

GENERAL SCIENCE

Science Talent Institute

Forty boy and girl winners in the Fourth Annual Science Talent Search, during honor-trip to Washington, are addressed by leading scientists.

See Front Cover

► THE YEAR'S talented young scientists of America attended the five-day Science Talent Institute in Washington (March 2-6) as the culminating event of the Fourth Annual Science Talent Search for the Westinghouse science scholarships. This educational event is conducted by the Science Clubs of America, administered by Science Service.

This issue of SCIENCE NEWS LETTER reports some of the highlights of the sessions. The next issue will continue this report.

The picture on the front cover of this SCIENCE NEWS LETTER shows Dr. S. G. Hibben and a group of the winners after his talk on "Lighting Tomorrow," given before the Science Talent Institute.

Rear Admiral J. A. Furer, Coordinator of Research and Development, United States Navy:

The war has not only brought science in civil life and the Armed Services together, but it has stimulated research to such a degree as to bring about speedy solutions to many important military and naval problems. It is this cooperative effort in research, plus speed, that has kept us ahead of the enemy in this complex technological war.

Scientists have invented new devices which make it possible for seamen to find their way on the ocean and to exact spots on distant shores under any condition of the weather. They are no longer dependent on celestial navigation, on lighthouses and on other aids to navigation in doing this. Range finding is no longer dependent on clear weather and optical instruments and gunnery has been so improved that ships at sea can demolish enemy gun placements on shore with the greatest precision. Rockets now make it possible to fire a great volume of high explosives on to the beaches from small boats, because the rocket has no recoil and does not require foundations like a cannon. But most important of all, the scientists and engineers joined forces in developing the means for getting large numbers of men and great

quantities of material of all kinds on to the beaches in an incredibly short space of time as compared to what was formerly possible.

Vessels for many purposes and various sizes all the way from 35-foot boats to 300-foot ships were specially designed and built to be run up on the beach. The idea of deliberately running ships up on the beach and discharging their cargoes from a huge port in the bow was a new one.

The great improvement made by scientists and engineers in the last ten years in the internal combustion engine for marine use has really made these special ships possible. Perhaps of even greater importance has been the development of amphibious vehicles such as the Alligator and the Duck. These seagoing trucks can take a load of men or materials from a ship ten miles out at sea, across coral reefs, through the surf, up on the beach and right on for miles inland to the unloading point.

The magnitude and speed of these operations are well illustrated by the assault on Saipan in which more than four regiments were put ashore on a single beach from over 700 amphibious vehicles in a matter of a few minutes, and within less than an hour tanks were being landed to support these men.

The scientists are doing a magnificent job. Without them the United Nations could not win this war. However, too many of these technically trained men are being put in uniform and assigned to duties that can be performed just as well by less talented men.

The core of the difficulty is that we have no adequate National Service Law. If we had had early in the war a true National Service Act it would then have been possible to keep the scientists at work on jobs that only they are qualified to do. Competent scientists are so few in number compared to the total population of the country that it is especially important that they be conserved for research work.

There were, for example, as of October 1, 1944, only about 4,500 physicists below the age of thirty in the United

States. Some of these men are in the armed forces and some are not. Very important research projects are right now slowed down and some have not been taken up at all because scientists and engineers in this age group have gone into the Services who should have remained in laboratories and in industry.

A true National Service Act would have made it possible to provide an opportunity for the four or five thousand boys with particularly outstanding aptitudes for science who reach the age of eighteen each year to continue their education. By providing for the education of this comparatively small number of talented youths, we would be doing much to insure our position in the scientific world ten years from now, otherwise we will be faced with a very serious shortage of scientists when that time comes.

Maj. Gen. James C. Magee, U. S. A., Ret., former Surgeon General:

The increase in our knowledge relating to the causes, the prevention and the treatment of diseases represents a notable triumph for medical research. The impetus given scientific investigation by the impact of war has served to focus thought particularly on problems of a military medical nature and to present them in sharp relief to our attention. This is as it should be, for the complete support of our fighting forces takes precedence over all other considerations.

The mobilization of scientific talent devoted to medical research in the past few years has been productive of enormous benefits to the military establishments and to mankind at large. It does not matter whether a specific bit of research had its genesis in a purely military demand or whether it had its origin in other sources; the results of the research are open to all. A very great degree of the success attained may fairly be ascribed to the policy which permitted the concentration of so much investigative effort in the Office of Scientific Research and Development and the Committees of the Division of Medical Sciences of the National Research Council. So successful has this policy been the government has wisely determined to carry the same activities into peacetime and an *ad interim* committee for research has been appointed to function until the establishment of a permanent body has been accomplished. We may hope with

great confidence that some of the many unsolved problems in medicine that still confront us may be attacked with the same vigor and concentration of talent

as were applied to wartime matter and that answers to some of those problems, at least, may be found.

