A good interview survey of this type rests on four essentials. Each is composed of a number of prerequisite elements, and all must be integrated into a functional pattern. The essentials are:

1. Planning and survey design—development of definite objectives to be satisfied; development of specifications of data necessary to satisfy each specific objective; development of a question schedule that will satisfy the specifications of data; pretesting of the question schedule to insure that each question actually does provide information to satisfy the datum specification for which it was designed; and development of detailed, question-by-question instructions to interviewers.

2. Sampling—development of a precise definition of the statistical universe that is to be sampled; choice of adequate sampling methods; determination of size and distribution of the sample in relation to the amount of error that can be tolerated; and development of clear and precise instructions to interviewers on how the sample is to be used.

3. Interviewing—administration of the field staff; use of proper interviewing techniques; and training of interviewers on the question schedule.

4. Analysis—development of an adequate code based upon the original specifications of data and the questionnaire; coding and check coding; tabulation and cross-analysis, correlations, et cetera; and preparation of the final report of the findings.

A NATIONAL INTERVIEW survey may cost between 50,000 and 100,000 dollars, depending on the number of separate regional tabulations involved. In the ascertainment of amounts of products used, prices paid, and frequency of purchase, it is subject to memory bias. There is no convincing evidence one way or the other, but it is generally assumed that while the diary-keeping panel method may somewhat underreport consumption, because of carelessness in recording by panel members, the interview survey has a telescoping effect and produces an overreport. The method has also been criticized on the grounds that the frames of reference in which the questions are asked may not be understood by respondents, so that much variability occurs in the meaning of the answers given.

It is evident that the investigator of consumer wants has a variety of methods to apply in the solution of the diverse problems arising in his field. Different problems require different approaches and it is a part of his skill to select the method or combination of methods which will best fit the particular situation. All the techniques discussed above have defects and some of these have been pointed out. Research in methodology, however, is continually going on and the results applied to the improvement of the basic techniques. They are good now; they will be much better in the future. (*Forrest Clements, Trienah Meyers.*)

The Long Fight for Pure Foods

The first laws prohibiting tampering with foods and selling unwholesome provisions were enacted in ancient times. Early Mosaic and Egyptian laws governed the handling of meat. Greek and Roman laws attempted to prevent the watering of wine. In 200 B. C. India provided for the punishment of adulterators of grains and oils. In the same era China had agents to prohibit the making of spurious articles and the defrauding of purchasers. Most of our food laws, however, came to us as a heritage from our European forebears.

In early times foods were few and

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very simple, and trade existed mostly through barter. Such cheating as did occur was crude and easily detected by the prospective buyer. In the Middle Ages traders and merchants began to specialize and united themselves into guilds. One of the earliest was called the Pepperers—the spice traders of the day. The Pepperers soon absorbed the grocers and in England got a charter from the king as the Grocers' Company. They set up an ethical code designed to protect the integrity and quality of the spices and other foods sold. Later they appointed a corps of food inspectors to test and certify the merchandise sold to and by the grocers. These men were the first public food inspectors of England. Later on they became officers of the crown, and King Henry III made them custodians of the official weight standards.

Pepper is a good example of the trade practices that brought about the need for the food inspectors. The demand for pepper was widespread, as much for its preservative action as for its value as a condiment. Its price was high; it was handled by various people during its long journey from the Spice Islands to the grocer's shelf. Each handler had opportunity to debase it; the grinders had the best chance, and made the most of it, since adulterants could not be detected in the ground spices by methods then available. Worthless barks and seeds, iron ore, charcoal, nutshells and olive pits, and coconut shell at times were ground along with the pepper berries.

Bread was another food that offered temptation to unscrupulous bakers. The most common cheat was short weight, but at times the flour used contained ground dried peas or beans. In fact, sharp practices by members of the Bakers' Guild brought about the passage of the first protective food law on record. Known as the Assize of Bread, it was proclaimed by King John of England in 1202. A quotation from the law, rewritten into modern English, shows the type of punishment meted to violators:

"If any default be found in the bread of a baker of this city, the first time let him be drawn upon a hurdle, from the Guild hall to his own house, through the greatest streets, where the most people are assembled, and through the streets which are most dirty, the false loaf hanging from his neck; if a second time he shall be found committing the same offense, he shall be placed in a pillory, and remain there at least an hour."

