

# *Science Education* IN CONSUMER BUYING

BY GEORGE L. BUSH

This volume points out the need for greater consumer education and emphasizes the opportunity and responsibility of science teachers in meeting this need. It describes sources of information for teachers and pupils and offers abundant concrete illustrative material. The author suggests changes in the nature of much of the consumer education which is now offered and directs attention to broader generalizations and problems for solution.

SCIENCE  
EDUCATION  
IN  
CONSUMER  
BUYING

By  
*George L. Bush*  
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THE SCIENCE IN MODERN LIVING SERIES  
*Basic Science Material for Use in Modern Education*

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Science Education  
in  
Consumer Buying

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## FOREWORD

AS TECHNOLOGICAL advances bring us an ever increasing variety of appurtenances for living, so the problems of intelligent consumership mount, and it seems altogether fitting that science classes on the high school level and college courses for high school teachers should be used as a framework for supplying correct information about products and their manufacturers and the opportunity to investigate their claims. Any number of products may serve the same purpose, but it is the wise consumer who is able to discriminate between them on the basis of which will meet his needs and his budget most adequately.

Much has been written about the value received for money spent, and many agencies have sprung up to assist the public in its buying. In this field, as in any other which has attracted rather sudden widespread interest, there has arisen rivalry among the several agencies and individuals working to advance consumer education. It is the task of the teacher to guide his students in a careful survey of the consumer organizations and literature as well as of the myriad products that daily lure the citizen, be he child or adult.

This book, the fourth of the source books in "The Science in Modern Living Series," is designed to help teachers and laymen set up certain standards for judging the worth and utility of their purchases. Among the consumer items considered are food, clothing, building materials, drugs, cosmetics, automobiles, and electric appliances. The first third of the book is concerned with an appraisal of several previous publications on consumer buying. Their inconsistencies and prejudices are pointed out with clarity and fairness.

The author, George L. Bush, as a high school teacher of many years' experience in a large city, has made a thorough study of

consumer problems from the standpoint of one who is striving to serve more effectively the young people in present-day society and to make them aware of the issues they face and must face as future leaders of that society. His recommendations relating to the place of consumer education in the secondary school curriculum are made from the perspective of both careful study and practical experience.

This book has been prepared primarily for science teachers and contains a number of suggestions for activities to be used in teaching. Because of the universal appeal of its subject matter, it will be of interest and value to the thinking layman as well as to the student and teacher.

SAMUEL RALPH POWERS

## PREFACE

THIS book is addressed primarily to present and prospective teachers of natural science. Secondly, it is hoped that it will be of value to all interested in consumer education and of general interest to those engaged in educational work of any nature.

There are four major aims of this book:

1. It is intended to be persuasive in encouraging science teachers to give serious thought to the urgent need for consumer education and to the part that science education may have in meeting this need.

2. It is intended to be helpful to science teachers who accept the responsibility offered by this consumer education need. Therefore it suggests suitable sources of information for teachers and students and proposes extensive illustrative subject materials which may be emphasized in consumer education work.

3. It is intended to be corrective with respect to the nature of much of the consumer education now being offered. Therefore it directs attention toward broader generalizations and problems for solution as opposed to the present tendency to consider as the ends of consumer education the learning of detailed facts dealing with the purchase of particular commodities.

4. It is intended to be hopeful rather than pessimistic as it reviews progress recently made and looks forward to the possible accomplishments of science in consumer education.

There is deliberate omission of any organized consideration of the history and growth of the consumer movement in general. Such omission is considered desirable because the history of the movement is only slightly pertinent to the major aims just outlined, and because these pertinent historical features are discussed where they appear necessary. Further, it so happens that science education in the past has had little to do with consumer buying, and



there is therefore practically no history which pertains to the work of science education in consumer buying.

No attempt is made in this book to describe in detail those features of consumer education which are essentially economic and social. Such features have already been successfully developed by others whose interests and education are primarily economic and social. However, these phases of consumer education are not avoided, since they must be included in some measure because of their close associations with the work of science in consumer education.

No claim is made that science can do more for consumer education than all or any one of the other fields connected with consumer work, and there is no intention of giving the impression that improved consumer buying is the only aim of science education. It is distinctly the purpose of this book, however, to support the contention that improved consumer buying is one of the major aims and one of the major responsibilities which science education must accept.

It is a privilege to acknowledge with grateful appreciation the suggestions made by Dr. Samuel Ralph Powers, Dr. Harold F. Clark, and Dr. Herbert J. Arnold, all of Teachers College, Columbia University. Appreciation is also due Miss Charlotte V. Meeting, of the Bureau of Educational Research in Science, for her editorial assistance.

G. L. B.

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**SCIENCE EDUCATION  
IN  
CONSUMER BUYING**

## Chapter I

### THE NEED FOR GREATER CONSUMER EDUCATION

Consumer education is not new. "Never look a gift horse in the mouth" is an ancient proverb that demonstrates clearly the fact that consumer education is not as new as it is sometimes thought to be. The purpose of looking any horse in the mouth, either a gift horse or one being considered for a prospective purchase, is plain enough to those who have had experience in buying horses and to those whose fathers or grandfathers often demonstrated the value of a little scientific consumer education in the "good old days" when horses were prime necessities. As might be expected, the age of a horse was a major factor in determining its value, and the prospective purchaser needed operational scientific knowledge about the connection between the age of the horse and the condition of its teeth. Operational scientific knowledge based upon experience was essential because one had to look into the horse's mouth and judge the age from his teeth. Only many previous examinations of the teeth of other horses, coupled with the knowledge of the changes that took place in the teeth as the horse grew older, permitted one to draw reasonably correct conclusions about the horse's age. A favorite activity among the boys of a farm community in the days before tractors and automobiles ran the horses off the farm was to examine the teeth of all horses that were not too "mean" to permit such familiarity. Perhaps such activity was just boyish sport, but it was good functional education as well.

Now this brief sketch about the relation between the appearance of the teeth and the age of a horse is not meant to prove that everything was better in the past than it is now—even scien-

tific consumer education. It is intended only to show that there has been consumer education for a long time, doubtless long before the origin of the proverb, and to suggest the purpose of this book: that present teaching in natural science may be improved by the consideration and consequent addition or substitution of much functional consumer education. This purpose may be stated as an effort to make clear to science teachers and others interested in education the high values which may result from increased emphasis upon functional contributions of natural science to consumer education.

**Educational needs in consumer buying are not always apparent to those who have the needs.** If we are to credit any value to human experience, it is apparent that educational needs must often be pointed out, to young people and to older ones as well, by those who have had wider experiences, or who have greater knowledge of the experiences of mankind in general, or who have keener insight into the possible effects of certain knowledge upon the lives of people. This was true of the now rather widely recognized need for consumer education. It is generally agreed that the book *Your Money's Worth*,<sup>1</sup> published in 1927, was the effective forerunner of the present wave of interest in consumer education. Such agreement is common both to those who favor the ideas expressed in the book and to those who are strongly opposed to them. It is quite true that previous to the publication of *Your Money's Worth* there had been occasional references to material which might indicate the need for more extensive information on the part of the consumer. Textbooks in the study of foods, in chemistry, and in general science usually indicated briefly some of the important provisions of the Pure Foods and Drugs Act of 1906. In 1912 and 1921, respectively, appeared the first and second volumes of the American Medical Association<sup>2</sup> publications on nostrums and quackery. These pub-

<sup>1</sup> Chase, Stuart and Schlink, F. J. *Your Money's Worth*. The Macmillan Co., New York, 1927.

<sup>2</sup> Cramp, Arthur J. *Nostrums and Quackery*, Vol. I, 1912. Vol. II, 1921. Volume III was published in 1936.

lications, however, did not even approach the sensation caused by *Your Money's Worth*. This book gave numerous examples of alleged worthless, overpriced, and dangerous articles, ranging through foods, medicines, automobile parts, insecticides, furniture, and many other similar products. According to a statement in the book itself, its aim was to make a "plea for buying goods according to impartial scientific test, rather than according to fanfare and trumpets of the higher salesmanship." *Your Money's Worth* was a choice of the Book-of-the-Month Club and had a wide sale in addition to the sales made through the club.

The need for consumer education evidently could be made clear only in a somewhat sensational manner, as this information about *Your Money's Worth* indicates. Most people probably recognized no particular need for consumer education until those with greater knowledge pointed out the mistakes that were being made in buying with so little correct information about the nature and value of the things which were being purchased. And yet it is evident that, on the basis of needed improvement in the lives of people, the need for such education was just as real before its existence was recognized as afterward. A doctoral study on the need for particular kinds of consumer education<sup>3</sup> showed that many persons in different occupations and stages of education recognized needs in this particular area, but that many others had little recognition of such needs. Even graduate students and professors of household arts reported difficulties in buying clothing, probably because they were more able to recognize defects in their purchases. It is likely that those who recognize little need for consumer buying education make the most mistakes.

Educational needs are centered in the lives of the people. It must not be supposed that these ideas about needs are meant to indicate that student interests cannot be used during the processes of determining objectives of education. Neither should it

<sup>3</sup> Phillips, Velma. *Evidence of the Need of Education for Efficient Purchasing*. Bureau of Publications, Teachers College, Columbia University, New York, 1931.

be supposed that those who are being educated are never able to recognize the existence of their educational needs. Rather, the purpose is to show that needs may frequently be pointed out to those being educated and that, after being pointed out, the needs may then be readily recognized. It appears that such needs, which must be pointed out by others, are just as likely to be important ones as those which seem to arise as the individual grows in his environment.

When one attempts to decide upon the objectives of education in the schools, it is important to make sure that these objectives are closely associated with the lives of the people. It is not necessary to be greatly troubled about the method of origin of the need, but it is necessary to make certain that any educational purpose selected for considerable emphasis aims to improve in some significant manner the ways in which people live. In order to understand the significance of consumer education in the lives of people and to make sure that consumer education is able to meet the requirement of a valid educational purpose, this book now undertakes a brief review of those conditions which have led to the realization that there is much greater need for information along the line of what is called consumer education.

Most people purchase a high proportion of their goods health services.\* Years ago when comparatively few of our people lived in urban centers most people were directly responsible for the production of their own goods and services. They grew their own food plants, killed their own food animals, built their own houses, grew and made their own clothing, generally managed their own medical treatment, and controlled quite directly their other more minor activities such as travel and recreation. Undoubtedly, additional "consumer education" about the food they

\* Out of 17 billion dollars spent for food in a twelve-month period in 1935-36, almost 15 billion was spent in stores and restaurants, while about 2 billion covers the estimated value of home-produced food. Out of 9.5 billion spent for housing 7.1 billion represents actual money expenditure. National Resources Committee, *Consumer Expenditures in the United States*, pp. 4 and 5. U. S. Government Printing Office, Washington, 1939.



ate, their methods of building houses, their clothing construction, and their home health remedies would have improved their lives considerably; but these people were in a far better position with respect to the best existing knowledge of their times than people now are with respect to the best existing knowledge of the present time. The people who, themselves, provided nearly all of their own goods and services generally knew pretty accurately what they were getting.

Then rapidly the picture began to change. Society became industrialized, cities grew at astonishing rates, and the people who lived in the cities had to purchase nearly all of their goods. Thousands and thousands of new articles and new types of old articles appeared on the market. Even farmers began to buy large portions of their goods. Many purchases of nearly worthless, quite useless, and even harmful products were made as advertising became more and more excessive in its claims. Camouflage went beyond the wars and became a fine art in the field of everyday purchases by everyday people.

**The need for consumer education is not limited to low incomes.** Many times in the course of reading one comes across the comment that the need for consumer education has arisen or has become much greater during the years since the beginning, in 1929, of the recent period of unusual economic distress. The reason given is that lower incomes and mounting costs have made it increasingly difficult to purchase a desirable standard of living. Such reasoning does not appear to have great merit. It is doubtful that the need for consumer education is any greater now or even as great as it was during, or previous to, the boom period which ended in the fall of 1929. Rather, it is more correct to say that the need for consumer education is now more apparent to more people than it ever was before. There is no basic reason to assume that the need for consumer education is necessarily less among those people who have a larger effective income. It has been proposed not at all infrequently that at least one of the larger causes of our lower incomes at present was the reckless spending and

the purchase of worthless or greatly overpriced articles in the period immediately preceding the big crash of 1929. If this proposal is a correct one it is possible to assume that increased consumer education before 1929 might have made the crash less severe and might, therefore, have reduced the need for consumer education since 1929.

Neither does there seem to be any valid reason to assume that families with very low incomes are necessarily in greater need of consumer education than families in a more fortunate position. Certain families with very low incomes may be applying fairly expert consumer knowledge in making the purchases permitted by their low incomes. Waste in any walk of life is socially and economically undesirable, and those who have made broad studies of economics often conclude that unwise spending has definite cause-and-effect relations with national progress. The factory owner who is operating a necessary business and who purchases worthless or excessively priced articles for his own consumption may possibly be using money that would otherwise be distributed among the workers for life necessities. The life of the wealthy man who kills himself unknowingly by taking a dangerous and costly quack medicine containing radium salts is not likely to be any less important than the life of the poor man who dies because of the use of a less expensive but equally dangerous quack medicine. Since there is also much evidence to show that inadequate diets are by no means limited to families with low incomes, there is still further reason for drawing a valid conclusion that the need for consumer education is common to families in all walks of life.

**Much advertising is false and misleading.** It appears correct to conclude that this modern life situation exists largely because of the use of a great deal of misleading advertising. Supporters of modern advertising and those who make a living from their direct connection with advertising readily admit that portions of the advertising are false and misleading. For example, at a national conference on consumer education held at Stephens College in April, 1939, Mr. John Benson, then president of the American

Association of Advertising Agencies, made the following statement: "We made such a survey [of advertising] a while ago in a dozen leading magazines, and found 5.6% of the advertising in violation of our own code, and another 4.4% debatable; that is, more facts were needed to determine whether right or wrong. That is quite a different showing than some reformers would have us think. Still serious enough to warrant improvement." In connection with this statement, it seems necessary to point out that the leading magazines usually carry higher grade advertising than is carried by countless magazines and newspapers which are less important singly but which, combined, reach millions of people. It is also necessary to point out that the percentages indicated in the above quotation refer to advertising stated to be in violation of the code of the American Association of Advertising Agencies and that this code may or may not be considered satisfactory by most consumers.<sup>4</sup> In order to be fair to advertising, however, it is desirable to indicate a second quotation from Mr. Benson's address. After approving the work of the Federal Trade Commission in administering the laws against false and misleading advertising, he goes on to say, "The misleading 10% of advertising is rapidly being cleaned up by operation of the law, and self-regulation is being legally supported."

There is still, however, a great deal of advertising which comes under the heading of false and misleading. A basis for this conclusion is the fact that the Federal Trade Commission, in each of its recent *Monthly Summaries of Work*, has listed from forty to sixty "Stipulations to cease and desist from false and misleading advertisements." For example, among the articles included in the forty-three such stipulations in the *Summary* dated September, 1939, were bread; glue; lubricant for internal-combustion engines; typewriter ribbon and carbon paper; furniture; drygoods; clothing; termite eradicator; poultry brooders; a product for waterproofing concrete; binoculars; electric fans; pleasure boats; a garden peat

<sup>4</sup> For this code and several similar ones, see H. J. Kenner, *The Fight for Truth in Advertising*, Appendix. Round Table Press, Inc., New York, 1936.

moss; pencils; mattresses; trusses; toys; laxative tablets; Cuban honey for treatment of stomach ailments, asthma, etc.; treatment for skin disorders; cosmetics; soaps; tonics; course of instruction in commercial art; books on art; aerial eliminator; gelatin. This long list of articles clearly indicates that false and misleading advertising is not confined to a few types of consumer goods. Neither are the stipulations directed only at small companies. Very large ones are often judged guilty. Moreover, in any consideration of the work of the Federal Trade Commission it must be remembered that any action of this Commission can be concerned only with articles that are sold across state lines. It is undoubtedly true that much additional false and misleading advertising is carried on within the borders of the separate states.

One should not get the idea that all advertising is false and misleading, and that there is no value to the people as a whole in any advertising. Without question, advertising has a worth-while function in the lives of people in giving them correct information about the goods and the services which they may wish to buy. The following facts should be kept in mind in considering the present situation in advertising: (1) Progress is already being made toward the elimination of untruthful advertising. (2) Consumer education has helped to bring about this progress. (3) Organizations of advertisers and advertising agencies have helped bring about this progress. (4) There is still considerable advertising that is false and misleading either because of the statements it includes or because of pertinent facts which are omitted. (5) More extensive and more satisfactory consumer education will do much to help advertising reach desirable high standards.

**The purchase of foods is still unsatisfactory.** It is probably true that more attention has been paid to consumer education which gives information about the method of purchasing satisfactory foods than any other field of purchasing. It is also probably true that more regulations have been made in regard to foods than for any one other type of commodity. This situation is as it should be, because an average of estimates on spending indicates

that more than one quarter<sup>5</sup> of the total expenditures of income in recent years has gone to the purchase of foods. It is evident that this figure can be used only as a comparative estimate with other fields of expenditure, since persons with high incomes spend a smaller percentage of the total income for food, while those with very low incomes spend a higher percentage of the total income for food. According to a recent figure, the family of a typical worker spends 33 per cent of its income for food.<sup>6</sup>

In spite of the great attention which has been given to consumer education about food and the numerous laws controlling the sale of food, many undesirable conditions still remain. For example, there is the widespread belief that many kinds of foods have unusual and specific values as far as health is concerned. This belief is encouraged by such advertising as the emphasis, a few years ago, on the value of raisins in furnishing iron; by the present advertising which indicates unusual athletic and energy values in certain cereal breakfast foods; and by advertising which indicates particular values of gelatin in combating fatigue. Authorities of the Federal government are still being forced to confiscate foods which are in decayed conditions, others which contain dirt, and still others which are adulterated, often with dangerous and filthy ingredients. Many sorts of worthless or dangerous reducing diets are popularized either through untruthful advertising or by word of mouth from person to person. Vitamins are used as the basis for much undesirable food advertising, particularly because lack of education on the part of the consumers leads to incorrect interpretations of the advertising. There is the advertised idea that bran is an essential food to furnish the roughage necessary to prevent constipation. There are many dietary fads, some of which have been started by health quacks seeking personal financial gain, and others which appear to have no particular purpose or

<sup>5</sup> Twenty-nine per cent is the figure given in National Resources Committee, *Consumer Expenditures in the United States*, p. 4. U. S. Government Printing Office, Washington, D. C., 1939.

<sup>6</sup> *Consumer's Guide*, U. S. Department of Agriculture, Washington, D. C., November 1, 1939.

origin. People even use for special health foods tablets which are purported to be concentrated vegetables but which actually have had added to them certain chemicals that serve as laxatives. Foods are grown, harvested, processed or canned, transported, and sold in unsanitary conditions. Unsanitary conditions exist in restaurants and even in some homes. Bacterial food-poisoning is very common. People get tularemia from rabbits, trichinosis from hogs, tuberculosis from milk. Poisonous insecticides and fungicides used on fruits and vegetables sometimes reach human stomachs in dangerous quantities. With many foods there are no standards of quality; with others the standards are very unsatisfactory. Not only is there a confusing number of differently sized containers in use, but containers are often insufficiently filled.

These statements illustrate only a few of the instances in which people are not making use of the best information available in regard to their food supply. Scientific information is available for the solution of practically every one of these food difficulties. Most of the solutions depend directly upon the wider dissemination of the scientific facts regarding the purchase and use of foods; or, in other words, solutions to these problems and difficulties depend upon consumer education about foods.

**Most people are poorly informed about proper housing.** The average expenditures for housing, either to purchase or to rent, are very nearly as great as the expenditures for food, especially if such items as furniture, equipment, fuel, and light are included. In spite of this high proportion of income which goes to housing, people in general have very meager education about the things for which they pay their money. It seems safe to say that the extent of consumer education on proper housing is proportionally far less than the extent of information in regard to foods; in other words, until quite recently it has been customary in the educational scheme to give very little information of a consumer nature on housing. Recently these facts regarding meager housing information were brought home to the writer in a very positive manner, as he had occasion to engage in the sale

of a house and listened to the questions of prospective purchasers. Even those greatly interested in making the purchase asked appallingly few questions that had much to do with the real value of the house. Questions on the nature of floor construction, whether single or double, insulation, existence of screens or double windows, cost of heating, dryness of basement, were conspicuous because of their almost total absence. Undoubtedly, the deplorably poor condition of housing in this country illustrates thoroughly the very general lack of knowledge of what constitutes good housing. In spite of the fact that much of the housing problem is due to low incomes, it seems evident that one of the first steps necessary in the improvement of housing conditions is to make more general that kind of knowledge concerned with desirable and available things in a house. As with food dispensers, those who have houses for sale or rent are not infrequently guilty of misrepresentations. Ordinarily it is necessary only to refrain from giving pertinent information, and, since the prospective user or purchaser knows few things about which to make inquiries, he frequently suffers. Heating plants are often in poor repair, or when in good repair are insufficient for extremely cold weather, windows are stuck and cannot be opened, or are so loose that they rattle violently when the wind blows, the roof leaks, floor boards are loose; but most people never think to investigate such readily apparent conditions. They do not even know that they should look for such conditions.

Although fairly extensive, consumer education on purchasing clothing has not been very effective. Only food and housing take a higher proportion of the yearly expenditures than clothing, which requires an average of about one sixth of the total. Chiefly because of the excellent work done in clothing classes in home economics courses, consumer education on clothing has been fairly extensive. Such courses do not reach nearly all of our girls because only about 65 per cent of the girls of high school age are actually enrolled in high school, and by no means all of those enrolled have suitable clothing courses available in their

schools. In those schools where suitable courses are available, many of the girls do not select such courses. Therefore, in spite of valuable consumer education courses in some schools, there is still needed much information in connection with the purchase of clothing. People buy clothing that does not fit, that rips soon after it is purchased, that fades in the sun or loses color during washing. There are so many variations in fabrics, so many mixtures of fibers, so much variation in kind and amount of sizing and filling, so many different weaves, that the problems of consumer education in clothing are very difficult to solve. Startlingly new synthetic textiles which are appearing on the market further complicate the problem. Rapid fashion changes and their consequent demands upon the income of the consumer appear to be totally unnecessary and undesirable features of the clothing industry. The complexity of the problem of buying clothing makes it difficult to indicate the kind of consumer information which is most desirable. But because of this complexity, it becomes even more necessary to work toward a suitable solution.

**Consumer education can give greater enjoyment of leisure-time activities at a lower cost.** Almost as high in the list of expenditures as clothing are those types of expenditures which may be grouped under recreation or leisure activities. Included here are such expenditures as those for automobile travel, amusements, sports, and hobbies. Here also there is need for consumer education, although the need cannot be considered as great as in the case of the major life necessities—food, housing, and clothing. Changes in new automobiles are made rather rapidly, and prospective purchasers can make use of information about these changes from sources other than the automobile manufacturers. In the purchase of used automobiles there are many useful bits of information which can increase one's chances of getting his money's worth. The old idea of an oil change every 500 miles is still too common among automobile drivers. There is much misinformation in existence about gasoline and gasoline savers, pol-



ishes, automobile radios and heaters, antifreeze mixtures, tires, and other automobile accessories. Consumer education along these lines can serve valid purposes.

Many other articles used in leisure activities can be made more useful to the purchaser at lower cost if suitable information is available. For example, most people who grow and care for lawns, flowers, shrubs, and house plants can make excellent use of consumer information which helps guard against unfair practices that exist in the sale of some of these products.

**Greater consumer education is urgently needed in buying health service.** It is probably true that, with the exception of food, more has been said and written on the subject of worthless and dangerous health treatments than on any other subject. The great importance of satisfactory consumer education on this subject is based upon the fact that the health and even the life of the user may well depend upon correct knowledge about health treatments. Instances of death from the indiscriminate use of dangerous advertised medicines are all too common, as are cases of severe poisoning from such things as hair and eyebrow dyes. The promises contained in the advertising of many worthless medicines often cause the postponement of a visit to the physician until it is too late for him to do the patient much good. Further, the number of quacks engaged in offering medical and dental treatment requires that people be given as much information as possible to enable them to make an intelligent choice of a person who is to give them treatment for some ailment.

It is difficult to see how anyone can fail to recognize the need for consumer education in the schools, so closely are the facts indicated in the preceding pages tied up with improvement in the lives of the people. In illustrating, throughout this book, the need for consumer education, there has been made a definite effort to select only those statements upon which there is practically universal agreement among people who are at least moderately well informed upon the subjects under consideration. It is be-

lieved that the statements made are indisputable. And yet there are many who will admit the truth of all these statements but deny there is real reason to trouble ourselves about these things. They argue that people can depend upon the integrity of manufacturers and merchants and upon the government to protect consumers against dangerous, worthless, and overpriced goods. They indicate that the cases in which errors of buying are clear are but minor mistakes and that anyone is likely to make a mistake now and then. Some of these arguments are developed more fully through quotations given in Chapter II.

Many educators support the need for consumer education in the schools. With consumer conditions as they are, it is understandable that support for the inclusion of consumer education in the school program is becoming more and more widespread. Professors of education in teachers' colleges encourage wider use of consumer education with special emphasis in secondary school work. Indeed, it is not at all uncommon to find that many of the leaders in educational fields are identified in some manner or other with organizations interested primarily in extending consumer information both in the school and outside of it. Some of this interest of educators in consumer education is indicated by the following quotations from *The Purposes of Education in American Democracy*.

People ignorantly waste many millions of dollars on needless illness and on useless or harmful patent medicines, spiritualistic seances, mind healers, and a sorry train of similar nostrums and quacks. The schools would save more than their own total cost if they could see to it that the oncoming generation of adults used its resources for health more wisely.<sup>7</sup>

Also in the same publication, under a general division entitled "The Objectives of Economic Efficiency," are found descriptions of these main purposes: The Educated Consumer Plans the Economics of His Own Life; The Educated Consumer Develops

<sup>7</sup> Educational Policies Commission. *The Purposes of Education in American Democracy*, p. 61. National Education Association of the United States, Washington, D. C., 1938.

Standards for Guiding His Expenditures; The Educated Consumer Is an Informed and Skillful Buyer; The Educated Consumer Takes Appropriate Measures to Safeguard His Interests; and finally at the close of Chapter VI appears the following statement:

Information and skill in choosing and buying are as important as information and skill in producing and selling. Consumer education is a universal need; it should be provided for all through the schools and not left to accidental learning.<sup>8</sup>

**Interest in consumer education is mounting.** There is plentiful evidence to show that interest in consumer education has been mounting rapidly in recent years. Largely because of popular demands, Federal government bureaus already in operation are expanding their activities, and new bureaus and new publications of these bureaus have made their appearance. State departments of education and state agricultural experiment stations are supplying additional consumer information. Many books have been written on the subject, and articles in magazines are numerous.

Private testing and rating organizations are in operation with the major purpose of giving detailed consumer information to the members or subscribers to their publications. Some of the more general types of periodicals available on the newsstands and by subscription claim to supply similar information to their readers. Chambers of commerce, advertising organizations, and many private businesses are showing considerable interest in all of this tendency toward making better informed consumers and are adding their bit, probably to some extent in self-defense. Large department stores have established testing bureaus for the purpose of making certain that the purchasers of their goods get better values. Following experimental tests, colleges and universities have added much valuable consumer education. Organizations with specialized interests, such as the American Medical Association and the American Dental Association, have long been supplying information for consumers. The Alfred P. Sloan Foundation

<sup>8</sup> *Ibid.*, p. 106.

has supplied money for the formation of an Institute for Consumer Education located at Stephens College, Columbia, Missouri, the express purpose of which is the development of more intelligent consumers in America. A number of colleges and secondary schools have organized special courses in consumer education, and direct consumer education is being given as part of a number of long-established courses.

The existence and operation of these and many other organizations in the interests of consumers seem to support quite clearly two ideas previously expressed in this book: (1) Consumer education is closely intertwined with much of the lives of the people. (2) That the need for additional consumer education must be very great is indicated by the fact that all these organizations are doing work in the field of consumer education and evidently are hoping and planning to do much more.

Articles on consumer education indicate the recent rise of interest. An examination of the *Education Index* which lists thousands of publications connected with education shows interesting facts that illustrate the rise of consumer education, at least in the educational world. In the *Education Index* which covers the period from July, 1935, to June, 1938, some ninety-eight publications are listed under the indexed heading of "Consumer Education." In the *Index* which covers a similar three-year period from July, 1932, to June, 1935, only six publications are listed, while in the period from July, 1927, to June, 1932, only one article is listed. The yearly *Index* from July, 1938, to June, 1939, shows forty-seven publications under the heading of "Consumer Education."

Because of the wide variation in the numbers of these publications, one can allow a good deal for a possible variation in the use of the term *consumer education* and still have plenty of evidence to support the belief that the need for consumer education has become much more apparent in recent years.

Consumer education has a variety of meanings. Because of differences in education, interests, and occupations, a variety of

meanings has been given to the term *consumer education*. In the broadest sense, it is said to be concerned with human consumption of goods and services. Now it is evident from such a statement that it becomes difficult to distinguish consumer education from any other kind of education. Consumption presumes production and depends upon production, and one is forced to the conclusion that practically all human activities are covered by the term *consumer education*. It has even been suggested that consumer education may be a philosophy of education characterized in the changed viewpoint that the school curriculum should be child-centered.

However, most people who use the term *consumer education* probably look upon it as being directly connected with the purchase of goods and services. Although this meaning of the term narrows the conception of consumer education, there is still included in this narrower field a variety of meanings. The person greatly interested in mathematics looks upon the details of budgeting, relative costs of consumer goods, insurance costs, and taxes as consumer education. The teacher of economics sees similar topics as consumer education, but he may wish to look a little farther into the background of human culture in order to discover bases for budgeting, for determining the costs of goods, insurance, and taxes. He may wish to propose, as consumer education and as solution for pressing consumer problems, certain fundamental changes in the structure of our business world. The sociologist may join with the economist in thinking of the preceding suggestions as consumer education. The manufacturer, the merchant, and the advertising specialist may consider that consumer education consists of descriptions of goods and services for sale in such a manner that people are persuaded to buy these goods and services and so make for progress and rising trade. The private testing and rating laboratory, furnishing information about goods and services to paid subscribers or members, may consider that no small part of consumer education consists in "debunking" advertising and showing the "crookedness" which is purported to exist

among manufacturers, merchants, advertisers, and others who have goods or services for sale. The home economics teacher looks upon such instruction as the preparation of menus, the purchasing of food supplies, the buying of textiles, the making of clothing, the purchase of household articles and equipment, and interior decoration as consumer education. The activities of government bureaus show that in their interpretation of consumer education they use a broad meaning which may include all or nearly all of the preceding ones.

**All of these meanings are correct.** Perhaps this variety of meanings given to consumer education is most significant in showing in a different way the great importance of education of this general type. As has already been indicated above, there is no escape from the fact that consumer education, either viewed in a general way or viewed from the position of a specialist in one particular field, does enter into the lives of people. Therefore, from a very general viewpoint, it seems possible to conclude, at this point, that the task of consumer education in the schools lies very largely in making curriculum materials a part of the pupils' lives. At least a portion of the educational shortcomings of the past has been due to the fact that the schools have attempted to teach many things without previously, concurrently, or afterward making the translation of those things into the ordinary life-situations of the pupils, with definite, clear meanings. There are no good arguments against the use of the various meanings of consumer education which are indicated under the preceding topics. All of these meanings of consumer education are correct because, in their expression, the translation into actual life-situations is clear and definite. Which of these meanings of consumer education are best? How can one or more of them be judged as the ones needed for emphasis? Their obvious interrelation indicates the great difficulty (one almost wants to say impossibility) of ever being able to pick out the most important meaning among these and many others which could just as well have been included. Any one of these meanings may be the keystone of the whole situation, but

it is more likely that all of them are necessary for the entire foundation.

**Consumer education has meaning for the natural science teacher.** As suggested in the main title and as stated in the Preface, the aim of this book is to discuss the significance which consumer education has for the natural science teacher. In this connection it is assumed, for the present, that the natural science teacher, because of his particular degree of expertness in a special field, can contribute to desirable consumer education. Similarly, it is assumed that a consideration of the meaning of consumer education can contribute to the improvement of natural science teaching. Although the major portion of this book is devoted to an attempt to make clear the relations between consumer education and the teaching of natural science, it seems necessary to indicate at this point a brief meaning of consumer education with respect to natural science—a meaning that can serve until the entire book has described the interrelations somewhat more completely. Although the great difficulty of ascribing any narrow meaning to consumer education is indicated in the two topics immediately preceding this one, in the consideration of material that is to compose this book, it has been necessary for the meaning to be narrowed somewhat. Therefore, in this book as planned and prepared, the meaning of consumer education is limited to subject materials and methods quite directly connected with the purchase of goods and services, insofar as these materials and methods are associated with the field of natural science.

The lack of definiteness of this meaning is obvious. The phrase *quite directly connected* may have special meanings read into it; for something that is "quite directly connected" for one person may be rather remote for another person. The field of natural science is not as clearly outlined as the statement of meaning tends to indicate. There is much disagreement, particularly in school curriculum work, as to what constitutes this field of natural science. But the simple fact that it is not possible to mark off or isolate completely any field of work from all others forces the

conclusion that there should not be too much concern over the lack of definiteness in the brief meaning just given to consumer education from the viewpoint of the science teacher. Instead, it must be remembered that there is now much objection to both the practicability and the desirability of attempting to mark education off into narrow, more or less isolated, subject-matter divisions.

Some narrowness of meaning seems necessary. In order to supply some basis upon which to judge the interrelation of consumer education and the teaching of natural science, it seems necessary to attempt to limit the meaning of consumer education, even though the limitation lacks clarity and definiteness. If there is no attempt to limit the meaning of consumer education, the following situation, not too difficult to imagine, arises: A teacher of traditional physics insists that he is teaching consumer education in his regular work. He has just spent a week emphasizing the laws of falling bodies and working out the formulas involved in making calculations to illustrate these laws. He then proceeds to show that one needs to understand the laws of falling bodies in order to get a clear conception of acceleration. Acceleration in turn is involved in a consideration of the laws of motion which, together with acceleration, help explain centrifugal force and inertia. It is well known that acceleration, centrifugal force, and inertia must all be considered in understanding the operation of an automobile. The automobile has an accelerator, the steering mechanism must operate to overcome centrifugal force in going around a curve, gears must be used in order to overcome starting inertia, and brakes must be used to overcome the inertia of motion. Therefore, it seems quite evident that the laws of falling bodies give essential consumer information in the buying of an automobile. Now it is very doubtful that even this particular physics teacher would argue that the laws of falling bodies were *quite directly connected* with the purchase or use of an automobile. He could do little more than argue for a somewhat indirect connection. If this imaginary sketch of a connection between



the laws of falling bodies and the purchase of an automobile seems quite farfetched to the reader, he can probably recall other claims for the virtues of teaching certain kinds of science information which are just as farfetched, if not more so.<sup>9</sup>

It is repeated, therefore, that in order to consider fairly the possibility of improving science teaching by the addition of consumer education material, it is necessary to impose upon oneself a rather narrow picture of the meaning of consumer education. If this narrow picture were not used, it would be easy to include under the heading of consumer science practically the entire field of subject material for science education as it is now used. In such a case there would be no improvement. It seems necessary to mention, however, that if the physics teacher in the imaginary case just described could show his students exactly how they might use the laws of falling bodies in the purchase of an automobile, then he would be making a valuable contribution to science teaching and to the education of his students. It is the definite and clearly understood tie-up between the laws of falling bodies and the purchase of the automobile that is important in education. This fact is one which other teachers, as well as science teachers, have too often neglected in their teaching.

**Science education in consumer buying is readily justified.** It is not difficult to find justification for the idea that natural science has an important part to play in consumer education and that much consumer education should be included in natural science teaching. As one considers, for example, the kinds of articles mentioned in the list of Federal Trade Commission stipulations against false and misleading advertising (pages 7 and 8), it is clear that the basis for judging any advertising as false and misleading must often rest upon scientific tests. Analyses must be made of foods; fabrics must be examined to determine composition; tests for wearability and elasticity need to be made; binoculars need to be tested for magnification; medicines need to

<sup>9</sup> Read "Consumer Education and Boyle's Law," *School Science and Mathematics*, June 1938, pp. 619-622.

be examined for claimed therapeutic value; electric fans must be tested for safety; cosmetics must be tested for effectiveness and harmlessness. As a matter of fact, the Federal Trade Commission, for many of its decisions, must depend upon the scientists in the National Bureau of Standards and in the Food and Drug Administration. These are only a few of the tests which require a knowledge of natural science before it is possible to make much progress with respect to the phase of consumer education connected with false and misleading advertising. Even the knowledge of the general nature of such tests is certain to be of much direct value in consumer education.

Proprietary medicines cannot be judged without complete chemical analysis of their contents in order to determine their value or lack of it. A scientific knowledge of composition and properties of foods is necessary if one is to judge correctly the value of foods advertised for roughage, for energy, for vitamin content, or for other specific qualities. Much scientific knowledge shows that soaps may not be expected to have special medicinal value or to result in any unusual beauty except that imparted by cleanliness. Scientific knowledge is responsible for supplying the information that probably the entire purpose of any dentifrice lies in very simple cleansing values, and the further information that the chief value of clean teeth is social rather than preventive. From the standpoint of a fair price on articles to be purchased, it is not difficult to understand that in many cases we need scientific knowledge of composition, method of manufacture, and source of raw materials in order to make a fair judgment. Naturally, one could go on with numerous other illustrations selected to show the necessity for scientific knowledge if consumer education is to be at all complete, but it seems unnecessary at this point. Beginning with Chapter VI of this book, many more illustrations are given, as suggestions are made for types of material to emphasize in connection with the incorporation of consumer education into the teaching of natural science.

**Natural science literature supports the introduction of**

consumer education into natural science. It is extremely interesting to find a discussion regarding science and consumer education in such an outstanding book as *The Social Function of Science* by J. D. Bernal,<sup>10</sup> of the University of London. Bernal, discussing especially the distortion of scientific research, writes that science places undue weight on production goods while doing very little on consumer goods and general welfare. He argues that the object of commerce is to provide the consumer with the cheapest goods at the highest possible price instead of to provide the best goods at the lowest prices. He points out that a main tendency of production is to produce articles that are shoddy and superficially attractive for quick sale rather than to produce articles that are durable and economical. He indicates that the great number of brands of goods, coupled with advertising, prevents any effective choice. However, he praises quite highly the work of the "Consumer's Research Council in the United States" and adds that "this eminently social service is prevented from being given to consumers at large by libel laws. The legalized conspiracy to deceive the public is even more effective in this country [England]. Harmful and useless patent medicines flourish for years because it is not safe to reveal their known constituents. . . . Even the extremely moderate and uninvincible advertisement of the British Medical Association, giving warning against the dangers of unpasteurized milk, was refused by most of the big newspapers." England, it seems, is far more in need of consumer education and the part that science plays in it than is the United States.

The book, *Science in General Education*, a publication of the Progressive Education Association, includes numerous statements recommending consumer education as an aim of natural science teaching.<sup>11</sup> For example, on page 239 the following appears:

<sup>10</sup> Bernal, J. D. *The Social Function of Science*, pp. 153-155. The Macmillan Co., New York, 1939.

<sup>11</sup> Progressive Education Association, Commission on Secondary School Curriculum. *Science in General Education*. D. Appleton-Century Co., New York, 1938.

The importance of the rôle that the adolescent plays as a consumer of goods and services stands in contrast to his minor rôle in the work of the nation. Although his father and grandfather at the same age were more independent economically, the modern youth is called upon to spend more money and buy more things. He does this in a society marked, on the one hand, by an increasing use of a variety of machines, chemicals, and prepared foods that challenge his discrimination, and on the other, by "high-pressure" salesmanship and a "let-the-buyer-beware" advertising system. Under these conditions the secondary school must help him to use intelligence in the choice of goods and services—to be an intelligent consumer both now and as an adult.

A few somewhat more definite recommendations are given on page 250:

The science teacher should provide opportunity for students to analyze the methods used in examples of commercial advertising. Simple laboratory procedures, especially in chemistry, may be used to test the claims made for some of the materials that the student buys and uses. The laboratory may also be used for the manufacture of such things as cosmetics, tooth paste, tooth powder, and inks.

And again on page 251:

He [the student] should also learn about such agencies as Consumers' Research, Inc., Consumers Union, and the American Medical Association, which provide information for the consumer's guidance; he should be led to discuss and estimate the reliability of the information dispensed by each. Thus, he may come to see that the reliability of the information disseminated by an organization must often be weighed in terms of its special and sometimes private interests.

Other support for the entrance of science into consumer education is plentiful throughout science literature. However, this support is adequately represented by the two books which are quoted in this topic. *The Social Function of Science* is concerned primarily with the direct contributions of science itself to the lives of people, while *Science in General Education* is chiefly concerned with the contributions which science teachers can make through the schools.

## Chapter II

### BOOKS AS SOURCES OF CONSUMER INFORMATION: A CRITICAL APPRAISAL

Teachers and students must make critical appraisals of sources of consumer information. Probably the most important, as well as the most difficult, task that must be undertaken by the science teacher who seeks to include consumer education as a part of his work is the choice of suitable sources of information. These sources of information need to be examined thoroughly and critically appraised by the teacher himself, and they need to be suggested to the students in accordance with methods which permit them also to make critical appraisals.

