refrigeration in the display case prevent discoloration and spoilage during a normal marketing period.

Even the dehydrated, frozen, and canned products deteriorate in quality if they are stored too long or kept under unfavorable conditions.

Dried fruits and vegetables are affected by loss of color, browning, off flavors, moldiness, and insects. Development of these defects can be retarded by storing dried fruits at about 55 percent relative humidity and temperatures just above freezing. Since the sugar content is rather high, the freezing point of these products is 22° to 26° F.

Dried vegetables are usually packaged in an atmosphere of nitrogen to retard deterioration. Refrigeration is desirable for long storage.

Frozen foods undergo changes in color, appearance, and flavor during storage, transportation, and marketing. Peach slices turn dark brown, strawberries become discolored, and the color bleeds from raspberries into the syrup. In vegetables, snap beans darken and later turn olive-drab and finally brown. Peas turn grayish-green and then yellowish. Cauliflower becomes gray. Both fruits and vegetables lose vitamin C.

These changes are affected by temperature. They are slow at 0° F. or lower but increase rapidly as the temperature rises. The rate of deterioration doubles several times between 0° and 25°. To maintain quality best, frozen foods should be kept at 0° or lower at all times during storage and transportation.

Canned foods are usually considered very stable but they deteriorate in quality if kept too long, especially if exposed to high temperatures. Changes occur in color, flavor, texture, and nutritive value. Storage life of canned foods is about 1½ to 6 years at 40° F. depending on the kind of product, but only 1 to 3 years at 70° and 3 to 18 months at 100°. In general, canned vegetables have a longer storage life than canned fruits.

Overall quality of the large variety of agricultural products in the market today is far superior to what it was yesterday. We can expect it to be better tomorrow. Better products will be produced and prepared for market; better storage, transportation, and packaging will protect it from deterioration from the farm to the consumer; and automated instruments will measure and control the quality.

THE MARKETING SYSTEM FOR FOOD, FABULOUS AND DYNAMIC

In early years, farmers took their products directly to towns and often dealt directly with consumers. Local custom governed market days, and the prices were subject to individual bargaining at many different places. Street stalls and peddler carts were early forms of specialized retailing. Most of the food sold was of local origin. Specialized wholesaling and warehousing were rare.

With the growth of cities, the food supply system changed. The big cities came to depend on shipments from distant areas. Commercial farming spread west and south. The increasing urbanization and its reliance on food supplies from long distances created the need for country assembly points to collect and sort farm products into wholesale lots for transportation to consuming centers.

Terminal wholesale centers were established to receive from country assembly points and to redistribute to the retail food trade. Specialists in transporting, wholesaling, brokerage, and warehousing multiplied. Process-
ing moved from farm and home into the factory. Commercial meat-packing, butter- and cheese-making, canning and baking became commonplace. Larger manufacturers established sales branches.

Terminal wholesale centers were more than a place to receive, store, display, and distribute a line of products. It was the pricemaking center, the place where supply and demand forces over a wide area converged. Many services were needed and pressures developed for public market information, grades, inspections, honest weights, and so on.

On the retail front, grocery stores, meat markets, bakeries, and other food specialty shops arose in great numbers as enterprising families scraped together the means of leasing stores and stocking shelves. Many businesses adopted systematic markons; haggling tended to disappear.

These were historical developments in the organization of food marketing up to the 1930's. But then things really began to happen. Retail chain organization, which arose in the twenties, spread. Self-service shopping, with a low markup policy, began.

After World War II, changes came rapidly. In a significant step, an independent retailer in Wisconsin demonstrated in 1947 the feasibility of extending the self-service principle to fresh meats. This heralded a revolution in merchandising perishables in refrigerated display cases.

As this retailing system expanded, procurement methods changed. Farm products increasingly bypassed established country assembly points and urban terminal market wholesaling districts. Eggs, dressed poultry, fruit and vegetables began moving in great volume, for long distances, from country points directly to retailers.

Moreover, grain and livestock increasingly bypassed the great terminals as shifts occurred in location of processing. The great price-making centers where farm commodities had collected declined. Thus, the marketing system came full circle, from direct to indirect dealings then back again.

But the new direct marketing system is much different. There are fewer, larger farms, and fewer, larger retail stores. Many processing plants have moved closer to sources of supply. There are many more products. There are modern highways. The system is fluid. Products move great distances, in any direction, at a low unit cost. There is a system of efficient warehouses which are materials-handling masterpieces. One could enumerate many other features.

