

may cause enough irritation in the mouth to bring on cancer.

The job of finding cancer while it is still curable by surgery, X-rays or radium must be shared by patients and physicians. There is not now any single diagnostic test for cancer, as there is for diabetes, nor is there likely to be such a test in the future. The condition does not lend itself to such testing, because in the early stages it does not produce any change that would show in the blood. It does give warning signals. The important point is to learn these signals and heed them.

They must be heeded not only by patient but by physician. All doctors should know that early diagnosis of cancer is not made with the eye or the finger but with the microscope. This means that a bit of tissue from the suspected cancer must be cut out for microscopic examination. The procedure can be quickly and safely done, under local anesthetic so there is no pain. The doctor who delivers a baby, in the opinion of one cancer specialist, is responsible for seeing that the mother does not have cancer. This means that he must repair any tears of the uterus that occur and must see that the patient is regularly examined throughout her life to detect the earliest signs of cancer if it should develop.

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## CHEMISTRY

## High Purity Demanded of Cesium for Photocell Use

**C**ESIUM, rare earth that makes the electric eye see, will not work if it contains more than one ounce of impurities in three tons of metal, reports Dr. J. J. Kennedy, of the Maywood Chemical Works, describing the cesium mining and purifying industry to the American Chemical Society.

Mined in the Black Hills of South Dakota, pollucite, the dull and gumlike ore of cesium, worth fifteen dollars a pound, contains from one to 30 per cent. of cesium oxide. Purified by successive stages, and reduced to a metal that burns in air and explodes in water, cesium is used as the sensitive metal in photoelectric cells—the “electric eyes” of industry—and as a “getter” in radio tubes. A radio tube “getter” burns up the last bits of oxygen that the vacuum pump couldn't catch.

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Cottonseed hulls are being used to fill joints between concrete highway slabs.

## ENGINEERING

# Engineers Seek Answer to Question: What Is a Draft?

**What's One Man's Draft May be Nothing to Others; Different Shoetop Climate Gives Most of Us Tough Ankles**

**J**ACK SPRAT, who ate no fat, and his wife who ate no lean have nothing on family arguments which arise over drafts. A draft for one person may not be a draft for another, and so the American Society of Heating and Ventilating Engineers have appointed a research committee to investigate the scientific bases of temperature and air movement which constitute a draft.

The report of F. C. Houghton, Carl Gutberlet and Edward Witkowski, working in the Pittsburgh laboratories of the Society, states:

“Drafts are probably the source of more complaints directed against ventilating and air conditioning systems than any other defect. Notwithstanding this fact, the engineer has no way of evaluating what constitutes a draft other than his own personal feelings. There is even a lack of understanding of just what is meant by a draft.”

The sensation commonly called a draft, explain the scientists, is feeling of local coolness in one part of the body while the rest of the body feels warm. Arguments about drafts arise because it is almost impossible for the average person to tell whether the local sense of coolness is caused by a stream of air (a real draft) or by local contact with air that is cooler than the rest of the air in a room. A person may also get a sense of local coolness because of radiation from the body to a cooler surface, like a cold wall or window. This feeling may be interpreted as a draft.

A draft then is any one, or all, of three conditions: excess movement of normal air, contact with cooler air, or radiation of a part of the body to a cold surface. A draft, while literally a movement of air, has come to mean a local coolness in the body and it is this mixed use of a single word which causes confusion.

To determine what combinations of temperature and air movement constitute a draft the research committee has been using test subjects in the laboratory.

To test a draft on the ankles the sub-

ject sits with his feet in separate cardboard boxes into which pours air of known temperature and humidity. Tiny thermo-couples enable investigators to know, at any time, the temperature of the ankles while the subject marks on a chart his feeling about the “draft.” Or, in another test, the stream of air may be directed at the neck.

Two findings have already been obtained. An air velocity increase of 15 feet per minute usually is equivalent to a drop in temperature of one degree. And the ankles stand a much lower temperature before a feeling of coolness is noted. This latter is explained by the fact that one's feet really dwell in a quite different temperature environment than the rest of the body. In a room where the temperature is 70 degrees at the waistline, the floor—and the feet and ankles—may be subjected to a temperature of 65 degrees.

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## CHEMISTRY

## Fund to Aid Search For New Farm Product Uses

**S**EARCH for industrial uses for farm products will be speeded up through the use of a \$500,000 grant by the Rackham Fund to Michigan State College. This is the first large-scale expenditure for the purpose, outside official appropriations by federal and state governments, and various grants by The Chemical Foundation. A \$2,000,000 appropriation for similar research is now pending in Congress.

In addition to the researches looking to industrial uses, one special objective of investigators at Michigan State College will be to make (if possible out of cornstalks, sawdust, straw, or other farm wastes) some material to be plowed into the soil for its physical improvement, as fertilizers are used for its chemical improvement. The sought-for material, by rendering the soil lighter and more porous, will increase its water-holding power, and thus indirectly make for better control of both floods and erosion.

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