Distribution of the benefits accruing from reductions in food-marketing wastes and losses by actions of marketing agencies depends on both the supply and the demand elasticities for the final product, the structure of the market with respect to competition, the extent to which knowledge of waste and loss reduction is spread within the industry, and the objective of the firm in making the change. These factors condition the extent to which the gains are retained by the firm, passed back to the farmer in the form of higher buying prices, or passed on to the consumer in the form of lower selling prices. For example, if only one firm possesses knowledge of how to reduce certain wastes and losses, it may retain the gains or pass them on, in part or in full, to consumers in an attempt to gain a larger share of the market. On the other hand, in another type of market situation, pressure of competition from other firms in the industry or other products may force the firm to pass the full benefits on to the consumer. In this situation, all the firm may hope to accomplish is to retain its share of the market.

The decision of the firm as to whether to make changes leading to reductions in food-marketing wastes and losses, the nature of the change—if any—and the timing of such a change may be spontaneous or induced. An example is the situation in which a processed form of a commodity is introduced when previously it was available only in the unprocessed form. The firm's decision as to whether it stands to gain anything by marketing such a product, and the type of action to take, may be dictated by what other firms in the same or other industries have done or are expected to do, or by anticipations of changes in consumer tastes.

Conclusions

This article has sought to clarify concepts of wastes and losses in food marketing, and to present some of the related economic concepts. The necessary research now underway represents an attempt to quantify and appraise the cost—in terms of resources and value—of past and prospective major changes in agriculture and in the marketing system involved in minimizing such wastes and losses. The study is planned to cover individual food groups and subgroups, as well as the total of all major foods.

Adequate quantity and value data by commodity group, especially as they relate to the corresponding total movement through marketing channels, would provide researchers in Government agencies, colleges and universities, and industry with a basis for evaluating (1) the relative cost of current changes aimed at reducing wastes and losses, and (2) the relative merits of research aimed at eventual accomplishment of this goal. The statistics developed would be useful also for estimating or checking the percentages currently used to estimate how much of the food at the primary distribution level reaches consumers at the retail level.

Book Reviews

Methods of Correlation and Regression Analysis, Linear and Curvilinear. Third Edition. By Mordecai Ezekiel and Karl A. Fox. John Wiley & Sons, Inc. 548 pages. $10.95.

THE GENERATION of agricultural economists who have looked on Ezekiel's *Methods of Correlation Analysis* as both primer and encyclopedia will welcome the third edition as an updating of the more familiar editions. Brought out under joint authorship, it will occupy a respected position beside the earlier volumes as an authoritative work in this important area of analysis.

It is, of course, not a new book, but clearly a revision of the earlier editions. Most of the chapters of the second edition and much of the text are retained. Some examples are retained, others are altered, and new ones are added. Scarcely a chapter of the earlier edition, however, escaped at least a modicum of reworking to clarify, to modernize, or to present more clearly the authors'

viewpoints on concepts under discussion. The reader will be the richer as a result.

The many friends of both authors will rejoice too at the joining of their talents in the new edition. They will find therein the same simplicity of approach, the same readability, the same logical development of the argument, the same free use of carefully worked examples, and above all, the same insistence upon the necessity for a reasoned analysis of a problem before undertaking statistical manipulation, that characterized earlier editions.

But readers will find also a number of changes. First noticed, of course, is the new title, *Methods of Correlation and Regression Analysis, Linear and Curvilinear*, which, as noted in the preface, was adopted "In recognition of the increased emphasis given to regression analysis in general, . . ." The treatment reflects the modern trend not only in this direction, but in others, as for example, in the free use of the idea of interval estimates. Readers will welcome several new chapters, particularly chapter 20, "The Use of Error Formulas with Time Series." This completely reworks the earlier treatment and gives the authors' mature evaluation of the application of regression analysis to time series.

