SCIENCE NEWS

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CHEMICAL MUFFLER TO ELIMINATE CARBON MONOXIDE

A CHEMICAL device to replace mufflers on automobiles that will eliminate the deadly carbon monoxide contained in the exhaust gases has been developed by Dr. J. C. W. Frazer, professor and chairman of the department of chemistry at the Johns Hopkins University.

Since carbon monoxide, odorless, colorless, tasteless and poisonous swiftly in small concentrations, claims many lives each month through the carelessness of automobilists failing to open garage doors before warming up their engines, this latest chemical achievement is hailed as an important step in making the machine age less dangerous. Dr. Frazer said that an automobile equipped with the new oxidizing device could be run in a closed garage without danger from carbon monoxide poisoning.

Because of patent claims, Dr. Frazer has not yet revealed the exact nature of the material that transforms the deadly carbon monoxide to carbon dioxide, the same gas that human beings breathe out of their lungs. But it is known that it is a catalyst, a substance that causes a chemical reaction without itself participating. It is similar in action to the catalyst, consisting of manganese dioxide and copper oxide, that was an outgrowth of chemical warfare work by Dr. Frazer and a laboratory staff during the war. Fire departments and mine rescue squads use gas masks to-day that rely on their war-time catalyst for purifying the air of carbon monoxide.

For a year and a half, Dr. Frazer worked to develop the new catalyst that will add oxygen to carbon monoxide even when in direct contact with hot, moist gases. Laboratory tests and thousands of miles of road testing convince him that a canister of the catalyst substituted for the regulation muffler will not only deaden the noise of the engine explosions, but remove all the unburned fuel gases in the exhaust, the ill-smelling ones as well as the deadly carbon monoxide. As about a third of the fuel is unconsumed in the engine cylinders, the small canister of catalyst has the task of burning half as much fuel as the engine does. Heat from this reaction may be utilized in some way in future installations, such as for car heating or preheating the fuel.

At present only one experimental unit of the catalyst muffler is in operation, mounted for convenience on the running board of Dr. Frazer's experimental car. A company for the commercial exploitation of the invention is in the process of organization.

AIRPLANE SAFETY

RATHER than expect airplane pilots to be supermen, who will always function at one hundred per cent. efficiency in an emergency, designers of airplanes must try to improve the construction of their machines to the point where they will be easier to land, will not have a tendency to spin and have satisfactory "controllability." Such are the conclusions reached by the National Advisory Committee for Aeronautics in its annual report recently made to Congress.

The Department of Commerce made an analysis of air-accidents in 1928, and came to the conclusion that in nearly half the mishaps, the pilot was to blame. Had his judgment been better, or had he not become confused by some untoward set of circumstances, had his "reaction" been better and quicker, the situation would have been met adequately. While this is all true enough, and while medical supervision of pilots, always strict, is likely to become even more stringent, nevertheless, flying should be made safer through the elimination from airplanes of to-day of certain undesirable aerodynamic characteristics.

It may be necessary for military airplanes to be able to spin for military maneuvers. It is neither necessary nor at all desirable for civil airplanes to have this tendency. Other factors in airplane safety which have to do with design are stability and controllability.

Whether the controls are being held by the pilot or left free, one should be able to proceed in a desired direction and at a desired altitude. Many airplanes do not have satisfactory stability in stalled flight. Scientific work is going on all the time in an effort to work out improved stability.

As for the factor of controllability, it is noted that while most airplanes have satisfactory controllability in normal flight, if the plane is stalled, the controls operate in a most confusing manner. After a spin has developed for several turns, it is often true that the controls become ineffective. While work is proceeding in an effort to solve this problem, there is much still to be done.

The formation of ice on airplanes is regarded as an element of danger, and this question is being studied at the Langley Memorial Aeronautical Laboratory. Protective coatings for aircraft surfaces have been attempted, but have not shown themselves to be conspicuously successful as yet. Glucose or corn sirup and certain liquids such as a mixture of glycerin and alcohol seem to have some effect in preventing the formation of ice.

After the factor of safety is solved, there will still remain the problem of making air travel reasonable in cost. Scientific research will solve both problems, in the opinion of the committee, and sufficient financial backing for this work should be given.

TALKING MOTION PICTURES

REDUCTION in the cost of distributing talking movie records to theaters, along with better reproduction of sound, is foreseen as the result of the development of "durium," a new synthetic resin that will make cheap and almost indestructible phonograph records.

While many of the talkie producers record the sound track on the film alongside the picture, from which it is converted back to sound by a photoelectric cell, the flat

disc record still finds wide use. One large producer uses such records entirely, while several others produce their films with both kinds of record, leaving it to the theater operator to decide which to use.

