GUSS, Leonard Morton, 1926-
THE MARKETING IMPLICATIONS
OF PACKAGING.

The Ohio State University, Ph.D., 1965
Economics, commerce-business

University Microfilms, Inc., Ann Arbor, Michigan
THE MARKETING IMPLICATIONS OF PACKAGING

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University

by

LEONARD M. GUSS, B.A., M.B.A.

*** *** ***

The Ohio State University

Approved by:

Theodore N. Beckman
Adviser
Department of Business Organization
My interest in the field of packaging dates back to my work as an industrial economist at the Battelle Memorial Institute. Here I became acquainted with and pursued on behalf of several industrial sponsors research in this fascinating and as yet not fully understood field. I was impressed then, as I am now, with the paucity of consequential and ordered material, a lack which I am sure hinders others than myself. When I suggested to Dr. Theodore N. Beckman of the College of Commerce and Administration, Ohio State University, that I undertake to bring some order and comprehension to the scattered material available, his warm support provided a value for which I shall always be grateful. The work itself, as such works do, has taken longer than anticipated. Dr. Beckman's gentle reminders of my responsibility from time to time have served to spur me to the end.

In fairness, I would also like to express my appreciation to Jean Koch, my secretary during the day, and my willing cohort after hours during the many tedious typings and retypings required, especially in a format unfamiliar to the business world. My thanks also to Deloris Tarzan and Bettye Elkins whose patient corrections of
my sometimes flamboyant grammar have been most helpful. Finally, I am grateful to my wife for many things, not the least of which is her sufferance of the many absences through the years while I worked on this dissertation.

Leonard M. Guss
Tacoma, Washington
March, 1965
TABLE OF CONTENTS

PREFACE ................................................................. iii
LIST OF TABLES .......................................................... viii
LIST OF ILLUSTRATIONS ................................................ ix

CHAPTER

I. THE NATURE AND SCOPE OF PACKAGING ......................... 1
   Size of the Industry
   Classes of Packaging
   The Functions of Packaging

II. THE TRANSITION FROM PACKING TO PACKAGING ............... 26
   The Development of Packing Materials
   The Unit Container
      The Glass Container
      The Metal Container
      The Paperboard Package
      Plastic Packaging
   Shipping Containers
      Wood
      Metal
      Paperboard
      Other Shipping Containers
   Packing into Packaging

III. PACKAGING AND THE FUNCTION OF PROTECTION .............. 49
   Food Processing and Protection

iv
IV. PACKAGING AND THE FUNCTIONS OF PHYSICAL SUPPLY ............ 61
  Unitization
  Packaging and Transportation
  Packaging and Storage

V. PACKAGING AND THE FUNCTION OF EXCHANGE ..................... 86
  Packaging and Buying
  Engineering and Design
  Information on the Package
  Resaleability
  Convenience
  Selling
  Self-Service Selling
  Sales Results from Packages

VI. PACKAGING AND THE LAW ........................................... 121
  Labeling Practices, Regulations and Recommendations
    Grade Labels
    Descriptive Labeling
    Informative Labeling
    Present Practice and Trends

VII. THE SOCIAL VALUES OF PACKAGING ............................... 145
  Packaging and the Creation of Value
  The Battle of Materials

VIII. THE DETERMINANTS OF PACKAGING ............................... 162
  The Manufacturer of Packaged Goods
  The Wholesaler
  The Retailer
  The Industrial Consumer
  The Institutional Market
  The Military
  The Agricultural Market

 IX. PACKAGING AND THE ULTIMATE CONSUMER .......................... 181
  Packaging Research

X. SUMMARY: THE PLACE OF PACKAGING IN THE MARKETING MIX .... 197
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Production of Packaging Materials, Selected Years, 1939-1961</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Value of Packaging Materials: 1939, 1947, 1961</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Estimated Production or Shipments of Selected Containers or Packaging Materials: 1940, 1950, 1961</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Shipments of Converted Flexible Packaging Products by End-Use: 1958, 1960</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>Freight Loss and Damage, U. S. Class I Railroads 1939-1962</td>
<td>71</td>
</tr>
<tr>
<td>6</td>
<td>Estimated Sales of Wood Pallets, 1955-1960</td>
<td>84</td>
</tr>
<tr>
<td>7</td>
<td>Cost of Packaging, Selected Products</td>
<td>91</td>
</tr>
<tr>
<td>8</td>
<td>Production of Nonfood Aerosol and Pressurized Containers, Selected Years</td>
<td>100</td>
</tr>
<tr>
<td>C-1</td>
<td>Firms With a Formal Packaging Organization</td>
<td>216</td>
</tr>
<tr>
<td>C-2</td>
<td>Use of Marketing Research in Packaging</td>
<td>217</td>
</tr>
<tr>
<td>C-3</td>
<td>Considerations Receiving Greatest Emphasis in Package Selection and Packaging Planning</td>
<td>218</td>
</tr>
</tbody>
</table>
**LIST OF ILLUSTRATIONS**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Major Market Segments for Packaging</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>End Use Distribution of Selected Consumer and Shipping Containers by Per Cent of End Use, 1960 (Wood Boxes, 1958)</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>U. S. Production of Steel Cans, 1945-1960</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Glass Container Shipments, Domestic U. S., Selected Years, 1928-1960</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>U. S. Production of Boxboard, Selected Years, 1925-1960</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>U. S. Shipments of Corrugated and Solid Fibre Board, Selected Years, 1925-1960</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>Consumer Unit Containers</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Standard Shipping Containers</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>Historical Packages</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>Packaging and Transportation</td>
<td>66</td>
</tr>
<tr>
<td>11</td>
<td>Per Cent Distribution of Domestic Intercity Freight by Type of Transportation, Selected Years, 1940-1960</td>
<td>69</td>
</tr>
<tr>
<td>12</td>
<td>Amount of Claims Attributed to Damage Causes for Fibre Boxes in Rail Transportation</td>
<td>72</td>
</tr>
<tr>
<td>13</td>
<td>Major Shipping Regulations</td>
<td>75</td>
</tr>
<tr>
<td>Figure</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>14</td>
<td>Integrated Materials Handling</td>
<td>82</td>
</tr>
<tr>
<td>15</td>
<td>Convenience in Consumer Packaging</td>
<td>99</td>
</tr>
<tr>
<td>16</td>
<td>Packaging in Retail Outlets</td>
<td>106</td>
</tr>
<tr>
<td>17</td>
<td>Major Federal Packaging Regulations</td>
<td>123</td>
</tr>
<tr>
<td>18</td>
<td>The Battle of Materials</td>
<td>158</td>
</tr>
<tr>
<td>19</td>
<td>Behavior Patterns of Adopter Categories</td>
<td>190</td>
</tr>
<tr>
<td>20</td>
<td>Packaging as a Marketing Function</td>
<td>203</td>
</tr>
<tr>
<td>C-1</td>
<td>Packaging Organization in a Large Multi-Product</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>Processed Food Manufacturing Firm</td>
<td></td>
</tr>
<tr>
<td>C-2</td>
<td>Packaging Organization in a Medium Sized</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Specialty Food Manufacturing Firm</td>
<td></td>
</tr>
<tr>
<td>C-3</td>
<td>Packaging Organization in a Textile Products</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Manufacturing Firm</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I

THE NATURE AND SCOPE OF PACKAGING

The packaging industry includes a large variety of companies engaged in the manufacture of materials, the formation of packages, the marketing of packaged products, and the supply of special services.

The purpose of this dissertation is to clarify the relationship of packaging to marketing, and its place within the marketing process, by organizing and discussing the materials and information available to the student of packaging. By this means, a conceptual basis should be laid, not now existent, for a more comprehensive understanding of this relationship.

Since the purpose of this work is to explore the relationship of packaging to marketing, it is desirable to consider what marketing is. The functions of marketing have been variously defined by authors in the field, many of whom find it necessary or desirable to enumerate a list of activities ranging from as few as six to as many as thirty. The most widely accepted concept is that eight functions are pervasive, necessary, and yet sufficient to incorporate all of the activities found in marketing.
A marketing function is defined as "a major economic activity which is inherent in the marketing process, pervades it, and which, through a continuous division of labor, tends to become specialized."\(^1\) Again, "a marketing function is an act, operation or service performed in the marketing process."\(^2\)

These functions are best enumerated as follows:

The Functions of Exchange
- Buying
- Selling

The Functions of Physical Supply
- Transportation
- Storage

The Facilitating Functions
- Standardization and Grading
- Financing
- Risk Taking
- Market Information\(^3\)

Marketing, then, is a process which incorporates all the transactions affecting the movement of goods and services from the producer to the consumer of goods. Selling is but one of the functions of marketing. Packaging is a marketing tool and, as will be shown, is closely interwoven with the performance of marketing functions other than selling, although most emphasis has been on this aspect.


The term "packaging" subsumes two distinct but related concepts. One of these relates to the physical task and, as such, is concerned with the packing materials and processes used. Primarily, this is a delimitation of space, a setting aside of the contained contents from the external environment. The materials of packing include glass bottles and jars, metal cans and foil, plastic films and molded containers, paperboard boxes of the several types, such shipping containers as cartons, bags, drums and casks, and many more. But packing is not in itself equivalent to packaging.

Packaging in the true sense is a totality, and has no existence aside from its marketing function. Packaging is a marketing tool, the purpose of which, from the seller's viewpoint, is to move goods; for this purpose it employs various packing materials. Used in this modern sense, the term is of relatively recent origin.

Packaging is the art and science of packing merchandise both to preserve its contents and to increase its sales.⁴

The underlying objective...has been and is to stimulate the movement of goods.... Properly designed, the package should enhance the value of its contained product and impart that impression, either directly or subtly, to the customer.⁵

---


According to D. M. Phelps,

The package must serve two basic functions in an effective manner. First, the package must contain and protect. Second, the package must have promotional value.

A further statement by a prominent designer says, "The contemporary package has become a marketing tool."

This duality is also recognized as basic by Theodore N. Beckman, Harold H. Maynard and William R. Davidson:

Traditionally, the functions of packages have been to provide a measure of a standard unit of sale and to preserve or protect. Under modern conditions, as a result of the influence of self-service merchandising techniques, the package must also clearly identify the product to the consumer and serve as a "silent salesman."

But this modern comprehensive concept is not recognized throughout the field of marketing. In a standard compendium the term is defined largely in its physical sense, e.g., "Packaging means placing the product in a container, receptacle or wrapping..." although some attention is later paid to the marketing aspects of packaging.

The history of packaging is largely the history of branded

---


goods,\textsuperscript{10} and the present view of packaging, e.g., the use of packing materials as an integral part of the process of marketing goods, could not be antecedent to the development of branded goods and, in fact, became generally recognized only recently. The term "packaging" as opposed to "packing" has been in general use in literature for only about four decades. While in scattered use prior to the early 1920's, it was only in the 1924-25 issue of the Industrial Arts Index that the term was first separately identified. In prior issues of the Index, the term "packing" is used and most references are to the physical implementation of this function.

This is more than an issue of semantics. Packaging is a function, or at least a subfunction, of marketing and a thorough understanding of this point is possible only if the place of the physical package in the larger context is recognized. But general literature and conditions of everyday discussion have confused the two terms so that they are used synonymously. Indeed, only a purist must insist today that "packaging" be reserved for the process and "packing" for the material. The one word "packaging" can be used for all related applications.

\textbf{Size of the Industry}

It is difficult to arrive at a precise measure of the packaging industry since it is difficult to define precisely of what elements it is composed. Certainly the manufacture of packing materials of all

kinds must be included. Here must be covered not only the primary materials such as paper and paperboard, glass, plastic films, steel and aluminum for cans and foils, and others, but also auxiliary materials, such as labels and tapes, adhesives, printing inks, closures, and others. Included, too, must be the capital and labor requirements in conversion, shipping, storage and other activities involved in the making of packages, as well as the design, testing and selling of the packages themselves.

The value of materials used by the industry so comprehended has risen dramatically since 1939 as shown in Table 1, which shows a seven-fold rise from 1939 to 1961. A detailed breakdown of this material is shown in Table 2, which cites the major components of the industry. Table 3 presents the physical volumes of packaging materials for selected years.

A generally accepted rule of thumb is that total packaging costs amount to about three-quarters more than the cost of materials and machinery. Using this as a basis, estimates of the total packaging industry in recent years are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>$15.5 billion</td>
</tr>
<tr>
<td>1958</td>
<td>$17.8</td>
</tr>
<tr>
<td>1959</td>
<td>$19.2</td>
</tr>
<tr>
<td>1960</td>
<td>$20.1</td>
</tr>
<tr>
<td>1961</td>
<td>$20.5</td>
</tr>
</tbody>
</table>

With price increases, higher labor rates and the use of some more costly materials since 1961, the value of the packaging industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Value of Product (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>$1,856,617</td>
</tr>
<tr>
<td>1947</td>
<td>5,393,055</td>
</tr>
<tr>
<td>1955</td>
<td>8,906,476</td>
</tr>
<tr>
<td>1956</td>
<td>9,693,748</td>
</tr>
<tr>
<td>1957</td>
<td>9,852,078</td>
</tr>
<tr>
<td>1959</td>
<td>11,110,982</td>
</tr>
<tr>
<td>1960</td>
<td>11,530,055</td>
</tr>
<tr>
<td>1961</td>
<td>11,672,799</td>
</tr>
</tbody>
</table>

Source: Container and Packaging Section
B.D.S.A., U. S. Department of Commerce
<table>
<thead>
<tr>
<th>CONTAINER OR MATERIAL</th>
<th>1939 (000)</th>
<th>1947 (000)</th>
<th>1961 (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper and paperboard containers (total)</td>
<td>$509,767</td>
<td>$2,069,120</td>
<td>$4,841,039</td>
</tr>
<tr>
<td>Grocery, variety and specialty bags</td>
<td></td>
<td>184,265</td>
<td>653,106</td>
</tr>
<tr>
<td>Paper shipping sacks</td>
<td></td>
<td>153,209</td>
<td>300,000</td>
</tr>
<tr>
<td>Paper boxes and cartons</td>
<td>233,064</td>
<td>664,281</td>
<td>1,236,848</td>
</tr>
<tr>
<td>Sanitary food containers (liquid tight)</td>
<td>29,056</td>
<td>137,374</td>
<td>678,539</td>
</tr>
<tr>
<td>Fibre cans, tubes, drums</td>
<td>34,124</td>
<td>77,206</td>
<td>150,584</td>
</tr>
<tr>
<td>Solid-fibre &amp; corrugated shippers</td>
<td>213,523</td>
<td>852,785</td>
<td>1,921,962</td>
</tr>
<tr>
<td>Flexible packaging materials (total)</td>
<td>103,127</td>
<td>256,214</td>
<td>992,083</td>
</tr>
<tr>
<td>Papers (for wrapping)</td>
<td>63,127</td>
<td>178,214</td>
<td>342,993</td>
</tr>
<tr>
<td>Cellophane (unconverted)</td>
<td>40,000</td>
<td>78,000</td>
<td>266,490</td>
</tr>
<tr>
<td>Polyethylene (unconverted) &amp; other plastic</td>
<td></td>
<td></td>
<td>219,400</td>
</tr>
<tr>
<td>Aluminum foil, flexible (packaging uses)</td>
<td></td>
<td></td>
<td>163,200</td>
</tr>
<tr>
<td>Metal containers and components (total)</td>
<td>498,288</td>
<td>981,239</td>
<td>2,343,018</td>
</tr>
<tr>
<td>Metal cans</td>
<td>339,413</td>
<td>619,946</td>
<td>1,805,360</td>
</tr>
<tr>
<td>Collapsible metal tubes and caps</td>
<td>8,398</td>
<td>23,772</td>
<td>41,750</td>
</tr>
<tr>
<td>Rigid foil containers</td>
<td></td>
<td>27,400</td>
<td>32,000</td>
</tr>
<tr>
<td>Steel shipping drums, barrels,</td>
<td>160,477</td>
<td>311,021</td>
<td>463,908</td>
</tr>
<tr>
<td>kegs, pails, others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerosols (total)</td>
<td></td>
<td></td>
<td>131,640</td>
</tr>
<tr>
<td>Nonfood</td>
<td></td>
<td></td>
<td>124,640</td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
<td>7,000</td>
</tr>
<tr>
<td>Glass containers (total)</td>
<td>156,365</td>
<td>422,963</td>
<td>966,600</td>
</tr>
<tr>
<td>Rigid &amp; semirigid plastics containers (total)</td>
<td></td>
<td></td>
<td>181,587</td>
</tr>
<tr>
<td>Plastics bottles, jars</td>
<td></td>
<td></td>
<td>100,397</td>
</tr>
<tr>
<td>Rigid plastics containers, including sheet,</td>
<td></td>
<td></td>
<td>81,190</td>
</tr>
<tr>
<td>except bottles, jars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wooden containers (total)</td>
<td>181,668</td>
<td>550,200</td>
<td>405,562</td>
</tr>
<tr>
<td>Wooden boxes</td>
<td>131,875</td>
<td>416,473</td>
<td>304,924</td>
</tr>
<tr>
<td>Cooperage (tight and slack)</td>
<td>34,569</td>
<td>101,981</td>
<td>69,815</td>
</tr>
<tr>
<td>Fruit, vegetable baskets</td>
<td>15,224</td>
<td>31,741</td>
<td>30,823</td>
</tr>
<tr>
<td>Textile containers (total)</td>
<td>110,504</td>
<td>334,335</td>
<td>179,140</td>
</tr>
<tr>
<td>Cushioning materials (total)</td>
<td>4,608</td>
<td>11,541</td>
<td>41,604</td>
</tr>
<tr>
<td>Component materials (total)</td>
<td>217,435</td>
<td>505,365</td>
<td>1,128,819</td>
</tr>
<tr>
<td>Adhesives (for packaging), tape &amp; twine</td>
<td>80,809</td>
<td>263,431</td>
<td>570,148</td>
</tr>
<tr>
<td>Labels, seals and tags</td>
<td>136,626</td>
<td>241,934</td>
<td>658,671</td>
</tr>
<tr>
<td>Packaging machinery (total)</td>
<td>16,204</td>
<td>127,893</td>
<td>187,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,856,617</td>
<td>$5,393,055</td>
<td>$11,672,799</td>
</tr>
</tbody>
</table>

Table 3

ESTIMATED PRODUCTION OR SHIPMENTS OF SELECTED CONTAINERS OR PACKAGING MATERIALS: (1940, 1950, 1961)

<table>
<thead>
<tr>
<th>Type of Container</th>
<th>1940</th>
<th>1950</th>
<th>1961</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSUMER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tinplate cans (1,000 tons, steel)</td>
<td>2,192</td>
<td>3,893</td>
<td>4,992</td>
</tr>
<tr>
<td>Aerosols, all types (1,000 units)</td>
<td>-</td>
<td>50,000</td>
<td>839,000</td>
</tr>
<tr>
<td>Glass containers (1,000 gross)</td>
<td>52,116</td>
<td>106,380</td>
<td>165,446</td>
</tr>
<tr>
<td>Collapsible tubes (1,000 gross)</td>
<td>2,683</td>
<td>6,449</td>
<td>8,093</td>
</tr>
<tr>
<td>Paper milk bottles (tons)</td>
<td>n.a.</td>
<td>219,920</td>
<td>607,326</td>
</tr>
<tr>
<td>Liquid-tight containers (tons)</td>
<td>n.a.</td>
<td>47,308</td>
<td>25,431</td>
</tr>
<tr>
<td>Round, nested containers (tons)</td>
<td>n.a.</td>
<td>106,219</td>
<td>263,135</td>
</tr>
<tr>
<td>Ice cream, frozen food, butter cartons (tons)</td>
<td>n.a.</td>
<td>189,389</td>
<td>412,456</td>
</tr>
<tr>
<td>Paper boxes (1,000 tons)</td>
<td>1,804</td>
<td>2,885</td>
<td>2,951</td>
</tr>
<tr>
<td>Fibre cans and tubes (1,000 tons, bd.)</td>
<td>n.a.</td>
<td>245</td>
<td>299</td>
</tr>
<tr>
<td>Paper bags; grocery, variety, specialty (1,000 tons paper)</td>
<td>606</td>
<td>760</td>
<td>1,273</td>
</tr>
<tr>
<td>Aluminum foil, converted (million lbs.)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>245</td>
</tr>
<tr>
<td>Molded plastics container (million lbs.)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>123</td>
</tr>
<tr>
<td>Polyethylene bottles, jars, tubes</td>
<td>n.a.</td>
<td>n.a.</td>
<td>123</td>
</tr>
<tr>
<td>Polystyrene containers</td>
<td>n.a.</td>
<td>n.a.</td>
<td>123</td>
</tr>
<tr>
<td>Transparent packaging film (million lbs.)</td>
<td>n.a.</td>
<td>300</td>
<td>826</td>
</tr>
<tr>
<td>Cellophane</td>
<td>110</td>
<td>265</td>
<td>423</td>
</tr>
<tr>
<td>Polyethylene &amp; other plastics</td>
<td>-</td>
<td>35</td>
<td>403</td>
</tr>
<tr>
<td><strong>SHIPPING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel drums, pails (1,000 tons, steel)</td>
<td>572</td>
<td>925</td>
<td>810</td>
</tr>
<tr>
<td>Nailed wooden boxes (million bd. ft.)</td>
<td>4,295</td>
<td>5,000</td>
<td>3,330</td>
</tr>
<tr>
<td>Wirebound boxes (1,000 units)</td>
<td>28,175</td>
<td>158,087</td>
<td>186,600</td>
</tr>
<tr>
<td>Slack cooperage (1,000 units)</td>
<td>35,000</td>
<td>23,370</td>
<td>n.a.</td>
</tr>
<tr>
<td>Corrugated &amp; solid fibre containers (1,000 tons) (container board)</td>
<td>3,114</td>
<td>5,832</td>
<td>9,308</td>
</tr>
<tr>
<td>Fibre drums (1,000 units)</td>
<td>3,500</td>
<td>26,000</td>
<td>29,735</td>
</tr>
<tr>
<td>Paper shipping sacks (1,000 tons paper)</td>
<td>195</td>
<td>743</td>
<td>852</td>
</tr>
<tr>
<td>Textile bags (millions yds.)</td>
<td>1,538</td>
<td>1,158</td>
<td>847</td>
</tr>
<tr>
<td>Veneer packages (million sq. ft. veneer)</td>
<td>1,529</td>
<td>1,100</td>
<td>1,100</td>
</tr>
</tbody>
</table>

Source: Containers and Packaging, Industry Reports, U.S. Department of Commerce, B.D.S.A., Various Series
by 1963 probably exceeded $21 billion, a figure considerably in excess of that ascribed to another very important factor in the marketing of goods, advertising.\(^{12}\)

The largest consumption of packaging — approximately 40 per cent of the whole — is in the food field as shown in Figure 1. Beverages and durable goods each take about 10 per cent; drugs and cosmetics together about 8 per cent; and the remaining 32 per cent goes to a miscellany of non-durable goods. An analysis of end use by important packaging materials is shown in Figure 2.

In 1961, the packaging goods and services used by almost all industrial, wholesale, and retail firms were produced by about 5,000 individual companies.\(^{13}\) While again no precise number of actual packages is available, since many data are kept and processed in terms of tons or square feet of product manufactured, estimates can be made of the equivalent of such production in terms of "standard packages." It is not trivial to consider that a reasonable estimate of the number of packages produced in 1960 was about 320 billion units\(^{14}\) or, expressed another way, about 1,800 units annually per capita. Such numbers serve only to confirm that packaging is an integral part of our business and consumer lives.

\(^{12}\)"Advertising: Today, Yesterday, Tomorrow." Printer's Ink, Vol. 283, No. 11 (June 14, 1963), p. 20. "More than $12 billion a year is spent on advertising in the U.S."

\(^{13}\)Author's calculation.

\(^{14}\)Ibid.
FIGURE 1

MAJOR MARKET SEGMENTS FOR PACKAGING

Source: Author's calculations based on trade association and government data.
# FIGURE 2

**END USE DISTRIBUTION OF SELECTED CONSUMER & SHIPPING CONTAINERS BY PER CENT OF END USE, 1960 (WOOD BOXES, 1958)**

<table>
<thead>
<tr>
<th>CONSUMER PACKAGES</th>
<th>Food and Liquor Products</th>
<th>Drugs and Medicinals</th>
<th>Cosmetics and Toiletries</th>
<th>Soaps and Cleaning Compounds</th>
<th>Beverages</th>
<th>Building Materials</th>
<th>Paper Goods</th>
<th>Petroleum Products</th>
<th>Household, Hardware, and Building Supplies</th>
<th>Textile Products</th>
<th>Tobacco</th>
<th>Stone, Clay and Glass Products</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Foil 1</td>
<td>60.2</td>
<td>.6</td>
<td>.1</td>
<td>.1</td>
<td>14.6</td>
<td>13.2</td>
<td>11.4</td>
<td>15.0</td>
<td>10.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collapsible Tubes 2</td>
<td>20.8</td>
<td>10.0</td>
<td>54.1</td>
<td></td>
<td>4.6</td>
<td>2.5</td>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folding Boxes 3</td>
<td>38.7</td>
<td>3.7</td>
<td>2.5</td>
<td>12.2</td>
<td>9.9</td>
<td>10.0</td>
<td>5.5</td>
<td>4.6</td>
<td>2.5</td>
<td>10.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass Containers 4</td>
<td>40.7</td>
<td>13.3</td>
<td>8.9</td>
<td>8.4</td>
<td>27.3</td>
<td></td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tinplate Cans 5</td>
<td>55.6</td>
<td>23.6</td>
<td>5.1</td>
<td></td>
<td></td>
<td></td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHIPPING CONTAINERS</th>
<th>Food and Liquor Products</th>
<th>Drugs and Medicinals</th>
<th>Cosmetics and Toiletries</th>
<th>Soaps and Cleaning Compounds</th>
<th>Beverages</th>
<th>Building Materials</th>
<th>Paper Goods</th>
<th>Petroleum Products</th>
<th>Household, Hardware, and Building Supplies</th>
<th>Textile Products</th>
<th>Tobacco</th>
<th>Stone, Clay and Glass Products</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrugated Cases 6</td>
<td>24.7</td>
<td>3.4</td>
<td>2.9</td>
<td>1.5</td>
<td>11.4</td>
<td>1.0</td>
<td>21.1</td>
<td>5.1</td>
<td>.8</td>
<td>8.6</td>
<td>16.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiwall Bags 7</td>
<td>32.5</td>
<td>38.8</td>
<td></td>
<td>18.3</td>
<td></td>
<td></td>
<td>8.0</td>
<td></td>
<td></td>
<td></td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel Drums 8</td>
<td>3.4</td>
<td>30.4</td>
<td>2.3</td>
<td>7.6</td>
<td>27.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood Boxes 9</td>
<td>40.0</td>
<td>2.0</td>
<td>38.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources:  
2 Collapsible Tube Manufacturers' Association.  
3 Folding Paper Box Association of America.  
4 Glass Container Manufacturers Institute.  
5 Can Manufacturers Association.  
6 Fibre Box Association.  
7 Paper Shipping Sac Manufacturers Association.  
8 Steel Shipping Container Institute  
A clearer view of the growth of the materials of packaging in recent decades can be seen in Figures 3 - 6. Figure 3 illustrates the growth of steel cans, still by far the largest number of units of packaging consumed although growth has slowed in recent years. Since the end of World War II the number of cans used annually (calculated on the basis of equivalent number of #2 cans, a popular size) almost doubled. Figure 4 presents a similar picture for glass containers, including bottles, vials, jars, carboys and all other forms used. In the thirty-year period covered, the use of glass containers increased fivefold. However, use in 1958 was but 60 per cent higher than at the end of the war due to competitive materials.

Figure 5 depicts the growth in boxboard production from both waste paper and virgin fibre for use in folding boxes and set-up boxes. It shows that production has been relatively static over the last few years; much of the growth in packaging consumer goods has gone to newer materials. Figure 6 deals with corrugated and solid fibre containers, the dominant shipping or master container. Growth was dramatic from 1915 to 1955, then slowed somewhat as the penetration of new markets became more difficult.

Finally, Table 4 presents recent information on the newest form of packaging, flexible plastic packaging, although some paper, alone and in combination, is included in flexible packaging. The strong and continuing growth of this segment of the industry is apparent in the total, which increased about 13 per cent in the period 1958 - 60.
FIGURE 3

U. S. PRODUCTION OF STEEL CANS, 1945-60

FIGURE 4

GLASS CONTAINER SHIPMENTS, DOMESTIC U. S.,
SELECTED YEARS, 1928-1960

Source: Glass Containers, 1962, Glass Containers Manufacturers Institute, Inc., p. 50.
FIGURE 5
U. S. PRODUCTION OF BOXBOARD,
SELECTED YEARS, 1925 - 1960.

FIGURE 6

U. S. SHIPMENTS OF CORRUGATED & SOLID FIBRE BOARD,
SELECTED YEARS, 1925-1960

Source: Fibre Box Industry Statistics, 1961, Fibre Box
Association, Chicago, April, 1962.
# TABLE 4
SHIPMENTS OF CONVERTED FLEXIBLE PACKAGING PRODUCTS BY END-USE: 1958, 1960

(Thousands of dollars)

<table>
<thead>
<tr>
<th>Item</th>
<th>1960 Total value of shipments</th>
<th>1960 Total value of shipments by end-use</th>
<th>1958 Total value of shipments</th>
<th>1958 Total value of shipments by end-use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Food</td>
<td>Nonfood</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL PACKAGING, TOTAL</td>
<td>$486,218</td>
<td>$347,319</td>
<td>$138,899</td>
<td>$434,624</td>
</tr>
<tr>
<td>Bags, pouches, and related material(^1)</td>
<td>261,812</td>
<td>182,430</td>
<td>79,382</td>
<td>241,089</td>
</tr>
<tr>
<td>Printed rolls and printed sheets,(^2) Total</td>
<td>106,949</td>
<td>80,302</td>
<td>26,647</td>
<td>102,872</td>
</tr>
<tr>
<td>Laminated or coated rolls and sheets, plain or printed(^3)</td>
<td>117,457</td>
<td>84,587</td>
<td>32,870</td>
<td>90,663</td>
</tr>
</tbody>
</table>


1 Cellophane, polyethylene, paper, alone and combined
2 Cellophane, polyethylene, paper, foil
3 Foil, polyethylene, other film, paper
Classes of Packaging

There are, generally speaking, two broad methods by which goods may be packaged: in unit or consumer-sized containers or in shipping or master containers. Some products are shipped in bulk, in which the transporting vehicle is the container.\(^\text{15}\) This may be considered a variant of the master container.

