1001 Questions Answered About the Weather. Frank H. Forrester. Dodd, Mead, New York, 1957. 419 pp. Illus. + plates. $6.

This is an unusual book written in question-and-answer form. The 1235 items are organized in 12 chapters, which deal with the sun, the air-conditioned earth, thunderstorms, color in the sky, climates, applications, medical meteorology, weather lore, the weather services, history of weather studies, and how to be weather-wise.

The author appears to have engaged in an orgy of questions and answers and to have come out with a peculiar mixture of good and bad. For example, one is surprised to read, "What is humiture?" and relieved to find that it is "a nonscientific term" which indicates "the mean between temperature and humidity." There are many other questions and answers on this level.

The style is admirably calculated to catch the eye of the reader, but the reader, if he has any background at all, will catch the author in a number of inaccuracies, oversimplifications, and sweeping statements.

Certain sections, particularly those which deal with instruments and observations, everyday weather, and climate, contain much information of interest to laymen. The most pleasing part of the book is the chapter on the history of weather studies. Here the reader is taken from antiquity to the International Geophysical Year and reminded of many historical dates which are often lost in the rushed tempo of modern teaching.

It has been difficult to determine what audience the author had in mind. The book is dedicated to "Michael, who is too young to ask questions." In the foreword, written by Ernest J. Christie, it says that the book will be valuable in libraries, schools, and places of business and will be a useful reference for amateurs and professionals alike. Perhaps one may assume that the author knows best. Few will wish to read the whole book, but many will like to browse through parts of it.

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Edward Williams Morley. His influence on science in America. Howard R. Williams. Chemical Education Publishing Company, Easton, Pa., 1957. xi + 282 pp. Plates.

To the many who refer glibly to the Michelson-Morley experiment, the second name in the couplet has almost no association with a human being. Howard R. Williams has not only brought the man, Edward Williams Morley (1838–1923), out from behind the tag, but he has also discovered and thereby undoubtedly preserved a large body of manuscripts concerning him. One need not go all the way with Williams in considering Morley "the greatest chemist and pure scientist of his time" to see in this account a progression which has wide implications concerning the state of science in America in the last half of the 19th century.

From ministerial student to secondary-school teacher, to college preacher and professor of all scientific work at Western Reserve University, to self-educated chemist and industrial consultant, Morley, by the 1880's, steadily moved toward basic research. His determination of the atomic weight of oxygen was his *magnum opus*. If Williams is less enthusiastic about the obstacles and missed opportunities in Morley's career, he nevertheless shows them clearly. Morley's years of work on the analysis of air missed the inert gases. His collaboration with Michelson ended abruptly and left a sense of strain. The university thoughtlessly allowed his oxygen apparatus to be broken up while he was in Europe.

Because of the importance of the experiment, a more detailed assessment of Morley's contribution to the work with Michelson would be welcome. But Williams has well performed the rescue from oblivion of Edward W. Morley.

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Schedules of Reinforcement. C. B. Ferster and B. F. Skinner. Appleton-Century-Crofts, New York, 1957. vii + 741 pp. $6.50.

A "schedule of reinforcement" might be described as an experimenter's strategy, prescribing exactly how the administration of reinforcing stimuli, usually food or water, to an animal depends upon the animal's behavior over a period of time. Combining extraordinary ingenuity with apparently limitless resources in the way of electrical programming devices, Ferster and Skinner have devised means of duplicating in the laboratory virtually any kind of response-reinforcement contingency that one might expect to find in an animal's natural environment, and probably some that unautomatized nature has yet to try.

The microcosm upon which these investigators have imposed their schedules is a modified picnic icebox containing a pigeon and a food-dispensing machine. Whenever it pecks a lighted key on the wall of the box, the pigeon operates an automatic recorder and, upon occasion, the food-dispenser. Five years of intensive research have been devoted to obtaining a detailed description of the process whereby the pigeon adjusts its rate of key-pecking to prevailing schedules of reinforcement.

This description is transmitted to the reader, just as it comes from the pigeon, in the form of graphs representing cumulative responses versus time for individual animals. Even to the untrained eye these graphs will spell out some striking facts. An abundance of direct and unequivocal evidence establishes the fact that the pigeon can learn discriminations based on "clocks" (that is, stimuli that vary systematically with time) and on "counters" (stimuli that vary systematically with cumulative frequency of the pigeon's own responses over any designated interval). From these facts it is but a short inferential step to the conclusion that variations in rate of responding under various schedules are attributable to discriminative control of the response by temporal patterns of response-produced stimulation.

To psychologists this monograph will represent not simply a research report but also a tour de force in Skinner's long-standing campaign against some of the most deeply entrenched canons of experimental method and theory construction. It presents, in some 900-odd figures, perhaps 5 percent of the staggering quantity of raw data collected during the project; it reports scores of experiments, and it reveals the delicate and precise control that one may obtain over an animal's behavior, given sufficiently complete command of the animal's environment. But it includes no mention whatever of systematic criteria for sampling, no formal experimental designs, no measurement of error, no logical deductions from hypotheses, no statistical tests, no summarization of the fruits of experiment in the form of abstract laws or conceptual models.

By comparing the present volume with, say, C. L. Hull's *Essentials of Behavior,* one can see clearly the consequences of following either the extreme "intuitionist" or the extreme "formalist" in his approach to a science of behavior.

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Light Scattering by Small Particles. H. C. Van de Hulst. Wiley, New York; Chapman & Hall, London, 1957. xiii + 470 pp. Illus. $12.

The book is divided into three main parts. Part I is devoted to "Basic Scattering Theory," part II to "Special Cases of Particles," and part III to "Applications." The first two parts are very com-