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SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Talent Search Winners

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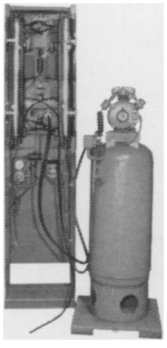
A SCIENCE SERVICE PUBLICATION

"Check your air, Sir?"



Air compressor and tank are at right. Long cylinders on rack dry air before it enters cables.

He's checking the air pressure in a branch cable, one of scores serving a town. The readings along the cable are plotted as a graph to find low-pressure points which indicate a break in the protecting sheath.

Master meters keep watch over the various cable networks which leave a telephone office in all directions to serve a community. Air enters the system at 7 pounds pressure, but may drop to 2 pounds in outermost sections—still enough to keep dampness out.

To keep voices traveling strongly through telephone cables, you have to keep water *out*. This calls for speed in locating and repairing cable sheath leaks — a hard job where cable networks fork and branch to serve every neighborhood and street.

At Bell Telephone Laboratories, a team of mechanical and electrical engineers devised a way to fill a complex cable system with dry air under continuous pressure. Pressure readings at selected points detect cracks or holes, however small. Repairman can reach the spot before service is impaired.

It's another example of how Bell Laboratories works out ways to keep your telephone service reliable — and to keep down the cost to you.

BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in mechanical engineering

What GENERAL ELECTRIC People Are Saying

E. S. LEE

Public Relations Division

RECOGNIZE THE ENGINEER: In engineering, the product's the thing. It is the product around which everything moves and toward which everything is directed. The scientist brings forth new knowledge from nature; the engineer forms that knowledge into products for people to have and to use. The engineer may improve present products or create new ones.

This is what makes engineering universal; this is why engineers are in the forefront of every advance.

Yet the man who uses the products does so without thinking of the engineer who produced them. Little does the user know who created the idea in the first place, how it got into its present form, who will make it even better in the days to come, or how it is produced in ever-greater quantities through the design of even-better production tools. All he knows is this: he has the product and it gives him satisfaction. The engineer is not spontaneously recognized.

The engineer has been so busy doing things that he has not brought his story to the people of our country. Therefore they do not recognize the importance of his story, and thus far his recognition has been a problem for him alone. But today the seriousness of our world situation has taken the problem out of his hands. It is now a problem for the nation—engineers must be conserved for engineering, and their numbers must be increased.

This demands an earlier understanding of the engineer by the public at large. It demands that he receive the recognition due him in substantial degree. It demands that military assignments be made only for necessity in technical matters. It demands that secondary-school curriculums be complete with the necessary physics and chemistry and mathematics to provide the best training for those entering engineering schools. And it demands that those young people capable of advancing in engineering be eager to tackle the hard work which the training requires.

There is an imperative need for this understanding if our nation is to advance its present world position. The creative ability of the engineer is meeting its greatest challenge. But now the engineer must create another new product: a universal and spontaneous recognition of the engineering profession.

General Electric Review

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S. P. NEWBERRY

General Engineering Laboratory

In the early excitement of the electron microscope, research workers joined in a mad rush to obtain higher and higher magnification pictures. Nearly five years elapsed before it became generally recognized that magnifications of 10 to 100 thousand times were far too great to correlate results with previous magnifications, usually less than one thousand times.

A practical idea of the difference in magnification can be gained by considering the $\frac{1}{8}$-inch, 200-mesh specimen grid of the electron microscope. At 1000 times magnification its image is 10 feet across, and a single mesh opening is approximately 2″ square. Now at 100 thousand times magnification the screen is more than $\frac{1}{5}$-mile across and the individual mesh opening is over 17 feet. An 8″ x 10″ picture obtained at 100 thousand times represents a sampling of only .2% of the area of a mesh opening and only 2/100,000% of the tiny $\frac{1}{8}$″ specimen we started out to explore. Experience has taught us that we must increase magnification in gradual steps of about 3X per step if we are to form a definite conclusion of how the minute structures are correlated with the over-all structure. Indeed, when we change methods of viewing or methods of specimen preparation, it is often necessary to compare pictures at the same magnification, actually superimposing identical fields of view, so we may maintain continuity with past knowledge.

After finding out that the highest magnification is not always the best, the electron microscopist has another important lesson to learn. He must realize that he cannot live in an "ivory tower," solving problems by crystal gazing in his microscope. He must work with the people who have the problems in the shop. He must help them to choose and prepare samples, and they must help him interpret what he photographs. He should encourage the use of other equipment to support or check his own findings. The electron microscope adds the very important element of vision to problems which depend upon the ultrafine structure of matter, but it does not give all the answers by itself.

7th National I.S.A. Meeting
Cleveland, Ohio

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G. A. MAYORAL

Electronics Division

THE FUTURE OF TELEVISION: UHF television—which is essentially television in a new segment of the radio spectrum—presents a challenging opportunity to American ingenuity both in engineering development and from the standpoint of programming, education, and commercial enterprise. No longer will telecasting be limited by unavailability of frequencies, but the limit on the number of TV stations will rather be placed on the ability of the broadcaster to obtain his fair share of the audience. UHF TV makes possible a truly competitive system of telecasting in accordance with American democratic principles. It will some day blanket the country with reliable television signals from thousands of television towers.

G-E Educational Service News