A third offense banished him from his Guild. At times the magistrate ordered a bakery to be torn down and the culprit banished from the city.

In the fifteenth century the explorers opened up the era of colonial expansion. New luxuries—such as tea, coffee, chocolate, and sugar—began to arrive at home ports. Some of these commodities, coffee and tea in particular, seem to have been adulterated from the beginning. They came from countries whose traders had developed skillful and novel methods of adulteration. The Chinese suppliers added to tea destined for export such things as dried leaves from other plants, sand, clay, and even dried spent tea leaves ingeniously dyed and rolled to look like freshly dried tea. The importers further stretched the tea with leaves from their own trees (completely unlike tea leaves) and spent tea leaves from their coffee houses and inns.

Coffee has a similar history; chicory, roasted turnips, barley, acorns, beans, and mahogany sawdust were used as adulterants.

The crown's first interest in this situation came from its loss of excise revenues; more tea and coffee were being served in England than had been taxed at the ports. A law passed in 1718 imposed a fine of 20 pounds for adding foreign substances to coffee.

The nineteenth century in England brought developments in the central processing of foods and with it new forms of adulteration, some of them definitely dangerous to health, such as mineral pigments in candy and spices; and opium, nux vomica, and picro-

toxin added to beer to conceal the addition of water. Publication of the scientific findings in the popular and medical journals resulted in the appointment of a committee of Parliament to investigate the extent of such adulteration, both dangerous to health and to the consumer's purse. This resulted in the enactment in 1860 of the Adulteration to Food and Drink Act, the first general food law of England.

The first general food laws in the United States were enacted by the States, Massachusetts leading the way in 1784. California enacted a pure food and drink law in 1850, a year after the Gold Rush. Most of the States had laws of this type by 1900, along with additional laws on special foods, many of them enacted to protect the farmers' basic commodities from competition with adulterated wares. Conditions paralleled those in nineteenth century England. New York inspectors in 1875 found 52 percent of the butter, 56 percent of the olive oil, and 64 percent of the brandy they examined to be adulterated. A Boston Health Department report in 1880 stated that 46 percent of the colored candies sampled contained lead chromate.

Little uniformity existed under the State laws; foods legal in one State might be banned by its neighbors.

The State chemists were among the first to advocate a Federal law to bring order into the chaos.

The pioneer who waged the most effective fight for Federal pure food laws was Dr. Harvey W. Wiley, who came from Indiana in 1883 to be chief chemist of the United States Department of Agriculture. Long interested in the composition of foods, he immediately assigned some of his staff to the problems of food adulteration. Soon a series of Government bulletins emerged; the most important was the 1,417-page Chemistry Bulletin 13, issued in 10 parts from 1887 to 1902, as *Foods and Food Adulterants*.

The first Federal food and drug bill was introduced into Congress in 1879, but the real fight for such legislation began about 1900 and lasted until the law was enacted 6 years later.

By that time the factory preparation of food had become big business, with each manufacturer a law unto himself, as far as the Federal Government was concerned. He could put whatever he chose into his wares, and his only labeling guides were his conscience and his competitor's practices. Few processors knew or cared about sanitation in those days, and commercial refrigeration was in its infancy.

Dr. Wiley, a born crusader, took his message to the public. He became a popular speaker before women's clubs and other organized groups. Reporters began to write front-page stories, which aroused consumers to the danger to their own health inherent in the debased foods of the day. Particularly interesting to the public were reports on the progress of Dr. Wiley's "poison squad," a group of young chemists who volunteered to be "guinea pigs" for a full year and eat nothing but the food prepared in the Bureau of Chemistry laboratories with measured doses of the chemicals prevalent in the prepared food of that period—formaldehyde, benzoate of soda, boric acid, and salicylates. Dr. Wiley became popularly known as "Old Borax."