With the old heavy disc records, made out of the same material as phonograph records used in the home, but 16 inches in diameter, shipping costs mount rapidly. The records are always sent in duplicate, and, to large theaters, in triplicate, so that breakage of a record will not stop the show. Furthermore, a single record can not be used more than 10 or 15 times, without the scratch becoming too apparent.

The durium records are made by coating the new synthetic resin on heavy paper and embossing the grooves of the sound tracks into it. They are light and unbreakable, thus cutting greatly the shipping and packing costs. They will stand all kinds of rough treatment, such as hammering, bending, heating or scratching, without impairing the sound track. They have practically no surface noise and can be played for a hundred or more times, according to the claims of the inventor.

Dr. Hal. T. Beans, of Columbia University, is the inventor of the new resin, the chemical details of which are not yet known because of the patent situation. Before long his company will produce a weekly 10-inch record of a new song hit, to be sold at a low price and playable on any phonograph. In addition, it is claimed, durium can be used as a spray for coating objects to waterproof and fireproof them, and also that large objects, such as toilet articles, can be made from it.

FLOOD CONTROL CANALS

ON a scaled model of the Des Moines River at Ottumwa, Iowa, hydraulic engineers of the state university have accurately determined the effect of cut-off canals around bends near the city and have advised a building program that has actually proved itself in miniature.

This was probably the first attempt in the United States to determine with models in advance of actual field construction the benefits to be derived from straightening rivers. It was very successful.

Ottumwa, a city of 27,000, has suffered often from floods. There are two big bends in the river, one just above and one just below it, and at the end of the first bend the city owns a power plant supplied with water by a canal across the neck of the bend.

The city wanted to enlarge this canal to increase the capacity of the power plant and at the same time wanted to know what effect this enlarged canal and a second one across the other bend would have on the height of flood waters.

The model was constructed of concrete reproducing exactly an area of the river valley 8,000 feet wide and 33,600 feet long containing the two bends and a part of the city. A horizontal scale of one to 800 and a vertical scale of one to 100 was used. Water was run through the miniature river at different heights, with and without the proposed canals cut, and accurate measurements of water flow and heights were taken.

The recommendations made, which will doubtless save Ottumwa both money and time, call for the construction of the two canals not more than 400 feet wide and as deep as the river, and for the removal of a number of levees.

CONTROL OF THE SAND FLY

SAND flies, so tiny that no screens can keep them out, and so ferocious that they recently broke up a horse show in Charleston, South Carolina, by their attacks on both men and animals, are to be studied by the Department of Agriculture this year, according to present plans.

An item of $16,000 for this purpose is in the Agricultural Appropriation bill, which recently passed the House, and is now before the Senate.

Although these flies have been a pest for years along the South Atlantic coast and also around the Gulf Coast, it is only this year, due to the pressure applied by realtors, chambers of commerce, and the like, that an appropriation has actually been recommended by the Bureau of the Budget for eradication purposes.

Representatives from the affected states told the House Committee on Appropriations, recently, that many wealthy persons spending money to beautify and restore old homesteads in the South were becoming discouraged in their plans to occupy these estates, on account of the sand fly. It is practically impossible to keep dairy herds on account of this pest, it is said.

Representative Ruth Bryan Owen stated that conventions of citizens who had banded together to fight the sand fly in her district had discovered that a mixture of sand and Paris green scattered on the surfaces of swamps had seemed to help in keeping the insect from breeding. She expressed a hope that other and more far-reaching methods might be worked out under the Department of Agriculture supervision.

CALENDAR REFORM

CALENDAR-REFORM action by the League of Nations in 1931 may make it unnecessary for Representative Stephen Porter, of Pennsylvania, to press his resolution authorizing the United States to send delegates to an international conference on changes in the calendar at some future time.

According to recent word from the National Committee on Calendar Simplification, the subject of calendar reform is to be discussed in the league's general assembly next year. It is one of the subjects under the general heading of "General Conference on Communications and Transit."

Since the United States usually takes part in such assembly discussions, even though it is not a member of the league, it is assumed that it will do so in 1931, and that action taken will be definite treaty action on the part of all countries.

Such action, however, would of course have to be submitted to various countries for ratification. It is possible, though it scarcely seems probable, that such ratification could proceed with sufficient speed, in the event of a determined change, that the new calendar may be put into effect in 1933.

Representative Porter recently stated that he was not pressing action on his resolution at the present time, but

was marking time to see what other countries were going to do.

What is becoming known as the "Thirteen Months Business Calendar" has now been adopted by several business concerns, among them the Mutual Stores of California and Sears, Roebuck and Company.

