Books

An Introduction to Spin-Spin Splitting in High Resolution Nuclear Magnetic Resonance Spectra

by John D. Roberts

W. A. Benjamin, Inc. . . . $4.95

Reviewed by Eugene I. Snyder research fellow in chemistry

In his second book on nuclear magnetic resonance spectroscopy, John Roberts, Caltech professor of chemistry, bridges the gap between a formal quantum mechanical treatment of nuclear magnetic resonance spectral analysis and its complete omission. Assuming no prior knowledge of quantum mechanics or the mathematics thereof by the reader, Prof. Roberts guides him with a gentle, but firm, touch from some simple tenets of quantum mechanics through their application to spectral analysis. This is done with the clarity, so seldom attained, which befits a worker with extensive experience in the field.

The many physical interpretations and problem sets liberally interspersed throughout the book will aid immeasurably in bringing a practical, working knowledge of nuclear magnetic resonance spectroscopy to those who are novices, and greater understanding and insight to those—particularly organic chemists — using this technique as an analytical tool.

Man and Dolphin

by John C. Lilly, M.D.

Doubleday $4.95

"Within the next decade or two the human species will establish communication with another species: nonhuman, alien, possibly extraterrestrial, more probably marine; but definitely highly intelligent, perhaps even intellectual. An optimistic prediction, I admit. In this book I have summarized the basic reasons for my beliefs and presented some evidence for the validity of the prediction. In a way this is a crude, elementary handbook for those humans who are interested in the realization of such communication."

This prefatory prediction sets the stage for Dr. Lilly's own absorbing account of his much-publicized research experiments with dolphins.

In searching for a species with which to attempt communication, John Lilly (Caltech '38) set out to find one with a brain equal to ours in size and complexity, with a body not too much larger than the human body, with a friendly attitude toward humans, and with the ability to vocalize within the same ranges and parametric sets of

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variables that the human uses.

The dolphin seemed to meet all these requirements, and in 1955, at Marineland, Florida, Dr. Lilly began his experiments with these creatures. In 1959 the work was transferred to the Communication Research Center, set up by Dr. Lilly in St. Thomas in the Virgin Islands.

In his book Dr. Lilly describes this fascinating project in colorful detail and in a straightforward no-nonsense manner that not only makes for fine reading, but puts this unique research back into the perspective that has been missing from most of the press accounts.

Symbols, Signals and Noise

by J. R. Pierce

Harper & Brothers $6.50

Reviewed by David Braverman
asst. professor of electrical engineering

This well-written book which discusses the origins, theoretical basis and applications of the theory of information, developed by Shannon in 1948, forms an excellent introduction to modern statistical communication theory. The book leads one from the early work in telegraphy, through the derivation of Shannon's model of the communication system, to the consequences and applications of information theory. The subject matter of the book forms the cornerstone of modern statistical communication theory.

The author has undertaken a difficult task in attempting to write a book on information theory for the general public, but for the most part he has succeeded.

Dr. Pierce received his BS (1933), MS (1934), and PhD (1936) degrees from Caltech. Because of his work in information theory and his close associations with the pioneers of the theory at Bell Telephone Laboratories, Dr. Pierce is well qualified to write an exposition of the theory.

The book is especially recommended for the scientist or lay person with a knowledge of mathematics and a desire to learn of the applications, origins, and limitations of information theory. Anyone looking for an introduction to the broad field of modern statistical communication theory would also find the book interesting.

In signal processing, noise is a general term for unwanted (and, in general, unknown) modifications that a signal may suffer during capture, storage, transmission, processing, or conversion. Sometimes the word is also used to mean signals that are random (unpredictable) and carry no useful information; even if they are not interfering with other signals or may have been introduced intentionally, as in comfort noise. Symbols Signals And Noise. Item Preview. > remove-circle. Share or Embed This Item. EMBED.Â texts. Symbols Signals And Noise. by. J.R. Pierce. Publication date. 1961. Publisher. Harper Modern Science Series. Symbols, Signals and Noise. however, it is more general, for all the mathematical results of network theory hold for vibrating mechanical systems made up of idealized mechanical components as well as for the behavior of interconnections of idealized electrical components. In mechanical applications, a spring corresponds to a capacitor, a mass to an inductor, and a dashpot or damper, such as that used in a door closer to keep the door from slamming, corresponds to a resistor. Symbol period (s). Signal to noise ratio (SNR), where the block calculates the variance from these quantities that you specify in the dialog box: SNR (dB), the ratio of signal power to noise power. Input signal power, referenced to 1 ohm (watts), the actual power of the samples at the input of the block. Changing the symbol period in the AWGN Channel block affects the variance of the noise added per sample, which also causes a change in the final error rate. NoiseVariance=SignalPowerÃ—SymbolPeriodSampleTimeÃ—10Es/No10. Tip. Select the symbol period equal to the symbol period of the model. The va