Science teachers on the whole recognize both the importance and the difficulty of obtaining information of reasonable accuracy along the lines of consumer education. This statement is justifiable in the light of a great many conversations with experienced science teachers as well as with those who are engaged in graduate preparation for science teaching. Almost invariably, when the suggestion has been made to teachers and prospective teachers that consumer education is a worth-while subject to be incorporated with natural science, the first question that follows has something to do with obtaining suitable information. The writer as he attempted to include a little consumer education in his science teaching in the past felt greatly handicapped by his lack of knowledge of the nature and relative reliability of various sources of possible information. Accordingly, in order to satisfy this personal need as well as with the hope that the results of the work might benefit other science teachers interested in consumer education, this task of indicating, describing, and making a critical appraisal of information sources is undertaken. It should be en-

tirely evident that no one person could begin to make such an appraisal by experimental checks on the sources of information. Much of the usable consumer information which now exists has been supplied as a result of the experience and work of experts in a variety of different fields. The impossibility of any wholesale checking of these results of the work of experts and the futility of any meager amount of experimental testing which the writer might do make apparent at once the fact that a critical appraisal of sources of information cannot be made on the basis of checking statements through laboratory experiments.

**Certain criteria serve as a basis for critical appraisal.** It follows from the preceding topic that some means other than laboratory experiments had to be selected in order to carry out this critical appraisal. It is believed that a consideration of the sources of consumer information on the basis of relative comparisons might be of noteworthy value to the science teacher in forming his own judgments of such information. In order to make such relative comparisons, the major sources of consumer information are described in this and the three succeeding chapters with the following criteria used as bases of judgment.

1. *What are the limitations of the field of information?* On this basis are considered such factors as the lack of trade names in connection with the information, the narrowness of the field under investigation, and the degree of definiteness or degree of generality of information.

2. *Are there obvious inconsistencies in the published material?* Although there is likely to be general agreement in most cases, it is apparent that what constitutes an obvious inconsistency is, in certain particular instances, likely to be largely a matter of opinion.

3. *Are descriptions given of the tests used?* Included here is a consideration of such factors as the types of tests made, the source of the tests, and the amount of checking of results.

4. *What are the unfavorable criticisms made by others?* Con-

sidered here are the types of criticisms made, and the organizations, groups, or individuals to whom the various criticisms were attributed.

5. *What special or private interests are held by those who prepare and publish the information under consideration?* Here is considered any probable or possible bias which may be held by the person or organization responsible for the information.

6. *What is the importance of the articles chosen for description?* Sometimes articles described at fairly great length in consumer information are of relatively minor importance among the purchases of most consumers.

7. *How up to date is the information likely to be?* Very often it happens that certain types of consumer information about particular commodities are nearly valueless before they reach the consumer.

8. *What authority is back of the information?* As with any other subject, authority in connection with consumer education is an important factor.

In this attempt to formulate a critical appraisal of the sources of consumer education, there have been examined in considerable detail a great many books, periodicals, pamphlets, and much mimeographed material with the preceding criteria in mind as comparative bases of judgment. However, in order to avoid obvious monotony, no formal checking of each of the preceding criteria is undertaken as the various sources of information are considered. In addition to this examination of printed and mimeographed materials, personal visits have been made to the headquarters of certain organizations to get first-hand answers to particular and pertinent questions not answered in the published material, and to gain a better understanding of the nature of the work undertaken.

For purposes of analysis and appraisal, the sources of information available on consumer education are grouped under the fol-

lowing headings, which serve as the subjects for this and the three succeeding chapters.

Books

Government agencies

Private testing and rating agencies supplying information to members.

Professional associations and related organizations

Periodicals which offer consumer information, business organizations and private companies, educational institutions, and consumer cooperatives

**Books supplying consumer information are plentiful.** There are available a great many books which deal more or less directly with consumer education. However, a large proportion of the fairly well known books have been written by persons interested chiefly in the field of economics. As a result, the number of books which have any special significance for the natural science teacher is not great. For example, a selected consumer education bibliography in *Science in General Education*<sup>1</sup> lists nineteen books, of which fourteen probably have definite value from a strictly scientific point of view. These fourteen come close to exhausting the field of books of this sort.

It is not the purpose of this book, however, to give an extended review of the other books which deal with consumer education in its relation to science. Instead, the remainder of this chapter is concerned with representative material from books which illustrate three major classifications into which most of the books may be grouped. The representative material itself is so selected that it illustrates major differences in viewpoints of different people on the problems of consumer education. Although some of the books are several years old, the quotations selected for discussion represent ideas so new that any of them are discoverable in current periodicals.

<sup>1</sup> Progressive Education Association Publications, Commission on Secondary School Curriculum. *Science in General Education*, p. 294. D. Appleton-Century Co., New York, 1938. In another connection this bibliography is reproduced in the present volume, pp. 45-46.



**"Your Money's Worth"**<sup>2</sup> aroused unusual interest in consumer education. As indicated in an earlier part of this book, it is likely that the publication of *Your Money's Worth* served as a crystallization or focal point for the many ideas on consumer education which had preceded it and as a starting point for the great wave of interest which followed it. This book has been called the "Uncle Tom's Cabin" of the consumer movement, a title that indicates the supplying of that emotional feeling which seems to be necessary for any great movement, educational or otherwise. Perhaps the effect of this book was great because it described and condemned in strong terms advertising which was considered untruthful and products which were considered dangerous, fraudulent, or overpriced; and recommended strongly the adoption of required government standards for many articles. The book comments on a large number of consumer purchases, ranging through such products as automobiles, antiseptics, dentifrices, cosmetics, gasoline improvers, wood for furniture, paints, motors, refrigerators, adulterated foods, soaps, textiles, furnace devices, heaters, stoves, and medicines. Statements are positive in their indications of ways in which the consumer does not get his money's worth. Many of the statements about the articles discussed in this book are supported by references to the publications of the National Bureau of Standards, the Pure Food and Drug Administration, and the American Medical Association. Other statements are given simply as the opinions of the authors. The preface indicates that Stuart Chase was previously on the staff of the Federal Trade Commission for some years and that F. J. Schlink is a mechanical engineer-physicist who for some years was on the staff of the National Bureau of Standards.

The following statements indicate to some extent the general nature and persuasive argument of the book and, at the same time, represent ideas which are current today: On page 3 is the previously quoted statement that the book is making a plea for

<sup>2</sup> Chase, Stuart and Schlink, F. J. *Your Money's Worth*. The Macmillan Co., New York, 1927.

buying goods according to impartial scientific test, rather than according to fanfare and trumpets of the higher salesmanship.

On page 203, along with the statement that the consumer is unable to get complete and definite information from the results of tests made by the National Bureau of Standards, there occurs the question,

Why does a service run by taxpayers' money refuse information covering competitive products—to that same taxpayer?

On page 243 is the following comment regarding the teaching of science:

To determine the excess alkali in a sample of soap flakes, the amount of palm and olive oils in Palmolive soap, or the amount of rug fiber picked up by a vacuum cleaner, are jobs which are not only interesting in themselves, but which will teach under-graduates more about the social significance of chemistry, physics and microscopy than all the text books ever written.

Again on page 244 there is a suggestion for a way of increasing consumer education:

. . . if the appropriate departments of state universities, putting aside their traditional dread of controversial issues, could constitute themselves centers of information to the people of their communities, covering articles commonly purchased—in the same manner that agricultural experiment stations handle such products as feeds, fertilizers and seeds—another long step forward would be registered.

**"Your Money's Worth" aroused much criticism.** As an indication of the effect produced by *Your Money's Worth*, one can take the fact that at least one book, *Dollars and Sense*, by Charles E. Carpenter,<sup>8</sup> was written with this stated purpose in the introduction: "The object of *Dollars and Sense* is to reply to *Your Money's Worth*. . . ." It is natural that such a book as *Your Money's Worth* would arouse criticism, especially from those who might be engaged in the manufacture or sale of products which were being attacked. Any method of judging fairly such a book

<sup>8</sup> Carpenter, Charles E. *Dollars and Sense*. Doubleday, Doran and Co., New York, 1928.

as *Your Money's Worth* must consider the criticism. The science teacher cannot afford to overlook the fact that there are criticisms which may have merit. These criticisms also have immediate value in that they represent current arguments against consumer education. For example, in *Dollars and Sense* occurs the statement, "*Your Money's Worth* goes further in advocating universal standardization than any other book, excepting it be those books which have for their object the advocacy of communistic theories. . . . Therefore *Your Money's Worth* is basically communistic propaganda whether or not it was so intended."<sup>4</sup>

The communistic accusation is used fairly often as a criticism of various consumer education groups and policies. To the science teacher it cannot be a valid criticism. One of the first principles learned by the student of propaganda analysis is the lack of definite meaning in "name calling." Therefore the statement that a proposal or policy is "basically communistic propaganda" can have very little accurate meaning except as someone reads into the phrase *communistic propaganda* meanings that are degrading or criminal.

Some criticisms of certain consumer information seem valid. Considerable space in this book is devoted to a consideration of the criticisms of *Your Money's Worth* as expressed in *Dollars and Sense* because these criticisms are ones fairly generally made by those who oppose the ideas expressed in literature which favors consumer education. The cry of communistic tendencies, as indicated in the preceding topic, is one of these more or less general criticisms.

*Dollars and Sense* on the whole appears to be well written and presents, among other ideas, a number of clever illustrations showing the weakness of using completely standardized specifications. For example, the book indicates an undesirable effect of standardization of clothing by emphasizing the lack of beauty and individuality in the dress of certain religious groups, such as the Mennonites. This argument is an interesting one, although it

<sup>4</sup> *Dollars and Sense*, Introduction, p. xiii.

considers an extreme in standardization that is recommended by only a few of the people favoring standardization of clothing. Other undesirable effects of standardization which are pointed out include the facts that (1) any set of standards is usually a compromise and therefore tends to prevent the best from being available; (2) there are numerous cases in which specifications have been greatly surpassed and the articles thereby improved. Undoubtedly these are valid criticisms of standardization, but they do not mean that all attempts at standardization should be discarded. Instead, such criticisms should be seriously considered and efforts should be made to devise ways of overcoming or lessening the undesirable effects just pointed out.

Since several dentifrices are ridiculed in *Your Money's Worth* and in many other publications intended for consumer education, it appears desirable to quote from *Dollars and Sense* (page 8) on this subject:

If the object of cleansing the teeth is merely to clean, then a little chalk on a waste rag will undoubtedly accomplish the object. If, however, the object is to cleanse the teeth under ideal sanitary conditions, then we want the best type of brush and dentifrice. If, perchance, the object is to preserve and harden the gums, or counteract deterioration due to the habit of eating soft foods, then our happiness may be further increased by confidence that the tooth powder or paste is properly medicated. The dentifrice might be offensive and still be effective, but does it become a luxury if our esthetic desires prefer a paste or powder agreeably scented and pleasantly flavored?

Again, further on occurs the statement:

Is it any more extravagant to flavour a tooth paste than a custard pie?

This quotation sums up excellently the arguments very often read and heard against the type of consumer education which recommends that in order to cut the cost of the dentifrice one make his own tooth powder by using precipitated calcium carbonate as the main or chief ingredient. The science teacher, as well as many of his students, while recognizing the value of considering the possibility of a price being too high for the ingredi-

ents and value of the dentifrice, will find it possible to agree with portions of the criticism.

In order to appraise the value of the original consumer information as well as the worth of the criticisms just quoted, it is desirable to consider the attitude which the American Dental Association takes toward dentifrices. In suggesting a formula for a dentifrice, the Association indicates that all legitimate requirements of a dentifrice are fulfilled when the substance aids the toothbrush in cleaning the teeth and is nonmedicated. The suggested formula includes flavoring agents, however. It can be seen that the American Dental Association adopts a somewhat middle ground and one with which the science teacher can find best agreement. In other words, the possible desirability of a flavor for the dentifrice is recognized if the cost is not unreasonably high and if there are made no claims which indicate that the dentifrice may have any value other than to give the toothbrush some moderate assistance in cleaning the teeth.

**Science teachers cannot agree with certain extreme criticisms of consumer information.** Some of the statements which occur in *Dollars and Sense* are far out of line with the best views held by scientists and science teachers. The ideas expressed in the following quotations are quite characteristic of the kind of thing that appears in articles in periodicals devoted largely to the interests of producers. Therefore these ideas need some critical examination. For example, on pages 71-72 of *Dollars and Sense* there occur these statements in direct criticism of the recommendation that government bureaus be used as consumer testing bureaus:

It is claimed that "government agents test the goods in a cool and dispassionate manner, with intricate instruments, and the contents of many reagent bottles." Are we very far wrong in stating that we have reason to believe the "intricate instruments" and "reagent bottles" are for the most part found and used in the laboratory? And the best that the laboratory can produce is a theory.

Even to the person who has only a very little scientific knowledge the preceding quotation has no semblance of truth in the

concluding statement because the laboratory clearly has produced countless facts. Again on page 81 occurs the statement,

"And if, perchance, science differs with common sense, then take it from us that common sense is correct."

On page 135 of *Dollars and Sense* occurs what appears to be an unsupported criticism of the National Bureau of Standards:

Those who believe it to be their duty to oppose and expose the National Bureau of Standards are accused of being in opposition to science and modern scientific methods, while in reality they are merely opposed to a bureau that parades quackery under the mask of science.

The reader is reminded that the first two quotations express the opposition to science that the third quotation denies. It is clear that the science teacher can find no agreement with any one of the three quotations given under this topic. Each statement is completely opposed to major ideas that science has supported again and again. Furthermore, among reputable scientists the scientific reputation of the National Bureau of Standards is of a very high order. Scientists often refer to work done by the Bureau as support of their own conclusions or as a basis for making further investigations.

The conflict between books appears again. In 1932 appeared another rather startling book which has become even more widely read than *Your Money's Worth*. This book is *100 Million Guinea Pigs*. The authors are Arthur Kallet and the same F. J. Schlink who collaborated in the preparation of *Your Money's Worth*. To the critical reader, *100 Million Guinea Pigs* seems somewhat more ready to make statements of an extreme nature than is *Your Money's Worth*. It concerns itself chiefly with medicines and foods and cites many cases in which people are purportedly being poisoned while they are used as experimental "guinea pigs" for the manufacturers of various kinds of foods and medicines.

There was published in 1938 a book which aimed to do the same thing in connection with *100 Million Guinea Pigs* as *Dollars and Sense* aimed to do in connection with *Your Money's Worth*.

This book is entitled *Guinea Pigs and Bugbears*, and the author is G. L. Eskew, about whom nothing is stated in the book. *Guinea Pigs and Bugbears* actually includes much more than a criticism of *100 Million Guinea Pigs*, since it also directs its criticisms at *Skin Deep*, by M. C. Phillips, whom it reports as Mrs. F. J. Schlink; at *Counterfeit—Not Your Money but What It Buys*, by Arthur Kallet; at *Partners in Plunder*, by J. B. Matthews and R. E. Shallcross; at *Eat, Drink, and Be Wary*, by F. J. Schlink; at *Guinea Pigs No More*, by J. B. Matthews; at the periodicals put out by Consumers' Research, Inc.; and at similar reports of the Consumers Union of the United States.<sup>5</sup>

*Guinea Pigs and Bugbears* makes a number of criticisms of one or more of these books and reports, and in some instances the criticisms appear to merit serious consideration and perhaps approval by the teacher of science. For example, several instances are cited in which Consumers' Research reports have made errors and in later reports have corrected them. In one sense this quality of admitting and correcting errors is a very good one, and is a policy that the science teacher can approve. In another sense it must be recognized that any reports in the nature of consumer information are better if they contain few errors or none at all. *Guinea Pigs and Bugbears* points to occasional inconsistencies in the publications it is criticizing and emphasizes the value of looking for inconsistencies as a method of judging such publications. For example, it is pointed out that "in *Skin Deep*, Mrs. Schlink warns against hand lotions containing glycerine on pages 44 and 45, after, on page 43, giving a formula for hand lotion containing it."<sup>6</sup>

Among other criticisms made by *Guinea Pigs and Bugbears* which will get support from science teachers is that concerning

<sup>5</sup> Phillips, M. C., *Skin Deep* (1937); Kallet, Arthur, *Counterfeit—Not Your Money but What It Buys* (1935); Matthews, J. B., and Shallcross, R. E., *Partners in Plunder* (1935); Schlink, F. J., *Eat, Drink, and Be Wary* (1935); Matthews, J. B., *Guinea Pigs No More* (1936). For periodicals referred to consult the Bibliography.

<sup>6</sup> Eskew, G. L., *Guinea Pigs and Bugbears*, p. 57.

the following statement quoted from a claim made by Consumers' Research:

On questions of nutrition, for example, we present data of a more advanced and scientific character than are available to the great majority of dietitians, physicians and college teachers of nutrition.<sup>7</sup>

The science teacher will agree that this statement makes a claim so broad that its truth becomes extremely doubtful. It is clear that such data must be presented by other scientists in order to have any value at all, but it is not clear that one must believe the scientists who present the views supported by Consumers' Research rather than the scientists who present views opposite to those selected for support by Consumers' Research. Indeed, the following criticism made on page 60 by *Guinea Pigs and Bugbears* seems to merit considerable thought: "Schlink *et al* denounce manufacturers for sensational advertising, yet they do the very same thing to sell their volumes."

"*Guinea Pigs and Bugbears*" shows very serious faults. As is the case with *Dollars and Sense*, the book *Guinea Pigs and Bugbears* includes many extreme statements for which the science teacher can find no support whatever. For example, on page 12 is the statement:

Everything that can be tested is tested before it is manufactured and offered to the public.

On page 80 occur the statements:

When a physician leaves a prescription and you take it, he will inquire of you on the next visit as to how it acted. We can all observe a like watchfulness in the case of medicines and foods, and we can do it better than anybody else can do it. Simply let common sense, coupled with our individual experiences, dictate what food we eat, what medicines we take.

Naturally, the science teacher can, under no circumstances, accept these statements in their entirety. However, the second quotation does illustrate how cleverly a well-known fact, such as what happens after a physician leaves a prescription, can be

<sup>7</sup> *Guinea Pigs and Bugbears*, p. 40.



twisted to the peculiar advice in the last sentence of the quotation. It is evident that the advice indicated there is for the reader simply to disregard all knowledge of nutrition and all gains which medical science has made. It is also evident that few manufacturers of the medicines or foods which call forth the major criticisms would be willing to follow such advice. Yet, in complete fairness, it must be pointed out that the advice in the preceding quotation does not differ greatly from the suggestion offered in Schlink's *Eat, Drink, and Be Wary*, that we use primitive instinct to determine our diet. Mr. Schlink himself goes off into deep water with this suggestion.

Other books and articles carry on the argument between producer and consumer. The books selected thus far for discussion in this chapter were chosen because they illustrate two extremes on the subject of sources of consumer information. On the one hand are the fairly influential *Your Money's Worth* and *100 Million Guinea Pigs*, while opposed to them are *Dollars and Sense* and *Guinea Pigs and Bugbears*. As already pointed out, there are several other books of the general nature of *Your Money's Worth* and *100 Million Guinea Pigs*. Most of these books are from the pens of persons who now are, or have been, associated with Consumers' Research, Inc., or with Consumers Union of the United States, Inc. There are, however, several other books definitely on the consumer side, which were not written by persons associated with these testing and rating agencies. Among them are *Nostrums and Quackery and Pseudo Medicine*, by Arthur J. Cramp; *Fads and Quackery in Healing*, by Morris Fishbein; *The Popular Practice of Fraud*, by T. Swann Harding; *Poisons, Potions, and Profits: The Antidote to Radio Advertising*, by Peter Morell; and *American Chamber of Horrors*, by Ruth de Forest Lamb.<sup>8</sup> This last book is worthy of careful attention on the part of the teacher of science because it is praised both by *Guinea Pigs and Bugbears*, which devotes four and one-

<sup>8</sup> Information and a brief annotation concerning certain of these books is given in the Bibliography of this book.

half pages to quoting it, and by Consumers' Research, Inc., which acclaims it as highly authoritative and lists it as a valuable reference book for consumers. A book that merits praise from these two opposite and highly critical sources clearly has much in its favor.

In addition to *Dollars and Sense* and *Guinea Pigs and Bugbears*, which criticize strongly the books that favor consumer education most ardently, there have also appeared in periodicals a number of articles that offer similar criticisms of consumer books, of some of the consumer organizations, and of the school textbooks and school classes which aim to give consumer education. However, these articles have no particularly distinguishing characteristics other than those already expressed about the books. Generally, such articles attempt to show that the actual situation is not as bad as the proponents of consumer information claim, that the various departments of the Federal government are doing a very effective job of taking care of the consumer, and that in most cases the consumer is able to depend upon the honesty and reliability of his neighborhood drugstore, grocery, department store, or manufacturer.

**Shopping books have value for the science teacher in consumer education.** There is a third class of books which deserves the attention of the science teacher in connection with his work in consumer education. These occupy a place midway between the two general types which have already been discussed at some length. The most usable ones have to do with department store buying. Many of these books look at the problem of consumer education in a very fair manner and yet are often written by persons directly interested in the merchandising side rather than the consumer's side. They generally take the position that there must be more cooperation and less conflict between manufacturer, merchant, and consumer, less cheating on the part of the manufacturer and merchant, and correspondingly less suspicion on the part of the consumer.

One of the most representative of this type of books is *The*

*Shopping Guide*,<sup>9</sup> made up of sections written by persons in the employ of eighteen different stores in various large cities. These sections have to do with the purchase of furniture, textiles, silverware, shoes, clothing, luggage, and rugs. The information about these articles is, almost without question, likely to be accurate. However, a great deal of it is certain to be of little help to the average consumer when he goes to make a purchase. For example, even after he knows that he should select upholstery fabric patterns in keeping with the feeling of the room, he still has difficulty in knowing just what is the feeling of the room. After he knows that gumwood in furniture is soft and susceptible to dents, he has to depend upon the merchant for correct information about the kind of wood in his proposed furniture purchase. In other words, much of this consumer information, although interesting and correct, is general in nature and therefore not as usable as it might be. Even so, the book is useful to the science teacher, as are other books of similar nature, because of the ideas it gives in regard to tests that can be applied and to the standards needed for improved consumer buying.

**The attitude of merchants toward consumers is changing.** Even the merchants are now admitting that the consumer has had much to complain of. The following quotation from *The Shopping Guide* indicates a most forward-looking attitude of merchants toward consumer education:

In the early days of consumer research, the shocked householder heard dreadful tales, reports of "ash can" hats; the sale of second-hand bedding; silk so weighted it would crack while hanging in the closet; antiseptics, for use on wounds, which would harm even healthy tissues; candy for children which was loaded with lead; and so on. Such instances, which were no doubt true, gave rise to a feeling on the part of both consumer and the investigator that all was not well in the world of manufacturing and retailing. There seemed a definite effort to gyp the buying public.

These early experiences of the consumer investigator have given definite color to his later attitude. The feeling that the manufacturer

<sup>9</sup> Compiled and edited by E. B. Weiss in collaboration with Maurice Mermev (1937).

intends to cheat the consumer for his own gain lingers still to a considerable degree.

This point of view has had manifold repercussions. It has made the intelligent consumer, who reads and follows the advice of consumer-research reports, tend to reflect the attitude and sentiment of the investigator. It has also aroused, up to a fairly recent date, a distinct feeling of antagonism on the part of the manufacturer, retailer, and advertiser.

Bad practices and dishonest merchandise are the attributes of the side-street store, which aims for quick turnover and trade of the casual customer. Larger establishments have a definite reputation to maintain and cannot, for their own sakes, afford to mislead the customer.

Retail merchants who do business on a large scale employ buyers of long experience, whose judgment of quality is the result of years of practical acquaintance with the goods they buy. In many cases such knowledge, obtained in the laboratory of experience, quite outweighs any findings which could be made in a testing laboratory not well equipped for conducting its tests on a sufficiently large amount of material.

Occasionally a buyer is in error, but it might also be stated that not all consumer research is perfection. Such laboratories have been known to make their mistakes also.<sup>10</sup>

This quotation is a fair statement of the entire situation in consumer education from the standpoint of the merchants. It is fair because it admits the sad conditions of the past, because it is willing to admit that these conditions may still exist at least in some stores, and because it indicates correctly the attitudes which have been held by both consumers and merchants. There is, however, still considerable doubt on the part of the consumers that everything is quite as rosy as the quotation indicates. There is doubt that the bad conditions of earlier days of consumer research have disappeared, and that the larger establishments are certain to sell only articles of established value. Sadly enough, it is still readily possible to purchase in large stores, as well as in small ones, many articles which are definitely not of high standard, and some articles which have been strongly criticized by the consumer organizations, by the American Medical Association, and against which action has been taken by a department of the Fed-

<sup>10</sup> P. 288.

eral government. It may be pointed out that the Federal Trade Commission, in its report for August, 1939, ordered one large department store in New York to "cease and desist" passing off domestic products as imported products. The particular products in this case were perfumes and toilet preparations. In the report of October, 1939, a baking company in Cincinnati was ordered to stop misleading advertising in regard to grapefruit juice, and a large pharmaceutical company received a similar stipulation in regard to preparations for the skin and hair.

**Science textbooks contain consumer information.** Science textbooks are, very naturally, likely to be much more familiar to the teacher of natural science than are books of a more general consumer nature. Although no detailed discussion of science textbooks is included as a part of this work, it is desirable to point out a few general conditions in regard to such books. In the first place, practically all science textbooks have considerable portions devoted to subject materials which may be called indirect consumer education. An illustration is the common discussion of the sources of various textiles and the different kinds of cloth made from these textiles. Such material is paralleled many times in other descriptions of how things are made and of what they are composed. This subject material is considered to be indirect consumer information because, ordinarily, the pupil is unable to make the carry-over necessary in order that such information may function in an actual buying situation, and because the teacher ordinarily offers little assistance to the pupil in the application of such material directly to buying situations. In other words, the information is of a general consumer information type and is not made specific enough for the pupil to use it as he wishes to purchase goods and services. To illustrate further, with respect to a different commodity, it is of practical value to a pupil to know that soap is made by the interaction of an alkali and a vegetable or animal fat or oil, and to know some of the details involved in this interaction. In order to make his information about soap more complete from a consumer standpoint, however,

science textbooks would need to supply such additional information as the following:

1. The chief difference between a good soap and a bad soap is the amount of excess alkali present.
2. A good soap has only one recognized purpose and that purpose is cleaning.
3. It is not wise to expect that any soap will have any unusual effect upon one's beauty, other than the effect which comes from being clean.
4. It is not wise to expect special medication in a soap.
5. It is not wise to expect to prevent perspiration odors by the use of any one particular soap in preference to another.
6. The amount of moisture present in a soap makes a good deal of difference in the value one gets for his money.
7. One should consider the amount of dry soap per pound as the chief basis of judgment of the comparative prices of good soaps.
8. Excess alkali and the amount of moisture in soap may be determined by methods which can be carried out in secondary school science classes.

At this point it seems desirable to emphasize again the boundaries of the meaning of the term *consumer education* as it is used throughout most of this book. In the preceding illustration on the subject of soap, information about the materials and methods of manufacture of soap is not considered to be direct consumer information to the same degree that the enumerated items are. The writer realizes that this distinction is a fine one and that it is open to much criticism. On the other hand, it still appears necessary to make this distinction for the purpose of this book, since the argument throughout centers about the desirability of including in natural science courses more of the type of information represented by the enumerated points in the preceding illustration.

**Textbook publishers generally refuse to publish consumer information which criticizes actual brands of products. It is**

not difficult to understand why the textbook companies generally refuse to publish the type of information which criticizes actual brands of products. The textbook publishers do not wish to antagonize interests which may have a part in the decision about the use of a particular textbook in the schools or which may be able to influence local boards of education and state textbook boards in their choice of a book.

There is also a further, highly important, factor. The mention of certain products by their brand names picks out those particular ones for emphasis. These particular articles with their possible defects are only a very few out of many other similar products which might be used for illustration. Certainly there is involved a question of fairness to the products so named. They tend to receive condemnation, while others which are less well known are permitted to escape without the emphasis which comes from naming them.

The textbooks appear to have no way of getting around this problem, since it is clearly impossible to name all brand products which might fall in any one of the several classifications that may be desirable to include for discussion. As a result, the textbook must hold very largely to generalities such as the discussion of the dangers of using pain relievers which contain acetanilide, or, even more generally, the discussion of dangers of using any pain relievers at all except upon the advice of a reputable physician. The necessity for using generalities in all such cases of consumer education puts several limitations on the science textbooks which attempt direct consumer education. Educational methods are generally agreed to be much improved if generalizations can be begun by very detailed and specific illustrations which are within the experiences of the pupil.

Probably as a result of this handicap, science textbooks for which emphatic consumer education claims are made have fallen even farther back on generalizations than is necessary. Such books have made great use of the same science material in general use in all science textbooks and have mistakenly, or perhaps delib-

erately, mislabeled such material as consumer education in science. Such action is a case of using the old material under a new name, which is evidently regarded as a way of making the old material appear more attractive. These practices are understandable, but it does not seem possible to justify them in the name of education.

**Certain bibliographies show biases which are barely understandable.** Science teachers will wish to consult various bibliographies in connection with their sources of information. Perhaps the most extensive of such bibliographies is a 286-page book published in 1939, *Bibliography on Consumer Education*, by George C. Mann. The author is described as Chief of Division of Adult and Continuation Education, California State Department of Education; and the book is indicated as "Sponsored by Foundation for Consumer Education, Los Angeles, California." A total of 1,981 titles of material published up to November 15, 1938, are included with brief descriptions of the nature of the material indicated by each title. The science teacher will find listed a wealth of books and periodicals on consumer economics; on standards and labels; on buying foods, clothing, shelter, household articles, fuel, drugs, cosmetics, automobiles, and the like. There are also sections on textbooks, teaching aids, curricula, and projects; on other bibliographies; and on commercial publications of a consumer nature.

The book has unquestionable value for the science teacher and for anyone else interested in consumer education. However, one feature is very difficult to understand—the omission of any mention of the exposure type of consumer education books. The table on pages 45-46 shows the books and periodicals listed in *Science in General Education* which are not given a place in the *Bibliography on Consumer Education*. The table serves to clarify this barely understandable omission from the latter publication.

It is to be noted in this table that the books most conspicuous for their exposure type of consumer education are included in the bibliography of *Science in General Education* and that not one book of this type is listed in Mann's *Bibliography on Consumer*



Books and Periodicals Listed in *Science in General Education* in the Bibliography on "The Need for Wise Selection and Use of Goods and Services"

Status of the Books and Periodicals in the *Bibliography on Consumer Education*

## BOOKS

Bennett, Harry, ed., <i>The Chemical Formulary</i>	Not listed
Brindze, Ruth, <i>How to Spend Money</i>	Listed
Bruce, Edwin M., <i>Detection of the Common Food Adulterants</i>	Not listed
Chase, Stuart and Schlink, F. J., <i>Your Money's Worth</i>	Not listed
Chilson, Francis, <i>Modern Cosmetics</i>	Not listed
Cramp, Arthur J., <i>Nostrums and Quackery and Pseudo Medicine</i>	Not listed
Fishbein, Morris, ed., <i>Modern Home Medical Adviser</i>	Listed
Fishbein, Morris, <i>Fads and Quackery in Healing</i>	Not listed
Foreman, Clark and Ross, Michael, <i>The Consumer Seeks a Way</i>	Listed
Harding, T. Swann, <i>The Popular Practice of Fraud</i>	Not listed
Kallet, Arthur, <i>Counterfeit—Not Your Money but What It Buys</i>	Not listed
Kallet, Arthur and Schlink, F. J., <i>100 Million Guinea Pigs</i>	Not listed
Matthews, J. B., <i>Guinea Pigs No More</i>	Not listed
Morell, Peter, <i>Poisons, Potions, and Profits: The Antidote to Radio Advertising</i>	Not listed
Phillips, M. C., <i>Skin Deep</i>	Not listed
<i>Report of the Inquiry on Cooperative Enterprise in Europe</i> , Government Printing Office, Washington, D. C., 1937.	Not listed
Schlink, F. J., <i>Eat, Drink, and Be Wary</i>	Not listed
Stieglitz, Julius, ed., <i>Chemistry in Medicine</i>	Not listed
Warbasse, J. P., <i>Cooperative Democracy through Voluntary Association of the People as Consumers</i>	Listed

## PERIODICALS

<i>Consumers' Digest</i> , Consumers' Research, Inc.	Not listed
<i>Consumers' Guide</i> , Consumers' Counsel of the United States Department of Agriculture	Listed
<i>Consumers' Research Reports</i> , Consumers' Research, Inc.	Not listed
<i>Consumers Union Reports</i> , Consumers Union of United States.	Not listed

<i>Hygeia</i> , American Medical Association	Listed
<i>Notices of Judgment</i> , U. S. Food and Drug Administration	Not listed
<i>The Woman Shopper</i> , League of Women Shoppers, New York City	Not listed

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*Education*. It is also to be noted that Mann's bibliography does not list the Consumers' Research and Consumers Union monthly reports and does not even list the *Notices of Judgment* of the United States Food and Drug Administration. Further examination of Mann's *Bibliography on Consumer Education* shows that it lists the two books from which quotations are given in an earlier part of this report, namely, *Dollars and Sense* and *Guinea Pigs and Bugbears*. About *Dollars and Sense*, the *Bibliography on Consumer Education* has this comment to make: "A thoughtful answer to Chase's *Your Money's Worth*." In regard to *Guinea Pigs and Bugbears*, the comment is: "The author endeavors to eradicate the mental weeds that may infest your minds, inculcated by irrational and unauthoritative literature." From these comments it is possible to draw the conclusion that the outstanding books among the so-called exposure type were omitted from *Bibliography on Consumer Education* with the definite knowledge that the books were being omitted.

The bibliography in "Science in General Education" neglects an important quality. A check of the books listed under the preceding topic shows that the bibliography on consumer education in *Science in General Education* has an interesting shortcoming. The bibliography does not list any books or periodicals that represent the viewpoint which is indicated in *Dollars and Sense* and *Guinea Pigs and Bugbears*. Although the bibliography in *Science and General Education* is not extensive and makes no pretense of being complete, it seems desirable that there should have been included at least one reference which attempted to give something of the answer of manufacturers, merchants, and advertising agencies to the considerable number of exposure type consumer information books which are listed. The unusual em-

phasis which is being given to the value of using the scientific method in forming conclusions, coupled with the emphasis which the other sections of *Science in General Education* give to the value of the scientific method, would seem to point to the conclusion expressed in the preceding sentence. However, in all fairness to those who prepared the bibliography in *Science in General Education*, it is possibly true that books representing the opposite viewpoint on consumer education were not deliberately omitted. The chances are that such books were simply not given any thought, a situation which is far more excusable than one in which books representing an opposite viewpoint are obviously deliberately excluded.

There are, of course, additional bibliographies, as separate publications, on consumer education, and there are shorter bibliographies contained in other books dealing either directly or indirectly with consumer education. The two bibliographies described here were chosen for purposes of illustration because of their importance and their characteristic representation of somewhat one-sided viewpoints. It is wise for the science teacher to consider the possible results from the use of a bibliography that is one-sided in its viewpoint and the consequent danger of presenting similarly one-sided consumer information to the students in his classes.

## Chapter III

### FEDERAL GOVERNMENT AGENCIES AS SOURCES OF CONSUMER INFORMATION: A CRITICAL APPRAISAL

As sources of information, Federal government agencies deserve compliments. Investigation of the work that is done by the different departments, bureaus, and commissions of the Federal government causes a mounting enthusiasm for the services offered to consumers by the various Federal agencies. The extent and variety of these services are almost certain to be amazing to one who has known only a little about them previous to a fairly extensive investigation. Probably the foremost department which supplies information and other services for the consumer is the Department of Agriculture. In addition to the fact that the Secretary of Agriculture is given considerable authority in connection with the new Federal Food, Drug, and Cosmetic Act, which became a law on June 25, 1938, and all the provisions of which became effective by July, 1940,<sup>1</sup> there are in the Department the following agencies whose chief work is direct aid to consumers:

1. The Consumers' Counsel Division of the United States Department of Agriculture, which publishes the periodical called *Consumers' Guide*.
2. The Pure Food and Drug Administration.
3. The Bureau of Home Economics.

In addition to these agencies in the Department of Agriculture, the National Bureau of Standards in the Department of Commerce has available a great deal of published material in connection with these agencies.

<sup>1</sup> Some provisions of the law went into effect immediately after passage, others on January 1, 1940, and still others on July 1, 1940.

tion with consumer problems. The Federal Trade Commission, with its recently increased powers, is performing great services in the prevention of false and misleading advertising. The Post Office Department also adds its services through the enforcement of laws having to do with illegal use of the mails.

Most of the services and information offered by these Federal agencies are free to the individual consumer, although they are, of course, in general paid for by consumers through taxes. The special services and information which are paid for directly by individual consumers are usually supplied at very low costs. In continuing this critical appraisal of the government agencies in the next few pages of this book, an effort will be made to indicate something of the scope of the services of these agencies and their value to the science teacher and to anyone else interested in his own education or in the education of others along the lines of consumer purchasing. This effort is made with the realization that any brief report of the work of these agencies is certain to be inadequate in comparison with the ideas that one may get by carrying on his own investigations over a long period of time. Therefore, it is strongly recommended that this book be considered as a preliminary investigation, and it is hoped that the science teacher will extend his study by investigating the actual reports of the government agencies and by maintaining a continuous acquaintance with new reports as they are issued.

**"Consumers' Guide" ranks high among Federal consumer publications.** The periodical, *Consumers' Guide*, as stated under the preceding topic, is a publication of the Consumers' Counsel Division of the United States Department of Agriculture. Its present publication policy, as outlined in the issue dated October 15, 1939, calls for two issues each month except June, July, August, and September, when only one issue per month is published. Ordinarily it is sent free upon request and is likely to be available to teachers as long as it is published. In the issue of November 7, 1938, under the heading, "Our Point of View," is the following general statement:

The *Consumers' Guide* believes that consumption is the end and purpose of production. To that end the *Consumers' Guide* emphasizes the consumer's right to full and correct information on prices, quality of commodities, and on costs and efficiency of distribution. It aims to aid consumers in making wise and economical purchases by reporting changes in prices and costs of food and farm commodities. It relates these changes to developments in the agricultural and general programs of national recovery. It reports on cooperative efforts which are being made by individuals and groups of consumers to obtain the greatest possible value for their expenditures.

The producer of raw materials—the farmer—is dependent upon the consuming power of the people. Likewise, the consumer depends upon the sustained producing power of agriculture. The common interests of consumers and of agriculture far outweigh diversity of interests. While the *Consumers' Guide* makes public official data of the Departments of Agriculture, Labor, and Commerce, the point of view expressed in its pages does not necessarily reflect official policy but is a presentation of governmental and non-governmental measures looking toward the advancement of consumers' interests.

As indicated both in this point of view and by an examination of the material in *Consumers' Guide*, its interests are largely agricultural and economic. Although it is not directed toward problems of special interest to science teachers, it contains many articles of importance in the teaching of science. These include information on such subjects as weights and measures; standards and labels for food and clothing; facts on nutrition; safety in home dry cleaning; testing fabrics for color fastness; health; cosmetics; insecticides; conservation; and much more on buying such commodities as electric stoves, furs, toys, foods, drugs, hats, candy, pop, paints, hosiery, vitamins, rugs, and many other similar articles. Thus the science teacher can find in the pages of *Consumers' Guide* many ideas for teaching consumer education and much information of a consumer science nature.

There are two other reasons why the science teacher will find *Consumers' Guide* helpful. In the first place, it describes in considerable detail the work of other Federal government agencies in connection with consumer education as changes are made in such work. Important contributions in regard to the regulations of various states are also described. Indeed, *Consumers' Guide*

is one of the very few places where up-to-date information about the consumer work of the state governments can be obtained. The second reason why the science teachers will be able to make frequent use of this publication is the fact that it maintains an up-to-date bibliography on consumer education through its department known as "The Bookshelf." Here are described new publications of Federal and state agencies as well as new publications of colleges and universities.

*Consumers' Guide* has not been published long enough for one to predict the likelihood of its being a continuous service to consumers. The first issue was in September, 1933. Since its operation has thus far been confined to the administration of one president of the United States, both its policies and its very existence are probably more dependent upon political changes than are the other Federal government consumer services described in this report.

**The work of the Secretary of Agriculture has been increased.** As stated previously, the Secretary of Agriculture took on increased duties and authority of a consumer nature as the provisions of the new Federal Food, Drug, and Cosmetic Act passed in June, 1938, went into operation. Although the value of this new law can be better judged after it has been in operation for a few years, it is necessary that the science teacher be familiar with its major provisions. For this purpose a satisfactory digest of the Act may be obtained at no cost by writing the Food and Drug Administration, United States Department of Agriculture, Washington, D. C. As with other laws of major importance,<sup>2</sup> interpretations from different viewpoints may be found in periodicals published before and after the date of passage.

In accordance with the provisions of the new Act, the Secretary of the Department is expected, after public hearings for interested consumers and business organizations, to indicate details of the standards of identification to be used for foods which are sold

<sup>2</sup> Some interpretations are given in *Consumers' Guide* for July, 1938.

through interstate commerce. For example, the Secretary may indicate the percentage of eggs that should be present in noodles in order that they may be labeled egg noodles, or the quantity of sugar necessary in a product before it can be called jam, or the amount of pork which must be present in a can of "pork and beans."

The Secretary may also indicate the maximum amounts of such poisons as arsenic and lead compounds which are to be permitted to remain on fruits and vegetables as a result of the use of insecticide and fungicide sprays and dusts. It is, of course, undesirable for any amount of such poisonous residues to remain on foods, but relatively large amounts have been tolerated in the past. Previous laws on these tolerances were inefficient because each violation had to be prosecuted as a separate case with the use of testimony from experts as proof that the amounts of lead and arsenic residue were too large.