ITEMS

WHAT is probably only the second or third occurrence of psittacosis, or parrot fever, in this country has been reported from Annapolis, Md., where three people are seriously ill with this little-known but highly fatal malady. The disease was contracted from a parrot bought three weeks ago. The bird died at Christmas. The germ causing the disease has never been determined, although several organisms have been suggested. The disease has symptoms typical of pneumonia, develops within a week or ten days after exposure, lasts about 15 or 20 days and causes death in nearly half the cases. Outbreaks have been reported in European and South American countries, and two others, one in Boston and one in Hollywood, California, have been reported in the United States besides the one in Annapolis. There is no indication of the disease being transmitted from man to man, Dr. George McCoy, of the U. S. Public Health Service, stated, so that probably no danger of an epidemic exists.

"THE time is not far distant when a new major decline in tuberculosis may again take place," statisticians of the Metropolitan Life Insurance Co. have just declared. Their earlier prophecy that 1929 would see the lowest tuberculosis death-rate ever recorded in the United States will certainly be fulfilled, they found after a review of the latest figures. Reports through the end of November, the latest available, showed a rate of 85.9 per 100,000, which is a decline of 5.7 per cent. as compared with the corresponding period of 1928. Tuberculosis will some day rank among the relatively minor causes of death. A death-rate of 40 per 100,000 will probable be approached during the next ten years.

METALS can be superhardened by magnetic treatment as well as by heat treatment, E. G. Herbert reports before the Iron and Steel Institute. Magnetic hardening is accomplished by repeatedly changing the polarity of the steel, Mr. Herbert explains. A specimen so treated could not be hardened more by low temperature annealing, he says. Whether the magnetic treatment is apt to become of commercial value is not indicated. It is evident that both magnetism and heating produce the same atomic rearrangement. This phenomenon may lead to the finding of additional information about the structure of magnetic metals.

AN aviator coming to earth through a dark sky can see a landing field covered with whitewashed crushed stone 15 times as well as he can see one paved with asphalt, aviation lighting engineers of the General Electric Co. report. To light both fields equally well, 15 times as much light is required for the asphalt as for the rock, they point out. Many surfaces have been tested and given a reflection factor. The stone reflects 75 per cent. of the light it receives and the asphalt reflects five. For Portland cement the figure is 30 per cent.; for crushed stone, 25; crushed slag, gravel and clay soil, 20; sandy soil, 10 to 12; cinders, five to 10; black soil, five to eight, and asphalt, five.

THE white potato, known as "Irish," whose more than 350,000,000 bushel annual production in the United States is the root of so serious an agricultural problem that the Federal Farm Board has set it apart for special treatment, is a native of America, like corn and tobacco. The Incas of Peru had it under cultivation for centuries before the Spanish invasion. The tuber's history, from the time it was an important food in this lost South American civilization, as prehistoric mounds show, was traced through a slow rise to its present-day place of prominence next to bread, by William Stuart, of the U. S. Bureau of Plant Industry, at the meeting of the Potato Association of America in Des Moines. For 150 years after its discovery by Europeans, only well-to-do people ate the potato. It was raised in their gardens and the lower classes knew of it by hearsay alone. Commercial production was begun about 1750. Now, by artificial propagation and sexual reproduction, science is producing new and improved varieties of the original potato.

BELTS of dead and blasted trees, standing like macabre processions around the edges of lakes created or enlarged by power and irrigation dams, are now things of the past, according to an announcement made by Dr. Ray Lyman Wilbur, secretary of the interior, before a meeting of the president's committee on outdoor recreation. Such eyesores are being removed where they exist, he said, and all new permits for the construction of dams on the public domain now have inserted in them clauses providing for the removal of all trees likely to be drowned, before the water is allowed to back up over their roots. This action has come as the result of the increasing use of publicly owned lands as recreational and educational areas, for tourists and students of nature alike have found such skeleton fringes as now disfigure the shores of Jackson Lake and other bodies of water most objectionable. The cost of removal is relatively low, if the work is done before the shores are submerged.

BLIND persons do not hear better, they simply seem to because they listen harder, Mrs. Winifred Hathaway, of the National Society for the Prevention of Blindness, recently told members of the Michigan Educational Institute. The popular belief that blind people have more acuity of other senses, such as hearing and touch, is not exactly correct. The special senses of blind people, aside from sight, are no better in the beginning than those of other people, sometimes not as good. But experience and specialization on the part of the blind persons enable them to make their other senses take the place of sight, so that their senses are better developed than those of normal people. The same thing applies to deaf persons who appear to have much keener vision than normal.