

Do You Know?

Peach trees need ground limestone plus a complete fertilizer.

Half the total income from *poultry* in America comes from the sale of eggs.

Victory gardens are needed again this year because of the world shortage of food.

Mohammedans consider the *praying mantis* holy, and it a sacrilege to kill one of these insects.

Sterilization of *pruning tools* used by tree surgeons is sometimes necessary; it is now known that canker stain, a deadly fungus disease of the plane tree, is carried on contaminated tools.

A process of making *Prussian blue*, an important pigment in commerce, has been developed in India using ferrous sulfate and potassium ferro-cyanide to obtain ferrous ferrocyanide which is then oxidized by potassium chlorate.

The best method of determining the correct harvest time for *peppermint* is by a laboratory analysis of the oil for its free menthol content, as this may decrease by 30% if the crop is cut too soon or too late.



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PHYSIOLOGY

New Circulation "Map"

Tracers used to study the permeability of gases in living cells of the human body. Blood circulation mapped in experiments with intact human subjects.

➤ A "MAP" of blood circulation and a new theory of the permeability of gases in living cells of the human body have resulted from wartime research by the Aero Medical Unit of the University of California.

The circulation of the blood was mapped in experiments with intact human subjects. Radioactive argon, xenon and krypton, produced in the atom-smashing cyclotron, were used to trace the flow of blood in all tissues of the body.

The experiments verify some theories which have been formulated by scientists but have been largely unproved because, since the time of the ancient Greek, Aristotle, researchers have had no way of studying the circulation without seriously damaging experimental human subjects.

The circulation "map" indicates that there is a large central pool of blood, consisting of about 70% of the body's supply, which circulates rapidly between the heart, kidney, liver, thyroid, lungs and brain. Lying outside this pool, in the extremities and other body parts, is the remaining 30%, which streams in and out of the central pool at a sluggish rate.

Within 15 seconds after it is taken into the body, material becomes well mixed with the fast-moving central pool, but it takes as much as 15 minutes for such material to reach the outlying pool.

Subjects were allowed to breathe radioactive argon, xenon and krypton—all inert, rare gases—through a metabolator. Geiger counters placed over various organs, such as the head, abdomen, legs, hands, arms, fatty areas, and the vital organs, gave a picture of the distribution, rate of accumulation and speed of circulation in all these parts of the body. Circulation in the skin was measured by placing a Geiger counter over the skin between the thumb and index finger. Brain circulation was measured by placing Geiger counters on the head; since the circulation of gas in the bone and other parts of the head is very slow—almost negligible in the early stages—the recordings on head circulation were a measure of brain circulation.

The scientists also determined that the

membrane of body cells apparently offers no barrier to the exchange of gas between cells and the blood. The rate of exchange of gas between cells and the blood depends on the amount of gases the blood brings into contact with the cells; in other words, the efficiency of the circulation system determines the amount of exchange of gases.

Permeability of the cells was determined by measuring the excretion by the whole body of radioactive gases and nitrogen.

In the metabolism of the body gas exchange in cells is of extreme importance. The cells breathe oxygen, nitrogen and other gases just as the body as a whole does. When the circulatory system is unable to carry sufficient gases to the cells of the various parts of the body the cells and the whole body suffer.

The importance of gas exchange in

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aviation medicine prompted the studies. High-altitude sickness, or bends, occurs among persons with poor circulation, while those with efficient systems are relatively resistant because sufficient oxygen is carried to the body cells to rid them of the nitrogen which causes the disease.

The research was performed largely by Dr. Hardin Jones, instructor in medical physics. Dr. John H. Lawrence, director of the Aero Medical Unit, supervised the work, which was sponsored by the Office of Scientific Research and Development.

Science News Letter, May 11, 1946

GENERAL SCIENCE-EDUCATION

25 High School Seniors Honored in Tennessee

➤ TWENTY-FIVE of Tennessee's high school students have been picked in the first Tennessee state-wide Science Talent Search as the most promising "scientists of tomorrow", Dr. Hanor A. Webb, president of the Tennessee Academy of Science, has announced.

