GENERAL SCIENCE

Science Talent Institute

Leading scientists addressed the 40 Science Talent Search winners who came to Washington to compete for $11,000 in Westinghouse scholarships.

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➤ THE YEAR's top high-school scientists made an honor-trip to Washington to attend the Science Talent Institute as the culminating event in the Science Talent Search, conducted by Science Clubs of America, administered by Science Service.

There they heard eminent scientists whose talks are reported in this issue of the SCIENCE NEWS LETTER. Coverage of the Institute will be continued in the issue of March 15, also, when the scholarship winners will be announced.

President Truman

The picture on the cover of this SCIENCE NEWS LETTER shows the winners at the White House, where they were welcomed by President Truman. He urged them to develop a common sense ability to apply their scientific knowledge to the world's problems. He told the teenagers that the next generation will depend increasingly on scientific knowledge and that we need people to put scientific ability to work for the benefit of the entire world.

In response to an invitation extended to him by one of the young scientists, President Truman paid a surprise visit to the Saturday evening hobby dinner. For about a quarter of an hour, the President, accompanied by his staff, viewed the project exhibits and then he continued into the annual dinner of the White House Correspondents Association which he came to the Hotel Statler to attend.

Heart Surgery Advancing

➤ A GROUP of nearly 300 "blue babies" who have been given a new lease on life by a surgical operation point the way to surgical rescue of other patients with heart disease.

"Surgery of heart disorders is in its infancy and many advances will be made in the future," Dr. Alfred Blalock, professor of surgery at Johns Hopkins Medical School and originator of the "blue baby" operation, declared at the Sixth Annual Science Talent Institute.

Forty high school seniors, boys and girls who are winners this year of the Science Talent Search conducted by Science Service for Westinghouse scholarships that may enable them to become famous surgeons some day, heard Dr. Blalock describe the "blue baby" operation and saw moving pictures of it.

The operation has been performed on about 330 patients at the Johns Hopkins Hospital in the past two years. Similar operations have been performed in other hospitals. The overall mortality rate is about 18%.

Most of the patients who have survived the operation are markedly improved, Dr. Blalock reported. Some of the patients who could walk only a block or two before the operation can now walk miles.

The so-called blue babies, some of whom are not infants, are blue because their blood does not contain enough oxygen, Dr. Blalock explained. In most cases this is because the blood vessel which ordinarily transports blood to the lungs where it takes up oxygen from the inspired air is constricted. The blood flow to the lungs is markedly reduced and hence an inadequate volume of blood is exposed to oxygen.

The "blueness" or cyanosis of the patient may be very marked.

Much more alarming is the incapacity of the patients. Most of them can walk only a short distance and this only with undue effort. Furthermore, many of them develop complications such as thrombosis or clots in the blood vessels of the brain resulting in paralysis.

The operation consists of the making of a shunt or by-pass between a branch of the aorta which conducts blood to the body (excluding the lungs) and the pulmonary artery (beyond the point of constriction or stenosis) which transmits blood to the lungs. Fortunately the pressure within the aorta is very much higher than that in the pulmonary artery. A large volume of blood will reach the lungs through a relatively small artificial opening and will take up oxygen, thereby reducing the cyanosis and the disability.

Stars from Atomic Action

➤ ATOMIC COMMOTION may well be behind the activity that causes a star to burst forth into a bright light, only later to fade into its former obscurity.

The theory of the cause of a "new star," known as a nova, was presented by Dr. Samuel G. Hibben, Westinghouse scientist, to 40 high school seniors from widely distributed schools throughout the country.

Explanations of novae have brought

TALKING SCIENCE—Winners heard scientists and talked with them at the Science Talent Institute. These students are questioning Dr. M. A. Tuve.

varying theories among astronomers, Dr. Hibben said, and expressed his belief that they probably are caused by a "species of molecular or atomic disintegration rather than by frictional heat dissipation. Development of the atomic bomb, which possibly is a miniature nova built on earth, will help science to better understand novae."

The mercury vapor lamp, and other modern electric light sources, were described by the Westinghouse lighting specialist as "distant cousins" of the atomic bomb. The methods of producing artificial light by other than incandescent means, he pointed out, "are remarkably similar to methods used in creating the world's most powerful explosive, although the lamps are tamed considerably by controlled operation."

The atomic bomb tests proved that the bomb was a tremendous illuminant as well as a powerful explosive, Dr. Hibben continued, thus giving the scientist "a hint of the atomic rearrangement likely to emit tremendous quantities of light. Consequently, modern lamps that operate on the general principle of atomic disturbance contain a hint as to how these new light sources can be of the highest potency."

Hopes for future progress in lamps are pinned primarily upon advances in fluorescent and other vapor discharge light sources unknown to the public a decade ago. Incandescent types will continue in wide use in spite of the fact that attainment of their peak efficiencies is not far away.

