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THE WEEKLY SUMMARY OF CURRENT SCIENCE



University of California

Rare Bird of Galapagos

See Page 151

A SCIENCE SERVICE PUBLICATION

When will it wear out?

Most things we know about—and this includes biological systems—begin to wear out as soon as they go into service. Survival rates do not follow a Gaussian distribution. Life is not symmetrical. For the person concerned with reliability, the problem is to find a realistic mathematical representation of the wear-out phase of components.

In a break from classical reliability statistics, GM Research mathematicians were among the first to use the relatively little known Weibull distribution function . . . a remarkable generalized way of handling skewed distributions by one family of straight lines. To demonstrate its appropriateness, they've developed a number of easy-to-use graphical techniques for planning and interpreting life tests, fatigue experiments, and even incomplete field service data. Among their pioneering contributions:

A new method using median ranks for graphically describing experimental main effects and interactions;

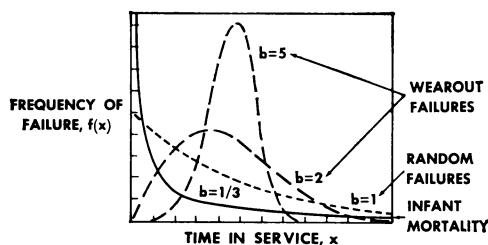
New ways of slashing test times and optimizing experimental designs;

A new method (theory of suspended items) for analyzing endurance data in which some items have failed and some are still running.

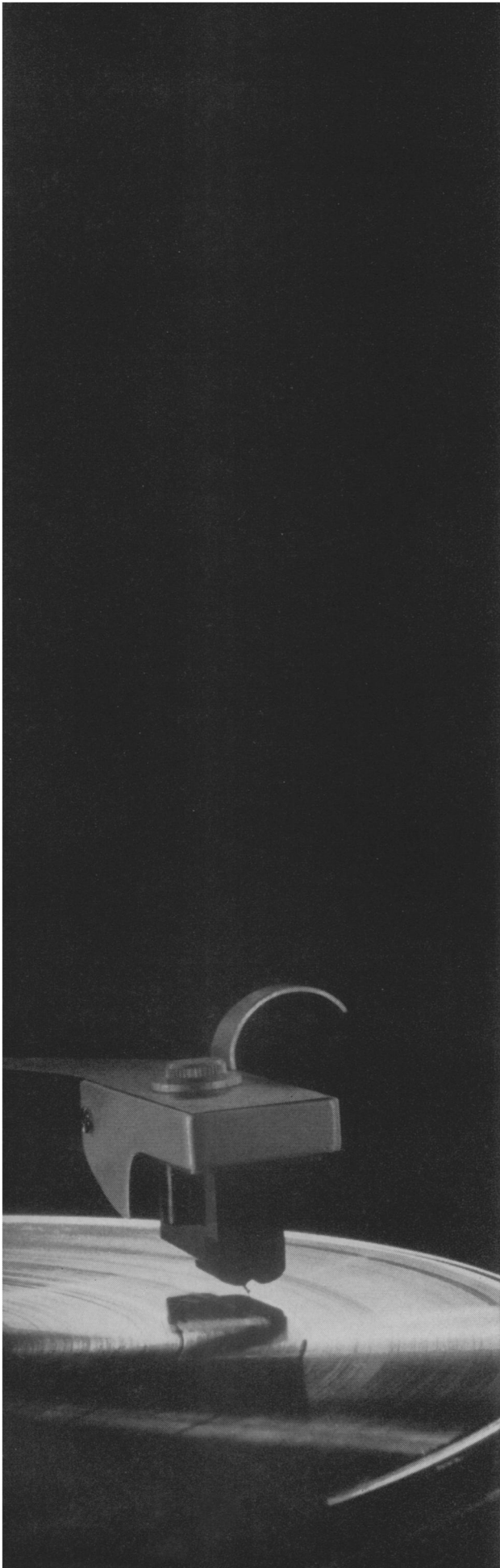
Now an accepted standard in the bearing industry, their graphic Weibull techniques have filled numerous papers and two books now on press. It's one of the ways GM researchers and engineers are working to bring improved reliability to both space and earth-bound hardware.