Fundamentally, the major developments are reflections of general economic growth. Growth means increase in per capita incomes and, therefore, more spending power. It implies a demand for more variety of output. In the food field, this means more seasonally produced items the year around, more manufactured products, more stages of preparation, and more types of away from home eating service.

Growth also means urbanization, mobility, and congestion, which in turn cause a demand for centralized shopping. By expanding the market, growth provides increasing opportunity for specialization, large size businesses, and applications of new and improved methods, all of which lead to lower costs. Looked on another way, growth occurs because capital is channelled into the most profitable ventures.

There was no one physical invention that unlocked the possibilities of cost reduction in retailing food. Rather, the modern self-service supermarket, large scale buying, and efficient supplier organizations simply applied methods that were around for years. One would be hard-pressed to find much in food retailing that was not known before. But what was new was
the opportunity at a certain stage of economic development for adapting known methods to a very ancient business.

The grocery chain organization became feasible when the individual store, small as it was, had enough volume to allow some labor to become more efficient running the store if others could apply their skills to reduce the cost of purchasing, warehousing, advertising, and financing, for many stores together. The small sales per store belonging to large chain organizations is evident as late as 1939.

Enlargement of the individual store since 1939 was a response to a different set of forces. The principle of one-stop shopping calls for a line of merchandise broad enough to attract a steady following of customers.

The modern supermarket is merely the application of the long-known department store principle to the food area but with distinctive features of self service, cash and carry, and community location.

The number of items stocked by the average supermarket has more than doubled during the past two decades. Nowadays, there is little difference in the average size of stores belonging to the smallest and the largest chain organizations.

When a grocer chooses to broaden his merchandise line he thereby provides a service. Its value is measured by the inconvenience customers would incur by going elsewhere to complete their shopping lists. Because different customers have different wants, the problem of satisfying all the needs of

<table>
<thead>
<tr>
<th>Grocery stores per firm</th>
<th>1939</th>
<th>1948</th>
<th>1963</th>
</tr>
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<tbody>
<tr>
<td>4-10</td>
<td>$258,000</td>
<td>$398,000</td>
<td>$910,000</td>
</tr>
<tr>
<td>11-25</td>
<td>272,000</td>
<td>512,000</td>
<td>1,090,000</td>
</tr>
<tr>
<td>26-100</td>
<td>186,000</td>
<td>382,000</td>
<td>1,265,000</td>
</tr>
<tr>
<td>101 and over</td>
<td>184,000</td>
<td>492,000</td>
<td>1,150,000</td>
</tr>
</tbody>
</table>

Based on "U.S. Census of Business."
every customer seems boundless. A retailer would feel warranted in stocking an item if he thinks the cost of doing so would be covered by the added sales volume it would cause.

Thus, opportunities for small stores have shrunk. But they have not been eliminated. There are pockets of demand that the supermarket cannot fill. There is a continuing search for new locations and new types of retail services which the growing market would support.

Economic growth not only hurt the small grocery store but also the independent store, large or small. As more possibilities occurred for reducing buying, warehousing, store delivery, advertising, and other costs through enlargement of size, the sovereignty of the individual store had to yield.

Cost advantages are realized where stores become part of a larger system. But the private chain is not the only system. Independent stores joined cooperative buying groups in order to survive. Similarly, the traditional full-line grocery wholesaler sought alliances with stores as business affiliates.

A basic difference among these systems is the location of ownership. Any successful system uses inducements and compulsions. The success of each form of organization depends on how well it adjusts to changing conditions. A private chain might delegate more authority to store managers. A voluntary or cooperative chain might tighten operating standards of member stores. Thus, each type of system bends in the other’s direction.

Retail chains have the advantage of “captive” stores who buy from the company warehouse. This insures volume needed for efficient materials handling.

Part of the problem in reducing costs of supplying stores is to build more volume per store. A store needs a minimum of $500,000 sales to enjoy most advantages of truckload deliveries. Most stores belonging to private chains are above this size, but
fewer than half the cooperative and wholesaler-affiliated stores are. Still, average sales per store in the latter groups have been on the increase, which is necessary so as to have an improved competitive position with the large chain organizations.

Part of the bottleneck to improving the efficiency of retailing lies with the nature of today's cities. The most efficient size store is the newer unit—usually located in the suburbs. Smaller, higher cost units tend to be located in older, close-in neighborhoods. Hence, the problem of further increasing the physical efficiency of the overall system is the problem of improving the city itself.

Economies in warehousing, delivery, and store operation feed one another. For example, while affiliated wholesalers always have supplied dry groceries, it is only in recent years that they have supplied more dairy products, meat, produce, and nonfood items. Additional services become possible only with growth of the group. But growth of the group usually requires growth of individual stores.

