GENERAL SCIENCE

The Scientist in the World Today

The Science Talent Institute was the occasion for reflections on the role of the scientist in the world today as well as a time for seeing laboratories and scientists.

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Excerpts from an address given at the awards banquet of the Eighteenth Annual Science Talent Search, in Washington, D. C., March 2.

Reflecting on the circumstances that brought you to the Capital, to be honored for what you have done in competition with your gifted contemporaries, and to be applauded and encouraged by your elders for having chosen science as a career, I was reminded of Max Planck's bitter commentary on the state of science in an earlier day. "New scientific truth," the famous physicist complained, "does not triumph by converting its opponents and making them see the light. It triumphs because its opponents eventually die."

It is no longer thus. Enveloping science today is a prestige unmatched by that attaching to any other profession. One distinguished scientist stands foremost among the President's advisers, to counsel him on the vast national program upon which rest our security and our technical progress. Another sits as a member, co-equal with his confreres, of the Atomic Energy Commission with which I am associated. Other scientists sit in the councils of the civilian secretaries and at the elbows of the generals and admirals who together guide our defense programs. Science is penetrating ever more deeply into industry, in all of its more revolutionary manifestations. The voice of the scientist everywhere commands respect and widening authority.

In electing science and engineering as a life pursuit, you have wisely entrusted your fate to a lifting wave. May all good fortune attend you, for your country stands in urgent need of the talents which you embody. I propose, too, to extend my congratulations to SCIENCE SERVICE and the Westinghouse Electric Corporation for their wisdom in seeking out and giving a helping hand to boys and girls with your precious talents. In recent years, and especially since the Soviet Sputniks, we have heard much about the so-called "crisis" in the scientific side of our educational system. It is to the everlasting credit of SCIENCE SERVICE and Westinghouse that they in partnership have for nearly two decades in this tangible and constructive way built solidly against the occurrence of such a crisis.

It has been said that youth is much too good to be wasted on the young. That cynicism of middle age may not, however, apply to those endowed with a scientific turn of mind. Whatever else it may be, science is venturesome; and while the scientist is expected in the nature of his discipline to be humble in the presence of truth, he is seldom humble in its pursuit. The finest work of many of the world's outstanding theoretical physicists, we are told, was done before they were thirty. I am not suggesting that any of you need burn yourselves out so soon, but rather that you have chosen a field where the gifts of youth—its courage and drive, and its imagination—are more swiftly appreciated than may be the case elsewhere.

Give thought to what awaits you. In my youth, the moon in its heavenly firmament represented something that was remote and utterly unapproachable. Now, technicians not much older than yourselves are shooting rockets at it. I was still a boy when, after demonstrations of courage and endurance that seemed at the time to exemplify the farthest reaches of the human spirit, the Poles at the opposite ends of the earth were gained by small parties of men, thrusting forward with dogs, sledges, and ponies. Now, your contemporaries and mine are reaching into space, as confidently as if it were scarcely farther away than tomorrow. They are pondering the strange signals emanating from the outermost galaxies. They are experimenting with machines which, before long, I am sure, will enable man to touch the stars. Your generation could well be the one that will usher in another of the mighty climaxes in the human experience—the discovery of worlds and systems beyond our own.

The stars beckon. Let us not forget, however, that this tired, old planet that we call the earth will continue to stand in need of constant thoughtful attention. You will not lack here when your time comes, for opportunities that will put a high premium on audacity and imagination. Our cities and countryside groan under the weight of traffic that may eventually choke our growth, unless our engineers come up with automatic systems for regulating it. Our air is becoming crowded; the task of controlling the future, vast flow of air traffic, in the interest of safe and orderly movement, will call for inventions and techniques which now at best are only dimly surmised. Hunger and disease plague many parts of the world. Too much of mankind is condemned to dull, dispirited toil. To improve the lot of many by banishing hunger, easing pain, and mitigating toil, while broadening their store of knowledge, are opportunities and, it seems to me, duties that must hold your minds and hearts for the rest of your days. . . .

In a field as broad and new as nuclear energy, the line between basic and applied research is of necessity often a dim and wandering line. For example, in the course of seeking a more efficient reactor fuel element—in itself a utilitarian goal—we stand a good chance of coming up with a new finding in the fundamental properties of matter. . . .

