BOOK REVIEW

Theory and Practice of Force Measurement

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REFERENCE: Bray, A., Barbato, G., and Levi, R. *Theory* and *Practice of Force Measurement*, Academic Press, London, 1990, ISBN: 0-12-1284530, 380 pp.

This book is the third in a series of monographs in physical measurement. The series editor is T. J. Quinn. The earlier volumes are *Frequency and Time* (1978) and *Temperature* (1983).

As I approached this book I did two things. First, I read the Foreword. The Foreword is bypassed by most readers. If read, it can remove many questions on content and approach to the material. It was clear that the authors intended to document many years of research in the field of force measurement. Their primary thrust was summed up best in their words, "... a researcher should publish the results of his work for the benefit of others ... I feel that the experience I have gained during thirty years may be useful to other people." This set the tone for the book. Now, as a reader, I expected topics to be separate and able to stand alone, perhaps as chapters.

The second thing I did was to begin reading the book at a chapter in the middle to see if it could stand alone. If I could read a middle chapter and use its contents without need of earlier information in the book, I would then be able to use the book as a possible reference or subject source to support research. The first chapter I reviewed was Chapter 3. It stood alone well. From there I reviewed each chapter according to my interests. Each presented the topics fairly independently.

Now let's look at the content of the book. The first two chapters define the terms and review the basics of force and weight. The

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measurement of gravity is the topic of the third chapter. Chapter Four goes into detail on force-standard machines. In Chapter Five, the reader gets a useful treatise on force-measuring devices. Once again this chapter is a good source for an over view of forcemeasuring devices. Topics from characteristics to bridge compensation are addressed. These five chapters provide an excellent background on the "hows" and "whys" of force measurement.

Chapters Six and Seven consume approximately forty percent of the text. Ring-type dynamometers are covered extensively in Chapter Six and multi-component dynamometers are the topic for Chapter Seven. It's clear that this was the mainstay of the authors' research for the past several years. Once again, these subjects, although very specific in force measurement, are covered in good detail. The authors conclude the book with a discussion of standardization of the unit of force.

The scope of the book is clearly defined in that the authors relate their experience in the force-measurement world. Although the book narrows its scope with the extensive consideration of dynamometers, it fulfills the authors' aim in disseminating valuable information. No specific audience is addressed but the ability of chapters to stand alone makes this book viable for researchers and students.

The book consists of two parts: the first is a background on force and its measurement: the second part is a study of dynamometers. The book is well organized with the exception of the last chapter on standardization which would fit better with the first five chapters. In addition, the references at the end of each chapter are extensive. A real plus is that the authors have included standards references where appropriate. In research, this can be of immense help.

The book has a few drawbacks. First, because it is translated from Italian, the sentence structures are sometimes long and hard to read. I had to reread sentences to fully understand their meaning. Secondly, the illustrations and tables are not self-explanatory, and the associated text explanation is scattered throughout a chapter.

Bottom line: The book's potential for a movie is slim, but its place on anyone's bookshelf involved in force measurement (instruction or development) would prove to be a definite asset.