Stories about medicines in national magazines alarmed every mother and homemaker—reports of infants' soothing sirups containing morphine and opium, of people who became narcotic addicts from the use of medicines with an innocent appearance, of women's tonics that depended on alcohol for their bracing effects, of the tragic consequences to those depending on the cure-all promises of the patent medicines on every drugstore shelf.

In 1906 a chapter in Upton Sinclair's *The Jungle* aroused the public with its graphic exposé of revolting conditions in the Chicago stockyards and packinghouses.

Mark Sullivan, in *Our Times*, wrote: "The women of the country were ripe for the crusade. Enough of them had

lived through the transition from home and village food-industry, to large-scale corporation food-industry, to know the taste, odor, and sight of pure products of nature; and to recognize that in what they were now obliged to buy, and what they could not avoid feeding their children, there were elements new and mysterious, and therefore disquieting. These women, by the support they gave Doctor Wiley, by the pressure they brought upon Congress—without votes, without ever thinking they needed votes—did a work greater than anything that women accomplished or attempted during the eight years after women got the suffrage in 1919."

From 1879, when the first Federal pure food bill was introduced, until the law was finally enacted, Congress considered 103 food bills. It passed a tea importation act in 1883, and in 1890 acts prohibiting the *importation* of adulterated food and the certification of certain meat products processed for exportation. In 1891 and 1895 it extended meat inspection to partial protection of domestic consumers by requiring inspection of animals for disease before slaughter.

Despite bitter opposition, the crusade was finally ended when Congress passed the Food and Drugs Act and the Meat Inspection Act. Both were signed on June 30, 1906, by President Theodore Roosevelt, who had fought valiantly for their passage.

Both laws went to the Department of Agriculture for enforcement by the Bureaus, which had small staffs to administer the limited laws enacted in the 1890's—the Food and Drugs Act to the Bureau of Chemistry and the Meat Inspection Act to the Bureau of Animal Industry.

The enforcement of the Food and Drugs Act, which went into effect in 1907, was a stunning blow to the doctrine of *caveat emptor*. Both the Bureau of Chemistry and the affected industries recognized that the new slogan was to be "public interest comes first."

During the first year, before any cases were prosecuted in the courts, the Bureau set up a series of laboratories throughout the country, supplementing the port laboratories already in operation to keep any adulterated foreign products from entering the country. A corps of inspectors was appointed to collect samples of the foods and drugs shipped in interstate commerce. Chemists at Washington headquarters were busy devising new chemical and microscopic methods to supplement the woefully few then available for objective tests of the samples deluging the laboratories.

The industries, too, were putting their houses in order to live with the new law. Labels had to be changed to declare chemical preservatives in processed foods, and to give consumers other information the law required for intelligent purchasing. Almost immediately the processors encountered buyer resistance to foods labeled as containing chemicals that the public suspected would do them no good. The Bureau of Chemistry sent experts into the field to demonstrate how foods could be preserved without chemicals by employing adequate sanitation and suitable raw stock. The processors who adopted those practices found a new, enthusiastic market and prospered. Many others fell into line, preferring to abandon preservatives rather than to declare them on their labels.

In general, factory conditions improved during this period, for it was an era of awakening to the concepts of modern sanitation. The sanitary requirements in meatpacking establishments and the suggestions of Food and Drug inspectors in the plants to which they were admitted (the law did not compel their admission) played no small part in the trend toward the production of cleaner food. Seizures of unfit products in the channels of trade also encouraged more attention to sanitation.

Some compromises had to be made to enact the 1906 law, but for its time it was a good law—the strongest in the world. However, the era of food in-

dustrialization had just begun. By the turn of the century there had been a marked change from home production to bulk distribution. The next 25 years brought the package age—not only a change from the cracker barrel to the sealed carton, but from the delicatessen tray to jars and cans. These foods were better protected from contamination, but their contents were conccaled from the inspection of the purchaser. More informative labeling was in order.

Other protections to the food consumer were needed, also—official standards defining the composition of basic food products, compulsory sanitary inspection of factories, heavier penalties for illegal practices, a ban on inherent poisons in food as well as added ones.

Stronger controls were needed in the drug field, also, and there was no Federal regulation of therapeutic devices and cosmetics, despite the injurious nature of many products on the market.

