

GENERAL SCIENCE

Release "Secret" Data

► UNLOCK many of the classified files in Government research laboratories. Much information now stamped "Secret" could be made available without injuring national security.

Scientists agree that fewer restrictions on the flow of scientific information into and out of Government research laboratories would speed up this country's defense efforts.

They urge taking a "calculated risk" of releasing basic scientific facts to speed up research. They draw, however, a careful line between secrets of nature and the secret of how a weapon is constructed or exploded.

Competent scientists in any country can learn from experiments the same facts United States scientists learn. Many important discoveries are often made simultaneously in two or more laboratories where the scientists have not been in communication.

Various remedies have been proposed to alleviate the difficulties of present secrecy regulations, which are keeping from the public information needed to make policy in a democracy as well as slowing down scientific research.

One suggestion is to declassify documents automatically at the end of a stated period, to be specified when they are written, unless national security clearly would be jeopardized.

Another is to create a corps of scientists to decide from among the many new re-

search results which few should be kept secret.

All information not directly related to weapons, their kind, number and how they work, should be published immediately, some scientists believe. The stimulus to research thus gained would far outweigh any possible loss by giving away "secrets."

Another idea is to classify by projects or subject matter rather than by "need to know." This would allow the cross-fertilization that has always proved essential to progress in science.

Some scientists urge setting up a uniform classification standard that would apply to all Government departments and agencies handling classified material. Regulations now vary from agency to agency.

An information problem not related to the national security concerns results of Government tests on industrial items, from nylon stockings to clinical thermometers, made in Government laboratories, the results of which are not made public.

The public, however, has paid for the research and there are many who believe the findings should be made available in specific rather than general terms.

These views were expressed by scientists testifying before the House Government Information subcommittee. Rep. John E. Moss (D.-Calif.) is chairman of the subcommittee. (See SNL, March 17, p. 175.)

Science News Letter, March 24, 1956

CHEMISTRY

Storing Sun's Energy

► HYDROGEN, lightest of the chemical elements, may prove to be the key substance in practical and economical use of energy from sunshine.

This possibility is brought out in a study of factors that will make conversion of solar energy more efficient by Dr. Rudolph J. Marcus of Stanford Research Institute, Stanford, Calif., and reported in *Science* (March 9).

Hydrogen is a chemically active gas capable of giving off a large quantity of heat when burned. The unburned gas can therefore serve as a means of storing potential chemical energy. Such a reservoir of potential energy is one of the necessary steps in making any system of photosynthesis practical as a source of useful energy.

In the green plant, life processes connected in some way not yet clearly understood with the green pigment in the chloroplast of the leaves are able to split water molecules into oxygen and hydrogen.

In the plant the hydrogen is not set free as a gas but is immediately used in chemical reactions that build up sugars by combining hydrogen with carbon dioxide. Man has

learned in general what sugars are formed in this way and they are continuously torn down and rebuilt in a life cycle.

He has not yet, however, mastered a way to keep these cycles going without the plant's help.

In another approach to the problem of using sunlight's energy, a number of chemical reactions have been studied which, on a small scale, can break down the water molecule and release hydrogen as a gas. They do this by changing the valence, or power of entering into chemical combination, of one of the metals.

Iron, cerium and magnesium are metals capable of such a change of valence when activated by the sun's energy.

Five steps necessary to make utilization of the sun's energy practical in industrial processes are listed by Dr. Marcus. They are:

1. Collection of sunshine, either with or without concentrating it.
2. Conversion of solar radiation into other forms of energy.
3. Storage of potential energy in a readily available and convenient form.
4. Generation of power.

5. Application of power to do useful mechanical work.

Production and storage of hydrogen as a gas would meet the third of these needs, "storage of potential energy in an available and convenient form."

A number of possible ways of using the hydrogen thus stored are suggested by Dr. Marcus. Since two volumes of hydrogen combine with one volume of oxygen with explosive violence, as chemistry students well know, to form water, Dr. Marcus contemplates burning the hydrogen either in an internal combustion engine or in two ram jets firing in opposite directions on a rotating bar connected to a generator.

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GENETICS

Foresee Safe Methods Of Sex Determination

► SAFE METHODS for determining that offspring will be of the desired sex "are sure to be found," Dr. H. V. Brondsted of the University of Copenhagen, Denmark, states in a report originally made to UNESCO and reprinted in the *Bulletin of the Atomic Scientists* (March).

The old wives' tale of a malformed child resulting from severe fright or shock to the mother during pregnancy gains some support from recent scientific findings, Dr. Brondsted also points out in his summary of recent world-wide research in embryology.

The effect of shock would come through disturbance of the balance of hormones in the body. This might be upset by the stress of the shock acting through the adrenal and pituitary glands.

Dr. Brondsted's prediction of sex determination at will is based also on animal studies that indicate the possibility of this, at least for cattle, and perhaps after that for humans. So far definite results have not yet been obtained even for cattle.

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PALEONTOLOGY

Saw-Toothed Birds Among 400 Fossils

► GROTESQUE, saw-toothed, lizard-like creatures with wings are among more than 400 North American and West Indian fossilized birds recently tabulated by Dr. Alexander Wetmore, Smithsonian Institution research associate.

Dr. Wetmore's checklist shows that nearly 100 new species of fossil birds have been recognized in North America and the West Indies since 1941.

Because of their fragile bones and aerial way of life, birds are much less likely to become fossilized than sturdy-boned mammals and reptiles. Many of the fossils found are incomplete. About half represent species not yet extinct.

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