A SECOND and more potent weapon against disease germs has been discovered in the mold, *Penicillium notatum*, which has already yielded the very powerful anti-bacterial substance, penicillin. The second substance from mold, called penatin, is reported by Dr. Walter Kocholaty of the University of Pennsylvania. (*Science*, Feb. 19)

Penatin, he reports, not only is more powerful than penicillin but is active against disease germs which are hardly affected by penicillin. Of 50 disease-causing and non-disease-causing organisms tested, none has been found which would resist the bacteria-stopping action of penatin in dilutions of not less than one to 10,000,000. Some organisms were stopped by penatin in dilutions of one to 400,000,000. Penatin not only stops the growth of organisms but also, though to a lesser extent, can kill them.

At dilutions of one to 12,500,000, in test tube experiments, penatin stopped the growth of diphtheria, anthrax, undulant fever, pneumonia, typhoid, paratyphoid and pus germs, among others.

Relatively large doses injected into the veins of a rabbit and a guinea pig had no obvious ill effects. The anti-bacterial action of penatin is not impeded in 90% serum, Dr. Kocholaty reports, which suggests that it would be as effective

against germs in the blood as against the same germs in a test tube. Further experiments on its effect as a remedy for germ diseases and on its toxicity will be reported later.

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MEDICINE

Diabetics Need Not Suffer Under Food Rationing

► THE 7,500,000 diabetics in the United States, and their friends and relatives, need not worry over any dangerous diet restrictions on the diabetics through food rationing.

The chief problem rationing presents to the diabetic is the matter of getting enough fresh and canned fruits and vegetables. The New York Diabetes Association has proposed that diabetics might turn in their sugar ration cards and receive in their place such special privileges, in the future, as their disease calls for.

OPA officials, however, state that this will not be necessary. There is a provision in the food rationing regulations that diabetics who require added amounts of special foods can get them. All the diabetic need do is take to his local rationing board a certificate from his physician stating the amounts of extra foods he needs and why. Then the diabetic fills out application form



HOMEWARD BOUND—A carrier pigeon, just released by Navy balloonists, takes off for its cotes at the Lakehurst, N. J., Naval Air Station with a message giving the position of the two Navy balloonists.

315, attaches the doctor's certificate, and gives it to the local board. The board then gives him the extra points.

Diabetics usually take extra cream and butter to supply the fuel they miss by not eating sugar or much carbohydrate. But the N. Y. Diabetes Association believes that the diabetic will not need extra cream if sufficient whole milk is

available. Oleomargarine and other fats, the association states, may replace butter for fuel needs to the extent advocated for normal persons.

Each diabetic, of course, must have his diet prescribed by his physician, but in general the above statements hold true for diabetic food requirements.

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sources, conscience and intelligence, can be used to help a group of people, or a nation, overcome the emotional forces that promote war.

The present century, Dr. Langner pointed out, has been characterized by two world wars and by progress in deep personality exploration with the possibility of counteracting the forces that lead to war.

The importance of intelligence and thinking for directing one's emotional life is being stressed more and more by psychiatrists, Dr. Langner said.

New trend in treatment of mental disorder is the use of group therapy, that is, treating patients in a group rather than singly. Developed originally as a more effective means for treating certain kinds of patients, group therapy is proving increasingly useful because of the war-caused shortage of psychiatric personnel.

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PHYSICS

Hard to Weigh a Battleship

Largest and smallest things are hardest to weigh. Mass of an electron can be determined with accuracy of only one part in a hundred.

► THE 52,000-TON full-load displacement of the new "Iowa" class battleships may actually be as much as 52,052 tons or only 51,948 tons without anybody knowing the difference. A battleship cannot be weighed with an accuracy closer than one part in a thousand, Dr. Harvey L. Curtis of the National Bureau of Standards stated in his address as retiring president of the Washington Academy of Sciences. By contrast, a kilogram weight (basic unit of the metric system, a little more than two English pounds) can be compared with another with an accuracy a little less than one part in a billion.

Biggest things and smallest things are most difficult to measure and weigh, Dr. Curtis told his audience. A battleship is about the biggest lump of matter which human means can weigh directly. In the opposite direction, the antipneumococcus germ or virus particle is among the smallest of living things. It would require 1,000,000,000,000,000,000,000,000 (one octillion) of these to weigh as much as a blue whale, largest of all animals. Far below this tiniest of germs, however, is the electron, smallest of all known objects. Its mass has been determined within an error of one per cent—but this is an accuracy of only one part in a hundred, as compared with one in a billion when kilogram weights are being compared.

As with weights, so with lengths. The standard meter bar (the laboratory's "yardstick") can be compared with another meter bar with an accuracy of one part in ten million, said Dr. Curtis; perhaps under very favorable conditions to one part in fifty million. The error amounts to something between a twentieth and a hundredth of the diameter of a fine spiderweb.

Accuracy of comparisons falls off with either increase or decrease in lengths being compared. The standard base line used in the most accurate kind of surveying is usually 1,000 meters. Its accuracy, however, can be determined only to one part in a million, as compared with one in ten million for the single meter. The millimeter (a thousandth of a meter) can be determined with an accuracy of only one part in a few hundred thousand. The distance between the nuclei of a hydrogen molecule is known only to one part in a thousand, while the diameter of a proton, the smallest known object, has not yet been determined within an error of less than one part in ten.

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PSYCHIATRY

Building-Stones of Peace Proposed by Psychiatrists

► CONSCIENCE and intelligence are the forces which psychiatrists believe can be used as building stones for lasting peace, it appears from pre-convention discussion as members of the American Orthopsychiatric Association gathered in New York for their annual meeting.

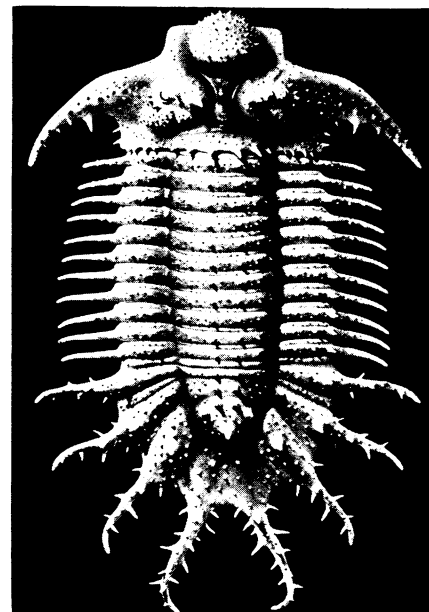
Feelings of insecurity, anxiety and aggression may lead nations into the disaster of war, as they lead individuals into personal disaster such as disordered mentality. Psychiatrists treating victims of mental disorder build on the individual patient's inner resources of personality, chiefly his conscience and intelligence, in helping him to recover his equilibrium.

They hope, Dr. Helen Langner, chairman of the association's publicity committee, explained, that the same re-

PALEONTOLOGY

Specimen of America's Biggest Trilobite Found

► THE ONLY KNOWN specimen of *Terataspis*, America's largest trilobite, that retains the head, body, and tail was discovered last fall near Buffalo by Irving G. Reimann, curator of geology and



GIANT TRILOBITE — This new restoration of *Terataspis*, biggest of its family known from this continent, has just been placed on display at the Buffalo Museum of Science.