The five girls and 20 boys who are winners are eligible for scholarships in Tennessee colleges and universities.

The Tennessee search was run concurrently with the Fifth Annual Science Talent Search for the Westinghouse Science Scholarships, as a cooperative effort with Science Clubs of America, administered by Science Service, Washington, D. C.

"The members of the Tennessee Academy of Science are firmly convinced that youth with an aptitude for science is one of the country's great national resources," Dr. Webb said. "This state-wide Science Talent Search will make it possible for certain Tennessee young scientists to continue their careers in science and will help to remedy the nation's grave deficit of scientists."

Science News Letter, May 11, 1946

≡ GOLD ≡

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CHEMISTRY

Wartime Smoke-Pots Used to Protect Apples

➤ SMOKE-POTS, that formed a protective screen for troops during the war, were used to protect Vermont's apple crop.

Six hundred of the 30-pound smoke-pots were rushed to Bennington County, Vt., to combat below-freezing temperatures that menaced the McIntosh apple orchards.

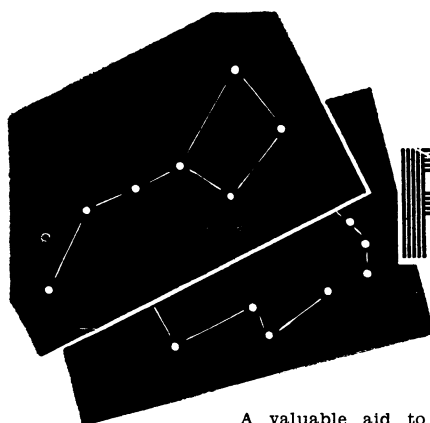
The smoke-pots, burning hexachloroethane, produce a white, non-gritty, sootless and harmless smoke. Each pot

smokes for about 10 minutes. The heat will not raise the temperature appreciably, but it does raise the dew-point enough to prevent frost.

"Operation Smoke-Pot" is being handled by the federal and state agricultural authorities in cooperation with the county agricultural agent of the University of Vermont Extension Service.

Chemical Warfare Service has 52,000 smoke-pots of the 30-pound size and countless others of varying sizes. They were offered to the Surplus Property Division, but the latter agency said the smoke-pots were useless and should be junked.

Science News Letter, May 11, 1946



STAR FINDER

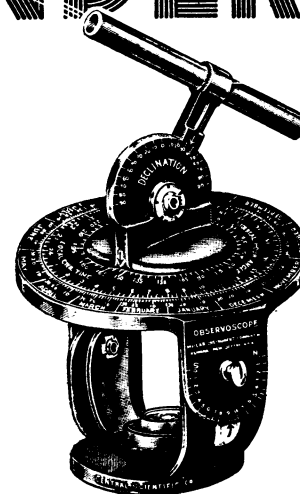
A valuable aid to the student of astronomy or of navigation has been designed to locate celestial bodies quickly and accurately. The Millar Observoscope is made on the same principle as the equatorial mounting of the astronomer's telescope. This precision instrument is constructed of impact-resistant phenolic plastics with declination and latitude scales impressed in the body of the instrument. Impressed also are scales which indicate month, clock and sidereal hour angles.

Use of the instrument helps the student in visualizing the coordinate system and the apparent motion of the stars, while locating instantly the desired star. Intricate and confusing charts become unnecessary. In use, the latitude scale is set to the latitude of the observer and the civil time, opposite the day of the month. The star or constellation to be observed is looked up in the list of 55 stars provided and the sidereal hour angle set and declination indicated. The instrument is then oriented to true north and the star or constellation will be seen in the viewing tube.

The instrument may be mounted on a camera or astronomical tripod or simply placed on its weighted base for accurate observations. It may be used equally well to locate true north, to indicate civil time or latitude if all known settings are made and the sight tube is pointed to a known star. It is designed for use north of the equator. For use south of the equator, a special instrument can be supplied.

Professional astronomers who are accustomed to using complicated devices will be amazed at the accuracy and mechanical simplicity of this device.

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