Milky Way to Be Mapped

➤ RESEARCHES of the past few years at Harvard's Oak Ridge astronomy station in Massachusetts have been merely pilot programs for the great study ahead of the Milky Way system, Dr. Bart J. Bok, associate director of Harvard College Observatory, told 'teen-age scientists attending the Science Talent Institute.

A five-year plan just inaugurated at Harvard should enable us to map accurately not only the direction, but the exact location in space of stars in our own Milky Way galaxy, Dr. Bok informed them. The survey should pry loose secrets about the heavens to a minimum distance if 117 million billion miles from the sun, and is expected to disclose information about the sky right up to the center of our Milky Way system.

The organization of the study and the methods to be employed have already been tested in small-scale programs for a few regions of the sky. Star counts and color measurements made at the Oak Ridge station near Harvard have given experience of great value in planning the equivalent southern programs.

The proposed five-year study of stellar distribution should throw light on the spiral character of our galactic system and—most important—give clues to the population characteristics of the central star clouds. It is expected to reveal whether the observed faint, red stars in the central clouds are highly-reddened luminous giants, seen through a thick cosmic mist, or truly red stars seen through a relatively thin haze. Astronomers should discover at what distance from our sun the increase in star numbers indicates that we are coming into the central star clouds.

Western Culture Minority

➤ WESTERN CIVILIZATION, already outnumbered two to one in the population of the world, is becoming an even smaller minority, Dr. Frederick Osborn, director-at-large of the Social Science Research Council, warned the group of young scientists.

Only about 600,000,000 people of the world's population of 2,000,000,000 have the Western European tradition of Christianity, self-government and freedom, Dr. Osborn said.

In the next 25 years, western civilization will barely hold its own in population, he predicted, while Asia will increase by 350,000,000 unless war or famine wipe out large numbers. Russia will gain 50,000,000 in the next quarter-century, and Africa 60,000,000 people.

"If we are going to spread the American way of life, which we so much believe in," Dr. Osborn declared, "we are going to have to do some pretty fancy missionary work, or we will be swamped by quite alien cultures in which life is held very cheap and in which the individual and his right to the pursuit of happiness are negligible."

Science, by increasing our knowledge of man and his behavior, can help spread our ideals to the rest of the world, the social scientist told the teen-age scientists.

"For the first time we have a little real knowledge about individual differences," he said, explaining that personnel work by industry and the Army, studies of consumer interest, public opinion polls and new sampling methods and techniques are all beginnings toward an understanding of the effect of different surroundings on human attitudes and motivations.

Tools provided by science offer a hope for the future of introducing a more rational way of thinking to the world, Dr. Osborn concluded.

Earth Magnetism Changed

➤ THE EARTH'S magnetic field as it existed 20,000 to 30,000 years ago is being studied by modern scientists, Dr. M. A. Tuve, director of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, told the Science Talent Institute.

Dr. Tuve, who directed part of the work on the World War II proximity fuze, explained that very slight permanent magnetism still remains in annual glacial clay-deposits, called varves.

A compass of several thousand years ago would have slowly varied in direction over a period of years. Systematic studies have shown this change during the past three centuries, Dr. Tuve said.

Future research in physics, the scientist told the teen-age group, will cover a much wider field than atomic energy and artificial radioactivity.

He showed motion pictures revealing the recent discovery of rapid variations in the ionized part of the upper atmosphere. Discovery of these changes, due to inrushing clouds of particles from the sun, was made with a radio pulse technique.

Science Must Have Freedom

➤ INTERNATIONAL freedom in science was termed essential to the welfare of the world by two of America's leading scientists as they answered questions from teen-age winners of the Sixth Annual Science Talent Search.

Dr. Harlow Shapley, director of the Harvard College Observatory and president of Science Service, and Dr. E. U. Condon, director of the National Bureau of Standards, were guests of Watson Davis, director of Science Service, on Adventures in Science heard over the Columbia Broadcasting System. They discussed "International Cooperation in Science" with some of the 40 high school scientists.

Describing freedom to scientific research as "one of the essential elements in the civilization we have all been fighting for," Dr. Condon declared, "we must have freedom from secrecy and freedom from national boundaries."

Questioned concerning military secrecy by one of the high school scien-

tists, Dr. Condon said secrecy "should not be applied to scientific principles and basic research data.

"As long as we have armies and navies and air forces with their military equipment, it will be desirable to keep secret specific design features. Such a policy would not react unfavorably on international cooperation in science, and it won't hamper the work and the development of our own science," the director of the Bureau of Standards explained.

Dr. Shapley, who recently returned from lectures and conferences in India, said, "Science is an integral part of the culture and civilization of America.

"But our science must not be nationalistic. In these days of a shrinking planet, and an expanding brotherhood of men of all latitudes and longitudes, we must develop planet-wide concepts of the functions of science in society," the astronomer declared.