Some of the early deficiencies were pointed out by the chief chemist of the Bureau of Chemistry soon after the 1906 act went into effect, and others from year to year as conditions developed that required greater consumer protection.

Meanwhile, a separate enforcement agency was formed in 1927. It employed the staff of the Bureau of Chemistry assigned to administer the Food and Drugs Act. First known as the Food, Drug, and Insecticide Administration, its name was changed in 1931 to the Food and Drug Administration.

PRESIDENT FRANKLIN D. ROOSEVELT gave a new impetus in 1933 to the reforms the Food and Drug officials had been calling for. A 5-year struggle for a stronger and more inclusive law finally culminated in passage of the Copeland bill in 1938. The best features of the 1906 act were retained, but the new law covered new conditions that had developed and put teeth into the enforcement provisions that had proved weak in the past.

There was little crusading in newspapers and periodicals for the passage of this stronger law such as that which had played so important a part in enactment of the Wiley bill in 1906.

Consumer groups, particularly the large national women's organizations, took up the fight, just as they had done for the first national law a generation earlier. They aroused public thinking on this subject in the cities, towns, and villages throughout the land, despite the general apathy of the press.

The Food, Drug, and Cosmetic Act of 1938 stands today, amended as weaknesses revealed by court decisions or changing conditions (such as the development of antibiotics, which required predistribution testing) were pointed out to Congress. This continuous process of keeping the law alive to the needs of the public should preclude another complete overhaul such as that necessary in 1938.

The new law made instantly effective the provisions designed to protect the public against dangerous drugs, devices, and cosmetics. As originally enacted, the statute was to become fully effective on June 25, 1939. This date was extended by amendment to January 1940, for the new labeling provisions and certain other requirements, with restricted authorization for additional postponements until July 1, 1940. Its complete coverage followed by a day the transfer of the Food and Drug Administration from the Department of Agriculture to the Federal Security Agency. All of the powers vested in the Secretary of Agriculture in the enforcement of the Food, Drug, and Cosmetic Act, the Tea Act, the Caustic Poison Act, the Import Milk Act, and Filled Milk Act were concurrently transferred to the Federal Security Administrator. In 1953 this Agency became the Department of Health, Education, and Welfare.

WHERE DO WE STAND today in the fight for pure foods? The American public has the best and safest food in

its history. We are no longer dependent on geographical location or season to have an abundant choice of nutritious food at any grocery store in the land. We cannot afford to be complacent, however, as we view the advances of the past half century. Most food is perishable or subject to the depredations of insects or rodents at some stage in its processing or distribution. Constant changes in producing and processing methods require comparable development in the regulatory field. There is wide variation among the industries subject to Federal food laws. Some are highly advanced technologically, with excellent control over the factors that lead to violative food, and others still employ methods unsuited to the protection of foods for human consumption.

With only a few hundred inspectors and analysis to cover the operations of 96,000 establishments that are producing and warehousing the commodities subject to the Federal Food, Drug, and Cosmetic Act, spot checking is the only course available. Violations involving direct danger to health receive first consideration in planning enforcement operations. Filth and decomposition are next in importance—and first in the amount of enforcement time actually allotted. Economic cheats affect the consumer's pocketbook, but they can be given relatively little attention. Coverage of the first two categories is woefully incomplete. It is possible to examine and inspect only a small fraction of 1 percent of the total production each year.

Conditions in food factories as a whole have shown progressive improvement throughout the history of enforcement of Federal food laws. The procurement of fit raw materials continues to be a problem. Milk and grain, for example, originate in thousands of farms that ordinarily make no interstate shipments. They are delivered to small collection centers—elevators or cream stations—and the intermingling of lots continues until large deliveries are made to the processors, whose business may be nationwide. The problem is to improve handling and storage conditions at the farms, then to protect the products at each step of the way. Such precautions are equally needed for our fresh produce, which is sometimes handled in city wholesale markets under reprehensible sanitary conditions. The Federal pure food laws can never substitute for adequate local protection of our food.

