

amplified hundreds of thousands of times. Besides the increased sensitivity of the instrument over present equipment, the device has the advantage that extraneous noises, such as the handle striking solid objects, are largely eliminated.

The Penn State researchers, who ordinarily do work for the U. S. Navy,

are now working on a similar device to detect kidney stones.

The college will place the gallstone detector on the open market, passing up patent claims, Dr. Walker said, so that it may be made available to the greatest number of people needing this medical aid.

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#### CHEMISTRY

## Cotton Gets New Qualities

**New chemical processes make treated cotton soak up more water, give it greater rot resistance, and increase the range of dyes it is able to absorb.**

► CHEMISTS are teaching cotton new tricks:

It can soak up more water.

It has greater rot resistance.

It can take a wider range of dyes.

The rapidity with which cotton cloth soaks up water is increased through a new chemical treatment. This suggests its possible use on toweling and similar materials, according to the annual report, just issued, of the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry. The treatment consists of tacking onto the cellulose molecule a group of atoms related to ordinary wood alcohol, called carboxymethyl.

A new type of cotton fabric, known as aminized cotton, is produced by a chemical finishing process recently developed at the Southern Regional Laboratory. This cotton, unlike ordinary cotton, has the ability to take acid wool dyes readily.

The process, which greatly increases the range of usable dyes, consists of allowing 2-aminoethylsulfuric acid to react with the cellulose of the fabric in a strongly

alkaline solution, whereby amino groups are chemically combined with the cellulose. It is simpler and less expensive than other procedures proposed for the same purpose.

The introduction of amino groups permits the addition of metallic elements to give rot resistance or the introduction of organic groups to give water repellency or other new qualities to cotton for specific uses, states Dr. G. E. Hilbert, chief of the Bureau.

The partial acetylation process, developed at the Bureau, is now in limited commercial use. It is the best method so far discovered for making cotton virtually rotproof and mildewproof.

Weather resistance for awnings, tents, shade cloth and seedbed covers was increased by a resin-pigment treatment. Samples of cotton duck treated with urea-formaldehyde resin in combination with lead chromate showed less than five percent loss of strength after a year's exposure to weather, compared to a loss of about 50% by untreated fabrics, the Bureau found.

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are for television.

Certain trends in radio broadcasting are indicated by the type for which operation licenses were sought. During the first half of 1948, there was a sudden surge in television applications, and a leveling off of FM requests.

Noncommercial education broadcast stations increased from 38 to 46, and television experimental stations jumped from 81 to 124. The broadcast year was marked by authorization of facsimile, which was scheduled for commercial operation over FM stations.

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#### CHEMISTRY

## University Grants to Aid Research in Chemistry

► A \$100,000-program to aid in "stockpiling basic knowledge" of chemistry was announced by the Du Pont Company in Wilmington, Del.

Grants-in-aid of \$10,000 to 10 universities are being made in the new program for the academic year 1949-50. Non-commercial research projects which will be selected by the universities will be aided by the funds.

Institutions receiving the grants are: California Institute of Technology; Cornell University; Harvard University; Massachusetts Institute of Technology; Ohio State University; Princeton University; Yale University; and the Universities of Illinois, Minnesota and Wisconsin.

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#### ENGINEERING

## Fluorescent Lamps Light Brooklyn-Battery Tunnel

► THE Brooklyn-Battery tunnel, now being constructed to connect Brooklyn with New York proper with a highway under the harbor, will be lighted by four two-mile-long continuous ribbons of fluorescent light, it was revealed by General Electric which will install the system.

The tunnel is being constructed with two tubes, each with two traffic lanes. Each tube will be lighted by twin rows of white fluorescent lamps. A total of 5,776 individual lamps, each six feet long, will be employed. They will be housed in clear pyrex glass tubes near the tops of the side-walls.

A unique feature of the lighting system is an automatic system that will turn on a higher intensity of light in the portal sections of the tunnel during bright daylight hours. This will promote safety for motorists driving from bright sunlight into the tubes at normal traffic speeds, by allowing the drivers' eyes to become gradually accustomed to the lower light level inside.

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#### RADIO

## Frequency Bands Crowded

► SQUEEZING new stations into already congested radio frequency bands to accommodate rapidly developing services has caused many headaches in the Federal Communications Commission during the past year, its annual report just issued seems to indicate. The report covers the fiscal year ended June 30, 1948.

Until methods and equipment are available to use higher portions of the spectrum, present frequencies must be employed more effectively, it says. During the year the Commission, in cooperation with industry, was engaged in reviewing and revamping existing radio service, and making studies looking forward to additional adjustments.

The general public is familiar with broadcasting because it enters the home. But it has little acquaintance with more than 50

other classes of radio stations, equally important in providing more than a hundred nonbroadcast services.

These nonbroadcast stations include safety and special radio services, devoted largely to safeguarding life and property on the land, sea or in the air. They include utilization of radio for industrial and business purposes, mobile stations for use in highway and other traffic, and radio stations in the aviation field which provide all sorts of services to aid air navigation.

Broadcast authorizations increased 400 over the previous year, bringing the total number of stations to nearly 4,000. Of this figure, 3,163 are major broadcast outlets. Of these, 2,034 are the long-used amplitude modulation (AM) type, 1,020 are the newer frequency modulation (FM) kind, and 109