GENERAL SCIENCE

Colleges Train 172,000 Youths; Ready By Beginning of 1943

Speed-Up Courses and Change to Three-Term System Hurries Graduation and Avoids Seasonal Peak

BY JANUARY, 1943, a new force of 172,000 young men and women will be ready to tackle the technical problems of war for Government and war industries. Already they are streaming from colleges, universities and technical schools as a result of speed-ups in educational programs.

This is revealed by a count just completed of the college students being trained for 103 war-vital occupations as picked by the National Roster of Scientific and Specialized Personnel. The survey was conducted by the American Council of Education at the special request of the National Resources Planning Board.

A majority of the 812 institutions surveyed are already teaching a capacity load of students in the fields where manpower shortages are developing, Dr. C. S. Marsh, vice-president, indicated in his report of the survey. Courses are being compacted, vacations shortened and the three-term college year is being substituted for the time-honored semester system.

Graduation comes at least a month earlier than it used to in the majority of the institutions studied. One technological school is delivering to industry twice its usual number of trained youth, and is doing it in 16 months less time.

Seasonal peaks are also being ironed out of the college-trained manpower supply by changes in teaching policy and speed-ups of courses. Although June is still the favorite month for cap-and-gown processions and the awarding of degrees, there is now a steadier flow throughout the whole year. This is the tempo at which 1942's graduates will become available for war employment.

Already graduated in February or March, 12,000; in April or May, 43,000; June or July 74,000; August or September 13,000; December or January, 1943, 29,000.

Special courses have been organized by colleges to aid in the war program. Many have night classes in the ESMDT (Engineering, Science, and Management Defense Training) courses administered by the U. S. Office of Education. Others have turned over dormitories and classrooms for use of Army and Navy fliers. Laboratories have been turned over to the Government for military research and faculty members have been loaned.

Special courses bearing on war problems, such as camouflage, explosives, tactics, map-making, radio communication, cryptography, and military law have been organized.

The colleges and universities are facing a manpower problem of their own, meantime. Skilled scientists are being taken from teaching jobs to do military research. Enrollments of students are dropping off, too, but this does not balance the loss of faculty members. The professors most needed in war research are those teaching in the physical sciences. Their loss is not balanced by the drop in numbers of music students. Student enrollments have decreased most sharply in the liberal arts courses, teacher training and law schools.

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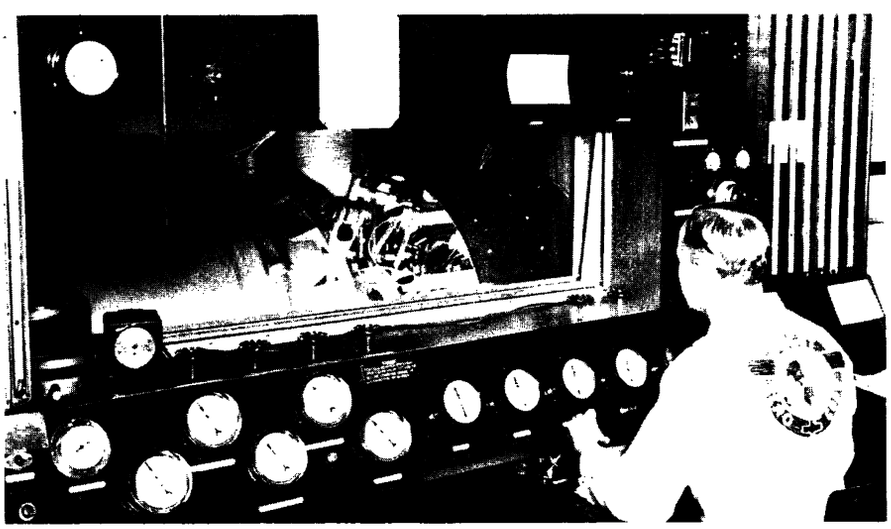

POSTGRADUATE

This engineer is one of 600, graduated two months ahead of schedule in the American college speed-up-for-war program, who have entered a post-graduate training course in the Curtiss-Wright plants. In the photograph, an airplane engine is being tested.

MEDICINE

Simple Treatment Works For Foot Wound from Nail

FOR getting men back on the job safely and quickly after foot wounds caused by stepping on nails, simple treatment is best, in the opinion of Dr. Fred H. Bowen, Lieutenant (j.g.) in the U. S. Naval Reserve.

Such treatment cured 661 nail puncture wounds of the foot in construction workers at the U. S. Naval Air Station, Jacksonville, Fla., with an average disability of 0.6 days, he reports to the *Journal of the American Medical Association*. (May 30)

Preliminary soaking of the foot in hot water for 15 to 30 minutes is an important part of the treatment. Dr. Bowen explains that this dilates the small blood vessels and brings into the wound an exudation of lymph, "the best germicidal agent in the body." The rest of the treatment consists, essentially, of painting an area around the wound with tincture of mercresin, picking or swabbing out the dirt that can be seen when the edges of the wound are held apart, and bandaging with a dry dressing.