Another limitation of food protection today, under laws against false labeling and advertising, is the inability to curb the practice of nutritional quackery. Self-styled nutritionists are distorting the facts of the real advances of the science of nutrition and menacing the health of ailing and misinformed persons by making unwarranted therapeutic claims for various "food supplements." People who should be spending their money for readily available and adequate foods, and for competent medical care, frequently divert it to the faddist items promoted by food quacks. This tribe of nutritional pitchmen base their sales talk on myths about soil depletion, misconceptions regarding food processing, and falsely alarming exaggerations about "sub-clinical deficiencies" in the diet.

The food quack has something to sell, but usually he is fully enough aware of Federal laws to keep his claims and promises off food labels. He frequently confines his false teachings to books, magazine articles, and oral promotion which cannot be linked with a commercial scheme of distributing the product. The purchasing public must set up its own defenses against such exploitation.

On the chemical front, the fight for pure foods has been waged in two major battles. The first was a struggle against the recognized poisons used in and on our foods in the past. After passage of the 1906 law, widespread use of formaldehyde and boric acids to preserve foods was soon abandoned. The chief chemist reported in 1909 that a large number of prominent manufacturers had "entirely aban-

doned the use of any kind of preservatives and openly announced their adhesion to the doctrine that drugs should not be placed in foods."

Arsenic was found in early samples of baking powder, confectioners' glaze, and a few other processed foods, added inadvertently because it was so commonly used in the manufacture of phosphates and phosphoric acid and other commercial preparations purchased by food processors. The primary fight against arsenic and lead occurred in the late 1920's and during the 1930's when those chemicals were widely used as orchard sprays to control insect damage. After turbulent protests against seizures of fruits bearing excess residues when they reached the market, the growers installed washing equipment recommended by State and Federal officials and found that with the exercise of adequate precautions on spray schedules and removal of residues above the informal tolerances set by the Secretary of Agriculture, they could still protect their crops without violating the pure food laws.

Stronger provisions to prohibit or control the known poisons that might contaminate foods were included in the 1938 act. Soon after the new law went into effect, however, and before all of its regulatory provisions could be employed, the Second World War began. With it came an accelerated development of chemicals needed for military supplies in all parts of the world. The second struggle in the cause of pure foods was against chemicals with unknown potentialities.

New insecticides, new packaging and preservative materials, and many other necessary adjuncts of modern warfare were accepted after preliminary tests showed they were safe for emergency use—a calculated risk. There was not time for the 2- or 3-year chronic toxicity tests, without which a pharmacologist could not venture an opinion as to long-range safety in the diet of the general public. Such tests were in progress, but most of the new materials were restricted to temporary military purposes, and permanent, unrestricted use in a civilian economy was a problem of the future.

The end of the war released not only these chemicals but many other new substances developed for technical purposes but later adapted to food uses. Much progress has been made in the study of their long-range effect if ingested day by day in our food supply but there is still much to be learned about them. Additional products continue to appear, much more rapidly than the Food and Drug Administration can study them.

A succession of obviously poisonous additives have been removed from the markets—beer containing fluorine; soft drinks, wine, beer, salad dressings, and sirups containing monochloracetic acid and the quaternary ammonium compounds; frozen peaches with thiourea added as an antioxidant; cheese wrapped in papers impregnated with dehydroacetic acid to prevent spoilage; and numerous other foods containing substances that have been proved deleterious and not required in good production or manufacturing practice. The courts have ruled that it is not necessary to prove that such added poisons are present in the food in injurious amounts. The Government has the burden of proof that the substance is deleterious—and this may take several years of investigation, while the product is being used, with the public serving as "guinea pigs."

In December 1952 a circuit court ruled that the Government may exclude ingredients from standardized foods if there is doubt as to their safety. The court said: "One making a rule for the future which in practical effect will determine whether millions of people shall eat something every day may reasonably refuse to subject the general public to even slight risks and small deceptions."

The Congress, through the Select Committee on Chemicals in Foods, held hearings in 1951 and 1952 to determine whether the public is receiv-

ing adequate protection from chemicals used in foods. In a report issued in 1952, it concluded that the Food, Drug, and Cosmetic Act should be amended to require that new chemicals in food be cleared for safety in advance of distribution, similar to the practice established by law in 1938 for new drugs. This would place on the producer the responsibility for establishing evidence of safety.