Definite cost advantages accrue to stores that price and advertise as a group in a metropolitan area. There would be little difference between the cost of a newspaper ad for one store and for twenty stores, but there obviously would be a large difference in the cost per store.

The problem of setting retail prices has become more critical and costly with the development of low markup, high volume methods. In the competitive struggle for customers, the sales special has become a standard method of selling. It is but a part of the larger problem of setting prices which requires skill. Any individual firm will find it hard to meet all competitors' prices at all times, yet it will set some distinctive prices to attract customers. But it also will rely on nonprice techniques to get trade.

Mass merchandising depends on procuring assured supplies of products of uniform quality, condition, and appearance. It also depends on stable price to induce sustained promotional effort.

Faced with procurement difficulties, mass retailing has developed remedies. For lack of reliable information, the retailers have placed buyers, grading stations, and packing sheds at appropriate country points to get the produce they want. They have generated supplies of some things by offering to buy to their own specifications.

These practices now are common for carcass meat, shell eggs, and fresh fruits and vegetables. For some manufactured products, like canned and frozen fruits and vegetables, retailers have entered into contracts with the processors to make them to specification for their own private labels.

Finally, larger retailers make some things themselves, like bakery products, where each firm can impart some degree of distinctiveness to its offerings. They also frequently manufacture other things in volume, like roasted coffee and table-ready meats, but difficulties in buying these items usually are not the reason. For the greater part, retailers have left most food manufacturing to others.

Beside the food retailing industry, the restaurant industry has begun to exert its influence on the system of supply. As one example, the modern franchise chain that features a limited menu and quick service may find it advantageous to buy its chicken, ground beef, or other featured item to its own rigid specifications.

These are new developments of a very old business. Commercially-prepared meals trace back to country inns and bazaars. With the rise of cities, numerous specialized restaurants appeared. With industrialization, the cafeteria, and now the coin-operated vending machine, have replaced the lunch box. These modern techniques are applied wherever large numbers of people congregate during the day—offices, factories, schools—and where incomes can sustain them. Being large volume, low markup businesses, they spread rapidly once they become economically feasible.
In short, the task of buying supplies which faces retail food stores and restaurants has become more complex as a result of the increasing array of possible products and services, the costs of searching the market, the problems of maintaining balanced inventories, and so on.

Most foods nowadays pass through some factory stage. Some—like fresh fruits and vegetables—merely have washing, cooling, grading, and packaging. Hence, steps are often carried out in simple plants at country points either by retailers, cooperatives that are owned by growers, or by independent shippers. But most farm products are substantially altered in factory processing and such factories tend to be large and elaborate. They are mostly owned by separate firms, ranging from big national food manufacturing companies down to small independents that own a single plant.

With the growth in demand for factory processing services, the food manufacturers have responded by developing new products and by elaborating product lines. Thus, for example, ice cream is no longer the only frozen dessert, and ice cream itself is now offered in an increasing array of flavors, kinds, sizes, and types of packages. The same goes for milk, cheese, bread, vegetables, and many other foods that formerly were simple and well standardized.

The second tendency is for manufacturing to become more specialized and for the size of operation to enlarge, with further opportunities to apply technology. Because most farm products are bulky or perishable, the historical reduction in ton-mile cost of transportation has allowed the plant to reach out for its supplies over a wider area.

Together, these tendencies have resulted in larger and fewer plants in the food manufacturing industry. Between 1947 and 1967, the average size of food manufacturing plants had almost tripled and the number of plants decreased by one-third. However, experience for individual sectors in the food manufacturing industry was diverse.

Altogether, there were about 30,000 food manufacturing plants in the United States in 1967. About 9,000 of these units belonged to companies that had two or more plants. These accounted for two-thirds of food industry manufacturing.

As firms grow larger and fewer, they tend to exert more buying power. It means that each firm is able to make more specific demands on suppliers for quality, conditions, delivery schedules, and perhaps, price. This is in addition to the tendency of the large retailers to make their own buying power felt, as described above.

Percent Change in Number of Establishments and Average Output Per Establishment, U.S., 1947 to 1967

<table>
<thead>
<tr>
<th></th>
<th>Number of establishments</th>
<th>Output per establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food manufacturing</td>
<td>-33%</td>
<td>+175%</td>
</tr>
<tr>
<td>Retail food stores</td>
<td>-42%</td>
<td>+194%</td>
</tr>
<tr>
<td>Eating places</td>
<td>+22%</td>
<td>+83%</td>
</tr>
</tbody>
</table>

1 1948 to 1967.