According to this Act, the Secretary is to pass upon new drugs that are intended for interstate use. The manufacturer must supply information to the Secretary about the composition of the drug, its method of manufacture, the labeling to be used and the tests which indicate that the drug is safe to use under the prescribed conditions. After receiving this information the Secretary may prohibit the introduction of the drug if he considers it dangerous.

These illustrations of the power of the Secretary of Agriculture under the new food and drug rules are described briefly in order to show the science teacher the value of the Act as a source of information in connection with the teaching of consumer education. Ordinarily the schools lag far behind before information of this sort is generally available. The science teacher who keeps himself informed will help reduce this lag. Further illustrations of the provisions of the new Act are given in the two following topics, again in order to illustrate the value of legislation as a source of consumer education and to promote understanding of the extent of the work of Federal agencies.



**The new law adds to restrictions on nonofficial medicines.** Medicines which are not recognized as official in the more or less well established lists prepared by the national organizations of physicians and pharmacists must have labels that fulfill certain requirements. The labels of such "nonofficial" medicines must carry adequate directions for use and adequate warnings against use under any conditions dangerous to health. In addition to the fact that the presence of narcotic or hypnotic constituents in such nonofficial medicines must be indicated on the label, there is the further provision that the label must include the statement, "Warning—May Be Habit Forming." In illustration of this new provision, it may be pointed out that possible products carrying this warning are the many pain relievers and cold tablets which contain acetanilide. Previously the presence and amount of acetanilide had to be stated on the label, but usually the statement was in very fine print and there was no such warning statement as that just mentioned.

**The new law extends to cosmetics and to mechanical health contraptions.** In the past, Federal regulations, which to some extent cut down the crimes committed through fake medicines, did not extend to mechanical devices for the improvement of health. Such devices as electric belts, "infra-ray" heating pads to grow hair on bald heads, impressive electrical cabinets for the cure of incurable diseases, ultraviolet ray lamps which produced no ultraviolet rays, metal health plates to put into one's shoes, and innumerable other fake contraptions for the improvement of health were allowed to flourish without the hindrance of Federal law as long as anybody would purchase them. For the first time, under the new law, the Federal government can take action against these devices.

Cosmetics, also for the first time, are affected by Federal regulations under the new law. The hair, eyebrow, and eyelash dyes which have in the past killed some women, blinded others, and ruined the appearance of many should now be effectively barred from interstate commerce by the new law. So also may be banned such things as superfluous hair removers containing thallium com-

pounds that cause paralysis, blindness, or all the hair to loosen, and such products as freckle removers and hair tonics containing poisonous and dangerous substances. In general, although the composition of cosmetics need not be stated on the label, their sale may be forbidden if they are found to be injurious either under the directions for use prescribed on their labels, or under any conditions of use which may be described as customary or usual.

Again it appears desirable to state that these few provisions of the new Food, Drug, and Cosmetic Act are mentioned here in order to assist in the critical appraisal of sources of consumer information, the particular source of consumer information under consideration at this point being the various Federal government agencies. However, it can also be seen that the new law itself offers an excellent source of consumer education because of the implications of its restrictions.

**The Food and Drug Administration** issues "Notices of Judgment." In the hands of the Food and Drug Administration, a division under the Department of Agriculture, rests most of the responsibility for setting up details of the restrictions indicated by the food and drug laws and for carrying out the enforcement of these laws. The specific regulations in connection with the general law are available from the Food and Drug Administration upon request. Notices of judgment made in connection with the enforcement of the food and drug laws are available after publication. If one requests these *Notices of Judgment*, which are issued at regular intervals, they are usually sent several months after the original request is made. The *Notices of Judgment* constitute the published information concerning action taken with respect to violations of the law. Goods which violate the law may be seized, or criminal action may be instituted against the shipper, or both of these procedures may be used in connection with the same shipment.

An indication of the extent of the work of the Food and Drug Administration, before the provisions of the new Act went into

effect, is given by the fact that there were 1,992 seizures of goods and 726 prosecutions during the fiscal year ending June 30, 1938. It seems probable that under the wider provisions of the new Act the work of the Food and Drug Administration will increase. However, it is important to point out here that the efficiency of operation of the Food and Drug Administration depends very largely upon the amount of money which is appropriated for the work of the inspectors and testers engaged in the enforcement of the existing laws.

As a source of information for consumer education, the *Notices of Judgment* of the Food and Drug Administration have a very high rank. The science teacher will discover that many public libraries have bound volumes of back numbers of these *Notices*. A glance through one issue, dated November, 1939, and marked "Drugs," would show, among other things, condemnations, seizures, and in some instances court action. There were numerous cases of misbranding, because therapeutic claims were judged false and fraudulent, of such products as cold tablets, cough sirups, liver pills, dyspepsia tablets, salves, worm medicines, and ointments. Many of these were also judged as misbranded because they did not contain materials as represented. Other judgments of particular interest dealt with sutures, cotton swab applicators and tongue blades, gauze pads, gauze bandages, hospital cotton, and surgical dressings because they contained viable microorganisms. Cod-liver oil and carotene were judged as adulterated and misbranded because they fell below professed standards of quality. Ether was judged as adulterated and misbranded because it differed from the professed standard and contained certain undesirable chemicals. Issues of the *Notices of Judgment* dealing with foods carry similar decisions about a variety of food products.

**The Bureau of Home Economics is a valuable source of consumer information.** Still another division in the United States Department of Agriculture which has available a considerable amount of consumer information is the Bureau of Home

Economics. As might be expected, the major work of the Bureau of Home Economics in the past has been connected with the preparation of food and the construction of clothing to a much greater extent than it has been connected very directly with the purchase of such products. Recently, however, with the increased interest in consumer education, the Bureau has prepared a number of bulletins more along this line. To a certain extent the use of the Bureau of Home Economics bulletins as sources of consumer education may be indicated by a few of the titles: *When a Woman Buys a Coat; Selection of Cotton Fabrics; Guides for Buying Sheets, Blankets, Bath Towels; Quality Guides in Buying Ready-Made Dresses; Hosiery for Women: A Buying Guide*. In such bulletins as *A Serviceability Test on Blankets Made from Four Blends of Wool and Breaking Strength, Elongation, and Folding Endurance of Films of Starches and Gelatin Used in Textile Sizing*, the science teacher may get ideas which can be adapted to his own teaching.

It can be seen that the Bureau of Home Economics, while giving consumer information of a valuable type, is quite distinctly limited in scope to subjects closely connected with the buying of food and clothing. However, the science teacher will find such material very complete, except that trade names of materials are never used, as they are in the reports of the Food and Drug Administration.

**The National Bureau of Standards supplies extensive information.** The general nature of the work of the National Bureau of Standards is likely to be familiar to many teachers of science, but it seems safe to say that probably not many of these teachers realize the extent of the work done by this Bureau and the intimate relation of much of the work to consumer education. This work of the National Bureau of Standards is far more meaningful to a person with fairly extensive scientific training than it is to one without such training.

One of the simplest ways to get started on the use of National Bureau of Standards publications is to write to the Bureau for its

Letter Circular entitled, "List of Publications of Interest to Household Purchasers." This list of publications is quite extensive and furnishes a good introduction to material available along consumer education lines. Many of the hundreds of bulletins are free and the others may be purchased at the usual small cost of government publications. Included in this list of publications are the specifications for household commodities purchased by the various departments and establishments of the Federal government. There is also additional information on types of standards, which is fairly certain to be of major value to consumers as progress is made in getting better goods and services for the money spent.

It is futile to attempt an adequate description of the extensive variety of products which enter into the work of the National Bureau of Standards, but it seems desirable to indicate briefly the scope of this work. For example, bulletins are available on building insulation; washing, cleaning, and polishing materials; information for the amateur designer of transformers; sound transmission through wall and floor structures; wear of carpets; standards for wallpaper, tents, blankets; simplified practice recommendations for such articles as bedsteads, sterling silver flatware, hot-water tanks, building tile, and paints and varnishes; the selection and use of furniture, home insulation, and judging a house; and Federal specifications for more than five hundred articles ranging from fresh watermelons to traveling bags.

Something more of the high value of the National Bureau of Standards is shown by the fact that other consumer organizations use Bureau of Standards information as a basis for much of their work. For example, one finds in the publications of the private testing and rating organizations numerous references to the use of Bureau of Standards specifications and to the methods, apparatus, and equipment used for testing various kinds of materials. It is also true that the other government bureaus which supply consumer information make extensive use of Bureau of Standards publications as well as extensive use of the scientists who work in the Bureau.

The Federal Trade Commission is doing excellent work for the consumer. The Federal Trade Commission, a little of the work of which is mentioned on pages 7 and 8 of this book, is another Federal government agency which supplies consumer information of a kind that is extensively quoted and discussed by other consumer organizations, particularly the private testing and rating organizations. The present work of the Federal Trade Commission has become an extremely valuable source of information for science teachers, as well as others interested in consumer education. Between 1914, when the Federal Trade Commission was first authorized by law, and 1938, when the Wheeler-Lea Act was passed, the powers of the Federal Trade Commission were limited to the prevention of unfair competition in business. The fact that a product was unfair to consumers or even produced actual injury to the health of consumers was not sufficient cause for action under the old law. The new Wheeler-Lea Act, however, greatly extends the powers of the Federal Trade Commission. The Commission may now take action to prevent business practices injurious to consumers as well as practices unfair in business competition. The Commission also has the responsibility of preventing false and misleading advertising. In this direction also the powers have been extended within recent years, until now the Commission has clerks and assistants who check each year thousands and thousands of advertisements of newspapers and magazines as well as advertisements in radio continuities. The Commission makes use of technical advice and tests from the scientists of the Food and Drug Administration, the National Bureau of Standards, and the Public Health Service.

The Commission sends upon request its *Monthly Summaries of Work*,<sup>3</sup> which contain brief statements about general investigations, trade practice conferences, complaints, orders to cease and desist from unfair practices, stipulations to cease and desist from false and misleading advertising, and court proceedings. In addition to these *Monthly Summaries*, the Commission also has a lim-

<sup>3</sup> Address Federal Trade Commission, Washington, D. C.

ited supply of the full text of these complaints, stipulations, and orders, which are sent free to those who indicate a specific interest and need. These publications of the Federal Trade Commission are especially valuable because they give brand names of products and the names of the companies which put out these products.

**Consumer services of Federal agencies have several limitations.** In order to make a critical appraisal of the value of government agencies as sources of consumer information for the science teacher, it has been necessary to describe briefly some of the details of the work of those Federal agencies which have a fairly prominent part in connection with consumer interests. Any résumé of the duties and accomplishments of these agencies in the interests of consumers offers an impressive array of aids for consumers. Since they know this fact, one of the chief arguments of those who oppose quite strongly the work of private testing and rating agencies is that there is really little actual danger from all of the fearful examples of harmful and worthless foods and medicines which these testing agencies emphasize. These opponents of the private testing and rating agencies argue that the Federal agencies take care of all of us. Indeed, they often argue so strongly for the fine work done by Federal agencies that one wonders why the same persons or organizations oppose so strongly any proposed extensions of the duties and work of the Federal agencies.

However, an examination of its work shows that there are several limitations in the services that the Federal government supplies. For example, information is available from the Food and Drug Administration and from the Federal Trade Commission only on those products which can be proved worthless or dangerous, or for which untruthful claims are made. Products which may have a slight value, but only slight at the most, are usually able to escape any legal action. It is also true that many products undoubtedly escape legal action simply because the Federal agency concerned has not had an appropriation large enough to enable the agency to carry out a thorough investigation of all products

that might come under its jurisdiction. The Food and Drug Administration has always been greatly handicapped by its small appropriation. A further similar limitation of the work of the Federal agencies is apparent from a consideration of the following figures from *Consumers' Guide* for June 6 and 20, 1938. During 1937 a first reading of advertisements by the Special Boards of Investigation of the Federal Trade Commission indicated some 23,000 periodical advertisements and 25,000 radio advertisements as tentatively misleading. Further weeding out of these nearly 50,000 advertisements resulted in the reporting of only 840. It is a fairly safe guess that many, if not most, of the discarded thousands were misleading but only in a lesser degree than those particularly selected for detailed examination. The necessary conclusion to draw from this discussion of the limitations of the Federal agencies is that the Federal agencies need the additional support of wide consumer education.

A further limitation of the work of the combined Federal agencies is that it tends to omit from consideration certain types of goods in which science teachers are interested. In addition, Federal agencies also omit practically all the services which may be connected with consumer education as viewed from the standpoint of the work of the science teachers. Automobiles are an important example of a type of goods not ordinarily included in the work of the Federal agencies. Similarly, one finds little or no information on the purchase of such services as medical, laundry, and dry cleaning services.

**In spite of limitations Federal agencies rate high as a source of consumer information.** The work of Federal agencies along scientific lines is, in general, highly regarded among scientists. There has been no loss in this high regard when the particular work of the Federal agencies has been concerned with consumer education. Many of the most important types of consumer information given out by Federal agencies have been supported by court decisions or can easily be supported by court decisions. Such facts do not mean that there is no possibility of



the scientific information involved being incorrect, but they show quite clearly that it is extremely unlikely that scientific information so supported is incorrect.

Although, as pointed out, some important types of goods and services are given little consideration by the Federal agencies, it is true that the goods which are emphasized are among the most important ones that need consideration. Foods and drugs are given extensive emphasis, as are also subjects concerned with the purchase of shelter and clothing, the other two of the three major life necessities. In addition to the somewhat narrow coverage of goods by those agencies giving direct consumer service, it is important to remember that the National Bureau of Standards has readily available much information of a type which the science teacher can translate into direct consumer education.

A further fact in favor of government agencies is that they have greater possibilities than other sources of information of being fair to all parties concerned—producers, sales agencies, and consumers. Information given is thus more likely to be correct. It is granted that there are likely to be some partisan influences apparent in the operation of the Federal agencies, but there is nothing inherent in the party organization which would necessarily cause one party to favor producers and the other to favor consumers. Much of the work in these Federal agencies is done by persons who are Civil Service employees and therefore comparatively free from strongly partisan influences. All things considered, the Federal agencies are likely to be the most complete, the most nearly correct, and the least expensive sources of information on consumer materials.

It is often claimed that the entire Federal government setup favors manufacturers and businessmen in general, because these are the groups which are able to exert powerful pressure upon the lawmaking bodies. This claim has a good deal of truth in it, as consumer groups have often seen when they have worked for legislation that seemed to favor consumers as a whole. However, there is opportunity to remedy this situation if consumers become

educated sufficiently to know what they want and to form into groups in order to give the necessary added support to their desires.

Although some of the special bulletins (not periodicals) of the various Federal agencies are one or more years old, much of the information is of a sort that has not changed greatly, and many of the other bulletins have undergone revision. It should be remembered that, when private testing and rating agencies use government information or report actions of the Food and Drug Administration and the Federal Trade Commission, this information reaches the science teacher more slowly and in less complete form than when it comes directly from the government agency. The information may also have undergone interpretations which materially change the meaning the science teacher might have gotten had he read directly the report of the Federal agency concerned.

## Chapter IV

### PRIVATE TESTING AND RATING AGENCIES AS SOURCES OF CONSUMER INFORMATION: A CRITICAL APPRAISAL

Two consumer testing and rating organizations are national in scope. The two testing and rating agencies for consumers, Consumers' Research, Inc., and Consumers Union of the United States, Inc., have been mentioned earlier in this report in connection with the discussion of books and bibliographies. These two organizations, although similar in many respects, have a few fairly important differences. The method of treatment here is a general consideration, in this section, of the nature of the organizations; in the following section, an expression of the major differences between the two organizations; and in succeeding sections, a critical appraisal of the value of their reports as sources of consumer information.

At this writing these two organizations are the only ones of their kind whose work is fairly national in scope. Consumers' Research, Inc., is located at Washington, New Jersey, and Consumers Union of the United States, Inc., has offices and laboratories at 17 Union Square West, New York City. A third similar organization, the Intermountain Consumers' Service, located at Denver, Colorado, is probably not as widely known and appears fairly localized as far as its membership is concerned. These testing and rating agencies test materials sold under brand names and then rate these materials as good, intermediate, or poor commodities for the average consumer to buy. The publications of these agencies also include a good deal of information that is mentioned elsewhere in this report as being the exposure type of

consumer information. Poor, worthless, or dangerous products are discussed in plain, definite terms and with the use of brand names. These are the only agencies or organizations which consider purchase prices in connection with the composition and nature of the articles so tested. They have their own testing laboratories and include technically trained persons among their personnel. It is customary, however, for these agencies to have a high proportion of their tests made by consultants. The consultants may be government agencies, scientists and engineers in universities and colleges, and private testing laboratories which also do research tests for private business firms.

Although advertising agencies and business organizations whose materials may have been unfavorably criticized have accused these testing agencies of underhanded motives, a careful examination of their publications shows no statements or attitudes that support the idea that they are against advertising in general or against business organizations as such. They are, however, strongly and definitely against false and misleading advertising and against the practice of putting out products which are clearly worthless or dangerous or greatly overpriced.

**These testing and rating agencies have interesting differences.** Consumers' Research, Inc., and Consumers Union of the United States, Inc., have three major differences which deserve the attention of persons who plan to make use of their services. The first of these differences has to do with the general organization of the two services. Consumers Union of the United States has a board of directors whose stated purpose is the determination of the policies of the organization. All persons who pay the three-dollar annual fee<sup>1</sup> for the complete reports have full membership in the organization, including the right to vote for members of the board and to help determine policies at the annual meetings. On

<sup>1</sup>The February, 1940, issue of *Consumers Union Reports* announced an increase to \$3.50, for which increased advantages were promised. These advantages include new technical projects; inclusion of more brands; intensified coverage of general consumer news, medical and health information, and problems in consumer services and buying economies.

the other hand, Consumers' Research does not have "members" but instead has "subscribers" who pay a three-dollar annual fee if they wish to receive all the regular bulletins. The subscribers have no voting part in the determination of policies, and the bulletins put out by the agency make no mention of a board of directors.

A second major difference is the fact that Consumers Union includes as part of its information to members reports on labor conditions in the companies which manufacture some of the products being rated. The labor information constitutes a relatively small part of the reports and is stated to make no difference in the ratings. Thus, members who are not interested in using labor conditions as one of the determinants in making purchases may form judgments without any consideration of the labor conditions. On the other hand, Consumers' Research does not concern itself at all regularly with giving to subscribers information regarding labor conditions.

A third difference is the fact that the Consumers Union reports have carried discussions of such consumer interests as the purchase of insurance, socialized medicine, and railroad service. In other words, Consumers Union tends to consider social problems which may concern consumers, while Consumers' Research limits its reports largely to technical facts about commodities.

It is a matter of some interest that Consumers' Research began its operations in 1929 with F. J. Schlink as the organizer. In 1936 Arthur Kallet, who had worked with Schlink in Consumers' Research and who had collaborated with him in the preparation of *100 Million Guinea Pigs*, began the work of Consumers Union. Since the split, there have been times when the two organizations appeared to be in conflict with each other. Needless to say, this is an unfortunate situation for the consumer movement as a whole. An idea of the extent of influence of the two organizations may be obtained from the fact that at the beginning of 1940 Consumers' Research claimed about sixty thousand subscribers, while Consumers Union claimed about ninety thousand members.

**Testing and rating agencies have difficulty in keeping up with changes in goods.** In making a critical appraisal of testing and rating agencies as suitable sources of information for the science teacher, it can be understood that such sources of information are certain to have considerable difficulty in supplying information that is satisfactorily up to date. It is possible for a product to change materially in the period that may elapse between the time tests are made and the ratings appear in print. The difficulty of keeping the information up to date is further increased by the fact that all products upon which reports are given cannot be rated in each monthly bulletin which reaches the consumer. For example, an examination of the October, 1939, issue of *Consumers Union Reports* shows that the following articles are rated: floor waxes, girdles, movie cameras, and canned corn. An examination of indices of previous issues of the *Consumers Union Reports* back to May, 1936, discloses no former reports on any one of these four commodities. Further similar examination of the *Reports*, however, enables one to pick out some repeated articles. Automobiles are repeated about the same month each year. Undoubtedly this repetition in the case of automobiles is made because of the tremendous impact of new models each year. Toilet soaps were reported in the May, 1936, issue and again in March, 1939, nearly three years later. Vacuum cleaners were reported in the December, 1936, issue, washing machines in May, 1937, and neither of these products was reported up to November, 1939, with the exception of three models of vacuum sweepers in March, 1938. Cameras, however, were reported in June (large cameras) and July (miniature cameras), 1937, and again in August, 1938.

Both in *Consumers Union* reports and in *Consumers' Research* bulletins similar illustrations may be drawn from an examination of back issues. It is evident that the purchase of a washing machine or a vacuum sweeper in December, 1939, would have been made with but little more knowledge after consulting the reports than before. In other words, the reports on models three years old may not be at all correct for the newest models.

Science teachers can use outdated reports. Although, as pointed out in the preceding topic, it is very difficult for the testing and rating agencies to supply up-to-date information even about articles of considerable importance, the science teacher can make good use of the reports of these agencies. In giving commodity ratings, these reports and bulletins frequently point out general characteristics which are desirable or undesirable. They indicate worthless and dangerous qualities and in some instances describe methods of judging and testing which the science teacher can adjust to his own conditions. Therefore, in spite of the fact that the actual rating of an article under a particular brand name may be of less value a year or two after tests have been made, it is often possible to make use of the general ideas which have served as background for the ratings. Consumers in general are also able to make similar use of such ratings. As a matter of fact, the detailed information about particular commodities is usually of comparatively little value as a phase of consumer education in the schools. Methods of testing, general ideas which serve as background for ratings, and suggestions for improvement of consumer conditions have immeasurably greater educational values than do details about which brand of an article is a best buy.

In fairness to the testing and rating agencies, it should be said that, although the information in regard to particular brands of products may not be as recent as one might wish it to be, the average consumer has no other source of information which is likely to be as up to date and at the same time as complete.

**Special interests of testing and rating agencies may be the interests of consumers.** In the appraisal of the various sources of consumer education, the criterion of possible special interests is certain to be of great importance. When one considers the possible special interests which a testing and rating agency may have, the field of such special interests seems to narrow down to the interests of consumers alone. The agencies have a service to sell to consumers. It is their task to make this service seem as valuable as possible to consumers. Periodicals which have more

general circulation and engage in testing as a side line have two directions in which their interests may conceivably lie: in the direction of the subscribers to the periodicals and in the direction of the advertisers who use the pages of the periodicals to describe the products they have for sale.

Business organizations which give consumer information about their own particular product have in mind only the sale of their product. Although the way to large and satisfactory sales over a long period of time may be the supplying of entirely satisfactory goods to consumers, there have been frequent cases where sales over a long period of time are not necessarily for the consumers' benefit. An example in support of this statement are products which contain acetanilide, a drug long recognized by the medical profession as dangerous for continued use. Even the Federal government organizations must keep in mind the interests of advertisers, manufacturers, and merchants as well as consumers when they offer services to consumers.

From the standpoint of special interests, then, the testing and rating agencies can be appraised as having a high and somewhat unique place among the various sources of consumer education. However, it is understandable that such agencies may tend to exaggerate the value of their services to consumers. They sometimes use testimonial letters in advertising their own value; and testimonial letters, because of their wide misuse, are generally recognized as rather weak bases upon which to judge any product or service.

**Care must be used in the selection of a testing and rating agency.** Distinctly in favor of the testing and rating agencies mentioned is the fact that their publications carry no commercial advertising and appear to have no connection with companies engaged in manufacturing and selling the products tested and rated.

It is interesting to note that Consumers Union of the United States, Inc., brought suit against an organization known as Consumers Bureau of Standards for alleged imitation of typography and wording of Consumers Union reports. This suit was upheld



in court. The Federal Trade Commission also brought a complaint against Consumers Bureau of Standards. This complaint charged that Consumers Bureau of Standards was falsely advertised as an educational organization maintaining a staff of technicians for investigating, testing, and reporting upon goods and services for the benefit of consumers. The Federal Trade Commission complaint also indicated that Consumers Bureau of Standards had implied that it was affiliated with the National Bureau of Standards of the Federal government, and that certain manufacturers were told that their products would be disparagingly listed if they did not purchase copies of the magazine put out by Consumers Bureau of Standards.

This incident is described here to show that fake testing and rating agencies are very likely to spring up. Perhaps, also, the incident shows that it would not be difficult for an agency operating in a manner acceptable to consumers to change about and become an unsatisfactory agency. The reason for such a change is understandable, especially if the agency should have financial difficulties and need additional income. Clearly, science teachers and other consumers who are interested in receiving reports from a testing and rating agency must examine with care the nature of such reports and must use all available sources in order to judge whether the agency selected to supply testing and rating information is a bona fide organization.

**Special criteria aid in appraising testing and rating agencies.** In addition to the general criteria outlined in Chapter II for an appraisal of sources of consumer information, there are a few special factors which may be considered in the appraisal of testing and rating agencies. One is the variety of products rated. If the variety is fairly large, support is given for the opinion that the agency has few or no special interests in a particular type of product, and that it is attempting to give to consumers as wide a service as is financially possible. Also to be considered in appraising a testing and rating agency is the amount of space devoted to details of the methods of testing. About the most valueless

kind of report that can be given, insofar as persons interested in science are concerned, is the one that simply makes statements that such and such are the facts about a product, while no indication is given about the nature of the tests which served as bases for the report. Testing and rating agencies base their relatively brief descriptions of the nature and method of making tests on the assumption that most of their subscribers and members are interested not in how they arrive at their ratings but only in the conclusions drawn. Persons with training in science, however, can see much more meaning in conclusions when the bases for the conclusions are adequately explained. It is advisable, therefore, for science teachers who make use of testing and rating services to write to the headquarters of the agency and ask for additional details on the methods by which ratings are made. In these tests and methods lies the greatest educational value to all consumers. If, as the testing and rating agencies claim, most consumers are not interested in the methods of testing, it is time for such interest to be aroused. As previously indicated, the completeness with which such methods are described is a good criterion by which to appraise the faithfulness of the agency.

Still a third factor which aids in the appraisal of a testing and rating agency is apparent in a consideration of the people who lend their public support to it. In illustration, one may consider the list of sponsors which Consumers Union of the United States, Inc., will send to anyone making a request. This list is fairly extensive and includes a number of distinguished names in social work, literature, education, and science. These sponsors offer the use of their names as indicative of their interest in the work of Consumers Union and of their belief in the integrity of the organization.

The January, 1940, issue of *Consumers Union Reports* announced that a working relationship had been established with the Boston-Cambridge and New York branches of the American Association of Scientific Workers. According to the announcement, the Association through a consumer committee "will help

Consumers Union technicians in setting up standards and methods of tests, and will advise on the conduct of tests and in the interpretation of findings." The announcement continues with a description of the aims of the scientific organization and the names of some of its notable sponsors and members.

It is too early to predict the value of such a working agreement, but it seems to hold much promise for consumer education and its relation to science.

**Testing and rating agencies are limited by their low income.** Several factors limit the amount of testing which a private testing and rating agency may do. In the first place, there is the difficulty of financing the organization. The services offered by the testing and rating agency are expensive to supply. A highly trained personnel is greatly needed, and highly trained people are often difficult to get unless they are assured satisfactory incomes. The testing itself is expensive, whether it is done by outside laboratories or individuals or in the laboratories of the organization. It is expensive to purchase the products to be tested, and one of the most important claims of the agencies is that most of the articles upon which tests are made are purchased in the open market at regular retail prices. The preparation, printing, and distribution of reports is expensive, and must be borne chiefly by one major source, and that source is the sum of the membership fees which are paid into the organization. Two other sources of income are gifts from persons interested in the consumer education movement and the income from books published by the organization. Ordinarily these books are ones which have been written by persons in the employment or management of the organization and are of a consumer education nature.

Those who strongly oppose the work of testing and rating agencies find in the cost of operation and in the publication of books two of their chief objections. These opponents attempt to show that not enough money is available to make adequate and worth-while tests. The opponents also state that the publication of books is done to make profit out of agencies which are claimed

to be nonprofit organizations. The testing agencies themselves claim that the profits of any books published by the organization go into the general fund of the organization in order to improve and extend its work. However, they do not deny that the individual authors of the books receive royalties to which they are entitled because of the extra labor and knowledge required to do the writing.

**Testing and rating agencies can include only a few of the numerous brands.** The testing and rating agencies are limited in the number of brands of a particular product which can be tested. When a testing and rating agency attempts to select particular makes of products to be tested, it must be governed to a considerable extent by consideration of which brands are being sold in largest quantities and most widely. If the agency has members scattered throughout the country, it is evident that nationally advertised and nationally sold articles will be the chief ones tested. Other articles that receive emphasis in testing are those which may be purchased in the particular locality in which the testing is to be done. Greater New York, then, becomes the favored locality for both Consumers' Research and Consumers Union, although the latter maintains a West Coast service especially for residents of that section. It can be seen that these conditions tend to favor greatly products which are nationally advertised, especially if any one such brand happens to merit approval, in preference to the others tested. A product produced and sold in a restricted locality, although it is of outstanding quality and low priced, then tends to be neglected by purchasers who make use of the reports of the agencies.

The testing agencies attempt to overcome this limitation in several ways. They have buyers who make purchases in various parts of the country, especially in the regions of large cities; their testing is done in laboratories which are somewhat scattered; and they request members to bring to their attention products of local origin which seem to have particular merit.

The testing agencies are also limited by the fact that they cannot

possibly test all the brands of a particular product or even a high percentage of such products. For example, the number of brands of a comparatively expensive product, such as vacuum sweepers, which can be tested is likely to be well under 10 per cent of the total number of brands being sold in the country. Still another limitation exists because only one or two articles of a particular make are tested. If these happen to be different from the general run of articles of the particular brand the results of the tests are worthless. All consumers are well aware that perfect uniformity does not exist, whether the article be a vacuum sweeper or a shirt, an automobile or a can of tomatoes.

Testing and rating agencies do only a small portion of their own testing. Several times, thus far in this book, it has been indicated that the testing and rating agencies do only a small portion of their own testing. Judged by statements in their reports and bulletins, a considerable amount of their information comes from the National Bureau of Standards, the complaints of the Federal Trade Commission, and the judgments of the Pure Food and Drug Administration. In addition, many of their reports on foodstuffs are based upon the work done by graders in the United States Department of Agriculture. The testing and rating agencies also have tests made by private testing laboratories which make tests for large industries, and by scientists and engineers in colleges and universities. The tests made in the laboratories of the testing agencies are generally ones which can be made without the use of expensive apparatus, or involve only checking of some features of the tests made by other laboratories.

There are two ways to look at the fact that the testing and rating agencies do only a small part of their own testing. One view is that it would be more desirable to have the agency do its own testing. In the long run, after testing equipment is available and enough well-trained technicians are employed in the agency's own testing laboratory, the testing might be done at a lower cost. Further, it seems very likely that the general buying public would have greater confidence in the work of the agency if it were known

that the agency had large, well-equipped laboratories manned by well-trained and capable technicians, and was able to do all of its own testing.

A second view is that it is better to have most of the testing done outside the agency's own laboratories. Such a method permits the testing to be done by persons who are highly specialized in a particular line of work. This method also permits the use of testing apparatus of several different kinds, apparatus which is so expensive that no one laboratory could be expected to have all of it. Still another possible advantage is that testing done in an outside laboratory with additional checks used by the testing agency may be more effective and more complete than testing and checking done entirely in one laboratory.

Testing agencies devote considerable space to relatively unimportant articles. As one reviews the work done by the testing and rating agencies in the past, there appear to be numerous examples in which much time has been given to testing and considerable space in the reports and bulletins has been devoted to relatively unimportant articles. In making this statement, it is realized, however, that articles which are considered relatively unimportant by one person may be considered quite important by another. A few illustrations of articles which the writer thinks are relatively unimportant are hot-water bottles, fish baits, electric shavers, electric heating pads, and sunburn preventives. These articles are so considered either because (1) they are purchased once or only a few times in one's lifetime, or (2) they are relatively inexpensive and purchased only a few times, or (3) only a small percentage of people ever expect to purchase them at all.

To illustrate further, the presence of potassium chlorate in Pebeco tooth paste has, for several years, been made the subject of numerous discussions in books and in the regular reports of testing and rating agencies. A great deal of fuss has been made over the fact that potassium chlorate is a dangerous poison and that the tooth paste should be labeled accordingly. Since adults do not generally eat tooth paste, and since the small amounts that one

might accidentally swallow in cleaning the teeth are not dangerous, the possibility that children might eat part of the contents of the tube has been emphasized. The point of this illustration is simply that the subject is not important enough to be emphasized as greatly as it has been. It cannot be denied that potassium chlorate is poisonous, and that children should not eat tooth paste containing it. Nor can any reason be seen for including potassium chlorate in a tooth paste. From the standpoint of danger, however, it seems that more should be written on the possibility that children might eat the cigars or cigarettes, for example, which are plentiful and within reach in most households. Surely a better case could be made for the dangers of poisoning from these articles than from a tooth paste which is not made to be eaten. Incidentally, the writer has never used Pebecco tooth paste and has no interest in its manufacture or sale, and knows no one who is interested in its manufacture or sale. The subject is mentioned simply to illustrate the tendency which testing and rating agencies seem to have toward emphasizing subjects of relatively little importance.

It is also true that the testing and rating agency may have made the selection of articles for testing with some particular reason in mind which the present writer is unable to understand. Nevertheless, it does seem desirable that agencies adopt a fairly regular method of selecting the kind of product which is to be tested and rated. Critical judgment of several subscribers indicates that, from the subscriber's viewpoint at least, the selection of products to be tested and rated has seemed haphazard. Such a condition is certain to lessen the usefulness of the reports and bulletins that come to the consumers.

**Physicians have opposed medical information given by testing and rating agencies.** It may be that the opposition of certain members of the medical profession to medical information given in the reports of testing and rating agencies results from the feeling that the giving of medical advice is exclusively a professional function. Or the reason for the opposition may lie

in the belief that information of a medical nature should not be handed out generally through the medium of the printed page, but should, instead, be given by the physician directly to the individual needing advice. However, the latter belief is not consistent with the practice of members of the medical profession in publishing *Hygeia*, a magazine which includes the discussion of many subjects of direct interest to those needing medical advice, or in the publication of many books which give general medical advice.

The objections given in the publications of the testing and rating agencies to the use of nose drops with a mineral oil base form an interesting case for illustration here. In several of these publications, nose drops with a mineral oil base are lengthily condemned because of the fact that oil droplets sometimes find their way to the lungs and cause the development of pneumonia. Particular danger is stated to exist in the case of children. This information in the agency reports and bulletins is based upon investigations and conclusions formed by doctors who were interested in the possible effects of such nose drops. In connection with this condemnation of nose drops with a mineral oil base, the writer has personally questioned seven physicians during the last two and a half years. These physicians were practicing in large cities and included specialists in nose and throat work and general practitioners. Not one of them agreed that there was sufficient evidence to indicate danger of pneumonia from the use of such nose drops. Four of the seven appeared to be well acquainted with the investigations and conclusions which the rating agencies had used as a basis, and to have obtained their information from professional journals or reports. It was also pointed out that in the case of certain types of lung x-rays, a mineral oil containing a substance impervious to x-rays is actually injected through the chest into the lungs, where it is expected to remain indefinitely without any known danger to the patient.

The writer is not attempting to support the contention that nose drops with a mineral oil base do (or do not) lead to pos-



sible development of pneumonia. No matter which side of this disagreement one may choose, the important thing is the fact that there is often likely to be considerable disagreement with the reports of testing and rating agencies on medical questions, and such disagreements are not likely to react in favor of the rating agencies.

Rating reports are confusing because of weightings given to different qualities. After laboratory tests of commodities are made and results are checked and agreed upon, it is still possible for the ratings of two testing and rating agencies to be quite different. This may happen even when the laboratory tests made for or by the two agencies are practically identical. A very simple illustration will serve to show how other similar, or more simple, or more complex, situations may exist for almost any product rated. Suppose that electric refrigerators have been tested and that five qualities are being considered; these five qualities are effectiveness of insulation, minor conveniences, ice production rate, operating cost, and safety from the standpoint of the nature of the refrigerant and freedom from electric shock. Assume that ratings are made on the basis of 100 points divided in the manner indicated in the following tabulation for two separate rating agencies:

	Agency A	Agency B
Effectiveness of insulation	20 points	15 points
Minor conveniences	20 points	15 points
Ice production rate	20 points	15 points
Operating cost	20 points	15 points
Safety	20 points	40 points

It is evident that Agency B gives to safety an arbitrary value which makes that feature twice as important as it is in the arbitrary rating given by Agency A. It is also clear that the same refrigerator may occupy an entirely different position in a rating schedule when these two agencies are doing the rating.

This illustration is offered to show that the ratings of any one agency are likely to give unusual weight to a quality which the consumer may not think is important. In the rating

of practically any article this arbitrary and relative weighting of various qualities is certain to appear, the relative weighting depending upon the person or persons who consider the qualities. The chances are that ratings are often made without assigning any definite number values to the different qualities. Instead, the qualities are probably grouped together and the person doing the rating draws a generalization which suggests the position of the particular brand in the rating scale. Obviously, as suggested in another connection in this book, the solution to the problem is that testing and rating agencies supply, with their ratings, more information about the methods of testing and the weighting given to the various qualities considered in the rating.

Closely associated with the variation in weighting of different qualities is the relation of price to quality in general. For illustration, assume that an article which costs one dollar is of a considerably higher quality than a similar article which costs only seventy-five cents. It is not difficult to understand the problems involved in determining which one of these articles is to be given the higher rating. Again, it must be concluded that in order to supply maximum service, the testing and rating agencies need to explain the use of some definite manner in which conclusions are made regarding the final rating. Occasionally the problem of price in relation to quality in rating is met by supplying a separate rating based on quality alone. There is also a problem here. The degree of difference in price is apparent to the consumer, but the degree of difference in quality is difficult to determine and to state.

**Testing and rating agencies probably serve a special group of consumers.** Some of the limitations of testing and rating agencies indicated in earlier sections of this chapter are more understandable in the light of answers given to questions sent out by Consumers Union.<sup>2</sup> The questionnaire was sent to Consumers Union members, and answers were obtained from about

<sup>2</sup> For a preliminary report on the questionnaire, see *Consumers Union Reports* for October, 1939.

fifteen thousand. Among other information gleaned from this questionnaire, Consumers Union reports that the largest single group of members are professional workers and, among these professional workers, teachers and school administrators make up the largest division. As far as this book is concerned, the most significant point shown by the results of the questionnaire is the fact that the median income of Consumers Union members was about \$2,600 per year. Five per cent of the members answering the questionnaire had yearly incomes of less than \$1,000, and 13 per cent had yearly incomes of over \$5,000. In 1935-36 the income of an average family in the United States was about \$1,200;<sup>3</sup> more than 41 per cent of the families had incomes below \$1,000 per year and less than 3 per cent had incomes above \$5,000. It can readily be seen that the members of Consumers Union do not form an average group of consumers. Rather, they appear to be a select group as far as profession and income are concerned. Perhaps this condition makes more understandable the kinds of commodities which are emphasized for testing and rating. According to the results of the questionnaire, the five most popular reports, in order of popularity, dealt with automobiles, soap, radio sets, men's shoes, and canned vegetables and fruits. This result also tends to emphasize the fairly high income level of the Consumers Union members. It seems safe to conclude that the income level of Consumers' Research subscribers is not lower than the level of Consumers Union members, because Consumers Union emphasizes its labor interest and therefore probably has more members from the relatively low income group composed of the so-called workers.

It is evident from the preceding paragraphs that if the testing and rating agencies satisfy the interests of their subscribers and members, then they cannot serve equally well an average cross section of consumers. Therefore, in selecting materials for study in consumer education, science teachers cannot be guided by those

<sup>3</sup> This figure and the two following ones are approximations adapted from National Resources Committee, *Consumer Incomes in the United States*. U. S. Government Printing Office, Washington, D. C., 1939.

commodities which are emphasized in the reports of the testing and rating agencies. Instead, it seems reasonable to conclude that any choice of commodities for study in consumer education should be made on the basis of the relative amount of money spent by the average consumer and the relative importance of the commodities to the consumer's health. On these bases, food and health and medical service are certain to outrank all other subjects. As far as average consumers are concerned, automobiles, radios, cameras, and electric razors must rank rather low as commodities which should be studied.

**Testing and rating agencies deserve consumer appreciation and support.** In spite of the limitations of the testing and rating agencies which are outlined here, there are several reasons for according them extensive support. In the first place, as was pointed out, many of these limitations are direct results of the low income which such agencies have for the support of the work they are attempting. In the second place, the leaders and directors of the agencies recognize quite fully their own limitations and shortcomings, probably much more fully than anyone else does. Although they tend to argue in favor of the services now offered to consumers, these agencies are often quite frank in admitting their own limitations. Such a policy is distinctly in their favor. A third reason is that consumers can make use of organizations which, in effect, stand off and look at the consumer services being offered by the Federal government and by other agencies. There is need for these services to be examined, described, and criticized. There is need for someone to attend court sessions in which Federal agencies take part, to keep in touch with proposals in Congress which deal with consumer affairs, and to make reports and interpretations for consumers. A final reason for giving support to the authentic testing and rating agencies is the unquestionable fact that their work, limited as it is, has been largely responsible for maintaining the growth of the consumer movement. Their harsh and open criticisms of worthless goods and false and misleading advertising have made apparent to many

people the need for improvement in the conditions existing in consumer buying. Although there is no way of proving this statement, these agencies, probably more than any others, deserve the thanks and the support of consumers. Without question, even the increased local, state, and Federal government aids for consumers have, directly or indirectly, resulted in a large part from the work of the testing and rating bureaus.