Tetanus antitoxin is given and if the nail that caused the injury is larger than a 10 penny, the patient is given crutches and told not to work for at

least one or two days. Otherwise he returns to work at once.

The probing, injection of an antiseptic solution and draining usually done in treating such wounds is, in Dr. Bowen's opinion, harmful. He described experiments showing that in the probing tissues uninjured by the nail are injured and opened to infection.

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PHYSICS

Three Rocket Weapons in Use By Both Germans and Russians

Rocket Projectiles Are In Use Against Airplanes, Tanks and, Upside Down, Against Armored Ships

ROCKET WEAPONS, reported in use by both Russians and Germans, are of at least three different sorts, the Harvard War Institute for newspapermen, meeting under the Nieman Foundation, was told by Prof. George B. Kistiakowsky, ordnance expert on the Harvard University faculty.

One of the weapons employing the rocket principle is a rocket-projectile fired from airplanes against other airplanes or ground targets. Since it can be discharged without recoil, a much heavier missile can be used than is possible with the very light cannon that are the largest type of ordnance now mounted on aircraft.

A second weapon is a multiple rocket projector said to be used by the Russians against German tank attacks. It can fire 20 or 30 shells at once, like an enormous shotgun discharge. Tanks find this extremely difficult to dodge.

Finally there is an "upside-down" rocket used by German planes in bombardments of the fortress of Malta, and against armored ships. This adds the force of the rocket-stream push to the attraction due to gravity, and obtains better penetration of the bomb against protected positions.

The high cost of modern war was rapidly reviewed by Prof. Kistiakowsky in the course of his unofficial backgrounding of ordnance information.

Despite the fact that the price of TNT declined from $1.50 a pound in 1918 to 15 cents a pound just before the outbreak of the present war, military costs in general have gone up terrifically, due to the great increase in numbers of weapons needed, their rapid wearing out under present-day battle conditions, and their great complexity.

One half million dollar bomber is good for just about 20 operational flights if it is not destroyed in action. Adding this rapid depreciation to the maintenance costs of airfield and other necessary servicing, the cost per flight for each bomber is about $50,000, according to Prof. Kistiakowsky's estimates. And it costs all this to deliver only about $600 worth of TNT.

It seems difficult to increase the efficiency of high explosives much beyond that reached by TNT. The "ideal" explosive (not yet produced) would according to chemical calculations develop at most about twice the smashing power of TNT. So we have to go in for enormous quantities. Allied explosives requirements in the first world war were about 250,000 tons a year. Now they are about four times that much.

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AGRICULTURE

Hybrid Alfalfa Is Good For Livestock and Soil

HYBRID alfalfa, produced by U. S. Department of Agriculture plant breeders in the same manner as the now famous and all but universally planted hybrid corn, promises great things both for feeding livestock and for rebuilding soil fertility and preventing erosion. Adaptation to regional climatic and local soil conditions, together with the stronger growth resulting from hybrid vigor, is expected to result in higher yields of hay and silage per acre, hence more meat and milk.

As yet, Department of Agriculture scientists emphasize, hybrid alfalfa seed is not ready for the market. The method is still on a limited experimental basis only—comparable to the point reached by hybrid corn about 20 years ago, when Vice President Wallace, then still a Midwestern farm editor, was just gaining the attention of corn breeders for his unorthodox but productive methods. It is believed here, however, that the stage is about set for large-scale production and commercial distribution of hybrid alfalfa seed.

As in the production of hybrid corn, the new alfalfa comes from four carefully selected grandparent lines. Each has some quality or combination of qualities desired in the ultimate descendant —winter hardiness, drought resistance, high productivity, etc. The grandparent lines are paired and crossed, and selections from their offspring are crossed again, producing second generation hybrids combining all the desired qualities.

One considerable advantage in hybridizing alfalfa results from the fact that this plant is a perennial, and hence capable of propagation by cuttings, like rosebushes or grapevines. Once the desirable traits are fixed in the ancestral lines, these can be kept going indefinitely by vegetative reproduction, whereas the parental lines in corn, an annual plant, can be perpetuated only by constant inbreeding. It is expected that when hybrid alfalfa production gets on a permanent basis there will be "foundation plots" of carefully selected ancestor plants which will serve as constant reservoirs of desirable crop characters.

Another crop type on which farm plant breeders are hard at work is fall-sown grain much "grassier" than the winter wheats, oats and ryes now cultivated. The tendency has been constantly to cut down the amount of straw in winter grains and to concentrate on the seed. However, in Texas and other mild-climate grain-growing areas winter grains have proved valuable as winter pastures, and have often paid a profit to the farmer even when early-starting rust and other diseases have spoiled the grain crops themselves. Hence the search for new types of winter grains that will yield more as pastures, even at the possible expense of slightly smaller yields at the thresher.

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● RADIO

Saturday, June 13, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Stephen Duggan, director, Institute of International Education, will discuss the work of the Emergency Committee in Aid of Displaced Foreign Scholars, of which he is chairman.

Tuesday, June 9, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.