The last 30 years have seen considerable research in this area, and a number of workers have offered contributions with respect to the limitations on conventional error formulas imposed by successive observations in time as opposed to random sampling, and to finding appropriate modifications to these formulas to compensate for the limitations. The authors draw on the work of Koopmans, Wold, Bartlett, R. L. Anderson, Hart, D. Cochrane and G. H. Orcutt, and others. They present helpful examples of the handling of autocorrelation and the use of von Neumann's ratio, together with tables. This chapter will furnish a measure of assurance to those who have become overly apprehensive concerning the time series problem, and at the same time it should flash a warning to those who would regard too casually the special problems thereby imposed. However, the student who aspires to work confidently in this tricky area will need to explore carefully on his own account, not only the references listed but other literature as well.

A new and helpful chapter on the analysis of variance, largely the work of Karl Fox, appears in this edition. Many readers will join this reviewer in wishing that much more had been made of this highly potent technique and will wonder why the excellent opportunity to explore the analysis of covariance was not pursued.

Another new chapter on "Fitting Systems of two or more Simultaneous Equations" provides a welcome introduction to the concepts involved in the use of "structural equations," following the lead of Haavelmo. This is a valuable addition to the book, and students seeking a point of departure for studying this technique will find the chapter very helpful, including as it does the introduction in elementary form to the concepts involved in the terms "just identified," "overidentified," "exogenous," and "endogenous." Illustrations are kept to manageable size and attention is centered on basic logic and concepts. But students who aspire to more than a casual acquaintence with this field will need to carry their study well into the references.

The chapter on areas in which correlation and regression analysis have been applied is expanded, and here indeed the list of references—with 202 citations—is impressive.

The format of the revised edition is improved in several respects. However, many readers will miss the convenient reference that would have been provided by numbering sections within chapters and carrying the chapter section number at the top of each page, as is the practice of some publishers. Also, users generally will wish that the tables and nomographs had been collected in one place for convenient working reference, instead of distributed through the text.

The third edition adopts generally the now virtually universal practice of using Greek characters for population parameters and Latin characters for sample statistics, a welcome updating of the earlier editions.

In appendix 2 on "Methods of Computations" the authors confine themselves to an explanation of solutions in terms of the matrix of the $\Sigma x_i x_j$ and of the augmented matrix, but do not include solutions in terms of the r_{ij} matrix. It seems that an authoritative treatment should not exclude a discussion of this approach.

The statistically sophisticated reader will miss fuller reference to the t-test and the pioneer work of W. S. Gossett than is provided in the discussion of small samples.

Like its predecessors, the third edition begins the development of the concepts of relationship and their measurement with the most elementary cases, and proceeds with a sure touch to the more advanced aspects step by step, thus providing to students safe conduct through a complex subject matter. Students who have thorough grounding in basic statistics and who come to the third edition for specialization in correlation and regression will be tempted to read on a highly selective basis—a temptation they would do well to resist—for comments by the authors along the way go far to develop insight into the confident use of these methods in productive research. But students who wish to master the theoretical background of the subject will find it necessary to delve heavily into the references, for this book is directed rather more to the operator—to one who wants to know *how* to apply a given technique—than to one who wants to know *why* the method works, where the error formulas come from, why they are valid, and when and why limitations are sometimes imposed on them.

B. R. Stauber

The Australian Wool Market—1840–1900. By Alan Barnard. Melbourne University Press New York: Cambridge University Press. 231 pages. 1958. $6.50.

A DETAILED historical analysis of the development of the marketing institutions is given major emphasis by Dr. Barnard in this review of the Australian wool market from 1840 to 1900. Preceding this analysis is a discussion of the production and consumption of Australian wool, its growth and location, changes in demand, organization of the textile industry, and competition from other national fibers. A brief summary of marketing costs, prices, and price movements—limited by the availability of statistical data—concludes the book.

Dr. Barnard's thorough analysis of the organization and function of the wool market during the last half of the 19th Century is a result of the labor of assembling and analyzing a wealth of reference material in both Australia and the United Kingdom. A great deal of this was from unpublished papers, supplemented by records and files of individuals and companies involved in the development of this market.