## Chapter V

### PROFESSIONAL ASSOCIATIONS AND RELATED SOURCES OF CONSUMER INFORMATION: A CRITICAL APPRAISAL

Some associations giving consumer information were organized for other purposes. The development of the material of this chapter assumes a slight relationship that may not exist between such professional organizations as the American Medical Association and American Dental Association, the research work of colleges and universities, the American Home Economics Association, periodicals of general interest, and publications of business organizations. It is assumed that each of these associations or companies was formed primarily for some other purpose than to aid in giving consumer education, and that the consumer services offered are relatively minor activities. Each of these organizations has special interests which are not necessarily the interests of consumers in general. Although this condition varies within wide limits, it is operative to some extent in all of the consumer aids mentioned in this chapter.

At the outset, it may be pointed out that the consumer work being done by the American Association of University Women,<sup>1</sup> the General Federation of Women's Clubs,<sup>2</sup> the National League of Women Voters<sup>3</sup> and possibly similar organizations is not described here. Such omission does not indicate that these organizations are not engaged in doing valuable work for consumer education. As a matter of fact their general influence has unques-

<sup>1</sup> American Association of University Women, 1634 I St., N.W., Washington, D. C.

<sup>2</sup> General Federation of Women's Clubs, 1734 N St., N.W., Washington, D. C.

<sup>3</sup> National League of Women Voters, 726 Jackson Place, Washington, D. C.

tionably been very great. They support consumer education in schools, work for laws designed to improve consumer conditions, provide speakers for groups wishing additional consumer information, and supply pamphlets and other printed materials dealing with consumer education. These materials are high grade and usable, but ordinarily they are gathered from sources which are described more completely in various parts of this book. In other words, the chief work of these groups along consumer education lines has been the organization and dissemination of material from other, more direct sources, and the exerting of pressure for consumer legislation.

One distinguishing feature of a consumer education nature supplied by the General Federation of Women's Clubs is a consumer information radio program. The programs which the writer has been able to hear seem to have considerable value for consumers in general.

**The American Medical Association supplies consumer information on health goods and services.** For many years the American Medical Association has been supplying consumer information on nostrums and quackery in connection with health. As pointed out earlier, several books on consumer education have been written by members of the Association. In addition to the books, there are available at relatively small cost a number of pamphlets on a variety of subjects connected with food products of a nonmedical nature, with apparatus and methods employed in physical therapy, and with nostrums and quackery. Upon request one may obtain from the Association a pamphlet which describes briefly all other pamphlets<sup>4</sup> available and gives the price of each. To quote from its bulletin, the Association now has a "Council on Foods which awards a seal of acceptance to foods which are advertised honestly and which represent therefore true value for the consumer's money from the standpoint of safety, nutrition, full weight, and lowest representation."

<sup>4</sup> Write to American Medical Association, 535 North Dearborn St., Chicago, for its "Health Publications Price List."

An invaluable aid for the science teacher, as well as an excellent reference for students, is the magazine *Hygeia*, published by the American Medical Association. This magazine is issued monthly and contains a great deal of material on the subject of health education as it concerns the consumer. Articles are included on food, drugs, nostrums, quackery, and other satisfactory or unsatisfactory products and procedures in connection with health.

There is little doubt that the consumer information given in the publications of the American Medical Association is as authentic and dependable as is obtainable anywhere. Anything that appears in the publications of the Association is certain to be read by many others in the profession, and material that does not have the general agreement of the members of the profession seldom appears in print. Except for the material which appears in *Hygeia*, the publications of greatest interest to the consumer are sometimes not as up to date as one would wish.

**The American Dental Association supplies restricted consumer information.** As might be expected, the consumer information available from the American Dental Association is confined to subjects having to do with the teeth. This field, however, while not of a very wide scope, has had a comparatively large place in consumer education work in the past. This is the case probably because of the extensive advertising which is done in the field of dentifrices, the numerous fakes which have been practiced, and the high cost of dentifrices in view of their composition and method of manufacture.

The American Dental Association has a Council on Dental Therapeutics, which supplies information of value to the science teacher. All publications of the Council appear in the *Journal of the American Dental Association*. The Council also supplies information in mimeographed form on dental products of interest. The nature of this mimeographed material is shown by the following titles: "Denture Cleaners," "Adherent Powders for Dentures," "Mouth Washes," "A Formula and Method of Preparation for Tooth Powder," "Dentifrices Acceptable to the Council



on Dental Therapeutics." This last named bulletin is of special value because it carries a date and is kept up to date. The Seal of Acceptance is awarded to dentifrices which present to the Council a complete formula, give satisfactory evidence of safety, and confine their advertising claims to the cleaning of accessible surfaces of the teeth. Since prices are not considered, the Seal of Acceptance is not necessarily a recommendation of one dentifrice in preference to another which has also received the Seal.

For the science teacher there is no better source of information about dental subjects than this Council on Dental Therapeutics of the American Dental Association, although the more complete reports which appear in the *Journal of the American Dental Association* are likely to be of greater value than the mimeographed bulletins.

As the science teacher considers the special interest criterion in appraising the various sources of consumer information, it is necessary for him to remember that both the American Medical Association and the American Dental Association have their own interests in mind as well as those of the consumer. For example, the long fight that the American Medical Association has waged against chiropractors, osteopaths, and others who have developed health treatments to which the medical profession does not subscribe cannot be considered to have been waged entirely in the interests of consumers. Even the strong protests which the American Medical Association makes against fake and dangerous remedies sold through advertising must be viewed in the light of the fact that many people probably try these advertised remedies because they feel the costs of legitimate medical service are high. This statement is in no way an indication that the fake and harmful remedies are not so bad as they are made out to be; it simply means that the protests of the American Medical Association are not wholly as altruistic as one might wish them to be. Neither is the statement to be taken to mean that the consumer information offered by these two professional associations is anything less than the best.

The American Home Economics Association supplies consumer information. Since its organization in 1909 the American Home Economics Association has been interested in consumer education, and the *Journal of Home Economics* has carried numerous articles on the subject. At present, in addition to the articles that appear in the *Journal*, the Association also has a special Consumer Education Service which is sent out as a mimeographed news letter from September through May at a subscription price of one dollar. According to an announcement sheet, this Consumer Education Service includes "annotated listings of new publications, reports of progress in standardization and grade labeling, news from governmental departments and regulatory agencies of interest to consumers, news of legislation, trade promotion and advertising campaigns, developments in the cooperative movement, reports of consumer projects, and suggestions for new projects."

The Association has also available for a small charge numerous pamphlets as well as reprints of articles published in the *Journal*, which are likely to be helpful to the teacher of science. As might be expected, these publications refer chiefly to articles of food and clothing, with some attention given to household articles. Most of the members and officers of the American Home Economics Association are teachers, either in the public schools or in the colleges and universities. Therefore, one hesitates to question in any way the complete dependability of the consumer information available. In view of possible special interests, however, it may be said that many of the members and some of the officers of the Association are employees of business firms which are not entirely on the side of consumers. The *Journal* also carries the advertising of these business firms and similar ones but has refused advertising offered by Consumers Union. Probably this situation means nothing more than a somewhat neutral policy on the part of the Association and its journal insofar as the consumer question is concerned. On the whole this policy appears to resemble the policy adopted by the best of the big business firms toward consumers.

Science teachers can use consumer information from the National Better Business Bureau. It is highly desirable that the science teacher become acquainted with the pamphlets of a consumer information nature which are issued by the National Better Business Bureau, Inc.<sup>5</sup> The Better Business Bureau is an organization composed entirely of business firms, and such an organization may well be expected to exhibit a strong bias in favor of its own members. If science teachers assume that this strong bias exists, the consumer pamphlets of the National Better Business Bureau can be examined with profit. Although they are prepared primarily for members of the Better Business Bureau, these pamphlets are very well written and, on the whole, state the general situation in regard to certain types of products in a very fair manner. No trade names are mentioned in the pamphlets.

Representative pamphlets that are likely to be of particular interest to the science teacher are entitled *Facts You Should Know about Buying Used Cars* and *Remedies for Coughs and Colds*. The last named subject is stated to have been based in part upon an analysis of stipulations and cease-and-desist orders of the Federal Trade Commission. The following quotation indicates something of the correctness of this source of information:

There is no generally accepted theory as to the cause or causes of colds. Some copy has given the impression that a cold is caused by a germ or that acid is responsible for a cold. While there may be some authorities who support these or other theories, it has not yet been definitely determined just what is responsible for a cold. Consequently, no definite statement as to the origin of a cold should be made.

These pamphlets of the National Better Business Bureau are quite strongly recommended to science teachers for three reasons. In the first place, if the science teacher is working in a community in which he thinks his position might be endangered by emphasizing strongly certain types of consumer information, he can be

<sup>5</sup> Address National Better Business Bureau, Inc., Chrysler Building, 405 Lexington Ave., New York, N. Y.

in no possible danger from business interests if he uses material from the publications of a well-known organization of businessmen. Second, the science teacher can be sure of correct and dependable information from these pamphlets if he considers only those statements which are directed against certain practices and types of products. He can be certain that material put out by a business organization is never going to be too extreme against the practices and products of business firms themselves. However, it is wise to consider with care any statements which favor existing practices and products. In the third place, the science teacher should know about these pamphlets because they are indicative of the rapid advances that are being made by consumers toward the time when they may expect to come close to getting their money's worth without any revolutionary change in business or government.

**Testing bureaus and informative labeling are consumer aids offered by large department stores.** The science teacher needs to know about the steps taken by a few large department stores toward furnishing consumer education. Although the stores indicate quite strongly the importance of their consumer aid, the writer is forced to the conclusion that the aids offered by such testing laboratories and by voluntary informative labeling are not as extensive as the consumers are often inclined to believe. The informative labeling is applied to only a few things that the stores sell, and in the cases where such labeling is used it often leaves much to be desired from the standpoint of completeness. Likewise, the testing laboratories, even in the stores where they have been longest in operation, are limited to a relatively small number of the articles. A suspicious person is likely to conclude that the testing laboratories serve their chief purpose very directly for the store in helping the store buyers to be sure that manufacturers or wholesalers have not misrepresented their materials. In an indirect way such testing may react to the favor of consumers.

**Magazines of general interest promise consumer assistance.** With the growing interest in consumer education, it is not surpris-

ing that magazines should attempt to make use of this interest. However, some magazines seem to have adopted practices which can meet with little approval on the part of science teachers. For example, one finds the statement quoted below in material entitled, "The Consumer and Her Medicine Chest" and stated as "Written for Consumer Division of Crowell Publishing Company" by Marguerite Mooers Marshall:<sup>6</sup>

Today she [the housewife] can perform her natural duties of home medication with a confidence never possible to her ancestors because at her service are hundreds of standard remedies, scientifically developed, compounded, tested and packaged. They cover a wide variety of products, from a scientifically mixed toothpaste to an unguent which will relieve the pain of a severe burn; from a liniment which will ease the ache of a wrenched ankle to a tablet which will soothe an aching head; from a salve which will heal chapped lips to a codliver oil that will build up a depleted system. These standard packaged remedies contain no bogus drugs. They make no bogus claims. They offer complete consumer protection by means of a double check; on the one hand the system of inspection and the enforcing arm of the U.S. Government; on the other side the honest and progressive manufacturer's laboratory control of production and voluntary censorship of advertising.

The science teacher will find little in this persuasive statement to add to his supply of consumer information. Indeed, it is interesting that even the National Better Business Bureau does not agree with the preceding quotation, for in *Facts You Should Know about Health Cures*, one of the pamphlets published by the Bureau, appears the following:

There are many fields of human activity where action, without the benefit of specialized knowledge, is sometimes a dangerous thing. . . . So it is with self-medication. To the uninitiated, the law, corporate finance or the mechanics of a motor car are all complicated and, often, mysterious subjects. But the human body is the most complicated mechanism ever created. Not all of its processes are completely understood even by those who devote their lives to a study of them. It is not surprising, therefore, that persons without medical training who attempt to diagnose and prescribe for their serious ills often do themselves irreparable harm.

<sup>6</sup> The material carries no publication date. The Crowell Publishing Company publishes *American Magazine*, *Collier's*, *Woman's Home Companion*, and *Country Home Magazine*.

"Good Housekeeping" has gone farthest in claiming consumer aids. For several years the magazine *Good Housekeeping* has been indicating that it gives a number of consumer aids. Among the practices which *Good Housekeeping* has followed and advertised as consumer aids are: (1) The issuance of various seals of approval to manufacturers. (2) The statement in its pages that it guarantees every product to be as advertised in the magazine, and the indication that *Good Housekeeping* assured its responsibility for the satisfactory quality of merchandise advertised.

Such services, if valid, would certainly supply a splendid service to consumers, and would be an invaluable source of consumer information for science teachers. It seems, however, that *Good Housekeeping* went much too far in its promises, since on August 17, 1939, the Federal Trade Commission issued a thirteen-page complaint against the magazine for false and misleading practices in connection with these promised aids. At this writing (April, 1941) a decision has not yet been rendered, but it seems fairly certain that *Good Housekeeping* will modify or stop some of its advertised practices in connection with consumer education. The following examples, among others, were used in the complaint by the Federal Trade Commission to show that "products purportedly tested and guaranteed by *Good Housekeeping*, actually contained grossly exaggerated and false claims for the products so advertised and purportedly guaranteed":

1. A bath powder which the manufacturers claimed would make the body beautiful easily and quickly, would cleanse the pores as they could not otherwise be cleansed and make skin imperfections disappear and the body take on new loveliness, when in truth and in fact the preparation contained no such properties;

2. A cosmetic which it was claimed would furnish an extra supply of vitamins for the future needs of smart girls who cared to provide against the loss of the "Skin-Vitamin." The product would produce no such results;

3. A cosmetic claimed to refine the pores to invisibility, remove puffiness from eyes, change sallowness to a transparent delicacy; cool, smooth and freshen the texture of the skin and pick up the contours. In truth, and in fact, the preparation would produce no such results;

4. A proprietary medicine which it was claimed would destroy pimples in sixty seconds and kill the "pimple germ," when in truth and in fact the preparation would not accomplish the results claimed. •

From the discussion of consumer aids in this and the preceding topic, it is very evident that magazines of general interest which accept extensive advertising of products that consumers may use cannot be considered dependable sources of consumer information. The science teacher, however, needs to know about these sources in order that he may assist students in reaching suitable conclusions about sources of consumer information.

**Commercial companies offer possible sources of consumer information.** Companies engaged in many kinds of business offer consumer information, usually in connection with the products or services which they have for sale. Some indication of this type of "consumer information" is the fact that in Mann's *Bibliography on Consumer Education* (1939) there are listed and described 266 such commercial sources purported to give valuable aids to consumers. Under a number of these headings several different publications are listed, so that actually the total number of such commercial publications is far more than 266.

Many of these commercial publications give correct and worthwhile information of a consumer nature, although it is safe to assume that some of them are certain to be biased in favor of the organization that is supplying the information. Usually these commercial publications are free to those who ask for them, a fact which indicates that the company expects the publication to react in favor of the product. An illustration of such commercial publications which are certain not to express undesirable bias are the publications on health, safety, and disease put out by the Metropolitan Life Insurance Company. Because of the nature of the business of the Metropolitan Life Insurance Company, it is evident that there can be no special interest in the publications which will not also react to the advantage of the consumer. It is distinctly to the interest of this company for people to live longer with greater freedom from accidents and ill health. These pamphlets

undoubtedly contain correct and dependable information for use by the science teacher.

In spite of the fact that some commercial publications may be satisfactory sources of consumer information for the science teacher, it appears advisable in general to refrain from using them as entirely dependable sources. There are two reasons for this conclusion. In the first place, it is usually difficult to pick out the correct and dependable information from that which is highly biased and, not infrequently, untruthful. In the second place, as one reads the material included in these publications and continues to read extensively from other more authentic sources, it becomes increasingly apparent that the commercial publications contain little consumer information that is not available from the other sources. Since the commercial publications are often very plentiful in the various departments of the schools, probably because they are supplied free, it is recommended that the science teacher seriously consider replacing them with material from other sources appraised more highly for consumer information. However, neither the comments under this topic nor the preceding recommendation should be taken to mean that the science teacher should be unacquainted with the existence and nature of these commercial publications. Students, too, should be acquainted with them. It appears to be the definite task of science education to make sure that the general nature and shortcomings of commercial pamphlets as sources of consumer information be made clear.

**Research in educational institutions is a valuable source of consumer information.** In many of the colleges and universities throughout the land, extensive and valuable researches are being carried on in relation to subjects and products of direct importance to consumer education. Such research work is growing more and more extensive as the interest in consumer education mounts. The greatest defect of this research work is that, all too often, the results are not made available to the general public. It is not difficult to understand the reason, since strong objections



would often be made by the business interests which might be unfavorably affected.

It is also possible to understand how research itself in some instances might be unfavorably affected. Scientists in colleges and universities not infrequently are retained as technical advisers for certain industries. If, for example, a chemist in a university is also paid to be a technical adviser for a paint company, it is possible to understand, in view of the special interest criterion, that research results might undergo modification. Sometimes, also, commercial companies finance research which is carried on in universities. If such research work were distinctly unfavorable to the products of the company financing the research, the results probably would not be published.

On this general subject J. B. Matthews expresses a somewhat extreme viewpoint which, nevertheless, deserves the attention of those interested in consumer education:

Education, too has been sucked into the general system of coordinating all major social institutions with the purposes of merchandising. Free education, like the free press, exists in name only. Agricultural colleges and the home economics departments of colleges and universities in particular have been made all too often into propagandizing adjuncts for the producers of commodities. They have been all the more valuable as adjuncts to business on account of their supposed freedom. The wise consumer will attach little importance to the findings of a state college of agriculture on the subject of milk when that college is located in an important milk producing state; or to the findings of a home economics department of a university on the subject of dried fruits in a principal fruit growing commonwealth such as California; or to the findings of a university home economist on the subject of bran when it is known that one of the great "breakfast food" companies has subsidized her study of the subject; or to the findings of a biologist on the subject of bottled beverages when his university and the Coca Cola Company were founded by one and the same family.<sup>7</sup>

It is doubtful that the picture is as bad as this quotation states. Most of the researches made in educational institutions are free from serious pressure influence. The small number, however, that are found not to be free produce a disturbing situation.

<sup>7</sup> Matthews, J. B. *Guinea Pigs No More*, pp. 182 and 183. 1936.

Nevertheless, more and more of the results of college and university researches on subjects of consumer interest are being made public through pamphlets which are often free or which are available at very low costs. The science teacher needs to investigate the publications of research work of his state-supported colleges and universities and the research publications of other colleges and universities near his place of work. It is fairly certain that the number of such researches available will increase. As indicated in an earlier part of this report, *Consumers' Guide* frequently carries descriptions of such researches made by state and agricultural colleges and universities. In this connection, one of the important generalizations toward which science teachers should work in their consumer education classes is that the results of research of consumer interest in colleges and universities need to be given wide publicity.

**A study of sources of consumer information may produce a changed viewpoint.** The science teacher, as he makes a more and more extensive study of sources of consumer education, may find that his idea of the relative merits of the various sources has undergone changes. It must be admitted that the appraisal of some of the important sources, as outlined in this book, was undertaken with certain preconceived ideas about the relative usefulness of the various sources. These ideas had been formed from occasional contacts with these sources rather than from any systematic and fairly complete investigation. One of the author's preconceived ideas was that Federal government sources were somewhat meager in extent and were not likely to be very useful. Another was that the private testing and rating agencies probably formed one of the best sources of information. It was not realized that much of this type of information on rating of commodities was of temporary value. It was also considered that commercial publications would supply the most extensive source of information because it was believed that these publications included much material that could not be obtained elsewhere. The books that were considered highly superior were those written by persons con-

nected with the private testing and rating agencies. It has been interesting throughout the investigation to note the changes that came in these preconceived ideas.

**Federal government agencies lead all other sources of information.** The summarizing conclusions outlined briefly in this topic are supported much more extensively in the preceding chapters of this book.

1. As he begins work with consumer education, the science teacher needs a background which he may get by examining books of the three types described earlier: (*a*) the somewhat sensational exposure type of book; (*b*) the intermediate type of shopping guide ordinarily prepared by business people; and (*c*) the strong opposition type written to refute type (*a*) and even occasionally to condemn certain Federal agencies.

2. For the science teacher the most strongly recommended sources of information on consumer education are the various Federal agencies. Chief among these are the Federal Trade Commission, the Food and Drug Administration, and the National Bureau of Standards. At this writing (1941) the two most illuminating, although brief, publications are the thirteen-page complaint against *Good Housekeeping*, prepared by the Federal Trade Commission, and the provisions of the new Food, Drug, and Cosmetic Act, which became a law in 1938. Based upon the the criteria of extent of the field covered, dependability of information from a scientific standpoint, lack of special interests, and very low cost of information, the Federal government agencies clearly lead all other sources of consumer information for the science teacher.

3. Other very satisfactory sources of information include the researches of colleges and universities; the publications of the American Medical Association and the American Dental Association; and the private testing and rating agencies which one has made certain are not agencies that make untruthful claims.

4. Clearly not generally acceptable sources of consumer information for the science teacher are the popular magazines of general interest and the pamphlet publications of a commercial

nature. The latter source is classed as not acceptable chiefly because other more dependable sources supply practically the same material.

5. Science teachers should not assume that the nature of each of the various sources of information on consumer education will remain unchanged. Change is to be expected. From the present trend it appears fairly certain, however, that the services of the Federal agencies are likely to increase rather than decrease in value. It is also likely that state and city government sources may become widespread enough to make them more usable. It is also possible that standardization of certain types of goods, standardization which is now under way, will narrow considerably the field that the private testing and rating agencies are now attempting to cover. Such standardization should increase greatly the value of these agencies by permitting them to concentrate their efforts on the products not well covered by standardization.

## Chapter VI

### ILLUSTRATIVE CONSUMER EDUCATION SUBJECT MATERIAL FOR NATURAL SCIENCE COURSES: FOODS AND HEALTH

Consumer education subject materials are likely to consist of minor facts. Consumer education, as it is now presented in science classes, is already beginning to develop a serious shortcoming, in that it is being confined almost entirely to single bits of knowledge about more or less isolated commodities. The larger and far more important consumer problems are being neglected. In other words, it seems to be concerning itself chiefly with such facts as the way to distinguish between fresh meat and old meat or how to select good cucumbers, instead of with the larger and far more significant problems having to do with the purchase of foods. It concerns itself only with the excess alkali in soap, the presence of a large amount of acetanilide in a headache powder, the way to tell whether a sweater is wool or cotton, or which kind of an egg beater to buy, rather than with the major consumer problems which these difficulties represent. True, these consumer facts and others like them are valuable bits of information, but they are relatively unimportant features of the task which science education must set for itself. These detailed consumer facts have their major value in science education only insofar as they serve to illustrate major consumer problems that need solution, and to lead to the development of methods of solution for these problems.

In this chapter, which deals with foods and health services, and in the three succeeding chapters, which deal with clothing, housing, and other more diverse consumer goods, an effort has been made to present illustrative consumer education subject material in such a manner that many large consumer problems are made

clear. The reader is urged to judge this subsequent illustrative material in the light of the preceding sentence in order that it will not be unfavorably regarded because of the omission of many details which are usually considered to be of a consumer education nature.

**Purchase of a satisfactory diet needs emphasis.** In suggesting subject material for consumer education with respect to food, one must conclude that extensive study of how to buy food for a generally satisfactory diet is still essential. It is well known that several science courses already in use have a fairly large percentage of their time allotted to the study of a satisfactory diet. Nevertheless, in spite of this emphasis on a good diet, it is still true that many people do not observe the simple, undisputed rules for selection of food. Although part of the difficulty is due directly to insufficient income, it has also been shown quite conclusively that the diet of families in middle-income and upper-income groups is often very far from satisfactory. Perhaps the difficulty is in the method of teaching; perhaps it is in the kind of subject material taught. Doubtless some of the difficulty is a result of the great amount of diet miseducation which everyone gets through advertising that emphasizes the value of particular foods. At any rate, it is quite evident that the science courses in the schools should continue to lay greater and greater stress on the foods needed to obtain a good diet.

In consumer education it is necessary to consider, for the sake of low-income families, the least expensive foods which will supply satisfactory standards. At the present time one of the important points requiring considerable attention is the minimum diet which Federal relief agencies recommend for families receiving aid. As devoid of luxuries as such a diet is, it is still often superior in actual health value to the diets purchased by families able to spend whatever they wish for foods. Actual cases of malnutrition among the children of the wealthy are by no means unknown.

**Ideas change about the content of a good diet.** As is pointed out in other portions of this book, the test of consumer

education does not lie in the passing of pencil-and-paper tests on the subject. The real test lies in the actual use that students make of the information obtained in their school courses. In connection with a good diet, consumer education must show that certain ideas often have widespread acceptance when there is little to support them. It is not at all uncommon to find these ideas present in cookbooks and in textbooks for use in home economics and science classes. The widespread praise of spinach and orange juice as highly necessary constituents of a good diet illustrates very well the point to be made here. Starting with scientific reports about the iron and vitamin content of these foods, there has been such extensive publicity about them that people have been convinced that these foods have highly special values. The publicity results partially from clever and extensive advertising campaigns, and partially from unconscious advertising through news articles, jokes, and cartoons. Spinach particularly has received a great amount of free, as well as purchased, publicity. These facts are important ones to be developed in consumer education in science.

There is no reason to indicate that spinach, orange juice, and other foods which have from time to time received extensive publicity are not good foods. However, it does seem necessary to see that students frequently and forcefully have contact with the idea that even these specially favored foods probably do not have any remarkable and unusual health values that cannot be supplied just as satisfactorily, and sometimes even more satisfactorily, by any of a number of other foods. Ideas about special values of foods have risen, changed, and disappeared so frequently in the past that great emphasis now appears to be needed on the simple fact that few or possibly no individual foods have values which require their extensive inclusion in the normal diet. Exception to the preceding general statement must, of course, be made when a physician recommends a special diet to assist in correcting a particular ailment.

**Adulteration of foods is extensively practiced.** The Federal food and drug regulations in regard to food adulteration are

especially interesting, since a somewhat special meaning is given to the word *adulteration* because the meaning has to be supported if necessary by court action. Examples under the law as well as other undesirable practices which might not come under the law need to be considered in connection with consumer education. Methods of discovering these adulterations and unsatisfactory practices are also appropriate for study. Students have to get a background of knowledge of unfair and undesirable practices in order to understand the reasons for intensive study of consumer education. A few examples of these undesirable practices are offered as illustrative of consumer education work on food adulteration.

1. Water is considered an adulterant, not only in liquids such as milk, but also when it is permitted to be absorbed by oysters and scallops in order to make them much larger, or by chopped or ground meat to increase the weight.

2. Prunes, dried peaches, and dried mixed fruits are judged adulterated when water is mixed and packed with the articles so as to reduce or lower the quality.

3. Frozen egg yolks have been judged adulterated because they contained excessive whites and undeclared added sugar.

4. Relish has been judged adulterated because it contained saccharin, substituted in part for sugar as a sweetening agent.

5. Butter has been judged adulterated because it contained less than 80 per cent of milk fat. This judgment is very common in the work of the Federal Food and Drug Administration.

6. Buckwheat flour has been declared adulterated because it contained atropine alkaloids, probably from jimson weed seed in the buckwheat.

These are only a few of the numerous illustrations of types of adulteration reported in one issue of Food and Drug Administration *Notices of Judgment*.<sup>1</sup> They show something of the serious consumer problems in connection with food.

**Foods sometimes contain dirt, decayed and disease-producing material.** It is extremely unpleasant to think that foods are

<sup>1</sup> December, 1939.



not infrequently found to contain dirt and other foreign material. Yet this subject is one that science teachers must bring to the attention of students if information is to become widespread enough to improve conditions. There is little question that dirt does get into food, both because of carelessness in handling and because of the deliberate use of decayed food materials in canning. Seizures of unclean and decayed food by Federal officers of the Food and Drug Administration have been numerous enough to show that conditions are very bad. Illustrative types of these seizures are diseased chickens, butter which contained parts of insects, cheese which contained hair from rats, frozen fish which contained parasitic worms, flour that was insect infected, and canned salmon which was in a partially decayed state. Examination of the publications of the Food and Drug Administration shows that these are only a few of the many similar illustrations. In this connection, it is necessary to point out again that the inspection of the Food and Drug Administration is very inadequate in consideration of the total amount of food that needs inspection. Science teachers may use such examples as those just given to point out the need for more extensive regulations, for greater inspection, and for much heavier punishment of violators of regulations. It is also desirable to keep in mind that in regard to food prepared and sold entirely within the state, a number of states have regulations which are far less adequate than the Federal regulations.

**Some foods contain poisonous compounds.** In connection with the study of properties of metallic compounds or in the general study of foods, a very important subject to consider is the presence of poisonous compounds of such elements as lead, arsenic, copper, mercury, and selenium. Chief among these are lead and arsenic compounds, their comparative danger being shown by the fact that for several years about 30 per cent of the energies of the Food and Drug Administration have been devoted to these two poisons as they are found in common foods. Lead and arsenic compounds are present in foods largely because of the use of insecticides and fungicides in the form of sprays and dusts upon

many fruits and vegetables. Although, under the new Food, Drug, and Cosmetic Act of 1938, the Secretary of Agriculture is empowered to set a definite tolerance for the amount of these compounds on foods, in the past the Department has been fairly lenient in regard to the amounts permitted. The opposition of the fruit and vegetable growers to low tolerances has been very strong. Undoubtedly few of them have yet realized the extent of the danger involved in the presence of lead and arsenic compounds on foods. Surely if the danger were realized a majority of the fruit and vegetable growers would not wish to endanger seriously the health of all those who eat such foods. Science teachers will wish to emphasize the study of the poisonous actions of lead and arsenic compounds upon the human body, the composition of insecticides, and the possibility of developing low-cost insecticides which are not poisonous to human beings. Indeed, the ultimate aim should be not to work out a low tolerance for lead and arsenic compounds but to work for their complete absence in foods.

Science teachers may also consider for study the existence of lead compounds especially, and also arsenic compounds, in foods which have gone through various stages of processing. Chocolate, maple sirup, and jelly are only a few of the foods which have been found to contain highly dangerous amounts of lead and arsenic compounds. Other poisonous compounds present in foods to a lesser extent but still worthy of attention by the science teachers are compounds of copper, mercury, and selenium.

**The use of chemicals in processing and preserving foods is questionable.** Since there are numerous dangers connected with the chemicals used in processing and preserving foods, this subject needs additional study in connection with consumer education. Especially does the preservation of foods by the use of certain chemicals need attention, because the subject usually occupies a very small part of the normal science courses. A study of the chemicals used in foods will include among others, sodium sulfite as a preservative for meat; sulfur dioxide as a preservative for dried fruits and meats; potassium nitrate to give old meat a fresh

color; ethylene in ripening oranges and other fruits; chlorine compounds and peroxides in bleaching flour; sodium benzoate in jellies, preserves, and oleomargarine; and dyes and artificial flavors in many different foods.

**Publicity on vitamins is often misleading.** It is common practice to include in those parts of science courses concerned with foods the importance of vitamins in the satisfactory diet. However, it seems that the makers of such courses seldom consider the great importance of including work on the present tendency to overemphasize the use of vitamins. Vitamins are being advertised as if they were twentieth century miracles offering a perpetual fountain of youth. Experimental evidence along the line of greater general need for vitamins by the entire population has not been sufficient to support the extensive advertising now under way for the encouragement of additional use of vitamins. This statement applies particularly to the widespread presence on the market of a large number of foods which have been irradiated in order to increase the vitamin D content. It is also true that experimental evidence in regard to the extensive use of vitamins is not yet sufficient to show that greater use of certain vitamins is harmless to the human body. As a matter of fact, expressions of possible dangers of overuse of certain vitamins, particularly vitamin D, are fairly common among scientists who are engaged in the study of foods. Scientists have only begun to learn the mysteries of vitamins; but, if one can judge from many advertisements, the manufacturers and advertisers already consider themselves far ahead of the scientists! It seems the height of wisdom, therefore, to think of the vitamins that occur naturally in a variety of foods as being satisfactory and necessary food materials, and to consider the additional use of vitamins in terms of the use of medicines. In other words, such additional use of vitamins should be undertaken only upon the advice of a physician to correct or prevent some particular ailment. It is also well to recognize that physicians are not entirely unaffected by publicity which may or may not have scientific support.

Along with the usual scientific consideration of vitamins, it is also desirable to devote some study to the many vitamin preparations on the market and to consider any claims or inferences being made for them. One seems to be able to buy vitamin milk, vitamin cough drops, vitamin soap, vitamin tooth paste, vitamin-rich bread, vitamin face cream, and dozens of other products which make similar claims, some of them probably correct and others without truth. Or, if one likes, he can buy his vitamins in the form of capsules, pills, or oils. The lack of scientific evidence to support any particular value in such products is worthy of consideration. Perhaps it is not too much to point out the probability that the person or persons who devise a solution for consumer problems in connection with vitamins may make a greater contribution to humanity than the scientists who discovered the vitamins and developed their synthetic production.

There are possible dangers from extensive processing of foods. Although direct and indisputable evidence is difficult to get, the opinion is becoming more and more prevalent among physicians and others engaged in the study of the effects of food upon human beings that the extensive manufacturing processes through which many of our foods are put tend to make these foods less desirable. Something of this changing opinion is evidenced by the pronounced swing toward the use of whole wheat bread instead of white bread. Some business interests sponsor the removal of bran from wheat, as part of the refining process, and then encourage the sale of a bran breakfast food to provide roughage. The need for additional roughage in the diet to relieve constipation is usually emphasized in the advertising. Such emphasis is not warranted in consideration of the amount of roughage, and probably less irritating roughage, that is available in whole wheat, and in such foods as lettuce, cabbage, and green beans. Science education can make situations of this sort clear to consumers.

The extensive use of breakfast cereals, baked sweets, candy, and sugar in general is being seriously questioned by those in-

terested in the investigation of satisfactory diets. All of these foods go through various refining processes which in some cases remove desirable minerals, vitamins, and nutrients from the foods and in other cases add undesirable chemicals, such as those used in bleaching flour. The extensive advertising of these foods, coupled with their comparatively low cost, has expanded their use to a point where the relatively high percentage of carbohydrates in the normal American diet is troubling a number of food experts. Undoubtedly science education is charged with the responsibility of bringing these questions before the pupils in the schools.

There are many untruthful claims for special values of certain foods. It is neither possible nor desirable to consider all the claims and inferences made for particular values of certain kinds of foods. The uselessness of unusual foods like spinach juice, mineral broths, and vegetables concentrated into small cubes or tablets is one illustration. Then there are dietary fads, such as the idea that proteins and carbohydrates should not be eaten at the same meal. The complex composition of most single foods readily shows how difficult it is to meet such a freak diet unless one confines a meal composed of carbohydrates alone to pure starch and pure sugar. Other illustrations are the inference that yeast will remove or prevent pimples when there is no scientific evidence to support the idea, and inducements to use supposedly weight-reducing foods, which often are largely starch.

It is also desirable to consider the type of advertising which encourages the readers to make certain inferences that lead to the purchase of particular products. With the new laws already beginning to have their effect, advertisers are making every effort to keep their advertising of such a nature that it cannot be legally condemned. There remains the attempt to let the unwary or non-scientifically educated person draw conclusions which are actually incorrect. Illustrations of this kind of thing are very common, and up-to-date examples, such as the following one about bread, are always available.

In the *Saturday Evening Post* of November 11, 1939, as well as in several other important national magazines issued about the same time, there appeared a full-page advertisement sponsored by the American Institute of Baking. This advertisement was illustrated with a beautifully dressed young woman surrounded by four handsome young men in evening dress and, in a smaller picture, two athletic-looking skaters. The wording of the advertisement indicated the desirability of a slender figure and gave a sample reducing diet for one day. In parts of the advertisement it was distinctly stated that bread was suggested to supply needed energy and to protect health and strength while one was using a reducing diet. It was not stated that bread would actually help in reducing, but neither was it stated that the bread would not help. However, this statement did occur: "Important in this diet is the amount of bread—two slices with each meal—which helps to burn up more completely the fat you are losing." The incorrect inference that two slices of bread per meal would aid one in reducing was very clear. Nonscientifically educated persons who were asked to look at the advertisement reported that it gave them the impression that bread was valuable for reducing weight.

**Sanitary conditions in handling and marketing food are desirable subjects for study.** Science education is faced with an important task in bringing about constant improvement in the handling and marketing of food. It is an exceptional food market that is even close to being satisfactorily free from flies. It is an exceptional food market whose display of food is in accord with accepted principles of sanitation. In the stores, the people who handle the food are not always acceptably clean or free from diseases which may be passed along through food. Few communities have regulations against such practices and enforce them. Nor do communities often enforce regulations against the presence of animals, such as cats and dogs, in the food stores.

Restaurants, soda fountains, and other public eating places are not infrequently as bad as, or worse than, the food markets insofar as proper sanitation is concerned. The control of these places

should be basically scientific as well as social, since back of any social regulations must be a knowledge of the scientific principles which are desirable and which are feasible. General scientific education in regard to the need for such changes in places supplying food is a necessary preliminary step toward improvement.

**Federal government standards are little known.** Although the work of the Federal government in connection with foods is not strictly within the field of science, the help which the government agencies are giving to consumers in the interests of better food needs to become more widely known. Much of this help which the government agencies give is described in Chapter III of this book in connection with the discussion of sources of consumer information for science teachers. In addition to the laws and the regular reports available, it is desirable for consumers to have continuous information on the extent of government inspection of food materials; on the meaning of the government food-grading stamps in common use; on the standards set up and the methods of grading for various foods as well as the methods used to indicate the relative values of these foods for which there are standards. It is also desirable to know what the Federal government considers to be full measure and to be familiar with the kind of statements required on labels of canned and other packaged foods. The whole problem of standardization of containers and labels for foods can be considered along with the regulations already in operation or in connection with the regulations which are desirable and feasible. Although both extensive scientific preparation and expertness in the field of standardization are needed by those who actually outline the regulations in detail, at practically any level of science instruction in the schools there are available desirable materials for additional and necessary consumer education in regard to standardization. The science teacher is also in a position to see that pupils understand the possible undesirable features of standardization in hindering progress, and the danger in lowering the best, as well as raising the poorest, to meet any particular standard set as a compromise.

**Advertised medicines have been given marked attention.** As stated in a previous part of this book, it is probable that, with the single possible exception of foods, more attention has been given to the fakes and dangers connected with advertised remedies for physical ailments and defects than to any other subject in consumer education. Certainly it is true that this is the one part of consumer education that has received much attention from science teachers. Even so, no one can deny that there is still much room for improvement in the buying habits of most people who attempt to give themselves health treatment through the purchase of advertised remedies. Either the methods of such education, or the materials used, or the relatively small number of people reached, or perhaps all of these factors together, are responsible for the failure of so many consumers even to approach satisfactory procedures in buying materials to be used for possible health improvement. There still is much that science education needs to accomplish in this particular division of consumer education.

Advertised treatments are suggested for hundreds of ailments, many of them real, some of them manufactured in the minds of readers by clever "scare" advertising. In a sense, it is a bit futile to suggest that science teachers consider the study of a large number of specific advertised treatments, but there appears to be no other satisfactory way that desirable generalizations may become established in the minds of pupils. The attempt to organize the suggested treatments into groups for more general consideration is helpful, but numerous specific illustrations are needed in each group.

**Advertised health treatments are of three general kinds.** The worst of the three groups of advertised health treatments consists of those that are likely to be extremely dangerous to health. In the past the number of these was much greater than it is now, because legal action has been most severe against them. However, there are still in existence flesh reducers which are definitely dangerous, diabetes cures which contain quantities of starch



or sugar, hair and eyebrow dyes which contain dangerous coal tar compounds or lead and silver compounds, superfluous hair removers which contain dangerous thallium compounds. It is not too much to consider as representative of this class of advertised treatments which are definitely dangerous such trade products as those suggested to relieve constipation and the powders or pills containing acetanilide suggested to treat colds and headaches.

A second group of the advertised treatments is composed of relatively harmless but worthless materials. Such examples are the almost numberless electrical contrivances, including transformer coils; heating caps known as infra-ray caps for growing hair, liquid concoctions also purported to grow hair, mouth washes advertised to have general antiseptic value, so-called herb remedies, and many others usually suggested as possible treatments for relatively dangerous diseases for which no satisfactory treatment is known. Even these worthless substances are often regarded as dangerous because they may be the indirect cause of preventing the person who is ill from seeking and obtaining accepted treatment in time to arrest a serious disease.

A third group of advertised treatments is composed of substances that actually have value and are accepted treatments for particular ailments. It is this group of substances which is partially responsible for the extensive use of the other classes. Aspirin, for example, is an accepted treatment for the relief of pain and is often prescribed for this purpose by physicians. Generally it can be used with safety. Probably in a similar class are treatments for colds that contain aspirin and a comparatively mild laxative. However, it is true that few or none of these things can be used indiscriminately and in large quantities without the possibility of harmful effects. If this statement is correct, the danger of such products also becomes evident.

**Self-medication is a difficult problem.** The entire subject of self-medication gives rise to problems that are not easily solved. Science education has the definite responsibility of seeing that

the features of the problem are made clear in order that pupils may have the necessary information for reaching intelligent conclusions. Many ailments are minor and yield readily to simple home medication practiced intelligently. Hot-water bottles, enemas, use of iodine antiseptic on minor cuts, simple tannic acid treatment for minor burns, opening of minor skin infections with sterilized needles, and even the temporary treatment of sore throat or tonsillitis by use of throat sprays or gargles composed of a solution of baking soda and common salt are only a few of the common types of self-medication which may be quite satisfactory. Physicians often say that such self-medication is undesirable because the pains which are being treated by hot-water bottles may represent some serious difficulty, and the cuts or skin infections or burns may lead to dangerous blood poisoning. Without question, this argument is valid.