Primary emphasis in considering packaging as a marketing tool is given to the consumer size or unit package. This is the traditional package of the supermarket and other retail outlets. It must protect the contents, provide a method of storage at the point of sale, display and identify the product, carry a selling message or design, provide information on the use of the contents, offer convenience in dispensing and use, and so forth. The unit package is what is usually meant in any discussion of packaging and this is what has been allied most dramatically with recent widespread changes in methods of retailing.

The kinds of unit packages available today vary widely in appearance and performance, each with its own properties and characteristics of value. Typical unit packages are illustrated in Figure 7. In many cases there is an overlap of function so that the packager has a spectrum of packages from which to choose, depending on the balance desired in appearance, performance and cost. The most important unit packages are the folding box, the glass bottle and jar, the "tin" can, \(^\text{15}\) Bulk shipments may include, as a subgroup, segmented loads, e.g., palletized and strapped materials.
FIGURE 7

CONSUMER UNIT CONTAINERS

(1) Flexible film packaging
(2) Metal tube
(3) Film-tray
(4) Shrink-pack film
(5) Squeeze bottle
(6) Steel can
(7) Glass jar
(8) Liquid holding paperboard carton
(9) Folding carton

Source: Author's collection.
the rigid plastic container, the flexible fill container (either metal or plastic), the flexible plastic "squeeze" container, the paper bag and many variants of these. For example, the unit serving of jelly, ketchup, and other condiments, now in increasing use in restaurants, is a variant of a rigid plastic sheet laminated to a flexible film. The familiar bacon package is a combination of paperboard and plastic film. The blister and vacuum packs are generally variants of rigid molded plastic sheets to which facings of film are laminated. In turn, individual unit packages may be banded together to form saleable groups of packages, as in the paperboard carrier for bottles and cans, or the multi-pack, which is a banding of paperboard or tape about, usually, 3 to 6 individual unit containers. Some idea of the variety of present consumer packages can be gained from Tables 2 and 3 which present the value and production of selected containers in 1940, 1950, 1960 and 1961.

Individual containers are almost always packaged in master, or shipping, containers. Major shipping containers are shown in Figure 8. In today's distribution system these are usually corrugated containers, with a small percentage being the closely related solid fibre container.

The shipping container, however, has extensive uses other than as a master package. It is frequently a unit container in the shipment of large volume industrial goods, such as foods, chemicals, paper and metal products. A plastic bag or liner inside the corrugated container often permits it to carry liquids and semi-solids.
FIGURE 8
STANDARD SHIPPING CONTAINERS

Corrugated Container

Multi-wall Bag

Wirebound Wood Box

Steel Drum

Source: Author's collection.
Wooden containers still play an important, although diminishing, role in the shipping container field. Wooden shipping containers are primarily of two types: nailed wooden boxes and wirebound boxes. In the latter, veneer segments are bound together with steel wire to form an effective but inexpensive container. Plywood and related materials are also used to some extent.

The last major class of shipping containers is the shipping sack made of multi-wall paper or heavy plastic film used extensively for such products as fertilizer and feeds, cement and chemicals. The former consists of laminations of several plies of heavy kraft paper often containing special purpose layers of plastic film or aluminum foil.

There are other shipping containers, usually for special conditions of shipment. These include collapsible, large rubber balloon-type structures and large metal returnable bins.

A recent trend has been toward the shipment of materials in bulk, thus avoiding the cost of any packaging or the disposal of packaging material. Materials such as chemicals, many fluids, flour, cement and the like are often transported in tank cars or trucks, hopper cars or flat railroad cars with demountable bins. Sometimes these materials are unit packaged near the point of use. On other occasions they are used directly as they arrive from the bulk shipper.

The Functions of Packaging

Packaging includes the successful performance of a series of functions, all of which are interrelated, and failure in any one of
which will destroy the general utility of the package. Obviously, performance in any subfunction can vary from barely acceptable to excellent, while the general adequacy of the package as a whole is a reflection of the composite of individual functional suitability.

Some of these functions are of vital importance throughout the life of the packaged goods; others are important only on specific occasion and under specific circumstance.

Obviously, packaging must protect the packaged contents. This is not always easy, for, under modern conditions, national producers serve far-flung markets through often extended channels of distribution with the ultimate consumer distant in space and time. Further, this overriding necessity can be and at times has been obscured by the performance of other functions, notably selling. Yet, unless the packaged product arrives at its final destination in usable condition, the values which have accrued during the several stages of extraction, conversion and distribution are wasted.

Packaging must also lend itself to the unitizing, storage, and transportation of goods. In a sense, this is an extension of the function of protection, but considered from a different aspect. The demands of an intricate and interwoven system of inventory and transport must be met with a minimum of cost, confusion and waste.

Packaging has an important role to play in the specific mercantile function of exchange — buying and selling. The development of this role and the present utilization of packaging in it will be considered extensively in a later chapter.
Finally, packaging must meet the requirements of the law and of the society in which that law is an expression of practice and need. Here the role is a dual one: the legal requirements affecting packaging usually deal with specific commitments for the guidance of the buyer, e.g., that description of the contents which will be most truthfully informative. This is an amelioration of the usual caveats that afflict the buyer, set forth in the light of the difficulty that a purchaser has in assessing the worth of hidden contents. The social expectations which packaging must fulfill are more subtle, and are part of the changing pattern of interrelationships in our society which deal with the responsibility of manufacturers and merchandisers to the public.

Each of these functions will be treated in separate chapters enlarging on their several aspects. However, before dealing with the functional aspects of packaging, it seems advisable to trace its development through the evolution of the various packing materials, to the origin of the material-functional complex of "packaging." This overview of the history of packaging and its material parts should provide a useful background in understanding and assessing the impact of packaging today.
CHAPTER II
THE TRANSITION FROM PACKING TO PACKAGING

Packaging has been described as a process, a part of the dynamics of marketing in which the packaging material itself plays a role. Packing, or the act of incorporating a product into a physical container is but one segment of the packaging process. The other is the brand identification of the product. Without the distinguishing symbolism of the brand name or trademark, and the accompanying serial steps of the distributive activities of merchandising, including advertising, direct selling, sales promotion and store distribution, packaging as a subject is barren. Packaging (as a marketing process) facilitates the transfer of goods from physical production through the intermediary steps of wholesale and retail distribution to final purchase by a consumer.

The Development of Packing Materials

The practice of packing extends back into prehistory. Anthropological studies\(^2\) have shown the dependence of cultural growth upon some means of storing and transporting goods, usually foods, which was essential to free a hunting society from dependence on immediate, day-to-day food gathering activities. The development of such packing practices is a mark of cultural level in the classification and study of the societies of early and primitive man, and the transfer of such knowledge by acculturation and diffusion is a recognized mark of progress of mankind through tool learning and use. The making of clay pottery for liquid storage was one of the earliest arts,\(^3\) and the basic functional purpose provided a sound foundation upon which many early societies built lovely and distinguished superstructures of artistic developments. Even where art did not lead to such developments the use of materials at hand, such as hides and gourds, was a basic necessity in the material progress of the society.

The Unit Container

A distinction was made earlier between the unit container which encloses the goods, and the master or shipping container which usually holds a number of unit containers. The first containers were unit packages. Some early historical examples are shown in Figure 9.


FIGURE 9
HISTORICAL PACKAGES

Hat Box, circa 1820
Whiskey Bottle, circa 1824
Snuff Bottle, circa 1805

Metal Box, 1923
Uneeda Biscuit Box, 1899

Source: Hat Box courtesy of Atwater Kent Museum, Philadelphia.
Uneeda Biscuit Box courtesy of National Biscuit Company.
Others from author's collection.
The glass container

The use of glass is now so commonplace that the drama of its origin is somewhat concealed. It represents the first of the truly transmuted packing materials, differing radically in concept from the merely adapted ones, viz., the gourd, the hollow log, shaped clay or tanned hides and skins. Ancient (circa 2000 B.C.) Egyptian bottles and jars were made either by pulling glass threads with a metal rod from a pot of molten glass and winding the strands around a sand mold, or by dipping the sand mold into a pot of molten glass, shaping each new layer with a wooden paddle. The expense of this procedure restricted these containers to the very wealthy, who used them as "tear bottles" to catch the tears of mourners at funerals or for rouge and kohl, the popular cosmetics of the day. Not until about 300 B.C. did an unnamed innovator invent the process of blowing a bubble on the end of a hollow rod to form a cavity. Still later was added the idea of shaping the resultant bubble in a mold, to obtain some degree of uniformity of shape. By the time of the Roman Empire, glass had in large measure replaced leather bottles and skins and the first tentative thrust to packaging occurred. In the first century Petronius reported that he saw wine in "glass bottles, carefully sealed. On the neck of each was a label thus marked: Opinian Falerian: one hundred years old." One might mark this as an early trend to fraudulent

4 The History of Glass Containers, Glass Container Manufacturers Institute, Inc. (New York, undated), pp. 2-3.

5 Ibid., p. 6.
advertising as well. In any event, the tendencies toward both pack-
ing and advertising were temporarily obliterated in the long, steady
decline of the Roman way.

Glassmaking was resurgent in Venice of the 13th century and
soon spread over all renaissance Europe. When the second expedition
of the London Company arrived at Jamestown, Virginia, in 1608, they
almost immediately built a glass factory which produced sporadically
for export until 1624. By the latter part of the 17th century, glass
factories were well established in the colonies primarily for the rum
trade. Wistar and Stiegel glass became famous examples of beauty and
function. After the Revolutionary War, glass factories increased in
numbers and moved to the interior states.

The work done in France, by Nicholas Appert, from 1795-1809 on
the development of foods preserved in glass was shortly followed by
American plants, in 1819. In 1841, the first nursing bottle was
patented, to be followed in 17 years by the still popular mason jar.

6This was the first factory of any kind in the English Colonies,
whose product formed part of the lading of the first cargo exported
from those shores. Glass Containers: Yesterday - Today - Tommorrow,
a reprint of talk available from the Glass Manufacturer's Institute

7The work of "Baron" Stiegel is immortalized in the story of the
man who donated ground to a Lancaster, Pa., church for an annual rental
of one red rose.

8The man who answered Napoleon's call for a method of food pre-
servation that would better enable his army to travel on its stomach.
In return for the development of the first new method of food preser-
vation since the dried or salted foods of ancient days, and the
founding of a great industry, he received a reward of 12,000 francs,
which he promptly invested in the infant industry he created.
In the middle 1880's, the first milk bottle was developed and gave enormous impetus to the industry. But glass containers, despite increased demand, were still limited by basically the same manufacturing techniques that had existed for many centuries. The breakthrough came in 1903, with Owen's development of the automatic bottle machine. Examples of applications proliferated as the industry grew to its present status.

The metal container

The use of metal containers is a relatively recent development aside from the individually made chests and boxes which date back to early Mediterranean societies. Widespread use depended on the prior development of methods for economical large-scale production of sheet steel, and on the concomitant development of methods for coating sheet steel with protective metals. The dawn of the 19th century witnessed the birth of the canning industry which became the first large-scale outlet for metal in packaging, although the initial output of the cannery was packaged in glass. By 1806, the work of Nicholas Appert in canning had reached the point of successful culmination. The process rapidly spread to England, where, in 1810, patents were obtained for the use of iron and tin containers in preserving food. By 1813, the British Navy was testing food in cans and within a few years was being

---

9Most first class anthropological and art museums have display examples of high craftsmanship from several diverse cultures, some preceding the Minoan era. In biblical context the Ark of the Covenant was a container, readily transported to the wars.
regularly supplied by such foods. Tin-coated steel cans were widespread in commerce after 1839, based on an invention by Peter Durard, an Englishman.\textsuperscript{10}

Many ingenious metal packages were developed in this period. Canned salmon was on the market in 1865, meat was canned in the Argentine before 1875 and pineapple was canned in Honolulu\textsuperscript{11} in 1901. Can manufacturing machinery kept pace with the rising demand. By 1885, automatic can-making machines in the United States were capable of producing 1,500 cans per day. The vacuum tin, developed for tobacco in 1898, gave impetus to the use of metal packaging. Thereafter, canning became a commonplace.

A recent innovation is the use of aluminum in cans used for beverages. There are other forms of metal packaging materials, primarily the collapsible tubes and foils. The former may be made of lead or tin; however, aluminum is the dominant material. Lead was early made into sheet, and the sheet then wrapped about contents to make a container. However, the commercial use of collapsible containers dates from 1841, when a patent was issued to John Rand for collapsible tubes to hold Devoe and Raynolds artists paints.\textsuperscript{12} From this, use rapidly expanded into drugs, cosmetics and similar

\textsuperscript{10}The History of Canning, National Canners Association (Washington, D.C., undated reprint).
\textsuperscript{11}Gray, op. cit., p. 642.
materials. Foil is primarily of aluminum and is a post-World War II phenomenon. It has found wide application as an adjunct to other packing materials, and more recently, in preformed packages.

The paperboard package

Paperboard is differentiated from paper by the thickness of the sheet. It is a relatively recent derivative from paper, although some evidence of related materials shows considerable antiquity.

Paper has had a fascinating history as one of mankind's major inventions. Some agreement exists that it is a Chinese invention, by Ts'ai Lun in 105 A.D.\textsuperscript{13} The Egyptians of course, had been writing on papyrus for some 2,000 years prior to this but papyrus is not a true paper. To the Chinese is ascribed the credit for breaking apart the cellulosic fibres of mulberry bark, and reconstituting these as a mat made from a water suspension. Knowledge of paper manufacture\textsuperscript{14} spread to Baghdad and Damascus by 800 A.D. and to Morocco by 1000 A.D. It reached Spain via the Moors by 1150 A.D. and disseminated through Europe, reaching England belatedly in 1494. The shortage or non-occurrence of mulberry bark in many parts of the world forced the use of other materials, notably cotton, linen, hemp, jute and other natural fibres.

Paper manufacture remained essentially a hand process until two


\textsuperscript{14} Harry J. Bettendorf, Paperboard and Paperboard Containers (Chicago, Board Products Publishing Company, 1946), p. 2.
great inventions which followed closely on each other's heels: the Fourdrinier machine in 1801 and the cylinder machine in 1809. These two paper making devices, each a giant factory in itself, formed the technical basis for the enormous jump in paper and paperboard consumption of recent years.

Paperboard boxes were being handmade by the end of the 18th century, frequently consisting of layers of paper laminated together to form a stiff board. The Chinese made such boxes for tea export and the English made them for patent medicines, candies and cosmetics.

Box making was practiced in America prior to 1785 but only as a specialized art. Early box making was devoted mainly to hat boxes, but the expense of such boxes precluded their use from all but wealthy travelers. Paperboard jewelry boxes were also made by hand about this time and frequently were so decorated as to be attractive possessions in their own right. The set-up box of this type (e.g., a rigid box which is manufactured and shipped completely assembled) reached its acme in English boxes of the late 19th century. One such used by Cadbury in 1884 is referred to in the trade literature of that year as follows:

This charming little bijou cabinet is adorned on its four irregular sides with pleasing colored designs, whilst the fixed top is usefully cushioned in velvet. On opening the back, three drawers are disclosed, filled with delightful

15Ibid., pp. 34 and 40.

16The Atwater Kent Museum, Philadelphia, Pa., has an especially attractive collection of hat and other boxes.
creams. As a present for a lady we can conceive of nothing prettier, for after enjoying the sweets, she still has left a useful receptacle for her trinkets and an elegant adornment to her boudoir.\textsuperscript{17}

All of this appears reasonable at a guinea.

The paperboard (folding box) revolution in packaging, like so many useful ideas, was born of an accident. The earliest form of folding box was called a "paper of tacks"\textsuperscript{18} and was developed somewhat before 1850 to handle the difficult problem of packing tacks. Basically, it was a sheet of paperboard wound over a wooden block or mandrel into which tacks were poured, after which the end was tied with string.

Within a few years, early types of folding boxes were being made. These were blanks with hook or lock catches at the corners, to be set up from the folded form by the users. These boxes of necessity were hand cut, creased and glued; they were used extensively for clothing, laundry and bakery goods. Paper bags were also in use at this time, usually for goods such as seed.\textsuperscript{19}

The fateful accident noted above happened when seed bags were being printed and a printing rule was maladjusted, thereby cutting the bags rather than printing. This occurred in 1879 at the New York

\textsuperscript{17}Gray, op. cit., pp. 639-40.

\textsuperscript{18}Bettendorf, op. cit., p. 7.

\textsuperscript{19}In 1852, Francis Walle of Bethlehem, Pa., patented a bag making machine but use lagged until 1869 when the Union Company of Pennsylvania developed an improved version. See Lawrence A. Johnson, Over the Counter and on the Shelf (Rutland, Vermont, Charles E. Tuttle Company, 1961), pp. 32-3.
plant of Robert Gair, a pioneer in the packaging field. Realizing that the cutting and creasing of paperboard on a printing press would immeasurably speed up the operation over hand manufacture, Gair rapidly developed sharp-edged printing rules designed to cut, rather than print.

Within the next few decades the use of folding boxes spread rapidly, especially for items like soaps, horse powder and cookies. By 1900, Quaker Oats was being packaged in folding boxes to follow up the first significant marketing development in packaging, the packaging of Uneeda Biscuits in a folding box with an overwrap of paper in 1896. From this flowed dramatic changes not only in packaging but in all retailing.

**Plastic packaging**

True plastic materials in packaging date, for all practical purposes, from the end of World War II. These materials arose first as films in competition with cellophane (a form of paper) but quickly succeeded in surpassing the performance and capabilities of that material. Developed in France, cellophane was commercialized in the United States by the Du Pont Company in 1924. But cellophane has

---


been primarily limited to a component part of the package such as overwraps and windows rather than creating new forms of packaging as have plastics.

Polyethylene, developed in 1930, was first used in packaging in England,\(^2^3\) in 1945. Technical difficulties slowed its growth initially, but by 1960 polyethylene film surpassed the use of cellophane in England for the first time. From this application grew many related ones, all dependent on advancing technology and the creation of new plastic materials. Among the most prominent developments are skin and blister packaging, whereby small items not easily packaged otherwise are placed on a card and a shrinkable plastic film overwrap is used. This package is also used for ham, turkey and similar foods to provide a tight skin to seal in fluid and flavor. Vacuum forming in which goods are placed in depressions preformed in a plastic sheet is a related packaging form.\(^2^4\)

The use of plastic film has gained wide acceptance both because of its transparency (which provides a visual support to impulse buying) and because of its ability to create pre-measured servings of small units. The transparency of plastic packages led to their use in

\(^{2^3}\)Ibid.

\(^{2^4}\)The key development was the Armour bacon package, marketed in 1947, based on developmental work dating from the late 1930's, by S. H. Berch, the president of Arden Farms, a West Coast dairy. "The Flexible Vacuum," Modern Packaging, Vol. 33, No. 10 (January, 1960), pp. 100-1.
certain foods which are appetizing in appearance, viz., ice cream, salads, cheeses.

The first practical example of molded flexible plastic packaging was developed in 1947 by a cosmetics manufacturer, Jules Montenier. The use of a squeezable polyethylene dispensing bottle to market an underarm deodorant made a significant impact on merchandising techniques. The success of this application brought a host of related ones.

Molded rigid containers also date from this period. One of the first such containers to be used on a large scale was the Gillette Blue Blade dispenser first used in 1948.

**Shipping Containers**

In the distant past shipping containers, designed to transport as much bulk as feasible, were also the practical unit containers. In many cases, the size of the container was limited by the nature of the techniques and materials available. Leather wine bottles, for example, could be no larger than the animal who furnished the hide, prior to the development of liquid-tight stitching. Clay pottery came in a wide variety of sizes and very large jugs were used to transport wine and oil over long distances.\(^{25}\) When these reached the destined market, the merchant would dip from them to fill the purchaser's jug or pot.

\(^{25}\)The legend of "Ali Baba and the Forty Thieves" is technically possible in this regard.
Wood

The earliest formal shipping containers were of wood. Prior to their adoption, goods such as metalware were commonly wrapped in heavy rugs or other cloth for temporary protection. The development of the cask was a major invention, ascribed by the Roman, Pliny, to the people of the Alpine Valley. The use of barrels, casks and related containers in the field of cooperage extended the range of shipment and travel. The importance of cooperage can hardly be exaggerated. To it, or rather to its lack, has even been ascribed the defeat of the Spanish Armada, for when Drake burned the oak staves drying in the sun at the beach of Sagres, he left the Spanish fleet short of fresh water and fresh food, easy prey to wind and storm.

Oaken cooperage played a vital role also in the development of the famous triangular colonial rum trade when rum was shipped in casks.
from the West Indies to the New England Colonies for bottling. 29

Large scale use of wood of necessity had to await the development of machinery for making nails cheaply and in quantity. When such machinery was developed, shortly before 1800, nailed wooden boxes became much more common and, in fact, the dominant packing material of the 19th century. The Civil War did much to further this development. The first veneer containers were made in the United States between 1830 and 1840; in the latter year a patent was issued for the rotary cutting of veneer from logs. 30

Metal

The manufacture of steel shipping containers (drums) had to wait, as did the steel can, upon the development of a sheet metal technology, including methods of joining by welding. Introduced in 1902, the utility of these heavy containers for fluids and semi-fluids swiftly became apparent and their industrial use grew rapidly.

Paperboard

By far the most important shipping container in use today is the corrugated box. Essentially this consists of three sheets of paperboard, two faces or liners and an inner layer, or corrugating medium. This medium has wave-like forms, or flutes, which determine the distance between the two facing sheets to which the medium is

29Johnson, op. cit., p. 8.

joined by adhesives on the flute edge. The whole structure provides a high strength to weight ratio at minimum expense.

The concept of corrugating paper to increase its cushioning ability arose with Healy and Allen in 1856 in England but was perfected by Albert L. Jones, who received a patent in 1871 on the corrugating of paper for packing bottles. Some experimentation by early manufacturers in the field (Gair, Oliver Long) followed, which led to gluing one liner or face to the corrugated material. By 1882, the standard double faced corrugated board was developed, at least in a primitive form, and in 1894 the Thompson and Norris Company was making the first corrugated boxes for express shipments.

To a freight handling system used to heavy boxes, the corrugated cases appeared cheap and flimsy and resistance arose to their use by the railroads, Wells Fargo and other agencies. This resistance evaporated after a few years, at least for the shipment of light goods, when improved design and materials plus experience with the container proved favorable.

A major step forward was made in 1903 when an exception was obtained to the Official Freight Classification, permitting the use

---

31 A detailed discussion is available in Bettendorf's Paperboard and Paperboard Containers, op. cit., Chapter 8.

32 A publication of the Official Freight Classification Committee, New York, a group composed of Eastern railroads which meet to decide and standardize matters of classifying goods for freight purposes and allied matters dealing with handling, packing, etc. Similar committees obtain for Southern and Western roads.
of corrugated containers to ship cereal packages; this was extended in 1905 to permit the shipment of fruit jars. By 1906, corrugated containers were officially accepted by the Freight Classification, but only at a penalty of 10 per cent, a penalty removed in 1908. Following this general approval in 1906, corrugated boxes were adopted for glasspacked goods, starch, sugar, baking powder, hardware and many other items. Canned goods, believed first packed in corrugated in 1907, were generally shipped this way by the beginning of World War I.

The final barrier to full acceptance fell in 1914 with the Pridham Decision. Prior to that time, corrugated boxes were still considered primarily as a substitute for wooden boxes and were subject to restrictions and penalties by common carriers. The R. W. Pridham Company, in planning a West Coast packing plant in 1912, objected to freight tariffs which penalized the use of corrugated and solid fibre cases in lieu of wooden boxes. The decision in favor of the company removed the last real barrier to the growth of the corrugated industry which took advantage of a rapidly developing technology in product improvement and manufacture to burgeon its output.

Besides the inexpensiveness of the container, and the better protection provided contents because of the cushioning effect of the

---

33 Interstate Commerce Commission, Docket 5273, April 6, 1914.

34 Solid fibre boxes consist of layers of paperboard combined by an adhesive, rather than two faces separated by a fluted sheet. Solid fibre and corrugated are usually treated together.
corrugating medium, the uniform properties and appearance derived from its manufacture permitted the corrugated case to offer for the first time a smooth surface suitable for fine printing. This characteristic was ignored for much of the initial introductory period but in recent years has been recognized increasingly as important. New methods of printing, lithography and half toning have permitted some startling illustrations to be made so that the creation of an attractive shipping case is no longer a novelty. This ability has been enhanced by the growing use of white exterior liners in place of the standard brown kraft paperboard.

Other shipping containers

Multi-wall bags were described in an earlier section. Fibre drums, developed in 1910, have found a place in the shipment of certain solids and semi-solids which do not require the high degree of protection of steel drums. Textile bags, woven of jute or hemp, are old in history but still established items of commerce. New developments in plastic containers are providing new materials of packing for special products and situations. But, by and large, the packing materials discussed above form the bulk of the industry.

Packing Into Packaging

The origins of packaging are diffuse. It is difficult to point to a clear delineation in time before which it did not exist and after which it was full blown. Some scattered examples of

35Bettendorf, op. cit., p. 103.
packaging date from the 17th and 18th centuries. Before the era of modern marketing, the separation between packaging and packing grows dim.

Packaging is the "art and science of packing merchandise to increase its sales"\(^3^6\) and, as such, is tied to the development of branded goods.\(^3^7\) With few exceptions the concept of branded goods is less than two centuries old and the origin of the earlier brands lay in the identification of the source\(^3^8\) rather than a conscious attempt to create a separate merchandising identity for the product. The marriage of packing and branded goods gave rise to packaging which, from its inception, has been part and parcel of marketing.

Some of the earliest entries in the field of branded goods occurred in England. These were patent medicines whose virtues were highly praised and somewhat exaggerated by the maker.\(^3^9\) In 1711, the Spectator printed an advertisement for "a most incomparable Paste for the Hands...A Hand cannot be so spoil'd but the Use of it will

36Gray, op. cit., p. 632.

37See earlier discussion. Packaging attempts to promote and maintain the brand image created by the packager in furtherance of his marketing goals.

38For example, the liqueur products of some old monasteries, viz., Benedictine.

recover them... at 1 s. 6 d. a pot, while two other products — Dr. John Harper's Female Pills (1743) and Dr. James' Fever Powder (1746) — illustrate that advertising, via handbills and newssheet ads, found a common origin with packaging in the creation of brand identities. Yardley's Lavendar Water, bottled in 1770, Crosse & Blackwell's olive oil and mustard, and A. & F. Pears packaged soap in 1789, further strengthened the creation of brand identities. These firmly established the manufacturer's name and credit behind his product which, in its turn, was made known to prospective customers by advertising and distinctive packaging.

The end of the eighteenth century and the beginning of the nineteenth saw the introduction of many branded products famous in the marketing literature and, in some cases, available still on the retailer's shelf today. In 1781, Dr. James Baker of Massachusetts took his already famous chocolate and packaged it under the brand name of "Baker's", surely a most fortunate combination of surname and use. The development of Appert's invention of canning (in glass and metal) brought forth many more.

But it was not until the latter part of the 19th century that brand names, and with them distinctive packaging, began to proliferate.

42 Johnson, op. cit., p. 60.
Some of the brands of that period include: John A. Andres & Company, Our Triumph Tea, 1876, a tin box with the complete story of the Boston Tea Party on the lid; Joseph Burnett's Vanilla, 1847; Enoch Morgan's Sons Sapolio, 1869; Charles William Posts' Postum, 1895; Pearl Wait's (later sold to Orator Frank Woodward) Jell-O, 1897; William Underwood's deviled foods, 1821; and Gilbert C. Van Camp's Pork and Beans - Boston Brand.43

The classic package innovation44 was the National Biscuit Company's Uneeda Biscuit box, 1899, which relegated the cracker barrel and all it connoted to the pages of history. The importance of this development is hard to overestimate. It was the turning point in a force which had been gathering impetus for some time, but which was still not fully established. Prior to this package both American and British consumers were possessed of an innate skepticism which retarded the acceptance of packaged products. Despite the stream of packaged foods, drugs, soaps and cosmetics coming onto the retail scene throughout this period, compared to the total number and types of goods available those items which were packaged were few indeed. There was

a deep core of prejudice against foods that couldn't be seen, sniffed, handled, and tasted, and years of "we never done it that way" to overcome. Early packaged goods were a curiosity

43A broad discussion of the introduction of branded products on the American retail scene is available in Johnson, op. cit., Chapter 4; see also Gray, op. cit., p. 633 and Bettendorf, op. cit., Chapter 7.

to be approached with caution, and manufacturers were as cautious as their customers. Whether manufacturers discovered packaging by accident, had it forced on them by competition, or recognized its advantages from the start, store shelves all over the country soon burgeoned with bright red, green, blue and yellow packages, decorated with eye appealing trademarks and fine print advertising claims.45

Again, there were fears, often well founded,46 of tainted foods, adulterated products, and short weights, carefully hidden behind a packaging facade. Except in a few cases, confidence had not been established in the minds of the consumer that the packaged product was as represented and that the package was not a medium for hiding, rather than disclosing, the true contents. To some degree, as discussed in a later chapter, this fear is with us today.

The National Biscuit Company was formed in 1894 from a number of cracker bakers in one of the mergers so popular and typical of the time. The cracker of that period was a form of "hardtack," shipped in barrels that gave their name to a period and method of retailing. A new cracker was developed, based on a soda flour, that was considerably more delicate than the hardtack version but that required protection from breakage, moisture and the contained oil's becoming rancid. A folding carton was developed (modified from Gair's development of 1879) with an inner wrap of waxed paper and an outer printed, decorative

45Johnson, op. cit., pp. 95-6.

