

CHEMISTRY

California Wells May Give 1,000 Tons of Dry Ice a Day

Natural Pressure of 230 Pounds Per Square Inch Reduces Artificial Pressure Necessary to Solidify CO₂

NATURE has provided raw material for a gigantic refrigeration plant by the side of one of the greatest outdoor hothouses for winter fruits and vegetables in the world—the Imperial and Coachella valleys of southern California. Huge reserves of natural carbon dioxide gas, from which is made “dry ice,” have been located under the torrid Salton Sea Basin of southern California, it was reported to the American Chemical Society. The gas is tapped from wells drilled starting at 200 feet below sea level.

One thousand tons of “dry ice” can be produced each day at one location on Mullet Island alone, according to Thomas B. Slate, pioneer construction engineer in that field. The natural pressure of 230 pounds to the square inch reduces the artificial pressure necessary to turn the pure carbon dioxide into its solid “dry ice” form, and consequently the cost is much less, estimated by Mr. Slate at \$10 per ton.

Almost limitless possibilities in the field of household refrigeration, air conditioning, railway refrigeration and dairy technique are seen. Located as they are on the transcontinental line of the Southern Pacific, the gas fields open new possibilities for the cheap refrigeration of the vast tonnages of fruits and vegetables shipped eastward across the continent every year. Not only does “dry ice” provide an ideal cooling agent, according to Prof. G. Ross Robertson, of the University of California at Los An-

geles, but the pure gas itself, introduced into a closed and sealed freight car, creates an insulating “blanket” which does not readily conduct the outdoor heat.

Scientists are at a loss to explain the extreme purity of the Salton gas, shown by tests to range from 99.1 to 99.6 per cent. pure carbon dioxide. There is no unpleasant intermixture of hydrogen sulfide, better known as “rotten egg” gas because of its similarity in odor to aging eggs. Like most natural carbon dioxide, it is probably made by the action of oxidized sulfur on natural mineral carbonates such as limestone. In this case purification is effected far below the surface by some unknown process.

Although discovered some three years ago, no reduction of gas pressure has been noted, indicating that almost limitless amounts of the gas are stored. Dr. Dwight Roberts, California geologist, estimates that about thirty-five billion cubic feet of the gas are already stored, capable of yielding nearly a million tons of “dry ice.”

“Experience in Mexico has shown that carbon dioxide wells may run at full blast for years without diminution, all of which suggests renewed supplies by chemical action deep below the surface,” said Professor Robertson.

Boulder Dam has removed forever the threat of inundation of the area by a flood of the Colorado River, it is thought.

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Unjustly Condemned

HOW OFTEN bright and brave things have to suffer for the crimes of others, who do their sinning sneakily!

Goldenrod, without question, is going to be cursed again this summer by millions of hay-fever sufferers, on the flimsiest kind of circumstantial evidence. They begin their agonies of sneezing and inflamed eyes just about when goldenrod comes into bloom. The two events are associated in time; therefore they are assumed to be causally connected.

Nothing could be farther from truth or justice. The pollen that actually causes most hay-fever cases during goldenrod time comes from the ragweeds, which also come into full flower in late summer. But their flowers are relatively inconspicuous green things, which most people would hardly recognize as flowers at all, since they lack the conspicuous petals and bright color that we commonly associate with flowers. So the honest bright goldenrod gets the blame.

As a matter of fact, goldenrod pollen hardly gets into the air at all. It is a heavy, sticky type, like most pollens produced by bright flowers that depend on insects to carry the fertilizing dust. It can be shaken into the air if you thrash an armful of goldenrod around enough, but it is hardly probable that it drifts very far. It is not impossible that there are a few persons who are susceptible to goldenrod pollen, but to get a sneeze out of a bunch of goldenrod you would just about have to burrow into it with your nose.

Ragweed pollen is quite something else. It is a dry, fluffy stuff, particularly well fitted for drifting down the wind, as the flowers that produce it are particularly adapted for discharging huge quantities of it into the air. Recent studies at the University of Minnesota have

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shown that in the month of August there are likely to be about 1,000 ragweed pollen grains in every cubic yard of air.

There doesn't seem to be anything one can do about the ragweeds. They are among our most abundant roadside and wasteland vegetable hoboos. Except for cleaning up vacant lots in cities, cleaning them out by cutting is prohibitively expensive. The low ragweed species survives well in over-grazed pastures, for it is so tough and bitter that even a goat will not eat it.