Whether self-medication is desirable or undesirable, it is probably true that a considerable amount of it is going to continue to be practiced by nearly everyone in practically every walk of life. This being the case, it seems necessary that science education concern itself with the desirable conditions and kinds of self-medication which can be practiced with intelligence.

**Composition and properties of compounds with medicinal uses form a part of consumer education.** For some years it has been an interesting and acceptable phase of chemical education to include the chemicals which are often used, under various names, as medicines. For example, many people have made use of Epsom salt and are well acquainted with its taste and use as a medicine. The additional information that Epsom salt is a common name for the chemical, magnesium sulfate, is a useful bit of consumer education. A large advertisement recommending the use of Pluto Water to relieve constipation shows that the label on the bottle carries this statement: "Concentrated spring water fortified with sodium and magnesium sulfates." If it is understood that magnesium sulfate is Epsom salt and that sodium sulfate is the Glauber's salt well known to veterinaries as a purgative

for horses, the prospective consumer immediately has some idea of the nature and possibilities of Pluto Water. There are many illustrations of the value of this kind of information, not only with respect to medicines but to other kinds of substances as well.

The spirit of the laws having to do with correct labeling of contents of medicines sold under trade names can easily be broken by the simple use of the chemical names which are familiar to so few people. It is evident that science education has a very definite service to perform here. Modern educational theory makes clear the fact that an illustration is far more effective and usable than a more brief but comparatively uninteresting chemical recipe. It is necessary that the functional tie-up be made if the knowledge is to have any appreciable degree of usable permanency.

**Testimonials have little scientific worth.** The continued extensive use of testimonials, not only in advertising treatments for ailments, but also for many other types of products, shows that it is believed that testimonials have great value in influencing buyers. It is important that people begin to realize the complete lack of scientific worth in choosing a product for health treatment because someone else permits the use of his name in support of its value. Testimonials often make use of fictitious names, or the givers of the testimonials are often paid for the use of their names in advertising. At times, testimonial companies have operated by selling to advertisers the names of people for use in testimonial advertising. The persons whose names are so used sell to the testimonial company the right to use their names for the support of any products. In other words, these persons never know for what products their names are being used, unless they chance to see the advertisements.

The only people whose testimonials have any worth in support of a health treatment are physicians—but as soon as a physician lends his name in advertising any such product he brands himself as an unethical member of his profession. The preceding statement means that one can put little scientific dependence upon the testimonials of his friends, of members of his family, or even

on his own testimonials when the value of health treatments is concerned. Without question, these testimonials are made in good faith, but it is possible, too, for them to be wrong. Human beings are so made that they often feel quite ill and then recover completely a few hours later, body processes having acted to overcome the illness. If during the period of illness a medicine or other health treatment is used, it is often incorrectly assumed that the treatment is instrumental in the recovery, whereas the treatment actually may have had nothing to do with the recovery. Thus, the physical and mental make-up of people tends to favor unscientific testimonials as well as the sale of fake treatments.

. **Constipation appears to need special attention in consumer education.** As a means of correcting the supposed ailment of constipation, the use of laxatives is so widespread in this country that it seems wise to accord this particular subject some special study. In spite of the prevalence of the belief among people in general that a bowel movement is necessary at least once each day and that lack of such a movement requires the use of a laxative, there appears to be little scientific evidence to support the belief. Physicians, on the whole, now refrain from prescribing laxatives except for extreme cases of constipation or in connection with the treatment of ailments other than constipation.

Regular elimination of the wastes that accumulate in the large intestine is essential to good health. The scientific fact that toxins are formed in the large intestine has been used by manufacturers of laxatives in influencing people to the excessive use of such products. It is recognized that this excessive use is likely to be very harmful, chiefly because persons soon become so addicted to the regular use of the laxatives that they are unable to have normal bowel movements. Physicians now believe that there is very little absorption of toxins from the large intestine into the rest of the body. They also believe that, no matter how often and how thoroughly laxatives act, there is always some poisonous material left in the large intestine, and that many people do not normally have daily bowel movements. Sometimes it is necessary

for waste to accumulate for two or even three days before the bulk is sufficient to stimulate peristalsis, the length of time necessarily depending to a considerable degree upon the quantity and kind of food eaten. Most people, however, probably as a result of extensive and incorrect advertising, decide to take a laxative before two or three days elapse, because they fear the "dangers" of constipation. Generally, cases of temporary constipation can be corrected by drinking more water and by increasing the bulk of the diet. Increased bulk can best be obtained by eating more vegetables, particularly leafy ones. Prolonged cases of constipation need the attention of a good physician rather than the use of an advertised laxative.

Cosmetics resemble advertised health treatments in several ways. Cosmetics have come to be recognized as being closely tied up with health. As with certain advertised health treatments, there are numerous cosmetics which are extremely dangerous. Skin infections, loss of eyesight, permanent disfigurement, and even death have resulted from the use of cosmetics containing poisonous substances. Cosmetics that are not in the least dangerous to most users often contain substances to which certain individuals are highly allergic. As among the treatments for ailments, there are among cosmetics many examples of substances which are totally worthless, insofar as accomplishing any of the wonders they are purported to accomplish. Great claims are made for wrinkle removers, many kinds of face creams, hair tonics, substances to remove blemishes, others to produce wonderful complexions, even solutions to make the eyes brighter; but the value of all of these together is known to be slight. The chief reactions one can expect from cosmetics appear to be that face powders will help hide certain blemishes and cover the oily shine on the skin; that rouge and lipstick will produce red colors; and that creams and lotions sometimes prevent the skin from chapping. It does not seem to be beyond the scope of science education to have students consider that the larger part of the \$400,000,000 yearly expenditure for cosmetics may be wasted, insofar as any

improved appearance is concerned. No small portion of this waste results from greatly overpriced cosmetics. The manufacturer and those engaged in the retail sale of these overpriced cosmetics are the gainers.

Soaps and dentifrices have many characteristics in common. Both soaps and dentifrices have been and are subject to extensive advertising campaigns. All sorts of claims regarding unusual cleaning properties, great beauty production, increased ability to get a husband or wife, and many other special qualities have been made for both soaps and dentifrices. None of these claims seem to have much merit. The value of a toilet soap lies entirely in its ability to aid water in cleaning the skin without producing unduly harmful skin irritation. Similarly, the value of a dentifrice lies in its ability to aid water and the toothbrush in cleaning the teeth without producing any unduly harmful effects. The chief harmful effects that are possible are excessive abrasive action of the dentifrice on the tooth enamel, or excessive acid content which may have a solvent action on the teeth. The composition of such substances as soaps and dentifrices forms a necessary part of science education as it is concerned with consumer education. Only by such study of composition and the use of numerous illustrations from representative trade products is it possible for students to form suitable functional generalizations.

It is interesting that dentifrices ordinarily contain a fair percentage of soap, along with a considerable amount of soft scouring powders and flavoring agents. The new liquid dentifrices, as well as a few of the tooth pastes and powders now being extensively advertised, have essentially the same composition as the liquid shampoos which are particularly useful in hard water. Chemically, the "new" substance is usually a sulfated alcohol, which serves as a soap substitute because it lathers just as soap does and thus serves as a cleaning agent. Its particular value, so far as is known at present, either as a soap or as a constituent of a dentifrice, lies in the fact that it produces a lather in hard water. Although many important results have been claimed for the de-

sirability of cleaning the teeth, the consensus of opinion among experts now appears to be that the chief value likely to come from such cleaning is a social or an aesthetic one. In other words, the teeth look better to others if they are clean.

**The purchase of health services involves many difficulties.** The most general advice given in dependable sources for health information is that when one is in need of health service he should act on the advice of a good physician. Most scientists and most other persons with good general education accept and follow this advice in all cases. Many people, however, do not follow such advice, either because they do not believe in any treatments for ailments, or because they do not believe in the use of medicines internally, or because they do not have the money. Many choose quacks in the belief that they are good physicians. It is probably true that most scientists and other persons with good general education usually choose so-called medical doctors from whom to purchase health services. This statement is not to be taken to mean that there is no value in the type of treatments offered by persons other than medical doctors, nor that there are no quacks among medical doctors.

Science education is responsible for types and methods of education which lead to intelligent choice of health services. In order to make such choice of services, it is necessary that people be generally familiar with many accepted methods of diagnosis and accepted treatments for particular ailments. It has been said with a great deal of truth that the only person capable of making a really intelligent choice of another to supply medical service is a person with medical training himself. Naturally, it is at present quite useless for science education to take on the wholesale aim of giving everyone a medical education. However, it is not beyond the scope of science education to give to everyone the type of education that permits the formation of generalizations leading to a much more intelligent choice of health services.

**Certain general criteria aid in the selection of health service.** In addition to actual knowledge of methods of diagnosis and

accepted treatments, there are certain general considerations that are worthy of study in connection with the selection of health services. The extent and nature of the education of those who sell health services are to be thought of as important, as are the particular schools from which degrees are held. There is also the fact that the American Medical Association and the American Dental Association, as well as most of the members of each of these professions, consider it unethical for those offering such health services to do any advertising, or to permit the use of their names in advertising any products for medication. Correct publicity in either of these professions is considered to be that obtained through the high grade of service offered, and that which satisfied patients supply.

There can be no secret treatments used by any ethical member of either profession, because the code of ethics requires that all discoveries of new and valid treatments be made public to other members of the profession. True, some members know more than others, but this condition does not exist because the information is not available to everyone. Other useful considerations in the choice of health service are the use of simple explanations of ailments rather than the choice of technical words with no clear explanation of their meaning when inquiry is made; the opinions which other members of the same profession have to offer about any particular member; the hospital connections which the physician may have; any methods which he may be known to use in keeping in touch with advances in his profession; and the care he takes in diagnosis and treatment. It is seen to be far from simple for science teachers or anyone else, for that matter, to supply clear, definite bases upon which to choose health service, but this situation does not mean that science education should refuse to consider the problem. Instead, it means the consideration of all pertinent facts regarding the problem in order that a reasonably intelligent choice may be made. Certainly, some bases for choice, even though incomplete, are better than none at all.

It is also distinctly a function of science education to help



students form similar criteria for judging a pharmacist who is to fill prescriptions and perhaps sell ice cream, but whose diagnosis of ailments and recommendations of proprietary medicines are not to be heeded. It is in science classes that the differences in the training and legitimate services of oculists, opticians, and optometrists may be made clear.

## Chapter VII

### ILLUSTRATIVE CONSUMER EDUCATION SUBJECT MATERIAL FOR NATURAL SCIENCE COURSES: CLOTHING

**It is difficult to determine just what constitutes suitable clothing.** Science education faces extraordinary difficulties in connection with the buying of clothing. There are many things that are not known about foods and the requirements for a good diet, but in some ways the problems connected with buying suitable clothing are much more complex. There is strong difference of opinion among health experts and people in general about the kinds of clothing that are best for good health and for suitable protection. Although scientific evidence on the subject is not entirely lacking, discussions on the proper kinds of clothing often degenerate into arguments between men and women about the relative advantages and disadvantages of the clothing of each. In other words, into the midst of the subject of clothing comes the whole problem of fashion. Fashion exerts such a powerful influence upon the choice of clothing that whatever scientific principles are recognized as desirable for good health seem to fade into the background.

It is evident that our warm homes, public buildings and automobiles are not at all consistent, from a health standpoint, with the lightweight dresses, thin silk stockings, and flimsy slippers which women wear to brave the snow and subzero temperatures. Even those women and girls who can afford the additional cost of galoshes are seen wearing, in extremely cold weather, uncovered toeless, heelless, sideless shoes with very thin soles because these are the fashion. It is interesting to make one brief comparison of the relative amounts of clothing of men and women, normally

worn about the upper part of the body. If it is assumed that the outer heavy coats are of approximately equal weight and warmth, the remaining clothing shows a wide variation. The clothing of a woman usually consists of a dress which may be wool, but may also be thin silk, cotton, or rayon, and one or two thin undergarments. On the other hand, a man's clothing ordinarily consists of a lightweight undergarment, a shirt of fairly heavy material, a heavy wool vest, and a heavy wool suit coat. The difference between men's and women's clothing is so great that it cannot be assumed that both afford maximum health advantages. The chances are good that both combinations are wrong; that women and girls wear too little clothing in winter and men and boys wear too much. There is no scientific evidence to show that the clothing requirements for best health are different for the two sexes. The hand of custom and fashion is seen again in the summer garb of men, which consists of undergarments, shirts with high, closed, uncomfortable collars, and heavyweight coats, often wool.

It is customary to look with a good deal of superiority upon the ladies of 1850 who wore five petticoats and squeezed themselves with stays until their internal organs were pushed far out of their natural position. It is also customary to view with disfavor the squeezing of the feet of the royal Chinese girls until they became useless for walking. Our own present-day fashions may not be quite so obviously bad, but there is little to say in favor of the health value of many of them. In general, it is evident that clothing that is uncomfortable is likely to be unhealthful, and we have many examples of uncomfortable clothing. A few of these examples are hot felt hats, hats that are tight around the head, collars that choke and rub the skin off necks, coats that roast men in hot weather, corsets that prevent free breathing, belts and garters which cut off circulation and leave deep marks of their use on the skin, underwear that binds as one walks or sits, shoes that produce corns and bunions.

Science education may find it difficult to make any inroads

against the powerful influence of fashion, but this difficulty does not mean that science education should not make the attempt.

Many scientific tests for textile differences have little practical worth. It has been customary to emphasize as part of consumer education the importance of burning tests, microscopic tests, and solubility tests in distinguishing textile fibers. The actual functional value of such tests is sure to be small because of the limitations of possibilities, and because there is no absolute surety that a low grade of weighted silk, for example, is going to be better than a high grade of cotton. There may easily be as wide a difference in value between a high-grade 100 per cent wool fabric and a low-grade 100 per cent wool fabric as there is between the low-grade 100 per cent wool fabric and a high-grade cotton fabric. Even the additional knowledge about thread count is not a very satisfactory basis for judging the real worth of clothing. However, this background information and the information suggested in the next six topics shows how science education may help consumers work toward some solution of the complex problem of purchasing clothing and other textiles.

Wide variation in fabrics hinders wise selection. Further examination of the complexity of the clothing situation demonstrates more and more clearly the difficulty of the task of science education in helping consumers. For example, the length of wear of a particular fabric may be affected, among other things, by the fit, by the kind of fibers, by the length of fibers, by the grade of the fibers, by the amount of twist in the thread, by the amounts and kinds of sizing, and by the care used in manufacturing. Tightly woven cloth, such as wool serge, wears well but soon gets shiny, while soft, loosely woven fabric does not wear at all well and yet does not get shiny. Two-ply cotton yarns when made into cloth produce a more durable fabric than do single yarns of the same diameter. Heavy mordanting of cotton and linen to hold colors fast tends to weaken the fabric. The only way to tell whether a fabric is colored with a dye that is fast in ordinary washing is to try it out, not once but several times. Some fabrics may

not fade when exposed to light for a few hours but may fade badly after a few days or a few weeks. Color lasts longer when dyeing is done on raw stock than when it is done after fiber is twisted into yarn; it also lasts longer when dyeing is done in the yarn than when it is done in the woven cloth. Bleaching when done poorly or when the chemicals are too strong weakens the fabric.

These representative factors which affect the value of cloth show something of the problems involved in making a reasonably intelligent purchase. And these factors are not by any means the only ones. The amazing variety in fabrics adds greatly to the problem. Cotton can be so much like silk or like wool that even an expert has difficulty in distinguishing the fibers without chemical or microscopic tests. Not only do such variations exist, but the fibers are often mixed in the same fabrics to improve appearance, strengthen weak materials, or adulterate expensive materials with cheaper ones. Even these conditions picture only a part of the complexity of the situation. For example, an enumeration of some of the more ordinary kinds of cotton fabric used in clothing might include batiste, broadcloth, calico, cambric, challis, chambray, cheviot, corduroy, crash, crepe, denim, dimity, duck, éponge, flannel, foulard, gabardine, gingham, grenadine, khaki, lawn, madras, muslin, nainsook, organdy, oxford, percale, poplin, seersucker, serge, swiss, and voile. It is not an easy matter to recognize these materials with their variety of weaves, colors, and properties. Yet such knowledge and much more is required if one is to make an intelligent selection of materials.

**Confidence in trade names and merchants is necessary.** It is evident that most people must depend upon honesty of merchants or upon trade names in buying most fabrics. Such dependence is unsatisfactory, since, even if it were possible to depend absolutely upon unchanging quality in goods offered under any particular trade name, there would still be difficulty because of the variation in quality offered at different prices under the same trade name. Buying by trade name also has a disadvantage in that people are prone to buy clothing which has the most widely

advertised trade name. Such buying does not necessarily mean that better clothing is being obtained. An additional factor of uncertainty here is that retail merchants themselves are often fooled in their purchases of stock from the wholesalers or manufacturers. As previously stated, this condition is an important factor in the establishment of testing laboratories in some stores.

Even if one knew all the different kinds of cotton cloth and the particular uses for which each is most suitable, there would still be the difficulty of knowing the relative worth of different grades of the same kind of fabric. For example, there is considerable difference among the broadcloths used for shirts. The simple fact that a shirt is made of broadcloth indicates a very small portion of the information a purchaser needs if he is going to buy intelligently. The value of a particular kind of broadcloth depends upon the tightness of the weave or the thread count; upon the kind and amount of sizing; upon the weight of the material; after the weight is set, upon the use of single or two-ply yarn; upon the amount of twist in the fiber; upon the length of the fiber; upon the amount and nature of pretreatment against shrinkage; and upon the dye and mordant used to supply the color.

All of this maze makes it seem almost impossible for the average person to become sufficiently familiar with such facts to use them in actual judgment of fabrics. Further, these facts have to be used continuously in order to be remembered. However, even a standard for tensile strength and some easy way to determine the tensile strength of a fabric would do much toward solving the problem.

**It is difficult to set satisfactory standards.** From the brief picture of complexity thus far described, it is understandable that any attempt to set standards for fabrics and finished garments would be faced with great difficulty. It is no easy task to decide just what are the maximum or minimum qualities which good clothing may be expected to have. For example, it is possible for certain good grades of reworked wool to be better than some poorer grades of virgin wool. To say that clothing of a certain

price must be 100 per cent virgin wool does not begin to give the desired information. It is not known what standards to set for the percentage of shrinkage to be allowed in various fabrics, and such lack of knowledge is also apparent with respect to nearly all of the other desirable qualities of fabrics. It is not known what the best thread count is for a standard. The best tensile strength from the standpoint of the relation of cost to wearing quality is not known. Standards for sunfastness and washability, on which there is now more or less agreement, are set at a fairly low stage.

It is a fair assumption that increased knowledge on the part of the consumer and correspondingly increased activity of various consumer organizations have had much to do with the attempts to set suitable standards of manufacture and suitable standards for labeling materials. There has been some progress toward simplification of standards and elimination of dishonest practices by agreements among the various groups engaged in a particular kind of work, but these agreements are few in number and meager in scope in comparison with the agreements that could be reached without loss on the part of any legitimate manufacturer. The function of science education in this connection is clear. There must be greater education in regard to the difficulties in the way of improvement; there must be numerous suggestions for overcoming these difficulties; and much work must be done in connection with detailed tentative standards that might be helpful.

**There is great need for more complete labels.** Along with the improvement in standards, or preceding or following such improvement, there is also the need for more complete labels on finished clothing and fabrics. To illustrate, according to a commercial standard agreement, anything labeled "all wool," "pure wool," or "100 per cent wool" must contain not less than 95 per cent wool. If the material is less than 95 per cent wool, and if the word *wool* is used at all on the label, the maximum percentage is to be stated. However, the joker in this agreement is that it con-

tains no requirement that the manufacturer use the word *wool* in any part of his label. Articles may therefore be sold as wool with or without verbal statements in regard to the composition of the fabrics.

It is pointed out elsewhere in this book that it is readily possible for a good grade of reworked wool to be better than a poor grade of virgin wool. Even so, there is greater safety on the side of quality if clothing made entirely of virgin wool is purchased. However, most wool clothing that is purchased has some reclaimed wool in it. This practice appears to be necessary in order to bring the price of wool clothing within the reach of more people. The practice is not indefensible, but the consumer should know something of what he is buying in order to make satisfactory comparisons. At present there may be two fabrics of similar construction for which claim is made that both are 100 per cent wool. Such a claim indicates to most people that the two fabrics are of equal or nearly equal value, when actually there may be a very great difference in quality and durability. Eighty per cent of one of the fabrics may be a good grade of virgin wool, while the other fabric may be only 20 per cent virgin wool. Not only is there no agreement or regulation which gives the consumer more information, but there is nothing to protect the manufacturer of the high-grade garment. There is little value in labeling his product "80 per cent virgin wool" because the other manufacturer may simply label his "100 per cent wool," and the consumer buys the second garment because it is slightly cheaper.

Considerable difficulty is involved in any labeling regulation which might have to do with the relative percentages of virgin wool and reworked wool in a garment. At present, there seems to be no way to enforce any agreement or regulation which might be made, because even experts find it extremely difficult, if not impossible, to determine such percentages after the manufacture of the fabric is completed. This difficulty in the way of more complete labeling for clothing is representative of many such difficulties. Nevertheless, it is worth recognizing that, although



there now exists no very satisfactory method of measuring the relative percentage of virgin wool and reworked wool in a completed garment, it is very possible that such a method could be developed if there were reasons to develop it.

In connection with labels the function of science education is again clear. Science education needs not only to supply the background necessary for the choice of suitable labels, and to show the need for much more complete labeling, but also to make certain that more people can understand the practical meaning of the labels after suitable information is given on them. It is readily understandable that there might be many people for whom the label "80% virgin wool" would be as useless as no label at all.

Science education does not face a hopeless task. In aiming toward improvement in standards and improvement in labels for finished clothing and other fabrics, science education is not taking on an insurmountable task. Enough progress has already been made that anyone interested in still greater improvement can hope for rather marked success to attend any extensive work. An example of progress is seen in the case of rayon. In recent years the uses of rayon have been very extensive. Taffetas, satins, crepes, and velvets, which are names long associated with silk, began to be made of rayon, and people did not know the difference because the fabrics looked like silk and felt like silk. Other rayon fabrics appeared which resembled wool, linen, and even cotton; and many new names such as Celanese and Bemberg were introduced. More and more imitations of the traditional fabrics appeared and the degree of imitation grew better and better. Then in 1937 the Federal Trade Commission took an important step toward bringing a little order out of the maze.<sup>1</sup> This step was the simple rule that all rayon be labeled and called *rayon*, and that its presence in any fabric be made clear to the purchaser. It is evident that this ruling is only a beginning toward more satisfactory labels, but it is a distinct and important step.

<sup>1</sup> The chances are that this action was the result of complaints made by manufacturers and others interested in the sale of fabrics being imitated.

Another illustration of progress is evident in connection with the use on garment labels of such terms as *shrunken*, *preshrunk*, *shrinkproof*, and *full shrunken*. So many different meanings had been ascribed to these terms that their actual meaning to consumers became nearly zero. Then in 1938 the Federal Trade Commission ruled on the subject of shrinkage in such a manner that a very important forward step was taken in labeling. No longer is it so likely that all sorts of conditions with respect to shrinkage can be concealed. No longer is it considered fair trade practice to fool the consumer by using terms which indicate that a fabric will not shrink. If the terms *shrinkproof* and *full shrunken* are used, they must mean that the fabric actually will no longer shrink. If the term *preshrunk* is used, it is then necessary to give on the label additional information which shows the actual maximum percentage of additional shrinkage which the fabric will undergo.

These are illustrations to show that some progress has been made and that science education can aim toward more. The fact that more progress is needed can be readily shown, for even in complying with the regulations of the Federal Trade Commission in regard to shrinkage it is not very difficult for the consumer to be misled. For example, the label may say that a garment is *preshrunk* and is guaranteed not to shrink any more than 5 per cent. To most people this might seem to be a very satisfactory guaranty, until a little calculation discloses that 5 per cent shrinkage in a dress forty inches long would mean that the dress would become two inches shorter. A 5 per cent shrinkage would change a size fifteen shirt collar into size fourteen and a half, surely a choking amount.

**There is need for much greater experimental work in connection with the qualities and the values of clothing.** New weaves are made, new fabrics are introduced, new dyes are used, new substances are used in finishing; and all too often these and other, similar processes do not have satisfactorily complete testing, even on the part of the manufacturer who puts out the materials. Frequently, tests are made and qualities improved only

after sales begin to drop. These statements describe quite exactly the history of rayon, particularly with respect to the fact that the first rayon which appeared on the market was very nearly worthless because of its extreme weakness when wet.

Those in charge of technical and research work in textile factories should, and probably do, know more about the qualities of fabrics than any other group of people. It seems, therefore, that a suitable way of solving many of the problems connected with consumer buying of better clothing is to use more informative labels. The textile research workers can readily supply this information. If such a plan is followed, manufacturers will need to make suitable tests before fabrics leave the factory. Probably there will then be a need for some kind of government agency to make tests to check the correctness of the information on the label. The classification of goods into quality groups, when labels are found to be incorrect, would soon cut down greatly the work of the government agency.

In order to bring about the more satisfactory situation just described, more widespread knowledge about the problems connected with the purchase of clothing and fabrics is necessary. In other words, more people need to know that there are such problems and more people need to know what might constitute suitable ways to solve the problems. Here, then, is one important aim for science work in consumer education. It would be difficult for any small group to resist very long the powerful force of this widespread knowledge. Even though they may be much more complex than food problems, consumer problems in connection with clothing are likely to be more readily improved by suitable science education, because there is already available much of the scientific information necessary to improve many of the most difficult conditions.

**Selection of laundry soap enters into consumer education on clothing.** It may be that the subject of laundry soap in consumer education is occasionally emphasized more than is justified by the proportion of income spent on such materials. However,

the importance of laundry soap is greater than the measure of its use in cleaning, since the soap may readily be the cause of damage to valuable clothing. The fact that clothes are sometimes ruined completely, or often deteriorate rapidly while being laundered, supports the fairly high position of laundry soap as a subject for study. It is usual to think of laundry soaps in four different groups. There is the common laundry soap which is made up in bars that are almost all soap with some moisture. Then there are soap powders, chips, grains, or flakes, which are similar in composition to the bars. A third group of soaps contains, in addition to soap, a substance such as washing soda or sodium phosphate, which serves both to soften hard water and to supply some additional cleaning action. These "builders" are likely to damage almost every kind of fabric except cottons and linens and are even likely to remove, somewhat slowly, the color from most of these fabrics. The percentage of builders in this group of soaps may vary through a wide range, but there is always much more soap than builder, the usual amount of builder being less than 20 per cent. The fourth group contains less soap than builder, often a good deal less. This type of material might better be called washing powder than the misleading soap powder. Washing powders of this fourth class are suitable only for cleaning very rough cotton materials. In a consideration of these four classes of laundry materials, it should be clear that the individual members of each group are likely to differ rather widely.

It is excess alkali that makes the chief difference between a good soap and a poor one for all uses. Washing soda used as a builder has somewhat the same action as excess alkali. The alkali has a dissolving action particularly on animal fibers, and an especially powerful action if it is used in a hot solution. These facts show why it is necessary to take special precautions when wool and silk fabrics are washed with soap. Since it is the presence of excess alkali that is irritating to the skin, the way to choose a satisfactory soap for wools and silks is to select one that does not irritate the skin. Good grades of soap with no excess alkali are

frequently no more expensive than the poorer grades. For rough cotton clothes which get very dirty, it is wise to use a soap which contains a fair amount of washing soda as a builder.

Here, again, in connection with these four different groups of laundry soaps arises the need for informative labeling. Here, again, science education must assume the responsibility of showing the need for this informative labeling and the responsibility of making clearer the meaning of such information when it is once given on the labels.

**The purchase of laundry service may be improved through consumer education.** In consumer education connected with clothing two services, laundry service and dry cleaning, are described here in order to illustrate general types of consumer study which may be undertaken in the purchase of services that are related to work in science.

Commercial laundering has been criticized because of methods that may be harmful to clothes. Perhaps the most common among the somewhat harmful practices has been the too generous use of chemical bleaching substances in order to make clothes look cleaner and whiter. Commercial laundries should be able to use better cleaning methods and produce less wear on clothing than the unscientific methods used in some homes. The laundries can employ expert help to make certain that satisfactory grades of soap are used, that temperatures are kept just right, and that machinery used is of the least harmful kind. Many if not almost all commercial laundries use soft water for their washing, which not only saves soap but makes clothes cleaner with less wear upon them during the washing process.

Aside from the actual cost, there are two chief facts about the work of commercial laundries which are of interest to those who are purchasing such service. The first is the degree of satisfaction with the work that is done, and the second is the amount of wear on the clothing being laundered. Neither of these factors is very easily judged by the purchaser and, when there are various possible choices of laundries, the selection is often determined by

some very minor factor. But, even in the case of laundry work, science education can show that there are many things that may help rather well in judging the choice of a laundry. For example, an actual inspection visit to the laundry itself may be of considerable value, both to learn how the process is carried out and to form judgment in comparison with some other laundry. On such visits to various laundries it may be found that the interior of one shows dark unpainted walls and ceilings hanging with cobwebs, cracked and unsanitary cement floors, old equipment such as soggy wooden tubs and machinery with numerous parts upon which clothing might be torn while being laundered, and workers with an exhausted appearance and wearing dirty, unkempt clothing. On the other hand, another laundry may be found with bright light-painted walls, plenty of light, clean finished floors, modern gleaming equipment having full safety protection for clothing, and alert workers neatly and cleanly dressed. The chances are that the second laundry will do much better work than the first.

Such visits to laundries have two results, as do visits to many other places where purchases of goods or services are made. One of these is the personal education mentioned earlier—one can always learn a good deal by seeing how things are done in lines of work different from his own. A second result is that such visits on the part of a number of people are practically certain to raise the standards of all laundries. The poor ones will try to present as good a case as the best ones, and the best ones will endeavor to raise their standards. At any rate, the choice of a laundry will be made upon a more scientific basis than it is when based on the appearance of a delivery truck, the talk of a salesman, or a catchy name or slogan.

**Dry cleaning at home must be greatly limited.** It is generally recognized that dry cleaning is of considerable value for some kinds of clothing because it removes much grease and oil difficult for soap and water to remove, because it may be used for fabrics which cannot be washed without the loss of color or sizing, and because it gets rid of much of the problem of shrinkage, which

arises when some clothing is washed. However, if any considerable amount of dry cleaning is to be done at home, other difficulties arise. One of the best of the dry cleaning fluids is a low-boiling naphtha, often called naphtha gasoline and made from petroleum. This fluid is good not only because it cleans the garments well but also because it evaporates quickly and leaves no odor in the garment. However, it is an extremely dangerous liquid to use in cleaning because it very quickly forms an explosive vapor which has a low kindling temperature.

Amateur dry cleaning is still one of the common causes of fire in the home, and these fires are not infrequently accompanied by death or disfigurement from burns. Science education needs to emphasize the great danger of both naphtha and ordinary gasoline. Any tiny flame in the house, such as a pilot light, glowing coals in the furnace, a lighted cigar, cigarette, or pipe, is very dangerous because of the quick spread of cleaning fluid vapors and their easy ignition. There is also the danger that the inflammable liquids may be ignited by a spark of the static electricity which results from the swishing of silk or fur while it is being cleaned. It should be emphasized that if dry cleaning must be done at home with naphtha or gasoline, there is only one reasonably safe procedure. This is to do the cleaning outdoors away from buildings and to have a second person at hand with a large heavy wool blanket ready to use in case of fire.

Carbon tetrachloride is a good cleaning fluid, but its vapors in any considerable quantity are poisonous. However, it may be used in the open without any particular danger. Even when purchased under the name carbon tetrachloride instead of under one of its trade names, its cost is still rather great if entire garments are to be cleaned. Carbon tetrachloride has been mixed with gasoline and benzene in order to lessen the highly explosive nature of these substances. Other petroleum products have been developed which are somewhat similar to gasoline in composition. These liquids are safer than gasoline because they have a higher kindling temperature. One such cleaning fluid used extensively by com-

mercial cleaners is known as Stoddard solvent. Under that name it may be purchased by individuals at a fairly low price. It is wise to ask for guaranties that a cleaning liquid is not readily inflammable and then to test the liquid before it is used by putting a few drops in an open saucer or other similar vessel and attempting to light the liquid with a match. If the liquid catches fire at all, it is probably better to have the cleaning done by an expert. On the whole, with all of the dangers of fire and explosion and poisonous fumes, the usual lack of skill and the doubtful economy of home dry cleaning, it is likely that the best method to follow is to confine home dry cleaning to small spots on clothing and to send entire garments to a commercial dry cleaning establishment.

**There is no satisfactory method for selecting a commercial dry cleaning establishment.** It is well known that garments sent to commercial cleaners are sometimes ruined, or are poorly cleaned, or are smelly when they are returned. On the other side, there are numerous experiences with very satisfactory dry cleaning work in which garments are made to look "as good as new" at the same cleaning cost as a poor job. As in the case of laundries, personal visits to the place where the cleaning is actually done are likely to be of value.

It is an important feature of good dry cleaning that clean liquid be used for each job. Clothing cannot be thoroughly cleaned in a dry cleaning liquid that has already dissolved a great deal of oil and grease from previously cleaned clothing. There is a further advantage in that a fresh cleaning fluid evaporates much more quickly from clothing than does a dirty cleaning fluid. If odors of the cleaning fluid remain in the clothing any great length of time after the cleaning is done, it is a good guess that the fluid was not very clean. Satisfactory dry cleaning establishments usually make use of extensive distillation equipment in order to redistill and purify the cleaning fluids at frequent intervals. One other possible method of consumer protection is the attempt to get satisfactory guaranties against shrinkage and lost color before garments are taken by the cleaning establishment. Reputable dry



cleaning establishments are generally willing to make suitable guaranties and to pay for their mistakes, or they indicate plainly that the nature of the garment prevents them from making any guaranty and that the customer must bear the risk if he wishes the garment cleaned.

There is danger that interest in consumer education may become one-sided. Very frequently great interest in one particular subject such as consumer education may cause one to take a very narrow viewpoint. It is necessary that science education recognize this human tendency and guard against it. For example, in connection with the problem of purchasing dry cleaning service, it must be remembered that the dry cleaning establishments may also have serious problems, the solution of which is likely to mean gains for consumers of such service. This is equally true for all other establishments supplying goods and services of any kind, provided these goods and services are meeting real needs.

Commercial dry cleaners have difficulty in getting a cleaning liquid that will do the work well, that is safe from the standpoint of fire and the workers' health, and that is not so expensive as to place dry cleaning beyond the reach of most people. They need to know all about the materials of which a garment is made, because a mistake may necessitate the replacement of an entire garment for the customer. One of the biggest problems a reputable dry cleaner has is to distinguish between legitimate and illegitimate claims for damage. Claims are often made that the damaged garments cost much more than they actually did, and that the garments had been worn only once or twice before cleaning, when actually they were well worn. In respect to dry cleaning service, the responsibility of a consumer is not limited to a consideration of possible unfair practices on the part of the cleaner, but must include a consideration of possible unfair practices on the part of consumers themselves. It is only fair that purchasers of dry cleaning service should make clear to the cleaner the nature of a fabric which is to be cleaned, the cause of spots if it is known, and probable changes in colors.

There is some advantage in having heavy wool clothing dry cleaned, even when it does not appear very dirty, and before winter garments are put away for the summer, because of the added elasticity and life of the garments and because of the resulting destruction of moth eggs. In such a case it is not always possible to see any difference in the appearance of clothing before and after cleaning, and the purchaser of dry cleaning service is forced to depend entirely upon the honesty of the dry cleaning establishment. For this and other reasons, there has been an attempt to form an association which sets standards for dry cleaning and attempts to maintain them. It is readily seen that such an association may be of value to the consumer in one respect, and that it may be a disadvantage if there is any attempt to force out of business the small cleaning establishment which does excellent work, but which cannot afford to pay the additional cost of belonging to such an association. In either instance it should be remembered that it is the general aim, in this topic, to show that science education has the task of making sure that consumer education examines both sides of problems before suggestions for solution are made.

## Chapter VIII

### ILLUSTRATIVE CONSUMER EDUCATION SUBJECT MATERIAL FOR NATURAL SCIENCE COURSES: PURCHASE AND RENT OF SHELTER

Unusual features enter into consumer education on housing. Elsewhere in this book (page 10) there is outlined briefly something of the need for greater consumer information in connection with housing. In this and in the remaining topics which suggest possible types of consumer education materials, additional needs are made evident. Consumer education on housing alone, that is, without consideration of household equipment and supplies, has some unique features that deserve attention. In the first place, shelter is one type of consumer goods that is widely rented instead of being purchased. Occasionally, consumers rent particular kinds of clothing or automobiles, or other special pieces of equipment, but slightly more than 50 per cent of the families in the United States are living in houses or apartments which they have rented. Second, the amount spent for a house, when it is purchased, is usually quite large. In many cases this amount is a high proportion of the savings of a lifetime. Third, as indicated in the brief outline of consumer needs in Chapter I, in spite of the high cost of building or purchasing a house, many people have little regard for the numerous factors that are likely to be important in determining the value of the house.

With the possible exception of those factors which deal with general location, architectural style, and the financing, science education appears to have the definite responsibility of helping people to become better informed about the houses which they purchase or rent. Even location and planning are not unrelated to factors ordinarily considered a part of science education.

**Acquaintance with construction materials is useful.** It is a function of science education to make certain that students are acquainted with the many materials of construction, something of the particular qualities and uses of these materials, and the relative values of two or more different materials when used for the same purpose. This acquaintance with materials may include consideration of wood, brick, stone, clay tile, concrete tile, and steel as possible exteriors for houses; the particular qualities of materials needed for finishing interior walls and floors of basements; kinds of wood for doors, windows, floors, and interior finishings; other interior finishing materials such as lath, plaster, and wall-paper; particular characteristics in regard to wiring and plumbing; kinds of insulating materials and possible advantages and shortcomings of insulation itself; various ways of fixing up a bathroom; materials for improving interiors or exteriors of old houses; heating equipment and the characteristics of air conditioning; varnishes, stains, and outside paints; double windows and screens; the various kinds of roofing materials; the relative uselessness of cedar closets; and even such things as the materials to be used for driveways. Some representative and desirable teaching materials are described briefly in the topics immediately following.

**Lumber, like clothing, has a shrinkage problem.** When one is having a house built or is buying small quantities of lumber for additions or repairs to the home, it is useful to know something about the shrinkage of lumber. Ever since timber began to be sawed into boards and to be used in construction there has been a problem of keeping these boards in satisfactory condition for their use in houses. Boards that are sawed from freshly cut trees still contain a great deal of moisture. If the boards are used with this excessive amount of moisture in them all sorts of disagreeable things may happen. Usually such boards shrink a good deal, especially if they are used inside where they will continue to dry out over a considerable period of time. It is not at all uncommon for a board twelve inches wide to shrink as much as a half-inch in width. Much less shrinkage than this, in interior wood, is likely

to have a distressing effect on the appearance of a newly built or refinished house. During shrinkage boards often split, especially if they are nailed into place before they have shrunk. Boards often warp badly as they shrink and this warping or twisting may make the boards practically useless for purposes of construction. The purchase of correctly dried lumber for building purposes is highly essential. Unless one knows what to do in order to insure correct drying, the purchase of undried lumber for construction is likely to be attended by much grief. Guaranties are needed either when lumber is purchased directly, or when the contractor or builder is supplying the lumber. It is evident that satisfactorily dried lumber is going to be more expensive than undried or poorly dried lumber. It is also evident that there are going to be varying amounts of shrinkage, depending upon the kind of lumber and the care and completeness with which drying has been carried out. The problem of shrinkage is highly important to the person who is purchasing a newly built house or is having one built. He must have definite written guaranties in regard to shrinkage, if he is to be properly safeguarded in his purchase.

The choice of wood for various purposes is quite intricate. Some of the wood used in the construction of houses is entirely hidden from view, some is meant to be covered with paint, and some is treated with waxes or stains in order to bring out the natural beauty of the grain. Some wood must have a good deal of strength, some must lend itself to very ready workability, some must be quite hard and not readily dented, while another kind used for a different purpose must be soft, and some must be able to withstand weathering for many years. Thus it can be seen that it is a valuable accomplishment, when purchasing a house, to be able to recognize the more common kinds of wood used in construction and to know something of their qualities and appropriate uses. The best wood for any one purpose is that which is most economical and does not change over a long period of time, although in certain instances the factor of beauty has enough effect to modify that fact considerably.

Some representative illustrations of the preceding statement are here outlined briefly. In most sections of the country such hardwoods as oak, birch, and maple are considered especially valuable for floors, doors, and door and window trims. These woods are moderately expensive, and their use is ordinarily confined to exposed work in the interior where the grain will show. The use of the more costly hardwoods, such as cherry, walnut, and mahogany, is confined to furniture, except in very expensive houses, where these woods may be used for panels or walls of special rooms. The less expensive softwoods, such as white pine, yellow pine, fir, spruce, and cypress, are usually used for the framework of the house, although low-cost houses may use these softwoods for interior finishes. The softwoods are generally not considered to be as beautiful as hardwoods, and they mar much more easily than do the hardwoods, from the natural bumps and blows which occur during occupancy of a house. Generally speaking, birch is a highly recommended and moderately inexpensive hardwood for interior work, while white pine is the leading softwood for the same purpose.

It is not very wise for one to leave most of the choice of wood for construction to the builder or general contractor. If definite specifications are not written into the contract, the builder is likely to choose the least expensive wood. With more knowledge of this sort purchasers in many instances would be able to get much better values for their money.