46A British journal, Tricks of Trade, reported in 1856 that coffee was often adulterated with barley rye by 25 per cent. See also Stuart Chase and F. J. Schlink, Your Money's Worth (New York: The Macmillan Company, 1931), pp. 20-26 and 134.
overwrap. This package was advertised in a national campaign, in newspapers and on billboards throughout the country. The cracker, the package and the advertising campaign were all phenomenally successful; manufacturers of related products were quick to adopt all three.

The creation of this package did more than any other single development to reinforce the growing trend to packaging. It contained all of the elements of packaging for the first time in a product distributed on a national scale: protection, uniqueness, dispensing, consumer appeal, easy distribution, and tie-in with other merchandising efforts. It is possible to say that packaging came of age with the impact of the Uneeda Biscuit package.

CHAPTER III
PACKAGING AND THE FUNCTION OF PROTECTION

With the background of packing and packaging established, it is now appropriate to examine in some detail the functions expected of packaging. The first of these is protection.

Consumer and industrial goods are packed in the condition in which they emerge from the manufacturing or handling process. During the succeeding stages of marketing — factory storage, transportation and shelf existence — and after purchase, in the buyer’s home or business, this condition must not be degraded or deteriorated. If packaging permits the decay of the values originally included, it has failed its initial function.¹ To illustrate, metal goods in process are commonly treated with rust preventatives so they will not oxidize within the plant.² Once the product leaves the plant, however, if it is a packaged good, it must rely on the package to act as a barrier,


staving off decay in its many forms until the product is consumed.

It is not possible for packaging to fulfill its marketing function without considering the technical characteristics and properties of the packaged goods. The kind and degree of protection required of packaging is determined by the requirements of the market, but the method is based on technology. For example, the marketing requirements of a breakfast food dictate that the product must withstand a warehouse storage period of so many weeks and a shelf period of so many days without becoming stale, or rancid, or tasteless, or soggy. The period of time required to consume the contents after purchase is also a factor; if the goods are not consumed all at once, protection must be retained for a reasonable period. Extended shelf life is a major marketing tool. Thus, good marketing in many cases is based on good technology.

The protection afforded the contents by the package must be available at several stages in the life of the product:

... at the end of the production line,
... during in-plant storage,
... during handling in plant and to the transportation medium,
... during transportation,
... during storage in a manufacturer's, distributor's or retailer's warehouse,
... on the shelf of a retailer,
... in the consumption process of the packaged product if it is not used all at once.

Such protection must guard against any of the following influences which tend to deteriorate the contents:

... physical breakage from rough handling, crushing or shock, biological degradation,
contamination by dirt, chemicals, moisture, fumes or other noxious or toxic elements,
instability due to the action of time, light, air or other physical or chemical influences,
absorption of tastes or odors foreign to the product,
loss of contents due to leakage, spillage, evaporation or other,
loss of identity through improper marking, marring or scratching,
pilferage,
temperature extremes

All of these possible hazards can be summarized as distribution hazards, which embrace packing, handling, warehousing and transportation activities. They fall into three major groups discussed below.

1. Environmental Hazards. Protection against ambient environmental conditions is a major factor, since any of the following may severely damage the contents:

heat: which could induce melting, spoilage, bleeding, blistering, peeling, fusing or discoloration.
cold: which could induce cracking, freezing, brittleness.
water: to prevent dissolution, dilution, separation, corrosion, illegibility, discoloration.
water vapor: to prevent corrosion, lumping, blocking, pitting.
pressure: to prevent bursting, collapse, displacement.

A study by the National Safe Transit Committee of the Association of American Railroads concerned the shipment of major appliances and allied metal products over a five-and-a-half year period. The

---

3The following discussion is largely patterned after a recent technical text. See Walter F. Friedman and Jerome J. Kipnees, Industrial Packaging (New York, John Wiley and Sons, 1960), pp. 38-53.

4Ibid., p. 40.
study revealed a definite pattern in the seasonal trend of product shipping damage, with July the most common month in which heavy damage occurred, and other warm months following closely. Further study revealed definite regional patterns as well; for example, damage is heavy for products which must cross deserts in summer.

2. Physical Hazards. These include both dynamic and static stresses and loads caused by the physical movement and storage of goods. Packaging must protect the product against one or more of the following, depending on the fragility of the goods:

vibration: to prevent scuffling, marring, abrading, loosening, fracture, misalignment, etc.
impact: to prevent crushing, breaking, cracking, distortion and shifting.
puncture: to prevent leakage, sifting, denting, contamination.
compression: to avoid crushing, buckling, bending, deflection.
miscellaneous: conditions of tension, tearing and other stresses.

Much of the physical damage that occurs to the goods is due to shocks incurred in plant handling and shipping. These shocks can range from the results of dropping the product to those sustained when a plane lands or when a freight train is "humped." Most of the other hazards noted above occur in loading or stacking containers, or under storage conditions in the warehouse.

3. Miscellaneous Hazards. The most important of these which

---

5Humping is the practice of assembling a freight train by rolling cars into one another. While all railroads try to control this practice, considerable damage still results from it.
a package must protect against are:

microorganisms: to prevent decay, primarily that caused by mold and bacteria.

insects and rodents: to prevent spoilage by contamination and by their eating the contents.

pilferage: to prevent ease of removal.

Contamination by microorganisms is of primary importance in foodstuffs, drugs and medical supplies and certain soap compounds. In foodstuffs, much technological development has been undertaken to prevent decay from the natural presence of bacteria, fungi, or protozoa. Such decay may simply spoil the contents or may induce toxic substances which are deadly when consumed. A recent case in point is the improper canning of certain shipments of tuna fish which resulted in two deaths in the Detroit, Michigan area. Most (but not all, viz., drying) processes which delay or control food spoilage are absolutely dependent upon the efficiency of the package, whether the goods are packaged first and then processed, or processed first and immediately packaged under antiseptic conditions.

Insect and rodent damage is obviously undesirable; this can usually be eliminated by proper packaging or treatment of the packaging material to make it less tasty to the pest. Such treatments are frequently undertaken for goods shipped to tropical climes where insects, rodents, mold and other fungi form an everpresent threat.

Pilferage is a major hazard throughout all stages of production, shipping and marketing. The "evaporation rate" of goods is high enough to be a real cost which must be calculated and included in the markup obtained at all transaction levels. Several major devices have been employed in packaging to reduce pilferage losses from shipping containers. One is to make the master container itself, while not impregnable, at least difficult to open; taping, stapling and other devices have been used to this end. In the case of certain high value goods (liquors, clothing) the manufacturer may resort to not labeling, or labeling in codes to reduce temptation. Another device, one which serves dual purposes, is "containerization" or the packaging of many shipping containers in one large van-type container. Containerization discourages thievery because the steel, wood or plywood van can be locked; it also simplifies transport. Containerization will be discussed in more detail in the section on transport.

Pilferage at the retail level amounts in some cases to one or two per cent of the value of goods. Department stores, variety stores and supermarkets are especial targets for pilferers and must constantly be on guard against such losses. Packaging has been employed

---

7This is not an uncommon occurrence especially with unbranded items or items branded after initial shipment. Information on this was developed from interviews conducted during several marketing research studies by the author. See also Edward Dahill, Container Hazards in Transportation, Consumer Marketing Series, No. 6 (New York, American Management Association, 1931), p. 62.

to reduce such losses where practicable, usually by the packaging of inherently small items in larger packages or in multi-packs where several units are physically tied together.

These considerations of protection apply primarily during the life of the product from the time it comes off the end of the packaging line until it is purchased by the final user. A degree of protection is also required while the contents are being consumed, if they are not used all at once. This is true of many consumer products: coffee, cereals, soap, etc. Naturally, the product will not be so well protected after the package is opened but some degree of retardation of staling, spoilage, wetting and other conditions is desirable and usually obtainable.

There is another hazard about which the package can do little except indirectly: misuse. The sole method by which a package can guard against misuse is through a proper label. However, the presence of proper identifications or instructions for use is no guarantee against misuse by housewives who will not, or children who cannot, read. One step that has been taken is the development of safety caps for drug and cleaning compound containers which are difficult for children to remove.

Finally, of course, the package is expected not to contribute to the degradation of the contents. This is especially true
concerning odor and taste. The package must be essentially neutral. In practice, consumer complaints and dissatisfaction in this regard arise because of the imperfections of packaging, especially with metal (steel can) and with paperboard packaging, which at times supports mold.

Packaging may actually enhance the physical value of the goods as well as play the more passive role of barrier to decay, by permitting desirable changes to occur. Certain materials "age" while stored or packaged and gain in value by so doing. Wine and certain liquors are the outstanding example, but similar conditioning or ripening applies to many other fields: metals, plastics, chemicals and foods.

Food Processing and Protection

Some allusion was made to the newer methods of food processing and the interplay of these and packaging. This is worth illustrating in more detail. Just as major segments of modern marketing were made possible by packaging — a thesis developed throughout this paper — which segmented, unitized, and identified the goods, major segments of food technology demand and create new marketing procedures and methods dependent on packaging. Certain technological developments could not be carried forward if there were not a ready built system of

---


distribution available to them to justify the large-scale investments in research and production that are required. These developments can create whole new methods of distribution that better suit their needs or take advantage of their peculiar properties in a way not previously possible.

An example is the frozen food industry, with all it requires in production, warehousing, retailing and home cold storage facilities.\(^{11}\) Food freezing, which developed commercially in the late 1930's based on patents issued to Clarence Birdseye\(^{12}\) gave rise to a new class of packaging material, "special food board", a form of kraft paperboard made from bleached virgin wood fibre, used in folding cartons for food.

Irradiation of foods is another new method of processing. It depends on the use of ionizing radiation, usually from nuclear byproducts, to destroy the microorganisms which promote food decomposition and spoilage.\(^{13}\) Since 1953 both the Department of Defense\(^{14}\) and

\(^{11}\)Another is the vending machine method of retailing.


\(^{13}\)Benjamin R. Briggs, Jr., "Revolution in Food Packaging," Bulletin of Southern Research Institute, Vol. 10, No. 3 (1957), pp. 4-8.

private firms have seriously studied irradiation of foods because, if successful commercially, it could have a vast impact upon food processing and marketing. It would provide a very long shelf life under room temperature conditions; under refrigerated storage the shelf life of some products could be almost indefinite. The disadvantages inherent in canning and freezing would not be present: canning frequently lessens flavor and freezing is cumbersome, requiring the provision of home freezer equipment, etc. Further, not all foods can be canned or frozen and frozen foods especially do not have an indefinite shelf life.

Packaging is necessarily involved in irradiated foods. First, once free from contamination only the package can keep the foods in this condition. Second, the nature of the process is such that only certain packaging materials work well. Others either do not transmit the necessary radiation, or decompose under radiation conditions. Some materials when irradiated contribute toxic elements to the contents. As an aside, the effectiveness of radiation decreases with the square of the distance which is a strong argument for thin, flat packages in this use. This in turn should affect all related practices from labeling to retail shelf storage and handling.

At the time of this writing, radiation sterilization is being used commercially for some drugs too delicate to withstand heat

treatment and has been proven in the laboratory for some foods perfectly safe for human consumption. Commercialization seems not too far distant and with it will come major effects on food marketing, especially produce. One author\(^{16}\) speculates that if irradiation processing is adopted on a large scale for fresh produce it could lead to the demise of terminal markets while creating a need and opportunity for specialized brokers and wholesalers. However, such large scale effects seem remote and the customer demand for fresh produce, increased by continued population growth, seems adequate to maintain terminal markets.

Freeze-drying is a process that depends on vacuum dehydration to remove the water from the product while the product is frozen and so retains its essential structure. The dehydrated food product is the same size and shape but only about a third the weight of the original. This process requires no major change in packaging from present frozen food requirements except that it is perhaps more stringent. It retains flavor to a high degree and the foods, which may be reconstituted simply by dipping in water, have a look and consistency almost indistinguishable from the original. Some such dehydrated products are now commercial or at least semi-commercial.\(^{17}\) Steaks and similar foods\(^{16}\) by Chester, "Irradiated Foods: What Will it Take to Sell Them?" \(\textit{Food Engineering}, \text{Vol. 30, No. 6 (June, 1958)}, \text{pp. 43-45.}\)

\(^{17}\)One of the earliest uses was for certain constituents of soups. These and packaged meals are available from Armour & Company, Chicago and Campbell Soup Company (Red Kettle Soups), Camden, through many retail outlets. Other firms have since joined the field.
are being packaged for boaters and campers since they provide a maximum of food value with a minimum of weight. However, the price of the products is still relatively high. Other food processing developments now in the laboratory could also have major effects upon packaging and marketing.¹⁸

¹⁸One of the most interesting is the encapsulation of foods by a compound both edible and nutritious. While still a laboratory possibility, some promise is seen. See Encapsulation of Foods, Air Force Systems Command, Biomedical Laboratory, MRL-TDR-62-53 (May, 1962). Another is the "R. F. Process" where radio frequency waves "shake" the water out of the foods.
CHAPTER IV

PACKAGING AND THE FUNCTIONS OF PHYSICAL SUPPLY

The functions of physical supply are those which relate to the handling, storing and shipping of goods. They are a real and costly part of marketing.

Unitization

The act of packing segregates given quantities and volumes of goods. The goods thus enclosed are separated from any homogeneous prior state of bulk into discrete units which, if consistent, become a basis for the necessary standardization of content. Goods may be unitized in what are really sub-bulk quantities, e.g., large shipping containers\(^1\) which are in a shadowland between shipping containers and transportation devices such as bins, pallet boxes, cargo-van types and the like. True shipping containers unitize industrial quantities of goods, if there is no further unitization within the master pack.

Thus steel and fibre drums, multi-wall bags, corrugated containers

\(^1\)Gaylord Container Corporation, St. Louis, Missouri (now part of Crown Zellerbach Corp.), has specialized in the area of multi-unit and bulk containers. Excellent examples are available in their product literature. See Case Histories: Gaylord Multi-Unit and Bulk Containers, undated.
and wooden boxes of several types are all industrial quantity units.

Unitization in consumer goods commonly proceeds to quantities closely related to the needs of consumers. Soap and detergent powder, processed foods, automotive parts and literally thousands of consumer items are unitized in numbers, weights and volumes related to the reasonable purchasing requirements of the user.² Sometimes unitization can increase the quantity sold at one time, as in multi-packing, where smaller consumer units are master packed for the most part in corrugated containers. In this fashion, the corrugated container segregates numbers of units applicable to the needs of the distributing system, the wholesaler and retailer.

The ultimate unitization, downward, is the quantity so packed that sufficient material is contained for but one application or use as, for example, single-shot refills of lighter fluid, one-time trays of ketchup or jelly in restaurants, and single packs of a tranquilizer. These ultimate units are combined frequently into intermediate containers, usually folding boxes, which in turn are master packed in shipping containers.

A fuller discussion of these smaller dispensing size units will be found in the later section dealing with convenience. At this time

²Obviously, not all consumers would agree on this point. As of 1963, three lengthy hearings had been held by the Subcommittee on Antitrust and Monopoly of the Committee of the Judiciary, U. S. Senate, 87th Congress, pursuant to S. Res. 56 and 258, dealing with Packaging and Labeling practices. The three-part transcript of these hearings records many consumer complaints against weights and volumes used by consumer goods manufacturers.
the primary point is that the quantity of goods can be matched to the use through unit packaging. Further, unit packages must be master packed in suitable quantities for ease and economy of handling.

The ultimate unitization upwards is being developed under the concept of containerization. Containerization is the principle of packing (consolidating a load of) standard shipping containers, most frequently corrugated boxes, within a large van-type container. While unfortunately these large containers have not yet been standardized, a typical size is 8 feet by 8 feet by 20 feet, although lengths of 10 feet to 40 feet are available. These containers are loaded at the factory, hauled by crane onto a flatbed truck or freight car, where they form the body of the rolling stock, and are strapped in place. Typically two units form a truckload and three units form a rail load.

Containers are made in steel, aluminum, plywood and plastic. The cost savings have proven so promising that despite the many obstacles of lack of standardization, reluctant labor unions, lack of cargo handling equipment and high investment, some 123,000 units were in use domestically by 1962. Farsighted transportation industry


4With a volume of 320 cubic feet and a load capacity of about 6 to 7 tons; "The Bumpy Road to Containerization," Dun's Review and Modern Industry, Vol. 79, No. 6 (June, 1962), p. 150.

5Still a minute foothold in the various modes of the U. S. transportation system.
executives look to this method to integrate, for the first time, all materials handling and transportation systems now in use.

Such integration is feasible and is practiced now even though limited in scope. Containers move with no disruption from loading dock to truck to rail to ship. The continued growth of containerization offers considerable promise:

1. Of primary value is the significant reduction of loss from freight damage and pilferage, the largest true loss in the distribution process.6

2. The development of containerization will encourage needed revision in common carrier tariffs. In order to complete any such transport media integration, equitable participation among carriers on a ton-mile basis must be established. Containerization will also encourage the impending revision in current documentary procedures where interchange between several carriers is involved. A single set of covering documents must be developed.

3. Containerization eliminates needless manual handling at each point of interchange, reducing transit time, reducing claims, simplifying packaging requirements and lowering insurance premiums. The reduction in handling costs through containerization can make profitable what is now unprofitable LCL business.7

Containerization is a further development of the earlier concepts of piggybacking (in which a demountable truck body could be shipped part of its route on a flatbed rail car) and fishybacking (in which demountable truck and rail car bodies could be hauled on

---


7"Containerization," op. cit., p. 34. The New York Central railroad reported a change in LCL position from a $6 million loss in 1955 to a profit in 1962, via containerization.
ships and barges); these are illustrated in Figure 10. The cost savings available from piggybacking were early recognized, but the investment required in new facilities was a hindrance to rapid development. Most railroads now offer this service and some of the larger ones have purchased specialized equipment for it. Not all railroads participate as common carriers; some restrict their piggybacking to their own units. In recent years, piggybacking has doubled and is continuing its high growth rate.

Fishybacking is not as advanced as piggybacking although the concept is as old. Since no general purpose ships have been specially built to take advantage of the new systems, they can not be brought into fullest play. Further, there are complex standardization problems involved in fitting U. S. built containers to European carrier dimensions. The problem is magnified since only freight which is of a single type moving to a single port in sufficient volume can profitably use the system. Still, some progress has been made.

The latest version of the multiple use concept in transportation is birdybacking. No planes are available or planned to carry

---


FIGURE 10
PACKAGING AND TRANSPORTATION

Piggybacking

Fishybacking

Source: Upper photograph from author's collection.
Lower photograph courtesy of Weyerhaeuser Company.
the weights enclosed in containers now used for rail, truck and
ship,\textsuperscript{11} but somewhat smaller versions have been in use since 1958.

Packaging and Transportation

Since transportation costs usually make up a significant
portion of the delivered cost of goods, the former have a considerable
influence on such factors as selection of markets, use of channels of
distribution, and location of plants.

Transport costs are incurred in the process of creating the
utilities of place and time in meeting the essential demands upon the
system:

\begin{itemize}
\item that it be adequate to meet all normal demands of trade,
\item that it be swift, minimizing the time between creation
of form utility and consumption,
\item that it furnish the number and variety of services
needed to make the marketing structure function with
highest efficiency,
\item that the cost of providing transportation be reason­
able related to the worth of the services provided.\textsuperscript{12}
\end{itemize}

Mass transportation media in the United States have been shift­
ing roles in recent years. The railroads, long responsible for the
major portion of tonnage moved in the United States, have lost po­
sition. While still the single largest factor measured on a ton-mile
basis, their share of the whole dropped in 1956 for the first time
below 50 per cent. In 1960, that share was 44 per cent. Motor trucks

\textsuperscript{11}"Containerization," op. cit., p. 37. The largest air con­
tainer offered is about 270 cubic feet.

\textsuperscript{12}Beckman and Davidson, op. cit., p. 467.
are the major competition for the rails. From 1956 to 1960, trucking's share rose from 18 per cent to 22.2 per cent. The changes that have taken place in major transportation media in recent years can be seen in Figure 11. Despite this loss of position, there is no question that the rails have exerted the dominant influence on packaging in view of their needs, practices, regulations and equipment.

Packaging is closely related to the rail transportation system in several ways. As already discussed, concepts like containerization can permit economies in transport not otherwise obtainable. Second, it must not be forgotten that carrier rates apply to the container as well as the product.13 This has spurred development of two types of containers in an effort to reduce the transport costs of tare14 weight to the minimum: lighter, stronger packaging such as corrugated cases to replace heavier and bulkier packaging such as wooden boxes, and the development of specialized rail cars which do away with packaging altogether by having specialized racks or frames to hold selected goods (e.g., motor blocks).

Third, packaging reduces losses which are incurred in the transport of goods. These freight and damage claims paid by the carrier involve substantial sums in view of the poor profit position of the roads. Despite all efforts at reduction they are still almost


14Weight of package and other auxiliary material; thus gross minus tare equals net weight of contents.
FIGURE 11

PER CENT DISTRIBUTION OF DOMESTIC INTERCITY FREIGHT
BY TYPE OF TRANSPORTATION,* SELECTED YEARS, 1940-1960

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Ton-Miles (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>651,204</td>
</tr>
<tr>
<td>1945</td>
<td>1,072,490</td>
</tr>
<tr>
<td>1950</td>
<td>1,094,160</td>
</tr>
<tr>
<td>1955</td>
<td>1,298,060</td>
</tr>
<tr>
<td>1956</td>
<td>1,376,320</td>
</tr>
<tr>
<td>1958</td>
<td>1,231,184</td>
</tr>
<tr>
<td>1960</td>
<td>1,346,650</td>
</tr>
</tbody>
</table>

* Airways have been excluded as insignificant.
1 1/2 per cent of the total revenue for Class I railroads and are rising. Table 5 presents information on damage claims paid from 1939 to 1962, for the larger roads. Naturally, these out-of-pocket costs are not the whole sum involved, since the railroads have additional charges in investigation and processing. Special studies of many kinds have shown that protective packaging can minimize these costs. However, packaging overdesign would be waste of another sort, probably involving much more money. The design problem is to achieve a balance between minimal and excessive freight damage, since the presence of some damage is the only real indication that the product is not overpackaged. One can draw an analogy to credit policies and bad debt losses.

Of course, better packaging is not the only method of reducing transportation claims, since packaging failures are by no means responsible for all such claims. Better control of humping, the development of better springing and shock absorbing cars, the switch to better methods of refrigeration than wet icing, the trend to high-speed freight, and piggybacking and fishybacking, all contribute to improvement in the ability of the railroads to meet the demands placed upon them.\(^{15}\)

Some of the causes behind damage claims for goods packaged in fibre boxes are presented in Figure 12, where it can be seen that all

<table>
<thead>
<tr>
<th>Year</th>
<th>Loss &amp; Damage Freight</th>
<th>Freight &amp; Switching Revenue</th>
<th>Per Cent L&amp;D of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>$ 20,683,091</td>
<td>$ 3,300,596,270</td>
<td>0.627</td>
</tr>
<tr>
<td>1940</td>
<td>21,764,284</td>
<td>3,590,159,116</td>
<td>0.606</td>
</tr>
<tr>
<td>1941</td>
<td>24,504,700</td>
<td>4,513,766,853</td>
<td>0.543</td>
</tr>
<tr>
<td>1942</td>
<td>36,365,308</td>
<td>6,018,705,592</td>
<td>0.604</td>
</tr>
<tr>
<td>1943</td>
<td>45,492,326</td>
<td>6,859,070,655</td>
<td>0.663</td>
</tr>
<tr>
<td>1944</td>
<td>63,789,708</td>
<td>7,075,728,737</td>
<td>0.902</td>
</tr>
<tr>
<td>1945</td>
<td>82,988,811</td>
<td>6,610,229,668</td>
<td>1.255</td>
</tr>
<tr>
<td>1946</td>
<td>90,726,547</td>
<td>5,865,047,415</td>
<td>1.547</td>
</tr>
<tr>
<td>1947</td>
<td>121,651,207</td>
<td>7,140,290,521</td>
<td>1.704</td>
</tr>
<tr>
<td>1948</td>
<td>129,530,291</td>
<td>8,090,999,636</td>
<td>1.601</td>
</tr>
<tr>
<td>1949</td>
<td>103,537,097</td>
<td>7,157,002,173</td>
<td>1.447</td>
</tr>
<tr>
<td>1950</td>
<td>81,983,543</td>
<td>7,939,972,648</td>
<td>1.033</td>
</tr>
<tr>
<td>1951</td>
<td>91,621,942</td>
<td>8,763,157,368</td>
<td>1.046</td>
</tr>
<tr>
<td>1952</td>
<td>100,693,926</td>
<td>8,920,772,128</td>
<td>1.129</td>
</tr>
<tr>
<td>1953</td>
<td>102,842,708</td>
<td>9,090,537,835</td>
<td>1.131</td>
</tr>
<tr>
<td>1954</td>
<td>92,584,263</td>
<td>7,925,957,651</td>
<td>1.168</td>
</tr>
<tr>
<td>1956</td>
<td>102,477,433</td>
<td>9,097,286,617</td>
<td>1.126</td>
</tr>
<tr>
<td>1957</td>
<td>111,421,929</td>
<td>9,079,040,846</td>
<td>1.227</td>
</tr>
<tr>
<td>1958</td>
<td>108,522,810</td>
<td>8,211,065,037</td>
<td>1.322</td>
</tr>
<tr>
<td>1959</td>
<td>108,185,653</td>
<td>8,459,161,944</td>
<td>1.279</td>
</tr>
<tr>
<td>1960</td>
<td>110,005,943</td>
<td>8,173,396,351</td>
<td>1.346</td>
</tr>
<tr>
<td>1961</td>
<td>112,432,301</td>
<td>7,884,508,772</td>
<td>1.426</td>
</tr>
<tr>
<td>1962</td>
<td>120,274,781</td>
<td>8,138,026,937</td>
<td>1.478</td>
</tr>
</tbody>
</table>

Source: Office of Director, Freight Loss and Damage Prevention Section, Freight Claim Division, Association of American Railroads; Chicago, Illinois.
FIGURE 12

AMOUNT OF CLAIMS ATTRIBUTED TO DAMAGE CAUSES FOR FIBRE BOXES IN RAIL TRANSPORTATION

<table>
<thead>
<tr>
<th>Causes of Claims</th>
<th>Per Cent of Total Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift in load due to improper handling of car in transit</td>
<td>25</td>
</tr>
<tr>
<td>Poor arrangement of the load</td>
<td>15</td>
</tr>
<tr>
<td>Shift in load due to loose loading</td>
<td>10</td>
</tr>
<tr>
<td>Boxes inadequate for contents</td>
<td>7</td>
</tr>
<tr>
<td>Failure to properly cover floor racks or floor</td>
<td>5</td>
</tr>
<tr>
<td>Defective floor or floor racks</td>
<td>3</td>
</tr>
<tr>
<td>Improper closure of box</td>
<td>2</td>
</tr>
<tr>
<td>Boxes apparently roughly handled prior to loading</td>
<td>1</td>
</tr>
<tr>
<td>Defective product (Including inner container)</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Fibre Box Association
claims assignable to improper packaging amount to at most 12 per cent; most of the rest are assignable to improper handling.\textsuperscript{16}

By the time the usual manufactured product requires transportation, a significant value has accreted to it. This includes the cost of material, labor, administration, capital investment and other burden of the manufacturer, packaging supplies and labor, and the irrecoverable time factor in amassing these resources, manufacturing and shipping. Not infrequently the product is not shipped until sold, so selling expenses enter the calculation. For the product to suffer damage at this late point in the distributive time scale is a costly burden.

The railroads have had an enormous effect upon packaging, especially shipping container packaging, through the influence of the Uniform and Consolidated Freight Classifications. These detailed rules and regulations specify what may be shipped in rail cars (and have been adopted in essence by the trucking industry) and what form the packaging must take. Compliance with these regulations has guided much of the development of the packaging industry since the notable Pridham decision\textsuperscript{17} and the even earlier acceptance on July 1, 1906, by

\begin{flushleft}
\textsuperscript{16}Friedman and Kipnees, op. cit., p. 53.
\end{flushleft}

\begin{flushleft}
\textsuperscript{17}Supra, page 42. See also Bettendorf, "Paper and Paperboard Containers," op. cit., p. 73.
\end{flushleft}
the Official Classification Committee of the use of corrugated and solid fibre boxes.18

Many regulations affect the use of containers in shipping. The Uniform and Consolidated Freight Classification has already been mentioned (Rule 40 deals with multi-wall sacks; Rule 41 deals with corrugated containers and fibre drums; each rule has many sections treating specifics). Freight Container Tariffs deal with the packaging and shipping of perishables. The Motor Truck Classification is an adoption of the rails' experience for trucking purposes (Rule 41 for the rails, for example, becomes Rule 5 for trucks). Then there are postal laws and regulations, Official Air Freight Rules, and others. These regulations are classified in Figure 13.

A final comment seems appropriate on air cargo. This is still an insignificant part of the whole of mass movement of goods. It has grown, but not as radically as early proponents had hoped. Air cargo more than doubled between 1950 and 1960, from 318 million to 778 million ton-miles.19 There are still no aircraft specifically and solely designed for air freight, although many aircraft originally designed for passenger or military service have been modified into

18Actually, such boxes had been used before (since 1903) under "exceptions" to the standards, e.g., special cases permitted for a length of time for experimental purposes before a decision that they are or are not in compliance and, if not, whether they are still so satisfactory that a new rule will be adopted. The "exception" is still the major tool by which new developments enter the industry.