I emphasize this agreeable co-existence of applied and basic research under the Atomic Energy Commission's roof for the reason that some of you may, as I would hope, be attracted to this field. The research projects which we sponsor at many universities make use of graduate students as research assistants. The Atomic Energy Commission also offers certain specialized training courses at the graduate level, and you may be drawn to them. Beyond that, our laboratories have need for scientists in many disciplines. Let me hasten to add, however, that I am not trying to place a recruiting blank into your hands. You will do well, I am sure, wherever your bent may lead you. My only purpose in advertising the attractions of nuclear science is to suggest the excitements of discovery, the breadth of learning, that it offers to an active scientific mind. . . .

The ever-expanding regions of knowledge make it impossible for even the most learned mind to grasp more than a fraction of what is significant. At the same time, the pressure for specialization tends to make a specialist hermetic and, perhaps, too well satisfied within the bleak limitations of his specialty. The life of the fully developed man, the truly cultured man and woman, is characterized by an articulation of knowledge linking the physical sciences with the humanities and the social sciences.

I leave with you Dr. Conant's definition of the meaning of an education:

"Our purpose is to cultivate in the largest number of our future citizens an appreciation both of the responsibilities and the benefits which come to them because they are American and free."

Five Days of Science

➤ THE 40 Science Talent Search Winners visited scientists and laboratories throughout the Washington, D. C., area, their visit ending with the banquet at which Chairman McCone addressed them.

Probably one of the most memorable visits was one with a non-scientist, the President of the United States.

President Eisenhower said it would be a good idea if an award equivalent to a football letter could be given outstanding science students in school.

Such advertising for scholarship in science might encourage more of America's boys and girls to study science diligently, and perhaps pursue scientific careers.

He said the award could be a special pin, perhaps similar to one presented him by 17-year-old John Letcher Jr., Lexington, Va. John, a cadet officer at The Baylor School, Chattanooga, Tenn., was later revealed as the top prize winner.

John was elected by the group to present the pin to President Eisenhower during a reception in the White House.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the President with the 40 young scientists-to-be.

Anti-Cancer Compounds

➤ SOME 70 compounds which have shown anti-tumor activity in laboratory animals are being evaluated in human patients. This is the result of a nationwide program in which about 40,000 chemical materials a year are being screened for anti-tumor activity.

Such is one of the directions cancer research has taken in recent years, Dr. Carl G. Baker, assistant director of the National Cancer Institute, told the Science Talent Institute.

One out of three cancer patients are being cured today compared with one out of ten 30 years ago. Improvements in cancer treatment are outgrowths of research, Dr. Baker said.

He pointed to recent advances in biochemistry, virology, genetics, tissue culture, immunology and biophysics as having provided powerful tools for study of the relationship of viruses and cancer. If such a relationship can be positively demonstrated, he said, it might lead to eventual production of a vaccine against human cancers.

Saturn's Rings

➤ SATURN'S RINGS are made of ice chunks, the nation's 40 top young scientists, winners of the Science Talent Search, learned.

Dr. Harlow Shapley, former director of Harvard College Observatory, said that studies of sunlight reflected from the rings showed their composition was very similar to that of the polar caps on Mars. Dr. Gerard P. Kuiper of Yerkes Observatory, Williams Bay, Wis., who made the observations, therefore concluded that Saturn's rings were probably composed of frosty ice.

Concerning other new information on the planets, stars and galaxies, Dr. Shapley said a most important event was the added confirmation of the theory of an expanding universe as shown by radio waves.

Drs. A. E. Lilley, now at Yale Observatory, and Dr. E. F. McLain of the Naval Research Laboratory, Washington, for the first time detected red shifts in the radio spectrum of distant galaxies. They found the speed of recession of a pair of galaxies in Cygnus the same as measured by radio wavelengths as by optical measures, about 10,000 miles per second.

Dr. Arthur E. Ruark, chief of the Atomic Energy Commission's controlled thermonuclear branch, outlined some of the many methods now being tried to tame the awesome fury of hydrogen bombs for peaceful power purposes. The experimental work is concerned with very dilute and very hot gas, confined by magnetic fields. Such a gas is called a plasma, he told the young scientists.

Dr. Ruark said the aim is to bring the plasma to the so-called ignition temperature, some 100,000,000 degrees or more, and keep it there for a sufficient time for the nuclei to fuse, releasing excess energy to produce economic power.