

Heavy Hydrogen for Sale

Deuterium is available from Matheson

Chemical Properties—three isotopes of hydrogen are known. They have mass numbers of 1, 2 and 3 and are called hydrogen, deuterium (stable isotope) and tritium (unstable isotope). Deuterium enters into all reactions characteristic of ordinary hydrogen and forms completely equivalent compounds. Deuterium's larger mass and lower zero point energy give much different positions of equilibrium points in the same reaction. In general, it reacts more slowly and less completely than hydrogen.

Uses—Deuterium is used in tracer applications, reaction rate studies, and exchange reaction studies, i.e., reactions in which one or more deuterium atoms trade places with light hydrogen atoms in the same ion or molecule.

It is particularly valuable due to its effect in shifting nuclear magnetic resonance and infrared bands when substituting for hydrogen in a molecular structure. Two examples of the numerous publications on the use of deuterium in various studies are the following papers: "The Study of Radical Reactions by Competitive Methods", J. H. Knox and A. F. Trotman-Dickenson, CA 53, 829a; and "The Ethylene-Deuterium Catalytic System", D. O. Schissler, et al., CA 53, 836g.

Deuterium is shipped by Matheson as a non-liquefied gas in high pressure steel cylinders. Write for our Deuterium Data Sheet. Catalog of 95 compressed Gases and Accessories available on request.

MATHESON

A Division of Will Ross, Inc.
East Rutherford, N. J.; Joliet, Ill.; LaPorte,
Texas; Morrow, Ga.; Cucamonga, Calif.;
Newark, Calif.
Matheson of Canada, Ltd., Whitby, Ont.

to military rather than educational purposes.

Southeast Asia is considerably larger geographically and demographically than the United States, yet its publishing and educational possibilities are not usually mentioned in the same breath with our own or those of Europe. In Hong Kong, the Cathay Press has for years been producing some of the world's most expert printing. And in Singapore and Kuala Lumpur, Far Eastern Publishers, led by a young Chinese executive, issues textbooks and books for children in press runs of more than a half million copies. Their biggest sales are to governments (Australia, for one); it publishes and prints, not only in English, but in Tamil and Malay, to allow for the possibility of mass sales. Its paper, color illustrations, and printing methods are excellent. Such developments push their way into the rosy picture although low labor costs may make problems for any contemplated cooperation or competition from Europe or the United States.

PAUL BIXLER

*Olive Kettering Library, Antioch
College, Yellow Springs, Ohio 45387*

Is Nuclear Power "Clean" Power?

Science and its contributor Nelson ("Thermal pollution: Senator Muskie tells AEC to cool it," 10 Nov., p. 755) missed an important opportunity to exorcise an irresponsible demon that has been invoked to plague the nuclear power industry. Nobody denies that power plants (except hydroelectric stations) need cooling water. Nelson's article, however, leaves the unfortunate impression that thermal pollution is a problem peculiar to nuclear plants. As nuclear engineers, we would like to know how conventional steam plants are able to circumvent the second law of thermodynamics!

Science can be more objective. It may be "ironic" to Nelson that nuclear power is advertised as "clean." We submit that clean air is preferable to dirty air. Further, inasmuch as most of the nation's hydroelectric potential is already in use, it seems that the real choice for the future is between "thermal pollution" and a shortage of electric power.

DAVID L. HETRICK

ROBERT L. SEALE

*Department of Nuclear Engineering,
University of Arizona, Tucson 85721*

Latin America: Dangers to Rainfall

So far, the discussion of the Amazon basin (Letters, 14 July, 1 Sept., 10 Nov.) has not covered one point that, in the long run, may prove to be of greater importance than the conservation of species of animal and plant life. The evapotranspiration of a dense evergreen tropical forest is practically equal to the evaporation of an open water surface of the same area. When the huge forests of the Amazon basin are replaced by anything else (except lakes), the water budget of the region will change in the sense that runoff will be increased and evapotranspiration decreased. At the present time, a great percentage (how great is not known) is carried away to the north where it falls as rain over Venezuela and parts of Colombia. It is also probable that part of the rains falling in central Brazil is caused by the evapotranspiration of the Amazon forests.

If the vegetation of the Amazon basin should be drastically changed by man, then, in the course of time, the rainfall rates of Venezuela, parts of Colombia, and central Brazil would decrease. Since large portions of these areas receive rainfall totals that are already rather small for tropical temperatures, a systematic reduction in rainfall would produce substantial changes in the habitability of those lands.

WILFRIED HELMUT PORTIG

*U.S. Army Tropic Test Center,
Research Division,
Fort Clayton, Canal Zone*

Evaluating Dreams and the Dreamer

S. L. Washburn, in his review of *Social Communication among Primates* (27 Oct., p. 481), classes as "obsolete theories of behavior which . . . considered internal events as unascertainable in principle."

He is right, but for the wrong reason. The "internal events" which have been a stumbling block are not those which demanded specially subtle techniques, such as brain stimulation and telemetry, but those which are indeed unascertainable except through the subject's report. A class of such events exists because subjects are undeniably observers too: we can observe rapid-eye-movement sleep, but we cannot know except by asking the subject,