VOLUME 21 NO. 1
JANUARY 1958

*Journal of*

# MILK and FOOD TECHNOLOGY

*Official Publication*

International Association of Milk and Food Sanitarians, Inc.

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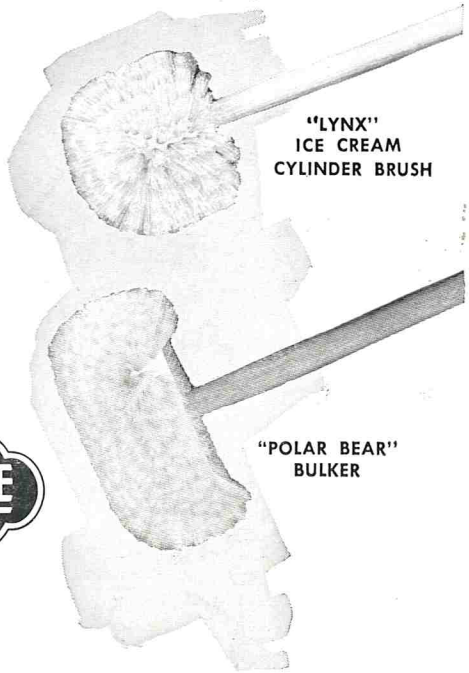


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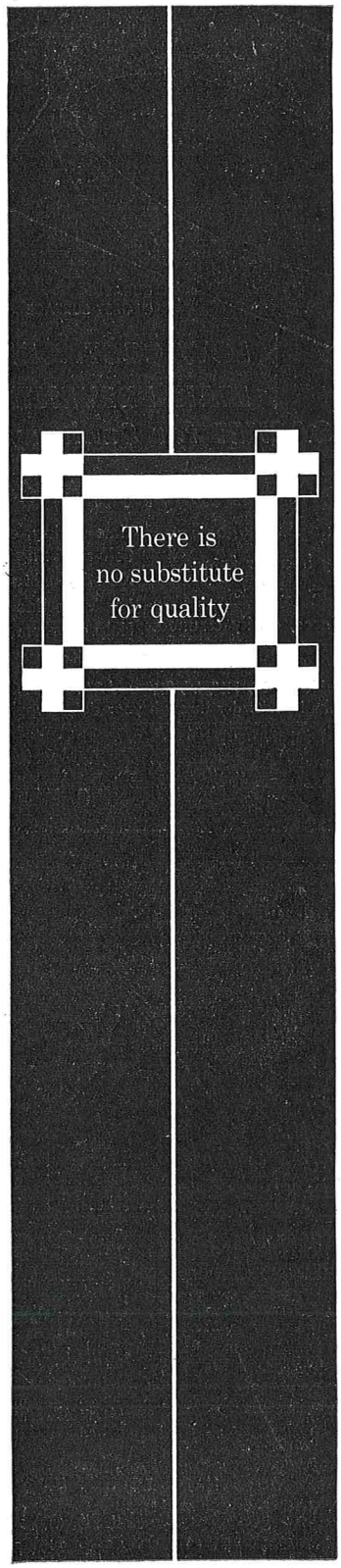


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# MILK and FOOD TECHNOLOGY


INCLUDING MILK AND FOOD SANITATION

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REG. U.S. PAT. OFF.

Vol. 21 January No. 1


*Contents*




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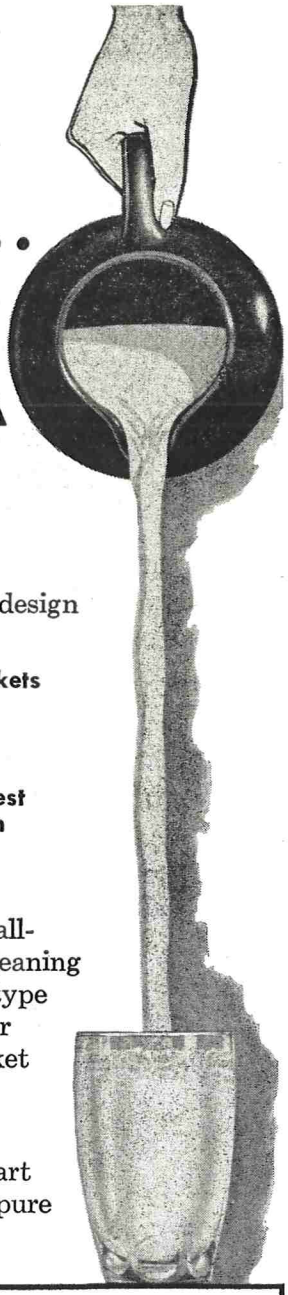
# trust HEIL quality



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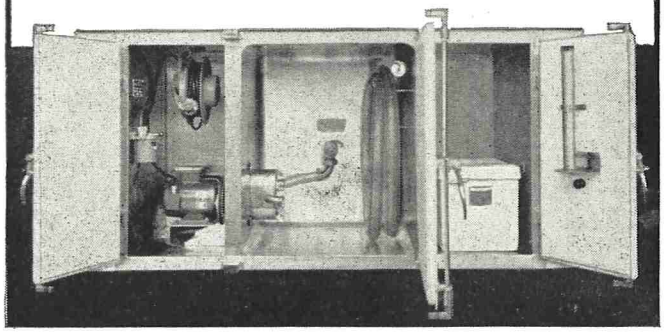
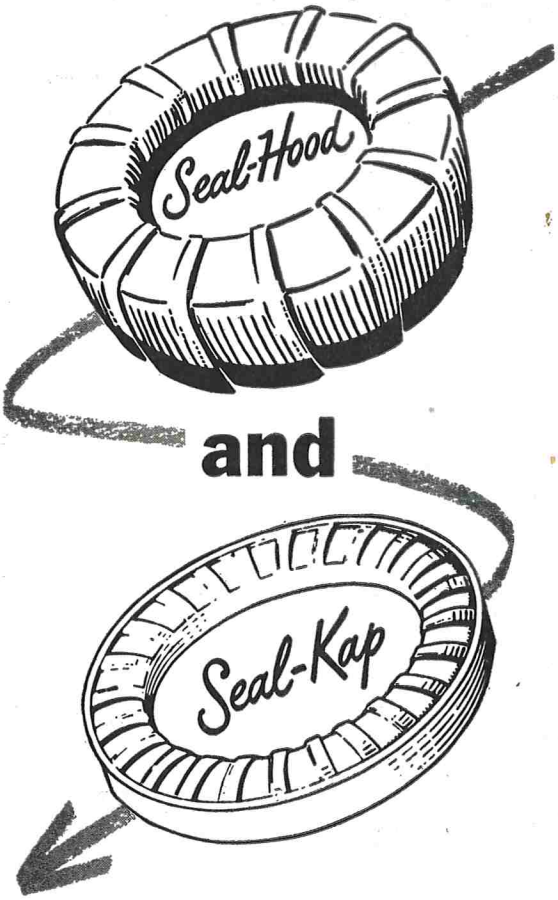


Sanitary 3-compartment cabinet is handy to use and keep clean. Plastic doors are warp-proof, lightweight and dust-tight.

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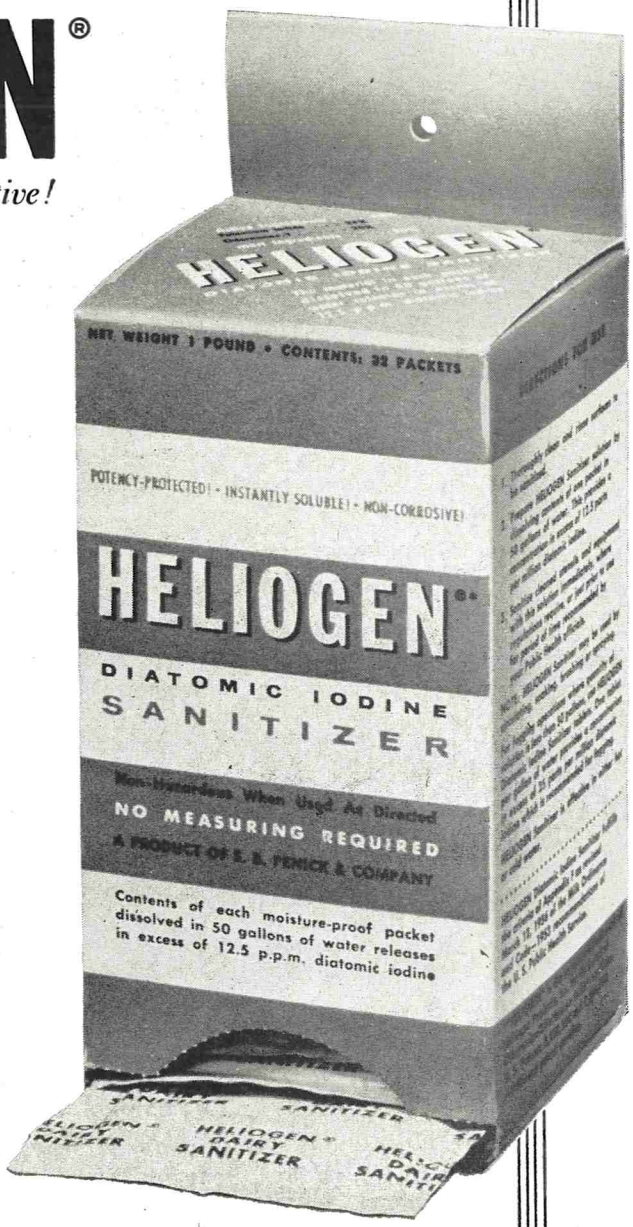


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# PRESIDENTIAL ADDRESS[1]

PAUL CORASH

*Milk Control Division, New York City Health Department*

The Annual Meeting of your Association is not only a time when we all gather for the purpose of hearing about and discussing new concepts and problems affecting our professional activities, renewing old friendships and forming new ones but it is also the time when your officers and committees render an account of their trusteeship for the past year. By tradition, it is also the time when your President is supposed to take out his crystal ball, polish it quickly and utter a few profound words to indicate what the world shaking problems of the future are likely to be and how we are going to solve these problems.

Actually, however, most of us do not deal in profundities in our day to day activities and we are more than content to handle the varied problems of the day as they arise, using our best judgment and hoping that we have supplied proper answers at least half of the time. In a general way, this same pattern holds good for the Association and its functioning. While many modes of action have already been established which serve for guidance, new questions keep arising which require decisions, and your Executive Board after due deliberation comes to a conclusion which, it hopes, is a correct one.

These questions which arise are, perhaps, not of great moment individually but taken all together, they make up the woof and warp of which our Association, is made.

It probably makes very little personal difference to most of you that our organization, for example, was asked to be a sponsor of the International Dairy Federation or that we have been requested to give consideration to establishing machinery for the certification of laboratory culture media. Nor is it, perhaps, of direct importance to you to know that your Association has been asked to be one of the component groups to help develop standards of construction and operation for the growing Automatic Food Merchandizing Industry.

