

They hold that a change should be made in the concepts to be implied by the term, "watershed protection," maintaining that undue and, in the main, erroneous emphasis has been laid on the value of timber growth for "increasing water supply," "securing favorable conditions of flow," and "promoting and protecting navigation." They emphasize their belief that where watershed protection means "retarding erosion," "conserving soil," or lessening torrential run-off it may be obtained as well by a cover of shrubs or grass, which may use relatively little water as well as by trees which may consume large amounts of water.

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## EXPLORATION

## Expedition Plans to Move Starving Islanders

**A** TWO MAN exploring expedition that will attempt to save 200 starving people and study for science the little visited Tristan da Cunha island group in the South Atlantic ocean will leave London soon.

The objective of the expedition, consisting of Francis K. Pease, age 27, and Edward B. Marsh, age 21, is the island group consisting of Tristan, Inaccessible, Nightingale and Gough islands. These lie about halfway between the Cape of Good Hope and Buenos Aires.

When it sails from London within the month, the auxiliary steam schooner *Sailam* will carry a ton of supplies for some 200 islanders on Tristan Island who are believed to be nearly starving. The soil of the island is becoming exhausted and the two explorers will attempt to move the population to Inaccessible Island where there is virgin soil.

Messrs. Pease and Marsh will remain on Tristan Island for two years with only a few contacts with the outside world. They will make an intensive scientific study with particular attention to the meteorology. The group of islands are important meteorologically because they lie in the open sea in a position between the poles of the earth.

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The tigon is a hybrid animal, offspring of a lion and a tiger.

Production of 1,000,000 tons of sugar annually from wood is projected in a research report to the Swedish Government Forestry Commission.

## ENGINEERING

# World Energy Estimates Quell Fears For Future of Mankind

## Harvard Chemist Evaluates Sunshine, Wind, Tide and Ocean Heat as Energy Sources When Natural Resources Fail

**A**MPLE ENERGY for mankind's future use is contained in the sunshine, wind, tides and ocean heat. This is the conclusion of Dr. Arthur B. Lamb, professor of chemistry at Harvard University and director of the university's chemical laboratories.

Each year the world uses 17,800,000,000,000,000 kilogram-calories or as much energy as is contained in 2,700,000,000 tons of coal; if our supply of natural resources were cut off, it would take the labor of 11,000,000,000 men—5 times the population of the world—to furnish the same amount of energy.

### Half Energy From Coal

At present, only 17 per cent. of this total is actual human energy while coal furnishes 50 per cent. and the remainder comes chiefly from oil, wood, gas and the labor of domestic animals.

Even these present sources of energy represent but a small fraction of the available supply of coal, oil and gas. The untapped reserves of these three natural resources amount to 2,200 times the world's annual consumption of all kinds of energy, that is, at the present rate of consumption, we can get along for a couple of thousands of years.

But this assurance, pleasing as it may be, is insignificant beside the tremendous stores of energy in sources as yet unutilized. Annual solar energy to the earth totals almost 42 times the energy of all the world's energy reserves in the forms of coal, oil and gas.

### Energy on Boston

If, for example, all the light energy that falls on Boston's 43 square miles could be converted into power, the output would surpass the total present output of power in the United States. Even the common winds, if harnessed, could deliver in one year 75 per cent. as much energy as could all coal, oil and gas sources during the next 2,000 years.

Another important source is the heat of the earth which would yield millions of times as much energy as all present

sources but which, unfortunately, probably will not be tapped. Dr. Lamb points out that proposals to sink deep shafts into the ground and use the subterranean heat to generate steam are not feasible.

"Simple calculations show this is quite out of the question," Dr. Lamb declares. "The only hope is to take advantage of the accidental supplies of hot water, or better, of superheated steam occurring in certain volcanic regions, such supplies, for instance, as Count Conti has utilized with conspicuous success in Italy and which can doubtless be utilized in Sonoma County, California."

Other sources draw Dr. Lamb's attention. One possibility is the fuel cell which uses carbon or carbon monoxide as one depolarizer and the air as the other. At 1,500 degrees Fahrenheit, these cells deliver large supplies of energy and their use, at room temperatures, is not out of the question.