The only thing that seems to help is the traditional "hair of the dog that bit you." Ragweed pollen is harvested by workers for some of the great therapeutic manufacturing companies and used in the preparation of immune serums that give lasting relief to at least some of the army of hay-fever sufferers.

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PLANT PHYSIOLOGY

Heavy Water Lowers Plant's Food-Making Efficiency

HEAVY water, in which the recently discovered double-weight hydrogen atoms replace the commoner single-weight ones, slows down the rate at which green plant cells can form food substances, Drs. James Curry and Sam F. Trelease of Columbia University have discovered. (*Science, July 5.*)

They used cultures of the simple one-celled water plant known as *Chorella*. Equal measured quantities of these cells were put into ordinary water and nearly pure heavy water, and their respective food-making efficiencies tested by measuring the amounts of oxygen given off as a by-product of the process. The results show that the cells in heavy water were only about two-fifths as active as those in the plant's normal medium of ordinary water.

The research was aided by a grant from the Rockefeller Foundation.

Science News Letter, August 3, 1935

● RADIO

Tuesday, August 6, 3:30 p. m., E.S.T.

THE PROGRESS OF MEDICINE, by Dr. Elliott C. Cutler, Professor of Surgery, Harvard University Medical School.

Tuesday, August 13, 3:30 p. m., E.S.T.

THE HISTORY OF HOUSES, by Dr. Laurence V. Coleman, Director, American Association of Museums.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

PSYCHIATRY

Brief Treatment In Clinic Improves Mental Patients

Follow-Up of 500 Cases After Lapse of Three Years Shows That More Than Half Are Still Doing Well

THE VALUE to patients with mild cases of mental disease of a short course of treatments at a clinic is demonstrated by a follow-up of 500 cases treated at the Institute of Medical Psychology, London.

More than half of these patients were not only relieved at the end of the treatments, but still in an improved or much improved condition after an interval of three years, reports Dr. Mary C. Luff, assistant director of the Institute, and Marjorie Garrod, registrar, in the *British Medical Journal*.

The greatest success was observed in cases classified by the physicians as "anxiety states." This is the type of psychoneurotic illness so frequently masked as gastritis, irritable heart, nervous debility, and so on. It is considered as probably the most important form of psychoneurosis as far as industrial disability is concerned. At the end of the treatment, 80 per cent. of these patients showed considerable improvement, and 64 per cent. were still improved after the lapse of three years.

The Institute of Medical Psychology was founded in 1920 as the Tavistock Clinic. Since then the number of patients treated each year has steadily increased. Most are sent in by their own private physicians. Others are referred by hospitals, social organizations, and even the police courts. They are given interviews once, twice or three times a week, according to their needs, and these interviews are spaced more widely apart as they improve. If the patient is employed in the daytime, his appointments are arranged in the evening so as not to interfere with his work.

In case the home of the patient is not favorable for his improvement, or in case he lives too far away to come frequently to the clinic, he may be admitted to an in-patient department.

They pay according to their incomes up to a maximum of 7 shillings, 6 pence (about \$1.85) a treatment.

A course of 20 interviews or fewer was found to be sufficient treatment for 50 per cent. of the 500 patients. Another 39 per cent. were seen from 20 to 60 times, and only 11 per cent.

more than 60 times. The staff member in charge of the patient was required to call a colleague into consultation before continuing any course of treatment beyond 60 interviews.

The follow-up showed that the proportion of improved cases was just about the same regardless of the length of the treatment, demonstrating that brief, relatively inexpensive courses of treatment give satisfactory results.

"The question of length of treatment deserves serious consideration," the investigators comment, "for the number of applications to the Institute is very large, and it is important that no patient should be given lengthy treatment unless it is essential.

"The question is also serious from a wider point of view. Halliday has recently published a survey of 1,000 patients referred to him as regional medical officer under the Insurance Acts on account of prolonged incapacity. He estimates that roughly one-third of these patients are in reality incapacitated by psychoneurotic symptoms.

"If, as is probable, this proportion holds good throughout the country, the number of such patients requiring treatment is so great that it behooves all those concerned to use the shortest methods compatible with efficiency in dealing with their cases."

The policy of the Institute has been to avoid so far as possible the orthodox Freudian analyses which normally take two years of almost daily visits.

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