

ELECTRONICS

New Cathode Ray Tube

Electronic tube using an electro-optic crystal may lead to color television based on different system of operation than present telecasts.

➤ A NEW cathode-ray tube that may lead to color television based on a different system of operation than that of present color telecasts is now being tested.

A cathode-ray tube is the heart of a television set, and this one, though in early development stage, makes a new color TV system appear promising.

One major obstacle needs to be overcome before work on the tube could be turned over to commercial production men. A crystal that will stand up under continuous operation must be found.

If and when the new tube is available it might be used to replace the cathode-ray tubes in present sets. The color television system would be similar to the recently FCC-approved CBS system, with the added advantage that picture size would not be limited by the color wheel size.

Physicists at the Naval Research Laboratory of the Office of Naval Research in Washington have proved that the new tube will work. But the crystal they use has a short life unless the vacuum tube in which it operates is continuously pumped out to maintain the vacuum.

"It looks now as if it will be possible to solve the crystal problem," Elias Burstein, physicist at the Laboratory, told SCIENCE SERVICE. "We expect that one way to get the crystal to stand up will be to coat the crystal we are now using with a suitable material. Then it would not be necessary to pump out the vacuum tube continuously as we must do now."

Major television companies, RCA, duMont and CBS, as well as Westinghouse, have shown interest in the project.

A light source, lenses which project the light through the tube, and light polarizers are the main parts of the new tube. The usual phosphor target is replaced by an electro-optic crystal.

An electro-optic crystal has a differing effect on polarized light, depending on whether or not an electrical field is present and on the magnitude of the electrical field. The electron beam controls the electrical field across the crystal and thus the amount of light transmitted by the tube.

The target surface of the tube is roughly one square inch. Magnification to viewing size is by a lens system, so a small color

wheel can easily be placed in the light's path. Since the size of the color wheel is independent of the image size, the lens-color system could be adapted to any suitable screen.

Drs. James W. Davisson and Paul L. Smith, and John E. Dehnel are collaborating with Mr. Burstein on the development of the new tube at the Laboratory.

Target elements used successfully to date are ammonium dihydrogen phosphate, potassium di-hydrogen phosphate and potassium di-hydrogen arsenate. These crystals are now widely used for pick-ups in phonograph players.

Science News Letter, July 7, 1951

ENTOMOLOGY

Balance Better, That's Why Insects Have Six Legs

➤ THE SEVERAL million species of the world's insects, with few exceptions, have three pairs of legs. Nature evolved the six-legged insects from many-legged ancestors because walking on two pairs of legs is not efficient for a small animal encased in an external skeleton, even though mammals get along well on four legs and man walks on two.

Dr. Urless N. Lanham, zoologist at the University of Michigan in Ann Arbor, explains this new theory of why insects have six legs by observing that the insect walks by lifting two legs on one side and the middle leg on the other. These are swept forward simultaneously and lowered together, completing a single step. The three legs on the ground furnish a tripod support while the step is taken. This maintains balance in the small creature.

A large animal walking on four or two legs has a comparatively longer time to maintain balance.

Dr. Lanham has published his new theory. (SCIENCE, JUNE 8).

Science News Letter, July 7, 1951

PHYSICS

Can Always Find Auroras In Alaskan Night Sky

➤ THERE IS always auroral display in the night sky of College, Alaska, even when ordinary observation with the unaided eyes fails to reveal such northern lights.

An instrumental survey of the heavens each night since last November shows that characteristic auroral emissions can be spotted with spectroscopic cameras and can be photographed even on moon light and cloudy nights.

The survey made by the University of Alaska was reported to the American Physical Society, Vancouver, B. C., by Dr. L. Herman of the University of Paris and Dr. H. Leinbach of the University of Alaska.

Science News Letter, July 7, 1951



TRAVELING WORKSHOP—Teachers from various schools in Texas are pioneering in an educational program, the *Traveling Workshop*, of the Texas State College for Women at Denton, Texas. They will travel 3,400 miles this summer studying industries in 17 states. Here they inspect four kinds of tobacco at American Tobacco Company's Research Laboratories in Richmond, Virginia.