Collectively, however, all of these happenings point to the achievement of a certain stature and prestige which, while it gives us the right to a feeling of pride because we are a part of it, also imposes a sense of

Paul Corash, President, IAMFS, 1956-57.

responsibility for the proper use of our prestige. The guiding hands of your previous officers have painstakingly built up a huge reservoir of respect and good feeling for the Association and we clearly cannot afford to waste this good-will on any dubious or poorly considered ventures.

As an index of the stature which your Association enjoys, it is gratifying to report that IAMFS has this year become affiliated with two outstanding National Associations, "Keep America Beautiful, Inc." and "The American Association For The Advancement of Science."

"Keep America Beautiful, Inc." is an association which is dedicated to the task of preserving the natural beauty and scenic resources of our country and keeping these resources from being despoiled by the careless, the willful and the selfish among us who simply have not come to realize that each of us must do his part lest our heritage of natural beauty be destroyed. The sponsors of "Keep America Beautiful, Inc." represent a cross-section of the largest organizations in American Industry and its officers and directors are a veritable "Who's Who" of our business management personnel.

Quite apart from the honor of this type of Association, IAMFS has a genuine and useful place in the

[1]Presented at the 44th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Louisville, Kentucky, October 7-10, 1957.

type of activity embraced by "Keep America Beautiful, Inc." since our field of activity, in its broad implication, is environmental sanitation. Any way in which we can improve the American environment, either as individuals or as an organized entity, presents us with a challenge which we must accept. A beautiful America is as much our right as is a healthful America and as guardians of the environment, we have a contribution to make to our new associate.

IAMFS has been rather loosely associated with the "American Association for the Advancement of Science" for a number of years but a recent amendment to the by-laws of the latter organization has enabled your Executive Board to decide on becoming a full affiliate. The "American Association for the Advancement of Science" is the largest organization of scientists in the country, if not in the world, with an individual membership of 60,000 and affiliations with 300 scientific societies. Its objectives are; (*a*) to further the work of scientists, (*b*) to facilitate cooperation among them, (*c*) to improve the effectiveness of science in the promotion of human welfare, and (*d*) to increase the public understanding and appreciation of the importance and promise of the methods of science in human progress.

The opening of new doors to some of nature's hitherto baffling mysteries has presented civilization with some fascinating and undreamed of possibilities for the improvement of mankind as well as with some frightening possibilities which could conceivably lead to world annihilation. The need for making momentous decisions having international implications faces our statesmen every day. These decisions must be generally reflective of the prevailing public opinion. Scientists are no longer content to restrict their efforts to the confines of the laboratory. They recognize the seriousness of their obligation to provide lucid and non-technical explanations of the implications of their findings to the peoples of the world so that decisions, when made, will be based upon recognized facts instead of upon emotionalism and prejudice. IAMFS is proud of the opportunity to join with other scientific groups in meeting its responsibilities and we must and will be worthy of this new affiliation.

The problem of achieving professional status and recognition for sanitarians is one which has occupied the attention of our Association for some time but, unfortunately, we must recognize that the achievement of this objective is not available for the asking, nor are we aware of any short-cuts to enable us to hasten to our goal. Professional recognition can come only when the character of the work which we perform reaches professional calibre, but we must be constantly on the alert to any developing situations which contain the possibility of a threat to the eventual achievement of our long-range goal.

Your Association was recently informed of a movement in one of the states which seemed to indicate that a two year sub-professional type of training was to be considered acceptable for the position of sanitarian. The course for which training was to be offered would qualify a person as a "Sanitarian Technician" which appeared to be a substitute category for a sanitarian. While we have no objection *per se* to two year training courses for technicians, the point which did disturb us was the purported willingness of local administrators in the field of public health to accept sub-professionally trained people to fill important positions in the increasingly complex field of environmental sanitation. These same administrators would never dream of engaging a partially trained nurse or dental technician to fill vacancies in their organizations but they presumably were willing to relegate the field of sanitation to a minor level.

Your president, acting under instruction from the Executive Board, remonstrated strongly against the reported action and wrote to the Commissioner of Health and to the State Health Officers Association describing our attitude. The latter organization has informed us that it subscribes to the recommendations of the APHA concerning the educational requirements for Public Health Sanitarians and this, of course, is gratifying since it coincides with the position of this Association.

The incident described here seems to have some serious implications to sanitarians. There is a significant body of administrative opinion which seems to feel that as long as milk is pasteurized or food is cooked, there is little need to pay attention to the other sanitary phases of milk or food control. They seem to feel that as long as morbidity and mortality charts do not indicate extensive illness or mortality from the consumption of milk or other prepared foods, there is no need to maintain sanitary control over these products except pasteurization supervision.

The fine record in the virtual elimination of milk-borne diseases which has been achieved in so many parts of the country, has given rise, first of all, to a false sense of security and, secondly, it has created a psychology that the only thing of importance in the field of milk control, is to provide for the destruction of pathogens.

These who expound this point of view and who picture themselves as hardheaded realists seem willing to overlook the fact that there are many sanitary factors other than those of safety alone which enter into the production and handling of milk and other

foods. They ask why it is necessary to continue spending time and money on farm inspection, for example, when everybody knows that it is pasteurization which makes milk safe.

We know, of course, that dairy farm inspection is not carried on for safety reasons alone. An esthetically acceptable environment is also a necessary ingredient of a satisfactory milk supply. Surely, consumers would not willingly accept milk produced under filthy conditions even if they knew it was completely safe. Certainly, our present cultural level and standard of living which demands clean wash rooms at gasoline stations would hardly be satisfied with insanitary dairy barns and milk houses.

Let us not get the impression that these people about whom we are speaking object *per se* to the esthetic phase of sanitary science. It is strictly a matter of competition for as large a share as possible of the public health appropriation. Just so much money is made available for the total health budget and there is an understandable effort to give increasing emphasis to those fields which can be popularly exploited.

The dramatic phases of milk control are largely a thing of the past and some new fields give promise of increasing popular acceptance. This is not an attempt to belittle the needs of such public health fields as geriatrics, polio immunization, cancer diagnostic clinics, etc. There is complete justification for giving these areas of need full attention but not at the expense of other important services.

While it may be more expedient to curtail the less glamorous public health projects than to put up a strong fight for extra funds which may be needed for new projects, a policy of robbing Peter to pay Paul is one of the ways that can result in a Lancaster type of episode.

While on the subject of professional status, it might be well at this point to mention the keen interest which exists in many parts of the country on the subject of Sanitarian Registration Statutes. Whether this makes for a desirable way of achieving professional status or not, the fact remains that many people in our field are looking in that direction. While our Association has prepared a Model Registration Law and offered it for use to affiliates, we must give some additional thought to whether or not we can or should do more in furthering this concept which seems to be achieving increasing popularity.

Our meeting this year is keyed to the celebration of the Twentieth Anniversary of the founding of our publication, the *Journal of Milk and Food Technology*. The Journal was launched in Louisville and it is most appropriate to have returned here to observe this milestone in our career. While the Journal, in a sense, is a collateral arm of the Association, the two are so completely interdependent that we cannot think of one without the other.

There is no special merit or cause for celebration in merely reaching a certain age. The worthwhileness of an existence is evaluated, not by a chronological interval, but by the things which have been achieved in this interval. The Journal was conceived by its founders because they saw the need for providing a medium of communication for people in the fields of milk and food technology. Knowledge and experience are not confined to one group or one area and our Journal provided a clearing house to enable people who had ideas to present them to others who were seeking information.

Our steady growth to a circulation of over 5,400 copies per issue, is tangible evidence that the Journal founders and those who succeeded them in carrying on the work, were not content merely to grow old but were zealous in expanding the fields of knowledge which deal with our profession.

We readers of the Journal who receive the finished article every month, can hardly realize how much time and effort are spent by the Journal staff in preparing each issue. The work of the Editorial Board is, of course, voluntary, our Editor's compensation is a token and the Managing Editor's salary is nominal. Here, is truly an enterprise which cannot be paid for in dollars and cents but can only be described as a labor of devotion.

It is now necessary to touch briefly upon the general state of our Association's health and well-being. I am sure that the reports of our Executive Secretary and Secretary-Treasurer will reflect a vigorous membership situation and a reasonably comfortable financial condition. While the period of our most rapid expansion in membership has probably been passed, there are still significant numbers of sanitarians in the country who do not have national affiliations as was fully outlined for you last year by Past President Adams. Some of these are completely occupied with activities outside of the milk and food field and others have general Sanitarian's functions along with milk and food work.

We have heretofore not made too strenuous an effort to reach the general Sanitarian and we must continue to ask ourselves if it is not now timely to broaden our scope and give this type of member and prospective member some consideration. If the answer to this question should be in the affirmative, it would become necessary to expand the Journal to include material on the non-food phases of environmental sanitation since we would hardly want to cut down on our present field of interest. In a modest way, a limited start has been made in this direction with

our annual meeting programs where we have been seeking to expand the range of presentations to other phases of environmental sanitation. Some may object that we would be going too far afield in taking such a course and that we would be reducing our appeal to those who constitute our basic membership.

I personally feel that this is too narrow a view and that even the specialists among us can be helped by acquiring a wider knowledge of the other phases of sanitary science. A milk sanitarian can be more effective if he is alert to the evils of stream pollution or if he can speak with a bit of intelligence about the possible contamination of the milk supply with Strontium 90. By the same token, a food sanitarian is a better man for knowing something of the danger of carbon monoxide poisoning from improperly operating gas appliances. While the value of specialization of function is apparent, it should not obscure the need for a wider acquaintance with related fields of activity.

In concluding my remarks, I believe it worthwhile to repeat a point that has been made before, namely, that your Executive Board and your various committees will truly reflect the type of organization and the policies which are desired by the members. A vigorous interest by the members at large will make for a robust Association. Your Executive Board members are not omniscient and they fully realize that excellent ideas can arise from even the remotest hamlet. However, ideas must be communicated before they can be adopted and we most assuredly will welcome your views for building a stronger Association.

# STRONTIUM 90 MEASUREMENT IN FOODS[1]

S. A. Lough

*Health and Safety Laboratory, Atomic Energy Commission New York, New York.*

Fission products are formed when uranium 235 undergoes fission in nuclear explosions. *Small weapons* (kilotons), fired near the surface of the earth, introduce fission products into the troposphere. *Larger weapons* (megatons) introduce fission products into both the troposphere and the stratosphere.

## Fallout Patterns

The radioactive debris is disseminated as particles of dust. If the burst is near the ground and soil is sucked up into the cloud, some activity will settle out promptly on large, heavy particles. The remainder will be in small particles which will move with the winds, which are prevailingly from west to east.

