GENERAL SCIENCE

The Burden of Expectation

Upon the successful young scientist rests the obligation of further accomplishments. With power, there should be humility and awareness of the heritage of hard-won knowledge.

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Excerpts from address given at the banquet of the 21st National Science Talent Search, March 5, at which scholarships and awards were given the 40 winners.

➤ ACCOMPLISHMENTS and rewarding honors such as yours carry the burden of expectation. The laurel wreath has in it the prickly reminder that more is expected of the wearer.

That was the theme of a recent cartoon of three cave men clothed in skins. One sulks depressed in a corner while the others are discussing him. Says the second to the third: "I admit he discovered fire, but what has he done since then?"

Much will be expected from you, for most is expected from those who have shown that they have ability to achieve more than the average. That is as it should be, for the greatest reward of achievement is the opportunity to go further in the achievement of our ambitions.

These awards are expressions of faith in you as individuals. But you are more than individuals to many of us here who have not had the privilege of meeting you. To us you represent countless young men and women in whom we see our own fulfillment and the continuing vitality of our nation.

I risk that platitudinous sentence which might have come from a commencement address because I mean it deeply and I think it timely.

In a recent review of Barbara Ward's "The Rich Nations and the Poor Nations," a university authority on modern American culture said:

"Every generation of thoughtful Americans has had its own dominant mood. In the middle 1800's it was one of enormous zest in the building of a great industrial nation. . . . Today, more and more the mood appears to be a kind of bewildered torpor, a torpor (or suspended animation) akin to funk (or fear)."

As I read that often repeated diagnosis of national lethargy of spirit, I first thought of a youth in 1849 who left a stony, hill-top farm and the Freshman class of Union College to sail around Cape Horn, dig gold and help to found the Golden State. He was only one of countless young men and women who have aroused that "enormous zest" which has vitalized our nation. You are the inheritors of that spirit of curiosity and adventure and scorn of security.

My second thought was of Col. John Glenn and of the thousands of scientists and engineers who enabled Glenn to orbit the earth. That achievement revealed a native spirit that I would not describe as "bewildered torpor."

And why? It is, I think because there is deeply rooted in the human spirit a desire to explore and to know the unknown and to achieve something that is respected by the society in which we live. Striving for the fulfillment of that desire gives a nation purpose and makes it vigorous and vital.

In the editorial words of the Washington Post, the achievement of Col. Glenn and his colleagues lifted our spirits above "the petty struggle for private place or public power." That is in the traditional spirit of scientific endeavor and so the Post went on to quote Francis Bacon, spiritual father of the Royal Society of London for the Promotion of Natural Knowledge, who said:

"Ambitions are of three types. The first is of those who desire to extend their own power in their native country, which kind is vulgar and degenerate. The second is of those who labor to extend the power of their country and its domination among men. This certainly has more dignity, though not less covetousness. But if a man endeavor to establish and extend the power and dominion of the human race over the universe, his ambition (if ambition it can be called) is without doubt both a more wholesome thing—and a more noble—than the other two."

You are fortunate in having chosen a career that will give you the great personal pleasure of discovering and creating something no one has ever known or done before while you are at the same time benefitting other people and your country.

On a recent trip to Brazil I discussed with those warmhearted friends of ours the development of science in their great country. Everywhere I found a new culture abuilding and the eager use of scientific knowledge for the creation of industries with which to satisfy the material wants of aspiring people. Everywhere I heard scientists decry the lack of adequate support for scientific education and research that scientists recognize as the only solid foundation on which to develop their country.

I fell into their mood of discouragement as I sat in my room on the Copacabana Beach and looked out at the sea rolling in to the beautiful shore on which happy people were. I doubted that many of them wondered and then thought of why it is the waves recur or whence cometh the energy that carries the bather onto the shore where the force of the waves is spent.

I shared my scientific friends' impatience as I saw the fabulous capital city of Brasilia rising out of the plain. I must believe with them that few Brazilians wonder whence came the material means and technical knowledge for them to achieve that spectacular ambition.

As my friends and I discussed the abolition of physical slavery in their country and in ours, a century ago, we thought of the countless people throughout this aspiring world who are now slaves to ignorance of the laws of nature. Pitiful they are because they are denied, or deny themselves, the understanding which is one of God's greatest gifts to man. Potentially dangerous they are, for they have vast power for good or evil over themselves, their fellows, and their descendants who must live upon the earth they despoil or enrich.

I hope a scientist may be forgiven for occasionally writing such paragraphs in which he looks with jaundiced eye at the lack of scientific interest among his nonscientific fellows. My faith in the will of Everyman to understand was soon revived when I landed in that blend of beauty and science which is Idlewild after flying from Rio to New York in nine short hours.

In the dawn there came to me vivid memories of our adventurous pioneering ancestors. How differently they approached our shores, not so many years ago, and moved across their new-found land on foot or by ox-drawn cart.

In the jet-powered dawn, I realized that if the spirit of science had not been a natural attribute of Everyman, this great nation would not have been built; we should not now have our vast capacity for building an even better way of life.