The Second World War brought a great change in the insecticides and pesticides used to protect food crops. Arsenic, lead, and fluorine, the poisonous sprays of the past, gave way to DDT and its newer cousins. Hearings were conducted by the Federal Security Agency from January to September 1950 to establish residue tolerances for all of the substances required in the production of all classes of food crops. In investigating the problems of poisoning pests without poisoning people, the Food and Drug Administration has received the close cooperation of the Public Health Service, several units of the Department of Agriculture, and many State agencies.

The 1938 act gave a new impetus to sanitation in our food supply. It expanded the definition of adulteration to include production or storage under insanitary conditions that *may* result in contamination with filth. Previously, actions against filthy foods had to be based on contamination that could be detected in the product of the market place. Sanitary inspection of factories gained a new importance in food regulation—not only as an enforcement tool, but also for its educational value.

FDA inspectors invite the management to accompany them during the factory inspection and, when it is completed, leave a written report to the management on observations of insanitary conditions. Usually their constructive suggestions are adopted, and if objectionable products are on hand they are not shipped for human food use. A minority disregard the inspectors' warnings and suffer subsequent seizures of their goods and criminal prosecutions for continued carelessness in preparing food for the use of human beings.

APPROXIMATELY 80 percent of the court actions involving foods each year are based on filth or decomposition. Major causes have been contamination by insects and rodents, and the use of unfit materials, such as decomposed or high-sediment milk, fruits and vegetables with the spoiled parts not adequately trimmed, and fish and eggs frozen after decomposition had set in.

The effectiveness of FDA's efforts toward a cleaner food supply was threatened by two court decisions. The first temporary setback came in February 1947, when the Supreme Court refused to review an appellate court decision which denied Federal jurisdiction over foods that became contaminated during storage after interstate shipment. An amendment in June 1948 closed this breach in the statute, and assured jurisdiction over adulteration and misbranding of interstate goods until they are delivered to the consumer.

The second came late in 1952 with a Supreme Court ruling that the language of the statute did not give the Government the right to make factory inspections without permission of the owner or manager. The immediate reaction of responsible producers was to invite continued factory inspections, making it abundantly clear that they were a burden only to careless and willful violators rather than to producers with pride in the quality of their merchandise. Early in 1953 amendments to correct this serious threat to law enforcement were introduced into Congress by members of both political parties. The President, in his State of the Union address, urged prompt action to restore FDA's factory inspection powers. Spokesmen of most of the trade associations of the food, drug, and cosmetic industries assured their support of prompt remedial legislation. This was enacted in August 1953.

To protect consumers against eco-

nomic cheats, the 1906 Food and Drugs Act prohibited shipment of foods adulterated with inferior ingredients, and misbranded with false labeling. The 1938 law provided that labels should be informative—the whole truth, rather than merely a prohibition against dishonest claims of composition.

One of the most important sections of the new law provided for establishing of legal definitions and standards for foods, wherever in the opinion of the Secretary they are needed to "promote honesty and fair dealing in the interest of consumers." The statute calls for a very democratic process in establishing such standards, with every interested party, producer and consumer alike, invited to participate in public hearings and to comment on the proposed standards before the specifications for each item are determined. After such standards become final, foods failing to comply are in violation of the act and are subject to court action.

Food standards are the cornerstone of effective protection of consumers against many economic food cheats. They likewise protect the honest manufacturer and dealer from unfair competition. The standard is a yardstick for the manufacturer and the law-enforcement official alike. While the housewife may not know the exact specifications for any standardized food, she can be confident when she buys a standardized food by name. She knows the law-abiding manufacturer follows the specifications, and that the Government has an effective basis for legal action against the cheating or careless minority that does not comply.

Water is still the commonest adulterant of foods. Court actions in 1952 involved watered oysters, low-fat butter, and frozen turkeys with an average of a quart of water injected into the flesh before freezing. In other instances a 7- to 10-percent ice glaze was produced on poultry by packing wet birds in plastic bags before freezing.