Standards for lumber help in making purchases. In connection with the consideration of the value of standards to the consumer, it is interesting that certain standards for lumber have been in operation for a number of years. For example, some idea of the varying grades and qualities of softwoods may be obtained by examination of the following information from the American Lumber Standards:

*Select*

Grade A—Practically free from defects.

Grade B—Allows a few small defects or blemishes.

Grade C—Allows a limited number of small defects or blemishes that can be covered with paint.

Grade D—Allows any number of defects and blemishes which do not detract from a finished appearance, especially when painted.

*Common*

No. 1 common—Sound and tight knotted stock. Size of defects and blemishes limited. May be considered watertight lumber.

No. 2 common—Allows large and coarse defects. May be considered graintight lumber.

No. 3 common—Allows larger and coarser defects than No. 2, and occasional knotholes.

No. 4 common—Low-quality lumber admitting the coarsest defects, such as decay and holes.

No. 5 common—Must hold together under ordinary handling.

In a similar manner, grades for hardwood lumber have been adopted and put into operation by the National Hardwood Lumber Association. Since such standards are in operation by voluntary agreement of producers, it is understandable that there might be difficulty in their enforcement. Also, there are qualities other than outward appearance which affect the value of lumber. However, these standards, even though they are not perfect, may serve as an excellent example of the sort of thing that may be done in many other kinds of consumer goods. It is also to be noted that government action is not involved here. Clearly, science education can make excellent use of such illustrations of standards, as their advantages and disadvantages are considered from several standpoints.

Other construction materials are judged by particular qualities. Even bricks, which to most people seem much alike, actually have differences in quality great enough to be worthy of study from a consumer standpoint. It is clear that if one simply took some wet mud, molded it into shape by hand, and then let it dry in the sun or perhaps baked it in the cooking oven, a brick of rather poor quality would result. It can be seen that the problems of getting good brick for construction are dependent upon the kind of clay selected, the method of molding, and the baking process. Actually, the strength and lasting qualities of brick are

measured by the amount of water a sample brick will absorb under specified conditions, by the force required to break the brick into two parts, and by the pressure it will stand before crumbling. These classification tests help to group clay brick into soft brick, medium brick, and hard brick.

For small homes stone is usually used sparingly and for decorative purposes because the cost is fairly great. In certain communities, however, the cost may be low enough for more general use. These are the communities which have a local supply of satisfactory stone and transportation costs are not heavy. Another factor about stone which may help one get his money's worth is that durability, strength, workability, and beauty of appearance are taken into consideration in the use of stone in building. Granite, for example, with its wide variety of colors and its great hardness and durability, is a very valuable building stone. Yet granite is so hard to work into suitable shapes that it is usually very expensive. Some stones, such as sandstone, for example, need a good deal of careful examination because certain kinds are hard and durable, while other kinds are so soft that for construction purposes they are very nearly worthless. Indeed, they may even break and crumble under their own weight.

Houses may be built very largely of concrete or of hollow tile building units or blocks, and be fairly satisfactory as far as fire-proofness and durability are concerned. One of the chief objections to the use of these materials in visible parts of the house is merely that of custom. In other words, such houses do not look attractive to most people. Methods of improving the beauty and decreasing the cost are likely to make such houses more attractive than they are now. Science education has the task of presenting for discussion the qualities of various building materials, as well as the future possibilities of these and other construction materials such as steel and the new composition building blocks which are beginning to appear on the market.

**Roofing materials need consideration.** It is peculiar that otherwise expensive houses are often roofed with rather cheap



wood shingles, whereas low-cost houses often have expensive tile roofs. A specially made tarred paper is the least expensive kind of roofing, if only the first cost is considered, but it is often true that a roofing material with a low first cost may, through extensive repair and quick replacement, actually exceed the original cost of a high-grade roof. Tar paper is not very strong, constitutes a fire hazard, and is very susceptible to temperature changes, sometimes softening and blistering with the heat and hardening and cracking with the cold.

Wood shingles are frequently favored for their decorative value, in spite of the fact that they are not fireproof and split and curl if they are not given periodic oilings. In their favor are the qualities of light weight and insulating value. Asbestos shingles are somewhat heavier, but are durable and fireproof. If such shingles do not offend one's sense of beauty, they will be found satisfactory, for they make effective and long-lasting roofs. Slate roofs are generally considered to be the most desirable, although they do have the disadvantages of weight and of breaking easily. Doubtless, part of the high regard for slate roofs is due to custom, since such roofs have been in use for many years.

**The increasing use of glass in construction gives rise to a representative consumer problem.** Science education has the responsibility of keeping up with the trends in construction by pointing out the possible advantages and making clear the disadvantages. A few of these conditions may be mentioned with respect to the use of glass as a construction material. Most modern designs of houses devote much more wall space to windows than was true in the past. There is a problem in the nature of the glass itself, either in extensive use or slight use. It is difficult to make ordinary window glass so that it has exactly parallel sides, and, as a result, light rays passing through such glass are bent and distorted. Such glass, when used in the windows of houses, offers no very great disadvantage, although it is sufficiently annoying to make better glass desirable if the cost were not too great.

Definitely connected with the use of larger wall space for

windows is the problem of lost strength. Window glass, even when fairly thick, is of very little value in supporting the weight of parts of the house above it. Structural changes to supply added strength become necessary and the cost of the house usually rises. Increased window space also increases the heat loss in the winter, and makes even more necessary tight double windows to provide suitable home heating sufficiently economical. This heating problem with extensive window space is greater than most people imagine, because the heat loss, even through fairly thick glass, is much greater than through an ordinary double wall, which is several inches thicker than the glass window. In the summertime there is another heat problem connected with larger windows or with glass walls, because the rays of the sun come through the glass readily and heat the interior of the house to a great degree. This disadvantage may be partially overcome by the fact that extra windows can be opened for additional air, but walls made of glass bricks are not usually opened.

Sunlight in moderation has a great health value; but thus far scientists have been unable to produce, for use in home construction, a low-cost and continuously effective glass which permits the ready passage of the ultraviolet rays of the sunlight. Since it is these ultraviolet rays which have the chief health value, it is clear that any additional value of extra window space and glass walls must rest almost entirely upon the additional natural light available in the interior of the house.

**Science education for consumers considers methods of construction.** In addition to the materials used in home construction, certain methods and conditions of construction must be considered by science education for consumers. Such education is of value to the consumer who is having a house built or who is considering the purchase of a house that is already built. The entire field of education has been prone to neglect subject material of this sort. It does not seem too extreme to claim that the housing situation has suffered because of this neglect.

One of the important factors in the construction of a house is

the foundation. Even a slight disturbance of the foundation may be sufficient to cause a chimney to fall, or the house to become lopsided, or part of it to break off, or other less serious troubles, such as plaster cracks, to develop. A foundation must extend into the ground deeply enough to insure a firm footing. If a basement six to eight feet deep is built under the house, then the foundation is not such a difficult matter, because thick basement walls made of stone, brick, tile or cement blocks are generally strong enough to support, for many years, the weight of a two- or three-story house and its contents. In the warm parts of the country, where basements are not common, special care must be taken to see that the foundation rests upon solid support. If there is natural rock or hard, solid clay for the footings to rest upon, the house is almost certain to have a satisfactory foundation. If the earth is sandy, or if there is a good deal of water around the base of the footings when they are being placed, extra precautions must be taken to avoid the dangers of settling. Houses that are already built may be examined from the standpoint of plumbness of walls, possible open cracks in exterior brickwork, interior plaster cracks, and doors that do not close satisfactorily. It must be remembered, of course, that such difficulties may also arise from other, less serious, causes than a weak foundation.

**Dry basements are valuable.** Modern basements have far more expected of them than did the dingy, damp cellars of former years. Basements are now often thought of as additional family rooms, which are to be put into use as laundry rooms, home workshops, or playrooms for young and old. Puddles of water after heavy rains or serious dampness of walls are naturally undesirable. Damp walls and floors, aside from possible unhealthful features, are difficult to keep painted or otherwise satisfactorily decorated. Modern basements need to be waterproofed and to have good exterior drainage, so that water cannot enter through the walls. In addition to waterproofing, proper ventilation aids greatly in preventing dampness in basements. In warm weather, basements are somewhat cooler than the remainder of the house

and the outside air. As a result, condensation of moisture from the air is likely to take place on the cool basement walls. Such condensation may be largely prevented if there is a means of getting cross ventilation for the basement, either through windows or by some more artificial means.

Tile drainage, around the outside of the basement walls and as deep as the basement goes, is of considerable help in keeping the basement dry, unless the house is built on unusually high ground. If one is having a house built, it is a good idea to have the builder guarantee that a basement be leakproof. Such a guaranty seldom costs extra, but it does insure greater care on the part of the person who is doing the work. After a house has been built without waterproofing, it is possible to get a waterproofing preparation to coat the inside walls of the basement, but this procedure is seldom as satisfactory as thorough external coating when the house is being built.

**Elimination of basements is a possible means of lowering building costs.** People in general are so accustomed to basements that they think of them as prime essentials of all first-rate houses. Architects and builders, who have been engaged in studying the problem, claim that there is little real reason for having a basement; that basements form an additional story which is costly to build; difficult to keep dry; difficult to light and ventilate; and by many families put to only occasional use. Such claims include the idea that there is really no good reason why furnace and laundry space need be confined to basements. True, when furnaces depended entirely on the natural convection currents in air, it was essential that the furnace be in the lowest part of the house. Now, however, with the increasing use and low cost of operation of fans in connection with heating, a basement is not essential even in colder parts of the country. As for laundry equipment, there are some very good reasons for not having it in the basement. If such equipment is located on the ground floor, heavy wet clothes would not need to be carried upstairs; trips to answer telephone and doorbell would not be so burdensome; small children could

be cared for more readily while the mother was doing laundry work; and light and air during such work would be better. The general conclusion is that space for furnace and laundry equipment can be supplied less expensively on the ground floor than in an extra story underground.

It is a needed function of science education to bring up for discussion problems of this general nature. Very often the bases upon which consumer decisions rest involve scientific considerations, which are judged desirable for needs other than those involved in consumer education. Such is the case in an examination of the value of basements, since the operation of furnaces and the principle of heat transference by convection have long been considered justifiable material for science instruction. It is also true that understanding of new ideas which arise is an extremely necessary feature of economical purchasing.

This topic on reduction of construction costs by elimination of basements emphasizes the desirability of including in science education for consumers other similar topics, such as all-steel houses and prefabricated or factory-built wood houses.

**Insulation of houses has both advantages and disadvantages.** There are a number of common misconceptions concerning the purchase of satisfactory houses. For purposes of illustration only, a few interesting and very common misconceptions are described in this topic, and in the topic immediately following. Two misconceptions in regard to home insulation are that it offers nothing but advantages and that insulation always makes a house much cooler in the summer. One of the frequent disadvantages of certain types of insulation is that condensation of moisture tends to occur rather extensively on the insulating material within the walls. This moisture gathers slowly and in time tends to cause rotting of the wood used for the walls and for general structural purposes. Although it is true that some kinds of insulating materials are less likely to cause condensation within the walls than others, the problem remains such an important one that architects and builders are giving it serious consideration.

Salesmen for home insulation often promise a good deal in connection with the value of insulation in keeping the home cool during warm weather. A gain in cooling is noticeable at times, since it is true that the protective insulation prevents the interior of a house from getting warm quickly in the summer. If periods of intense heat are only a day or two in length, then insulation is of definite value in preventing the house from warming up as rapidly as does the outside air. However, if there are several days of intense heat in succession the interior of the house finally gets hot and the insulation prevents it from cooling off rapidly at night, just as the insulation in the winter hinders loss of heat to the outside air. The insulation acts as a blanket to prevent the escape of heat. When considering the purchase of insulation, it is well to remember that the blanket is still there during the summer. Incidentally, one of the best low-cost cooling devices for hot weather is the location of a large fan in the attic or on the top floor. At night the operation of this fan produces an air circulation which moves the heated air out at the top of the house, and promotes the entrance of cool air below. The combination of such a fan with insulation is a desirable feature for cooling the house at night during very hot weather.

It must be realized that the difficulties with insulation are relatively minor when one considers its value as a fuel-saver in the winter. Both wall and roof insulation are of value in reducing heating costs, but of the two roof insulation is ordinarily much more important. It is not possible to state any approximate percentage reduction in heating costs because the construction of houses varies within wide limits.

**Air conditioning is a broadly used term.** There are no very definite misconceptions about air conditioning, other than the variety of meanings attached to the term itself. Judging from its use by the salesmen or rental agents of a house, the term seems to mean anything from a small fan used to circulate warm air, through washing and humidifying air, to cooling in the summer-time. A misconception exists in connection with the health value

of humidifying air for the home. This is called a misconception because scientific information on the subject appears to be somewhat confused. It is said that the air in heated houses is usually much too dry for good health, especially with respect to freedom from respiratory diseases. This belief may be correct, although experimental evidence for it does not appear very plentiful or very satisfactory. In support of the opinion, there is the fact that many house plants do not seem to do well in the dry air of the ordinary winter-heated home. However, human beings are much more adaptable than plants. Therefore, the fact that some plants die in the dry air is not satisfactory evidence that the dry air is actually harmful to human beings. Furthermore, the dry climates of sections of New Mexico and Arizona are generally considered particularly helpful to those who have respiratory diseases. In such sections the daily humidity may vary between 10 and 50 per cent on most of the days of the year.

However the question of the possible dangers to health from dry air in the home may be decided, the fact still remains that many home owners are purchasing and installing various means of increasing the quantity of water vapor in the air of their winter-heated homes. Water is sprayed into the air, water tanks are fastened to furnaces and the heated air passes over the water in these tanks, and radiator covers are made with a space for water which evaporates and thus increases the humidity in the rooms. Some of these methods have little importance, because the amount of water supplied is so small that it makes very little difference in the humidity of the air throughout the entire house. Others of these plans of increasing humidity work so "successfully" that on cold days water condenses not only on the windows but on the interior walls of the house. In extreme cases, when the outside temperature drops suddenly, the water may even run down the walls in tiny streams because of the condensation of the moisture in the air. It is clear that there is no very satisfactory way of keeping the humidity high in the interior of the home without the possibility of condensation difficulties. If there is plenty of mois-

ture in the air when the temperature is 70° F., a drop in the exterior temperature causes an increase in humidity and usually condensation as the warm air touches the cold windows and outside walls.

**Science education may aid renters.** Many of the conditions which apply to the purchase of houses already built and houses that are to be constructed also apply in part to houses that are being rented. The renting of a house, unless it is done under a long-term lease, cannot be considered as important as the purchase of a house. The amount of money involved in renting is not nearly so great, and renting is not usually a long-term transaction. However, discussions concerning factors to consider when the use of a house is purchased appear to be valid parts of science education. When a renter learns that the house or apartment he has selected does not meet his desires and is not the best he can get for his money, he is not entirely free to move without considerable loss to himself. About all that he can do is to attempt to make the best choice from the various possibilities in houses which are within his price range. A prospective renter, when starting to look for a house, would do well to put down first the absolute maximum he considers he can pay, and then make a check list which includes the things he thinks are desirable. Most prospective renters probably consider such factors as general appearance of the house; its location from the standpoint of neighborhood and nearness to shopping facilities, schools, and work; interior papering or painting; and how well the rooms fit the family. However, science education can encourage the examination of some additional factors and can aid in developing ways of judging these factors.

Among the things which prospective renters need to consider and which they very often overlook are the factors that make a house comfortable and inexpensive to operate as the seasons change. For example, a prospective renter during the winter will need to consider carefully the nature and adequacy of a heating plant, although he will generally have little basis upon which to



judge. It is the function of science education to help him judge, at least in a general way, such factors as the condition of the grates in the furnace, the size of the fire pot or boiler in relation to the size of the house to be heated, the condition of the smoke pipe, the protection of pipes and furnace against fire, the amount of radiation per room, and the cold air returns. He will want to investigate the way of getting a supply of hot water, whether the tank operates automatically, or whether water may be heated by a pipe that passes through the furnace. He will examine the windows and doors with respect to tightness of fit, and will want to know about the availability of double windows and doors or the nature and extent of weather stripping. From the standpoint of heating costs, the renter will also want to consider possible exposure of the house on the side of the prevailing direction of the winds. Although the prospective renter may give suitable consideration to some of these factors in the winter, it is seldom that he considers them carefully enough if he is renting the house in the early spring or summer. It is evident that it is desirable to consider all-year-round service for a house. From a summer-use standpoint, one will wish to investigate such things as the availability of screens and methods of installation, the rooms that are to receive full exposure of the sun on hot afternoons, shade from trees or other buildings, and the possibilities for cross ventilation in all rooms.

**Standards for housing are still very low.** Again, it must be stated that the factors described in the preceding topic are only illustrative of the things science education needs to consider to help improve housing conditions. There are many others, such as measurements of wall space for furniture already owned; condition of lawns and shrubbery; condition of toilets, faucets, and drains; ease of cleaning; amount of closet space; number and availability of electric outlets; soundproof walls and ceilings in apartments or double houses; amount of natural light available; squeakiness of floors; locks on doors and windows; safety and lighting of stairways; dirt from the heating plant; and insect in-

festations. Any or all of these subjects, and still others, are likely to be worth-while topics for science to consider as a part of consumer education.

In 1912, the National Conference of Charities and Correction drew up certain minimum housing standards for each family. According to these standards, "social welfare demands for each family a safe and sanitary home; healthful surroundings; ample and pure running water inside the house; modern sanitary toilet conveniences for the family's exclusive use and located inside the building; adequate sunlight and ventilation; reasonable fire protection; privacy; rooms of sufficient size and number to house decently the members of the family; freedom from dampness; and prompt, adequate collection of waste materials."<sup>1</sup> In spite of the fact that these standards were deemed essential as long ago as 1912, there are now many families that are living in conditions far below these minimum standards. As a matter of fact, numerous estimates recently made have placed at about sixty million the number of people of the United States who are living in dwellings that are below the minimum standards just outlined. It is a fair assumption that one of the first things needed to improve this housing condition is for more people to know what really constitutes minimum standards, and to know something about judging the purchase or rent of housing that meets such standards. Especially in this respect does science education for consumers have a definite responsibility to aid in the improvement of housing conditions.

**Household equipment is closely associated with housing itself.** The dividing line between some so-called household equipment and the equipment which is considered to be a part of the house itself is not very distinct. Furnaces, bathtubs, and toilet facilities are generally considered as parts of the house, but refrigerators and gas stoves may or may not be supplied with an unfurnished house or apartment. Although the particular di-

<sup>1</sup> Committee Report on "Standards of Living and Labor." National Conference of Social Work, 1912. (Then called National Conference of Charities and Correction.)

viding line is unimportant, there are a number of things that need some consideration from a consumer standpoint.

In discussing household equipment and supplies science teachers interested in consumer education often are quite confused as to their aims. Not at all infrequently one may find a high proportion of the available time for consumer education being devoted to such things as egg beaters, can openers, and even matches. It is true that there are valuable things for consumers to learn about these minor articles, but it must be remembered that, when considerable attention is given to extensive laboratory tests on them, time is taken from other subjects. Although these other commodities or general consumer education problems may not be so easy to test, so readily available for study, or so simple of solution, they must be seriously considered in the light of the general aims one has for his work in consumer education.

**Household equipment affords an extensive field for consumer education.** Stoves, refrigerators, cooking utensils, silverware, dishes, and such electric appliances as toasters, mixers, and roasters form common equipment used in preparing and serving food; washing machines, hand irons, mangles, and vacuum sweepers are appliances used for keeping clean; furniture, lamps, and air conditioners add to general comfort; and radios, musical instruments, and photographic equipment supply recreation. It is not the purpose of this book to describe desirable consumer information about all of these types of equipment and the numerous others which might be named. Instead, as stated several times previously, the purpose of this book is to provide illustrative material only about relatively large divisions of products which are ordinarily purchased. Even refrigerators and vacuum sweepers, the two household articles selected for brief discussion in this book, are of special importance only as they contribute illustrative material for more general consumer problems. For example, general consumer problems, in this relation, might be stated as follows: "What can be done in order to improve buying conditions for household equipment and supplies? What wrong con-

ditions now exist? Can standardization and informative labeling be of any assistance?"

Refrigerators form a satisfactory subject to use for illustrative purposes. The construction, care, and operation of both iceboxes and automatic mechanical refrigerators are usual topics for science education. They begin to take on a more definite character when comparisons are made regarding the original costs and operation costs of iceboxes, electric refrigerators, and gas refrigerators. Naturally, any positive statement about operation costs must take into consideration the cost of ice itself and the relative cost of electricity or gas to operate the mechanical refrigerators. Numerous claims to such special advantages of iceboxes as less drying out of food and better preservation of flavors are to be discounted, since there is not sufficient proof to show that such advantages exist. Other factors worthy of particular consideration in the purchase of mechanical refrigerators are freedom from danger of electric shocks, relation of the amount of space to the family needs, and the ability to make ice and to maintain a suitable temperature within the refrigerator on hot summer days. It is sometimes possible to get, from companies handling the sale of mechanical refrigerators and iceboxes, definite written guaranties in regard to temperature maintenance. Purchasers of refrigerators should ask for such guaranties, as well as for guaranties regarding the life of the machine. It is evident that guaranties regarding operating costs are not likely to be available, because of the wide variation possible both in use of the refrigerator and in the temperature which the owner desires to maintain. A temperature of 50° F. is usually considered a safe maximum in the general food compartment of the refrigerator or icebox. Except in the freezing compartment, the temperature should be so regulated that it does not drop below 32° F. Tests and calculations show that if somewhat comparable conditions are maintained in the various refrigerators and if ice costs fifty cents per hundred pounds, electricity five cents per kilowatt-hour, and natural gas an average of sixty cents per thousand cubic feet, one may expect

to pay nearly twice as much for ice for refrigeration as for electricity, and about two thirds as much for gas as for electricity.

Community scientific tests on such generalized costs are always highly desirable features of consumer education. Even if the details of the tests are not remembered, the important general conception is likely to remain long with the student. This important general conception is that such comparisons can be made and are necessary subjects for investigation if a refrigerator is to be purchased.

Vacuum sweepers are particularly interesting because of numerous incorrect claims made for them. In general, it can be said that four major factors are important in the purchase of electric vacuum sweepers. The first factor is the amount of suction obtained for cleaning purposes, the second is a safety factor in regard to complete insulation of all exterior parts of the sweeper from any possibility of electric shock, the third is the probable life of the sweeper, and the fourth is the cost. As is true with many other appliances for which new models are brought out each year, the real differences are slight between new models and models one, two, or even more years old. Relatively unimportant gadgets and changes in color and design are seldom worth the price differences when older models are available at much lower prices. It is also true that a few dollars spent in reconditioning an old sweeper may often be a much more economical expenditure than a more expensive trade-in. The amount of wear on rugs and carpets produced by any type of sweeper is likely to be of little importance in relation to the general wear produced by the usual use of rugs and carpets.

Vacuum sweepers cannot be expected to do much more than to clean, in spite of numerous claims to the contrary. Claims that sweepers are able to kill moths and other insects in carpets and upholstered furniture, and that the air may be purified by their action are often based upon the fact that the air that goes through the sweeper passes through a chemically treated pad. It is unlikely that any such pad can do more than impart a slight odor

to the air in the room. Other similar claims are that the sweeper sucks through itself nearly all of the air in the room and effectively removes the dust from the air. This claim has little merit, whether the air passes through water or through an ordinary bag, because there is no reason to believe that different air always goes through the sweeper. Neither is there any reason to believe that the total quantity of air which passes through the sweeper during one use is likely to be any large proportion of the amount of air in the house. Likewise, there is little justification for the claim that the passage of air through water in some sweepers is likely to raise the humidity of the air in the room any appreciable amount. One can see that the investigation of such factors as safety from electric shock, possible purification of air by use of sweepers, and possible increase in humidity of air will supply excellent leads for science education into the more traditional types of material. This traditional material then becomes more meaningful because it becomes more functional.

In lighting, cost of electricity is a more important factor than cost of bulbs. Electric light bulbs have been so greatly improved, so largely standardized, and so much reduced in price that they are now of somewhat negligible importance to the consumer in relation to the cost of the electricity used to keep the bulb lighted. Bulbs with relatively high wattage for home use cost practically the same as low-wattage bulbs. Consumer education in regard to correct lighting should be concerned chiefly with the amount of light needed for various tasks in the home. The number of foot-candles of artificial light needed for reading, as indicated in science books of twenty years ago, is much smaller than the number now usually accepted as necessary. Perhaps some of the difference is the result of the fact that it is now possible to get much more light than it was twenty years ago, as well as the fact that modern research has pointed to the need for more light. It is interesting that most of the research in connection with the light needs for various occupations about the home has been carried out in the research laboratories of the General Electric

Company. One reason for the wide acceptance of such results is probably the very high regard for other researches made by the noted scientists employed by this particular company. Another reason is the fact these results are in accordance with what might be expected when comparisons with daylight are made. For example, if one is indoors and near a large window on a clear day, he may expect to receive on a book as much as 150 foot-candles of light, even when there is no direct sunlight coming through the window. By comparison, a single 40-watt bulb in a bridge lamp will supply possibly five foot-candles for reading—and this is a common setup in many homes. In view of the amount of light that comes through a window on a bright day, it does not seem unreasonable to consider twenty foot-candles as the minimum of artificial light for reading. In an ordinary floor lamp, about twenty foot-candles may be supplied by one 100-watt bulb, two 60-watt bulbs, or, if three sockets are available, by two 40-watt bulbs and one 60-watt bulb. If glare is produced by such wattage, a different type shade or possibly a different design of lamp is needed. Undoubtedly, as far as glare is concerned, there is much value in the lamps which supply indirect light reflected from the ceiling.

There is need for much more science education along the line of better lighting for the home—education that is of a very definite consumer nature. Illustrations include particular needs for older people; variation in requirements for such work as close sewing and newspaper reading instead of book reading; need for distribution of light throughout a room; different requirements for different rooms; and ways of preventing glare.

Again it appears desirable to point out that these somewhat detailed suggestions in regard to the purchase of refrigerators, vacuum sweepers, and satisfactory home lighting by no means cover the field of important subjects for household appliances and equipment. As is true in other parts of this book which deal with suggested materials for consumer education, there is no attempt

to exhaust the subject by including all necessary information. Instead, the object is to include illustrative material which can serve to show the nature and extent of the work that science education may do for the purchaser of goods and services.



## Chapter IX

### ILLUSTRATIVE CONSUMER EDUCATION SUBJECT MATERIAL FOR NATURAL SCIENCE COURSES: A VARIETY OF SUGGESTIONS

Many commodities are possible subjects for special study. As indicated at the close of the preceding chapter, the varieties of consumer goods which may become a part of the work of science in consumer education are much more numerous than is evidenced by those described here. For example, in this book such obvious and frequently used commodities as the following are not mentioned: carpets, upholstery, leather and rubber clothing, furs, jewelry, luggage, kitchen utensils, ingredients in factory-made cakes and pies, gasoline, and dozens of others equally important, as well as devices to correct hearing defects, obesity, acidosis, and the like.

The relative importance of goods and services in the buying habits of the people of individual communities is the best basis that can be used in determining the choice of subjects and the relative amount of attention that is to be given to each. There is, however, one significant modifying factor when the choice is made in such a manner. This modifying factor is that commodities which may be dangerous to health or life deserve a place in science education, whether or not these commodities happen to occupy a high position economically in the purchases ordinarily made. Drugs, cosmetics, and health services are partially in this class, except that only a relatively small portion of them are likely to be dangerous. Strong caustics, such as sodium hydroxide and potassium hydroxide, used in cleaning clogged drains, methyl alcohol, used to prepare an antifreeze solution for automobile radiators, and poisonous insecticides used in the home, are also common examples of substances that are dangerous. These sub-

stances, and others like them, should be used with great caution, if they are used at all.

This chapter, the final one dealing with consumer education subject material, includes a brief discussion about the purchase of automobiles; a consideration of fertilizers, grass seed, and other commodities related to leisure-time gardening; and several topics which have a general connection with other classes of commodities discussed in previous chapters, and with consumer education as a whole.

**The automobile is an important subject for consumer education.** Because of its high unit cost and wide use, the automobile, almost in its own right, is a desirable subject for consumer education. In other words, it is conceivable that some major generalizations may be localized about the automobile and transportation, just as they are localized about housing or clothing. It is probably true that, on a comparison basis, one will come as close to getting his money's worth in the purchase of a new automobile as in the purchase of any other commodity. This statement means that, as one new automobile in a low-price range is compared with another of similar price, there are not likely to be major differences between them; the differences are largely dependent upon personal likes and dislikes of the purchaser. It is true that there are occasional models, for almost any make of automobile, in which certain features either do not work out well or do not hold up under use. The extensive testing now done before new models are brought out, however, tends to eliminate the weaknesses that show up only after the automobile has been in use for some time.

The information supplied by testing and rating agencies on the subject of new automobiles is especially valuable in science education. It is valuable not because of the comparison ratings of different makes of automobiles, but because new, special features are often described in considerable detail. While the classifications used may throw the ratings of automobiles into rather hopeless confusion for the consumer (even to persons with little scientific training, the bases used for the approval of one make in preference

to another often seem minor), knowledge of special features and a ready comparison of the weights of different makes are very desirable. Upon this latter quality and the power developed depends a large portion of the gasoline operating cost of the automobile. Such information is more readily available from private testing and rating agencies than from any other source.

Among the most usable generalizations in the purchase of a new automobile are these:

1. Standard models are usually better purchases than corresponding *de luxe* models, because the *de luxe* features are few and are generally overpriced.

2. From the standpoint of original cost and operating cost, when transportation alone is considered the low-priced automobiles are practically certain to be more economical than higher priced ones. Experience has shown that, in general, one has little basis for the argument that the purchase of a higher priced automobile is likely to be more economical than the purchase of a lower priced one.

3. It is probably safer to postpone the purchase of automobiles which come out with radically new features until these new features have been in operation for several months or for a year. On the other hand, careful testing has tended to cut down the danger that these new features will be unsatisfactory, and of course new features are often new only in that they are being emphasized in advertising for the first time. They may actually have been on last year's model.

4. When automobiles are being compared, they should be tried out over the same streets or roads, with the choice of road such that some idea may be obtained concerning the following qualities: power, riding comfort, steering and holding to the road, smoothness of engine, brakes.

**Technical knowledge of automobiles helps in purchasing wisely.** There can be no satisfactory argument against the idea that greater scientific and technical knowledge of how an automobile operates is likely to be of considerable service in the pur-

chase of an automobile. The same situation, moreover, exists in the purchase of practically any commodity. Scientific background in general, and detailed technical knowledge about the particular commodity, are practically certain to give some assistance to the prospective purchaser. This statement summarizes the arguments of those who favor teaching science in the traditional manner. They say that there is no need to give special attention to consumer education, since the traditional science principles and methods supply the background needed for judgment of consumer goods and services. Those who favor special attention to consumer education insist that the teaching of such traditional scientific background has not been adequate in the past. They say that science education must go further than the science principles themselves. They say that science education must consider of major importance the definite functional relations of scientific background and principles to the purchase of goods and services. They even say that consumer problems may deserve the position of major importance, that the science principles are secondary, and that they are to be introduced only when needed for the understanding and solution of consumer problems.

**The purchase of used automobiles is a special problem.** Few other commodities present a buying problem so extensive and unique as that offered by used automobiles. Automobile transportation is now at a stage where second-, third-, and fourth-hand automobiles are common purchases. Although some dealers are offering various guaranties which help in the purchase of a used automobile, there is a distinct service that science education can render in this connection. Some of the practices common among dishonest dealers suggest one basis for study. Representative practices of this sort are setting back speedometers; making worn, noisy gears quiet by running them in a mixture of sawdust and heavy grease; removing all signs that indicate former use of the automobile as a taxicab; retreading tires so that they look like new, but actually have a very thin layer of "good" rubber; and covering up evidences that the automobile has been in a serious wreck.

A better indication of actual use than is offered by the speedometer reading can be obtained by looking for signs of wear. Worn and dirty upholstery; a steering wheel with a badly worn surface, holes in the floor board under the brake or clutch pedal, absence of paint or enameled surface about the ignition switch and light buttons, and badly worn rubber on running boards, all indicate heavy usage and mileage. Steering gear may be tested for excess play. Brakes may be tested for effective and smooth operation at various speeds. Both brakes and clutch adjustments may be examined to determine the possibility of additional adjustments before extensive overhauling is needed. Tires and battery may be considered from the standpoint of possible early replacement. Valuable information about a battery may be obtained by checking the amount of dimming of lights when the starter is used. Noisy operation of some part may be an indication of special defects. Continuous heavy, bluish oil smoke from the exhaust may be an indication of worn rings or pistons. These are all representative of a number of tests and examinations which are worthy of consideration in the part that science has in consumer education.

**New yearly models of commodities may not benefit consumers.** The new models of automobiles which appear yearly represent an unusual situation in the whole consumer picture. It is so common, however, that many people seem not to see the unusual side. There are also new models each year in other commodities, such as refrigerators, vacuum sweepers, typewriters, radios, and washing machines, but the number of these commodities is actually very small. It is evident that the practice of issuing new models about the same time each year is considered by the manufacturer as financially advantageous, otherwise the practice would be discontinued. On the other hand, one can see numerous disadvantages from the standpoint of consumers. The unnecessarily big splurge of advertising which accompanies the introduction of the new models, and the pronounced drop in price of an old model as soon as the new one appears, are both practices which do not have any particular merit. Careful examination of

new models often shows negligible differences in construction. Ordinarily, the major differences are in the advertising and in the outward appearance of the product. The whole question of new models is worthy of consideration in science classes studying consumer problems. In many cases it will be possible to make careful comparisons of old and new models of these various commodities, in order to determine the differences that may or may not exist. Any conclusions are certain to have a desirable effect in developing a greater sensitivity to those factors in our economic system which require examination.

**Seeds, bulbs, and growing plants enter consumer education.** Little consideration is given to consumer education in regard to the purchase of seeds, bulbs, and growing plants. However, knowledge of the large number of nurseries and seed houses, and the increasing interest in the growing of grass, flowers, decorative shrubbery, or even vegetables on a small scale, combine to show the desirability of increasing consumer education in this direction. Because of the specialized work in agriculture, science education should be concerned chiefly with the education of the purchaser who confines his work with growing plants to beautifying his home grounds, to house plants, and to small vegetable gardens for home use. If there appears to be needed consumer work that is not covered by specialized agricultural courses, those engaged in science education should consider this phase of consumer work.

With respect to seeds, bulbs, and growing plants, there is much valuable information which science education may make available for study. For example, grass seed for lawns forms only a small portion of the total cost of preparing a good lawn, and therefore it can and should be the best available. Both the percentage of sprouting and the percentage of weed seeds are important considerations; a high grade of lawn seed is guaranteed to contain less than 0.1 per cent weed seeds. Different kinds of lawn seed are used for different purposes and for different soils. Knowledge of the particular situation often saves considerable money, and

frequently makes possible a good lawn a year earlier than would be obtained if the wrong seed were used. Seeds of all kinds, bulbs, and plants, when purchased for planting at certain times of the year, have much greater chances of satisfactory growth. In this respect there are, as might be expected, wide differences in practices for different parts of the country and for different kinds of plants. It is the function of science education to supply the opportunity to work with materials of this sort in relation to each community.

It appears to be a common misconception that flowers which grow well in Texas or California are likely to do as well or even better in Michigan or Maine than those which can be supplied from local nurseries and seed houses. Many persons purchase seeds and plants from distant seed houses and nurseries. Apparently they make such purchases with no more basis for believing that satisfactory growth will result than the glowing descriptions and beautiful pictures presented in the catalogues. Little thought also appears to be given by purchasers to the fact that the number of seeds in a package or packet can vary almost without limit; prices per packet are compared, whether the packet contains ten seeds or a hundred.

Among desirable generalizations for science education to develop are these: Seeds should be purchased by weight, or by the package only when the approximate number of seeds per package is specifically stated. Sprouting percentages are tested and stated on containers as a regular practice by a few seed houses. Such information is desirable, and such seed houses are likely to be more dependable. Plants, when purchased for transplanting, are more likely to live if the time between digging and replanting is short. For example, the widely grown, fairly expensive, and lovely hybrid tea roses which are sold in stores are not infrequently dead before the customer makes the purchase. Field-grown plants are far more desirable and more likely to grow than are those which are grown in pots. A few nurseries offer to purchasers an unconditional guaranty that plants will grow. Such nurseries depend en-

tirely upon the statement of the purchaser as a basis for replacement of plants which did not grow. Other nurseries are frank in informing customers that certain plants will not do well in particular localities, and indicate which varieties are most subject to blight, which do well or poorly in the shade, and the conditions under which others are hardy. Science teachers may wish to compare relative values of such education with that which deals with details of structure of a leaf or a stem.

**Prices out of proportion to value are common among advertised fertilizers.** Closely connected with the growing of plants for home beautification, or as a hobby, are fertilizers. No small part of the problem of fertilizers, to persons only moderately engaged in the growth of plants, is a result of the misleading advertising of some manufacturers who are engaged in the sale of fertilizers under various trade names. Nitrogen, phosphorus, and potassium are the three most important elements supplied in compound form in commercial fertilizers. Now a chief function of nitrogen is to give aid in the production of the green parts of plants. Nitrogen, therefore, is especially important in a fertilizer for lawns where a rapid growth of green leaves is desired. Phosphorus is especially useful in the production of large, vigorous roots. Potassium also aids in producing better lawns, since it is essential for general growth, although it is much more valuable in the production of flowers and vegetables than of grass.

There are a great many fertilizers on the market, and even moderately complete knowledge of their compositions and relative values for different purposes requires considerable study. Those consumers who expect to make only slight use of fertilizers will probably find it desirable to limit their purchases to two kinds only. One of these is the commonly used 10-6-4 for lawns, and the other is the common 4-12-4 for general use on most flowers and small vegetables. The figures refer, respectively, to the quantities of nitrogen, phosphorus, and potassium available in the fertilizer. It is a questionable procedure to advertise, under a trade name, a 4-12-4 fertilizer as a wonderful lawn fertilizer. A 4-12-4 fer-



tilizer is relatively unsatisfactory for lawns, unless it is supplemented by suitable amounts of another fertilizer which furnishes nitrogen very largely or entirely. Another questionable procedure is that of advertising a fertilizer under a trade name and selling it for nearly twice the price that the company asks for the identical fertilizer when it is sold in a bag not bearing the advertised name. Still another kind of misleading advertising with respect to fertilizers is that which emphasizes the necessity for elements other than nitrogen, phosphorus, and potassium. It is quite true that these other elements are necessary for plant growth, but it is equally true that they are usually present in natural soils in sufficient quantities, and that the need for their addition in specially priced fertilizers is not pronounced.

Since most states now require that the correct composition of fertilizers, as far as nitrogen, phosphorus, and potassium are concerned, must be stated on the bag, the best way to buy a fertilizer is to check this composition. Then prices may be compared and a purchase made of just a fertilizer rather than some euphonic name with which familiarity has been obtained through advertising.

**Weights and measures suggest an important consumer problem.** A study of weights and measures is a valuable subject for the work of science in consumer education. The chances are that most people think that any consumer problems of weights and measures are connected with incorrect scales, low-capacity containers, or short-measure gasoline pumps. It is true that, in spite of many laws and the efforts of numerous enforcement officers, there are still a great many deliberate violations of the law. Community, state, and Federal regulations, methods of enforcement, and number and nature of the violations are worth-while subjects for study.

In addition to this fairly common idea about the violation of weights and measures, there are other factors that are important features of the problem of getting as much as one pays for. A few illustrations will serve to show the rather broad nature of

the weights-and-measures problem. Ice cream, for example, is sold in most places by the pint, quart, or gallon. Such measures for ice cream have very little definiteness, for the ice cream may be so puffed up with air that the consumer is getting a very poor value for his money. States which have attempted to supply aid for consumers specify that the ice cream must weigh not less than a certain number of pounds per gallon. Under such a law, quarts and pints must have a proportionate weight.

Another weights-and-measures problem exists in the sale of fruits and vegetables. When these commodities are sold by the quart, box, bushel, or barrel, it is understood that the variation is likely to be very great. Regulations are increasing regarding the sale of such goods by weight instead of by measure. Numerical count is still much used for certain fruits and vegetables and for eggs. Comparisons are practically impossible when prices are given at so much per basket.

The Federal Food, Drug, and Cosmetic Act of 1938, which is briefly described elsewhere in this book,<sup>1</sup> attempts to regulate slack fill of containers. Foods, drugs, and cosmetics are considered misbranded if containers are so "made, found, or filled as to be misleading." Something of the value of this law is evidenced by the appearance, in the business sections of the New York City daily newspapers, of articles dealing with new box and package sizes for numerous products. Such articles were especially numerous in the late months of 1939.<sup>2</sup> Also connected with slack fill are problems involved in shrinkage of canned goods after they are packed, and possible excessive amounts of water, brine, or sugar solution as a liquid packing medium. The Federal government is attempting to set standards which will take care of the most serious problems of this sort.

**Standard sizes of containers are needed for simplification.** The problem which exists because of the wide variety of sizes for containers is intimately connected with the whole problem of

<sup>1</sup> Particularly in Chapter III.

<sup>2</sup> This feature of the Federal law went into effect January 1, 1940.

weights and measures. This problem also is an excellent one for study in consumer education, whether children or adults are involved, or whether the class is one in science, home economics, mathematics, or economics. An idea of the nature of the problem may be obtained by a brief review of a report of tomato juice purchases in one store in Washington, D. C.<sup>3</sup> Purchases of tomato juice in this one store yielded eleven different brands and seventeen different sizes of containers, which sold at fifteen different prices. Net weight of the juice in these containers varied as little as one-half ounce. The confusion of the consumer is evident when a decision needs to be made between buying 14-ounce containers at three for nineteen cents and 10 $\frac{1}{4}$ -ounce containers at two for nine cents. A similar state of confusion exists in nearly all canned and packaged foods, as well as in that sold in open containers. Net weights on the containers have little meaning for consumers even when they take time to read the labels.