I recalled a passage from John Livingston Lowes in his "The Road to Xanadu" which I will modify but little:

"The imagination is not a bright but ineffectual faculty with which in some esoteric fashion scientists, poets and their kind are especially endowed. It is of the utmost moment that we recognize the essential oneness of its function and its ways with all the creative endeavors through which human brains, with dogged persistence, strive to discover and realize order in nature."

Thus, in the words of Francis Bacon: "The bounds of human empire are enlarged, to the effecting of all things possible."

Science has increased the years between the birth and death of many people throughout the world. But we should ask ourselves whether more scientific knowledge could not be used more wisely to enrich the lives that are lived over the longer span of years. Man's scientific achievements have made possible more than mere survival.

This leads me to consider some of the biological aspects of science which are often overlooked in this materialistic age.

During the course of centuries, man evolved gradually in an environment which changed slowly except in times of catastrophe. This is no longer true. By the use of scientific knowledge, men can now alter their surroundings rapidly and radically.

They can move quickly from environments in which man has lived for countless centuries into environments in which man has never lived before. Man can make his environment what he will.

Our early ancestor gradually moved from caves to rude huts to cold houses of rough hewn stone. For countless centuries he warmed himself before open fires. The building industry has not been the most notable example of the application of science in the satisfaction of human desires, but within a century man has learned to build for himself towering structures in which he is surrounded by the humidity and temperature and light he chooses.

Throughout recorded history and until a century ago, men moved on their own legs. They gradually learned to travel a little faster and more easily by harnessing animals to carts on skids or wheels; boats were ultimately propelled by the force of wind on sails. In the short space of a century and a half, man has increased his speed of travel from no more than he could run to greater than the velocity of sound.

The leap of the imagination from the fall of an apple in the garden at Woolsthorpe to an architectonic concept, cosmic in its scope and grandeur, is one of the dramatic moments in the history of human thought.

There are times when the boundaries of human experience, always narrow, and fluctuating but little between age and age, suddenly widen themselves, and the spirit of man leaps forward to possess and explore its new domain. Those are the great ages of the world: The age of Pericles in Athens; the age when Europe passed, spiritually and artistically, from what we call the dark to what we call the Middle Ages; the Renaissance; the period of the French Revolution. The present period in which man is now possessed of new forces, new extensions of his senses, new mental powers with which to seek knowledge and shape the pattern and environment of his life could be another of the great ages of the world—or the catastrophic last.

In your chosen career you will acquire great power that knowledge of nature gives. But with power should go humility, humility in the awareness of our heritage of hard-won knowledge. Recall, I suggest, the desirable and widely admired modesty of Col. Glenn who recognized that what he did was made possible by many others. We who know the narrow limits of man's knowledge know that man's authority is a frail thing in the face of natural forces.

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GENERAL SCIENCE

Young Scientists Divided On Atmospheric Tests

➤ THE NATION'S top young scientists, winners of the National Science Talent Search assembled in Washington, were about evenly divided as to whether scientists should favor atomic testing in the atmosphere.

In a poll taken by SCIENCE SERVICE of the 40 young winners from all parts of the country, 20 opposed the step, 19 favored atmosphere testing with eight of these agreeing only if military necessity demands. One young scientist felt that scientists should not take a specific attitude toward nuclear testing.

Typical comments, in opposition, were:

All atomic testing in the atmosphere should be stopped until more is known about its effects on man.—Lewis Haberly, 17, Severance, N. Y.

The testing and buildup of weapons will never bring about peace, but can only prepare us for war.—Robert E. Strom, 15, New York City.

I do not think we can afford to stop atomic testing, but I do think we can afford to stop doing so in the atmosphere.—Jack Morava, 17, Mercedes, Texas.

In favor of atmospheric testing:

Our national security rests on our supremacy in the field of nuclear weapons.—Donna Gene Hayes, 18, Toledo, Ohio.

Atomic tests have not been shown to be significantly more dangerous than the other common health hazards, particularly war.—Robert L. Walton, 17, Cincinnati, Ohio.

Scientists should favor atomic testing in the atmosphere only if such testing is absolutely necessary in maintaining the security of the Nation and the free world.—Mitchell J. Fruitstone, 17, Coral Gables, Fla.

Not voting was Raphael W. Zahler, 16, Little Neck, N. Y., who said:

"Saying that scientists should take a specific attitude toward nuclear testing and building fallout shelters is just like saying that people five feet eight inches tall should take a specific attitude toward these issues. My feeling is that scientists as a group will act together only on issues having to do with science. On political questions, scientists are just other human beings.

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Forty Winners Visit President at White House

See Front Cover

➤ "WE EXPECT great things of you," President Kennedy told the Science Talent Search winners when they visited him at the White House.

This country feels the necessity of developing "people competent in science and technology," the President said. He told the winners that he hoped that the success of the Science Talent Search winners "would encourage others to follow in their paths."

He told the young scientists that he had looked at the examination that they took to compete in the Science Talent Search and, with a broad smile, added: "I don't know anyone in Washington who could pass, particularly in the White House."

The President predicted that our life is going to be changed with the space age.

After greeting the winners, President Kennedy arranged for them a special tour through the redecorated reception rooms of the White House.

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