The *troposphere burden* falls to earth rather rapidly. The larger portion of this material falls out within 1,000 to 2,000 miles and within a few weeks or months after entering the atmosphere. The rate of deposition is increased by rain or snow.

The *burden in the stratosphere* is composed of very small particles which migrate rather slowly down into the troposphere from which they finally reach the ground. Particles in the stratosphere travel around the world, generally from west to east, and seem to exhibit less movement from north to south. They are deposited upon all portions of the earth's surface, but not uniformly. The residence time in the stratosphere is measured in years.

Our ultimate interest is in the amount of these materials which may enter the human organism through the food chain. To predict the amount of fission products one might expect to find in foods one needs to consider some characteristics of fission products.

Most of the radioactive fission products have a short half-life, hence they disappear rapidly by decay both before and after deposition on the ground. Two fission products are notable for their long half-life. Cesium 137 exhibits a half-life of 33 years, strontium 90 one of about 28 years.

These two isotopes behave quite differently in the biosphere. *Cesium 137* seems to be fixed in the soil in a form not readily taken up by root systems; it is distributed in the soft tissues of the body; its effective half-life is only about 120 days, that is, one-half of it will leave the body in about 120 days.

*Strontium 90* is taken up readily by plant roots; it follows calcium in plant and animal metabolism, hence goes to bone. It is excreted rather slowly after deposition in bone, exhibiting an effective half-life about 7 years. Certainly strontium 90 is the fission product which might become the most troublesome on a long-term basis. In foods, therefore, principal interest has centered on the determination of strontium 90.

## Relationship of Strontium 90 and Calcium

Since calcium and strontium resemble one another chemically and metabolically, growing plants or animals will take up and utilize strontium if the soil, or feed, is relatively low in calcium. Consider two soils with the same strontium content, but with a lower calcium content in one soil than in the other. Tissue of a plant growing on the low-calcium soil will exhibit a higher ratio of strontium to calcium than will those of a plant growing on the soil high in calcium. Further, a cow which has eaten forage showing a higher Sr/Ca ratio will produce milk and develop bones with a higher Sr/Ca ratio. Finally, a human who drinks milk with a relatively high Sr/Ca ratio will deposit strontium in his bones at a higher level with respect to calcium.

### *The Strontium Unit*

As a consequence of the above, it can be seen that in the strontium 90 problem the important value from the physiological standpoint is the ratio of strontium 90 to calcium. The quantities of strontium 90 encountered are very small, and in order to express these amounts in whole numbers, a very small unit was adopted. This is referred to in fallout literature as the *strontium unit.* One strontium unit is one micromicrocurie of strontium 90 per gram of calcium (1 micromicrocurie Sr 90/ g Ca). A micromicrocurie is a millionth of a curie ($10^{12}$ curie). One-hundred micromicrocurie Sr 90/g Ca has been considered the maximum permissible skeltal ratio of strontium 90 in the general human population.

[1]Presented at the 44th Annual Meeting of the Intetnational Association of Milk and Food Sanitarians, Inc. at Louisville, Kentucky, October 7-10, 1957.

*Amount of Strontium 90 in Foods.*

In general, plants contain fewer strontium units than the soil on which they grew, cow's milk and bone contain fewer strontium units than their feed, and human bone less than was in the food of the subject. In the cow and the human, part of this discrimination in favor of calcium is due to preferential fecal and urinary excretion of dietary strontium.

Since milk is outstandingly important as a source of dietary calcium and it is readily available for sampling, emphasis has been placed on its analysis.

*Strontium 90 in Dry Milk*

Powdered milk from eight locations has been analyzed monthly for varying periods. The longest continuous program has been on milk obtained from Perry, New York. Monthly analyses have been made from April, 1954, through June, 1957.

During the period the number of strontium units has increased from 0.47 in April 1954 to 4.6 in June 1957. The values have fluctuated rather widely at certain periods, but the trend of increase in uuc Sr 90/g Ca is definite. Some of the fluctuation was caused probably by deposition of fresh fallout on the leaves of forage just after a major weapons test. During the winter months when the herd was not grazing on pasture, the strontium 90 levels have tended to be lower. In addition, the sampling problem accounts for some fluctuation. One sample withdrawn from a day's run at a powdered milk plant may not represent the average for the entire production run even for that day. In a 16-hour run at one milk powdering plant the strontium 90 level measured hourly varied between 3.4 and 5.5 strontium units. This hourly and daily variation may accentuate or obscure a seasonal variation or modify the rate of increase in strontium 90 concentration over a period of many months.

In spite of these sampling problems, it is reasonably safe to assume that the Perry, New York milk contained about 5 micromicrocurie Sr 90/g Ca in June 1957.

*Human Milk*

If the cow discriminates against dietary strontium 90 and produces milk of lower concentration, the lactating human should behave similarly. Mother's milk, and the cow's milk drunk by the mother, have been analyzed. Results are preliminary but they suggest that human milk may contain as little as one-tenth as many strontium units as the dairy milk in the mother's diet. The values found thus far range from about 0.6 to 3.9 micromicrocurie Sr 90/g Ca, with most of the values between 1 and 2 strontium units. In no case has it been found that human milk contained more strontium units than the dairy milk of the diet, this despite the fact that consumption of copious quantities of vegetables and cereals might lead to secretion of human milk with unexpectedly high strontium to calcium ratio.

*The nature of radioactive fallout and its effects on man* has been published to record the Hearings before the Joint Committee on Atomic Energy, Congress of the United States. From Merril Eisenbud's testimoney, on page 565 of Part 1, it appears that a child would be expected to develop a skeleton containing from one-half to three-quarters as many strontium units as were in the child's diet. If the present level of 5 micromicrocurie Sr 90/g Ca persists in Perry, New York milk, children fed on it might develop bones containing about 3.7 strontium units. This would be no more than about 4 per cent of the maximum permissible skeletal ratio (100 micromicrocurie Sr 90/g Ca).

Kulp, Eckelmann and Schulert (Science, **125**, 219, 1957 reported that the average strontium 90 content in human bone in 1955 was 0.12 strontium unit for all ages and all locations represented. In young children of 0 - 4 years, whose skeletal development had occurred since weapons testing began, the average concentration was 0.31 micromicrocurie Sr 90/g Ca. Thus, even in young children, the measured level of strontium 90 in bone, in 1935, was only about one-tenth the value of 3.3 micromicrocurie Sr 90/g Ca which might appear in the skeleton from the level found in milk in December 1955. Apparently, the population is not yet in dietary equilibrium with the strontium 90 of the environment.

The significance of the internal radiation dose which would be delivered by the projected skeletal burden can be appreciated more clearly by comparing it with that due to the presence of naturally occurring radioisotopes. The 3.3 micromicrocurie Sr 90/g Ca would deliver about 0.7 rad to the skeleton over a period of 70 years. The K40 and C14 and radium which occur naturally in the body, combined with the cosmic rays and terrestrail gamma radiation, deliver a 70-year skeletal dose of about 7 to 30 rads. The estimated strontium 90 dose of 0.7 rad is, therefore, only from about 2.3 to 10 percent of the radiation dose due to natural sources.

# THE SANITARY ASPECTS OF FOOD AND BEVERAGE VENDING[1]

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A few weeks ago a syndicated columnist writing in one of our larger daily newspapers stated that he had seen the following sign in the assembly room of a manufacturing plant - "BE ALERT — REMEMBER YOU CAN ALWAYS BE REPLACED BY A PUSH BUTTON". The sign would have been just as appropriate in the boss' office above his new "electronic brain" — and it would have been better advised from the viewpoint of employee relations.

However, this news item does point up the fact that "automation" has become a household word - one that is giving all of us many extra hours of leisure time through use of the "push button".

Automation is the foundation of the food and beverage vending industry. Present day vending machines store food and beverage products under controlled conditions; prepare and mix ingredients accurately and uniformly; dispense the product upon consumer order; accept and make proper change, and perform many other functions - all automatically. But instead of replacing people with "push buttons", the food and beverage vending industry is creating new jobs in machine manufacture, commissary operation, and location servicing.

Food and beverage vending is a distinct food service industry - one which is rapidly taking its place in the American way of living. Automatic merchandising solves the problem of finding trained cooks and other food employees to operate manual food facilities in remote areas of employment. In establishments where quick feeding is essential, and in locations where round-the-clock sales volumes will not warrant manually operated food facilities, the location of automatic food and beverage machines meets both needs for service and economy. Coin operated dispensing of foods and other merchandise is not new. Ball gum, for instance, has been coin vended for more than 60 years. Collar buttons at a dime a pair were a popular vended item at the turn of the century. One of our present day machine manufacturers recalled recently that his first vending machine - made by his father in 1905 - was a colored, flavored water dispenser which came complete with tin cups and a one-compartment sink for "rinsing". Only a finicky customer ever rinsed his cup, and even he didn't question the source of the artificial coloring and flavoring or the other sanitary aspects of this penny-operated vending machine.

Mr. Hartley is a 1940 graduate of Purdue University, with a B.S. degree in Zoology. He joined the Indiana State Board of Health as a food sanitarian in late 1945, serving consecutively as survey officer and chief of retail food sanitation. Mr. Hartley is president of the Indiana Association of Milk and Food Sanitarians and has been a member, and later chairman, of the I.A.M.F.S. Food Equipment Sanitation Standards Committee. He joined the National Automatic Merchandising Association in August 1957 to direct the industry's public health program.

From this humble start, the vending industry has made great strides, sanitationwise, during the past 50 years. Up until World War II, vended food and beverages were largely bottled or packaged goods - gum, nuts, candy and bottled drinks. Machines were located and operated as an adjunct to other services in factories, offices, transportation terminals and similar places of public gathering.

After the second World War, the true potential of food and beverage vending began to be explored. The industry developed bulk carbonated drink machines,

[1]Presented at the 44th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Louisville, Kentucky, October 7-10, 1957.

hot coffee units, bulk and packaged milk vendors and then developed a line of pastry machines to complement this new pattern of operation. From this point, it was only a matter of time before consumer demand added hot soups, sandwiches, salads, desserts, fresh brewed coffee and full meals to the list of vended foods.

As we review the broad selection of foods now available, it is not by accident that the trend is toward those food items which have an increased influence upon the public health. This is the normal evolution from refreshment type service toward full menu vending, and it reflects customer demand for this type service (see Figures 1 and 2). Since the large percentage of the American diet consists of foods which are perishable in their prepared state, we can expect food vending to encompass more and more of the perishable items as the industry progresses into "full line vending".

The Food and Beverage vending machine has the potential to be the perfect food establishment. This is one of the advantages of automation. It reduces the "human factor" which is the ever present problem in practically every other food sanitation program. To reach this high level, the vending machine and its supply and servicing must meet certain specific standards of sanitation.

## COMMISSARIES

Commissary operation in many present day vending businesses is limited to the storage and handling of pre-packaged goods. The health factors involved here are the ones normally associated with any food warehousing, namely, the rotation of products, protection against flooding, and safeguarding against vermin infestation.