From 1840 to 1900, marketing of Australian wool changed from a centralized market in London to one in Australia. In the 1840's, half of the clip was disposed of in central auction sales in England on behalf of general merchants, 30 to 40 percent was consigned to England sales agents on behalf of the growers, and the rest was shipped directly by the growers. By the 1860's, 80 percent was consigned for sale in England, at the risk of growers, largely through specialized wool-consignment agencies. But by the turn of the century, half of the production was sold by auction in Australia.

An analysis of the important marketing functions shows the changes and improvements made in these services as the marketing pattern turned to local auctions. Major emphasis is placed on market information, grading, transportation, storage, distribution, risk bearing, and financing. The economic factors that affect the competitive market practices and the development of specialized banking and marketing agencies for the handling of wool in the central Australian markets are thoroughly covered.

Dr. Barnard describes the role played by the pastoral industry in the economic development of Australia during the 19th Century. Wool did not provide a large part of Australia's national income or employment during this period, but did give use to a substantial demand for investable funds and private capital. Subsequently, wool became the dominant export commodity. This encouraged the growth of marketing services. Wool also had an important influence on the social and political development of Australia during this period. This book provides a good historical analysis of the wool industry during 1840–1900 and provides a firm basis for understanding the nature of importance of subsequent development.

Charles E. Raymond

Food, America's Biggest Business. By Pauline Arnold and Percival White. 338 pages. Holiday House, New York. 1959. $3.95.

THIS BOOK provides a quick tour of America's food industry. Covered here in broad outline is nearly every aspect of the food business, from farming through processing, packaging, and distribution.

Although 4 of the book's 26 chapters are devoted to agriculture, the main emphasis is on processing and distribution. Separate chapters deal with baking, canning, freezing, meat processing, packaging, wholesaling, retailing, and advertising and promotion. The cereal, meat, dairy, poultry and egg, and fishery groups of food r e c e i v e considerable attention. Surprisingly though, the fruit and vegetable groups are relegated to a chapter entitled "Et Cetera, Other Things To Eat," and follow a discussion of tea and coffee, sugar, and candy. The book closes with a chapter on research and development in which the authors speculate, in a rather romantic mood, on the wonders yet to come.

Treatment is historical and descriptive, with special emphasis on technological development.

The book is written for the layman, and contains an abundance of anecdotal and feature type material. Inevitably, the range of the subject matter covered precludes much detail. Statistics are held to a minimum. A few economic charts are included, but most of the book's many illustrations are line drawings.

The authors address the book "primarily to students—in or out of school." For this group, it should be excellent; certainly there is a wealth of suggestions for themes and term papers. The volume should be a valuable addition to the libraries of those engaged in food promotion or advertising. It should be equally useful to the vocational counselor for guidance of youngsters considering the food business as a career. A chapter on this subject is included. The general reader interested in an overall view of the complex food industry should find here both entertainment and useful information.

Wayne V. Dexter

Food Research Institute Studies. Food Research Institute, Stanford University, Stanford, Calif.

THE FOOD Research Institute of Stanford University has begun publication of *Food Research Institute Studies* which will contain articles by staff members reflecting their current research interests. It will be published three times a year, in February, May, and September.

Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges [1]

CHRISTENSEN, R. P., JOHNSON, S. E., AND BAUMANN, R. V. PRODUCTION PROSPECTS FOR WHEAT, FEED, AND LIVESTOCK, 1960–65. U.S. Dept. Agr. ARS 43–115, 47 pp., illus. Dec. 1959.

With continuation of present prices, costs, and farm programs (including 28 million acres in the Conservation Reserve Program) we should expect excess production of wheat and feed grains during the next 5 years unless serious drought intervenes. Increased demand arising from population growth is likely to be more than offset by the expanded output resulting from continued increases in crop and livestock production.

CONLOGUE, R. M. CANDLING AND CARTONING EGGS AT COUNTRY PLANTS. U.S. Dept. Agr. Mktg. Res. Rept. 366, 16 pp., Dec. 1959.

[1] State publications may be obtained from the issuing agencies of the respective States.