therm" could be devised to cover all surface phenomena.

The importance of this field of surface chemistry is really just beginning to be realized. There is much pioneer experimental and theoretical work to be done to establish even the fundamental principles which should guide investigations of these phenomena. What we need particularly is to study in great detail and with high accuracy a few typical simple examples of adsorption.

Dr. John Bradshaw Taylor and I are attempting to do this through an exhaustive study of the electrical and chemical properties of monatomic films produced on the surface of tungsten filaments when they are brought into contact with vapors of the alkali metal such as caesium or potassium. The effect of adding minute amounts of oxygen is of particular interest. Oxygen and caesium represent substances of two extreme types and so by working with surfaces that contain both kinds of atoms in varying proportions a very wide range of surface phenomena can be investigated.

The delicacy of the methods that can be evolved to detect caesium or oxygen atoms on surfaces is quite extraordinary. For example, it should be quite possible, if desired, to detect the presence of caesium atoms inside a vacuum bulb even if the average concentration of atoms in the space is only about one atom per cubic meter.

We intend to continue such investigations until we have obtained far more fundamental knowledge of surface phenomena than we have at present.

*Science News Letter, November 19, 1932*

RADIO

LIGHTNING CALCULATION

will be demonstrated by the prodigy

Dr. Salo Finkelstein

of Warsaw, Poland, when interviewed by Dr. Paul S. Achilles, managing director of the Psychological Corporation.

FRIDAY, NOV. 25

at 12:45 P. M., Eastern Standard Time, over stations of the Columbia Broadcasting System. Interview arranged by Science Service.

CHEMISTRY

# Huge Tanks of Curious Alcohol Go Begging For Worthy Use

WANTED: A practical use for tertiary butyl alcohol.

This is not an advertisement of surplus depression stocks, nor yet a bid for relief from the Volstead act. Tertiary butyl alcohol is not in the beverage class, though to be sure the chemist has tagged it with a suspicious name.

Following the post-war practice of cracking heavy petroleum to yield gasoline, certain leading oil refiners discovered that several kinds of alcohol could be made economically from the more volatile parts of the cracked oil. These alcohols have proved to be of great value, especially in the lacquer industry.

Unfortunately the oil refiner has to take what Nature gives him when he demolishes the large molecules of cheap, heavy petroleum. An appreciable fraction of one peculiar alcohol, the so-called tertiary butyl variety, turns up regularly by the thousands of gallons, and the present customers do not welcome it. It has eccentric chemical habits which do not fit the solvent industry.

Tertiary butyl alcohol is normally regarded by chemists as an academic curiosity. Its full industrial virtues have undoubtedly not been tested. Like grain alcohol, but unlike most of the newer alcohols, it mixes freely with water. It is readily frozen, more easily than water itself. It evaporates almost as freely as grain alcohol. The partial likeness of tertiary butyl alcohol to the ordinary alcohol suggests that it might be substituted for the latter in some of the host of industries using the older product. Such substitution would be a godsend to manufacturers who at present regard grain alcohol as indispensable, but are seriously hampered by the government prohibition restrictions.

For more than half a century chemists have known the structure of the molecule of the tertiary alcohol to be like a compact bunch of grapes rather than the more slender chains characteristic of its alcoholic brethren. The bunch-like molecular structure has suggested value as an anti-knock motor fuel. It is known that the more compact molecules in petroleum treat high powered motors more kindly than do the snake-like type of gasoline particles. Tertiary butyl alcohol seems to follow the rule.

Thus it might land in the gas tank, inasmuch as it dissolves freely in motor fuel as well as water. Knowing the more elegant applications of alcohols, however, the chemist hates to run his product into so ignominious a channel at a few cents per gallon. He probably will find a more profitable use for it.

*Science News Letter, November 19, 1932*

ARCHAEOLOGY

# Tunnel at Monte Alban Yields Skeletons and Jewels

A TOMB-LIKE entrance leading to a long underground passage, two skeletons lying far in the depths of this secret passage—these are the latest discoveries announced by Dr. Alfonso Caso, noted Mexican archaeologist who is exploring ruins of ancient Monte Alban, in the state of Oaxaca, Mexico.

The tunnel, which dates from prehistoric times, is only 20 inches high and 24 inches wide, and follows an irregular course up and down. The archaeologists pushed their way 320 feet by crawling on their backs, propelling themselves by elbows and toes. At times they found themselves moving downward head first.

The first skeleton lay 195 feet from the tunnel entrance. In the dust, beside the bones was a necklace of jade, pearls, and red and white onyx beads. The second skeleton was encountered 320 feet from the entrance, and at a blocked end of the passage. This skeleton was broken and incomplete, Dr. Caso reported. With it lay pottery, also broken. Theories have already been advanced to account for Monte Alban's tunnels, of which there are a number. Their discovery recalls old Indian history, which says that armies of Zapotecan Indians had a way of vanishing into secret passages. One theory is that not only troops but supplies might have been transported underground. Finding two burials in one tunnel is considered rather strong evidence that tunnels were tombs in the ancient city.

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