Many vending operators, as noted earlier, are branching out into the field of food preparation and packing. Whether these operators prepare foods in their own commissaries or purchase fabricated items from restaurants, sandwich shops, and bakeries, the sanitation standards within the preparation and packaging establishment must be equal to those required in restaurant-type operations. Commissaries preparing and packaging goods for use in vending machines are particularly adaptable to sanitary supervision since their function is specific. Employees can approach their commissary duties properly prepared for food handling and can complete the task without the interruption and distractions created by customer service. This is a sanitary aspect of food vending which will be of particular interest to the food sanitarian responsible for training and supervising retail food employees.

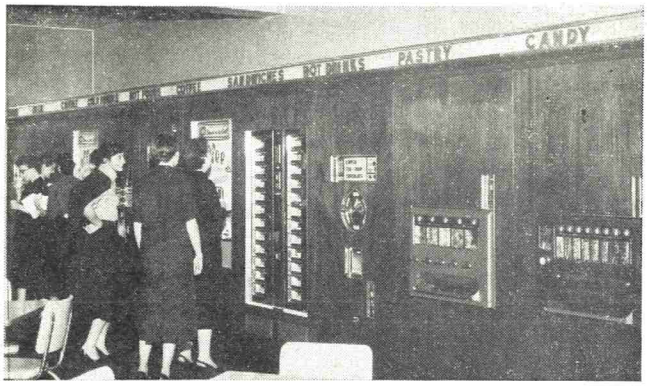


FIGURE 1. One out of every two industrial plants has adopted automatic food vending for employees. Here is a typical "Full-line" feeding facility.

## TRANSPORTATION

Vending routes may be close to the commissary or they may require miles of travel between stops. The perishable product routes are a key factor in maintaining top levels of sanitation. Hot foods in bulk should be transported at 150°F. or above, while cold perishable goods need to be held below 50°F. In larger operations, mechanically refrigerated vehicles are now in use. In smaller ones ice chests or hot food containers perform the required service. An advantage of portable coolers or hot units is that the product or ingredient can be carted right to the machine location with a minimum of holding at dangerous temperatures. This can be a factor in large industrial plants where machines are located in several adjacent areas or buildings which require


FIGURE 2. In some locations automatic food centers are designed with special decor, such as the French outdoor motif shown here.

the serviceman to be away from his truck an hour or longer at a time.

### LOCATION SERVICING

Once the products and ingredients are at the machine location, their continued quality depends on machine filling procedures, machine cleaning, and the function of the machine itself. The loading operation is not particularly significant from the sanitation viewpoint in those machines which vend only prepackaged merchandise. The routine service call here should include interior machine cleaning and wiping in order to maintain a neat appearing unit, and also should include a check for possible vermin infestation. A neat interior, even though the need may be aesthetic, is important to building customer goodwill. Many customers have a chance to see the interior of the machine during the servicing period. The general cleanliness that is evident will influence repeat sales to a marked extent.

The cleaning and filling of bulk or unwrapped food machines is of increased health significance. The routeman must have clean hands if his duties require the handling of unwrapped foods or product contact surfaces. Frequent handwashing is difficult in some areas where vending has its greatest usefulness. Since bulk-type machines are in demand in these locations, it is obvious that the need for handling contact surfaces and ingredients must be reduced to a minimum if the vending operation is to enjoy a high sanitation status. Machine manufacturers have worked toward this objective by making product containers removable for washing, sanitizing, and filling at the commissary. In addition, products and ingredients are being packaged by suppliers in containers which permit on-location bulk loading without manual contact.

In some machines it is not feasible to remove product piping and fittings for cleaning at the commissary. Some post-mix drink machines are an example. In lieu of being removed, fixed pipes and fittings must be cleaned by some other effective method. Cleaning in place (CIP) is the present answer. Cleaning in place requires techniques and equipment especially tailored for the vending machine. Where special appurtenances for CIP are needed, they must be portable and capable of use in machine location areas. CIP is presently being used successfully. However, we may expect that vending machine designers will reduce the product contact surfaces which must be cleaned in this manner.

Another significant operation in machine servicing is the handling and storage of paper cups and containers. Progress has been made in the packaging and labeling of these items so that the user need not contaminate the product by unnecessary handling. Improved machine design has also been important in promoting this objective. Cup tubes in most machines are designed to hold multiples of 50 to correspond with present packaging methods. A cardboard blank is inserted at the factory in the top cup in each carton to keep the user from handling the cup improperly. On the surface, this would appear to satisfy the sanitary demands of utensil handling. However, the machine tube does not always need a full carton of 50 cups and the routeman may have to shuffle odd cups. This illustrates the fact that the advantages of automation and improved utensil packaging still do not eliminate the need for sanitation training of the vending employee to assure the machine owner and the public that his activities of a sanitation nature are carried out in a proper manner.

Thus far the procedures of food vending have been discussed from the source of the product to the loading of the machine. The links in this chain are obviously quite similar to equivalent procedures in other types of retail food service, and the sanitation aspects are much the same. In the vending operation beyond this point most of the similarity ends.

In viewing the aspect of vending sanitation, one of the important considerations is the fact that machines are usually unattended. There may be an employee on duty during peak periods, but he doesn't run the machines, nor is he present 24 hours a day. The vending machine is its own "chief, cook and bottle washer" all rolled into one. It is expected to perform its functions properly at all times. The product must be stored without danger of pollution or spoilage until it is vended. It must be dispensed safely into a clean container with a minimum of splash or spray. When the machine is empty, or operating under improper temperature conditions, it must notify the customer of this fact and reject coins until serviced. Unless it does accomplish these functions, customer acceptance of this type of food and beverage merchandising can be retarded - to the detriment of the industry.

### MACHINE LOCATION

The location of each machine is determined by the operator on the basis of consumer convenience and potential sales volume. To bring the food service facility of vending to those areas of greatest need, it is common for food and beverage machines to be

located in factories, mills, foundries and military posts as well as the more plush surroundings of employee recreation rooms in office buildings and manufacturing plants.

In some of these locations an exposed type food operation could not meet public health demands. Because of the protected nature of vending, food and beverage machines may be safely installed and operated under conditions that would normally be considered adverse. However, vending locations also should be viewed with regard to potential contamination from the environment. Even though it be in the entry way of a boiler-room, the location must be capable of being kept reasonably clean. Overhead sewer piping, for example, could contaminate machine interiors during servicing and must be avoided in selecting locations. The floor area in the vicinity of the machine should be reasonably smooth and washable. The machine should be located with regard to adjacent walls and other equipment so that uncleanable spaces and harborages are not created. Proper operation of most bulk machines requires that a supply of potable water for product use or cleaning be available near the machine. All of these items are important to the selection of machine locations, both from the viewpoint of the health agency and the operator.

## EXTERIOR MACHINE CONSTRUCTION

The construction of the vending machine cabinet is the factor which permits machines to be located in a wide variety of areas. The machine cabinet, in effect, isolates the interior and its contents from the machine environment - forming a compact and protected miniature food service establishment.

Cabinet construction features which are significant begin with a provision for keeping the floor under the machine clean - through elevation, movability, or sealing to the floor. Vermin entry is minimized by the use of door-gasketing, service port grommeting of doors or other closures on vending ports, and screening of ventilation louvers and openings. Gasketing and grommeting materials also serve the useful purpose of excluding dust and moisture and in promoting the efficient operation of the machine.

Although machine location and cabinet construction are important in precluding the entrance of insects and rodents, accidental infestation may still occur. It is then the responsibility of the routeman to apply proper control measures.

## INTERIOR MACHINE CONSTRUCTION

Construction of the machine interior is most important from a sanitary aspect. Many complicated mechanical and electrical units must be fitted into the relatively small interior to provide the means of automation. The first requirement for interior construction is adequate housing for the maximum volume of foods, ingredients and containers needed to make the machine economically profitable. Next, these foods and utensils must have safe storage and in many cases proper temperature controls. It is also necessary to accommodate the various machine components which are required for coin acceptance, product selection, preparation, delivery and disposal of waste materials. These components, of course, vary greatly in their number and space requirements according to the type of machine.

All areas of the machine interior should be constructed for ease of cleaning whether or not they are in direct contact with unwrapped foods. In the non-food contact zones, general cleanability, plus elimination of dust collecting and vermin harborage areas, is sufficient. Food contact surfaces have the same basic construction criteria which are necessary in other types of food and milk equipment. These criteria are specified in the recent publication *"The Vending of Food and Beverages - A Sanitation Ordinance and Code - 1957 Recommendations of the Public Health Service"*.

The unattended feature of most vending machines requires that automatic devices be available to perform duties which in other types of food service are done by on-duty personnel. Hot and cold food vending machines are equipped with automatic devices which note the temperatures and render the machine inoperative when required temperatures are not maintained. Automatic controls are necessary when liquid waste containers are located in the machine interior. These controls prevent overflow by shutting off the machine when waste containers become filled to a certain level.

Controls of a different type are necessary in machines which dispense carbonated beverages by mixing carbon-dioxide, water and various syrups. When these machines are connected to the water supply system they should be provided with suitable safety devices to prevent accidental backflow. These devices may be two check valves, one double check, an air gap, or other device which the health authority considers effective in venting carbon-dioxide to the atmosphere in case of improper operation of the unit. To reduce the possible obstruction of check valves, a removable 100-mesh screen is inserted upstream in the supply line at the time of machine installation.

### RESEARCH ENCOURAGED

The National Automatic Merchandising Association (N.A.M.A.) has made research grants to university agencies and private consultants for several years. Research and mechanical development is also conducted on a continuing basis by manufacturers. Special studies are currently underway on toxic copper compounds and more effective mechanical safety devices. Additional research grants will be made as the food and beverage vending industry explores new avenues of service which may present problems of a public health nature.

### EMPLOYEE HEALTH AND TRAINING

It has been noted that much of the "human factor" is eliminated in automatic merchandising. To the degree that this factor remains, however, the daily health of the vending employee and his knowledge of health and hygiene habits is important in arriving at a high level of sanitation on an industry-wide basis. Many vending personnel have no previous experience in food service operations. They represent a group which will be highly receptive to sanitation since ingrained bad habits have not yet been firmly established. Specific training guides and visual aids must be developed for use by the industry and health agencies when training meetings are held. The present supply of instructional movies developed by machine manufacturers will be supplemented by visual aids produced by the industry trade association, N.A.M.A., and by national or local health agencies. As in other food industries, health supervision and employee sanitation training should be a joint effort of industry and public health people if it is to accomplish its desired goal.