### Energy From Rainwater

Another source is rainwater. The annual yield of rain water in the clouds would, if harnessed, be sufficient at the present rate of energy consumption to satisfy all demands for the next 150 years.

Still other sources are being examined

**▼ SEEDS**

**R** an address by

**A** Dr. John T. Buchholz

**D** Of The University of Illinois

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To be given Friday, August 18, at 1:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting system. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

at present. Georges Claude is engaged in an attempt to utilize ocean heat economically. Tidal energy has been sought on a large scale, the most important current proposal being the Bay of Fundy plant which would yield over a half billion kilowatts. The photoelectric cell, still in its infancy as a commercial proposition, is expected to add further to this enormous store of energy which may some day entirely relieve mankind of the necessity of providing for its own economic welfare.

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## CHEMISTRY

## Unpleasant Smell of Rubber May Be Eliminated

**T**HE PECULIAR odor of rubber goods may be diminished by the addition of certain chemicals.

Drs. H. P. Stevens and E. J. Parry, research chemists for the British Rubber Growers Association, have found that the addition of zinc carbonate will counteract the odors produced by nitrogen-containing quickening agents or accelerators used in the process of manufacture.

Rubber raincoats have a distinctive smell that is due to certain petroleum and coal-tar products used in their manufacture, and the less pronounced odor of solid rubber articles is derived from the sulfur used in the vulcanizing process. Steaming the finished goods has been found to be a useful temporary remedy, but permanent removal of the smell can only be effected where pure latex and pure materials have been employed.

Odorless rubber would be extensively used for lining food containers, vats and rubber hose used by brewers, and for other purposes from which it is at present excluded.

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## The Front Cover

**T**HIS IS a moonlight photograph of the 400-watt electric lamp on the top of Mt. Washington. When flashed recently in visibility tests conducted by the Mt. Washington Polar Year observers, it was noticed as far away as Boothbay Harbor, Me., 95 miles distant, and at many other points in New England.

Current for the light was supplied by a portable gasoline power plant.

## MEDICINE

# Acid Stomach in Old Age May Be Index to Long Life

**V**ERY ACID condition of the stomach seems to go with youth and when found in old age is an index to a long life, it appears from a study reported by Drs. Zachary Sagal, Jerome A. Marks and John L. Kantor of New York City to the American Gastro-Enterological Association and published in *Annals of Internal Medicine*.

These physicians made 6,679 determinations of the amount of hydrochloric and other acids in the stomachs of nearly that number of patients having symptoms of digestive disorders. The patients were of all ages and came from many different walks of life. Here are some of the other interesting findings of this study, some of which confirm observations by other scientists:

There are several constitutional types with regard to gastric acidity, as well as with regard to other conditions.

After constitutional predisposition, age is the dominating factor in gastric acidity. The greatest percentage of high stomach acidities was found in the fifth decade of life. This is the period when all bodily functions begin to decline, including stomach secretion, Dr. Sagal and associates pointed out. Diminishing amount of acid in the stomach may be considered one of the indications of approaching old age, such as loss of hair and teeth, diminishing activity of the glands of internal secretion and hardening of the arteries.

Sex is also a factor, men having higher degree of stomach acidity at all

ages than women.

Certain diseases are known to be associated with certain ranges of stomach acidity; for example, the acidity is high in duodenal ulcer, while hydrochloric acid is absent in pernicious anemia and cancer of the stomach. These acid levels seem to precede the disease, however, and Drs. Sagal, Marks and Kantor believe that the degree of acidity, which is a constitutional factor, predisposes to a certain disease, rather than that the disease produces the change in acidity.

Regular determinations of the acid in a person's stomach, therefore, are recommended in order to watch for predisposing signs of disease, and also as a guide to treatment.

For example, persons with a tendency to have too much acid in the stomach should avoid spicy and other foods that stimulate stomach secretion. Low acidity, on the other hand, calls for an entirely different diet.

In many cases of heartburn the New York doctors found little or even no acid in the stomach, and they point out that medicinal treatment should be guided accordingly. It would seem that baking soda, favorite home remedy for heartburn, may be all wrong in some cases. If the condition in a given case were due to too little acid, the soda, by neutralizing what acid there was in the stomach, would exaggerate the condition and aggravate rather than relieve the symptoms.

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