### MAJOR SHIPPING REGULATIONS

<table>
<thead>
<tr>
<th>Carrier *</th>
<th>Published Regulations</th>
<th>Controlling Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Freight</td>
<td>&quot;Uniform Freight Classification,&quot; and &quot;Consolidated Freight Classification.&quot;</td>
<td>Interstate Commerce Commission Control is under its &quot;Code of Federal Regulations, Title 49 - Transportation Parts 70-90.&quot; Uses services of Bureau of Explosives (Association of American Railroads).</td>
</tr>
<tr>
<td>Rail Express</td>
<td>&quot;Official Express Classification.&quot;</td>
<td>Interstate Commerce Commission Control is under its &quot;Code of Federal Regulations, Title 49 - Transportation Parts 70-90.&quot; Uses services of Bureau of Explosives (Association of American Railroads).</td>
</tr>
<tr>
<td>Waterway Freight</td>
<td>Intercoastal Freight Tariffs.</td>
<td>Coast Guard. Dangerous cargo regulations are in Title 46, Code of Federal Regulations, Parts 146-149.</td>
</tr>
<tr>
<td>Export</td>
<td>&quot;Exporters' Encyclopaedia&quot; (annual), Complete Export Shipping Guide (with special bulletins semianually).</td>
<td>Bureau of International Programs, U.S. Department of Commerce.</td>
</tr>
<tr>
<td>Air Cargo and Air Freight</td>
<td>&quot;Civil Aeronautics Manual 49 - Transportation of Explosives and Other Dangerous Articles.&quot;</td>
<td>Federal Aviation Agency</td>
</tr>
<tr>
<td>Air Express</td>
<td>Official Express Tariff No. 1.</td>
<td>Post Office Department</td>
</tr>
<tr>
<td>Parcel Post and Air Mail</td>
<td>POD Publications 2 and 3 on Packaging and Postage Rates</td>
<td>Post Office Department</td>
</tr>
</tbody>
</table>

* Shipments employing two or more methods of transportation, such as truck and air or rail and water, must comply with regulations for each type of shipments; more than one jurisdiction may apply.

freight carriers, and such modifications were allowed for in the design.

As noted before, air cargo has made few special demands on packaging,20 for the most part simply requiring the selection of the lightest available containers, pallets, bins, vans, etc. Some goods, like dresses and coats, are shipped hanging from a rack with no packaging. Substantial change has occurred in a few instances which could be a harbinger for the type of distribution process and packaging that will be required in the future. This is the use of air cargo to obviate the need for local warehouses. To the extent that this is possible the need for the sturdier packaging required for multiple handling, high storage, shock resistance and other specifications will be reduced. Two instances should suffice to make this point.

Sears, Roebuck and Company, in cooperation with Eastern Airlines, developed a program in Florida to cover catalog sales transactions to be shipped by air cargo.21 This not only increased volume in Florida through the advertising and "glamour" associated with this method of delivery, but enabled Sears to compete with local department stores, offering next day delivery from its district warehouse in Atlanta. Sears reportedly increased its local catalog sales by from


50 to 80 per cent on covered items; another source of gain was the reduced handling and storage costs (including packaging) which more than offset the increased freight charge on a per-pound basis. Although cost per unit process was increased, cost for the total goods in place was reduced.

Another even more pertinent event was the decision, after long study, of a major manufacturer of electronic tubes (for radio, television, other electronic gear) to give up the system of multiple local warehouses it had established in favor of one large warehouse at the factory supported by air freight delivery to all customers.\textsuperscript{22} Exceptions were made for a very few original equipment manufacturer users in the beginning; but these soon increased their factory inventories (encouraged by price adjustments) to provide for possible service interruptions. The savings in multiple freight, multiple handling, local storage and heavy-duty packaging — all of which could be eliminated or reduced — more than compensated for the increased unit freight on these high value items.

Packaging and Storage

Storage is an inherent part of marketing as well as of physical production. Not all stored goods are packed, of course, especially raw materials on which little work has been done except extraction and initial beneficiation. But many industrial goods and almost all consumer goods are now packaged. This packaging must aid the storage

\textsuperscript{22}Discussion with a consulting firm based on private records. The firm is the Sylvania Company.
function. The purpose of inventory storage, or the accumulation of goods, is to act as a reservoir to meet foreseen and possible unforeseen demand. The stored goods act as slack in a rope, permitting time to meet unforeseen demand while maintaining an even flow of processing or sales. Degradation in storage then causes a deterioration of this safety margin, which may not be in existence when called upon.

Packaging must do more to facilitate the storage of goods than simply maintain their condition in a sort of homeostatic defense against a hostile environment. Modern warehousing is a many-sided complex depending on efficient input, ready access and rapid throughput of goods. Packaging must make the goods more amenable to placement and recovery by utilizing geometry, volume and linear dimension most efficiently. Often packaging overcomes the awkward shapes of manufactured goods or parts permitting a rational storage not otherwise possible. The relation of warehousing and materials handling to packaging is of increasing importance.\(^{23}\) A relatively new term "packaging materials handling"\(^{24}\) has been coined to express this integrated concept.

The concept of a warehouse has evolved in recent years, from a place of storage to a means of movement of goods. This concept requires integration of all the factors associated with physical handling of goods. Warehouses themselves have changed radically from

---


\(^{24}\) Pearce, op. cit., p. 1.
multistory buildings to newer, one-story designs with floor plans which permit maximum flow of goods from in-loading dock to out-loading dock with a minimum of handling. Such warehouses lend themselves better to the essential steps in the warehousing process:

... unloading of cars and, where required, unpacking of cases,
... goods to storage,
... moving merchandise from reserve to forward stocks
... assembling orders, either in case lots or packaging of smaller orders,
... shipping and delivery.25

Warehousing expenses are not minor; they represent an important part of total operating expenses for wholesalers, as well as significant outlays for retailers and manufacturers. Reductions in such expenses obtained by more efficient use of buildings; minimizing materials handling and labor costs; increasing inventory turnover; and decreasing waste in inventory through obsolescence, physical damage or deterioration can all provide significant contributions to net profit.

The present emphasis on one-story buildings has had direct effects on packaging.26 In a one-story building the space factor of importance is "cube," i.e., the cubic content of the building; this is of more concern than the square footage available, the older

---


measure for multistory warehouses. The desired situation is to stack goods as high as possible, limited only by available materials handling equipment and the height of the ceiling which has grown from the 10 to 12 feet common to multistoried buildings to as much as 25 to 30 feet. In a multistory building the height of floor stacks is usually limited by two factors: static floor loading limits, and the inability to get efficient (but heavy) materials handling equipment above the first floor. Such problems are obviated in one-story construction.

Since stacks are higher, packages must be stronger. This is true whether the goods are palletized or not, since palletization spreads but does not eliminate the weight. Some products bear the weight of goods higher in the stack themselves, e.g., canned goods, where the can contributes greatly to the ability of the corrugated shipping container to withstand loading. In many cases the container has to bear all the weight. This has led to stronger containers but the corollary is implied; without this stronger packaging the higher stacks in today's warehouses would not be possible and the full cube of the warehouse would not be utilized. Since this waste space must be paid for whether used or not, warehousing costs would rise on all stored goods.

A major factor in planning shipping container design is the concern for maximizing the ability to fit on pallets, and thus best use warehouse cubage.27 Trade associations and other industry groups

frequently meet to discuss the best way of developing and/or standardizing on designs that will accomplish these goals. Figure 14 illustrates the integration of fully used pallets handled mechanically in a modern, high-stacked single-story warehouse.

Materials handling factors are so basic that today's warehouses (and factories) are essentially designed around a materials handling system. Conveyor systems, bulk materials handling devices, fork trucks and the like are the arteries of the establishment. For the most part, in the mass movement of packaged goods today, there is little if any of the manual handling that formerly comprised a heavy warehouse task.

Much of this machine handling has been accomplished by palletizing, which is the unitizing of a load of several containers on a pallet or skid, a low portable platform or support, made of wood, plywood, metal or corrugated paperboard. Pallets may be heavy returnable platforms, or the lighter relatively inexpensive, disposable variety, the so-called "one-trippers." Even these, however, must be handled several times.

Palletizing received its major impetus during World War II, when it proved that substantial economies could be achieved. Because of the diverse nature of the industry and the many small suppliers, no accurate data are available on pallet production. Too, such figures would be vitiated because of the unclear distinction in the

---

High stacked palletized corrugated boxes, mechanically handled.

Source: Courtesy of Weyerhaeuser Company.
statistical sources among pallets, skids, pallet boxes, bins and other related devices. Table 6, however, illustrates the growth of wood pallets, the major factor in the field. The 1960 dollar amount represents a production of an estimated 70 million units.

The advantages of palletizing derive from the fact that it (1) makes possible automatic machine handling of cases for pallet loads, (2) lowers handling costs by unitizing loads, (3) speeds up the flow of goods through the warehouse, (4) provides maximum utilization of warehouse cube, (5) permits better housekeeping and the easier taking of inventories, and (6) reduces damage done to goods by handling. 29

However, palletizing, although a powerful handling tool, is not the only one. Lift trucks have been developed which can pick and stack unit loads that are unpalletized, by means of a pressure or vacuum clamping device which grips the stack. More and more the conveyor is coming into play for the mass movement of goods either in unloading, or processing, or assembling orders. 30

The use of pallets and conveyors usually requires that the goods be packaged. Preferably the packages will have been designed to fit the common forms of pallets (although not standardized, a few

29 Beckman, Engle and Buzzell, op. cit., pp. 443-5.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>$105,408</td>
</tr>
<tr>
<td>1956</td>
<td>126,000</td>
</tr>
<tr>
<td>1957</td>
<td>116,000</td>
</tr>
<tr>
<td>1958</td>
<td>110,000</td>
</tr>
<tr>
<td>1959</td>
<td>149,203</td>
</tr>
<tr>
<td>1960</td>
<td>162,811</td>
</tr>
</tbody>
</table>

Source: 1955, 59-60 National Wood Pallet Manufacturers Association; 1956-8 developed from data supplied by U. S. Department of Commerce, B.D.S.A.
sizes are typical, viz., 40" x 48") in an interlocking fashion, maximizing the use of space and lending mutual support to the load or, in the same fashion, designed to be readily handled by conveyor.

Certain forms of warehouses depend on packaging for existence. Since the adoption and widespread growth of frozen foods, for example, increasing amounts of warehouse space have had to be created to facilitate this burgeoning industry. In 1954 there were 247 million cubic feet of refrigerated warehouse space suitable for frozen foods.\textsuperscript{31} The growth of frozen food space since then has been at the rate of about 15 million cubic feet annually; as of 1962 the total space available was about 370 million cubic feet.

The warehouse — materials handling — packaging complex then is interlocked so that developments in one area both demand and induce developments in others.\textsuperscript{32} Many of these developments are proceeding today, with new concepts of warehouse design, new methods of physically moving goods, and new packaging to aid and abet these approaches.


\textsuperscript{32}"Overall Distribution Featured by SIPMHE" (Society Industrial Packaging and Materials Handling Engineers), Distribution Age, Vol. 56, No. 12 (December 1957), p. 53. A discussion of the integrated approach to warehousing, unitizing loads and cutting the costs of physical distribution.
CHAPTER V

PACKAGING AND THE FUNCTIONS OF EXCHANGE

This chapter deals with the functions of exchange — buying and selling. It is also concerned with the facilitating function of information, a necessary part of exchange. Finally, it explores the concept of "convenience" which does not readily lend itself to classification under any other of the accepted marketing functions.

These topics are so broad as to require a variety of treatments. Buying is related to selling, as both reciprocal and antithetical. Grading and labeling are involved in information; these have the force not only of custom but of law and will require attention in the section dealing with the social and legal implications of packaging. Marketing information is in certain aspects closely related to packaging research which will be dealt with as a separate topic in addition to material presented here. With these interrelationships in mind, it is possible to proceed to the functions of exchange.

Packaging and Buying

Buying is an active marketing function in which the purchaser
makes an effort to seek out and assess the goods available on the market in the light of his needs.

The distinction is often made that buying motives are of two types: rational and emotional. Rational motives are those that can be expressed as reasons, viz., dependability, economy, money gain, and convenience. Emotional motivations are of the class primarily concerned with prestige; the desire to conform, emulate, or differ from one's fellows; the desire for pleasure or for comfort; the desire to be creative. These distinctions are of more than passing importance in the field of packaging since the manufacturer and the distributor are reportedly more concerned with rational motives, while the ultimate purchaser is reportedly more affected by emotional motives.

This distinction seems unreal, and even pernicious. It has been used as the basis for attack on many marketers of consumer goods in that their packaging is said to appeal to the emotional rather than the rational.1 This is especially noticeable in the testimony given by consumer "spokesmen" before Congress where rational motives have in effect been reduced to cost per unit and all other factors that enter into a purchase are classed as "emotional".2 But it is


2Ibid., Part 1, p. 181-5.
difficult to assume that when people act in the role of business purchasers they act solely in a rational manner since in no other human activity can they segregate their attitudes so effectively. Further, the tests by which rationality of purchase are measured are frequently neither good nor fully applicable; conversely, the appeal of so-called emotional motives and of such things as reciprocity is not unknown in business.

If the premise is accepted that the human being takes actions to promote a state of homeostasis or equilibrium against the world, there is little ground for assuming that money gain is more desirable than comfort or prestige. It seems rational to do that which promotes a state of well-being, regardless of the motive, and classification of motives as to rationality or emotionality seems both out of date and out of touch with reality. Such classifications imply an objective set of standards applicable to all or most people in all or most buying situations. Standards in turn imply measurement and knowledge. Such knowledge is speculative at best and measurement is almost entirely restricted to price, e.g., historical records of prices paid. For this reason, price has become the measure of objectivity and rationality.

In this thesis any motivations that affect buying decisions will be considered as equally valid since the end result — a decision
to purchase or not to purchase — is an amalgam of all factors consciously or unconsciously considered.3

Buying for any purpose, whether for consumption, for resale or for use in a manufacturing process, involves certain specific steps. The buyer must decide upon his need. He must determine the quality of available goods in terms meaningful to his need and set up a basis of quantity determination, either from available offerings or from those tailored to his requirements. Sources of supply must be assessed in terms of price, convenience, dependability, interest and personal relationships. The development of a method of acquiring goods follows. Packaging comes into play in some of these steps, but not all.

Engineering and Design

Engineering and design are primarily the concern of the original packager of goods, usually the manufacturer, although wholesalers and retailers do packaging as well. The work is required to facilitate the buying function on two levels. In the matter of shipping containers, the question is primarily an engineering one. Thus

that method of packaging that reduces costs,\textsuperscript{4} lends itself readily to materials handling, transportation and storage\textsuperscript{5} and protects the contents best, will be selected. Insofar as unit containers are concerned, the manufacturer's buying decision is guided by his knowledge or opinions of what will be desirable for the middleman to handle and the consumer to buy.\textsuperscript{6}

These are not clean-cut decisions. More and more the shipping container is becoming a vehicle of promotion and salesmanship. The designing of a unit container requires a high degree of sophistication in engineering and technology. But the emphasis pertinent to the buying decision differs in the two classes of packages.

Cost reduction is paramount in the buying decisions of manufacturers.\textsuperscript{7} Packaging in almost all cases involves significant sums. Frequently, these costs are quite high relative to the value of the contents. Table 7 presents information on the cost of packaging in selected industries.

\begin{quote}


\textsuperscript{6}Phelps, op. cit., p. 140.

\end{quote}
**TABLE 7**

**COST OF PACKAGING, SELECTED PRODUCTS**

<table>
<thead>
<tr>
<th>Product</th>
<th>%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inks and adhesives</td>
<td>40.0</td>
</tr>
<tr>
<td>Cosmetics and toiletries</td>
<td>36.3</td>
</tr>
<tr>
<td>Drugs</td>
<td>35.2</td>
</tr>
<tr>
<td>Motor oil</td>
<td>34.0</td>
</tr>
<tr>
<td>Beer</td>
<td>30.0</td>
</tr>
<tr>
<td>Foods</td>
<td>24.1</td>
</tr>
<tr>
<td>Candy</td>
<td>21.2</td>
</tr>
<tr>
<td>Stationery</td>
<td>20.0</td>
</tr>
<tr>
<td>Wax polishes</td>
<td>15.0</td>
</tr>
<tr>
<td>Paints</td>
<td>12.5</td>
</tr>
<tr>
<td>Toys</td>
<td>9.1</td>
</tr>
<tr>
<td>Cigars</td>
<td>8.0</td>
</tr>
<tr>
<td>Baked goods</td>
<td>7.8</td>
</tr>
<tr>
<td>Meats</td>
<td>6.5</td>
</tr>
<tr>
<td>Liquor</td>
<td>5.2</td>
</tr>
<tr>
<td>Automotive parts</td>
<td>5.0</td>
</tr>
<tr>
<td>Cutlery</td>
<td>5.0</td>
</tr>
<tr>
<td>Hardware</td>
<td>4.0</td>
</tr>
<tr>
<td>Office machines</td>
<td>1.4</td>
</tr>
</tbody>
</table>

* Average percentages of manufacturer's selling price.

Source: Battelle Memorial Institute studies.
Packaging innovations can effect substantial savings. This has been recognized for many years. Changes in materials, packaging techniques, or design are a constant factor in industry and have led to lighter, stronger materials, higher-speed packaging lines and easier handling of packaged goods.

**Information on the Package**

Both middlemen and ultimate consumers need sufficient information to be able to make an intelligent choice. Information may be of several types: identification of contents, handling instructions, use instructions, ingredient composition, hazards, quantity, price, and others. Buyers at different levels have different informational needs.

The wholesaler, industrial user or retailers' warehousemen are most concerned with identification of contents and handling instructions. Elementary as it seems, this is frequently inadequate, sometimes totally lacking. Corrugated cases are shipped with identification so complex or so limited that once stored, the only way to ascertain the contents is to look inside. Trade groups frequently encourage manufacturers to put sufficient information on the shipping

---

container so that the buying and handling functions can be properly conducted.9

Informational needs are more complex at the consumer level where the actual buying decision may well rest upon the information obtainable. Just what the informational needs of the consumer are and whether information available on packages is heeded by buyers, is a matter of current and pressing debate.10 The ultimate consumer, dealing with unit packages such as those on the supermarket shelf, is primarily concerned with ease of identification, quality, price, and use instructions (either per se or in recipes). To be meaningful for comparative shopping, price must be related to quantity. To be meaningful at all, the information must honestly reflect the contents.

**Resaleability**

The belief that a package will enhance, or at least not retard the saleability of the goods, is a buying requirement of those elements in the chain of distribution which must take, and later hope to transfer to others, title to the goods. For the retailer, "packaging can be the difference between profit and loss and whether the product sells."11 According to variety store retailers a good package

---

9*Grocery Product Shipping Cases*, Grocery Manufacturers of America, Inc., (New York, 1955), p. 5. Specifies: marking on four sides, bold print, 1" high for letters, quantity in case, package sizes, brand name, product name or variety.


11"Buyers: Key to Good Packaging," *Chain Store Age* (Special Reprint, 1960), p. 9.
must be self-selling, durable, practical and attractive. Retailers, with especial emphasis on those to whom self-service is vital (supermarkets, variety stores, many drug and hardware stores, etc.), frequently make a buying decision on their expectation of the package's ability to sell itself. Retailers are less concerned with the mechanical performance of the package assuming, on the basis of experience, that the package will have adequate shelf life and afford reasonable protection to the contents.

Size is another important factor. In the eyes of the retailer, the size of the package must be geared to the expected unit of demand and the desired sales price in order to fulfill his expectations. This may mean varying the quantity packaged for different seasons of the year, especially in food items. Another aspect of size is shelf space minimization. The retailer does not look kindly upon packages which needlessly consume valuable shelf space.

Convenience

Convenience is important on many levels in the marketing process: to the manufacturer, the retailer, the wholesaler and the

\[12\] Ibid.

\[13\] This is also reflected in the size of the shipping container which must carry a quantity of units reasonably related to the turnover.

end user. Convenience, especially at the ultimate consumer level, has been responsible for a high degree of innovation, the development of new materials and methods in packaging, and the development of several new industries, especially in food processing.

A good discussion of convenience (some but not all of which deals with packaging) was presented by Charles G. Mortimer,15 President of General Foods Corporation, who listed ten concepts as primary:

1. Convenience of form — soap for example is available as bars, liquids, powder, flakes.
2. Convenience of time — extended availability of goods, offered by late shopping hours, by vending machines.
3. Convenience of place — shopping centers, drive-in banks, vending machines.
4. Convenience of quantity or unit — matched to the need and rate of use.
5. Convenience of packaging — throwaway containers, re-usable containers, dispensing containers.
9. Convenience of selection — the variety of product types and suppliers.
10. Convenience of credit — available for almost all products and services, from many sources.

Mr. Mortimer concludes that wide-awake marketers keep their products convenient.

The desire and need for convenience on the part of the consumer is both a consequence of increasing prosperity and an imperative to its maintenance if the housewife who helps create it is at the same time to maintain a home and family with her available time and effort.

Increasingly the ultimate consumer of unit packaging, most often the housewife, looks for convenience in the package as well as in the product. A large number of articles in current periodicals deal with specific examples of convenience and its growing attractiveness to the housewife who is willing to trade money for a package and/or product which will save her time and effort. The work function, of course, has simply been pushed back to the factory or other points of production and this displacement, in effect a saving of time, is incorporated in the package.


Convenience to the buyer may mean convenience of size since the consumption needs of individuals and families differ; the buying decision among products and suppliers often rests on this factor. It may be convenience of opening. The technical problem here is the balance between a package that is well protected against its environment and one that is so well protected that it cannot be opened by the purchaser. Tear-tapes, pull-tabs, flip-top boxes and many more variants have their place in serving the needs of the consumer and affecting her decision to buy.

Convenience may be in the form of associated packages banded together such as syrup and pancakes, or in multi-packs of the same products, as in soft drinks or dog food. Convenience may be in the method of use made possible by packaging. This is especially true of the food field and is exemplified by frozen foods, by boil-in-the-bag foods, by foods which come in their own baking tray, and others. Convenience is frequently a matter of dispensing. Many packaging innovations involve new methods of dispensing the contents: aerosol

---

18"Convenience is King," loc. cit. This article presents a fairly detailed analysis of the various ways in which packaging offers convenience.


containers, single use strip of blister packs,\textsuperscript{21} or built-in pouring spouts. Several forms of convenience in packaging are illustrated in Figure 15.

An example of the increasing desire for convenience is the growth in use of the aerosol can, a method of packaging which exists solely for its convenience by any standard, since the cost of the packaging usually outruns the cost of the enclosed product. However, in recognition of the fact that it permits dispensing or use of the contents at a rate, or in a manner, not otherwise feasible, sales of this container have increased apace. Developed as an outgrowth of World War II research on mosquito repellants, by 1951 aerosols were a popular item of packaging. Between 1951 and 1961 as shown in Table 8, its use in non-foods multiplied twentyfold and, still growing, is expected to double by 1972. Recent food uses add a minor volume.

Sales of convenience items are reported by the A. C. Nielsen Company to have risen 157 per cent in the decade of the 1950's, while sales of non-convenience items rose but 14 per cent. Sales of instant mashed potatoes rose 60 per cent from 1958 to 1959, while sales of frozen foods increased sixfold in six years from $100 million in 1953

\textsuperscript{21}"Strip Packaging," Modern Packaging, Vol. 33, No. 4 (December, 1959), pp. 116-17. The development of strip packaging in plastic and foil gave impetus to a concept that originated in 1917 when the American Seed Company of Newark, New Jersey, packaged strips of seeds in a glued paper fold. Single service unit packs are now available for sugar, ketchup, sauce, ointment, chemicals, jellies, instant coffee, phonograph needles and a host of other items.
FIGURE 15

CONVENIENCE IN CONSUMER PACKAGING

(1) Dispensing and storage.
(2) Single-service unit.
(3) Boil-in-bag.
(4) Multi-pack.
(5) Convenience in dispensing.
(6) Convenience in opening.
(7) Convenience in application.

Source: Author's collection.
<table>
<thead>
<tr>
<th></th>
<th>1961</th>
<th>1959</th>
<th>1955</th>
<th>1951</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total, all products</td>
<td>676,262</td>
<td>498,287</td>
<td>236,784</td>
<td>34,184</td>
</tr>
<tr>
<td>Insect sprays</td>
<td>63,594</td>
<td>65,911</td>
<td>55,979</td>
<td>17,319</td>
</tr>
<tr>
<td>Coatings and/or finishes</td>
<td>76,785</td>
<td>52,556</td>
<td>9,247</td>
<td>2,733</td>
</tr>
<tr>
<td>Household products</td>
<td>179,205</td>
<td>137,333</td>
<td>45,133</td>
<td>7,506</td>
</tr>
<tr>
<td>Shaving lather</td>
<td>82,353</td>
<td>72,611</td>
<td>45,387</td>
<td>3,649*</td>
</tr>
<tr>
<td>Medicinals</td>
<td>18,038</td>
<td>10,036</td>
<td>1,455</td>
<td>-</td>
</tr>
<tr>
<td>Hair sprays and dressings</td>
<td>140,216</td>
<td>79,687</td>
<td>53,790</td>
<td>-</td>
</tr>
<tr>
<td>Colognes, perfumes, personal products</td>
<td>63,971</td>
<td>57,560</td>
<td>n.a.</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>52,082</td>
<td>22,593</td>
<td>11,576</td>
<td>2,977</td>
</tr>
</tbody>
</table>

* Includes medicinals, hair sprays and dressings, colognes and perfumes.

to $600 million in 1959. Many more examples are available. Convenience may be built into the shipping container as well as the unit package. In the shipping container it takes the form of design that permits easier handling. For example, corrugated boxes are designed with entry ports for forks of lift trucks, wirebound wood containers are designed for easy assembly, drums and other liquid containers have built-in pouring spouts. A growing recognition of the problems of opening containers, especially corrugated boxes, has led to the incorporation of easy opening devices such as tabs, pull-strings or tear tapes, so that a corrugated case could be opened by the retailer without damage to the contents.

Corrugated cases are frequently designed so that the bottom portion can serve as a tray for easy placement on a supermarket shelf, also facilitating price marking.

---


23 "Whose Convenience?" Modern Packaging, Vol. 29, No. 11 (November, 1955), p. 93, considers the convenience of the wholesaler, retailer and industrial user in respect to labeling, preventing damage, size and shape of shipping containers, ability to handle, etc.

24 Product literature from manufacturers of corrugated containers, wirebound boxes, fibre and steel drums, are all illustrated with case histories and discussions.

25 Unfortunately a stock knife is part and parcel of a supermarket employee's baggage and many cases are opened with it, ignoring the built-in case opening device. Much needless stock damage is thereby caused.
The presence or absence of these and similar factors of convenience more and more affect buying decisions in terms of products and suppliers. Naturally there are convenience factors that relate to the supplying firm rather than to the product.

**Selling**

Since for the most part the protective and other mechanical attributes of packaging are taken for granted by long performance, the most familiar role assigned to it is that of silent salesman. But if packaging is to sell the customer, it must first stop him. Here are the significant challenges to packaging if it is to do an adequate self-service job:

... The package must attract attention.
... The package must tell the product story.
... The package must build confidence.
... The package must look clean and sanitary.
... The package must be convenient to handle, to carry out of the store and to use.
... The package must look like good value.\(^{26}\)

By no coincidence at all these items are akin to any method of doing the selling job, viz., personal selling, the steps of which may be listed as follows:

... the approach and greeting,
... determining customer's needs,
... presenting the merchandise effectively,
... meeting objections,
... closing the sale,
... developing good will after the sale.\(^{27}\)


\(^{27}\) *Phillips and Duncan*, op. cit., p. 585.
Recognition of the selling function of packages has tendrils extending back into the nineteenth century, but major growth was reserved for the twentieth. Many specific examples were cited in Chapter II of the series of changes that culminated in the Uneeda Biscuit box of 1899. There is no lack of other examples of packages whose job it was to aid, if not to undertake alone, the selling function.

By 1920 packaging had become firmly fixed on the American scene.28 Most foodstuffs once handled in bulk were packaged. Packaging had come also to safety pins and wrenches, batteries and paper handkerchiefs.29 The period of transition was rapid and completed in something between two and three decades.

Nor was recognition of the new role of packaging in selling goods far behind. As early as 1928, marketing authors were able to say "packaging has revolutionized modern merchandising, changed the buying habits of a nation, changed the appearance of stores, revolutionized window display..."30 and, with great authority, discuss almost all of the reasons for and uses of packaging's growth to the field of marketing.

28Johnson, op. cit., p. 125.
Packaging was to make "a product become a self-seller by changing a normally bulk...item into a promotable specialty" and it would do this by:

... being distinctly individual and of good design connoting its contents,
... telling its message simply and explicitly,
... being practical.

The marketers of the 1930's had no hesitation in calling a spade a spade. "We are all interested in...making the package a sales package...as retailers throughout the country are (making) their rooms not storerooms or display rooms but salesrooms." This early and to-the-point sales orientation for packaging has never left the industry.

Still the emphasis was on packaging as a selling aid rather than on the package which must do the selling job at the point of sale alone and almost unsupported except by the recall of the purchaser.

In other words, the true relationship of packaging to self-service had not yet been established.

Self-Service Selling

While packaging preceded and could exist independently of self-service selling, there was no practical way for self-service selling to exist without packaging to unitize and sell the goods.


32Ibid., p. 16.

Self-service merchandising originated in California in 1912 long after packaging had taken hold of most packageable foodstuffs and many related products. This later blossomed into the so-called Los Angeles "Super" and came to full flower in Cullen's King Kullen stores in and around Jamaica, New York. The contrast between a store of the early twentieth century, containing some packaged goods and many in bulk, and a modern self-service supermarket is shown in Figure 16.

A close examination of three textual works dealing specifically with supermarkets failed to reveal a full understanding of the dependence of self-service and the whole supermarket concept upon the creation and marketing use of packaging. Indeed, out of a total of some 750 pages written in these three books, two allotted one sentence each to acknowledgement of the debt and the relationship, while one author found it possible to examine the whole concept of supermarkets and self-service without once referring to the packaging that made it possible.

Packaging men writing in the periodical literature are not so


35Ibid. See also M. M. Zimmerman, The Supermarket: A Revolution in Distribution (New York: McGraw-Hill Book Company, Inc., 1955), p. 296. Actually, here the error is compounded by the latter's assumption in the preface that the supermarket radically altered packaging (which it did) without his understanding that packaging, in a very real sense, altered retailing and made possible the supermarket.