### CONCLUSION

The food and beverage vending industry has a vital interest in the acceptance of uniform sanitary standards on a national basis. Its component groups, machine manufacturers, product suppliers and venders, all operate on an interstate or, at least, an intra-state level. Uniform sanitation requirements as embodied in the Public Health Service Ordinance and Code mean convenience and economy to the industry and better compliance to the health agencies. The industry's national trade association, N.A.M.A., began working with the Public Health Service in the development of the Ordinance and Code several years ago. N.A.M.A. has more recently created a Health-Industry Council to guide the industry in its continuing programs of machine evaluation, education, and research. Outstanding national health organizations are represented on this Council. The health program is designed to keep the industry informed of its obligations to the public health and to provide the know-how for meeting this obligation.

It is fortunate that the sanitary aspects of food and beverage vending have been made the subject of study while the industry is still comparatively young. This will promote a mutual understanding of health and industry practices during the period when adjustments can best be made. An intelligent and cooperative implementation of uniform sanitation standards for the food and beverage vending industry should prove of great value in promoting its future growth and public acceptance.

# THE INFLUENCE OF WATER TEMPERATURE AND HARDNESS ON THE CLEANING OF C-I-P FARM MILK PIPELINES[1]

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**By means of a laboratory model of a C-I-P milk pipeline device, it has been shown that farm C-I-P milk pipelines can be satisfactorily cleaned with the cleaning solution temperature starting in the range of 130-140°F. and cooling to as low as 90°F. during the washing cycle. This was demonstrated with waters of as high as 25 grains per gallon hardness. Satisfactory cleaning is dependant upon the use of an adequate cleaning agent and the periodic use of an acid cleaner.**

Permanent pipelines that can be cleaned in place have been shown to be a very satisfactory way of handling milk on the farm. As with any other type of milk handling equipment, C-I-P milk pipelines must be properly cleaned and sanitized to avoid jeopardizing the quality of milk handled in the lines.

The greatest variations in the recommended procedures for cleaning farm C-I-P milk pipelines are in the temperature of the washing solution. Temperatures ranging from 120°F. to 185°F. have been recommended at different times. In addition to the different temperatures used, considerable variations are encountered in the hardness of the water used in preparing the cleaning and rinsing solutions. It is not uncommon to find water ranging in hardness from less than one grain per gal. to as high as 25 grains per gal. being used for cleaning and rinsing the pipelines on dairy farms in different areas of the country. Since a combination of high temperature and a high degree of water hardness is conducive to water stone deposit in C-I-P lines, these two factors are important in the effective cleaning of C-I-P milk pipelines.

The purpose of this research was to determine the influence of the temperature and the hardness of water used in the washing and rinsing solutions on the effectiveness of cleaning farm C-I-P milk pipelines.

## EXPERIMENTAL PROCEDURES

A device was constructed to simulate a farm C-I-P milk pipeline. This is shown in Figure 1. It consisted of three main parts: (*a*) a stainless steel tank of approximately 25-gal. capacity for holding the milk, sanitizing solution, washing solution, or rinsing solution; (*b*) a pipeline of 1½ in. stainless steel and pyrex glass piping; and (*c*) a centrifugal pump for circulating the milk, sanitizing solution, washing solution, and rinsing solution. The device was so constructed that the milk or appropriate solution could be circulated through the line at any given rate up to approximately 50 gal. per min. In addition, the temperature of the milk or other solutions could be raised by inserting a heating rod in the tank, or lowered by a cold water jacket on the vertical stainless steel section of the pipeline.

The influence of each particular factor was studied by inserting either pyrex or stainless steel plates in the C-I-P pipeline where they were held by a suitable device. The pyrex glass plates averaged 21.6 gm. in weight while the stainless steel plates averaged 14.1 gm. The stainless steel plates had either a dull (#4) or bright (#8) finish. All plates had a surface area of approximately 55 sq. cm. It was assumed that any changes occurring in these plates would also be characteristic of the changes of a similar surface on the interior of the pipeline. Typical plates in their appropriate holder are shown in Figure 2.

## CONTROL WASHING PROCEDURE

All plates were numbered, then appropriately clean-

Prof. Harold E. Calbert has been interested in dairy and food sanitation for a number of years. In addition to a course in Dairy and Food Plant Sanitation, he also teaches courses in Dairy and Food Chemistry, Food Ingredients, and Fluid Milk Processing. His research work has been in the fields of milk and food sanitation, bulk milk handling, and milk product research and development. Dr. Calbert is a Past-President of the Wisconsin Association of Milk and Food Sanitarians.

[1]Presented at the Thirteenth Annual Meeting of the Wisconsin Association of Milk and Food Sanitarians, Elkhart Lake, Wisconsin, September 10, 1957.

ed and weighed. Following this treatment, the plates to be studied were fastened into the proper frame and placed in the horizontal section of the C-I-P pipeline. In this series of control washing treatments all water used for preparing the sanitizing, the washing solutions and also for rinsing was soft water containing less than 1 grain per gal. hardness. The procedure was as follows:

1. The sanitizing solution was made from soft water containing 200 ppm of chlorine. This was circulated through the line for 5 minutes at a temperature of 105-110°F.

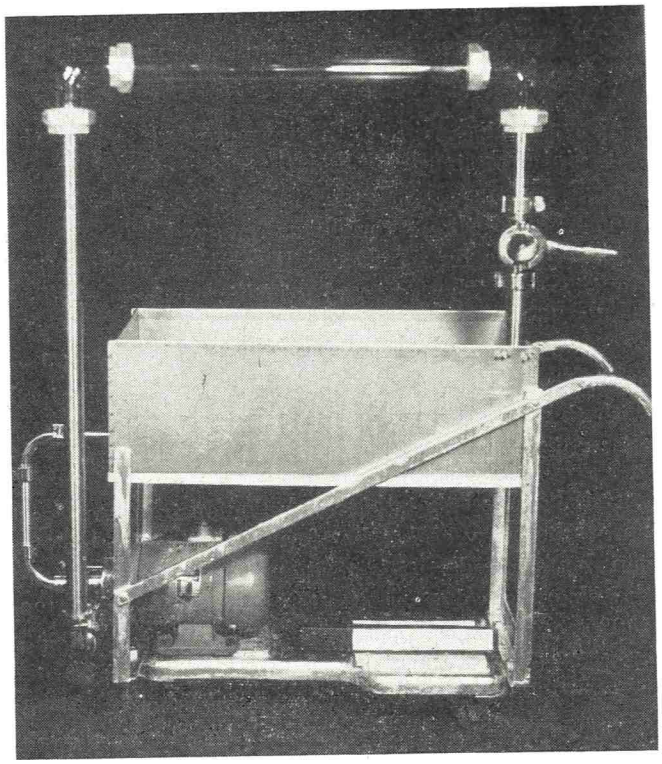

Figure 1. Side view of C-I-P milk pipeline device.

2. The sanitizing solution was drained from the line and then raw milk (90-102°F.) was passed through the line for one hour. The flow of this milk was regulated to simulate the type of flow obtained in pipelines during the milking operation.

3. The line was then rinsed clear with soft water at a temperature of 105°F.

4. The washing solution made from soft water at 160°F. and containing 3.2 oz. of chlorinated trisodium phosphate per 10 gal. was circulated through the line for 20 min. The temperature of the washing solution was maintained during the washing cycle. On every fifth washing 3 oz. per gal. of acid cleaner (combination of organic acids) were substituted for the chlorinated trisodium phosphate.

5. Following the washing cycle, the line was rinsed with soft water at 160°F. for 10 min.

The flow of the sanitizing, washing, and rinsing solutions was at the rate of 35 gal. per min. through the 1½ in. lines. The cycle was then repeated. The plates were subjected to this control treatment for a total of fifteen runs. Following this they were removed, dried, and weighed and any change in weight noted. The concentrations of sanitizer and cleaning agents were based on the manufacturer's directions. This control treatment simulated as closely as possible the accepted and recommended procedures for cleaning farm C-I-P milk pipelines.

### MODIFIED WASHING PROCEDURE

The following washing procedure is typical of the procedures used to determine the influence of temperature and water hardness on the cleaning of C-I-P milk pipelines. In this procedure all the water used in the preparation of the sanitizing, washing and rinsing solutions was a hard water containing 25 grains per gal. hardness. The weighed plates were placed in the proper holder and inserted into the horizontal section of the C-I-P pipeline.

1. The line containing the plates was sanitized with a solution of 200 ppm chlorine in hard water for 5 min. at a temperature of 105-110°F.

2. After the sanitizing solution had been drained from the line, raw milk was circulated through the line for one hour in a manner and at a temperature similar to that described above under control treatment.

3. The line was rinsed clear with hard water at a temperature of 105°F.

4. A washing solution was prepared with hard water at 130-140°F. using 6 oz. of chlorinated trisodium phosphate and 1 oz. of a sequestering agent per

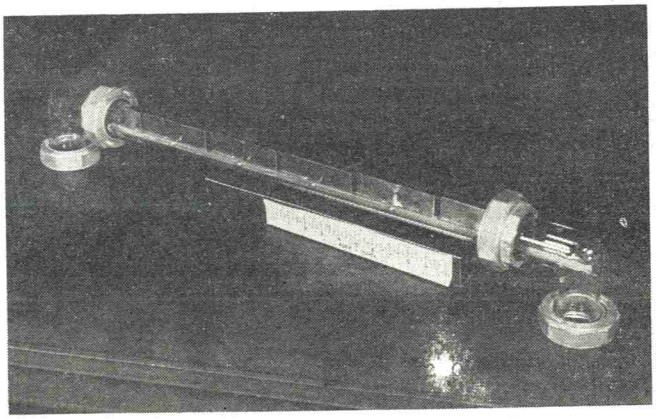

Figure 2. Test plates in holder inserted in horizontal portion of C-I-P milk pipeline.

10 gals. of water. (These were concentrations recommended by the manufacturer.) This solution was circulated through the line for 20 minutes. During the

TABLE 1 — AVERAGE CHANGES IN WEIGHT OF TEST PLATES.

| Type of Plate | Treatment | |
|---|---|---|
| | Control | Modified |
| | (gm) | (gm) |
| Pyrex | −0.00558 | −0.00219 |
| Stainless steel No. 4 | −0.00001 | −0.00025 |
| Stainless steel polished | +0.00033 | +0.00021 |

| Average weights of plates before treatment | |
|---|---|
| Pyrex | 21.64071 gm. |
| Stainless steel No. 4 | 14.19806 gm. |
| Stainless steel polished | 14.16986 gm. |

period of circulation, the temperature of the solution was gradually lowered to 90-105°F. On every fifth run 3 oz. per gal. of acid cleaner (combination of organic acids) was substituted for the chlorinated trisodium phosphate and the sequestering agent.

5. After the washing cycle was completed the line was rinsed with hard water at a temperature of 130°F. for a period of 10 min.

In this modified treatment, the flow rates for the sanitizing, washing, and rinsing solutions were 35 gal. per min. through the 1½ in. pipeline.

The cycle was then repeated. The plates were subjected to this modified treatment for a total of fifteen runs. Following this they were removed, dried, and weighed and any change in weight noted.