Among the reasons for this chaotic condition are the varying sizes of the food units which go into cans, and the desire for large and small cans for different sized families. Cannery operators often operate on the theory that the best way to deal with the scarcity or abundance of a commodity is to change the size of the container slightly. They say that this method is better than changing the price of a particular size of can.

Shippers, manufacturers, and others concerned with making or handling containers often favor greater standardization of sizes. In addition to greater simplicity in comparing prices, some other advantages are reduced costs of manufacturing containers and the packaging, shipping, storing, and marketing of the packed goods.

**Standardization has two broad features.** The numerous references to standardization throughout this book tend to support the idea that standardization may be the broadest single consumer problem. Doubtless the solution of the quantitative phase of the standardization problem, discussed above, is likely to be simpler than the phase which deals with the standardization of quality of

<sup>3</sup> *Consumers' Guide*, August, 1939, p. 6.

goods. At least one can find much more agreement on what to do to improve quantity standardization than on what to do to improve quality standardization. Perhaps one reason is that standardization of quality of consumer goods is comparatively new.

Even quantity standardization, however, is not as exact as it sometimes is thought to be. A bushel is a standardized measure throughout the United States, but a bushel of beans, in the different states, may vary from 24 pounds to 78 pounds. A bushel of sweet potatoes may be 24 pounds, or 40 pounds, or somewhere between, depending on the state standard. If the Federal government sets a definite standard for the pound and a definite standard for the bushel, which one varies throughout the states, the pound or the bushel?

In studying the whole problem of standardization in connection with consumer education, it is well to keep these two points in mind: There appears to be some merit in looking at quantitative standardization as a separate type in itself, but there are evident advantages in considering qualitative standardization as part of the study of each commodity considered. The reader is reminded that the problem is a broad one, and that the treatment in this book is intended only to suggest features for more extensive study in the work of science.

**Like standardization, labeling of consumer goods is a major problem.** The problem of labeling consumer goods has been mentioned several times in the preceding pages, particularly in the descriptions of consumer problems relating to foods, drugs, and clothing. As with standardization, the subject of labels is both general and specific in regard to the particular goods being labeled. The relation between standardization and labels is even closer, because upon the standards set depends the kind of labels to be used. With the increasing pressure from consumers for corrective measures which will improve the consumer situation, there is a growing favor in business circles for labels which will give more information. Many large industries favor the adoption of what is known as descriptive labeling, and some organizations,

particularly those connected with the food industries, have put into operation a type of descriptive labeling which is a distinct improvement. However, such a label as "preshrunk," referred to in the section on clothing, is descriptive and, as was pointed out, is at the same time practically meaningless. It can be seen that descriptive labeling can vary from the kind that is meaningless to consumers and open to as much deception as no labeling at all to the kind that will give about as much information as the consumer can wish. A label in use on a cleanser for porcelain is illustrative of the complete descriptive type. This cleanser is distributed by Eastern Cooperative Wholesale, Inc., New York. The label includes a list of the articles for which the cleanser is recommended and follows that with a statement of composition: "ABRASIVE—Approximately 75%. Finely powdered chalk (whiting), selected as the safest abrasive for use where scratching must be avoided. Soda—Approximately 22% Trisodium phosphate to cut any oil or grease present, a great help to cleansing efficiency. Soap—Approximately 3% pure powdered soap to assist in washing away dirt loosened by the whiting." Then follows a statement of directions for use.

In spite of the completeness of such a label it is evident that some additional knowledge on the part of the consumer is always necessary if he is to understand the value of this product in comparison with another which may state a different composition. It is also clear that the degree of completeness of descriptive labeling is difficult to specify and to control, even if such labeling were done by voluntary agreement among the producers of each particular commodity. For these reasons most consumer organizations favor what is known as grade labeling. In grade labeling minimum standards and specifications are set, either by law or by voluntary agreement, for one or more different grades of a product. Then the grades may be indicated simply by A, B, C, and so on. It can be seen that such grades may be necessary in certain kinds of food and clothing, but that only one high grade might be adopted for particular drugs or medicines. Truly, there is a great deal about

the problem of labeling that needs extensive discussion and investigation from the standpoints of scientific knowledge and science education. Labeling, along with standardization, can form a major area for study in much of the work of science.

Care and proper use of commodities are not a part of this book. The care and proper use of commodities are often considered a valuable phase of consumer education. It is apparent that a great deal of valuable educational material is available on such subjects as the preservation and care of foods in the home; the care of sick members of the family; the laundering of clothes; the desirability of giving shoes and clothing a rest; the operation and repair of plumbing fixtures and electric appliances; care of the family automobile; proper methods of economical driving and procedures for safe driving. These and similar topics are not included in this book because it is felt that they receive relatively adequate treatment in science courses as well as in numerous other school courses. The proper operation of automobiles, for example, has become a special course in a large number of high schools.

It is understandable that the care and use of commodities are just as likely to be helpful consumer education materials as any of the subjects selected for treatment in this book. Indeed, the proper operation of the automobile from the standpoint of safety is of much greater importance as a subject for emphasis in education than any material that may deal with the economical buying of automobiles. The omission from this book of material dealing with the care and use of consumer goods is not in any way an indication that such material should be omitted from an organized consumer education course.

## Chapter X

### PROBLEMS ARISING FROM CURRICULAR EMPHASIS ON CONSUMER EDUCATION

Science education occupies a relatively low position in connection with consumer courses. There is wide support among school administrators for organized consumer education in the schools. One survey, although meager, indicates something of this opinion. According to this survey, made in 1937, 100 per cent of the 196 high school principals answering a questionnaire believed that consumer buying should be included in the high school curriculum. Other surveys and reports<sup>1</sup> induce the estimate that from 5 to 10 per cent of America's schools and colleges were offering consumer education as a separate course in 1939. It is evident that these figures show only a part of the picture, because consumer education is also receiving attention as a part of other school courses.

The place of science education in the entire picture is not particularly complimentary to science. One investigator<sup>2</sup> finds that consumer education courses were most frequently operated in social studies departments. Home economics and business departments were next. When secondary school courses alone were considered, the business department led, with home economics and social studies close seconds. In the field of adult education, practically all the consumer courses were given by economists. In regard to science, Harap writes: "On the basis of supplementary material received after the tabulation was completed, I am able to report three courses representing the department of science. Pioneering instructors in chemistry have apparently

<sup>1</sup> *Consumer Education, a News Letter*, October, 1939, p. 1.

<sup>2</sup> Harap, Henry, "Seventy-one Courses in Consumption." *School Review*, October, 1938, Vol. 46, pp. 577-596.

recognized the possibility of applying scientific knowledge to household and buying problems."

The position of science in the consumer education picture is further shown by the results of a questionnaire sent to readers of *Consumer Education*<sup>3</sup> just before the close of the school year in 1939. The following tabulation gives the main subjects in which consumership is taught and at what level:

	<i>High School</i>	<i>College</i>	<i>Graduate</i>	<i>Adult</i>
Commercial	127	25	1	20
Home Economics	76	68	1	17
Social Studies	48	13	3	4
Economics	13	54	1	
Consumer Education	16	16	14	5
Science	6	4	1	
Psychology	3	3	1	

This comparison between the part that science has in consumer education and the part being assumed by other fields of education is not an attempt to show that work in science should replace the work of other departments, but that science education is not bearing the proportion of the responsibility it should bear and is not making the contribution which its particular nature permits it to make. Educators whose special interests are in fields other than science invariably refer favorably to the help science can give in consumer education, but those engaged in science education appear to have largely disregarded such references.

The center of emphasis for consumer education probably is the senior high school. Whenever any discussion arises regarding the introduction of an important area of material for study into the relatively well standardized setup of the school system, there are always such questions as these: "Where is the best place to introduce such material?" "Should it be especially emphasized in the elementary school, junior high school, senior high school, or college?" "Is it important enough to include at all levels?" With respect to the last of these three questions, it can be said that the thesis of this book, thus far, has been

<sup>3</sup> *Consumer Education, a News Letter*, October, 1939, p. 7.



to show that consumer education and the part that science education has in it are highly important, and certainly comprehensive enough to be included at all levels in the school setup. It is now a commonly accepted viewpoint of education that even very broad fields and generalizations can, if it is thought desirable, be successively analyzed into smaller and simpler parts which can finally be comprehended by very young children. Such an analysis is desirable and readily applicable to the field of consumer education and to the generalizations which it may include. The important subjects of food, health, and clothing offer possibilities for consumer emphasis at practically all levels of education where these subjects are already introduced. An excellent illustration of science in consumer education for very young children is demonstrated by the work of a second grade class on the purchase of Christmas trees. The quality of fireproofness and the kind of tree which might be expected to hold its needles longest were two ideas considered at some length. Several desirable activities were planned and carried out to give a practical answer to the problem.

In spite of the desirability, applicability, and necessity of including consumer buying in the work of science education at all levels, several factors support the opinion that the senior high school is the place for particular emphasis on the purchase of goods and services. At the present time about two thirds of our population of high school age are actually enrolled in high school. It therefore is possible to reach a large proportion of these young people at a time when the amount of their buying is increasing materially. Furthermore, many of these young people enter directly into full home responsibilities shortly after they leave school. If the emphasis on consumer education were left to the college, or even junior college, the number reached at present would be extremely small. If the number reached is the only consideration, the junior high school is a more desirable place for emphasis on consumer education than the senior high school, and the elementary school even more desirable than the junior high school. Another

factor that must be considered important is the amount of buying actually being done by students at various ages, or the amount of buying which is to be done shortly after the period chosen for greatest emphasis on consumer education. The arguments are excellent for making the ninth grade the particular center of emphasis, because at this point only a small percentage of the students have left school. However, the increasing amount of buying done by high school young people and the rapidly approaching time for assuming full responsibilities of home life favor greater emphasis on consumer education throughout the science work of the tenth, eleventh, and twelfth grades. Public junior colleges of the future may well move this center of emphasis still further upward.

**Adult education is a fertile field for consumer education.** The increasing emphasis on tax-supported adult education indicates a trend toward the time when adults who feel the need for education of any sort will be able to obtain that education at little or no direct money cost to each individual. Science education needs to recognize this trend so that it can accept its responsibility for providing suitable educational experiences for adults in the field of science. There is every evidence that the work of science in consumer education is a particularly appropriate area for adult study, and that suitable courses in the purchase of goods and services would meet with hearty approval on the part of adults.

Those who have training in science, and who have special interests in or knowledge of valuable materials for consumer education work, are likely to find adult education a fertile field for their efforts along consumer education lines.

**There are four possible arrangements for developing consumer education in science work.** There are arguments for considering consumer education one of several large areas about which the work of a considerable part of the school program may be integrated. In the first place, curriculums integrated about life-problems are currently popular as methods of improving an educational setup and of getting rid of artificial subject matter divi-

sions which are not consistent with actual life-conditions. Mathematics, business, social studies, home economics, and science all could contribute directly to such consumer education if it were considered a suitable area for integrated study. These statements, coupled with the fact that consumer education is considered an important area now largely overlooked, present arguments for the use of consumer education as a desirable field for such integration. However, the administrative problems of setting up a school curriculum on such a basis are quite extensive, and many school people argue that the result would be simply the formation of a new set of artificial divisions:

A second possible arrangement for developing the work of science in consumer education would be the establishment of a course, labeled "Consumer Education," which would be a part of the work of the science department and would be taught by persons with acceptable scientific training. Although this setup is a suitable one for advancing consumer education, there are several obstacles and disadvantages. As is true with the first arrangement, it presents serious administrative problems. The addition of such a course to an already overcrowded curriculum means difficulties not ordinarily understood by those who may happen to be sponsoring the extra course. This statement applies particularly to the introduction of new courses into the senior high school. If the course is an elective, the number of students reached may be small. If it is made a prescribed course, it must push out other desirable subjects in varying degrees. Furthermore, prescribed courses have often tended to become somewhat static because they no longer need to attract students chiefly on a course merit basis. State requirements for graduation from high school and the oft maligned requirements for admission to college add to the confusion attached to the organization and operation of consumer education as a new high school course.

A third possible arrangement for developing the work of science in consumer education appears to be the most workable one, because it requires no very difficult or drastic changes. This

arrangement proposes the inclusion of consumer material and methods as part of biology, chemistry, physics, and other established science courses of the high school. In many schools, science teachers alone will be involved in making a shift toward consumer education in their regular work. The difficulties of administration will be slight compared with similar difficulties of the other possible arrangements. This method also has the advantage of insuring the necessary science background for understanding and coping with consumer problems.

A fourth possible arrangement is that a separate unit on consumer education be made a part of each of the major courses in science. Such a plan appears to have no particular advantages over the arrangement just suggested, but has the disadvantages of narrowing the field of endeavor considerably. It is hoped that the broad nature of the work in consumer education will effectively discourage allegiance to a plan that so narrows the consumer work that it becomes limited to a study of only a few subjects, such as proprietary medicines, soaps, and dentifrices, subjects usually selected for such a unit. A further disadvantage of this arrangement is that it tends to produce a purely artificial separation between intimately related scientific subject material and consumer problems.

It cannot be assumed that college preparatory students have no need for consumer education. Perhaps the strongest single movement in secondary school education at present is the increase in attention to materials and methods which are to supply a more functional type of education. The developments in curriculums are strongly in the direction of this "education-for-life" movement. However, there has been a pronounced tendency to leave those students who are planning a college education entirely out of the functional education courses. Such appears to be the case with respect to work in consumer education. There is little reason to assume that students who are to attend college later are in no need of functional education, particularly consumer education. Clearly, they belong to the ranks of consumers, and cer-

tainly college curriculums have not been outstanding for their emphasis on courses which deal with "education-for-life" subjects. However, it is probable that the exclusion of future college students from functional courses has not been based upon any particular philosophy of education; instead, it is likely that the functional courses are excluded largely because of mechanical difficulties. The prescribed courses for college preparatory students occupy so much of the school time that there is no room for the more functional courses. The increasing doubt in educational circles that any particular secondary school course is of much significance in the success of a student in college indicates the desirability of more functional courses for all students in secondary schools. Further support for a functional education curriculum is evidenced by the recurring proposals for a scheme of general education which may extend through the first two years of college. This scheme is one of the arguments for the junior college movement.

If it is assumed that the idea of general education through junior college is to become more fully accepted, the present situation is in the nature of a transition period. The existence of such a transition period gives additional support to the inclusion of consumer education materials and methods in those science courses which are already established. This plan permits the continued meeting of the entrance requirements of colleges which still maintain the traditional setup, and at the same time permits the introduction of teaching materials and methods dealing with the urgently needed field of consumer education.

**Work on consumer education must replace other subject material.** Although the simplest and probably the best arrangement for the development of consumer education in science work is the third of the four possible methods described earlier in this chapter, even this procedure is not without its difficulties. Any pronounced emphasis on consumer education is certain to have considerable influence on the content already common in the established science courses. Those who constantly refer to the

need for the continued emphasis upon what they fondly call the "fundamentals" (although there is scant agreement on what these fundamentals are) will probably prefer to do little or nothing along the line of specific and direct consumer education in the science courses which they offer. Even those who believe that greater attention should be paid to direct consumer education in science courses will be troubled in planning the work to be offered as part of their established courses.

Emphasis on consumer education is certain to mean the exclusion of other subject materials from the courses. Science educators must examine critically the courses being offered, in an attempt to make a comparison of the relative value of different kinds of subject materials. There is no doubt that custom and tradition are strong forces in determining the present content of biology, physics, and chemistry as they are generally offered, but such traditionally offered material cannot continue to occupy a place of importance with no other support than the fact that it has long been accepted.

The present trend in science teaching toward the use of functional materials—materials closely associated with the lives and needs of people—coupled with the emphasis on general education instead of highly specialized subjects, tends to favor the substitution of consumer education for at least a part of the traditional material. It is certain that work time cannot be devoted to consumer education in biology, physics, or chemistry without replacing other material already there, since there is general agreement that these courses, as they are commonly taught, are now too crowded. Undoubtedly, there can be no general decision about the particular kinds of materials that may be replaced by functional consumer material. Instead, the decision should be made in each community by teacher, students, interested parents, and school administration officers.

Consumer education is not limited to the selection of a "best buy." A common reaction when the subject of consumer education is mentioned to a group interested in the teaching of

science is for the members of such groups to limit their thoughts to the type of work done by testing and rating agencies. This reaction indicates that special effort should be directed toward making clear, both to teachers and to students, that the work of science in consumer education is not so limited. The task of science in consumer work is much more than the simple determination of what constitutes a "best buy." Knowledge of any particular article which may, at the time, be the best one of its kind to buy is of only fleeting value. Soon after a rating is determined, changes may take place which cause previous considerations to become worthless. Through work in methods of making ratings, through acquaintance with sources of information, through knowledge of scientific principles involved in making ratings, through a continuous attempt to keep up to date, and through the development of a questioning, critical attitude toward the conclusions of others and one's own conclusions, science education must aim to go far beyond any simple rating which, at its best, can be no more than temporary.

Much "consumer education" remains producer education. An examination of textbooks, courses of study, special units, and claims for general emphasis on consumer education in connection with courses already established in the curriculum discloses an interesting characteristic of much so-called consumer education. This characteristic is that a great deal of the claimed consumer education is still distinctly on the producer side. For example, one finds lengthy sections in consumer education course outlines and units devoted to such topics as the following: the meat packing industry; the dairy industry, including cleanliness and pasteurization; the preparation of fish for marketing; the sources and uses of cereal foods; sources of various textile fabrics; the bleaching and dyeing of fabrics and yarns; construction of shoes; the weaving of different types of rugs; the production of heat through the use of different fuels and the sources of various fuels; characteristics and properties of wood; manufacture of paper; manufacture of linoleum; the making of automobile tires.

These are the types of subjects favored by the business concerns that publish pamphlets represented to give consumer education. As was pointed out in Chapter V, such publications are exceedingly numerous and most schools have a plentiful supply of them. The fact that they are put out by producers supports the contention that they are representative of producer education, and that their practical use to consumers may be considerably limited.<sup>4</sup>

There is no question but that knowledge like that indicated in the preceding paragraphs is useful to the consumer in making his purchases. It is also true that the dividing line between consumer education and producer education is far from being clear and distinct. Therefore, there can be no objection to the use of such subjects in a course which has consumer education as one of its aims or as its only aim. The objection is not to the use of such subjects, but to the practice of using just these subjects without moving on to the more direct consumer buying problems. It should be remembered that science education, in both elementary and secondary schools, has for years devoted considerable time to these and similar sources and methods of production of materials, and that during these same years science education has been of very little service in direct consumer buying. In building the consumer education division of the curriculum it is necessary that administrators take account of this danger of continued emphasis on producer education in the name of consumer education and the resulting exclusion of direct consumer materials.

Extreme caution must be used in publicizing school laboratory tests on consumer goods. This warning, which has to do particularly with the danger of permitting publicity on tests made by students in connection with their work in school laboratories, must be heeded by science teachers who are engaged in consumer education work. Two illustrations serve to make clear the nature of the danger and the reason for the warning. In the

<sup>4</sup> Chap. XIII, "Commercial Publications" of Mann's *Bibliography on Consumer Education* (1939) presents a more complete picture of the producer nature of such materials.



first instance, high school science students, on the basis of some very inadequate tests, concluded that a certain brand of milk contained the forbidden formaldehyde as a preservative. The conclusion was noised about and finally came to the attention of the officials of the milk company. The milk, as might be expected, was definitely shown to contain no formaldehyde and the inadequacy of the high school laboratory tests was made clear. Not only was the milk company accused unjustly, but the science teacher and the school dropped appreciably in the estimation of the students and the members of the community. A similar instance involved the analysis of face creams by a high school science class interested in consumer education. This class made several analyses and finally prepared a public exhibit which showed, among other things, that face cream put out by a particular cosmetic company contained the harmful lead and mercury salts. Again the findings came to the attention of the company, and again it was possible for the company to prove that the face cream did not contain the harmful ingredients which the school analysis had shown. In this case it was concluded that the incorrect results obtained by the students had been occasioned by the use of dirty laboratory vessels. Again the work of the science teacher and the school suffered.

Suitable precautions can and must be taken in any work in consumer education to prevent such situations as those just described. It is essential that the limitations of the individuals engaged in making such tests be realized, not only by the teachers in charge, but also by the students themselves. An answer to the problem is not obtained by following the obvious protective procedure, that is, by eliminating such tests entirely. The chances are that science teachers who do not accept responsibility for the proper education of students about the beginner's limitations in scientific fields are likely to be failing in other respects in the science education which they are directing. The less obvious but more satisfactory method of preventing such dangerous situations is to make sure that students do understand the limitations of their

tests, and that suitable confirmatory tests are made before any publicity is given to the results.

**Care must be used if goods are to be made for home use.** During the study of consumer education in science classes it is often suggested that inks, cold creams, floor wax, tooth pastes or powders, and the like, be prepared as a part of the laboratory work. Clearly, such operations have considerable value from an educational standpoint, but insufficient care in preparing these materials often detracts a great deal from any value the project might have. Ingredients of satisfactory purity and fineness must be used and the amount of each must be in accordance with an accepted standard formula. The greatest difficulty in making such preparations is probably that of thoroughly mixing the various ingredients. In factories where the preparations are made commercially specially constructed mixers are used for each product. The school laboratory can seldom supply suitable mixing machinery, and consequently the resulting preparations are often unsatisfactory.

It can be seen that making these preparations at home or in school laboratories is the result of a fallacy in thinking. The same fallacy exists in the thinking of those who suggest that bread should be made at home. It is clearly not the task of science education to suggest that the production of these commodities and others similar to them go back to the stage where each individual or family made its own products for its own consumption. Rather, it is the task of science education to show how better and cheaper preparations can be made in factories, where an increasing amount of machinery operates automatically. In its work in the interests of consumers, science education needs to show that consumers can get more goods and more extensive service if factory methods are used. The work of science education in consumer interests must, therefore, be directed toward improvement in production and distribution of goods and services so that a high grade can be made available to consumers at prices comparable to values.

**Judging some commodities requires very complex tests.** Wherever consumer education is part of the curriculum, science faces the problem that tests for the value of many commodities are indeed far from simple. Too often it is assumed in science education that the comparative value of two kinds of a particular product can be judged by a consideration of one or two properties of the product. For example, the impression is frequently given that a house paint is high grade if it has a linseed oil vehicle and a pigment composed of about two thirds white lead and one third zinc oxide. True, such ingredients do have a good deal to do with the value of a house paint, but this composition is far from being the only criterion of value. Such a paint may be of relatively low value if the white lead is of low grade or if there is an insufficient amount of pigment for the amount of vehicle used.

A further illustration of the complexity of judging a paint can be used to show the difficulty that may exist in judging other commodities. The Regulatory Department of North Dakota<sup>5</sup> made the following tests for consumers on paints that are sold in the state:

Drying time was determined by brushing the sample of paint on metal panels and observing the condition of the paint after one hour, four hours, and eighteen hours. Further observations were also made at intervals on the samples not dry at the end of eighteen hours.

A brittleness test was made by pouring the paint on a metal panel, which was whirled on a revolving disk until a uniform film was produced. After the paint had been allowed to dry for eighteen hours at room temperature, it was baked for four hours at a temperature of 105° C. to 110° C. Then, after a thirty-minute cooling period, the panel was bent rapidly over a one-eighth inch rod at a temperature of 75° F. Observations for cracking were made with a magnifying lens.

The hiding power was determined by brushing the sample on an impervious surface having a checkerboard design consisting

<sup>5</sup> North Dakota Regulatory Department. *Paints and Varnishes*, Bulletin No. 53. Bismarck, N. D., 1938.

of alternate four-inch squares of black and white. The black squares had a reflectance of 8 per cent and the white squares, 75 per cent. Then the hiding power of the paint in terms of square feet per gallon was calculated from the amount of paint needed to hide the design.

Accelerated weathering tests were made by brushing the specified number of coats of the separate paints on red cedar panels of particular specifications, each coat being prepared and applied according to directions on the label. Panels were then placed in an Atlas Weatherometer and given an initial exposure to ultraviolet light for twenty-four hours. This was followed by a continuous cycle of ultraviolet light and mild water spray, with the spray being applied for one and one-half minutes during each twenty-minute cycle. In these accelerated weathering tests, even the wood panels which are used have to conform to specific standards, because certain woods show tendencies toward failures earlier than do others.

Floor, porch, and deck enamels, as well as floor varnishes, were tested for abrasion. After definite drying periods Ottawa sand of 20-30 mesh was allowed to fall through a distance of one meter at a point where the paint film measured .001 inches in thickness, with the panel being held in place at an angle of 45°.

In addition to these tests, actual volume of paint was checked with the claimed volume on the container; relative percentages of vehicle and pigment were determined; the weight and specific gravity were found; general condition of paint was noted; and a detailed analysis of vehicle and pigment was made.

Thus it can be seen that rating of the relative value of paints must be based upon tests and examinations of many qualities before complete judgment is made. At the time that the complexity of the necessary tests is shown, it is also advisable to show that knowledge of the good or poor nature of any particular quality is better than no knowledge at all about the commodity which is to be purchased. In other words, any basis, however slight, is likely to be of some value to the purchaser in making his selec-

tion. The choice of the degree of complexity to be used in any particular portion of consumer study is no small problem for science education.

Science may be partly responsible for the extreme gullibility of many people. Some basis exists for the opinion that science is at least partly responsible for the extreme gullibility shown by many people in their acceptance of untruthful claims about commodities. People today are prone to make fun of the earlier belief in witches and the still earlier belief in gods who took specific control of certain natural phenomena, but the same people who make fun of these early beliefs seem to accept, quite wholeheartedly, equally fantastic claims about the merits of various commodities on the market today. Certainly the claim that a particular commodity can restore the color of the hair, whether that color was black, or brown, or yellow, or red, is about as fantastic a claim as can be imagined. Yet it is undoubtedly correct that the actual accomplishments of science itself are so miraculous that many people are ready to believe practically anything that is described in printed or radio advertising as a "new discovery." New discoveries that are real come so fast and are often as unbelievable as some fantastic figment of the imagination. Not many years ago the radio itself probably would have been beyond the area of imagination. Further, the actual accomplishments of sulfanilamide, sulfapyridine, and related synthetic drugs now used in the medical world surpass even the extreme claims advertisers have made for some of the cure-all fakes of the past.

Since science probably is responsible for a part of the extreme gullibility which characterizes many people today, it is particularly appropriate that science education assume a large share of the task of developing a critical, questioning attitude. Consumer buying is a special field which lends itself well to the effort and need for developing such an attitude. If buying of goods and services is done well, there must be continuous improvement in understanding the need for suitable checks before any extensive

belief is given to new discoveries or to new statements about old discoveries. Even in strictly scientific fields, well-trained scientists have been known to accept statements of other scientists when proof was very meager, or have been guilty of making extreme claims for their own discoveries, without sufficient preliminary checking. The scientist Robert Boyle is said to have believed in the curative value of certain formidable and repulsive concoctions which were common at the time he lived.

In one respect, a certain amount of gullibility is desirable. The famous story of how the people laughed at Robert Fulton's maiden trial of his steamboat against the current of the river illustrates the point. In order to make progress, science cannot consider the impossibility of tasks; otherwise the reasonably satisfactory education of consumers might be considered one of the impossibilities. A little open-mindedness appears desirable to season properly an extreme questioning, critical attitude.

**Operation of a questioning, critical attitude lies in the selection of suitable sources of consumer information.** In view of the special treatment of this problem in preceding sections of this book, it is necessary only to call attention here to the fact that the word *consumer* is used by many organizations and companies which do not necessarily supply authentic information for consumers. For example, at this writing, the Manhattan telephone directory of New York City lists thirty-odd organizations, companies, or publications whose names begin with the words *Consumer* or *Consumers*. It is evident from the names of certain ones that they are probably not different from other companies engaged in a similar business. There are also a number of other organizations and publications which purport to give valuable information or services to consumers and which make no use of the word *consumer* in their names. The size of the problem that faces science education in this respect is understandable.

**Inadequately educated teachers are a problem.** No matter what the field of education under discussion, there is always the problem of inadequately prepared teachers. No educational field

is free from this problem, and no educational field is ever likely to be free from it. As the preparation of teachers has increased in past years, so have the demands and needs for increased preparation grown, and so will they continue to grow. It is true, however, that the combination field of science and consumer education is less well situated in regard to teacher preparation than are most other accepted educational fields. The reason for this general lack of suitably trained teachers in the consumer science field is that little or no attempt has been made on the part of teacher-training institutions to give education in this particular field. Generally, the science teachers who are reasonably able to handle educational work in the consumer field are those who have become interested in consumer problems and have gradually increased the consumer emphasis in their regular science courses.

The lack of preparation of teachers in the consumer phase of science education is no reason for a refusal to advance. Teachers of science have only to aim toward progress in their own education along consumer lines, and to strive to make application of their expertness in science to the direct solution of consumer problems. Progress is certain to be made, and even a little progress is better than none at all.

**Institutions for teacher education may help solve the problem.** Naturally, if institutions which provide teacher education in the field of science begin to give attention to the highly important phase of consumer education in science teaching, then there is certain to be improvement in the ability of science teachers to provide suitable consumer education. In the beginning, most of this work in institutions for teacher education should be concerned with the numerous interrelations between the topics normally used for science courses and those regarded as having a high value from a consumer standpoint. However, it is also advisable to consider the content of a complete course which might be called "Consumer Education" and which might be offered by teachers educated in science.

Additional studies which would have value in the education of

science teachers for consumer work are those in which current and practical economic problems are considered in relation to consumer education. Still other courses might consider social problems in general and the problem of increased government regulation of trade practices. Such studies are essential if science teachers are to have a sufficiently broad view to handle consumer education in its proper perspective while they are making other contributions because of their expertness in science.

**A special appeal to college teachers of science is in order.** In the preceding topic it was pointed out that schools offering teacher education may be of assistance in improving the preparation of science teachers in the field of consumer education. Teachers of the usual college courses in chemistry, physics, and biology may also add much to the education of teachers in the field of consumer education. In many instances, the detailed and accurate testing which usually is not feasible at the secondary school level or below becomes a matter of major importance at the college level. Therefore, an appeal is hereby made to those teachers of specialized science in colleges to consider the addition of material of a consumer education nature to their courses. This appeal is directed not only to those college teachers who may have future teachers of science in their classes but also to college teachers who are giving instruction in science to students preparing for a variety of other careers. It is doubtless true that there is some transfer of straight science information to various consumer situations, but college teachers of science seem to have no more reason for believing that this transfer exists than do high school teachers of science. More science instruction may make the amount of transfer greater, but there is no reason to believe that the proportion of transfer may be relatively greater. It is a responsibility of the college science teacher to make certain that his students have experiences which emphasize the relations of science to important consumer problems. Nearly all important consumer problems have a technical and scientific side, which only experts can solve. Surely the technical and scientific aspects of



consumer problems are not less worth while than the technical and scientific aspects of production problems.

The main thesis of this chapter has been that consumer buying has a place in the part of the curriculum which deals with science education. On the whole, special emphasis on consumer education appears to belong in the senior high school. There are also ample opportunities and needs for attention to consumer education in the work of science in elementary schools, in junior high schools, in teachers colleges, and in the more general colleges and universities.

## Chapter XI

### BROADER HORIZONS

**Through emphasis on consumer buying, science education may broaden its effect on the lives of the people.** The main content of the materials presented in this book may be summarized briefly by the following statements:

1. It is only within recent years that there has been a pronounced movement for consumer education.
2. The need for widespread consumer education is great, not only from the standpoint of the prevention of waste in buying power but, in many instances, also from the standpoint of the preservation of health and life.
3. Science education has lagged in accepting its responsibility in the field of consumer buying. The particular expertness of those engaged in science work makes this responsibility a major one.
4. A moderately complete picture of the present situation in consumer education may be obtained from a general examination and critical appraisal of the various sources of information now available for consumer buying.
5. Many of these sources of information supply continuously up-to-date materials which are particularly necessary in the field of consumer education.
6. There are indicated fairly prominent divisions of consumer education in which science teachers may work to advantage.
7. There are many problems connected with the work of science education in the field of consumer buying, but the situation is far from hopeless.

In addition to providing this summary it is the purpose of this final chapter to suggest even wider conceptions of the part that

science may have in the lives of the people through its emphasis on consumer buying.

**Science education and consumer buying may be mutually helpful.** Throughout this book it has been emphasized that science education has much of value to contribute to the improvement of consumer buying. On the other hand, it is not beyond the realm of possibility that the inclusion of consumer buying as a major area for the work of science teachers may mean a distinct gain for science education. Certainly any actual improvement that takes place in consumer buying as a result of the efforts of science education must react in favor of science education itself. It does not seem too extreme to say that science education is in need of some assistance of this sort. From all sides, scientists and science educators are receiving complaints that science has not concerned itself enough with the functioning of its discoveries in society. The most common special divisions of science subjects—chemistry, physics, and biology—are more and more frequently criticized because they are too largely concerned with the abstract facts and theories of pure science rather than with those factors which represent greater practical needs in the lives of most people. For example, the relatively small percentages of students who are electing these science subjects as they are offered in our secondary schools show too plainly that many are unable to see suitable comparative worth to themselves in electing such subjects. Those who believe thoroughly in science education as it is traditionally presented would do well to consider that the values of that kind of science education are not becoming increasingly clear to the students now in our schools. Because of its intimate relation to the needs and lives of people, there is reason for believing that consumer education as it is related to science teaching may help to produce a trend toward more extensive science education.

**There must be special precautions against overemphasis of detailed facts.** One of the most common objections to the teaching of science subjects arises from the extensive emphasis of science facts as ends in themselves. There is increasing evidence

that when these many facts, which are so laboriously learned, often through drill, are forgotten—and forgotten they are—students have little of lasting value. The crime of overemphasis of disconnected facts is as likely to be committed in the name of consumer education as it is in that of other subjects. The present tendency in consumer education appears to be toward this emphasis of detailed facts regarding the purchase of single articles, without much thought for the temporary nature of this type of consumer education. Although mention is made of this danger elsewhere in this book, the subject is of such far-reaching importance that it cannot be overemphasized. As has been pointed out, the various sources of consumer information, especially the testing and rating organizations, tend to emphasize temporary facts rather than fairly broad generalizations and methods of solving problems. It is important that science teachers who undertake work in consumer education, or in any other educational area, realize that broad generalizations and methods of solving problems are the desirable focal points for consumer education. These generalizations must be developed by utilization of numerous facts, and the methods of solving problems must be supported by numerous experiences with them.

**The scientific method of problem solution may be emphasized in consumer education.** It is customary to think of the scientific method of reaching conclusions and the development of critical thinking as being closely associated with instruction in science. Indeed, such education is usually considered one of the major aims of science teaching. In general, the scientific method may be thought of as involving the recognition and clear statement of a particular problem, the making of observations and the gathering of data, the formation of hypotheses, the revision of hypotheses in terms of additional information, and the construction of workable conclusions, which may also undergo revision. Use of the scientific method presupposes a desire for truth and accuracy. It is no part of this book to describe the inadequate degree with which science education has attained this major aim.

The purpose here is to point out that consumer education, with its wealth of current unsolved problems, both individual and social, offers many opportunities for use of the scientific method and for critical thinking. If the scientific method is to be used, it is important that, even with a marked bias toward changes which will improve consumer buying, the other side of problems must always be sought and be made a part of the thinking. For example, most people would probably assume that the presence of poisonous lead and arsenic compounds on fruits and vegetables is so dangerous that there could be no possible support for it. However, examination of the arguments of those who are engaged in the production of fruits and vegetables discloses the following: The destruction of fruits and vegetables by insects and diseases might seriously affect our food supply if insecticides and fungicides were not used. Poisonous lead and arsenic sprays and dusts are effective and relatively inexpensive substances with which to control insects and plant diseases. After fruits and vegetables are harvested it is both difficult and expensive to wash off the poisonous compounds. The use of insecticides and fungicides nonpoisonous to man or the use of suitable washing devices would raise the price of fruits and vegetables to such a degree that many people would have to do without them. It is evident, therefore, that there are complications even in this problem which at first appears quite one-sided.

It is often said that much teaching fails to recognize the importance of emphasizing suitable methods by which to solve problems. There is a tendency to emphasize subject materials to such a degree that methods of solving problems are largely excluded. Clearly such exclusion of methods of problem solution is not desirable, because students may as a result be almost helpless in the face of new problems. Therefore it is to be hoped that, in consumer education in science, a major effort will be directed toward providing extensive experience in scientific problem solution. Such experience should create the habit of suspended action on major problems until thorough investigation has been

made, and the habit of using a questioning, critical attitude toward the conclusions of others and toward one's own conclusions.

Consumer problems remain very pressing. It is difficult to understand how there can be indifference to consumer problems when their relation to life and health is understood. For example, a January, 1940, issue of *Notices of Judgment* of the Food and Drug Administration carries, among others, the following reports: Seizure and condemnation of 1,405 drums of maple syrup, involving four different companies; the syrup contained an amount of lead which "might have rendered it injurious to health." Seizure and destruction of 159 bags of flour, "because adulteration was alleged in that the article consisted wholly or in part of a filthy vegetable substance." A fine of eight hundred dollars imposed on a sea food company, because of the shipment of quantities of adulterated canned tuna fish, consisting "in large part of a highly decomposed animal substance."

These reports from the publication of the Food and Drug Administration may be used to support some points made above. The foods concerned are not important, except as they serve to illustrate the variety of things which may make different foods unfit for use and to illustrate the point that consumer problems are by no means solved, in spite of claims to the contrary. Even the companies named are unimportant, except as they serve to develop the generalization that undesirable practices are by no means confined to small companies and little used products; large, well-known companies producing nationally advertised products may also permit the distribution of foods dangerous to health. In other words, these are the generalizations which far overshadow the facts stated in the reports. These are the types of generalizations which science teachers must seek to have their students realize, not simply by stating the generalizations, but by providing experiences which will permit them to form their own desirable generalizations. It is also an important feature of science education in consumer buying that students and teachers investigate together possible procedures leading toward the permanent solution of the

problems, or at least toward improvement of such conditions as those indicated by the Food and Drug Administration reports. It is even desirable that the problem itself become the focal point about which the generalizations center. Then, and only then, can there be hope that our education will be centered about basic issues.

**Cooperation rather than conflict is likely to solve consumer problems.** In general, people may be divided, according to their views upon the problems of consumer buying, into four major groups. Some of their views are represented by the types of books described in Chapter II. One group is somewhat radical and engages in powerful condemnation of advertising and business. A second group is just as radical regarding all consumer groups, tending to accuse consumers of plotting against the public welfare or of getting unduly excited over minor conditions which exist largely in their imagination. A third group is composed of consumers, advertisers, and businessmen who are interested in consumer problems and who tend to favor cooperation as the best means of improving the situation. A fourth group is composed of those who have very little knowledge of the distressing conditions which exist and of those who have the knowledge but are not interested. This group is the large, inactive one. Among these groups, it is difficult to venture a selection of a spot which science education should occupy. Thus far, it has seemed to place itself pretty largely within the fourth group. Probably a fair position for science education to take would be one that is sufficiently militant to accept no permanent compromise as long as serious consumer problems exist, but one that recognizes that as a means of improving a situation, cooperation is always more desirable for all concerned.

**Science education is concerned with advertising.** It is particularly appropriate for consumer work in science education to be concerned with advertising, because so much advertising makes extensive use of science to support its claims. Readers of advertising learn that "Science has discovered the dandruff germ,"

"Science tells you why nervousness or strong feelings cause your sweat glands to act," "Tests by college physiologists proved scientifically that . . ." "In recent laboratory tests . . ." "Five years of scientific research develops a new . . ." White-coated scientists are shown peering through microscopes or standing in front of an impressive array of laboratory glassware and other equipment. Every effort is made to transfer the effects of the accomplishments of science to the advertised product. Some advertisements which make use of science are for legitimate products reasonably advertised; others praise products that are satisfactory for some purposes but do not justify the extreme claims made for them; still others make untruthful claims for products that are worthless.

The effects of improvements in advertising, resulting in part from consumer education in science, may be extremely broad. It is interesting to let one's imagination run loose on the possible results to our world today if all the forces of false propaganda and false and misleading advertising suddenly made an about-face. The newspapers, magazines, pamphlets, books, radio broadcasts, and motion pictures, which now give out a considerable amount of misinformation, would begin to publicize information only insofar as they knew it to be true or could find good evidence to support it. The countless companies that offer products represented for health improvement would supply proof of their worth before advertising and selling them. Other products would have their uses and limitations directly and truthfully described. Without question, our education and our methods of living would advance greatly. Surely such a situation is not an unreasonable ideal toward which science education can work.

Consumer education may give the undesirable impression that all advertising and business are to be condemned. In consumer education, it is rather easy to leave the impression with students that all advertising is untruthful or misleading and that all business is dishonest. Precautions must constantly be taken to



show that both advertising and business have important functions in the world today. It is necessary to guard against creating incorrect impressions with the members of groups engaged in the study of consumer education. Science must help in the removal of misconceptions rather than engage in fostering them. It must be made clear that the task of science in consumer education is to work toward the elimination of false, misleading, and ignorant advertising and toward the elimination of dishonest business which may endanger the life or health of consumers or give them little value for money spent. The work of science in consumer education is toward cooperation among consumers, advertisers, and business—cooperation that will constantly improve and increase the goods and services available to all consumers.