FIGURE 16

PACKAGING IN RETAIL OUTLETS

A&P Store, 1890

Supermarket, 1965

modest. Full cognizance of both the relationship to sales and dependence of self-service on packaging was taken early and continues today. A major manufacturer of plastic films for packaging has headed one product brochure "Packaging — last step in manufacture, first step in sales."37 A book has been written devoted entirely, although somewhat breathlessly and overawed, to the selling aspect of packaging and its ability to move goods.38 Packaging is now viewed by a respected journal in the sales field as a function of sales and a survey conducted by that journal of a panel of 1,000 sales executives revealed that in 56 per cent of the cases they made final packaging decisions as opposed to other executives in their concerns. Also these sales executives had overwhelmingly the final authority in making specific decisions in packaging, viz., design, changes to a new material, new product packaging or the selection of a designer.39 Even the staid New York Times recognizes the relationship of the package to the selling function.40

If "good" packaging is operationally defined as that package which most favorably affects sales then the common denominator of "good" packages begins to be of serious interest, in terms of design,

37Tenite Plastics, Eastman Chemical Products, Inc., undated.


color, size, shape and graphics. Again, if "good" packaging increases sales then "poor" packaging will lose sales at retail and will cost the manufacturer of the product a position that he might otherwise have won. Gain or loss in sales, in market position, and in profits may be in certain cases ascribed to the factor of packaging and thus can be changed by changing the package.

The question of package design rapidly became paramount and, packaging decisions are now recognized as sales decisions or, rather, as marketing decisions by more sophisticated firms. Designers moved from the general field of industrial design into the specialized field of package design.41 In order to be able to define and so create a good package, it became necessary to learn a great deal about the purchasing habits and practices of retail customers, primarily women, in supermarkets. Such factors were studied42 as (1) the length of time devoted to each shopping trip, (2) the amount of time a woman would give to a product decision (about 4 seconds), (3) how much preplanning the shopper did for her purchases, (4) how much she could perceive at a glance, (5) the effect of different shapes, colors, typefaces and juxtapositions of these, (6) preferences for materials, and (7) preferences for product characteristics. With all this in mind, still the package designer must be well versed in the technology

41Frank Gianninoto, "I Get Into Everyone's House," Saturday Evening Post (Special Reprint, 1955), p. 3.

42Based on an average 27 minute shopping trip; 5,000 items per store. The Sixth Du Pont Consumer Buying Habits Study, Du Pont Co. (Wilmington, Delaware, 1959).
of the product and its requirements for protection.  

In designing packages that sell, designers must consider such factors as whether a package would (or should) stand out in the likely position it would have on the retail shelf. Should it blend with or dominate its environment? Should it be blatant or dignified, exciting or restful, luxurious or thrifty? Should it have built in convenience? Should it be multi-packed or joint packed? How shall it be made easy to handle, easy to see, and easy to buy?

The marked degree of success designers have had in answering these questions is evident in any supermarket or self-service retail outlet. Good packaging has recently shown a trend to subtle, more sophisticated, more incisive design. Blatant and loud packaging has its own built-in retardant in the consumer's resistance ability, which seems to grow in direct measure to the degree of the challenge — somewhat like the concept of countervailing power. Consumers have an ability to blank their minds in regard to advertising. They

43Giannino, op. cit., p. 4.


do not see or hear (really, register) what they do not want to see or hear.\textsuperscript{46}

Good packaging is also tending toward more convenient use, toward a greater compactness to reduce shelf space demands, toward increasing use of illustration, graphics and color, and toward an extension into the area of formerly unpackaged goods, especially textile soft goods.\textsuperscript{47}

Poor packaging, criticized from the same viewpoint, suffers from poor shape (say, too spindly), from lack of identity so that the product is indistinguishable, from lack of stacking ability which makes the product suffer at the hands of the retailer and while on the shelf, from overuse of strident colors and from poor, cluttered design.\textsuperscript{48}

Packaging has an immediacy about it that most other selling devices do not have, an immediacy shared with personal selling where the salesman must "close" the sale. Advertising and much of sales promotion usually work at a distance, whether it be distance of time, space or psychology. For example, only in such relatively minor instances as direct mail campaigns with coupon response can advertising


\textsuperscript{48}"How Poor Packaging Loses Sales at Retail," \textit{Printer's Ink}, Vol. 269, No. 12 (December 18, 1959), pp. 52-3.
be said to have immediacy. But packaging works and works only at the point of sale. It may, of course, be reinforced by advertising, by point of sale promotion, by previous experience, or by need. But if packaging is to be considered as related to selling at all it must be considered the tool that produces the sale "now".

"(The) package represents (the product) at that last critical point in (the) business — at that moment the buying decision is made."49 Because of this, packaging has "an important influence on sales."50

A concise discussion of packaging at the point of sale has appeared as an editorial in a business journal of repute. This editorial states:

Everything succeeds or fails at the point of sale. All the time, talent and money invested in planning, research, raw materials, processing and distributing reaches the payoff point when the goods are offered to the consumer. That is why the appearance of the product at the point of sale is of tremendous importance...Merchandising problems deal with intangibles...People buy what they want, not always what they need...Good packaging appeals to the senses...The art of effective merchandising includes many elements but the visual display of the product and the combined utility and beauty of the container are a powerful sales builder...the merchandising specialists using modern packaging are putting

---


up a strong fight for the buyer's attention and action at the time and place where profits are made or lost.\footnote{Point of Sale and the Product,' Dun's Review and Modern Industry, Vol. 70, No. 3 (September, 1957), p. 87.}

As noted above, packaging people in marketing early saw the specific relationship of packaging to self-service selling as contrasted to the more generalized relationship to all selling. The Du Pont Company, by virtue of its cellophane manufacture, has long had an interest in self-service selling and packaging and in 1946 reported some of the findings of its research. In an article that traces Du Pont's early research on shopping, why and how people buy, and on the spread of self-service in supermarkets, independent neighborhood groceries, variety stores, drug stores, department and other stores, specific factors were cited as being necessary for success in self-service selling. The dealer also makes certain demands on the package if he is to give it the shelf space that is the necessary prerequisite to self-service:

... The package must look like a fast seller.
... The package must deserve a preferred display spot.
... The package must minimize the selling time required.
... The package must be convenient to stock and display.
... The package must prevent spoilage during the selling period.
... The package must resist soiling.\footnote{L. B. Steele, The Responsibility of the Package in Self-Service Selling, Packaging Series No. 19 (New York: American Management Association, 1946), pp. 24-32.}

These principles were restated again and again as the need for the package to sell itself became more obvious and more pressing with
the spread of the self-service concept throughout almost all types of retail merchandising. The later restatements add only some detail about the need for using the packaging as a display and advertising medium so that it will practically leap into the customer's hand.53 The more sophisticated versions take into account the changing nature and design of the supermarket or other self-service outlet. They discuss the need to design packaging to fit such factors as wider aisles, different kinds and color of lighting, different height and width of shelving, different decor and personality of the store, and the need to minimize the use of valuable floor and shelf space.54

Visibility of contents in prior years had been possible only with glass packaging. The development of strong, safe and flexible transparent films multiplied the material resources available for visible packaging. The rule became: make the contents visible wherever possible.55 This was done by using whole overwraps of plastic film, or by using windows in otherwise opaque constructions, and sometimes was done regardless of whether the contents were attractive in their own right.

Such visibility can be a two-edged sword. This amount of visibility, limited as it was since one could not see all the way into


54"How to Wrap it up to Sell Itself," Printer's Ink, (Reprint from Printer's Ink of March 20, 1953).

55Barksdale, op. cit., p. 54.
the interior of the contents, yet sufficed to give the buyer the confidence that he (she) had fully examined the product. If the interior of the package proved inferior to the visible part (bone and gristle under meat in prepackaged meats, poor cheese slices between good ones) the disappointment of the consumer was multiplied by a sense of betrayal. This sense of betrayal has been extended by analogy to all packaging by some people. 56 This point will be considered at length in the section dealing with the social and legal relationships of packaging.

A word seems appropriate on another aspect of self-service: vending machines. Some view this as the ultimate resolution of the supermarket itself, 57 others as an adjunct to present marketing that has a place but will not become a dominant force. In any event, in 1963 vending machines accounted for some $3 billion in both foods and non-foods. 58

The requirements set by vending machines are both simpler and more complex in terms of packaging. They are simpler because the package as a salesman, while it still has to perform this function, does not often have to do it in competition with like products.


Except for the classic cases of cigarettes and candy, most entries in vending machines are one of a kind. The selling job is undoubtedly made more difficult because the package, behind glass as it is, gives a diffuse impression and because it cannot be handled. Further, the technical problems of storage, the need to use every cubic inch, the ability to be chilled or heated, easy opening when dispensed and others, are quite difficult. The risk of dissatisfied customers is higher in that if a poor package is delivered no immediate palliative is available. The customer can not complain to the machine but must write the often hard-to-find machine servicer or, worse, buy again what she has already bought.

Sales Results from Packages

If the package is such an important factor in selling goods there should be illustrations of success clearly assignable to the package or package improvement. There is indeed a plethora of such instances. The assumption of such occurrences is implied in the very spread of packaging. An early article\textsuperscript{59} dealing with package design cites several instances where the redesigned packages were responsible for spurts in sales: Camel cigarettes, Canada Dry Ginger Ale, Cut-Rite wax paper.

\textsuperscript{59}Ben Nash, Restyling the Old Package, Consumer Marketing Series No. 6 (New York: American Management Association, 1931), pp. 27-8. See also, Using a Change in the Package to Revitalize a Sales Program, ibid. See also, "Is Packaging in a Box?" Tide, Vol. 33, No. 2 (January, 1959), pp. 27-31, for a later view of the effect of a package change on these products.
More recent illustrations include Marlboro cigarettes which were built upon a flip-top box and a tattoo; Johnson's Wax shoe polish kit-in-a-can, Knorr dehydrated soups, and a liquid detergent from Armour and Company. One should be able, with minimal effort, to recall from his own experience many more examples. Sometimes the package is given credit not only for a sharp jump in sales but for the continued existence of the producer, as with Flav-R Straws, Inc. This firm produces a straw filled with a flavoring ingredient. The president acknowledged that a newly designed package saved the firm from bankruptcy and completely reversed its poor financial position within months.

Packaging is considered to be a major factor in impulse buying. Impulse buying occurs when a purchaser is attracted by a product, a

---


61 "Knorr Dehydrated Soups," Modern Packaging, Vol. 36, No. 7 (March, 1963), pp. 100-1. This journal is currently running as a series of packaging "success stories" of which the above is number 24. There is little likelihood they will run out of candidates.


display, a notice, or a package and makes an unplanned purchase.

There is nothing new in the present concept of impulse buying, at least not since the growth and spread of self-service stores. End-aisle mass displays in supermarkets, shelf space assignment and related product selling have long been used. But it appears to be spreading as a buying tool, perhaps as more housewives neglect to make lists, depending on the shelves of the supermarket to act as a reminder and on their higher average incomes to compensate for any extra purchases that would otherwise inconvenience a budget.

Impulse buying is considered to have two components: reminder buying and suggestion buying. "Reminder buying occurs when a shopper sees a product and remembers that the stock at home is exhausted or low. Suggestion buying occurs when the buyer sees a product displayed and visualizes a need for it." Buying of both types has increased from 38.4 per cent of supermarket purchases in 1949, to 50.9 per cent

---


67Markman, op. cit., p. 52.
in 1959, according to a series of studies on consumer buying habits conducted by the Du Pont Company. The latest Du Pont survey indicates that attractive packaging is in large measure responsible for the surge in impulse buying although there is no doubt that the sheer milieu of supermarket self-service is jointly responsible.

It is possible to overdo the concept of impulse buying and ascribe to it actions which are perfectly explicable in other terms. For example, there is no real reason to consider that every purchase for which the housewife has not made a prior notation is an impulsive one. Many people simply use the existence of goods displayed on a shelf as their list and select from stock on that basis. However, studies such as those conducted by Du Pont show the existence of unplanned purchases as an important factor in the total retail selling mix.

Packaging and packaging design are widely recognized as a sales tool. Recently, recognition has been given to packaging as a

68 Packaging and Labeling Practices, op. cit., p. 554. Du Pont's interest, of course, stems from its position as a major manufacturer of transparent film which is promoted for encouragement of impulse buying.

69 Ibid.

70 Alderson, Marketing Behavior and Executive Action, op. cit., pp. 166-7. The author discounts to a large extent the importance of impulse buying, and believes that such apparent actions result from the consumer's attempt to use foresight to anticipate need.

marketing too; a recognition of its fuller, more pervasive role. This latter concept was enunciated in a paper presented at the Twenty-Ninth Boston Conference on Distribution, where some of the functions of packaging in buying, storage and transportation as well as selling were discussed. The speaker stressed that the creator and planner of packaging has to be marketing-oriented, in the meaning of the marketing concept, which is in effect the orientation that impells the producer to learn, through research, of the needs and wants of his customers. Thus he may integrate his total resources and effort to satisfy them. The package, in this view, is required "to stimulate new product success, to put new life into existing products and, in so doing, to reinforce and help establish the validity of all the links in the distribution chain."  

The emphasis of this section has been on consumer packaging since it is in that context that the selling ability of the package has the most meaning. But this is not to ignore the selling potential of the package in other areas. Packaging is playing an increasingly important role in the selling of industrial goods, by providing convenience, brand identity, eliminating waste and making materials


handling more efficient. In some ways, industrial and consumer packaging have become much closer because of the similarity of objectives in providing identification, convenience, protection and sales appeal.

Finally, the concept of integrated packaging, storing and handling systems has developed and become widespread in the field of shipping containers so that many manufacturers of these containers emphasize the sale, not of a box but of a system. A system takes into account the design of the container, the kind of equipment needed to handle it, of warehouse needed to store it, and of truck or rail car needed to ship it. This system concept holds great promise for reducing marketing costs.


Packaging, like many aspects of marketing, is subject to regulation by government, primarily Federal, for the public weal. Such regulation is closely related to the performance of two major packaging functions: protection and information. Packaging falls within the regulatory interest of the government when (1) it either fails to protect or actually contaminates the packaged contents or (2) when the package (inadvertently or by design) provides misinformation to the purchaser.

Fraud in marketing is as old as trade. In the early days of barter, cows were traded that were dry rather than fresh; some horses had spavin unrevealed to the buyer; and jewels were not always what they seemed. The butcher developed a heavy thumb almost as soon as he was furnished scales; the vintner quickly learned the value of adding water to wine; sand was mixed with wheat somewhat oftener than the laws of chance would allow; it was early learned that water soaked meat did not impair the price as it did the taste; and many men became rich after the development of coinage by systematically debasing gold coins either by alloying with base metal or by frugally chipping away at the edge. Such careful attention to detail was discouraged,
but not eliminated, by harsh regulations dating from early history.¹

In colonial times, local governments embarked upon a program of preventing fraudulent business practices involving the use of false weights and measures as well as non-safe and deceptive practices.² Since then a large body of both Federal and state legislation has developed. It is under more or less continual modification, usually in the direction of augmentation, as increasing technology and the increasing complexity of marketing have generated new ways of deliberate or inadvertent fraud.

The most important Federal regulations are presented in Figure 17 which depicts the agencies involved in enforcement, the products regulated and the source of legislative authority. Most state codes are similar to one aspect or another of the Federal codes, differing usually where tax revenues are involved, e.g., alcohol, tobacco. Frequently the codes simply provide for intrastate control the same elements that Federal regulations do for interstate commerce.

The goal of all these regulations insofar as packaging is concerned is to assure that packaged products will be legal, safe and non-deceptive. Unfortunately it is not easy for governmental agencies to define or manufacturers to comply with readily recognizable conduct that will accomplish these ends. The Food and Drug Administration of


## FIGURE 17
### MAJOR FEDERAL PACKAGING REGULATIONS

<table>
<thead>
<tr>
<th>Agency</th>
<th>Product Class</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Agriculture - Agriculture Research Service</td>
<td>Foods including meat, poultry &amp; soft drinks</td>
<td>Act and Date</td>
</tr>
<tr>
<td></td>
<td>Meat, meat products</td>
<td>Meats Inspection Act; 1906</td>
</tr>
<tr>
<td></td>
<td>Alcohol products</td>
<td>7 Insecticides, Fungicides, Rodenticide, Virus, Serum, Toxin Act, 1913</td>
</tr>
<tr>
<td></td>
<td>Tobacco products</td>
<td>9</td>
</tr>
<tr>
<td>Federal Aviation Agency</td>
<td>Foods, including pet unless otherwise stated</td>
<td>Aviation Act, 1958; Part 49. Transportation of explosives, etc</td>
</tr>
<tr>
<td>Dept. of Health Education &amp; Welfare Food &amp; Drug Admin.</td>
<td>Alcohol in drug products</td>
<td>Food, Drug, Cosmetics Act, 1938 (amended)</td>
</tr>
<tr>
<td></td>
<td>Drugs, cosmetics</td>
<td>21</td>
</tr>
<tr>
<td>Treasury Dept. Alcohol &amp; Tobacco Div.</td>
<td>Alcoholic beverages</td>
<td>Internal Revenue Code of 1954. Alcohol Administration Act</td>
</tr>
<tr>
<td></td>
<td>Tobacco</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Dangerous articles</td>
<td>27</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>Dangerous articles</td>
<td>Dangerous Cargo Act, 1940</td>
</tr>
<tr>
<td>Interstate Commerce Commission</td>
<td>Dangerous articles</td>
<td>Transportation, Parts 71-90 - Explosives, etc. Part 78 - Containers</td>
</tr>
<tr>
<td>Post Office Department</td>
<td>Enforces various regulations regarding postal shipments</td>
<td>The Postal Service Act of September 2, 1960</td>
</tr>
</tbody>
</table>

the Department of Health, Education, and Welfare plays the most prominent role in defining and enforcing the application of packaging laws and regulations, aided to a much lesser extent by the Federal Trade Commission and other departments of government. The authority to act of the former is derived from the Pure Food and Drug Act of 1906, as amended in 1938 in content and title (Food, Drug and Cosmetic Act) and amended again in 1962 via the "Drug Amendments of 1962" revision.

**Labeling Practices, Regulations and Recommendations**

The label is the immediate and obvious source of information about a packaged product, and because it is frequently the sole source of information it has become subject to many laws, regulations and trade practices. A label in the packaging sense fulfills the requirements of the Federal Food, Drug and Cosmetic Act of 1938 in that the term includes all "labels and other written, printed or graphic matter (1) upon any article or any of its containers or wrappers or (2) accompanying such article. The term 'label' means a display of written, printed or graphic matter upon the immediate container of any article..." which must also be on the outside wrapper, if there is one, or visible through it.

---

3 Ibid.

4 Ibid.

The kind of container and the way it is marketed to a large extent governs the type of label required. Can labels are usually wrap-around sleeves of paper, varnished for protection from water. Glass containers may have wrap-around sleeves similar to cans or may use spot labels. Sometimes the label may be etched or sandblasted directly onto the glass. Frozen food labels are usually of the wrap-around or overwrap type. Paper and plastic flexible packages, bread for example, often use an end label. Again, the label is often printed directly on the package.

Labeling may be solely grade labeling, descriptive labeling or informative labeling. In practice today, labels usually include all of these elements, especially where the package is used primarily in self-service selling.

Grade labels imply that the products contained meet certain standards or specifications of quality that have been established; this is attested to by the presence of a number, letter, stamp of approval or other symbol. Grade labeling is based on the concept that certain standards of goodness exist and can be objectively measured so that products can be classified. Proponents believe that this system is simple and definite and that a label so marked will convey the same meaning to anyone who reads it. The problems with grade labeling are that (1) the determinants of grade may not be objectively measurable, e.g., flavor, visual appeal; (2) those standards chosen may not be significant to most users; or
(3) discontinuities between one grade and the next one above or below may be so minor as to vitiate the attempt to separate them.

Grade labeling is usually found in natural food products rather than processed ones although there are some exceptions. The Agricultural Marketing Service of the USDA has established four grades for fruits packed in cans: A Grade or Fancy, B Grade or Extra Standard, C Grade or Standard, and Offgrade or Substandard. Eight grades have been established for beef under the Meat Inspection Division of the Agricultural Research Service of the USDA, while the Poultry Division of the Agricultural Marketing Service inspects and grades poultry and poultry products. Fish is inspected and graded by the Bureau of Commercial Fisheries of the Department of the Interior. Most other similar foods are inspected and graded by the appropriate Federal agency if the product moves in interstate commerce. Frequently there is a state agency with similar requirements for those products which do not move out of state.

Descriptive labeling is less subject to misinterpretation than is grade labeling. The descriptive label contains information relating to the size, kind, ingredients, quality, number of units, method of processing, and other specifics. Descriptive labels depend upon brand or trademark identification to convey the image of quality rather than a separate grade standard. By referring to the printed information and by recall of past experience with the brand, the buyer is placed in possession of sufficient information to make a choice.
Proponents of descriptive labeling object to the use of grade labeling, fearing that it will remove reliance upon the brand name, and thus diminish the individual responsibility of the producer. The Grocery Manufacturers of America, Inc., a major trade association in the field, has published extensive literature on the merits of descriptive labels. They define a "good" label as one that carries an "adequate description of the product, gives all the facts necessary to select merchandise, has attractive design, easy to read type and information concisely stated..." The elements of this good label are these:

1. Name of product.
2. Name and address of manufacturer and distributor.
5. Statement of dietary properties, especially if special dietary uses are claimed.
6. Statement of artificial coloring, flavoring or preservative, if used.
7. If below basic standard of quality or below standard of fill of container as set by Food and Drug Administration, must so state in prescribed legal manner.
8. English must be used for all pertinent information.
9. Ingredients (unless a government standard of identity has been set, as for ketchup, margarine).

The above are the legal requirements. In addition, the following information is recommended:

10. Picture of the product, accurate as to size, color and appearance.
11. Detail about quantity expressed where possible in terms of portions, cupsful, etc.
12. Description of raw product with method or processing.
13. Directions for use, including recipes.
15. Mention of recipe books and other available literature.
Informative labeling goes beyond what is normally found in grade and descriptive labeling although each of these is intended to inform. The informative label seeks to give information about methods of end use in terms of instructions, or alternatives available to the buyer. It might also warn of ill effects (in addition to meeting minimum legal requirements) that could follow misuse. Informative labels might specify recipes, or even menus, give cleaning instructions for textile products, or suggest levels or quantities of use as for a clothes washing detergent.

Naturally the value of the informative label in helping the buyer match the product to his requirement is based on the pertinacy, accuracy, and intelligibility of the information. If the information tendered is remote from the end user's needs, if it is not accurate as a reflection of what the product will do, or if it is proffered in language or in measures which the buyer does not understand, it is of little use.

The National Consumer-Retailer Council, Inc., has prepared a model of an informative label analogous to the Grocery Manufacturer's descriptive label.

...labels should conform, of course, to local, state or Federal regulations where such exist.

What it will do (performance).
Degree of color permanence; shrink or stretch; breaking strength; seam slippage; resistance to water, perspiration, wind, wear; light, heat, and power tests; cost of upkeep, etc.

What it is made of (composition).
Kind and quality of fiber, metal, wood, leather, ceramics, cement, rock, fur, plastics, petroleum products, rubber, paper, bone, chemicals, drugs, ingredients of food products, etc.

How it is made (construction).
Size, weight, number of yarns per inch, weave, number of stitches per inch, finish, ply, cut, hand or machine made, pressed, molded, stamped, inlaid, etc.

How to care for it.
Detailed instructions for washing and/or cleaning; precautions to be observed in cleaning or storing; refrigeration; oiling and greasing; polishing, etc.

Recommended uses.
Purposes for which it is most suitable; recipes, etc.
Name and address of manufacturer or distributor.

As noted before, few labels fall solely in one class or another although this is more likely the case for fresh food products, e.g., eggs, meats, poultry. But labels of processed goods usually have elements of all three kinds of labels so that the end product more and more meets the needs of self-service selling where the buyer has no ready source of amplification.

In labeling, manufacturers are under three kinds of pressures. The most obvious is that derived from the power of government to regulate for the common good. Another pressure is derived from government departments acting on behalf of the consumer but on a voluntary basis, and from consumer groups who also seek to influence producers into modifying their labeling practices usually in the direction of more precise, visible information. Finally the manufacturer is under the pressure of the marketplace in that the consumer, if he or she does not like the label, is free not to buy the product. It is, however,
difficult to pinpoint consumer reaction to labels alone (as opposed to the package and product as a whole) unless the label is so clearly fraudulent as to give rise to a body of complaint.

The responses available to manufacturers to meet these several pressures are clear. Insofar as the legal requirements of labeling as to quantity, content, etc., are concerned, he must meet them or violate criminal statutes, making his goods subject to seizure and himself liable for imprisonment and/or fine. The various government bodies have had frequent occasion to seize goods for improper labeling. The manufacturer's alternatives are to comply by changing the label or to request a trial to test its contention that its label is proper. Another alternative is to ignore compliance until caught or to make compliance so minimal as to barely get by.

On the assumption that most manufacturers have pride in their output and wish to stand behind it, that most are honest and have no wish to cheat in terms of contents or weights, but that most are subject to competitive pressures and to cost squeezes, it still seems that the best procedure is full compliance.

The manufacturer can similarly ignore the offer of voluntary cooperation under government or trade association auspices but, for the same reasons as noted above, will usually do well to heed when he can.

His reaction to the vote of the marketplace is obvious. But the manufacturer cannot always heed the desires of his customers even when he recognizes the legitimacy of their point of view. Assuming a full desire on the part of the producer to comply with all reasonable
standards, still there may be technical difficulties not readily comprehended by the layman which affect: his ability to change the way he labels; the kind, position and quantity of information he can put on the label; and his ability to use measures of weight or volume that correspond to what consumer groups usually want.

Because compliance with these pressures is not always automatic or feasible and because the pressures are sometimes contradictory, the labeler has in the past been castigated for willful non-compliance that has inevitably led to law and regulation. At the present time such pressures on labeling and packaging are mounting high and will, in their turn, lead to modifications (most likely, extensions) of present laws.

**Present Practice and Trends**

Most packagers are vitally concerned that their products meet the standards required, however ill-defined, although they have traditionally tended to resist the imposition of new, more stringent standards. The checklist shown in Appendix A illustrates the comprehensive approach to assuring conformity that most major manufacturers follow.

It has become increasingly evident that government agencies and many consumers do not share the view of most manufacturers that present regulations suffice to protect the consumer from deliberate

---

7*Packaging and Labeling Practices*, op. cit., p. 348. "We (a group contesting the original 1906 legislation) believe that it is the part of wisdom to fight the proposed legislation in principle, to make no compromise whatever with the scamps who are behind it...."
or accidental violations of the general rule of "legal, safe and non-deceptive." Senator Phillip A. Hart (D. Mich.) stated in the opening session of a series of Hearings on a proposed new bill to tighten controls on deceptive packaging, that his bill "recognizes the emergence of a relatively new form of non-price competition, packaging and labeling...(seeks) to reduce needless waste in marketbasket expenditures resulting from those marketplace activities which this bill seeks to arrest...that industry has not been able to correct these conditions (of ambiguity and dishonesty in packaging) itself...(due to) the complexity, diversity and intense competition in the economic sector involved." During these Hearings, Commissioner George P. Larrick, Food and Drug Administration, and Wilbur J. Cohen, Assistant Secretary for Legislation of the Department of Health, Education and Welfare repeatedly stated that present legislation was inadequate to protect the consumer against unfair and deceptive packaging and that industry could not of its nature perform this function voluntarily. In this they were supported by vehement testimony from divers consumer group spokesmen.

The bill itself seeks the following primary results:

---

8Ibid., p. 5.

9Ibid., pp. 348-351. See especially statements by Professor Irston Barnes (Graduate School of Business Columbia University, New York), Mildred E. Brady (Consumers Union of the U. S., Mt. Vernon, New York), Esther Peterson, Assistant Secretary of Labor, Sarah Newman (National Consumer League, Washington, D.C.), Honorable Maurine B. Neuberger (Senator, D. Oregon).

10"The Hart Bill: Day of Reckoning," Modern Packaging, Vol. 36, No. 10 (June, 1963), p. 132. See also Appendix B which recapitulates the essence of this bill.
1. Net weight to be printed prominently on the front panel of all packages.
2. Packages shall carry no illustrations that could deceive the consumer as to content.
3. No more "cents-off" or "economy size" designations, precludes the use of qualifying words for content, e.g., "full" quart.
4. Prevent the use of packages (shape and structure) that could deceive the consumer as to content.
5. Regulatory agencies (F&DA, FTC) will be authorized, if marketing conditions require, to set up weights and measures in which a certain product line may be sold.
6. Establish standards for "servings".

Not unexpected but still disappointing, the industry's reaction was violent and almost unanimously opposed to any further regulation of packaging practices. Objections were based on denials that packaging malpractices occur except in a minute number of cases; on the technical difficulties of doing anything about challenged practices (notably slack fill); and on the alleged infringement of the right of the consumer to freedom of choice in the marketplace. Editorials representing the industry's point of view proliferated usually with titles such as, "The Hart Bill: Day of Reckoning," "The 'Deception'"

12Hearings, op. cit., Part II, pp. 608. Statement of Senator Dirksen (R. Ill.).
13Ibid., pp. 229-234. Statement of Paul S. Willis, President Grocery Manufacturers of America, New York.
15loc. cit.
Pot Still Boils," and "A Bill That Could Strangle Packaging." But as Hearings and testimony have developed over the past three years since the initial entry of this "truth-in-packaging" bill, the tone of industrial leaders has moderated somewhat as more and more of the most objectionable provisions have been eased or stricken (primarily those dealing with criminal rather than civil penalties).

There is little doubt that practices which range from dubious to deceptive have found their way into consumer goods packaging. Packaging provides new opportunities for the honest man to fall into error, or for the dishonest one to perpetrate fraud upon his customer. Since in most cases the contents are wholly or partially obscured the purchaser must rely upon the visual message delivered by the package. In all too many instances this message has fallen short of reality.