## EXPERIMENTAL RESULTS

The average change in weight of the plates as caused by the control and the modified washing treatments is shown in Table 1. All plates appeared clean by visual inspection. The pyrex plates and the dull finished (#4 finish) stainless steel plates lost weight when subjected to either treatment. The highly polished plates exhibited a very slight gain in weight when subjected to either treatment. It must be pointed out that any changes in weight of the plates were of a very small order.

There was no significant difference in the results obtained with either type of stainless steel plate with either treatment. The pyrex plates did not lose quite as much weight when subjected to the modified treatment as when subjected to the control treatment. However, a loss was noted with both treatments.

## DISCUSSION

The cleanliness of a C-I-P milk pipeline is normally judged by visual appearance and by a bacteriological swabbing technique. When a line appears to be free of water stone and milk stone deposit it is considered to be clean. This is based on the assumption that while a line may contain a sterile soil and not impair the quality of the milk that may be handled in the line, it is much preferred that no soil be present to serve as a possible harbor for bacteria. Since it is difficult to measure soil (water stone and milk stone deposits) in a quantitative manner by visual inspection, attempts were made in these experiments to weigh any deposition that might occur within the pipeline.

It was noted with both the pyrex glass and the dull finished stainless steel that loss of weight occurred, and no deposit was formed. In fact, some of the surface of the material was removed. The amount removed was extremely small, and of no practical significance. The removal of this surface was no doubt due in part to both an etching action on the glass and a possible erosive action on the stainless steel. In all instances the cleaning results obtained with the modified procedure were as satisfactory as those obtained with the control procedure.

It is believed that this work demonstrates, at least on a laboratory scale, that farm C-I-P milk pipelines can be cleaned satisfactorily with temperatures of the cleaning solutions starting in the range of 130-140°F. and cooling to as low as 90°F. This was demostrated in waters with a hardness as high as 25 grains per gal. Satisfactory cleaning would be based, of course, on the use of an adequate cleaning agent and the periodic use of an acid cleaner. Conditions such as this may be common on dairy farms. With the proper cleaning agents, and a washing solution starting temperature in the range of 130-140°F. no harm should be encountered if this solution temperature drops to 90°F. during the washing cycle. Apparently the need for any type of an auxiliary heater to maintain the temperaturue of the washing solution at or near 130-140°F. is not indicated. It has been the personal experience of the author that many farm C-I-P milk pipelines have been satisfactorily cleaned by essentially the same treatment as has been described as the modified cleaning procedure in this paper.

Currently, work is being continued using various types of cleaning agents and procedures to determine the variations that might be acceptable for satisfactory cleaning of farm C-I-P milk pipelines.

# THE RELATIONSHIP OF THE WHITESIDE TEST ON BULK HERD MILK AND THE INCIDENCE OF MASTITIS IN THE HERD[1]

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**The results of 26 farm visits and several hundred Whiteside tests on bulk herd milk indicate that there is a relationship between the Whiteside reaction of bulk herd milk and the incidence of mastitis in the herd. Mastitis was detected by use of the strip cup on milk from each quarter of the udder.**

Although all do not agree on the proper methods of controlling mastitis in dairy cattle, all dealing with mastitis agree that it is a most serious problem. This belief is so universal that it is unnecessary here to document it or to approximate economic losses, which certainly are great.

The direct economic loss to the farmer from decreases in production and loss of animals is not the only effect of mastitis. It is very probable that abnormal milk from mastitic cows is mixed with normal milk and sold from the farms. Such a practice can only result in lowering the quality of milk and dairy products.

The public health is also involved. Although most milk borne infections are caused by contamination of milk after it is drawn from the udder, some have been traced to udder infections (*7*). However, this is not the only threat to public health. At the present time there are many antibiotic preparations which a farmer may buy for infusing into mastitic quarters. The milk drawn from quarters infused with such preparations will contain appreciable quantities of antibiotics for at least 72 hours (*16*). Studies have shown that antibiotics, especially penicillin, can be found in fluid milk supplies (*2,16*). Presence of an antibiotic in milk may cause sensitization of a consumer which could possibly result in severe reactions if the antibiotic was later administered by a physician. Other investigators have isolated antibiotic resistant strains of possibly pathogenic organisms from cheese which they suggest is the result of the presence of antibiotics in the raw milk (*15*). Schipper (*14*) and Doan (*4*) have discussed these problems more fully in recent papers dealing with indiscriminate use of antibiotics.

[1]Published with approval of the Director, North Dakota Agricultural Experiment Station.

Christian Jensen received the Ph.D. in Dairy Bacteriology from Iowa State College in 1940. Since 1926 he has been associated with the North Dakota Agricultural College and the North Dakota Agricultural Experiment Station. He is currently Professor of Dairy Technology, Dairy Technologist and Chairman of the Department of Dairy Husbandry.

A quick, reliable, and simple test devised to detect the practice of mixing mastitic with normal milk would provide dairy plants and sanitarians with a basis for a program of controlling such practices. The use of the Whiteside test has been suggested for this purpose (*6,7,11,12*). Petersen and Schipper (*12*) examined the milk from 24 herds and found that 19 of them exhibited a strongly positive reaction to the Whiteside test performed on bulk milk. Only one of the 19 did not show mastitis in the herd when checked by the strip cup method. Based on these observations it was decided to investigate further the use of the Whiteside test for detecting the mixing of mastitic milk with normal milk.

## Procedure

Samples from milk delivered to creameries were taken intermittently over a perior from December, 1955, through August, 1956. A total of 1825 samples

TABLE 1 — INCIDENCE OF MASTITIS IN HERDS AND THE WHITESIDE REACTIONS OF BULK SAMPLES TAKEN THE DAY OF THE FARM VISIT

| Whiteside reaction | No. of herds | Total No. of cows | No. of herds in which mastitis occurred | No. of qtrs. showing mastitis[a] | | |
|---|---|---|---|---|---|---|
| | | | | Very mild | Mild | Acute |
| — | 4 | 119 | 2 | 3 | 0 | 0 |
| ∓ | 6 | 124 | 4 | 4 | 2 | 0 |
| + | 5 | 150 | 5 | 8 | 4 | 1 |
| ++ | 0 | — | — | — | — | — |
| +++ | 2 | 32 | 2 | 4 | 1 | 0 |
| Totals | 17 | 425 | 13 | 17 | 7 | 1 |

[a]Based on abnormal milk detected by strip cup.

from approximately 440 herds were taken. The modified Whiteside test of Murphy and Hansen (*10*) *was* performed on each sample. The test consists of mixing 5 drops of milk with 1 drop of *N* sodium hydroxide solution. The mixing is done on a glass plate placed on a black background. After approximately 30 seconds the test is read. If no precipitate forms the test is negative. A thick viscid mass is classified as 4+. If a thick viscid mass forms which later breaks up into large particles of precipitate, the test is classified 3+. A 2+ reaction shows smaller particles than a 3+, and when the precipitate is composed of small particles dispersed throughout the mixture the test is classified 1+.

Bacterial counts were also made on 331 of the samples by the plate count method.

Visits were made to 26 of the producers from which the previously mentioned samples originated. The producers were selected on the basis of willingness to cooperate, geographical location, and results of previous Whiteside tests. At the time of visits an appraisal of the environmental conditions and milking practices were made, as well as strip cup examinations of the milk from each quarter. Clinical mastitis was classified as follows:

*Very mild* — slightly abnormal secretion exhibiting small quantities of clots.

*Mild* — abnormal secretion exhibiting various amounts of clots, with probable swelling and heat in the infected quarters.

*Acute mastitis* — Abnormal secretion exhibiting various amounts of clots and/or serosanguineous, purulent or watery secretions. In addition, infected quarters exhibiting one or all of the cardinal symptoms of inflamation, with body temperature above normal.

Seventeen of the farm visits were made at milking time and the Whiteside test was performed on the bulk milk from that same milking. Visits were made to nine producers whose bulk milk had been checked by a series of Whiteside tests performed between December 20, 1955 and the first week in February, 1956. These nine visits were made during the last week in January, 1956; Whiteside tests were not carried out on the milk produced the same day as the farm visit.

## RESULTS AND DISCUSSION

Table 1 shows a summary of the 17 farm visits when strip cup tests of individual quarters were made along with the Whiteside test on bulk milk from the same milking. An inspection of Table 1 shows that as the Whiteside reaction changed from negative to 3+, the incidence and severity of mastitis increased. Similar results occurred when the information from a farm visit was compared to a series of Whiteside tests made before and after the farm visitation. A summary of this work in Table 2, shows that in herds where the series of Whiteside tests were predominantly negative or doubtful, there occurred only few very mild cases of mastitis as shown by the strip cup. In the three herds which exhibited predominantly positive reactions, there was a much higher incidence of acute mastitis as shown by the strip cup test.

Table 3 shows the relationship of the Whiteside test and bacterial counts of 331 bulk milk samples.

TABLE 2 — INCIDENCE OF MASTITIS IN A HERD AND WHITESIDE REACTION OF A SERIES OF BULK SAMPLES TAKEN BEFORE AND AFTER FARM VISIT

| Herd No. | No. of cows | Whiteside reaction[a] of several samples of herd milk | | | | | No. of quarters[b] with mastitis | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (—) | (∓) | (+) | (++) | (+++) | Very mild | Mild | Acute |
| 259 | 12 | 7 | — | 1 | — | — | 0 | 0 | 0 |
| 599 | 18 | 4 | 4 | 1 | — | — | 1 | 0 | 0 |
| 411 | 18 | 1 | 1 | 4 | 2 | 1 | 0 | 0 | 8 |
| 31 | 16 | 1 | — | 2 | 3 | 1 | 1 | 2 | 4 |
| 2 | 11 | 5 | 2 | 2 | — | — | 0 | 0 | 0 |
| 500 | 9 | 8 | — | 1 | — | — | 1 | 0 | 0 |
| 400 | 23 | 4 | 3 | 1 | — | — | 2 | 0 | 0 |
| 417 | 21 | 3 | 1 | 3 | — | 2 | 1 | 0 | 6 |
| 558 | 20 | 5 | 2 | 3 | — | — | 2 | 0 | 0 |
| Totals 9 | 148 | | | | | | | | |

[a]Samples for Whiteside tests were collected over a period of approximately 7 weeks, and farm visits to perform strip cup tests were made during later part of 7 week period.

[b]Based on abnormal milk detected by strip cup.

