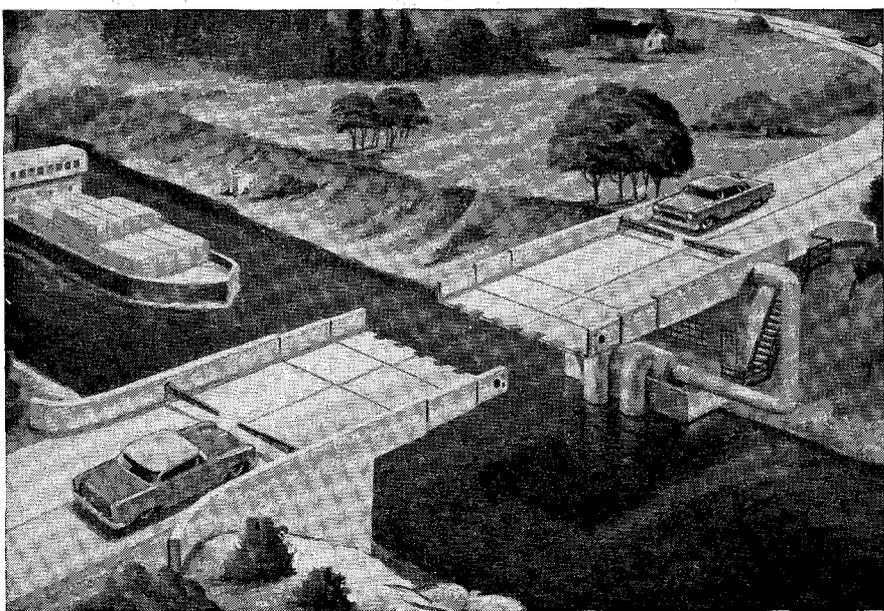


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MARS outstanding design **SERIES**



automated bridge

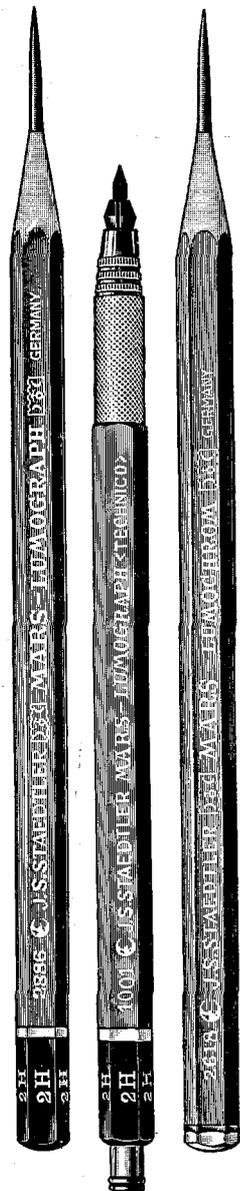
The bridge of tomorrow will be self-activating, equipped with electric-eye controls and an anti-freeze system. No overhead structures will obstruct the view, or interfere with radio reception, according to Robert J. Companik of Chicago.

In his design, the bridge is operated by pressure pumps that draw water from the canal into the hollow structure and hold it shut by the weight of the water. To allow boats to pass, pressure is released, counterweights pull the sections together, and the bridge opens. An electric eye down the canal activates the opening and the bridge does not close until an eye on the other side is passed. Heating units keep both eyes free from snow and ice, and a brine system keeps the bridge in operation in freezing weather.

Many ingenious solutions to traffic and other problems are on the boards today. To make their ingenuity clear, and to translate them from idea into reality, requires the best of drafting tools.

In pencils, of course, that means Mars, long the standard of professionals. Some outstanding new products have recently been added to the famous line of Mars-Technico push-button holders and leads, Lumograph pencils, and Tradition-Aquarell painting pencils. These include the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman" pencil sharpener with the adjustable point-length feature; Mars Lumochrom, the color-drafting pencils and leads that make color-coding possible; the new Mars Non-Print pencils and leads that "drop out" your notes and sketches when drawings are reproduced.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom color-drafting pencil, 24 colors.



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Books

Nuclear Magnetic Resonance

by John D. Roberts

McGraw-Hill \$6.00

Reviewed by Harden M. McConnell

In this book John D. Roberts, professor of organic chemistry at Caltech, is primarily concerned with applications of high resolution nuclear magnetic resonance spectroscopy to problems of modern organic chemistry. Chapter I is a concise but remarkably clear qualitative introduction to the magnetic resonance phenomenon. Each of the following four chapters deals in turn with the principal characteristic phenomena of the high resolution spectra of molecules in liquids: Chapter II deals with nuclear shielding, Chapter III with indirect nuclear spin-spin coupling, Chapter IV with the effects of molecular kinetic phenomena on resonance spectra, and Chapter V is concerned with nuclear quadrupole relaxation and double resonance experiments.

The exposition of each of these subjects is accomplished largely by means of illustrative spectra, many of which are taken from Professor Roberts' own research work.

For organic chemists

As an introduction to the structural applications of nuclear magnetic resonance this is an excellent book for organic chemists, particularly since so many illustrations are given in terms of structures and concepts that the organic chemist is familiar with. A physical chemist may perhaps feel just a little frustrated in reading the book, however. This is largely because so many of the subjects that are discussed here could have been treated quantitatively with relatively simple mathematics and physical principles.

All in all, however, the interests of the general reader and the organic chemist are doubtless best served by Professor Roberts' qualitative but lucid introduction to the subject.

Harden M. McConnell, associate professor of physical chemistry, received his PhD from Caltech in 1951.

Engineering and Science

Nuclear Magnetic Resonance (NMR) spectroscopy is a technique used to precisely identify the molecular structure of the compound [2]. NMR results for unknown compounds can be scanned with respect to a library of known compounds to reveal the identity [3]. What do the individual letters "NMR" mean? Nuclear: NMR technique is concentrated around the properties of the nucleus of an atom. A closer examination of an atom reveals that it has a dense core that is made up of protons and neutrons. Nuclear magnetic resonance (NMR) is a physical resonance phenomenon involving the observation of nuclear spin transitions induced by the absorption of radio frequency quanta by atomic nuclei interacting also with an external (either static or gradient) magnetic field. NMR is thus commonly referred to as "a family of scientific methods and techniques that exploit the nuclear magnetic resonance resonance phenomenon to study Nuclear magnetic resonance (NMR) is one of the most useful analytical methods in modern chemistry. It is used to determine the structure of new natural and synthetic compounds, the purity of compounds, and the course of a chemical reaction as well as the association of compounds in solution that might lead to chemical reactions. NMR spectroscopy is particularly useful in the study of organic molecules because these usually incorporate a large number of hydrogen atoms. NMR Spectrometers. Nuclear Magnetic Resonance (NMR) yields information about the structure and electronic properties of metals and alloys. It also can be applied successfully to investigate amorphous alloys.¹ For thin tapes no complications occur due to skin effects. On the other hand, however, there exist some restrictions.