Urging young scientists to tackle "scientific problems on an international basis," Dr. Shapley suggested nutritional studies as an example.

Students of nutrition and allied problems "should think of the nutrition problems of the Tropics and the Arctics, as well as what goes best for us in the Temperate Zone."

Dr. Shapley reported that several hundred students from India are on the waiting list for one American technological school alone and that there are other countries whose students seek to enter our colleges and universities.

Explaining that he was startled to learn of this situation, the scientist added, "And the situation disturbs me because I fear that we in the fields of education and science do not sufficiently realize our heavy responsibility in the advancement of civilization and our golden opportunity to serve the world."

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MEDICINE

Legs Saved From Gangrene

Vitamin-amino acid combination starts body reactions which halt gangrene. Treatment may be useful for other blood circulation-impaired diseases.

➤ FIVE VETERANS who faced amputations of feet or legs because of gangrene are on the road to recovery. Their blackened, shrivelled, mummified toes are getting soft and pink and ready for walking.

Another six are also recovering from the same excruciatingly painful blocking of blood circulation which caused gangrene in the first five.

A new treatment with a vitamin and an amino acid is responsible. It was devised by Drs. Zolton T. Wirtschafter and Rudolph Widmann at Wadsworth General Hospital, Veterans Administration Center, Los Angeles, as reported to the *Journal of the American Medical Association* (March 1).

Patients with disease of the heart's artery, with angina pectoris, high blood pressure, kidney disease, paralytic strokes and a half dozen serious ailments may be helped by this same new treatment.

The treatment itself consists of injections of synthetic vitamin C, or ascorbic acid, and of another chemical, histidine, which is one of the amino acids that are building blocks of protein.

Vitamin C converts histidine into another chemical, histamine. This was a test-tube discovery made 10 years ago by a German chemist, P. Holtz. The VA doctors are apparently putting the same chemical reaction to work in the bodies of the patients.

Histamine has a powerful dilating effect on small blood vessels. Contraction of small blood vessels by inflammation of the lining of the vessels or the presence of clots in the vessels can dangerously slow blood circulation. Gangrene is one result. Tissues deprived of blood die and decay. The affected part must be cut off to stop the spread of the gangrene, if possible. Before the gangrene, patients suffer horrible pain which frequently cannot be relieved by any drug.

Getting the blood circulating again is the object of doctors treating the condition. In New Orleans Dr. R. A. Katz, after heroic experiments on himself, tried injecting ether into the patient's veins to increase circulation of the blood.

Drs. Wirtschafter and Widmann tried this ether treatment. They found it helped some patients but not all, and caused complications which made it necessary to discontinue the ether injections. Studies they made of the patients getting the ether treatment, however, suggested that it increased circulation by causing a release of histamine in the body.

This gave them the idea of trying the vitamin C-histidine reaction to produce histamine.

The results, with patients relieved of pain in a few hours and gangrene beginning to clear up in a day or two, make the method worthy of further investigation, they believe. They are going to try it for a number of serious diseases in which blood circulation is impaired.

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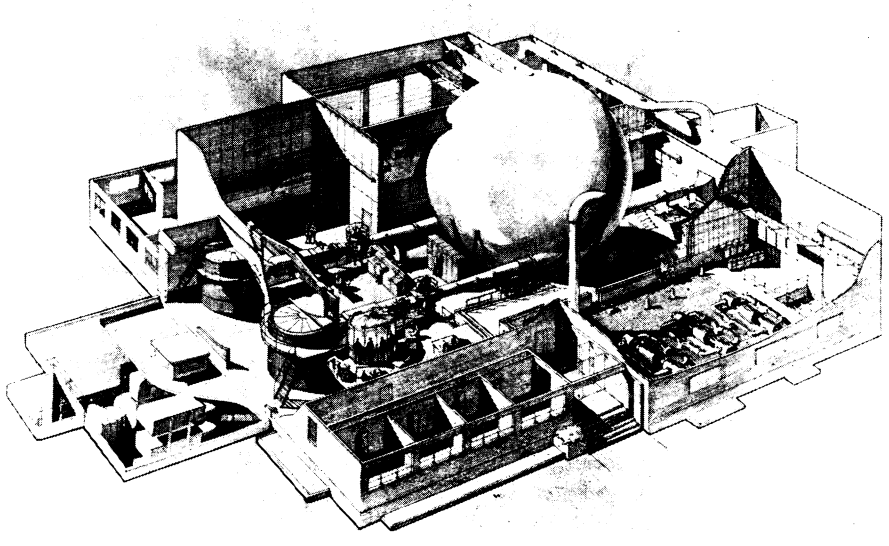

WIND TUNNELS—Original supersonic wind tunnels captured at Kochel, Germany, will be reinstalled in this special building of the new Naval Ordnance Laboratory, now under construction at White Oak, Md.