Packaging has been deliberately used for fraudulent selling in the following ways: (1) short weight, (2) deteriorated contents, (3) mislabeling as to grade, quality, quantity, performance, or other material factors, and (4) misleading price information. Packaging has been used additionally in ways that could be construed as fraud as follows: (1) deceptive package sizes, (2) disproportionate costs of package relative to contents, (3) deceptive illustrations, (4) burying of pertinent price or quantity information in text or design, (5) use

of odd weights to make price comparisons difficult, (6) use of misleading terminology describing sizes or contents, and (7) mixing of contents with diluents solely for selling purposes.

Actual, deliberate misrepresentation and similar forms of fraud are becoming increasingly rare in American marketing. By and large, such practices lead to inevitable discovery with penalties out of proportion to the gains involved. Present legislation has been effective in correcting the ills of the past.19

Most of the real or alleged abuses in the general area of misrepresentation of contents revolve about slack fill. Slack fill is the condition where there is unused space within the container, whether deliberately introduced or inadvertent and related to the packaging process. Frequently slack fill is unavoidable. In cereal packaging, most often involved in accusations of deliberate slack fill,20 the condition occurs because cereals tend to settle during storage and shipment due to their friable nature. This happens despite the standard attempt to vibrate the contents to a settled condition during packaging. Upon opening the box, an inch or two of free head space is usually present.

Certain packaging techniques such as aerosol cans or squeeze

---

19Stuart Chase and F. J. Schlink, Your Money's Worth (New York: The Macmillan Company, 1931). This dramatic and groundbreaking book in its era cited some especially dreadful instances of fraud. See page 188 wherein sodium hydroxide was sold as nonpoisonous; page 134 wherein "Mother's Friend," a useless compound was sold to relieve the pangs of childbirth, and many more.

bottles depend on enclosed gas (including air) to expell the contents. Allowance must be made for such enclosure.

But in many cases the charge of slack fill is avoidable at the marketer's discretion. Packages may be designed with spaces filled by packaging materials rather than the product,\(^{21}\) glass bottles may have hollows in the bottom,\(^{22}\) packages are frequently made larger than required to occupy more shelf space or to give the appearance of size greater than warranted,\(^{23}\) and sometimes the product itself may be modified so that a given weight requires more volume.\(^{24}\) It is difficult to determine whether this last is done solely to require a larger package and so obtain more shelf or display space, or whether it represents a product improvement with certain advantages to the user. In point are the developments of aerated margarines, low density detergents, puffed cereals, and many more. In some cases the suspicion does arise

\(^{21}\) A turning point has been the Delson Thin Mints case in which the Food and Drug Administration charged Delson with deliberately substituting packaging materials for mints. Carried to the Supreme Court, the F&DA finally won after several reviews and established the principle that interior packaging materials could not take up an undue amount of volume. However, where the extra packaging serves a functional purpose it is allowable. See "California Versus Creative Plastics," Chemical Week, Vol. 95, No. 23 (December 5, 1964), p. 31. A double-walled plastic jar provided thermal insulation to delicate cosmetics and so is allowable.


that the product benefits are minimal and that the primary reason for the product in the expanded form is the impression of size unrelated to useful volume.

Perhaps the best answer to charges by government and consumers of slack fill has been the recent successful efforts of large manufacturers of cereals and detergents to re-package in containers which are shorter and broader, and thus have much less "head" or empty space at the top. The squat cereal box has rapidly become a new standard, and detergent boxes, if not changed so radically, at least are filled much nearer the top.

Deteriorated contents are not usually considered a deliberate fault of the seller. Most packaging today is capable of protecting contents. Where the package fails, the producer is liable for either damages and penalties, or for a directly traceable loss of good will. Much more frequent than package failure is failure due to a relatively short shelf life of the product. Manufacturers have made considerable progress in developing packages to overcome the perishable nature of certain products. For example, meats and other foodstuffs subject to rapid deterioration are packaged in inert gases which retard such spoilage. Packages containing perishable products are frequently dated and directions given that the contents are not to be used after the authorized time period. Fraud rarely lies in this direction at this time.

Mislabeling is still practiced by misguided marketers
although the consistency and sternness of law enforcement in this area discourage most overt attempts, at least by large national or regional sellers. Grade labeling is open to abuses since performance or product characteristics are so variable even within grades that for many products the output of one manufacturer designated Grade B may be better than another manufacturer's Grade A. When quantity information is presented in units of weight or volume, it is rarely deliberately erroneous although often hard to find and harder to read. When this information is translated into such intangibles as "servings" or "portions" the resultant calculations are sometimes so difficult to relate to the amount packaged and the customer's consuming habits as to constitute fraud.25 During the Hearings on the "truth-in-packaging" bill, many challenges were cast at present labeling practices. Points were made that needful information was difficult to locate due to the use of unduly small type or lack of contrasting colors, and that the information when found was unintelligible due to the use of fractional units of measure and fractional prices.26

Product performance as illustrated on the package is an open target for those who seek truth in packaging. Packages may carry printed or visual statements which display little regard for the actual contents. This is an old practice dating from the earliest marketing


frauds, well illustrated by the patent medicines of an earlier day. Here, of course, packaging simply shares and reinforces the guilt borne by advertising and other media. Several volumes have been written with instances of packages that made product claims partially or entirely beyond the scope of the product.\(^27\) Frequently the reaction of the marketplace shortens the life of such product offerings; too often it does not.

The line between permitted puffery and the actual capability of the product in the hands of a reasonably skilled buyer and user is dim under present practice. Further, package illustrations often depict the use of the product in conjunction with additional products not contained, e.g., cake mixes illustrated with iced cakes; succotash illustrated as used in a stew. Much has been made of such instances, as when Senator Hart solemnly counted the cherries illustrated in a picture of a wedge of pie on a package (34 cherries) and compared this to the actual count of cherries in the whole packaged pie (40). The Hearings cited before are replete with consumers' testimony to many such occasions.

One of the practices of which packagers have been accused that apparently generates a high degree of irritation in consumers is deception in the price/volume or weight relationship of the packaged product. When packages remain the same size but the weight or volume

of the contents decreases (a common practice to avoid raising prices), when package size is increased or distorted in shape so that the container does not resemble a common variety of container of a certain volume but the contents remain the same, or when the contents are packaged in quantities requiring two or more decimal places to describe, then the fury of the consumer raised mightily.

Packagers have advanced what undoubtedly seemed to them good and sufficient reasons for such practices. Many goods are sold to a price line, as candy in a vending machine and the alternative of a smaller candy seemed preferable to an increased price. Many customers would agree. Again, new products are frequently brought out which differ in density from the old and so less product can be packaged in the former container which is still a desirable size. This is true of aerated fats, of detergents and of cosmetics. New shapes have been used, often successfully, as marketing tools to add attractiveness to the product. Finally, many products are packaged in fractional units because standard size boxes or other containers are used for products of different physical characteristics, including density; simply, different weights per volume will go into the standard box.


While some of these reasons are undoubtedly technically sound, enough doubt has been cast on present packaging practices by consumer protest to cause some changes. Former difficulties have evaporated in some cases, notably in the use of unit weights, printed in large, contrasting type. Packages significantly larger than the contents require are being reduced in volume so that the ratio of packaging material to product is decreasing.

More and more industry leaders are being found who are willing to admit that some past practices were of uncertain legitimacy, at best. Rather than spending all their efforts attacking the proposed Hart Bill, packaging men from consumer goods firms have developed and are proposing a model code for state adoption which incorporates some of the elements of the Hart Bill, but without the extension of Federal control. New package designs have been developed, to the limits of present technology, which minimize the objections raised by consumers. Such tendencies should help remove the onus from packaging of being a prime perpetrator of fraud in marketing. However, these tendencies do not go far enough. It is a truism that mass production depends upon mass distribution. Our mass distribution system, in turn, depends on


packaged goods and would be immobilized without packaging or if the integrity of packaging came so seriously into question that few goods were bought without the consumer opening the package for inspection. If all consumers insisted on opening and weighing packages, examining contents and computing comparative prices, the whole system of mass distribution would break down.

Therefore packaging is an act of faith. It is faith on the part of the seller that he can enclose his product at the factory (or at the wholesale or retail level in the case of fresh produce and fruit), transport it, store it, advertise and sell it and have it fairly represent him to a buyer who will buy again. It is an even greater act of faith on the part of the buyer who has been conditioned by a long and successful experience to purchase, often blindly, a product which he cannot see, in a form which must be transmuted to be useful, at a price which he cannot compare in detail, in the expectation that his purchase will satisfy his wants and needs fairly and with safety and economy. This faith is as central to marketing as the faith which underlies credit. When this faith is denigrated, deliberately or inadvertently, when trust in the enclosed value is diminished, the ability of the economy to act as a mass marketing medium is thereby diminished. To the consumer it matters little whether this effect results from a deceptively packaged product from a large manufacturer, or whether a local retailer has hidden the bone under store pre-packaged meats. Every such instance is actually an added cost to the economy,
in that packaging and other marketing media must then work harder to overcome an air of distrust. The current consensus is that packaging enjoys a great reservoir of faith, weakened only here and there by special instances. It is not (yet) in the position of advertising where consumer receptivity often is dulled by years of overloud and overblatant promises. Even the youngest television watcher soon learns to believe only part, indeed to hear only part, of what he is told by commercial messages. This is a real cost in that it increases the threshold level which must be reached to gain attention at all. Advertising believability has long been a subject of concern to seller and buyer alike. Each instance of unbelievability makes it more difficult for the succeeding message to penetrate, convince and institute buying action.

If packaging falls into the same trap, a spiral of increasing effort and expense will be required to overcome a mounting distrust that the contained elements are in accord with the package’s representation, and the task of marketing will become more difficult. A fair note of warning was sounded in testimony before the Hart Committee.

I wonder if the manufacturers, advertisers and retailers realize the extent of the suspicion and dislike they have earned from the people who buy, and have to buy, their goods. I used to be reasonably trusting; if a new "improved" package was advertised, I had the curious idea that the improvement might be for the consumer's benefit. I have learned better and now I believe absolutely nothing.34

CHAPTER VII
THE SOCIAL VALUES OF PACKAGING

Packaging has facilitated, modified, and created offspring from existent marketing institutions. New classes of retailers, such as supermarkets and vending machines, depended in large part for their birth and their growth on packaging innovations. The operations of wholesalers have been greatly aided by integrated concepts of materials handling which permit the storing and movement of goods in ways not possible before the emergence of sophisticated packaging systems.

But what of the larger values of the marketing system per se as related to packaging? What is the role of the marketing system in an affluent economy? It is clear that the American economy has long passed the level of subsistence for the larger part of the population. The uses of the marketing system go beyond the provision of food, shelter, clothing and other basics. Emphasis has shifted from mass producing to mass selling and now to mass consuming.

Mass production, of course, was the first concept involving the use of the term "mass" in the American economy. This concept is not solely, nor even primarily, concerned with volume production, for
goods had been produced in large volumes long before the term came into being. Mass production implies something further, the organization of process, the specialization of work functions, the ordering of work flow and the interchangeability of standard parts. By such segregation of functions, improvement of each part of the system is possible and, eventually, optimization of the whole.

It soon became apparent that this was not enough. Mass production of itself only generates large quantities of goods neatly stored on the shipping docks. Distribution systems had to be modified and in some cases created to match the capabilities of mass production. Such mass distribution has permeated all aspects of the economy, from transportation and distribution facilities, to the creation of wholesaling and retailing outlets best adapted to move large volumes of goods. These included the development of mass selling devices such as catalog selling and large self-service retailers when sufficient salespersons could not be economically obtained; mass sales facilitating devices such as communication through advertising and packaging; and credit which permits people to buy in anticipation of their incomes.

Now the emphasis is shifting once again. Mass distribution of itself merely shifts the locus of goods from the manufacturers' loading docks to the shelves and warehouses of the retailers. Concentration is now on mass consumption, for without organized efforts to induce and support consumption of goods and the values inherent in goods, nothing has been accomplished. The techniques of data processing, operations
research, business simulation and others that have served so well in manufacturing, have been trained on the problems of marketing, which are at least able to be conceptualized and will eventually be reduceable.

But the problems of mass consumption remain. They involve new concepts of consumer income, consumer choice and the values of ownership of goods as opposed to purchase of functions. As the consumer aspect of the multi-faceted citizen rises in importance over the producing aspect,¹ it is inevitable that the nature of our society change as radically in the future as mass production and mass marketing concepts have changed it in the past.

Consumption of values inherent in goods goes beyond the possession of the goods themselves and has become the focus of marketing. Such a focus concentrates on the utilities of convenience and of possession of goods in a form and at a time and place most convenient for consumption. Packaging increases consumability.² It has been stated that "the affluent citizen of the next century will be oriented

¹"...our economic system has to produce consumers, whereas previously we only produced goods." This highly quotable, succinct statement epitomizes the difference between past and future. Ernest Dichter, Handbook of Consumer Motivation (New York: McGraw-Hill Book Company, In., 1964), p. 453.

²The emphasis on use values rather than product was forcefully stated by Walter P. Paepcke, Chairman of the Board, Container Corporation of America. "Nobody wants a paper box. You never see a man try to collect 300,000 paper boxes before he dies." "Packaging -- A Special Report," Dun's Review and Modern Industry (November, 1961).
to buying time rather than products...As scarcity of product disappears, scarcity of time ascends the value scale."3 Throwaway goods, highly processed goods, such as frozen or irradiated foods, all those where the work of preparation is built in at the factory and preserved by packaging, and where the package itself does part of the work of preparation and/or dispensing, help to free time. Packaging, of course, is not the only element in this concept, which orients the customer to use rather than purchase and ownership. Disposable goods, contract purchases, and rental of many goods and services now purchased, all play a part in the approach to a consumption oriented economy. But packaging will be the frequent handmaiden.

Packaging and the Creation of Value

The question has often arisen whether packaging adds a value to the packaged product beyond the strictly measurable functions of storage and display, or simply adds a cost which is an economic waste. Value itself is not an easy term to define. Values may be defined as the capacities of goods and services to satisfy human wants and needs,4 but this definition makes no statement as to the legitimacy, if such be needed, of these human wants or needs. Such a definition focuses on the economic "utilities" by which value is defined, which in turn are primarily concerned with form, time, place and possession. It provides no basis for considering the truly subjective aspects of


4Beckman, Davidson, op. cit., pp. 7-8.
value. These go back to early economic thought wherein value is defined as "an expression of the varying esteem which man attaches to the different objects of his desire"\(^5\) without necessarily being tied to any rational basis for esteem.

Earlier it was shown that the costs of packaging different classes of products ranges from 1.4 per cent to 40 per cent and more of manufacturers' selling prices. There is little question but that packaging costs in the upper portions of this range are not caused solely by the mechanics and protective aspects of the process. Rather, especially in cosmetics, certain foodstuffs and convenience household goods, much of this cost has been incurred for reasons relating to subjective values. These costs have been attacked as economic waste.

Certain consumer groups and spokesmen for these groups have been most prominent in these charges. Their views and the implications of these views are noted throughout the testimony given during the Hearings on the "truth-in-packaging" bill: "The Consumer's Union would like to call to the Committee's attention the economic impact of deceptive packaging,"\(^6\) "the Food and Drug Administration (has received) a great number of complaints about packaging abuses and merchandising:

---


\(^6\)Hearings, op. cit., Part I, p. 53.
gimmickry, 7 "packaging costs are equal to almost half the total revenues of our state and local governments," "the average family is taxed $190 annually or $16 monthly for containers which almost invariably end up in the garbage can," "the consumer pays for the package," "nearly a fifth of the consumer staples outlay was spent on the package." 8

Most such comments and objections have in common the viewpoint that all consumer values are, or should be, rational and measurable and in turn these should be based on price as the best (i.e., most rational) indicator of worth. Such testimony reflects the view that minimum price per quantity purchased is a value in itself and reflects the Puritan ethical tradition common to the country's origin and growth. Such concepts incorporate the ideal of austerity and minimum cost and focus suspicion upon gadgetry and "superfluous" expenditures, including those for packaging. Inherent but unnoticed in many of the comments is the fact that the speaker's position is essentially based on value judgments of his own, just as subjective and difficult to defend as value judgments not so firmly grounded in measures such as "price per ounce."

At this point, it would be well to introduce a clear distinction between fraudulent or deceptive packaging and packaging which by


8Ibid., Part II, p. 585. Statement of Joseph A. Beuse, Vice President, Industrial Union Department, AFL-CIO.
added convenience and beauty seeks approval of the market even though a part of the market objects to the added cost as nonutilitarian. No standards exist for what is convenient and what is beautiful, let alone for how much convenience and beauty are permissible before the costs venture on the extravagant. Few ground rules exist for distinguishing between deception and harsh practices required (and justified) by competition. Pending the introduction of further legislation, each package must be considered on a case-by-case basis. But if the most obvious violations of good packaging and good marketing are set aside, such as containers which are only partially filled; whose contents are misdescribed or described in minute or hard-to-read type or not described at all; containers whose cost is many multiples of the cost of the contents; then it is possible to justify consumer packaging on traditional marketing grounds. The consumer knowingly purchases certain values over and above the most drab and obvious functionality.

These values are worth restating. There are the obvious and aforementioned values of utility of form, time, place and possession. There is the value of scarcity, in that certain consumers esteem what is not common, what is rare, the possession of which indicates to the world and to themselves the kind of person they are and the means they

9Among the infrequent occasions that such items are reported in the literature, one of the most pointed is the following statement: "Procter & Gamble came out with an overpackaged home permanent called Pace to justify the relatively high price of a low cost product to produce. The size of the Pace package also was a step toward crowding competition off the shelves." "Is Packaging in a Box?" Tide, Vol. 33, No. 2 (January, 1959), p. 29.
possess of satisfying their wants. When such products are packaged goods, the packaging lends, or should lend, reinforcement to this perception. Allied with this is the item which is singular and distinct, if not scarce. Contrasted to this is the item which offers as a prime and saleable virtue its conformity with what other consumers desire and buy.

Packaging is often explicitly designed to forward a prominent marketing goal, after-the-sale attention. It has the value of reassuring the customer that his purchase was a wise one, especially where continuing purchases are desired. Packaging frequently aspires to, and less frequently obtains, an aesthetic level of its own. Some consumers select from an array of products those packaged in a manner which most appeals to their sense of beauty. This beauty has been recognized independently of marketing factors, in art shows by major institutions.10

The values of packaging in enhancing a self image have been a subject of study. Such factors are included as the sensual pleasure of handling a container, prestige, implications of considerateness (the manufacturer cares enough...), sanitation, and finally creativity, as

10"Packaging Comes to the Modern Museum," Modern Packaging, Vol. 31, No. 3 (November, 1959), p. 158. The New York Museum of Modern Art held a major show of some 200 packages selected for their design, excellence of structure and shape, color, texture, proportion and suitability of these qualities to functional performance. However, not every marketer would agree with the specific packages selected or the bases for selection. While justifying beauty in packaging, the shows' director Wilder Green said, "An alarming number of packages are more elaborate and costly than the things they contain. Such packages are altogether wasteful."
when the package induces a purchase so that the consumer can duplicate or exceed the desired end result pictured on the container.\textsuperscript{11}

These values can be discounted only if one discounts values of marketing in a (relatively) free society. If one accepts the concept of consumer choice based on motivations best known to and evaluated by the consumer, then one must accept the range of product offerings that cater to the heterogenous consumer. Always excepted are products which are harmful or fraudulent.

Packagers recognize that packaging and marketing are inseparable. This recognition accounts for some of the violence of their rejection, by and large, of the Hart Bill, even of some aspects of it that appear desirable to those wishing to reduce fraud. Manufacturers fear that a bill too restrictive of packaging must inevitably conflict with present day marketing methods and product formulation, since the three are integral.

...You cannot divorce packaging from the product. You cannot sell cereal in the nude so to speak.\textsuperscript{12} (In) perfumes price considerations have little or nothing to do with consumer choice. Competitive articles are not comparable in subjective satisfaction. No calculation regarding the value of a painting per square inch or per pound of paint is a guide to value. The emphasis is on beauty. The additional cost is (similarly) accepted in toiletries. If a bottle is designed so that it is tall and slender, who is to say that it was so designed because it appears larger than its squat cylindrical counterpart or that it was made slender and delicate because of aesthetic


\textsuperscript{12}Hearings, op. cit., Part II, p. 726. Statement of Frederick M. Rowe, Attorney for the Chamber of Commerce, Washington, D. C.
considerations. I submit that the only valid determination is that made by the buying public as an expression of their desires.\textsuperscript{13} ...a theoretical economic philosophy (states) that promotional competition involving differentiated products is somewhat "impure" competition and disadvantageous to the buyer. We have no apologies to make for competing on the basis of product and package differentiation. The whole history of our business, since the days of the unwrapped soap bar, has been one of increased performance based on the housewife's own opportunity for comparison....\textsuperscript{14} It is necessary to understand present day marketing methods which have grown up largely because of the packaging revolution. I cannot overestimate the importance of the role played by the container in modern marketing, nor the importance of free choice in the selection of container design, shape or size.\textsuperscript{15} The impetus to buy may arise, not because a cute, thin, tall bottle is deceptive but because the purchaser likes it and would rather have an attractive bottle than a drab one.\textsuperscript{16}

This last quotation is probably as good a summing up as any.

If one subscribes to the theory that marketing focuses on the consumer and attempts to interpret his wants and needs in terms of the available and potential product, plant and services mix, then one must accept the fact that consumer choice will vary, and will be based on rationales to which everyone does not subscribe, yet all of which have equal merit in the marketplace.

Marketers do not seek to deny the affluent foolish and careless

\textsuperscript{13}Ibid., p. 662. Statement of Gilbert Miles, Toilet Goods Association, Inc.

\textsuperscript{14}Ibid., p. 598-600. Statement of E. Scott Pattison, Secretary and Manager, Soap and Detergent Association, New York.


the opportunity to exercise choices that may not be open to the less affluent. Except in instances of fraud and extreme health hazard, marketers do not make moral judgements as to which purchases or purchasers are foolish or careless. The system must be tolerant of a little slippage, perhaps even a little venality, in order to protect the freedom of choice of wants of most consumers and the freedom of choice of satisfaction mechanisms of the sellers.

Packaging, then, adds values to goods beyond the physical attributes of containment; values which are marketable and for which consumers are willing to exchange other values. Since marketing has no other justification, packaging needs no more.

**The Battle of Materials**

One further aspect of economic and social utility remains to be treated — whether the rapid flux and shift of packaging material choices further or retard the ends of the general economy in that industries are created, enhanced or diminished almost overnight, with consequent loss of investment, displacement of jobs and the like ills.

Of the fact there is no doubt. Packages and packaging materials replace each other with bewildering speed. The range of alternative choices includes new classes of materials for packaging such as plastic films, metal foils and aluminum cans and combinations of these with older packaging materials, to produce such things as plastic faced paperboard and resin lined cans, and with each other, to produce

such things as Mylar-polyethylene film and plastic coated foil.

Again, the older materials have reacted aggressively to the loss or threatened loss of markets by new product development and modification. The steel industry, after a long period of somnolence induced by the belief that its packaging markets were invulnerable, reacted to the introduction of aluminum ends on paperboard cans and to cans made entirely of aluminum, by creating "thin tin", a much thinner sheet steel which sharply reduces the weight and cost of cans. The bottle industry, alarmed by the loss of the beer market to cans, introduced the lightweight throwaway bottle, in an attempt to defend and regain such markets. In some cases a marriage of materials has been necessary to erect a defense against encroachment, so that a partial loss of markets is accepted in preference to a total loss. Thus the paperboard industry accepted polyethylene coated paperboard for milk cartons to stave off the plastic milk bottle which, however, still looms on the horizon.

The velocity of such changes is astonishingly swift. A fair example can be found in the quart oil package, traditionally of steel. In the space of two years this industry, accounting for almost two billion units, switched to the use of aluminum cans, discarded these in favor of aluminum ends on spiral wound paperboard


tubes which in turn are threatened by all plastic packages of semi-rigid polyethylene. Before the latter material can fully achieve penetration, it must face fully flexible film packaging as an alternative, less expensive container. Three major competitors for the quart oil package are shown in Figure 18.

The same shifts are occurring in foodstuffs such as bread, frozen juices and vegetables, in dog foods, in cosmetics, and many more.\(^\text{20}\) Many such instances have been cited in prior chapters; cigarettes in plastic packs, all sorts of foodstuffs and chemicals in aerosol cans, many foods and non-foods, including liquids, in paperboard.

But this "battle of materials"\(^\text{21}\) is more than an advertising term or a semantic convenience. Each time a major displacement occurs, new capacity must be created to manufacture the raw materials of the new package. Major investments in plant must be made in the anticipation of such growth. Since many related materials seek the same markets, and since individual firms within industries all vie for the same opportunity, serious over-capacity in most plastics, for example, has developed. As a result, production is equal roughly to half the capacity in many of the resins that go into packaging.


FIGURE 18

THE BATTLE OF MATERIALS

(1) Foil-fibre can, 1963.
(2) Polyethylene bottle, 1964.
(3) Steel can, 1962.

Source: Author's collection.
Moreover, prices have been depressed to the point where investments have inordinately long payout periods and profits are minimal.

But the velocity of the changes does not permit long periods to recoup investment. Obsolescence is a major factor and therefore new investment must be made constantly on the heels of the old, whether or not it is economically justified by profit expectations. Plant modifications must be made to produce known materials as cheaply as competitors do and new plants must be added for new products that render the old obsolete. The alternative is to retire from the business.

Even this is not the sum of the effects. There are like changes in the older materials. As glass bottles have lost part of their markets to plastics, utilization of capacity and employment have been reduced in bottlemaking. The steel industry has suffered loss of markets and consequent diminished use of capacity in its canmaking aspects. The folding carton industry has been profitless almost since the large-scale introduction of plastics.

The question is one of the value of such changes, many of which are changes for the sake of change. Many products have been packaged in newer materials which added no functional value to the product, but simply provided a facelift. Naturally some cases of misuse of packaging materials occurred, especially before full information was developed on the technical capabilities of certain plastics. Most of these have been rectified.

On balance, is there worth to the economy and society in undergoing the dislocations and dis-economies which result from such rapid transitions of materials? The answer must be "yes." These losses and apparent dis-economies are part of the price of a free market economy. If consumer preference and consumer choice are to be the major criteria, then the packaging materials industry must take the risks of offering choices which can be implemented only by risk assumption investment in plant, design and marketing. This risk is neither greater nor lesser than that undertaken by the manufacturers and marketers of the packaged products. These latter also face competition, technical obsolescence and the fickle favor of the marketplace. In attempting to win and maintain a share of the market, they knowingly employ packaging and the use of varied packaging materials as a competitive, usually non-price competitive, weapon. In so doing, they shift part of the risk backwards to the packaging materials manufacturer who depends on the derived market for subsistence.

The alternative is the abandonment of free choice on the part of the consumer as reflected in his selection of the packaged product. It is a truism that no one wants and no one buys packages per se. The total product in its packaged form represents a value to the


consumer for which he will trade his funds or his credit which repre-
sects the accumulated or anticipated value of his productive output or
capital. He is free at the time of each purchase to accept or reject
the offerings available to him. Such risks are inherent in every
aspect of our society; change is constant, continuing and planned.
CHAPTER VIII
THE DETERMINANTS OF PACKAGING

Form follows function in packaging as in architecture. The nature and kinds of packaging flow from the forces which act upon it. These forces in turn are derived from the needs of the major factors of our producing and distribution systems. But these needs are not completely separable. The same package or packaging concept must do several jobs for each factor, and must be in harmony with the requirements of several factors. These forces act as constraints and provide criteria by which selection can be made from the many materials, configurations and properties available to the packager. At the same time packaging is used as a positive tool to forward the goals, implement the strategies and complement the other marketing activities of the user. Thus packaging means different things to different segments of the economy, and is used in different ways to accomplish separate but related purposes by each segment. Each packager has available to him the array of materials and packages from primary producers supplemented by a host of facilitating services in design,
printing, filling, packaging machinery, etc. The needs of the user
determine the packaging system.

**The Manufacturer of Packaged Goods**

The manufacturer looks to packaging to accomplish product pro-
tection, cost reduction, marketing strategies and marketing tactics.
Investment in work in process increases during each succeeding stage
of manufacture, as capital and labor inputs accrue, as the time value
of money invested increases, as fall down and ruined stock diminish
the volume of successfully produced end product. If the finished
good deteriorates prematurely while in either the manufacturer's or
seller's inventory, serious waste occurs. There are detrimental
effects upon the manufacturer's reputation as well as the costs of
original production and replacement.

Product protection also permits enlarged scope for marketing
strategy. First, the sheer extensions of shelf life, in an industry
where short shelf life is the rule, is a marketing value for which
revenue or consumer preference is obtainable. Second, extension of
shelf life may permit the use of channels otherwise barred, as for
example the use of vending machines as a retail outlet, where the turn-
over might be slow or uncertain. Third, product protection may be
vital in new product introduction where the new product has require-
ments substantially greater than its predecessor. A case in point is
the marketing success achieved by sugar coated cereals, a product line
made possible by two elements: chemical additives which retard
rancidity and oxidation of fats, and protective packaging achievable only by the newest plastic coatings and treatments.

Closely allied to protection is handling. The selection of packaging designs and sizes (in master containers) which are in harmony with the needs of the distributor rather than solely accommodating the needs of the seller has led to competitive advantage. Items which have low turnover in one or another element of the distribution system are awkward to handle if packaged only in large lots. Such lots represent not only an expensive inventory on the shelf but force re-ordering in quantities which are uneconomical in terms of money tied up and space withheld from other, faster moving items.

But certainly the most promising concepts are those directly related to marketing strategies. Packaging is used to enlarge the number and variety of channels of distribution. A product normally sold only in retail stores may be made suitable for vending machines. Again, a product formerly sold only where sales personnel were available may, through packaging, be fitted for impulse purchase and self selection. Packaging has permitted the growth of non-food lines such as clothing, toys and kitchen utensils in supermarkets.

Packaging is used to communicate with the ultimate purchaser. As stressed before, in self-service selling it is the only point of contact with the buyer. The appearance, design, and information contained on the package frequently determines the sale. Such packaging must, of course, complement and supplement advertising and other
promotional efforts to form a complex of marketing impact that converts the looker to the buyer. Packaging, here, focuses attention on the image and identity of the firm, providing a chance to emphasize brand and trademark.