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ENGINEERING

Uses Either Gas or Oil

Conversion from one fuel to another is made almost instantly in the new diesel engine which needs no electric sparking device.

► A NEW development in the diesel engine field permits the use of either gas or oil as fuel without any electric sparking device, saves from 20% to 25% in fuel consumption, and enables the change from one fuel to another without the necessity of a shut-down. It is a development of the Cooper-Bessemer Corporation.

Any engine built as a diesel can be fitted to operate on gas, but engines built purely as spark-ignited gas engines cannot be converted to work on the principle of the diesel. Conversion of diesels from one type of fuel to another has been possible in the past, but it has always been necessary to shut down and exchange major or minor parts. With the new development conversion is as simple as closing one valve and opening another, and it can be arranged so that the engine automatically goes from one to the other as the gas availability changes.

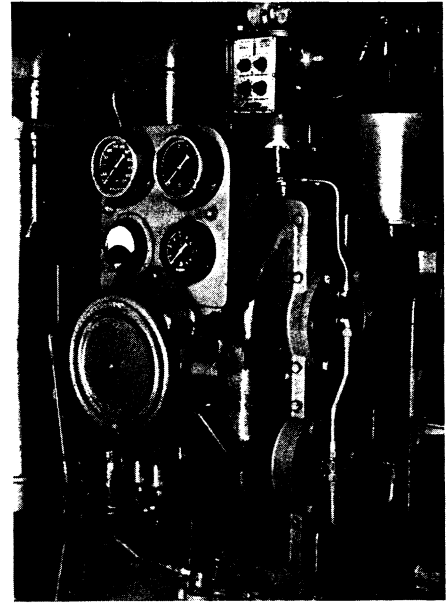
Seventeen years ago the company built a single-cylinder test engine on the diesel cycle to operate on gas. It used compressed air with the gas injected on top dead center under very high pressure.

It was found that while it was possible to run such an engine without other ignition means, the engine performed very much better if pilot oil injection was also used. This engine was not marketed.

No thought was given at that time to the possibility of allowing the gas to go in with the intake air, because of the assumption that it would pre-ignite. It is now found possible to admit the gas with the engine air intake and be free of any evidence of premature ignition. In fact, an engineer of the company states, on very heavy overloads with natural gas, the mixture will not fire without the pilot oil.

"Assuming a diesel oil engine in operation and on load," Ralph L. Boyer, Cooper-Bessemer Corp. engineer, says, "if gas is admitted in the intake air the governor obviously will immediately reduce the amount of oil to compensate for the percentage being carried in the gas. It then merely becomes necessary to reduce the fuel oil injection to the desired minimum and then govern the percentage of gas according to load."

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CONTROL END—This is the Cooper-Bessemer Type JS-8 Diesel engine, showing the gas-oil operating mechanism. This engine is rated 675 horsepower at 400 revolutions per minute.

broadcast of "Adventures in Science."

Plant scientists can offer you specific varieties of vegetables that have been created by plant breeders for better quality, higher yields, resistance to disease, and for other virtues of good garden crops, he stated.

Thanks to fertilizer technologists, Victory gardeners will have all the fertilizer they need, Dr. Cardon announced. Last year a new form of fertilizer nitrogen, granular ammonium nitrate, made up about a fifth of the nation's total nitrogen supply. We had ammonium nitrate before, but it attracted moisture so readily that it caked, sometimes even turned to liquid. Fertilizer scientists studied this problem and found a way to produce ammonium nitrate in very small pellets with a coating to protect them from moisture.

"Plan your garden for a long season," Dr. Cardon urged, "so that something fresh will be available from early in the spring until late in the fall. Home canning and storing plans should be included in garden plans. Vegetables you grow and can or store yourself don't cost you ration points. If you have any gardening problems, get in touch with your local Victory garden chairman or county agent. Planning your garden ahead will give you the most returns for your effort."

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HORTICULTURE

Home Grown Food

► HELPING to win the war isn't the only reason for having a Victory garden this year. You can save yourself money, too. By supplying your family with fresh vegetables for a whole season at little cost from even a small garden, you can grow the same vegetables that you would have to pay up to \$50 or more for on the market. Home grown food is tastier, too. Vegetables and fruits do have a better flavor when they are garden fresh, as they are when they come out of your own Victory garden.

Science will be the Victory gardener's unseen helper this year, more than ever before, to help produce more and better vegetables. Science can be brought into

your Victory garden from the moment you begin to plant your crops, reports Dr. P. V. Cardon, in charge of the Agricultural Research Administration of the U. S. Department of Agriculture.

"When you select the vegetables to plant in your garden you are applying at least two lines of scientific research. Scientists who breed better varieties of plants, and investigators who study nutritional needs may not seem to have much in common at first glance. Yet you are relying on recommendations made by both these groups when you choose your garden crops," Dr. Cardon pointed out, speaking as the guest of Watson Davis, director of Science Service, on the CBS