TABLE 3 — SUMMARY OF RELATIONSHIP OF WHITESIDE TEST AND BACTERIAL COUNTS OF BULK MILK

| Whiteside | (−) | (∓) | (+) | (++) | (+++) |
|---|---|---|---|---|---|
| Av. bacterial count per ml. | 160,000 | 170,000 | 300,000 | 220,000 | 380,000 |
| Range | 4,000 – 7,500,000 | 5,000 – 1,400,000 | 5,000 – 4,400,000 | 5,000 – 2,000,000 | 16,000 – 1,600,000 |
| No. samples in each group | 123 | 65 | 96 | 25 | 22 |
| No. of samples too numerous to count at dilutions used | 7 | 2 | 9 | | |

There is a gradual increase in bacterial counts as the Whiteside test changes from negative to 3+. However, the range of values in each category is similar. This can probably best be interpreted as meaning that there is a general relationship between overall management and bacterial counts, and also a general relationship between overall management and Whiteside reaction (or mastitis, assuming positive Whiteside tests indicate mastitis). The relationship of the Whiteside test to bacterial counts of bulk milk at the receiving station is more likely to be indirect rather than direct. There is also a wide range of bacterial counts for milks showing any one Whiteside reaction.

The relationship of acute mastitis to bacterial count in milk delivered to the dairy plant was observed in nine cases. Plate counts were made from samples collected at the receiving station on two or three days near the date of the farm visit for strip cup tests. Counts from two of the three herds showing acute mastitis were below average, and in the third herd the counts were only slightly above the average for this study. (Not shown in Table 3). Such factors as contamination from utensils and improper cooling probably contribute far more to total bacterial counts than the initial count of milk as drawn from the udder. Swab tests also were made on teat cups of milking machines and other utensils, but there appeared to be no relationship between contamination of these objects and acute mastitis.

Of the 1825 samples on which Whiteside tests were performed, 612 (33.5%) were negative, 309 (16.9%) were doubtful, 624 (34.2%) were 1+, 131 (7.2%) were 2+, 47 (2.1%) were 3+, and 2 were 4+.

It has been shown that the presence of leucocytes in milk are largely responsible for the Whiteside reaction (*5,13*). The leucocyte content of normal milk varies greatly between cows and from day to day within the same cow (*1,3,8*). Colostrum contains very large numbers of leucocytes and occasionally very high counts are observed in late lactation, although the leucocyte count is usually normal by the third week after parturition (*1,8*). No satisfactory explanation has been given for all the variations in leucocyte count. A high leucocyte count may be associated with bacterial infection of the udder (*3,7,9*). MacLeod *et al.* (*9*) estimates that 78% of the variation of leucocyte counts in herd milk can be explained by the amount of mastitis in the herd. If this is true it is reasonable to suspect that when herd milk is consistently very high in leucocyte count, mastitis is a problem in that herd.

## SUMMARY AND CONCLUSIONS

The Whiteside test is a rapid and simple test for detecting high leucocyte counts in milk. It requires no special equipment and any technician can learn to perform it. Routine checks of herd milk can be made by dairy plant operators or sanitarians. From evidence obtained in this study it would appear that bulk milk which consistently shows strongly positive Whiteside reactions can be suspected of coming from herds where mastitis is a problem. The authors feel that control of mastitis is mainly a management problem on the farm. When problem herds have been identified it should be possible for quality control fieldmen or sanitarians to work with these herds in an attempt to improve milking practices and general management. In this manner it should be possible to decrease the incidence of mastitis, which will decrease the losses to the farmer, and also improve quality of milk and dairy products.

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# NEWS AND EVENTS

## REPORT OF EXECUTIVE SECRETARY AND MANAGING EDITOR OF JOURNAL OF MILK AND FOOD TECHNOLOGY

In many respects this has been a very successful year, in spite of the fact that our expenses exceeded our income for the first time in six years. This was largley due to the expense of the Seattle meeting and it was anticipated. The continuing rise in costs has been a contributing factor to the difficulty of maintaining a balanced budget with some held for the contingency fund reserve. I believe we will be able to get back to operating in the black this fiscal year, as our income is already $3,000.00 greater than at this same time last year.

The Seattle meeting was a good one and well worth what it cost. The Washington Association did a splendid job and I feel sure the west coast members feel a much closer relationship with the Association. I am sure that the eastern members present, profited by their contact with the west coast members. Paul Corash and I had the great pleasure of going on to Los Angeles for the California meeting afterwards. This was an excellent meeting and our only regret was that since we had been away so long, we felt it necessary to cut our visit short.

In Dickinson, N. Dakota, I enjoyed an exceptionally fine meeting with the sanitarians of that state. I am proud to announce that the North Dakota Association of Sanitarians was organized after this meeting and has affiliated with the International. May I take this opportunity to welcome North Dakota and hope that you will all make a point of getting acquainted with the representatives present. Also, please do everything possible to help our newest affiliate.

Some of the other meetings attended were the Dairy Industries Exposition; APHA annual meeting in Atlantic City; Florida Association meeting at Gainesville; National Conference on Interstate Milk Shipments in Memphis; the South Carolina meeting at Myrtle Beach; the Texas meeting at Houston; Klenzade Seminar and Interim Executive Board Meeting, Washington, D.C.; 3-A Sanitary Standards meeting at Excelsior Springs, Missouri, and Bethesda, Maryland; and my own Indiana Association meeting. Several trips have also been to New Albany and Louisville preparing for this meeting.

Some accomplishments of special note are the publication of the "Procedure for the Investigation of Foodborne Disease Outbreaks" which has had a tremendous acceptance. We had 5000 copies printed and have already sold 3000. Also, our new Association pamphlet for membership promotion was developed largely through the cooperation of Tom Jones, Chairman of our Committee on Publicity, and Past President Dick Adams.

Our membership continues to increase and we still have great potential. The Journal circulation averaged over 5400 copies per month during this past year which includes subscribers as well as members.

Distribution of 3-A Sanitary Standards has shown a constant increase from year to year. Personnel in many foreign countries are now ordering these standards.

We are constantly studying the Journal in an attempt to improve it. One effort which is being made is to add to our milk and food coverage that of general sanitation since an increasing number of general sanitarians are becoming members. Also, the search for good articles, particularly useful to sanitarians in the field, is constantly going on. We need your help with these problems and timely news or projects carried out by affiliates are always welcome.

More and more members write me for more and more things. We are always happy to help each and every member whenever and wherever we can. It is good to know you feel our headquarters is a place to go for service.

For the good of the organization I feel that I would be remiss if I did not again point out to you that we are reaching a time when our organization must take concrete steps to provide an assistant who could possibly become a full time Editor of the Journal and learn the ever increasing functions and duties inherent in so large and important an organization. If we are to continue to maintain and improve our service to the membership, as well as maintain our service to the cause of sanitation in the world, such a step is absolutely necessary. I do not see how this can be done without a raise in dues. We have gone a long way on dues which have not been increased since January, 1951, even though we have increased Journal issues from six to twelve. Our dues are the lowest in this country for an organization of the size and the scope of ours. Costs such as postal increases already made and more anticipated, publication cost increases, etc., are reaching the point

where it is not possible even with the most efficient management, to operate on a safe margin.

We are succeeding in making ours a proud and noble profession. I cannot believe anyone worthy of the name sanitarian would object to a couple of dollars annual dues increase for the purpose of maintaining and continuing to improve our position.

Again, it has been a great pleasure and privilege to serve you for another year.

H. L. Thomasson
*Executive Secretary and Managing Editor*

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## FINANCIAL REPORT — 1957
## INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC.

For the last fiscal year ending July 15, 1957 the International Association of Milk and Food Sanitarians had a total gross income of $40,027.26. This includes all forms of income derived primarily from membership dues from over four thousand members and advertising and reprint income from the Journal of Milk and Food Technology with a circulation over five thousand issues monthly.

All financial transactions are handled in the office of the Executive Secretary and Managing Editor, Mr. H. L. Thomasson, in the main office of the Association in Shelbyville, Indiana. All receipts are deposited in a General Fund from which withdrawals can be made only upon co-signature of the Executive Secretary and the Secretary-Treasurer. Withdrawals are made to an Operating Fund maintained at a level of about ten thousand dollars.

The firm of Robert E. Eck, Certified Public Accountant, of Shelbyville, Indiana, is retained to maintain accounting of all finances of the Association. Their services consist of monthly audits, quarterly reports to the Executive Board, and an annual complete audit and report. The Executive Board has carefully and thoroughly reviewed the annual report and has found the finances of the Association in proper order.

The Balance Sheet shows the present financial condition of the Association.

### BALANCE SHEET

#### ASSETS

| | |
|---|---|
| *Current Assets* | |
| Cash in operating and general funds | $ 8,534.47 |
| Accounts receivable, general and special award | 2,813.36 |
| Savings Account (Building and Loan) | 2,126.20 |
| U. S. Bonds and interest | 1,983.30 |
| Inventory of Supplies | 2,492.45 |
| Prepaid Expenses and insurance | 103.93 |
| Total Current Assets | $18,053.71 |
| *Fixed Assets* | |
| Office, addressing and mailing equipment, at cost, less accumulated depreciation | $ 2,621.09 |
| *TOTAL ASSETS* | $20,674.80 |

#### LIABILITIES AND RESERVES

| | |
|---|---|
| *Current Liabilities* | |
| Accounts payable | $ 2,388.67 |
| Accrued salaries and bonus | 84.00 |
| Payroll Taxes withheld from employees | 709.65 |
| Reserve for Special Award | 1,200.00 |
| Reserve for Scholarship Grants | 149.75 |
| Total current Liabilities | $ 4,532.07 |
| *Reserve for Contingencies* | $16,142.73 |
| *TOTAL LIABILITIES AND RESERVES* | $20,674.80 |

The ratio of Total Current Assets to the Total Current Liabilities is 4.0. A ratio of 2.0 usually is considered satisfactory.

Since the Association agrees to render certain services for a definite future period (such as sending Journals to members who have paid in advance), this deferred income liability should be recognized, which is estimated at $7,500.

The net reduction in Reserve for Contingencies for the year was $2,078.73. This reduction, or net operating loss for the year, is approximately five per cent of the gross income. The main items contributing to the deficit were high travel costs to the Seattle, Washington meeting and also the general increases in the printing cost and distribution of the Journal. The Executive Board already has taken necessary corrective measures. With careful management the over-all financial operation of the Association should remain in balance the current year.

To add a personal comment, I have enjoyed serving the Association for the past six years as Secretary-Treasurer. While it is no longer possible for me to give the time required of an officer of the Association, it is my intention however, to continue active membership in this important organization.

My best wishes go to my successor and the newly elected officers; to the present and former members of the Executive Board with whom I have been privileged to serve; to the Editors; to the Committee chairmen and committeemen; to all the members of the Association; and of course to Red Thomasson, genial and capable Executive Secretary. All of these have made my work with the Association most enjoyable and an experience I shall never forget.

H. H. WILKOWSKE,
Retiring Secretary-Treasurer

## NOMINATIONS NOW OPEN FOR 1958 SANITARIANS AWARD

Announcement is made that nominations will be accepted for the annual Sanitarians Award until May 15, 1958 and members of the International Association of Milk and Food Sanitarians, Inc., are requested to give consideration to the nomination of individuals whose professional work in the field of milk and food sanitation in their communities has been outstanding.