Packaging is used in shelf space strategies. By the placement of vital identifications and communications on end panels or face panels the retailer is frequently forced to array the package in a manner desired by the manufacturer for greatest effectiveness. At times packages are so designed that the individual unit is but a part of mass display effect, fully realized only when deliberately arrayed to best advantage. When this is realized in store practice a massive, compelling sales display is achieved. Again, by a proliferation of package sizes, some sellers achieve an otherwise disproportionate share of valuable shelf space since sufficient items in each size must be displayed by the seller.

Packaging serves as an alternative to price competition. Several strategies are available. One is the use of a smaller size package, or a smaller quantity of goods in the same package, rather than a price increase. Another is the deliberate use of odd weights or sizes to prevent or retard direct price comparison for those products whose makers prefer non-price considerations to rule. Although this practice is under attack, it is still frequent and considered justified by many sellers.

Packaging is used to give continuity and a family relationship
to all the products of a manufacturer's line. Where an advantageous position has been won in one product line, the halo effect which can be carried over to an entirely dissimilar product line is of value; package design is a usual tool for this end.

The use of the package as a selling tool was discussed in Chapter V. The package may have imprinted upon it premiums, games, recipes, special promotions which enhance the contents value. Packaging is designed to be consistent with the contents in value and appeal. The image of a luxury good is enhanced by a consistent package and diminished by one which does not provide an atmosphere of luxuriousness. Appeals of masculinity or femininity, appeals to different age groups, or income classes, are made via different packaging.

Packaging of itself creates new products which are promotable. This is of especial value in the fast moving consumer goods field. Frequently product differentiation is difficult in many consumer goods, and newly designed packages provide a focus for marketing effort. When "Lucky Strike Green" went to war, much was made of this fact; the flip-top box was as strong an element in the sales success of Marlboro cigarettes as the tattoo on the hand of the smoker. Frequently new product marketing strategies are based on radical packaging changes. Deodorants in flexible plastic packages, or in stick form; toothpaste in aerosol cans; foods in boilable packages; beer with aluminum pull tabs; these and many others are as much new products as if the contents were changed. Indeed, frequently new
Packaging concepts induce new product development via physical changes in the form of the contents so that both become the focus of new merchandising strategies.

Packaging provides a means of shifting inventories forward into the field.¹ By the proliferation of outlets, by a variety of sizes and shapes, by increasing product differentiation due to packaging, a considerably greater volume of goods must be held by retailers and by supporting wholesalers than if conscious use of packaging were minimized. The investment in carrying such inventories is usually the responsibility of the distribution system, rather than the manufacturer. Further, such inventories are held closer to the point of use than if they were in-plant inventories. Package shape also plays a part. Specific attention can be paid to increasing the density of product per package; this too has the effect of increasing inventories at the places most readily available to the ultimate buyer.

Strategies must be implemented by tactics, which take into account the shifting values of the marketplace and the need for quick reaction to competitive pressures and special opportunities. Many tactical responses are open to the manufacturer within the framework of existing packaging strategies.

One of the readiest is multiple or tie-in selling of a promotional nature. Price changes can be rapidly accommodated by packaging techniques; dissimilar but complementary items can be banded together.

for joint sale; multiples of like items can be banded to offer special promotions; new labels likewise offer special promotional ability in the form of premiums, rebates, etc.

Packages can be adjusted to reduce the possibility of pilferage, loss of vital parts or waste, so that a specific channel of distribution can be used. Packages can frequently be changed in size, shape or minor design factors to accommodate special promotions of many kinds, complementing advertising efforts keyed to a specific goal. Rapid response to competitors' promotions, or even market tests, can be obtained with packaging so that the effect of these is negated or at least vitiated.

Many of those factors that determine packaging requirements for the manufacturer are the same for all other segments of the distribution system. But each other segment has its own special point of view.

**The Wholesaler**

Whether or not the wholesaling function is carried on by the manufacturer or by a separate business entity is a matter of indifference from the viewpoint of packaging. The needs and requirements of the wholesaler differ somewhat from those of the manufacturer and some accommodation must be made for the former's benefit. These accommodations must take into account the reason for being of the wholesaler and the trade he serves.

The wholesaler exists as a connecting link between multiple producers and multiple retailers. He acts as an exchange network which reduces the searching costs of the manufacturer for outlets and
those of the retailer for supply. By his ability to match the needs of each he justifies his existence. Usually he finds it economical to buy in quantities that are large and sell in quantities which are smaller; this derives from the different economies of scale of producer and retailer. Therefore he breaks bulk. Again, since he serves a wide class of retailers' needs, he must be able to provide an array of goods. Finally, one of his primary values lies in his immediacy of supply. He usually carries a field inventory which is readily available to his customers on short notice. Packaging must not detract from and should enhance these values.

Modern wholesalers carry their inventories in large, single story facilities designed for straight throughput. Most are either conveyerized, have forklifts or other materials handling equipment. Many are computerized so that outgoing shipments are assembled with little or no labor until the loading dock. This makes proper identification of the content essential. Poorly identified goods cannot be integrated into automated materials handling systems.

Order size is relative, of course. Some goods are both bought and sold by wholesalers in carload lots. Others move out in unit quantities. Packaging which is inconsistent with average order size works a hardship (i.e., a cost) on the wholesaler. Master containers are now available which break into two or more shipping containers, yet retain the protective ability of the original.

Protection is no less important to the wholesaler than to anyone else. Goods that deteriorate in storage due to poor packaging
accrue the costs of double handling, of money tied up, of replacement
time and possible lost sales (since immediacy of delivery is usually
required) and loss of reputation.

Some wholesalers lack the covered and protected warehouse space
available to the manufacturer or to the retailer. Special packaging
may be required which will withstand weathering and take the place of
covered facilities.

Most of the other requirements of the wholesaler are wholly con­
sistent with those of the producer. There is a common interest in the
fast movement and turnover of goods and the other attributes of the
marketing pattern chosen by the producer.

**The Retailer**

While the desires and needs of the retailer are generally con­
sistent with those of manufacturers in general, yet they are frequently
opposed to those of any specific manufacturer. The retailer offers an
array of goods and services which usually comes from a number of sup­
pliers. The attempts of any one supplier to dominate, the very basis
for most packaging and other marketing decisions, are most often dia­
metrically opposed to the needs of the retailer.

Shelf space (considered along with the complementary facilities)
is all that the self-service retailer has to sell. When packaging is
deliberately designed to obtain more shelf space than would otherwise
be required then the retailer's freedom of use of his shelf space is
diminished. The proliferation of products carried by the retailer
means that the space allotable to any one or to any one class is increasingly limited since the size of retail establishments, while growing, has not kept pace with the number of kinds of items for sale.\(^2\)

The retailer reacts to such a situation by limiting his purchases from the available array, by favoring some suppliers who package more in accord with his needs, and by an increasing trend to private labels,\(^3\) over which he has considerably more control, not only in product, quality, price and proprietary nature, but in packaging.

Even in the largest supermarkets only a fifth of the items carried move as much as a case a week.\(^4\) Shipping containers that hold undue amounts of unit packages then force the retailer to carry uneconomic volumes of goods and to reorder in uneconomic quantities. More and more manufacturers, however, are recognizing this need by creating case sizes in accord with actual turnover; the appearance of the dozen unit case is in point.

The retailer suffers from an increasing lack of skilled and interested help. Indeed, this accounts in part for the growth of

---

\(^2\)As a matter of fact, supermarkets, reversing a 10-year trend, are reducing their average shelf area. This was down to 12,700 square feet in 1962, about the 1956 level. See "What Supermarkets Want," Modern Packaging, Vol. 36, No. 5 (January, 1964), p. 82. On the other hand, the number of items and brands in an average supermarket have doubled in the last decade or so, now stand at about 8,000. See "The Supermarket: What's Happening?" Modern Packaging, Vol. 33, No. 9 (May, 1960), p. 87.


\(^4\)Robert W. Mueller, "Future Patterns in Food Retailing," Progressive Grocer, Reprint (September, 1955), unpagedated.
self-service. Such help can be destructive of packaged goods during the opening, price marking and shelf filling processes. These are real problems. Careless opening of cases (e.g., knives cutting into the packages) creates goods which must be sold at discount or which may be unsaleable. Some manufacturers have reacted to this problem by incorporating tear-tape opening devices in their shipping containers. Cases which are difficult to open for ease of price marking mean that many unit packages will not be marked causing delays at the checkout counter — again a cost. Some cases are so designed that they can be slipped in toto onto shelves — an obvious saving.

The retailer views the producer's packaging efforts with mixed emotion. He shares in the obvious benefits of highly saleable, attractive goods with high turnover and substantial profit margin. He is generally sympathetic to any move which increases real value to the consumer such as convenient packages. He will favor packaging that permits him to carry lines that were awkward or impossible to market before.

On the other hand, much of the effort of producers represents a real cost to the retailer. New packages that require special protection, as in freezer or refrigerator space, require new facilities provided by the retailer. Packages which are delicate or require special handling create a real labor cost. Packages which are involved in special promotions, such as items banded into multiple or floor displays, create a pressure on space or a traffic problem. And
finally the proliferation of sizes and shapes forces a constant program of weeding out to make room for newcomers who will hopefully generate the required minimum revenue.

Not all packaging for retail distribution is done by manufacturers. Some is done at the wholesale level and a good deal is done by the retailer. This is primarily for meats, produce and other foodstuffs. Such prepackaging has grown enormously since its introduction and the positive benefits to retailer and consumer have been well documented in a long and continuing series of studies. The retailer obtains several advantages through such prepackaging. If done by his source of produce, no matter at what stage, he does not pay for the freight and handling of waste parts. If done by himself, he creates easily saleable, attractive units for purchase. Prepackaging usually lengthens the shelf life of high perishable goods. It permits economies in the cutting of meat and its assembly for sale, since the work can be carried on at times and in places independent of customer's demands for special service. Unfortunately an additional value is sometimes obtained by a retailer to the detriment of his customer when

---

5 This has been an endlessly and well researched field. See for example, Emil Wade Owens, "A Study of Consumer Acceptance of Prepackaged Produce and Meats," unpublished PhD dissertation, Ohio State University, 1952; Thomas B. Smith, "Trends in Prepackaging Fresh Produce," USDA Agriculture Marketing Series, 1958.

less saleable meat or produce is hidden by packaging behind the more saleable parts. Prepackaging has enabled some retailers to carry or retain lines they would otherwise dispense with for reasons of economy of labor and space.

In a broad sense, however, such prepackaging is merely a physical adjunct to retailing. By its use the retailer does not seek to create a proprietary good, which utilizes on its behalf all the marketing tools used for a manufactured product; rather, it is simply a convenience to seller and buyer alike.

The supermarket operator is, of course, not the only retailer whose needs determine packaging. Packaging has been largely responsible for the ability of the variety store and the hardware store to shift into self-service, less costly selling. The need to package many small items in a manner both attractive and inexpensive, yet highly resistant to pilferage, has generated a host of packaging techniques.

The desire of the department store and other retailers to increase tag-out selling has influenced unit packaging of both soft goods and smaller hard goods. Specially designed packaging has met the requirements of this use.

The special needs of the retailer, over and above those of the producer, are few in terms of required packaging changes. Most run parallel with the producer's own needs; some directly counter. While still further packaging developments might minimize this conflict, they

---

will never eliminate it since it is inherent in the pressure forcing manufacturers to attempt to expand their volume through a crowded channel.

**The Industrial Consumer**

An industrial firm's most earnest desire concerning the packaging of goods it purchases is to minimize or eliminate it. The value of packaging is solely the value rendered by the delivery of the goods in safe, undamaged condition, their protection while in inventory and any ease of use built into the package. The ability of a supplier to perform these functions through his packaging is taken for granted and a claim will usually be made against the supplier who does not deliver.

Packaging represents two kinds of expense to the industrial user. One is the expense as part of the cost of the goods. The other is the cost of disposal. A large plant will have to dispose of many thousand packages per day. These must be collected, hauled, shredded, burned or possibly sold. However, the scrap value of waste packaging rarely offsets even the full cost of collection. Therefore, more and more firms are exploring the possibility of supplies delivered in bulk or via special rail cars with no packaging, or the use of very large containers such as bags and corrugated boxes that hold a ton or more. In some cases the packaging must be durable enough for two uses; for example, bottles are shipped into a filling plant, filled and shipped out in the same corrugated boxes.

But with all the limitations and restrictions imposed by a customer who is not buying for resale and who is not highly influenced by
design and appearance, there is still an area where attractive pack-
aging is beneficial. Industrial packaging today frequently uses bright
colors and bold designs. Trademarks and company logotypes are pro-
minately featured. Packaging has been recognized as the means of
presenting a company's identification effectively and enhancing its
reputation. To a lesser degree, the values are the same as those
sought in consumer packaging.

The Institutional Market

This market, composed of restaurants and schools, prisons and
hospitals, special homes and the like, has had only one impact of note
upon packaging. To serve the needs of this group, a different array
of package sizes has been required. This is true not only of unit but
of master containers. Such sizes are, of course, larger than those
common to the retail trade. In turn, this has permitted the patrons
of this market to benefit by consuming goods which would be uneconomic
if available only in packages designed for normal retail trade.

Most restaurants today use packaged foods either raw or par-
tially prepared, canned, frozen or otherwise processed. This permits
even the smaller establishments to offer an array of foods on its menu
that would be impracticable if unpackaged foodstuffs had to be pur-
chased, stored and prepared. But aside from the special class of
sizes required, the needs of this market segment have made no extra

8 J. Gordon Knapp, "Ten Things to Look for in Your Package
84-89.
demands on packaging. Packaging however has permitted some producers to serve a market not otherwise obtainable.

The Military

The special requirements of the military establishment have had as great an impact upon packaging technique as upon electronics, the atomic sciences and comparable fields. It will be recalled that canning itself was a response to a (French) military demand. The same pattern has followed with newer food processing techniques and consequent packaging developments. As discussed before, military research into irradiation pasteurization and sterilization, freeze-drying and radio frequency sterilization have all generated new packaging materials and concepts.

The military, of course, is seeking lighter packaging with lighter contents that do not require special equipment to maintain and protect and will resist a variety of hazards. From industry's attempts to meet these needs, coupled with the work of research groups in university, government and quasi-public laboratories, have come many new products and treatments. For example, rot, rust and fungal resistance is required for combat supplies packed to meet tropical requirements. Conversely, artic environments impose their own strictures on packaging materials. Waterproof containers developed from military needs, but are now common in agricultural packaging. The needs of the Air Force to air drop supplies to surrounded troops and communities gave rise to
relatively shockproof packages, a development now pursued by industries whose products must resist rail car humping. 9

But military requirements do not lend themselves to a marketing interpretation. Most such effects have been on the materials and technical construction of packaging. The goals of the military are solely functional in terms of performance characteristics. Perhaps the best summation is that the influence of the military has been to stimulate the creation of packages and packaging materials that the civilian economy has adapted and used in marketing its products.

One further military influence is of note: standardization. Since a multitude of sizes, shapes, patterns and configurations is a military cost, and added costs are to be avoided where possible, the military have taken the lead in demanding standardization of rail and truck equipment, of pallets and bins, of shipping containers and unit packages. The economies realized thus have not been lost on industry. The trend to standardization continues except where a special marketing influence is involved.

The Agricultural Market

Packaging has been affected by the needs of agricultural producers in three major ways. The farmer is under continuous pressure to reduce the cost of field labor not only because of the rising wage rates of stoop or harvesting labor but because of its present or

---

threatened unavailability.\(^{10}\) Wherever capital goods or supplies can reduce the amount of labor required they have usually been employed. For this reason packaging has been developed that can be filled in the field for certain crops or as part of a joint materials handling/packaging system. Such systems might include field bins, handled by forklift truck to a processing center and later packaging in master containers. The severe requirements of such field handling have generated a good deal of research and development on bins, pallet boxes and shipping containers.

A second area of importance is in processing itself. Some produce must be cooled to reduce the field heat to avoid spoilage. Such cooling can be done by vacuum, by icing, or by hydro-cooling. Packaging must withstand such processing requirements, yet retain its structural integrity for storage and shipping.

A third area is that of storage and shipping. Many agricultural products must be stored under conditions of controlled temperature and humidity. Such cold and damp storage rapidly deteriorates most shipping containers unless specially treated. The special needs of farmers in this area have brought forth a variety of treated containers. As for shipping, much produce is bulky and freight plays an important part in the cost picture. To reduce the weight of the packaged goods, the

\(^{10}\) With the end of the "Bracero" program as of 12/31/64. This program provided a mechanism for legal importation of temporary farm laborers from Mexico. There is considerable doubt that alternative programs will meet the need.
trend has been to lighter packaging as for example the replacement of wooden containers by corrugated paperboard. Such freight savings have been a partial offset to the rising cost of agricultural products.
CHAPTER IX

PACKAGING AND THE ULTIMATE CONSUMER

That the consumer is a determinant of packaging seems obvious — if he does not buy he has had the utmost impact upon the package. But this superficial view cannot be sustained. The consumer, after all, has only two practical options: to buy or not to buy. This total reaction, similar to a go-no-go situation, must serve as the response not only in the light of the consumer's desires in respect to packaging, but also in respect to the products' characteristics, its price, the store in which it is seen, the additional marketing services made available by the seller and many more factors. Thus the response of purchase or non-purchase is too all-encompassing, too blunt, too overwhelming to be ascribed to packaging alone. But certainly in the long run consumer wants in regard to packaging influence changes in almost all matters; in the short run, in cases where packaging is the only difference in the same product (as when a new package is contemplated and tested), consumer buying reaction is an immediate determinant.

The choice of buying or not buying as the sole response is really a reflection of one-way communication from seller to buyer.
Recent studies have explored the kinds of responses and conduct generated under conditions of one-way communication, communication with limited feedback and communication with full feedback.\(^1\) Results from such studies bear out the intuitive concept that performance of both communicator and respondent is improved in regard to the desired goal when a two-way flow is established.

Where the manufacturer/seller opens no return path from the consumer but restricts the flow of information to the consumer to imperatives to buy, whether promulgated by the package, by advertising or by other forms of indirect selling, he will rarely if ever be able to distinguish the impact of the package in the total sales mix. If sales are good, he will not be able to ascribe such success to any one element or synergistic combination of elements. The converse is also true.

Actually a completely one-way system of information flow is rare. First, all marketing research is an attempt to translate facts, opinions or behavior into information that will influence the conduct of the packager. Most firms with investments in the consumer goods market conduct some form of research ranging from store audits to psychological testing of consumers. Second, even for the most disinterested manufacturer there is some spillover of information if only from the occasional consumer who writes a letter expressing her disgruntled reaction to a new package, or, far less frequently, her

appreciation. Again, many producers have set up formal systems seeking direct communications from the consumer in the form of letters, or responses generated by demonstrations of the product or service. Seminars are commonly held under the auspices of packaging, marketing and management organizations. Finally, there is no lack of information available in consumer, trade and professional publications which summarizes the results of explorations into consumer preferences for packaging. Analysis of the results of studies conducted several years ago reveals that a surprising number of packaging attributes that were a source of complaint have been modified or radically improved.

Let us consider some of the observations elicited by a survey of consumers in regard to packaging that later found their way into creative modifications. A significant percentage of women rely on the packaging in their buying decisions. They requested "less advertising" and more information of the kind that accurately described the contents or gave specific directions for use. They appear perfectly willing to trade some extra funds for convenience in opening, in use, in reclosure and in space storage. The younger housewife is experimental and demonstrates less brand loyalty. She has more of everything except time and leans toward that packaging that conserves her time yet enables her to

2"Food Packages as Housewives See Them," Sales Management, reprint of articles appearing in issues of 10/21, 11/4 and 11/18/60. The survey was conducted by National Family Opinion, Inc. See especially pp. 1, 2, 6-7.
better fulfill her multiple roles of wage earner, housewife, family purchasing agent and mother.  

The women surveyed had strong negative opinions on packaging that leaked or was of an awkward size or shape. Such opinions have been translated into packaging changes such as the plastic coated paperboard milk carton which rapidly displaced the wax coated one; and into more square cereal cartons that are rapidly gaining favor over tall, thin cartons. Women seem to want packaging that is up to date and modern, e.g., that reinforces their image of themselves. They tend to reject packaging that does not recognize that "we've changed but too many packages haven't." Premeasured packages that reduce waste or reduce the change for error in use are in strong favor. The desire for unbreakable packages and for modern materials was a forerunner of the strong acceptance of plastics in packaging. Similarly the early indications of desire for convenience in dispensing, even at added cost, was an indication of the forthcoming spectacular growth of aerosol containers.

Other studies have so reinforced these data that it is at times difficult to understand the reluctance of some marketers to make packaging changes consistent with findings. Good Housekeeping\textsuperscript{4} surveys point up many illogical attributes of present packaging that go a long

\begin{flushright}
\textsuperscript{3}"Convenience is King" \textit{Modern Packaging}, Vol. 34, No. 3 (November, 1960), pp. 93 ff.
\end{flushright}

\begin{flushright}
\end{flushright}
way toward defeating the marketing objectives of the companies con-
cerned: unit quantities not consistent with the method of use, direc-
tions that cannot be read or followed, packages so difficult to open
that sales are restricted.

Still other investigations show clearly the importance of pack-
aging in selection among relatively similar products. But they also
show an increasing disdain for misuse of language that is supposed to
communicate, e.g., "giant half-pound," the "jumbo" size which is the
smallest of the line and the "new" product, often simply the old one in
a smaller box. The same circumstances apply of course to advertising
so that the average consumer frequently has developed a filter mechan-
ism to screen out such "noise". Recognizing this, some firms have dis-
continued the use of excessive language, e.g., General Foods has
requested its divisions to avoid the use of such terms as "jumbo".

The thread of convenience to the consumer runs through the pack-
aging material derived from the literature, research and observation.
This convenience presumably engenders a cost, a cost which, however,
the housewife is usually quite willing to pay if the convenience con-
herits her scarce time and energy. The concept of built-in maid ser-
vice is one that rapidly comes to mind especially when one considers
prepared food products with waste removed, possibly pre-cooked, placed
in packaging that can itself be part of the cooking process. But there

6Ibid.
is evidence to show that the idea of extra cost for these built-in services may be overstated.

Opinion in recent years seems widespread that "built-in maid service" has (1) reduced the farmer's share of the consumer dollar, (2) substantially increased food prices and the family food budget, and (3) added sharply to the total cost of the country's food marketing bill.

All three of these propositions were challenged in an analysis that showed that the actual dollar impact of such conveniences is quite small, on the order of a few percent of the total food budget for a family. Certainly there are costs in the preparation of foods, in their processing and specialized packaging. But these costs are largely offset by consequent economies which derive from significantly reduced transportation and storage costs of waste parts. In some cases where the new processed food has sharply increased in consumption over its unprocessed counterpart, simple economies of scale come into play. Thus frozen processed orange juice is less expensive, unit for unit, than fresh. Far from increasing total outlay, the extra services of preparation, storage convenience and accessibility in many instances are available for less cost. The housewife's recognition of this factor has aided in her swift acceptance of products and packaging which give her the happy combination of utility and economy.

In order to comprehend the full impact of the ultimate consumer

---

as a determinant of packaging, some idea must be gained concerning the
dimensions of meaning of packaging to the buyer. These have been suc­
cinctly expressed by a psychological investigator in the field as
three: packaging is a symbol of considerateness, it facilitates
choice, and it can arouse emotions.8

Packaging communicates to the potential purchaser the care and
forethought that the manufacturer has taken to ensure that the product
will be delivered in fresh, useable condition. If well done, it gen­
erates in the buyer a sense of security as to the quality of his
purchase and increased the buyer's sense of prestige in the acquisi­
tion.

The problem of the purchaser in, say, a supermarket, of choosing
from a multitude of goods in a limited time has already been discussed.
Packaging facilitates this choice by conveying at a glance an image of
the physical and psychic attributes of the contents. By creating an
aura of confidence it can speed selection, give assurance of sanita­
tion, create the feeling of added value through better protection, and
be an easily recognizable element in the formidable selection of goods
on the shelf. When on display, a good package "reaches out" to the
consumer, and provides an opportunity for rapid inspection.9

Finally, packaging can arouse favorable or unfavorable associ­
ations which facilitate or impede selection. The image afforded by the

8Dichter, Handbook of Consumer Motivations, op. cit., p. 312.
package should be consistent with the product and with the buyer's personal image of himself. Some products are designed for masculine or feminine use. When the package reinforces these concepts the purchaser is more receptive to the product. Substantial changes in sales have resulted from packaging changes which reflect different images of the contents; selection by the consumer of such packages has determined product acceptability.

Products do have "sex" and packaging should reflect this. They also have attributes of fragility or durability, quality or economy, temporary or enduring aspects, and many more dichotomies. When packaging reinforces the concepts desired by the marketer, it is consistent with the total marketing mix. When it is inconsistent with the sum or, more properly, the vector of these attributes, consumer determination acts as a brake on acceptance.

Packaging in consumer goods is almost by definition for a mass market. Therefore the process whereby acceptance of new packaging ideas as well as any new product becomes widespread, diffuses throughout the distribution system, is of importance. It is only in recent years that formal studies have been published summarizing the extensive research in the process of diffusion of new products, ideas and


12Everett M. Rogers, Diffusion of Innovations (New York: The Free Press of Glencoe, 1962), see especially Chapter IV.
packages. Much of this work is based on sociological studies done in the agricultural field. Some of the principles developed are applicable to packaging.

Essentially consumers accept new ideas in stages, not all of a piece. First they must become aware of the new concept; then interest must be awakened in trying it; an informal evaluation is made based on available data and present attitudes; if the evaluation is favorable the consumer conducts a trial or test in the home; and finally, if the trial is successful the product is adopted. In marketing, both advertising and packaging play a part in the first three stages of acceptance while packaging still has a role to play in the latter two.

Consumers, of course, are not a homogeneous group. In terms of new products or new packaging ideas, they can be segmented for convenience into five key groups: innovators, early adopters, early majority, late majority and laggards or non-adopters. This division of consumers according to a time scale of adoption depends on the kind of product and magnitude of investment, on personal and community attitudes, and on the demographic characteristics of the group. But the studies conducted support such a classification. The time scale itself has varied from six months to fifteen years in the instances studied.

Figure 19 summarizes the characteristics of each group and their behaviour pattern for the adoption of a new idea. Such classifications can provide guidance to the marketer in directing the impact of packaging innovation to those groups most likely to fairly assess its benefits. Again packaging may be so directed as to increase acceptance
<table>
<thead>
<tr>
<th>Adopter Category</th>
<th>Salient Values</th>
<th>Personal Characteristics</th>
<th>Communication Behavior</th>
<th>Social Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovators</td>
<td>&quot;Venturesome&quot;; willing to accept risks</td>
<td>Younger; highest social status</td>
<td>Closest contact with scientific information sources; interaction with other innovators; relatively greatest use of impersonal sources</td>
<td>Some opinion leadership; very cosmopolitan; travels frequently</td>
</tr>
<tr>
<td>(3-5%)</td>
<td></td>
<td>most specialized operations; wealthy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early adopters</td>
<td>&quot;Respect&quot;; regarded by many others in the social system as a role-model</td>
<td>High social status; large and specialized operations; well educated</td>
<td>Greatest contact with local change agents; receives many newspapers, magazines</td>
<td>Greatest opinion leadership of any category in most social systems; very localite; holds office in church groups, PTA,</td>
</tr>
<tr>
<td>(10-15%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early majority</td>
<td>&quot;Deliberate&quot;; willing to consider innovations only after peers have adopted</td>
<td>Above average social status; average-sized operation</td>
<td>Considerable contact with change agents and early adopters; above average receipt of newspapers, magazines</td>
<td>Some opinion leadership</td>
</tr>
<tr>
<td>(15-20%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late majority</td>
<td>&quot;Skeptical&quot;; overwhelming pressure from peers needed before adoption occurs</td>
<td>Below average social status; small operation; little specialization; small income; less education</td>
<td>Secure ideas from peers who are mainly late majority or early majority; less use of mass media</td>
<td>Little opinion leadership; less social participation</td>
</tr>
<tr>
<td>(40-60%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laggards or Non-adopters</td>
<td>&quot;Tradition&quot;; oriented to the past; satisfied with status quo</td>
<td>Little specialization; lowest social status; smallest operation; lowest income; oldest; least educated</td>
<td>Neighbors, friends, and relatives with similar values are main information source; receives few publications</td>
<td>Very little opinion leadership; semi-isolates</td>
</tr>
<tr>
<td>(5-10%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

of the product by innovative groups. Further, such a schema provides increased understanding of the role of the consumer as a determinant of packaging in marketing.

Packaging Research

Research is a determinant of packaging in two senses. One, the flow of new materials, processes, configurations and techniques permit the marketer to package in new ways not heretofore known. The technology of packaging has a decided impact upon the spectrum of alternatives available. Two, consumer research provides a formal feedback of information from the potential purchaser of goods which can be incorporated in design, choice of colors, container configuration and other variables.

Let us briefly consider technical research first. Most manufacturers of packaging materials, supplies and machinery maintain continuing and extensive research efforts, at significant cost.\(^{13}\) Further, major users of packaging maintain their own research efforts in laboratories where they test materials and packages in an effort to reduce cost while maintaining desired performance characteristics.\(^{14}\) Probably more developments have come from the laboratories of the


major food packers than from the suppliers of materials. But in most cases, technical research is a cooperative effort between supplier and packager, to develop a system that will meet necessary criteria of performance, cost and appearance.

Consumer research in packaging is not new. Much of the early work was in color research, to determine which colors were most attractive to potential buyers under which circumstances. Color is used to create an image, to attract attention, to conform to certain surroundings, to be consistent with a kind of product content, to attract a certain class of consumers, to make printing legible (or inconspicuous), to arouse emotion and for a variety of other related reasons.