**Accusations of communist activity in consumer organizations present a problem for consideration.** Although the subject is more closely related to social and economic problems than to the work of natural science, it cannot be denied that the natural science teacher engaged in consumer education may find himself accused of un-American activities. Support for the truth of the preceding statement is given by the publication in the daily newspapers, in December, 1939, of wholesale accusations that Communists were active in various consumer organizations. The accusations were made in a publication release by a House of Representatives committee investigating un-American activities. Among the organizations so accused were the League of Women Shoppers, Consumers Union, and Consumers' National Federation. Even the Federal government publication, *Consumers' Guide*, described in Chapter III of this book, was criticized indirectly because it had "given frequent and favorable publicity to Consumers' National Federation."

Several explanations other than un-American activities were offered later by those organizations which had been so accused. There seems to be no way of knowing whether these explanations had any elements of truth, or whether the original report itself merited belief, especially since all the accused con-

sumer organizations promptly issued denials, which were also published. In one respect neither the truth of the original accusations nor the explanations offered in regard to hidden purposes seem very important to science teachers. Although the whole difficulty may be a temporary situation in the consumer education movement, it is thought to have a place in this book because it illustrates a more general situation; namely, that the consumer education area is likely to be one of those strongly controversial areas which have been subjects for discussion in educational circles. Although there are workers in the educational field who profess to believe that public education should stay out of controversial areas, the more generally accepted belief at present is that only by entering controversial areas can education hope to give much aid in improving the lives of people. Science teachers must therefore realize the possibility of opposition to their extended work in consumer education. They must make every effort to see that their work is directed toward the truth and toward complete fairness to all parties concerned.

**Viewpoints will be broadened through science work in consumer education.** Fortunately, there is no likelihood that the work of science education in consumer buying will be limited to those aspects of problems which are directly a part of the field of science. It is readily possible and highly desirable that broader views of social, economic, and political conditions may result. Among the objectives of this nature which science educators should keep in mind as desirable attainments for students are:

1. A broader understanding of the wide variation that exists in the economic ability to buy and the patterns of buying which are common to groups at different economic levels.
2. The necessities for, and difficulties in the way of, additional governmental regulation of the sale of consumer goods and services.
3. The relation of powers of the Federal government to those of state and local governments.

4. The functioning, values, and responsibilities of consumer cooperative organizations.

5. The desirability of, and difficulties involved in, setting standards for certain kinds of goods.

6. A broader understanding of our ability to produce and supply an abundance of food, clothing, shelter, and health services so that everyone may have adequately high standards of these life necessities.

Unless they are deliberately excluded, there appears to be little possibility of science education engaging in work in the area of consumer buying without consideration of each of the preceding social, economic, and political points. Certainly there is no reason for excluding from science work topics with such far-reaching importance in our lives today. Especially is this true when a consideration of such topics is likely to arise naturally as science students and teachers work in the area of consumer buying. In the following six major topics inadequately brief summaries are attempted to illustrate the probable relations of these topics to science work in consumer buying.

**Wide variation in the economic ability to buy affects science work in consumer buying.** Even in the choice of topics for study and in the recommendations developed for the improvement of conditions, the factor of wide variation in the economic ability to buy is certain to be of major importance. Any agreement on the desirability of generous quantities of butter, milk, and fresh fruits and vegetables in the diet suggests apparent difficulties in communities where such foods are now beyond the reach of many, if not most, of the people. A lengthy investigation of air conditioning for homes is ridiculous in a community where many homes are deficient in sanitary methods of sewage disposal. The suggestion that, in cases of major illnesses, opinions from two or more doctors may assist in the purchase of medical service is no help to persons who find it extremely difficult to pay for meager service from one doctor. Science teachers will recognize that these illustrations do not begin to cover the eco-

conomic situations that will determine the selection of major consumer education materials. It appears inevitable that, in any such discussion, the distribution of income will be important both in connection with the choice of detailed subjects for study and in considering ways of solving consumer problems.

**"The government ought to do something about it" is not a suitable solution.** Too often it is the tendency in work of a consumer nature to terminate discussions with the statement, "The government ought to take care of that," and then to cease constructive work and thought on the problem with an agreement or resolution to write to one's congressman or member of the legislature, or to talk to one's councilman. There is no doubt that some government action in connection with consumer problems appears necessary to most people. In some instances, perhaps, government action is the most desirable solution. However, there is strong feeling, even among those who are deeply concerned with consumer problems, that increased government control of factors related to such problems is not as desirable as some other method of control. The following quotation illustrates this feeling: "If instruments of control [of advertising] were entirely confined to political government, the prospect indeed would seem almost hopeless. . . . There is no reason to think that control bodies with real power might not represent advertising mediums, advertising agencies, the advertiser, and the public."<sup>1</sup> Among those who are engaged in legitimate business and advertising, the feeling against expanding government regulations is much more general. This attitude, which is indicated in other parts of this book, is one that might well be expected. It is in accord with the oft-repeated statement by advertising and businessmen that they are rapidly clearing up the undesirable consumer situations without government interference.

On the other hand, it is very plain that any adequate treatment of consumer problems in science education must, of necessity, include a consideration of the part that our government may and

<sup>1</sup> Clark, H. F. *An Introduction to Economic Problems*, p. 189.

should have in the solution of the problems. Science teachers cannot escape such education if they are to be concerned with life-problems.

When government control is necessary, the next question is, "Which government?" When or if government control of consumer problems is determined to be necessary, there arises the question of the particular division of government which is to exercise the control. In other words, is the control to be primarily or entirely in the hands of Federal, state, or local governmental units? It can be seen that this problem is closely connected with that described in the topic immediately preceding this one. Also it can be recognized that here, in connection with consumer problems, arises again the political problem that has been a major concern of our people since the formation of the country.

The connection between consumer problems and the relative powers of the different units of government is immediately apparent when it is recalled that the Food and Drug Administration, the Bureau of Home Economics, the Federal Trade Commission, the National Bureau of Standards, and the Consumers' Counsel Division of the United States Department of Agriculture are all Federal government agencies. The Federal laws and regulatory methods for benefit of consumers are probably superior on the average to those that exist in many of the states. In considering consumer problems, however, it is important to remember that these Federal laws and regulatory methods do not extend to consumer buying in which the goods concerned do not cross state lines. Some states have patterned their own control schemes after the Federal, others have certain regulatory features which are superior to the Federal, and still other states have devoted relatively little attention to consumer problems. As is pointed out elsewhere in this book, science educators must be concerned with the nature of these regulations and controls and the degree to which they function. Local controls also enter the picture, especially in those cities which have adopted measures more extensive than those indicated in the Federal and state regulations. Unlike the

relation that exists between Federal and state controls, the local controls can never be less complete than the state controls.

**Consumer cooperatives may help in solving buying problems.** Just as the possibilities of government assistance in solving buying problems are certain to be considered part of the work of science education, so also are the values and functions of cooperative organizations of consumers certain to become a part of the work in consumer buying. The idea of cooperation is not new. In family life cooperative principles must be adopted, and in any form of government considerable cooperation is required. There have been for many years rather numerous farmers' cooperatives for purchasing goods needed, as well as for marketing goods produced. But stores in small rural communities no longer comprise the only consumer cooperatives. There are in cities a number of consumer cooperatives which engage in the sale of food, clothing, household supplies, gasoline, and numerous other commodities. To some extent the cooperative movement crosses the usual consumer-producer lines of demarcation, since there are single consumer-controlled organizations which engage in production for the consumption of members.

Limitations in the scope of this book prevent even a moderately complete discussion of the varieties of purpose and types of organization which have been undertaken by consumer cooperatives. The purpose of the topic is served when it becomes clear that the work of science education in consumer buying is likely to have artificial and limited boundaries if students and teachers do not make a fairly complete examination of the possible services of consumer cooperatives to improve existing consumer conditions.

**The problem of standards for consumer goods is a broad one.** Because of the necessity for a great deal of scientific knowledge before adequate standards can be defined and set, the problem of standardization of consumer goods is more definitely scientific than are the subjects treated in the four preceding topics. In spite of this more intimate connection with science, the problem is none the less social and political. It is closely tied up with all

governmental controls and regulatory methods, and just as closely tied up with advertising, business, and cooperative controls.

How far shall we go with standardization? How much standardization is desirable from the standpoint of the most high-grade goods and services for the most people? How far will standardization impede initiative and improvement of particular kinds of goods? Will standardization lower the high-grade products, as well as raise the low-grade products to the set standards? Must the set standards always be in the nature of a compromise, or can they be set as high as can be reached? Is anything less than the best ever a desirable article for consumption? Is it sufficient if there are relatively few grades, for instance, three or four for canned tomatoes? Are four hundred makes of vacuum sweepers (all supposedly with essential differences in construction) necessary or desirable for the satisfaction of the consuming public? Is it possible to set standards so that they will be sufficiently dynamic to encourage improvement and sufficiently stable to permit economical production? Does standardization mean a loss of individuality for consumers? Is a loss of individuality necessarily undesirable, especially if it is balanced by higher grade goods for more people? What agency or agencies are to set the standards?

Although these are only a few of the questions which have been asked in connection with proposals for standardization of consumer goods, they serve to show something of the extent of the problem of standardization and the types of work in which science teachers at all levels may engage. The answers to the questions are not well understood. Perhaps there are no actual answers that will serve in every case. Nevertheless, science education cannot disregard the responsibility for investigating the problem and the responsibility for working toward the best solution that can be devised at any one time.

**It is possible to produce enough goods that everyone may have much higher standards than the average person now has.** Slowly the idea is spreading that we are making very poor use of our ability to produce consumer goods. At least for the

United States, scientific discovery and technology have removed the handicap under which man has labored for thousands of years, the handicap of inability to produce enough goods to satisfy the major life-necessities of food, clothing, and shelter. There is at our command a rich abundance of natural resources and an undreamed capacity to change this natural wealth into useful goods and services. Our major economic problem is to release this potential productive power for the well-being of all our people. It is indeed discouraging to think that this situation has at last been reached, only to find that the social-economic system is inadequate to produce and distribute the wealth of goods now available. There is general agreement among expert investigators, engineers, economists, leading educators, and even industrialists that our present standards of living could be raised considerably if we used properly our present natural resources, our physical equipment of machines and factories already in operation, and our trained personnel already available for the production of necessary goods. The chief difference of opinion among the experts lies not in the question of whether or not higher standards are available but only in the degree to which such standards may be advanced.

The solution of the economic problems now facing the country undoubtedly rests upon our ability to plan and to put into operation a system which will result in maximum production of the goods needed by the people and which will make certain that each person in our country receives the high minimum standard now considered possible. It is not too much to claim that science education must play an important part in this development of a workable social-economic system. Neither does it seem too much to claim that the work of science education in the field of consumer buying is likely to contribute to speeding up the development of such a workable system. If science education in the consumer buying area can contribute nothing else, it can at least help make the general consuming public dissatisfied with existing conditions. Through such dissatisfaction more people may be moved



forward to a realization of the possibilities for improvement. Such realization is an essential first step toward a democratic accomplishment of a revised social-economic system that will permit our highest development.

**It is easy to adopt a defeatist attitude on consumer problems.** Not only does the whole problem appear overwhelming, but separate, small difficulties sometimes seem insurmountable. For example, there seems to be no readily apparent solution for getting rid of the poisonous lead and arsenic compounds present on food ready for consumption. Such poisonous compounds, it will be recalled, result largely from the use of certain insecticides and fungicides on the growing plants. Either the insecticides and fungicides are used or insects and disease destroy the food crops. In the face of the immensity of the consumer problem, an individual science teacher may well be inclined to refuse to accept the responsibility of working on the problem. It is certain that it is a far simpler matter to continue to work with the somewhat traditional science subject material. It is equally certain, however, that the relation of science to consumer problems offers far greater opportunity for science teachers to contribute to improved living than does the traditional subject material.

Even if the problems of improving consumer buying seem great, there is no good reason to adopt a defeatist attitude. Enough progress has been made in the last five years to offer considerable encouragement. This progress has been made despite the fact that school systems in general, and science education in particular, have barely begun to lend their helping hand. In these consumer buying problems the opportunity open to science education is not a small one. But there is no reason to begin to think that science teachers are to form a new priesthood to lead humanity out of the wilderness; it must be fully realized that real progress can be made only through complete cooperation of the individual teachers and the schools with many community institutions and groups, of which the teachers and the school are only a part.

**The good consumer is an active one.** If progress is to be

made in solving consumer problems, work in consumer education must develop what may be called "good consumers." In other words, students of consumer education need to learn to rely upon themselves for consumer progress. They need to realize their responsibilities, as well as their power, to bring about improvements in the major consumer problems. Indifference can make no appreciable gains; the other fellow cannot do all the work.

The following are among the activities in which the good consumer may learn to engage somewhat continuously. Students and teachers will undoubtedly develop others. The good consumer keeps himself well informed on the consumer regulations of local, state, and Federal governments. He lets his voice be heard by his legislators and by the editors of his newspapers. He watches the bills in the legislature and checks the votes of his representatives on bills that favor consumers. He investigates the weaknesses of existing laws and recommends that his newspapers and periodicals publish the releases of the Food and Drug Administration and the Federal Trade Commission. The good consumer endeavors to make courteous, intelligent, and frequent suggestions for improvement to those persons from whom he is buying goods and services, and he also takes into consideration their own problems. He realizes that they also are consumers and may conceivably be interested in the same problems. When he learns of fakes or false and misleading advertising claims, he makes reports to the local Better Business Bureau, to the Federal Trade Commission, to the Food and Drug Administration officials, or to other suitable authorities. He engages in cooperative activities with other consumers and with business, and encourages cooperative investigation of consumer problems. The good consumer watches the scales when he makes a purchase. The good consumer reads the labels on goods that he buys or considers for purchase; he encourages, by means of his purchases, goods which are correctly and completely labeled.

The good consumer keeps himself continuously informed on consumer problems after he ceases his study of the subject in

formal classes. His interest has been aroused, and he has had experience in enough ways of getting dependable information and has sufficient consumer knowledge to permit him to continue his activities without extensive direction from someone else. It is conceivable that the good consumer may be better educated in this field six months, a year, five years, or more after he finishes his formal work in school than he was at the time his school work ended. Such a situation would be in sharp contrast to the condition that now prevails for most science education and for other fields of school education as well. It is conceivable that the work of science in consumer education can be such that this ideal of education may be reached.

## ANNOTATED BIBLIOGRAPHY

THIS bibliography lists the books, agencies, and periodicals to which reference is made in this book. In addition, it includes readings which are likely to be most helpful for the science teacher who wishes to work in consumer education. Although books supply much excellent material, it is believed that current periodicals and government reports offer essential and more valuable readings.

Aside from these features, this bibliography is in no way a complete one on consumer education.

### BOOKS

Agan, Tessie. *The House*. J. B. Lippincott Co., Philadelphia, 1939.

An unusually complete new book designed as a text for a college course. Much of the material will supply suggestions for consumer education work in science at all school age levels.

Bauer, Catherine. *Modern Housing*. Houghton Mifflin Co., Boston, 1934.

Deals with housing throughout the world. Does not contain direct consumer education but helps supply general understanding of needs and possible accomplishments in housing.

Bennett, H. *More for Your Money*. Chemical Publishing Co., New York, 1937.

Food, clothing, fabrics and textile goods, cosmetics and toilet requisites, articles for domestic use, furniture. Well worth attention from the standpoint of buying advice as well as because of numerous tests for composition and performance of consumer goods. Many ideas to use or elaborate. Largely but not entirely limited to examinations of a scientific nature.

Brindze, Ruth. *How to Spend Money*. The Vanguard Press, New York, 1935.

A great many detailed facts to help one in buying a wide range of commodities. Emphasizes textiles and ready-made clothing; medicines and bathroom supplies; table service; light; food, canned, pack-

aged, and fresh. Helpful for one who is concerned only with this phase of consumer education.

Brindze, Ruth. *Johnny, Get Your Money's Worth*. The Vanguard Press, New York, 1938.

Written especially for children but contains much useful consumer material for high school students and older persons as well. Most science teachers and students will find this book extremely helpful.

Carpenter, Charles E. *Dollars and Sense*. Doubleday, Doran & Co., Garden City, N. Y., 1928.

Described in Chapter II.

Carver, T. N., Woolman, M. S., and McGowan, E. B. *Textile Problems for the Consumer*. The Macmillan Co., New York, 1935.

Considers textile problems from the standpoint of the economist, the textile specialist, and the textile teacher. Written especially for home economics use and also for the general consumer, but has much good material which can be adapted for use by the science teacher.

Chilson, Francis. *Modern Cosmetics*. The Drug and Cosmetic Industry, New York, 1934.

Gives a great many formulas and methods of manufacture for all sorts of face creams, dentifrices, shaving preparations, hair tonics, deodorants, astringents, depilatories, lipstick, manicure preparations, shampoos, powders. Presents the side of the manufacturer. However, occasional comments on dangers and on extreme advertising claims are particularly interesting, as for example, the following: "All sorts of claims are made for tonics intended to cure baldness, but none has ever been substantiated. When baldness is due to heredity or congenital causes, we may simply state that, as yet, it can neither be cured nor prevented. But, when the hair begins to fall out, due to improper care and lack of stimulation, we are on reasonably safe ground in saying that we can prevent further loss of hair." (p. 247) Notice especially the phrase "on reasonably safe ground in saying."

Clark, H. F. *An Introduction to Economic Problems*. The Macmillan Co., New York, 1936.

A clear, concise, and simple presentation of modern economic problems. Many teachers will find the viewpoint presented here pleasingly unique among books dealing with economics. Ideas which may be applied to science and consumer education are numerous.

Coles, Jessie V. *The Consumer-Buyer and the Market*. John Wiley & Sons, New York, 1938.

Up-to-date discussion of basic economic and social problems associated with consumer buying. Prepared for students on the college and university level. On the whole, the contents of the book cannot be considered to give much direct help to the consumer. However, it should be of great value to science teachers in helping them to broaden their own background for teaching in the consumer area. Discusses inadequacies of present buying guides. Aids in understanding problems and practices of business. Good material on descriptive and grade labels, quantity and quality standardization, brand names, advertising.

*Consumers' Bookshelf. A Bibliography of Publications on Commodity Buying and Other Consumer Problems*. Superintendent of Documents, Washington, D. C., December, 1937. Price, 15 cents.

An excellent annotated bibliography of free and low-cost publications of the Federal government, state extension services, universities and other nonprofit sources. No discoverable bias in this bibliography.

Dana, Margaret. *Behind the Label*. Little, Brown & Co., Boston, 1938.

Deals entirely with textiles and clothing. Interesting style. Excellent consumer education materials. Contains many details on actual buying but does not neglect major generalizations on consumer problems. An extremely valuable and usable book.

Davies, J. E. *Fundamentals of Housing Study*. Bureau of Publications, Teachers College, Columbia University, New York, 1938.

An extensive treatment which considers desirable housing standards, present conditions of housing in the United States, reasons for the unsatisfactory situation, and suggestions for improvement. Contains much useful background material, although not directly related to science education.

Edwards, Alice L. *Product Standards and Labeling for Consumers*. The Ronald Press Co., New York, 1940.

Points out that the effects of a large number of standards extend far beyond the given firm or industry adopting them. Contains much good material that can be secured only by considerable investigation in other books. Outlines past and present progress toward more extensive standards and labels. Describes organizations interested in greater standardization, work of government agencies. Considers labels only in connection with standardized articles.

Eskew, G. L. *Guinea Pigs and Bugbears*. Research Press, Chicago, 1938.

Described in Chapter II.

Foreman, Clark and Ross, Michael. *The Consumer Seeks a Way*. W. W. Norton & Co., New York, 1935.

Describes in an elementary, conversational manner the economic problems which are so serious in our lives today. Very worth while from the standpoint of economic background for consumer education in science.

Foster, W. T. *Doctors, Dollars and Disease*. Public Affairs Pamphlet No. 10. Public Affairs Committee, Inc., 8 West 40th Street, New York, 1940.

Considers costs, needs, and lack of medical and dental care; also possibilities for improvement.

Frederick, Christine. *Selling Mrs. Consumer*. The Business Bourse, New York, 1929.

Consumer buying from a business standpoint. Illustrative topics are: "The psychological method of establishing new food habits"; "Education in the effective use of the appliance." Chapter on obsolescence, style, and the American consumer. Shows a business view of consumers that is fairly characteristic.

Furnas, C. C. and Furnas, S. M. *Man, Bread and Destiny*. Reynal & Hitchcock, Inc., New York, 1937.

One of the essential books in connection with foods. Interestingly written and presenting many ideas to stimulate thought about food. Scientific in nature but popular in style.

Gordon, Elizabeth and Ducas, Dorothy. *More House for Your Money*. William Morrow & Co., New York, 1937.

Contains much excellent material from the consumer standpoint, but not primarily scientific. Although it discusses economic problems connected with buying or building a house, there is also much material which science teachers can use. For laymen; interestingly and simply written.

Gordon, L. J. *Economics for Consumers*. American Book Co., New York, 1939.

A college textbook which treats economics from the consumer, rather

than the producer, viewpoint. Contains much excellent and up-to-date material that will help in supplying needed economic background. Much good material on standards and labels.

Halbert, Blanche. *Better Homes Manual*. University of Chicago Press, Chicago, 1931.

Unusually complete. Although published several years ago, the contents are far beyond anything that has yet been reached in homes. Much material that is of direct scientific interest.

Harp, Henry. *The Education of the Consumer*. The Macmillan Co., New York, 1924.

A pioneer in the field of consumer education. The author states in the preface: "Since this study grew out of an attempt to make a curriculum for effective living, it is frankly intended to furnish a method and some working material for those who are engaged in constructing curricula." In spite of the fact that the book is somewhat old and is not written primarily for science educators, there are many valuable suggestions which can be made to apply to science education as it is today.

Harding, T. Swann. *The Joy of Ignorance*. William Godwin, New York, 1932.

Very interesting style. A pleasure to read. Science viewpoint, but presents many sides of consumer problems. Particularly emphasizes drugs and health remedies. Quite ironical. Much on advertising. Jokes and points out its own weaknesses. Also discussions of researches on coffee, tobacco, alcohol, exercising.

Harding, T. Swann. *The Popular Practice of Fraud*. Longmans, Green & Co., New York, 1935.

One of the essential books. An exceedingly interesting style. Emphasizes both sides of the problem but is distinctly on the side of the consumer. Criticizes the "hell-fire, scare the consumer out of his wits technic" which, as the book points out, is used both by advertisers of foods and medicines and by the publications of Kallet and Schlink. Very strongly recommended because it supplies so many usable facts to illustrate generalizations. Discusses general consumer problems from scientific and social viewpoints, is not quite so extreme as *100 Million Guinea Pigs*, but does not pull its punches in the least. Contains a wealth of material and will supply many ideas that can be used in teaching.



Hausrath, A. H. and Harms, J. H. *Consumer Science*. The Macmillan Co., New York, 1939.

An interesting title, but the contents of the book are disappointing. There is good consumer material on soap, lubricating oils, gasoline, automobile tires, fuels, insulation, refrigerators, and light. However, there is almost no consumer material on the more important subjects of foods, clothing, and housing. The major portion of the book is traditional science, the connection of which with consumer education is not made clear. A worthy attempt but not a great success at meeting consumer problems.

Hawes, Elizabeth. *Fashion Is Spinach*. Random House, New York, 1938.

This book has had great popular interest since its publication. Although it has no particular relation to science education, it should give any teacher interested in consumer buying a wealth of ideas about possible changes for the better in the clothing situation. Highly recommended both for the ideas and for its general interest.

*Housing America*. Editors of Fortune. Harcourt, Brace & Co., New York, 1932.

A business viewpoint of the housing situation, what it is, what made it that way, and the beginnings of improvement. Although this book was published in 1932 and there have been a few notable advances, conditions on the whole have not changed greatly.

Hoyt, Elizabeth E. *Consumption in Our Society*. McGraw-Hill Book Co., New York, 1938.

Economic in nature. Useful for general background. Considers basic factors which determine choice of consumer goods. Also treats the effects on consumers of modern machinery, advertising, standardization, consumer cooperatives, government service to consumers.

Kallet, Arthur and Schlink, F. J. *100 Million Guinea Pigs*. The Vanguard Press, New York, 1932.

Described in Chapter II.

Lamb, Ruth deForest. *American Chamber of Horrors*. Farrar & Rinehart, Inc., New York, 1936.

Although the material which composes other "exposure type" consumer books is often criticized for inaccuracies, this book has usually been free from such criticisms. It is one of the essential books to be read by those interested in consumer education dealing with foods

and health. Although it was written before the passage of the Food, Drug, and Cosmetic Act of 1938, much of its discussion of Federal laws and their shortcomings is still fitting. The extensive appendices are highly illuminating. One of the essential books.

McCollum, E. V., Orent-Kiles, Elsa, and Day, H. G. *The Newer Knowledge of Nutrition*. The Macmillan Co., New York, 1939.

Basic scientific information dealing with nutrition. Technical and quite complete. Chapters XXIV to XXVIII, inclusive, contain good material to assist in solving certain consumer problems as to the relation between candy and tooth decay.

Mann, G. C. *Bibliography on Consumer Education*. Harper & Brothers, New York, 1939.

Aside from the evident bias described in Chapter II of the present book, this bibliography is certain to be very helpful to anyone interested in consumer education.

Matthews, J. B. *Guinea Pigs No More*. Covici, Friede, New York, 1936.

Visualizes what a consumer society would be like. Contains many excellent suggestions and ideas for the development of such a society as an alternative to a "worker's state." The consumer's case against business gives 75 illustrative cases in which consumers have been "gyped" by business. In the appendix there is "An Enabling Act for a Department of the Consumer" by Oscar S. Cox, which contains many ideas about a Federal law for consumers. Very necessary reading. One will wish to see how many of these ideas fit with his own.

Morell, Peter. *Poisons, Potions, and Profits*. Knight Publications, New York, 1937.

Deals particularly with the numerous incorrect claims in radio advertising. Many different kinds of consumer goods are considered. In a chapter titled "Mulcting the Mother through the Child," there are presented indirect arguments for emphasizing consumer education in the schools. Suggestions for solution of the radio consumer problem are also given.

*National Conference of Social Work Proceedings for 1939*. Columbia University Press, New York, 1939.

Especially recommended as general reading in order to make clearer the social conditions related to science teaching of consumer education and to science teaching as a whole. Up-to-date *Proceedings* are recommended as they are issued.

*New and Non-Official Remedies.* American Medical Association, Chicago, 1939.

Contains listing and description of articles accepted by the Council on Pharmacy and Chemistry of the American Medical Association as of January 1 of the year of publication. Published yearly. Most recent copy is preferable. Extremely useful as a reference book. Usefulness will increase as statements of composition of proprietary remedies are given on the labels.

*Next Steps in Consumer Education.* Proceedings of a National Conference on Consumer Education Held at Stephens College, Columbia, Missouri, April 3, 4, and 5, 1939. Institute for Consumer Education, Stephens College, Columbia, Missouri, August, 1939.

Not directly related to the work of science education in consumer buying but the best single cross section picture of consumer education available at present. One of the essential readings.

Palmer, D. H. and Crooks, Laurence E. *Millions on Wheels.* The Vanguard Press, New York, 1938.

Has numerous suggestions dealing with the purchase of automobiles and accessories. Expresses a number of interesting ideas in regard to possible improvements in automobiles—improvements which could be made but which are not made.

Peet, L. J. and Sater, L. E. *Household Equipment.* John Wiley & Sons. New York, 1934.

Emphasizes detailed information about household equipment. Describes equipment but does not deal directly with consumer buying problems. Written from a home economics viewpoint for use as a college textbook.

Phillips, Velma. *Evidence of the Need of Education for Efficient Purchasing.* Bureau of Publications, Teachers College, Columbia University, New York, 1931.

An analytical study of consumer difficulties in choosing and buying clothing and home furnishings. Many examples show that needs exist even among businessmen and graduate students and professors in household arts. Helpful in forming consumer background for science teachers and in suggesting several of the usual consumer problems for investigation.

Pitkin, Walter B. *Let's Get What We Want!* Simon & Schuster, New York, 1935.

One of the essential books from the big business standpoint. Many good ideas. Lengthy discussion of the four great necessities, shelter, health, food, and clothing. Book tends to favor big companies, nationally advertised products. Says that primitive goods are shoddy compared with factory-made quality goods. Favors the good side of mass production, the big advertiser, the big medicine producer. Like *Dollars and Sense* and *Guinea Pigs and Bugbears*, only much more cleverly and sanely written. Likely to exert considerable influence in causing one to turn away from consumer education and lulls one to a feeling of safety and security. Possibly there are about as many fallacies in its own arguments and proofs as are pointed out in the arguments and proofs of the extremists in the consumer movement. Blames ills of consumers on an "underworld of 4,000,000 or more scoundrels willing to do anything for a price" and upon "a twilight world of 40,000,000 people of profound stupidity or ignorance or indifference."

Prescott, S. C. and Proctor, B. E. *Food Technology*. McGraw-Hill Book Co., New York, 1937.

Treats of the industries and methods by which many foods are processed and changed as they are made ready for market use. Primarily producer education, but has much necessary background material for one who is to go very far into work in consumer education. Especially valuable to aid in solution of problems dealing with consumption of particular foods.

Reich, Edward and Siegler, C. J. *Consumer Goods*. American Book Co., New York, 1937.

A textbook suggested both for business courses and consumer courses. Contains fairly detailed descriptions of a wide variety of consumer goods. Treats commodities from both production and consumption standpoints. Not much attention paid to development of generalizations dealing with consumer education, but one of the necessary books for science teachers interested in consumer education.

Schlink, F. J. *Eat, Drink, and Be Wary*. Covici, Friede, New York, 1935.

One of the exposure type consumer books. Deals with sanitary and chemical horrors about food and drink. Although the book has been much criticized for scientific errors, there is no question that its material is in the main correct. The final chapter, which attempts to develop the thesis that "man's instincts are the best guide to his

diet," is probably most open to criticism, since it is well known that there are many diets among primitive peoples which cut life short and produce disease. Many of the detailed arguments and illustrations in this chapter are correct, but the conclusion would not be acceptable to those who have studied foods and diets extensively.

Trilling, M. B., Eberhart, E. K., and Nicholas, F. W. *When You Buy*. J. B. Lippincott Co., Philadelphia, 1938.

Written as a textbook for use in separate courses in consumer buying. It is also suggested "for use in clothing, food, home management, economics, and social studies courses where consumer buying is included." Includes attention to numerous generalizations as well as specific details about some goods. Although written primarily from a combined economics and home economics viewpoint, there is much that science teachers may use.

Tucker, Milton. *Buying an Honest House*. Little, Brown & Co., Boston, 1930.

Especially good consumer buying material on determining quality of materials and workmanship in a house. Simply written and contains much practical usable material.

Watkins, R. K. and Perry, Winifred. *Science for Human Control*. The Macmillan Co., New York, 1940.

A science textbook evidently meant for ninth grade pupils. Good consumer material which deals with such general problems as "How much of modern advertising can we believe?" and "How can we have scientific attitudes in buying?" "What is in soap, tooth paste, baking powder, antiseptics, and our common foods?" "What information do we need about the things we buy at the drug and grocery stores?"

Weiss, E. B. and Mermey, Morris, editors. *The Shopping Guide*. McGraw-Hill Book Co., New York, 1937.

Described in Chapter II.

Wilson, S. R. and Mullins, M. R. *Applied Chemistry*. Henry Holt & Co., New York, 1939.

Contains a number of brief statements about consumer education, although the word "consumer" is not in the index. Previews to certain units, as one on Textiles and another on Drugs, Poisons and Cosmetics, emphasize the needs for consumer education; but the units themselves do not meet the needs very well. The textiles unit

is poor, but the other is good, especially in regard to satisfying the "What is it?" question. Although published in 1939, the book goes back to 1906 for a Pure Food and Drug Act and does not mention the 1938 Food, Drug, and Cosmetic Act.

ZuTavern, A. B. and Bullock, A. E. *The Consumer Investigates*. H. M. Rowe Co., Chicago, 1938.

A textbook for secondary school use in business classes. Of particular interest to science teachers because it helps present a picture of work being done in consumer education from a nonscientific point of view.

ASSOCIATIONS, PERIODICALS, GOVERNMENT AGENCIES,  
AND REPORTS

American Dental Association, Council on Dental Therapeutics. 212 East Superior Street, Chicago, Ill.

Described in Chapter V. All of the Council's publications appear in the *Journal of the American Dental Association*. The information in these publications may be had upon request. Available material is at present supplied in mimeographed form.

American Home Economics Association. 620 Mills Building, Washington, D. C.

Described in Chapter V. The official publication is the *Journal of Home Economics*.

American Medical Association. 535 North Dearborn Street, Chicago, Ill.

Described in Chapter V. Make first contact by requesting a price list of health publications. The *Journal of the American Medical Association* is a valuable weekly. Although articles are primarily of medical interest, science teachers will often find things of major interest and importance both in consumer education and in science education as a whole. Answers to letters from doctors often contain unusually good and direct consumer material, as safety and value of the shoe-store fluoroscope (p. 1737, May 15, 1937); typhoid food-handlers (p. 1747); current legislation and bills voted down on distribution or possession of foods, drugs, cosmetics, and biologics. Bureau of Investigation publishes reports of frauds, as "The Sabo Painless Hair Remover Fake" (p. 661, Feb. 18, 1939); articles on new groups of health practitioners, as "Naturopathy" (p. 736, Feb. 25, 1939); amount of starch in gluten bread (p. 871, March 4, 1939).

Annual Reports of most or all of the Federal government bureaus and

agencies which are listed in this bibliography often supply excellent summaries of consumer material. Such reports usually can be obtained for school libraries through congressmen. The actual cost, however, is very small.

Bureau of Home Economics. United States Department of Agriculture, Washington, D. C.

Work is described in Chapter III. As a preliminary step in becoming better acquainted with the Bureau, ask for a list of its printed publications. A reprint of a speech by Ruth O'Brien on "Standards for Consumer's Goods" is well worth having.

*Consumer Education, a News Letter.* Institute for Consumer Education, Stephens College, Columbia, Mo.

Not much information directly related to science, but contains much valuable general consumer information. One of the essential ways of keeping up to date. Published monthly except July, August, and September. Subscription 75 cents per year.

*Consumers' Digest.* Consumers' Institute of America, Inc., Washington, N. J.

A monthly publication which makes use of a great deal of Consumers' Research material. Gives some ratings but presents only recommended products. Ratings are not confidential. Considers in addition many general consumer problems. A good source of consumer material. Evidently closely associated with Consumers' Research but maintains a separate corporation.

*Consumers' Guide.* A publication of the United States Department of Agriculture, Consumers' Counsel Division, Washington, D. C.

Described in Chapter III. Address all inquiries to the Editor, *Consumers' Guide*, U. S. Department of Agriculture, Washington, D. C.

*Consumers' Research Bulletin.* Issued by Consumers' Research, Inc., Washington, N. J.

Described in the main content of this book, chiefly in Chapter IV.

*Consumers Union Reports.* Consumers Union of the United States, Inc., 17 Union Square West, New York City.

Described in the main content of this book, chiefly in Chapter IV.

Federal Trade Commission, Washington, D. C.

Services described in Chapter III. For preliminary contact, write for the regular *Monthly Summaries of Work*.

Food and Drug Administration, United States Department of Agriculture, Washington, D. C.

Work described in Chapter III. Request that you be sent the *Notices of Judgment* upon issue. Yearly report also should be examined.

*Good Housekeeping*. Monthly. Hearst Magazines, Inc., 57th Street at Eighth Avenue, New York City.

Connection with consumer education described in Chapter V.

Household Finance Corporation. 919 North Michigan Ave., Chicago, Ill.

A number of bulletins on better buymanship of such commodities as fabrics, food fats and oils, dinnerware, soap and other cleansing agents, automobile tires, cosmetics, floor coverings, household refrigerators, etc. These bulletins are listed with considerable hesitancy because they are meant to serve as an indirect advertising feature of the Household Finance Corporation. Except for their emphasis on producer education, the bulletins are well prepared. They are probably the best among the commercial bulletins available, their use in schools is widespread, and their listing here is probably justified for that reason.

*Hygeia*. American Medical Association, 535 North Dearborn Street, Chicago, Ill.

An indispensable periodical for science teachers whether or not they are interested in consumer education. It is unfortunate that the magazine sometimes carries advertising which is not as high grade as its articles.

*Industrial Standardization*. Monthly. American Standards Association, 29 West 39th Street, New York City.

Highly necessary reading in order to keep up on the progress and difficulties involved in developing a cooperative standardization program. Strongly recommended.

*Intermountain Consumers' Service, Inc.* 435 Marion, Denver, Colo.  
Similar in nature to Consumers' Research, Inc.

National Better Business Bureau, Inc. Chrysler Building, 405 Lexington Avenue, New York City.

Chapter V of this book has a brief description of the service of the Better Business Bureau. Ask for list of publications dealing with aids for business and consumers.



National Bureau of Standards, Department of Commerce, Washington, D. C.

Services described in Chapter III. For preliminary contact write for Letter Circular (LC-416) entitled "List of Publications of Interest to Household Purchasers."

North Dakota Regulatory Department, Bismarck, N. D.

Publishes numerous booklets, pamphlets, and mimeographed bulletins dealing with consumer goods. North Dakota is not the only state that has made a definite attempt to assist consumers, but this state has probably gone farther than any other. All the materials offer great possibilities, but science teachers will probably get the most ideas from bulletins on the "False and Misleading Advertising Law," "Flour Label Act," "Standards for Canned Tomatoes and Canned Peas," and bulletins on "Sanitation of Food and Drug Establishments," "Hotels and Tourist Camps," "Dairy Inspections," "Cosmetics, Deodorants and Anti-perspirants."

*Propaganda Analysis.* Institute for Propaganda Analysis, Inc., 40 East 49th Street, New York City.

Of general interest in connection with consumer education. The title indicates the nature of the work it attempts.

United States Government Printing Office, Washington, D. C.

All government publications for which there is a charge are purchased from this office. One may get free a "Weekly List of Select U. S. Government Publications" if he purchases occasional new publications. This service is an extremely valuable one.

The following periodicals are suggested for frequent examination in order that teachers may keep in close touch with the attitudes of advertising and business toward consumer problems. Other similar trade publications are likely to be just as valuable as these indicated here.

*Advertising Age.* Published weekly, 100 East Ohio Street, Chicago, Ill.

Presents the problems of advertisers as advertisers see them.

*Business Week.* Published weekly, 330 West 42nd Street, New York City.

Particularly useful. Contains a section on "Production" which is distinctly scientific in nature and may be related to consumer education. Also discusses some actions of the Federal Trade Commission from the business viewpoint.

*Food Industries.* Published monthly, 330 West 42nd Street, New York City.

Contains frequent comments on factors of interest to science teachers of consumer education. For example, in the February, 1940 issue, pp. 92-93 one finds: "To improve keeping quality, it is desirable to subject fillets and other fish products to some preservative treatment prior to freezing. Possible use of chemical preservatives depends upon the food laws enforced in different counties." The article then reports experiments under way to test preservative action of sodium benzoate, benzoic acid, potassium nitrite, hydrogen peroxide, chloroform, boric acid, hydrochloric acid, sodium hypochlorite, formaldehyde. However, no mention is made of experiments to investigate possible harmful effects on human beings when such substances are used as preservatives.

*Printers' Ink.* A journal for advertisers. Published weekly. Printers' Ink Publishing Co., 185 Madison Avenue, New York City.

Articles are usually of fairly broad interest and challenging.

*Tide of Advertising and Marketing.* Published twice monthly. 232 Madison Avenue, New York City.

Presents the problems of advertisers as advertisers see them.

Following are a few articles of specific interest because their titles indicate direct relation to the subject of this book.

"Consumer Education and Boyle's Law." *School Science and Mathematics*, June, 1938.

This article illustrates how possible it is to read extreme meanings into teaching. However, depending upon the way the subject is handled, consumer education might possibly be taught through Boyle's Law. This author argues that he did it through the "development of scientific thinking and its application in everyday life."

"The Teaching of Consumer Chemistry." M. C. Crew. *School Science and Mathematics*, June, 1939.

One of the very few published materials having to do with the function of science education in consumer buying. Suggests laboratory projects having to do with analysis of household fuels, comparison of gasolines according to fractions distilled between various temperature ranges; analysis of household ammonia and common bleaches; a comparison of several water softeners. Many good ideas, but author apologizes for working with consumer education by saying that this

was done as extra work and did not affect the regular chemistry course.

"A Consumer Approach to Science Teaching." G. P. Devoe. *Science Education*, October, 1935, pp. 95-103.

An excellent exposition of the same general view which this book takes. The reader will wish to compare the more general treatment offered in the article with the somewhat extensive treatment outlined in this book.

"Seventy-one Courses in Consumption." Henry Harap. *School Review*, October, 1938, pp. 577-596.

Helps in giving a picture of consumer education as it was at the time the survey was made. From such a basis it is possible to draw conclusions about the nature of the present trends in consumer education. The article also contains a number of valuable ideas for the conduct of consumer education.

"Science for the Consumer." W. A. Partridge and Henry Harap. *School Science and Mathematics*, March, 1933, pp. 266-274.

Consists of an analysis and classification of scientific terms used in the publications of Consumers' Research, Inc. Authors suggest that the classification will be useful to teachers of science and economics and to the curriculum worker. Among definite uses suggested is its use as a basis of a science course for consumers.

"Consumer Education in North Central Schools." B. J. Rivelt. *North Central Association Quarterly*, April, 1939, pp. 534-540.

Supplies the most complete survey to date made of consumer education. Reports on results of a questionnaire sent to all schools in Illinois, Iowa, Kansas, Indiana, Minnesota, Missouri, Colorado, Arkansas, Arizona, and samplings of other states. The part of science is not large.

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