From the larger viewpoint, the methods of organizing the food economy look quite different than they once did. The terminal market used to be the nerve center. Grain terminals, stockyards, wholesale poultry and eggs districts, fruit and vegetable auctions—each brought together competitive forces over a wide area. Prices were openly established and news of their changes was spread widely by press and radio. The behavior of these wholesale price centers was understood in terms of cyclical, annual, and seasonal influences. Producers largely decided what to produce for tomorrow's market by their interpretation of today's prices.

The rise in more direct dealings caused a decline in the terminal markets and a change in their roles. While the volume of products traded in these
Varieties of away-from-home eating services are increasing.

Markets has drastically declined, they are still used as basing points for pricing such products as butter, eggs, and cattle. For example, a retail chain organization in Philadelphia may buy fresh eggs from the Midwest based on a price established by the New York Mercantile Exchange.

This system of pricing is sometimes questioned. Partly it is because of the thinness of trading at wholesale markets on which the side dealings are arranged, which suggests the possibilities of abuse. But partly, the uneasiness is based on the difficulty of trying to make prices in a market that is so widely dispersed.

But it is no longer economically feasible for all commodities to be physically present when buying and selling occurs. It would be wasteful. Nor is it necessary. As long as one
I can describe a commodity to the reasonable satisfaction of others and assure delivery, payment, and redress of grievances, a satisfactory exchange can occur. As a matter of fact, the commodity need not even be in existence at the exact time that the trading occurs.

In the modern economy, there are emerging possibilities for many kinds of pricing that heretofore were nonexistent. In large measure, problems of market organization become problems of making such pricing more efficient. The new vistas for the functioning of commodity markets include not only formula pricing but also a wide range of possibilities for contract growing, future trading, and the application of electronic computers to searching the market and even for trade negotiations.

The problem of achieving satisfac-

Manufactured products are on the upsurge in the food field. Above, continuous pressure cookers for sterilizing cans of food. Left, in-line juice extractors, for orange juice concentrate, at Lakeland, Fla.
tory market organization is indeed difficult. It depends on solving several problems. As the economy continues to expand, new production possibilities will arise—due to new products, more specialization, and new technology. More stages in the production of a given commodity can be separated out and brought into a separate market decision. Thus, there constantly will emerge new ways of doing business. These pose not only opportunities but also hazards.

Each way of doing business might meet the needs of some different participant as he reviews his comparative advantage, resources, and the uncertainties that will face him. In short, a range of potential trades open up that are far different from the simple spot, cash-and-carry deals of the traditional wholesale markets. The problems of market organization are indeed great, but then, the economy is attempting to do far more than it ever did before.

Achievements of the food marketing system may be judged on four levels. First is maintenance of quality standards and provision of significant choices. Here, results have been generally good. The main questions concern excessive tie-ins of advertising and promotional gimmicks with the food supply, and to some extent the excessive difficulty of comparing real unit prices of different size packages.

Second is the economic efficiency of physically getting farm products to the ultimate consumers. Costs can be lowered by eliminating needless transport, processing, and storage activities. And they can be lowered by reducing the costs of performing remaining services. On these counts, results of the system have been good.

Third is efficient transmission of consumer wants back through marketing channels to guide production. In this respect, the modern system is much improved over what it was. Large scale merchandising exerts effective pressures in this direction. Years ago the system absorbed whatever the farmer decided to produce. Today there may be no profitable markets for some products.

Fourth is minimizing the costs of change. Increasingly, established farmers and middlemen are being bypassed to their disadvantage. They cannot easily shift into other occupations or businesses. This is a severe problem, but it is a general problem of a rapidly changing society. With increased understanding, more people are coming to regard the plight of the individual as society's plight. Society is constantly searching for ways to soften the blow to individuals who are hurt by economic growth and change.

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A MARKETING ORDER MAY BE THE ANSWER

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A severe freeze wiped out the south Texas citrus industry in 1951, and growers faced a market rebuilding job.

Favorable growing conditions for California raisins resulted in consecutive years of near-record production in the 1960's, seriously threatening market stability.

A 1967 State court decision invalidated Georgia's milk control program, requiring a new approach to stabilizing fluid milk prices.

A California water pollution control board outlawed dumping a salt brine solution used to store black ripe olives, and the olive industry had to replace an age-old process.

Each of these situations was unique and different. Yet the answer in each case was found in a Federal marketing order.

Citrus producers adopted a dual approach of regulating the quality of oranges and grapefruit going to the fresh market, and promoting the use of their products by advertising.