



**TEST RUN FOR JET FUELS**—A test run on the combustor section of a commercial turbo-prop engine being made in the recently opened jet fuels laboratory of The Texas Company at Beacon, N. Y. Charles M. Kubbach, engineer in charge, watches the glowing exhaust pipe that indicates the intense heat generated by burning fuel in the jet combustor, which is the component with the quartz window, left of the exhaust section.

#### MEDICINE

## Cigarette-Cancer Link

► **FURTHER EVIDENCE** that cigarette smoking may lead to lung cancer appeared in a report at the Third National Cancer Conference in Detroit.

Definite pre-cancerous and other possibly pre-cancerous changes in the lung tissues parallel to the degree of cigarette smoking were seen in the lungs of 117 men examined after death.

The report was given by Dr. Oscar Auerbach of the Veterans Administration Hospital at East Orange, N. J.

There are causes other than cigarette smoking for lung cancer, Dr. Auerbach said. He pointed out that uranium and chromate dusts and general air pollution have been incriminated as well as cigarette smoking.

If, however, inhalation is a major factor, he said, one would expect to find certain tissue changes in the remaining non-cancerous lung tissue of patients dead of lung cancer and in patients dying from other causes but similarly exposed to potential cancer-causing inhalants.

The changes are basal cell hyperplasia, stratification and squamous metaplasia, which, although not cancerous in themselves, may really be the staging ground for cancer, and definite early cancerous changes.

These changes are the ones he found run-

ning parallel to the known smoking habits of the 117 men before death. Of the group, 16 were non- or irregular smokers, 20 were light smokers (less than a pack a day) and 47 were men who had smoked more than a pack a day. Of the 117 dead, 34 who were all smokers died of cancer.

In his studies, he removes the entire tracheobronchial tree so as to examine both the windpipe and the rest of the breathing apparatus for abnormal tissue. In cancer victims, such tissue might be found in areas not directly involved in the cancer.

Similar studies of women and children must be made, Dr. Auerbach said, to complete the picture. His next project is to study separately tissue from those who had lived in cities and those who had lived in the country to see what effect urban air might have had on the breathing tissues.

Assisting in the research, which entailed the microscopic examination of some 29,000 slides, were Drs. Jerome B. Forman, James B. Gere, Gerald E. Maehsam, Thomas Petrick and Harold Smolin.

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The average migratory speed of the *bluefin tuna* is 3.5 knots while moving through the Straits of Florida.

#### MEDICINE

## Arthritic Morning Pain Due to Gland Variation

► **THE REASON** many arthritis sufferers complain of stiffness in the morning when they wake up may be the fact that their adrenal glands do not put out as much hydrocortisone during the night.

Findings showing this explanation possible were reported by Dr. Joseph E. Warren of the University of Pittsburgh at the American Rheumatism Association meeting in Chicago.

He and his associates measured the amount of the hormone in the blood around the clock at approximately three and one-half hour intervals. They did this on both normal and arthritic persons.

"We found," Dr. Warren said, "that the production of hydrocortisone by the adrenals is at its lowest levels during the early hours of sleep. This low point continues past midnight and may decrease even further by 3:30 a.m. There is then an abrupt rise to the highest concentrations for the day at 7 a.m."

Comparing the normals with the arthritics, Dr. Warren said that, generally, the 3:30 a.m. low of the arthritic was much higher than that for the normal person but, as morning approached, the rise in the arthritic was less than that for the normal person.

"That many rheumatoid arthritis sufferers complain of morning stiffness on awakening," Dr. Warren said, "may be due to the fact that the output of the hormone, hydrocortisone, is lowered during the night. The peak levels of hydrocortisone at 7 a.m., then, could explain the disappearance of the stiffness during the morning and the return of this symptom later in the day."

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#### TECHNOLOGY

## Instrument Locates Kidney Stones

► **KIDNEY STONES**, which are sometimes difficult to locate during surgery, can now be found with a new instrument that produces X-ray-like pictures.

The device was developed by Dr. Donald E. Burke, resident in urology at the University of California Medical Center at Los Angeles.

Dr. Burke calls the device the "Thul-X" because it makes pictures like X-rays, called radiograms, using as an energy source a thulium radioisotope. The pictures produced are technically not X-rays in the usual sense of the word.

During surgery to remove stones in kidneys, it is often difficult to locate the stones exactly. The Thul-X, which is about the size and shape of a small hand microphone can be used rapidly and conveniently to aid precise localization.

It is also thought the device may be useful in fracture surgery, and during surgery for removal of gall stones.

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