The greatest incidence of fraudulent adulterations came in wartime when food was scarce and many items were rationed. Substitutes and "extenders" appeared on the market, some in disguise and others legally labeled for what they were. Such things appeared on the market as "victory butter," containing only 30 percent butterfat instead of the 80 percent the law demands; an eggless egg substitute; coffee diluted with roasted cereals and even the exhausted grounds found in pre-control days; french dressing devoid of salad oil; and coconut-peanut candy with corn flakes substituted for the coconut and processed wheat for the peanuts. Any product labeled "olive oil" was suspect, for the adulteration of olive oil is an ancient pursuit, even when there is a free flow of imports. Rationing of food oils induced many a mineral oil substitute—a good example of an economic adulteration with a direct bearing on public health. Spices, always subject to adulteration, became much more of a problem when imports of many items were cut off.

Throughout those trying times, however, the general integrity of our food supply was maintained. Enforcement was aimed to insure honest labeling and no concessions were made for expediency that would lower public confidence. As a result, there were few problems in resuming the higher standards of a postwar economy, although high prices prevalent since that period have been tempting to the unscrupulous to take any advantage of the buyer.

There will always be a regulatory problem in the economic adulteration field as long as one product closely resembles another selling at a higher price. A recent example has been the conviction of horsemeat racketeers who removed all required labeling and markings from horsemeat to sell it at triple the price as beef. In a somewhat similar fraud, "butterleggers" surreptitiously repackaged oleomargarine and labeled it as butter, selling for more than twice as much.

The Federal Food, Drug, and Cosmetic Act covers animal feeds and veterinary remedies as well as products for human use. These controls are of great value to the farmer. He depends on the labeled protein content of feeds to determine both the price he should pay and the feeding schedules he should adopt. He is also protected from worthless animal and poultry remedies which, if used, may result in serious loss of stock that could be saved with proper medication.

The story of the fight for pure foods would not be complete without recognition of the part played by the men behind the lines—the chemists, microanalysts, biologists, bacteriologists, and pharmacologists who have developed the objective evidence that has made possible the progress of the past half century. Before a pharmacologist can test the effects of minute daily doses of a substance on laboratory animals, the chemist must develop methods to isolate and measure them. The bacteriologist must study the effects of bacterial contamination of foods, how it occurs, and how it can be prevented. The biochemist has basic responsibilities in the nutritional value of foods, not only in devising testing methods, but in guiding administrative decisions as to enrichment of products and the validity of labeling claims.

In the struggle for pure food, the Food and Drug Administration has had valiant allies in other Federal groups, in State and local enforcement officers, and in the responsible elements of the regulated industries.

The Bureau of Animal Industry, fortified by the Meat Inspection Act of June 30, 1906, continued its elimination of diseased animals brought to slaughter, but added to it post mortem examinations by veterinarians, of slaughtered animals and parts. It was also provided sanitary controls over slaughtering houses and supervision of all meat condemned by its inspectors. All unprocessed meat shipped in interstate commerce now bears the stamp "U. S. Inspected and Passed," and processed meat products are labeled "U. S. Inspected and Passed by Department of Agriculture."

The Public Health Service of the Department of Health, Education, and Welfare establishes uniform sanitary codes used by local health departments in the control of the sanitation of restaurants, and has a comprehensive program to reduce or prevent pollution of the Nation's waters.

State and city officials enforce their own laws and ordinances controlling products distributed within State lines, and work closely with Federal control officials in the planning and operation of food-protective measures that neither could accomplish alone.

Last, but not least, has been the constructive work of the food industry to produce better, purer foods. Its members have drawn themselves into associations which have improved their products, both by sanitation campaigns and collective research to solve technical problems common to all. Most American food manufacturers today have the will and the know-how to produce the pure foods that the public wants. They accept the Food, Drug, and Cosmetic Act as a blueprint of their obligations to the Nation's consumers. (*Charles W. Crawford.*)

Payment for Quality

The simplest way to pay producers is to pay the same price to all, regardless of differences in quality—to pay Farmer A and Farmer B the same amount for a dozen eggs, say, although A's eggs are bigger and fresher, and of the color one wants.

But we do that less and less today.