

OPTICS

Axicon Optical Devices

➤ A NEW KIND OF OPTICS that now makes possible devices useful for aligning industrial machinery was described at the Optical Society of America meeting in New York.

Axicon, which means axis image, is the name applied to the new class of optical elements. Axicons form images only of small bright sources such as lamp filaments or brightly lit pinholes.

They do not have a definite focal length, Dr. John H. McLeod of Eastman Kodak Company, Rochester, N. Y., said, so they do not need to be focused. An ordinary

lens forms an image of a distant point source at a point in the focal plane, which must be focused exactly.

An axicon image of a point source is not a point but a continuous line of points stretching from close to the axicon out into space.

This line, as straight as a ruler's edge, is so precise it can be used to line up industrial equipment, in one case with an accuracy better than half a thousandth of an inch, or less than a fifth the thickness of a newspaper page.

The most useful axicon so far discovered,

Dr. McLeod said, is a very flat glass cone with its tip in the center of a glass disc.

He noted that other forms of axicons have been known. A small bubble floating on the water's surface in a washbasin forms an axicon image of an overhead light in the bottom of the basin.

Axicons are of no use as camera lenses, Dr. McLeod emphasized. One possible development he foresees is a servo system to guide machine tools by photoelectric means along a highly precise axicon line.

Dr. McLeod first reported discovery of the class of optics in 1954.

Science News Letter, April 20, 1957

BIOCHEMISTRY

Barbital Quadruples Streptomycin Production

➤ BARBITURATE sleep-producing drugs added to the synthetic food for the streptomycin-producing microorganism has quadrupled the production of streptomycin, H. T. Huang and J. W. Davisson of Chas. Pfizer and Co., Brooklyn, N. Y., reported to the American Chemical Society meeting in Miami. The late J. H. Ferguson was on the research team.

The barbital used does not seem to produce its effect as a hypnotic, and it does not act as a precursor or as a coenzyme. The drug known as barbital and related compounds produce the effect of increased growth.

Science News Letter, April 20, 1957

ENGINEERING

Powerful Searchlight To Spot Enemy Subs

➤ A SEARCHLIGHT that can put enemy submarines or movie stars in a spotlight equivalent to 10,000 automobile headlights was unveiled in Garden City, N. Y.

Primarily a new weapon for airborne submarine detection, the carbon arc searchlight has promising civilian use. The searchlight, tabbed AN-AVQ-3 by the military, has a candlepower of 130,000,000. It is designed to be airplane-mounted and will burn for a long time. Older types of searchlights now in use for spotting submarines on the surface of the water can burn for only 30 seconds at a time, and have a candlepower of 70,000,000.

The new searchlight can also be used for air-sea rescue work, lighting runways, locating persons in disaster areas at night, and for television and movie-making.

A development of the Arma Division of the American Bosch Arma Corporation in Garden City, the carbon arc searchlight employs several new electronic techniques, including a new transistor-magnetic amplifier and new applications of film reflecting and heat containment. It can also be operated by radar or hand.

Science News Letter, April 20, 1957

The period from about 18 months to four years is the time of most rapid *muscle growth* in relation to total body growth.

TECHNOLOGY

Injections by Spray Gun

➤ ARMY RECRUITS may soon receive their vaccine shots from a spray gun instead of the hypodermic needle, doctors learned from an Army exhibit at the American Academy of Pediatrics meeting in Washington.

The automatic jet injection syringe uses a high-speed spray that takes less than a

until the vaccine bottle sitting on the back of the gun is emptied.

After six years, the automatic injector is in the "advanced stage of development," Lt. Col. Robert B. Lindberg, chief of the department of bacteriology, Walter Reed Army Institute of Research in Washington, said. He hopes that a prototype of the gun will be ready for field tests "in a matter of months."

The major advantages to the Army will be the reduction of time lost by the recruits and a great saving in syringes and needles. The gun can be cocked and reloaded in a matter of four to six seconds and no sterilization is needed between injections. The tip of the injector nozzle does not actually touch the skin.

The jet velocity of the vaccine is 700 feet per second when it comes out of the nozzle and, although not always completely painless, causes less discomfort than a hypodermic needle.

Science News Letter, April 20, 1957

ENTOMOLOGY

Carrier of Wheat Virus Found: A Mite Is Named

➤ THE WHEAT CURL mite has been positively tagged as a carrier of wheat streak-mosaic virus, a disease that has wiped out entire crops of wheat in the Great Plains region, the U. S. Department of Agriculture has reported.

Earlier reports of virus transmission by other insects are cases of mistaken identity, researchers stated. Wheat curl mites, which are small enough to pass through cloth barriers, are often found clinging to insects' legs.

Identification of the wheat curl mite as the only carrier of the disease is a result of a three-year cooperative search involving the Kansas and Nebraska Agriculture Experiment Stations.

Science News Letter, April 20, 1957



SHOTS BY SPRAY GUN—This jet injection syringe may soon replace the hypodermic needle for giving injections to U. S. Army personnel.

second to penetrate the tissue beneath the skin. The hand-held gun is powered by a small hydraulic pump, connected to it by a rubber hose, and can be fired continuously