Color research has become even more intense and sophisticated in recent years. The extensive use of color by marketers has created a problem in reaction, i.e., the consumer has in some cases become indifferent to, even fatigued by, color. Again, early work set


certain definitive patterns of color use and raised caveats against other uses. Present day researchers are no longer so accepting of these caveats as, for example, a dread of the color black. Newer research has shown the acceptability of colors and designs that are in direct contradiction of earlier work which may be equally an indictment of such work or simply an indication that tastes change.

Research today runs the gamut from the subtle to the obvious. At one end of the scale, consumers are asked their opinion about certain packages and package design. They are asked what properties they would like to see in a package intended for such and such a use, sold through a particular kind of store. Other research techniques consist of offering the identical product in two or more packages on the shelf and measuring the rate of purchase of one against another. Still other research makes use of hidden devices which record the behavior patterns the rapidity of eye blink or the extent of pupil dilatation of buyers as they approach, handle, consider and accept or reject a package.

Optical devices assist in measuring the visibility of packages when placed on a shelf filled with competing goods, and the readability of a particular brand. Miniature supermarkets have been created as


21 Ibid.
test devices wherein consumer panels are held to evaluate new products and new packaging. But most consumer packaging research is unconscious level research, based on some form of "depth analysis."

There is little question but that certain colors are associated with certain sensations or moods. Red is a vibrant color; black a sombre one. The same concept holds true for shapes. The triangle is said to be the shape with the highest degree of impact but, at the same time, is supposed to generate unfavorable associations in the minds of women.

Investigations are also held on the total impact of shopping on the buyer. A new phenomenon is an emotional disturbance on the part of the buyer faced with overwhelming choice and a multitude of colors and patterns as in the supermarket. This has been called "supermarket trance."

It is quite possible that packaging is over-researched. It also seems likely that too much attention is being paid to small differences. As in other forms of research, some of these differences may not exist objectively but may be artifacts created by the very devices which seek to measure them. Motivational research, especially, has come under attack in recent years in packaging research as in other

---


areas of marketing, for the use of techniques derived from pathological psychological research, for deliberately ignoring sampling procedures and the concept of representative groups and for over concern with subconscious findings which are not operable, e.g., which cannot lead to positive action by the marketer. The proliferation of "new" fields of research may also be taken to task; in addition to motivation research there are perceptual research, susceptual research, activational research and other forms of research which one suspects are less objective disciplines than proprietary pecuniary devices for their developers.

There are some serious questions raised about the advisability of too much packaging research although it is admittedly difficult to define what is "too much". Information gleaned from the consumer, whether overtly or by more subtle indirective techniques, is limited to the capacity and imagination of the consumer in defining what he wants from a limited basis of knowledge. If such research is used in a restrictive way, little that is new and unfamiliar would be developed.

Package designers, whether on corporate payrolls or acting as independent consultants, sometimes resist the results of research especially if conducted by separate groups. This is due to a complex including some bad research, the fear of limitations on design creativity, the desire to avoid shared responsibility and the difficulty

\[25\text{"M.R. Sense or Nonsense?" op. cit., p. 54.}\]
of translating some of the more esoteric findings into physical constructions.

On balance, packaging research whether technical or consumer, does act as a determinant of packaging and has tended to produce better packaging if better is defined as aiding the success of the product in achieving its marketing goals. The key is to have a packaging development program consistent and well integrated with stated marketing goals, in such terms as the following:

... What product characteristics are to be emphasized?
... What correlative advertising and promotional media will be used?
... What retail channel is being used?
... What store displays?
... At what group is the product aimed?
... Are there special shelf-life demands?
... What unit quantity is required?
... What are the special demands of the retail channel?
... Does the product have multi-component aspects?
... Should a family relationship be maintained with other products?
... What is the method and quantity of use?
... What value (cost) does marketing allow for the package?26

When these and others are spelled out, packaging research based on sound marketing research can be a factor in balancing the objectives of the supplier with the needs of the distribution system and the desires of the consumer.

CHAPTER X

SUMMARY: THE PLACE OF PACKAGING IN THE MARKETING MIX

Whether or not packaging is a "marketing function" depends on the narrowness of interpretation of the concept but there is no doubt that packaging is a function of marketing. In a framework distilled to the essential elements as, for example, the eight functions used by most authors and cited in Chapter I, there may be no room for the devolution of packaging from other functions as there has been no room for other worthy claimants, e.g., merchandising. But a broader array of significant, even essential, activities would certainly include packaging as a facilitating function.

This is not to claim that packaging in the marketing sense (over and above the physical containment of goods) occurs in each and every marketing transaction. It does not. But this is not a test of every marketing function. Rather, referring to the definition given above, a marketing function must be a major economic activity, inherent, pervasive and specialized. Even those meeting these criteria are of greater importance (fundamental functions) or of lesser importance (facilitating functions). Without serious strain, certain marketing
actions can be visualized (and do occur) which make no use (or vanishingly small use) of any given marketing function. Therefore packaging has to meet the test of universality no more than do other functions.

Packaging is a major economic activity on which over $20 billion is spent annually. It is inherent in the marketing process in that packaging or its more restricted predecessor packing must necessarily be involved in all but the most specialized transactions. Packaging is pervasive, affecting almost all of the other marketing functions and most parties to marketing transactions. Finally, it has become specialized through a continuous division of labor.

It is not the intent of this dissertation to construct a new pantheon of marketing functions or to displace or affect the hierarchy of any now recognized. Evidence seems to show that packaging could be regarded as one of the marketing functions, that it is separable from other influences and that its place has gone remarkably unrecognized in the formal marketing literature.

A study of packaging is enlightening not only for its own sake, but for the light it sheds on other aspects of marketing. To students who seek understanding of the underlying causes of change as a basis for reasonable anticipations of the magnitude and direction of further change, this study should explore and explain some of the interrelationships responsible for change and growth in marketing. Institutions and processes which heretofore have stood alone will be seen to depend in whole or in part upon a neglected aspect of marketing. It is hoped that other students will continue the examination of this
field as a contribution to analysis and theory, the latter of which is scarce enough in marketing. Such theory will probably be, rather than a theory of packaging, an enlarged, more inclusive theory of marketing.

For the practitioner in the business world this study should also be of value. Businessmen every day are forced to make sufficient decisions on insufficient evidence. A study of packaging that provides understanding of the relationship of packaging to other marketing functions enables a better manipulation of this vital attribute. Packaging, rather than an afterthought could be considered earlier in marketing plans, and as an integral part of the total marketing picture. Packaging decisions made in this light would be better marketing decisions.

What are the key points that have emerged from this analysis? A brief restatement seems in order.

1. Packaging in consumer goods largely depends on branded, identifiable merchandise although the corrolary is not always the case. Packaging in the marketing sense has only a limited selling function to perform without brand identity.

2. Packaging has overcome the early prejudice against hidden goods and thereby has greatly fostered the speed and efficiency of modern marketing. Together with advertising, merchandising and other marketing tools, it has helped instill the confidence in the supplier's integrity required for mass distribution. However, this confidence is threatened by some modern practices, and must be fully restored.
3. Packaging is the subject of a large body of law and custom. The complexities of modern society and modern technology in processing and packing consumer goods will inevitably tend to increased regulation. However, the extent and velocity of such regulation can be minimized by cooperative suppliers who remain attuned to consumer's needs in this area as they do in other aspects of the marketing orientation.

4. Packaging is a major weapon in the constant battle to reduce the costs of distribution. Through efficiencies gained in transportation, storage and selling, packaging enables products to be distributed at less cost even when additional values are included; or, at worst, holds the additional cost of these values to a minimum.

5. Packaging is a major tool in developing marketing strategy and tactics. The selection of new marketing channels, the extension of shelf life, the ability to combine sales with supplementary or complementary products, the effect of point-of-sale contact, all combine to make packaging a formidable influence.

By the same token, packaging is a major weapon of non-price competition. It accomplishes this end either by making direct price comparisons difficult while focusing on those product attributes the producer desires, or by creating an image of the product consistent with its attributes and with that segment of the market that the marketer wishes to attract. This is of especial importance in products which have little physical or measurable difference from their competitors.
6. Packaging provides a new dimension of convenience to the user, on a scale and of kinds never before available. This convenience extends from an array of quantities matched to the use, to dispensing of the contents. Convenience is of like importance to the wholesaler and retailer.

7. Packaging bears the major credit for the development of self-service distribution systems and has affected the nature of these and, in its turn, been affected. Whole systems of distribution would be impossible or greatly hampered without packaging in marketing. Packaging has greatly increased the ease of access to goods.

8. Packaging similarly has been responsible for the development of a broad selection of new products, of use and value to consumers while again, in its turn, it has been affected by new product development. In this regard, it affects product life span, greatly increasing the velocity of or even initiating the cycle. Packaging thus is a major factor in what has been called "innovative" competition.

9. Packaging is a major factor in inventory strategies. It increases the density of goods at the point nearest consumption and enables major inventories to be effectively dispersed in the field, usually at the expense of someone other than the producer.

10. Packaging increases the consumability of goods and the disposition to consume. It does this by adding a value of its own, over and above the costs of the materials, labor and handling required to construct the package. These values are desired by
consumers who exchange other values in the form of currency or credit for them. The values added may be substantive, in the form of convenience of use, storage or other element, or they may be intangible such as providing a sense of security, worth, or reinforcement of personal image. In either case, they are values of importance to consumers.

These are the essential statements. Others could be made. Packaging as a function of marketing impinges more or less directly upon every other and is deeply involved in buying and selling, transporting and storing, standardization and grading, risk taking and marketing information. Undoubtedly a relationship, perhaps more tenacious, could also be shown to financing. An attempt to visualize these relationships is presented in Figure 20. To illustrate the parallel importance of each function, including packaging, they have been placed in the matrix of a Moebius strip, a geometric shape which has but one plane or surface despite its complex configuration.

What is the most important conclusion to be drawn from this study? Perhaps it is that marketing is more complex and has more aspects than students have believed before. All the analysis and studies made to date have not exhausted this subject, nor even determined all the salient factors. There are more factors to be analyzed, more inter-relationships to be determined, more patterns to emerge. Packaging is one such thread. Because of packaging's essential interweaving in the warp and woof of modern marketing, the importance of its place can only increase.
FIGURE 20

PACKAGING AS A MARKETING FUNCTION

Source: Author's conception.
APPENDIX A

REQUIREMENTS FOR LEGALLY ACCEPTABLE PACKAGES

Design and Construction

1. Have deceptive constructions (i.e., false bottoms, hollow dividers, fillers, side walls, lids and covers) been avoided?

2. Is portion of package or wrapper in contact with food, drugs or cosmetics free of any substance which could be a health hazard? Does it require clearance by F&DA?

Product Name

1. Does product name (usual or common name as set forth in the U.S. Pharmacopeia\(^1\) and/or other official compendium or in Government Standards of Identity\(^2\)) appear completely and legibly, and is it accurately descriptive of product?

2. If no standardized name applies and product is not an imitation of a standardized product, does devised or coined name accurately describe product?

3. Have all words in product name which are geographically or descriptively misleading as to origin or type of product been avoided?

4. Are all words in product name in lettering of same size, style, type, color — on same background and with equal prominence — to avoid misleading impressions?

\(^1\)Published by the United States Pharmacopeia, New York.

\(^2\)Definitions and standards under the Federal Food, Drug and Cosmetic Act; the Federal Alcohol Administration Act; the Internal Revenue Code.
Necessary Declarations

1. Do optional ingredients appear as required by Standards of Identity, etc.?

2. Do name and address of manufacturer, packer or distributor appear as required or permitted by F&DA, Meat Inspection Act and Poultry Inspection Act?

3. Does word "imitation" appear where applicable and where allowed?

4. If a drug, is there, (a) a complete listing of ingredients constituting a nonstandardized product; (b) a complete listing of active ingredients; (c) a listing of ingredients in order of prominence by weight and by their common or usual name; (d) a statement of presence of artificial coloring or flavoring or of chemical preservative? Are there any ambiguous or obscure abbreviations which should be eliminated? Has proper clearance for legal use been obtained?

5. Do the name, quality, kind and proportion of certain drugs appear on package or label together with information as to whether it is active or inactive?

6. If a new drug, has new drug application become effective? Does package bear the labeling, including warnings, indications, etc., for the drug? If a new drug for experimental use, does label conform to regulations for drugs for such use?

7. Where applicable, do adequate directions and necessary warnings appear?

8. If warning labels are used, are they really necessary? (Unnecessary use of such labels fosters disregard of them in general—defeating their real purpose.)

9. On a package containing hazardous household substance, does required warning appear in specific type and does an "antidote" statement appear?3

10. If product is an antibiotic, insulin or certified color, does label conform with regulations that apply?

3Federal Hazardous Substances Labeling Act.
Declaration of Quantity of Contents

1. Are industry customs followed in declaration of quantity of contents, in terms of weight: avoirdupois pounds and ounces; liquid measure: gallon, quart, pint, fluid ounce; dry measure: barrel, bushel, peck, dry quart, dry pint; numerical count: whatever the case may be; or a combination of these?

2. Is declaration expressed in the number of the largest unit? (Example: a package containing 32 oz. must declare contents as 2 lbs. rather than 32 oz.)

3. Is declaration the minimum or average net weight (reasonable tolerances permitted under average; no shortages permitted under minimum-weight statement)?

4. Have governing regulations for tolerances and exemptions been thoroughly investigated to determine whether they apply specifically to the particular product? Allowable tolerances relate to (1) bulk shipments, (2) packages holding 1/2 fluid or avoirdupois oz. or less, and (3) packages containing less than six units which are easily seen and counted through outer transparent wrapping. Otherwise, assumptions as to tolerances and exceptions should not be hazarded.

APPENDIX B

BRIEF ANALYSIS OF THE PROPOSED PACKAGING AND LABELING LEGISLATION

S. Res. 56 on S. 387

To amend the Clayton Act by adding a new section, (3A), (to take effect six months after enactment) for the purpose of prohibiting restraints of trade carried into effect through the use of unfair and deceptive methods of packaging and labeling certain consumer commodities as defined by this section.

Subsection (a) makes it unlawful for any person to package or label any consumer commodity (as defined by subsection (j) (1)) or to distribute in commerce any packaged or labeled commodities which do not conform to these regulations.

Subsection (b) directs that the following regulations be promulgated:

1. To require that net content, net weight statements or both be stated upon the front panel of packages and labels.

2. To establish minimum standards with respect to the location and prominence of net weight or content statements (including minimum standards relating to type size and face).
3. To prohibit adding any qualifying words to net content or weight statements.

4. To prohibit the printing on packages of information stating or implying that the product is being offered for sale at a price lower than the customary retail price, or that a price advantage is being accorded to the purchaser because of the size or quantity of the package. (This does not apply to the ultimate retailer.)

5. To provide for exceptions to the foregoing requirements when necessary because of the nature, form or quantity of the product.

6. To prevent placing illustrations or pictorial matter on packages which may deceive the purchaser as to the contents.

Subsection (c):

(1) (a and b) require that these regulations shall be promulgated by the Secretary of Health, Education and Welfare with respect to foods, drugs or cosmetics and by the Federal Trade Commission with respect to all other commodities.

(2) Provides that regulations promulgated by the FDA and FTC shall be as uniform in content and extent as possible.

Subsection (d) gives the FTC discretion to establish additional regulations on a product-by-product basis. Its authority under this subsection extends to all consumer commodities encompassed by the bill. This authority may be used when necessary to establish or preserve fair competition by enabling consumers to make rational comparisons between competing products and when necessary to prevent consumer deception. Such regulations may be promulgated only to:
1. Establish reasonable weights or quantities in which a product can be sold.

2. Prevent the sale of a commodity in a package whose size, shape or proportions may deceive purchasers as to weight or quantity of product within the package.

3. Establish standards of size terminology such as "small," "medium" or "large."

4. Establish "serving" standards.

5. Establish standards to designate the quantitative contents of a package where net weight or number is not meaningful.

6. Require that adequate information about the content ingredients or composition be displayed prominently on the package or label with the exception of information concerning proprietary trade formulas.

Subsection (e):

(1) Provides that in promulgating these regulations the FTC shall consult with persons who would be affected by their application and shall also consult with other Government agencies having special competence with respect to the subject matter. Consultation shall be directed to the scope, application, form and effect of the regulation. This subsection anticipates the "trade-conference" concept presently being utilized by the FTC.

(2) Provides that any regulations may be modified on the initiative of the promulgating authority or by affected persons when changes in marketing methods and techniques make it necessary.
3. Provides that nothing in this bill shall be construed to prevent a person engaged in retail sales to ultimate purchasers from marking on any package or label the correct retail price at which the product is being offered for sale.

Subsection (f) authorizes the promulgating authority or the appropriate officer thereof to make a written request of any producer or distributor for a correct sample of any package or label he is presently using or intends to use. Failure to promptly forward the requested samples with intent to avoid compliance is punishable by a fine of not more than $1,000 or not more than a year's imprisonment, or both.

Subsection (g):

(1) Provides that if a commodity is put into commerce in violation of an FDA regulation, it shall be deemed "misbranded" within the meaning of the Food, Drug & Cosmetic Act and subject to the penalties provided therein. This includes seizure, injunction or criminal sanctions, depending on the circumstances involved and the discretion of the agency.

(2) Provides that if a commodity is put into commerce in violation of a regulation promulgated by the FTC, the enforcement procedures of Section II of the Clayton Act shall apply. Section II details the procedure for issuance, enforcement, and review of cease and desist orders. The remedy available in Section 16 details the procedure for private litigants to obtain injunctive relief when threatened
with loss or damage by violation of any regulation promulgated under this Act.

Subsection (i) provides that a copy of each regulation promulgated under this bill shall be forwarded to the National Bureau of Standards. The bureau is directed to transmit copies to the appropriate state agencies and officials, and furnish information and assistance to the states for the purpose of promoting uniformity between state and Federal standards. This subsection anticipates the utilization of the Bureau of Weights & Measures in working with state officials or agencies on a voluntary basis to make state and Federal packaging and labeling regulations conform to the greatest practicable extent.

Subsection (j):

(1) Defines the term "consumer commodity" as any consumable or non-durable article or commodity of any kind or class customarily produced or distributed for sale through retail outlets for personal or household use or consumption. It also lists the following exclusions:

Meat and meat products, poultry and poultry products and insecticides, fungicides and rodenticides with respect to which the Secretary of Agriculture is authorized to prescribe packaging and labeling requirements;

Any alcoholic beverage subject to the packaging and labeling requirements of Chapter 51 of the Internal Revenue Code of 1954;

Any household appliance, equipment, furniture, furnishings, or other durable and non-consumable article or commodity.
(2) Defines "package" to mean any container or wrapping in which a consumer commodity is enclosed for use in the delivery or display of the product to consumers. It exempts shipping containers or wrappings used solely for shipping the product to wholesale or retail distributors.

(3) Defines "label" to mean any written, printed or graphic matter affixed to a consumer commodity.

(4) Defines "person" to include any firm, corporation or association.
APPENDIX C

COMPANY ORGANIZATION FOR PACKAGING

Recognizing the influence of packaging in marketing and its considered use in planning marketing strategies are not necessarily sequential. The kind of packaging group within a firm and its place in the organizational structure will have a decided impact on whether packaging is treated as the last phase of production or part of the total marketing effort. The structure and place of packaging control in companies varies widely from industry to industry and firm to firm within an industry. This reflects not only the historical growth of the function within the firm, but the attitudes of management groups toward it and their recognition and acceptance of the contributions possible. One thing seems clear. The rapid growth of packaging in terms of expenditures is commanding an increasing amount of attention within the firm.¹

The packaging function today is located in groups as diverse as production, traffic, sales, general administration, purchasing and

research. In many firms, even those of significant size, it is still not given the status of a separate identity. In those firms that have formally recognized the function, the trend is to centralization rather than divisional autonomy. A recent survey of 86 companies revealed that 76 have a packaging coordinator or director. Of the 76 companies, 43 have in addition a packaging committee on which is represented all major departments. However, only rarely is the packaging head himself an executive of more than middle management level; only rarely is his position at all comparable to that of men managing advertising or direct sales.

The packaging function like any other operates best when guided by specific corporate objectives and goals. This is as rare, unfortunately, in packaging as it is in advertising. But even when existing under vague charters, many groups manage to conduct design and development work in coordination with other marketing and production groups using internal staff and consultant services.

A recent exhaustive survey on packaging groups' structure produced responses from 202 firms out of the 1,397 to whom


3Ibid., p. 82.


questionnaires were mailed. One question asked concerned the existence of formal packaging organizations. The results are shown in Table C-1. Most of the industry categories having a high percentage "yes" response are consumer goods firms as would be expected. Another question of interest dealt with the use of marketing research to select new packages or assess current ones. If there is broad recognition of packaging's place in marketing, a widespread use of research would be anticipated as the best way to relate consumer wants and needs to the marketing effort. The results as presented in Table C-2 do not bear out a particularly high recognition of this relationship. Again generally speaking, consumer firms, especially those that have packaging groups, are more frequent users of marketing research but even these at best use research in only two cases out of three.

How then are packages chosen? Returning to the committee concept, those firms with packaging committees choose designs and structures by joint action, with some members having more weight than others.

Production personnel are more frequently represented on packaging committees than any other, yet sales and marketing men have more weight in the final decisions. The major criteria considered by such committees are shown in Table C-3. By far the most important is consumer acceptance. Product protection also, of course, receives

<table>
<thead>
<tr>
<th>Industry</th>
<th>Rank</th>
<th>Total No. Respondents</th>
<th>% &quot;Yes&quot; Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety stores</td>
<td>1</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>2</td>
<td>8</td>
<td>87</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>3</td>
<td>12</td>
<td>83</td>
</tr>
<tr>
<td>Industrial devices</td>
<td>4</td>
<td>16</td>
<td>69</td>
</tr>
<tr>
<td>Furniture</td>
<td>5</td>
<td>6</td>
<td>67</td>
</tr>
<tr>
<td>Industrial equipment</td>
<td>6</td>
<td>33</td>
<td>64</td>
</tr>
<tr>
<td>Appliances</td>
<td>7</td>
<td>8</td>
<td>63</td>
</tr>
<tr>
<td>Industrial chemicals</td>
<td>8</td>
<td>13</td>
<td>62</td>
</tr>
<tr>
<td>Food processors</td>
<td>9</td>
<td>41</td>
<td>61</td>
</tr>
<tr>
<td>Building materials</td>
<td>10</td>
<td>9</td>
<td>56</td>
</tr>
<tr>
<td>Automotive products</td>
<td>11</td>
<td>8</td>
<td>50</td>
</tr>
<tr>
<td>Package suppliers</td>
<td>12</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>Paper products</td>
<td>13</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>Oil products</td>
<td>14</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>15</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Clothing</td>
<td>16</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Deming, op. cit.
### TABLE C2

**USE OF MARKETING RESEARCH IN PACKAGING**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total Number Respondents</th>
<th>% Using M.R. to Assess a Current Package</th>
<th>% Using M.R. to Select a Proposed Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetics</td>
<td>8</td>
<td>68.8</td>
<td>59.5</td>
</tr>
<tr>
<td>Food Processors</td>
<td>41</td>
<td>60.6</td>
<td>52.5</td>
</tr>
<tr>
<td>Paper Products</td>
<td>5</td>
<td>55.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Tobacco Products</td>
<td>5</td>
<td>50.0</td>
<td>50.5</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>12</td>
<td>48.0</td>
<td>47.0</td>
</tr>
<tr>
<td>Building Materials</td>
<td>9</td>
<td>41.8</td>
<td>47.3</td>
</tr>
<tr>
<td>Clothing</td>
<td>10</td>
<td>32.5</td>
<td>30.0</td>
</tr>
<tr>
<td>Oil Products</td>
<td>8</td>
<td>31.3</td>
<td>37.5</td>
</tr>
<tr>
<td>Variety Stores</td>
<td>4</td>
<td>31.3</td>
<td>31.3</td>
</tr>
<tr>
<td>Industrial Chemicals</td>
<td>13</td>
<td>31.2</td>
<td>34.5</td>
</tr>
<tr>
<td>Industrial Devices</td>
<td>16</td>
<td>29.8</td>
<td>28.3</td>
</tr>
<tr>
<td>Appliances</td>
<td>8</td>
<td>25.0</td>
<td>31.3</td>
</tr>
<tr>
<td>Automotive Products</td>
<td>8</td>
<td>25.0</td>
<td>28.3</td>
</tr>
<tr>
<td>Furniture</td>
<td>6</td>
<td>25.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Industrial Equipment</td>
<td>33</td>
<td>24.3</td>
<td>26.7</td>
</tr>
<tr>
<td>Package Supplies</td>
<td>16</td>
<td>17.3</td>
<td>19.8</td>
</tr>
</tbody>
</table>

Source: Deming, op. cit.
TABLE C-3

CONSIDERATIONS RECEIVING GREATEST EMPHASIS IN
PACKAGE SELECTION AND PACKAGING PLANNING

<table>
<thead>
<tr>
<th>Order of Importance*</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of operational change</td>
<td>6</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Unit cost of package</td>
<td>8</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>Display</td>
<td>3</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Consumer acceptance</td>
<td>37</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Frequent change</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Retailer convenience</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Long shelf life</td>
<td>3</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Fast turnover</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Protection</td>
<td>25</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

* Number of firms ranking items in order of importance. Of the 83 firms responding, not all furnished rankings for #2 and #3 positions.

significant weight and the other factors seem to be of minimal significance. But the question arises as to the validity of the judgment of consumer acceptance, which seems to be a melange of opinion on the part of many groups which do not usually come into customer contact. It is unlikely that all groups at such committee meetings defer to sales and marketing in their concepts of consumer acceptance. In turn, marketing personnel seem to rely more on experience and judgment than on directed research.

It is of interest to examine the current structure of the packaging function in selected firms to whom packaging is of importance. Figure C-1 reproduces the organization of the grocery products division of a major food processor. This firm is in the forefront of packaging technology and marketing and its personnel are recognized experts in almost every packaging area. Packaging planning is, however, part of the advertising group rather than marketing, while the technical segment is handled by research.

Another major food firm has organized as shown in Figure C-2. Here packaging is at a low level, organizationally, and is placed in the context of and on a par with technical functions. The marketing impact of packaging is lost in the formal structure although there is evidence that an informal structure exists to communicate marketing requirements as an influence in technical specifications. 7

Finally, let us consider a textile mill which is a prominent

7Deming, op. cit., p. 89.
FIGURE C-1

PACKAGING ORGANIZATION IN A LARGE MULTI-PRODUCT PROCESSED FOOD MANUFACTURING FIRM

Obtain specified quantity & quality when desired, where desired at most favorable price.

Source: Deming, op. cit.
FIGURE C-2

PACKAGING ORGANIZATION IN A MEDIUM SIZED SPECIALTY FOOD MANUFACTURING FIRM

Source: Deming, op. cit.
manufacturer of household linens, among other products. Its structure, as shown in Figure C-3 gives the most prominent place to the packaging function of the three firms reviewed. Packaging is placed as an integral part of the merchandising function, which itself is on a level with advertising and sales.

Summarizing the information developed above, it is apparent that despite the large amount of literature on the place of packaging in marketing, and in contrast to the expressed marketing orientation of many large consumer and industrial goods firms, packaging is usually held at a relatively low level organizationally a position from which it is difficult to play its full part in the total marketing concept.
FIGURE C-3

PACKAGING ORGANIZATION IN A TEXTILE PRODUCTS MANUFACTURING FIRM

Source: Deming, op. cit.
BIBLIOGRAPHY

Books


Bartels, Robert (ed.). *Ethics in Business*. Columbus: The Ohio State University, 1963.


Periodicals


"Buyers: Key to Good Packaging," Chain Store Age, (Special Reprint, 1960), 9-10.

"California Versus Creative Plastics," Chemical Week, Vol. 95, No. 23 (December 5, 1964), 31.


"How to Wrap it up to Sell Itself," *Printer's Ink* (Reprint from March 20, 1953 issue), unpaginated.


"M.R: Sense or Nonsense?" *Packaging Parade*, Vol. 26, No. 9 (September, 1958), 53-56.


"Marketing and Package Research: Profitable Togetherness?"  


Mueller, Robert W.  "Future Patterns in Food Retailing,"  
Progressive Grocer (Reprint September, 1955), unpaginated.


"Organizing for Packaging," Modern Packaging, Vol. 34, No. 4 (December, 1960), 81-86.

"Overall Distribution Featured by SIPMHE" (Society Industrial Packaging and Materials Handling Engineers), Distribution Age, Vol. 56, No. 12 (December, 1957), 41-59ff.


**Reports**


**Case Histories:** Gaylord Multi-Unit and Bulk Containers. Chicago: Gaylord Container Corporation, undated.


**Glass Containers:** Yesterday - Today - Tomorrow. New York: Glass Manufacturer's Institute, undated.


**The History of Glass Containers.** New York: Glass Container Manufacturer's Institute, Inc., undated.


**A Market Profile of the Boxboard Container Industry.** Chicago: Boxboard Containers, August 1, 1961.


American Management Association Material


Nash, Ben. *Restyling the Old Package.* Consumer Marketing Series No. 6, 1931.


Rogers, Johnson. *The Open Display Method of Retailing and Its Effect Upon Packaging.* Consumer Marketing Series No. 6, 1931.


Public Documents


Packaging and Labeling Legislation. Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary. United States Senate, Eighty-Eighth Congress.


Unpublished Material


Miscellaneous


I, Leonard M. Guss, was born in Philadelphia, Pennsylvania, December 8, 1926. My secondary education was received in the Philadelphia public schools. I entered the University of Pennsylvania in June of 1944 and received a Bachelor of Arts degree from the College of that institution in 1949, after a period of service in the United States Navy. I entered Drexel Institute of Technology in the graduate program in 1950 and was granted a Master of Business Administration degree in 1955. During that period I was employed in research and as a supervisor of production at a Philadelphia chemical firm, E. F. Houghton Company. In 1957, I entered the doctoral program at Ohio State University, where I majored in marketing in the College of Commerce and Administration, completing the course requirements in 1960. During the latter period I was employed as an industrial economist at Battelle Memorial Institute, Columbus, Ohio. While completing this dissertation I have been employed as Manager of Marketing Research, Weyerhaeuser Company, Tacoma, Washington.