General Motors Research Laboratories

Warren, Michigan



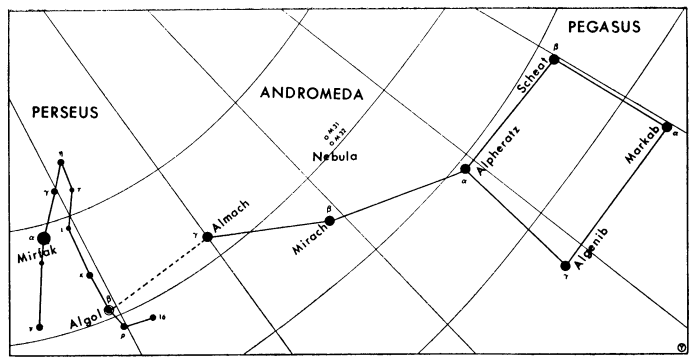
Varying one parameter (b) in the Weibull distribution function allows the characterization of many types of reliability phenomena.



To help all beginning star-watchers . . . the classic of naked-eye observation again available.

The Friendly Stars by Martha E. Martin \$1.00

Revised by Donald Menzel, Harvard Observatory



In any given field of study there are usually one or two introductory books that stand apart from similar works, either because of their acceptance by readers or because of the respect accorded to them by professionals in the field. In astronomy Martha Evans Martin's "The Friendly Stars" is just such a book. Not has it introduced hundreds of thousands of readers to the stars and constellations, but it is warmly regarded by practicing astronomers, many of whom were first attracted to astronomy by this book. Unfortunately, it has long been out of print and difficult to obtain, while—until this edition—parts of it were necessarily out of date.

This minor classic, first published more than 50 years ago, covers the stars and other celestial bodies that can be seen without the aid of a telescope or other equipment, presenting them not as dull compilations of data, but as "personalities" of the sky, that you will want to locate in the heavens and examine. Yet the author has managed to bring her topic to life without either sacrificing scientific accuracy or becoming skimpy or oversimplified. She covers exactly the right ground to give a beginner a basic, completely reliable entry to sky observation.

Mrs. Martin begins her study of the heavens with an account of the rising and setting of the stars (with times for latitude 41° North, reasonably accurate for almost all observers in the U.S.A.). Chapters then follow on the brightest stars visible at this latitude: Capella, Arcturus, Spica, Vega, Deneb, Altair, Antares, Fomalhaut, Regulus, Aldebaran, Rigel, Betelgeuse, Sirius, Procyon, etc. For each star she imparts a wealth of information on rising, position in the sky and locating it by orientation with the Big Dipper and Polaris, viewing times, size, brightness, distance from Earth, color, class, age, path, constellation and whatever else is interesting and germane.

Other chapters are devoted to discussions of stars in general: their number, history of their names; significance of classification; calculation of distance; double stars; the Pleiades, other constellations, including some below the equator.

Throughout this work Mrs. Martin maintains a sparkling, light style that conveys in an informal, enthusiastic manner, an enormous amount of basic material. And because she has concentrated upon stars and

formations visible to the naked eye, she opens up a whole wonderful world to persons without access to any kind of equipment.

We feel that no better book has ever been written in this area, and that it cannot be excelled as an introduction for a bright youngster who is curious about the heavens. It is also a first-rate background for anyone who plans more advanced study, for the person who is considering purchase of a telescope, for the student in other fields, and for any adult who would like to know more about stars.

This present edition has been thoroughly revised by Professor Donald H. Menzel, Director, Harvard College Observatory, with 23 new illustrations, charts, etc. by Professor Ching-Sung-Yu. It is now completely up to date and suitable.

New foreword by Dr. Menzel and W. W. Morgan, Director, Yerkes Observatory. 23 illustrations and charts. 2 fold-out star maps. Index. 159pp.

Paperbound, \$1.00

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