The Award consists of a Certificate of Citation and $1,000 in cash, and is sponsored jointly by the Diversey Corporation, Klenzade Products, Inc., Oakite Products, Inc., Pennsylvania Salt Manufacturing Company, and the Olin Mathieson Chemical Corporation. It is administered by the International Association of Milk and Food Sanitarians, Inc., and is presented annually. The next presentation will be made at the 45th annual meeting of the Association which is to be held at New York City in September 1958. The Sanitarians Award was initiated in 1952, and was presented in 1957 to Mr. Harold J. Barnum, Chief, Milk Program, Denver, Colorado, Department of Health and Hospitals.

The Executive Board of the Association has established the following rules and procedures governing the Sanitarians Award.

*Eligibility*

The rules concerning eligibility of candidates for nomination are:

(1) Any living citizen of the United States or Canada who, at the time of nomination, is employed as a professional milk and food sanitarian, or both, by a county or municipality, is eligible for the Award, except members of the Executive Board and members of the Committee on Recognition and Awards of the International Association of Milk and Food Sanitarians, Inc. Employees of State or Federal agencies and of industry are not eligible for the Award. Membership in the International Association of Milk and Food Sanitarians, Inc., is not a prerequisite of eligibility, and there are no restrictions as to race, sex, or age.

(2) A candidate shall have made a meritorious contribution in the field of milk and food sanitation to the public health and welfare of a county or municipality within the United States or Canada.

(3) The achievements and contributions on which the Award is to be based, must have been completed during the five-year period immediately preceding January 1 of the year during which the Award is to be made. Under special circumstances, consideration will be given to related work accomplished by the candidate during the seven-year period preceding January 1 of the year during which the Award is to be made. Under this rule, the principal work to be considered for the 1958 Award must have been performed during the period January 1, 1953 to January 1, 1958, and the related work during the period January 1, 1951 to January 1, 1958.

(4) Co-workers are eligible for nomination if both have contributed equally to the work upon which the nomination is based.

(5) No person who has once received the Award shall be eligible for nomination.

*Nominations*

Nominations of candidates for the Sanitarians Award may be submitted by the Affiliate Associations of the IAMFS, or by any member of the Association in good standing except members of the Executive Board, members of the Committee on Recognition and Awards, and employees of the sponsoring companies. Nominations from persons who are not members of the Association cannot be accepted. No member or Affiliate may nominate more than one candidate in any given year.

Each nomination must be accompanied by factual information concerning the candidate, a resume of his work and achievements, evidence supporting his achievements and if, available, reprints of publications. A form for the submission of nominations may be obtained upon request from Harold S. Adams, Indiana University Medical Center, 1100 West Michigan Street, Indianapolis, Indiana, or H. L. Thomasson, Executive Secretary, International Association of Milk and Food Sanitarians, Inc., P. O. Box 437, Shelbyville, Indiana.

*Deadline for Submission of Nominations*

The deadline for submission of nominations is May 15, 1958, and all nominations and supporting evidence must be postmarked prior to midnight of that date.

*Selection of the Recipient*

The Committee on Recognition and Awards of the International Association of Milk and Food Sanitarians, Inc., has full responsibility for selecting from among the candidates nominated the recipient of the Sanitarians Award. In judging the contributions of each candidate, the Committee will give special consideration to (a) originality of thought, mode of planning, and techniques employed, (b) the comprehensive nature of the candidate's achievements, and (c) their relative value as they affect the health and welfare of the candidate's community. The Committee will give consideration also to the efforts of the candidate to establish professional recognition in the community in which he serves, as well as to his research, administrative development, program operation and educational achievements. Additional information or verification of submitted information will be requested when considered necessary by the Committee. *Testimonal letters in behalf of a candidate are not desired.*

If, after reviewing the nominations and supporting evidence, the Committee should decide that the work and achievenments of none of the candidates have been significantly outstanding, the Award shall not be made. In this connection, it is fundamental that if meritorious professional achivement cannot be discerned the Award shall be omitted for a year rather than to lower the standards for selections of a recipient.

The 1958 Committee on Recognition and Awards consists of H. S. Adams, Chairman, Indianapolis, Indiana, G. C. Leonard, Charleston, South Carolina, Richard Parry, Warwick, Rhode Island, Paul Corash, New York City, James M. Doughty, Jr., Austin, Texas and Richard Mansfield, Clinton, Tennessee.

## IAMFS MEMBER OF ADVISORY COUNCIL TO KEEP AMERICA BEAUTIFUL, INC.

Keep America Beautiful, Inc., is a national public service organization for the prevention of litter. It is devoted to the preservation and improvement of America's scenic beauty — both rural and urban — and conducts a continuous program of public education to stimulate individual responsibility and pride in clean, safe, healthful and attractive surroundings. International, along with a large number of other societies and organizations is a member of the advisory council.

The need for Keep America Beautiful program has been quite well documented through recent releases from this organization and some of the facts set forth are quite revealing.

They point out that many Americans have felt no *personal* responsibility for the appearance of our public areas. They have had no feeling of guilt when tossing trash on the roadsides, streets, parks and other recreational spots — and simply have not realized the staggering amount of litter left in their wake nor considered the cost and effort required to remove it. The net result is that litter has become a national problem. Not only does it mar natural and scenic beauty of our country but costs huge sums for its removal and disposal The following facts point up some important aspects of the problem.

Over 50 million tax dollars are spent each year just to remove litter from our primary highways alone not to mention countless additional millions spent cleaning up parks, beaches, streams, city streets and other public areas.

Between 750 and 1,000 Americans are needlessly killed and nearly 100,000 injured each year as a result of cars striving to avoid hitting objects thoughtlessly thrown on our highways.

Rubbish and litter add to the fire hazard. In 1955, rubbish and litter started 18,500 fires in Chicago and the total cost of litter caused fires throughout the country was more than 70 million dollars.

The U. S. Forest Service budgeted, in 1957, three million dollars just to clean up litter from our national forests.

Litter can become a menace to public health. It creates a harborage and breeding place for insects and rodents. Litter and trash thrown into our streams and water courses makes swimming hazardous and unsafe, and spoils such places for recreational purposes.

The Keep America Beautiful is based on a four point plan for litter prevention:

1. Public education to cultivate individual responsibility, civic pride and good citizenship habits.
2. Participation in public interest projects for cleaner, safer and more attractive surroundings.
3. Adequate collection and disposal facilities.
4. Adoption and proper enforcement of state and local legislation to penalize willful offenders.

A nation wide public opinion poll completed recently by the Gallup organization, indicates that the American people from coast to coast are "fed up" with littering and want something done about it. Eighty six percent stated that litterbugs should be fined to the full extent of the law.

## RESEARCH ON ANTIBIOTICS IN MILK CHECKS REACTION AGAINST CONSUMPTION

Recently, milk consumers in a large population area in Central New York were startled to read in their newspapers, headline stories obtained from statements of a local official that their milk supplies were contaminated with pencillin likely to cause allergic reaction in humans. As a result, milk consumption in this area, overnight, dropped drastically.

However, later newspaper accounts based on research conducted at Cornell University since 1950 reassured consumers that there was little cause for alarm, and largely for this reason the consumption trend was reversed. Dr. Frank Kosikowski, of the Cornell staff, in charge of research investigations of antibiotic residues in milk following mastitis therapy of the cow, was able to supply the factual material showing that the amount of antibiotics in milk in the area was low and presented no immediate danger to consumers. Dr. Kosikowski showed, from extensive surveys on New York State milk, that the incidence of antibiotics in milk apparently has not changed materially over the past five years. It is simply that more and more people are becoming aware of their potential presence.

A problem does exist, however, in the complete cradication of milks containing antibiotics even though

in small quantities. They are adulterated milks and if no check is made, levels might increase. The responsibility for this problem rests equally with the milk producer, dairy plant operator and the public health official. The farmer can help by withholding all milk from treated animals for at least 72 hours. The milk plant operator and public health official can contribute by periodically checking milk supplies for the presence of antibiotics. Adequate tests are available and if used would eliminate many penicillin-contaminated milks before these entered public consuming channels.

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## VINCENT T. FOLEY

Vincent T. Foley of the Kansas City Health Department was elected to the office of Secretary-Treasurer at the 44th annual meeting at Louisville, Kentucky. Vince attended Baker University and Iowa University. During World War II he served in the Armed Forces from 1942 to 1946. He joined the Kansas City Department in 1946. He is Second Vice President of the Missouri Association of Milk and Food Sanitarians and a member of the Mid-Continental Association of Food and Drug Officials. His hobbies include sports and presently he is captain of the Mayor's Bowling Team in the City Hall League which at present is in number 1 place. He is also active in dog training and exhibiting and is past chairman of the Board of Directors of the German Shepherd Dog Club of Kansas City. He is presently acting chief of the Food Division of the Department of Health. Vince has long been an active member of the Missouri affiliate and is currently Chairman of International's Committee on Bakery Equipment Standards.

## MINUTES OF EXECUTIVE BOARD MEETINGS INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. ANNUAL MEETING, LOUISVILLE, KENTUCKY, OCT. 5-10, 1957

1. President Paul Corash called the meeting to order at 9:30 A.M. October 6, 1957 in the Brown Hotel, Louisville, Kentucky. The various sessions continued during the next several days. All members were present.

2. The agenda prepared by the President was approved and the subsequent discussions followed the proposed agenda.

3. A discussion took place regarding a suggestion that had been made to establish some type of continuing nominating committee. It was the concensus of the Executive Board to continue the present procedure, which had been successful in the past and which insured a completely open and fair election. (Note: This discussion took place prior to the action by the general assembly to initiate steps to change the Constitution and By-Laws to permit earlier appointment of the Nominating Committee).

4. The Executive Board discussed the employment contract of the Executive Secretary. It was noted the present contract expires July 15, 1959 so it was pointed out that this item should be placed on the agenda for the spring 1958 interim Board meeting.

5. The Auditor's report and financial status of the Association was considered. It was noted the past year was operated at a net loss of about two thousand dollars. However it was pointed out that several items represented delayed expense from last year. Payment of some advertising commissions, the scholarship funds and social security expenses had been delayed for payment during the past year, the total of all these items being about $1,500. When these were taken into account the net loss for the year was only about $500. In further study of the current financial picture it appeared that the present fiscal operation should be in the black about two or three thousands dollars. Greater income is anticipated for 1957 as compared to the same period last year.

6. The pricing of reprints was reviewed. It was shown that the present prices permit a break-even operation. It was decided not to increase cost of reprints at this time.

7. It was pointed out the Secretary-Treasurer is supposed to be bonded in accordance with the Constitution. It was further suggested that perhaps this matter can be handled differently when the contract for the Executive Secretary is renewed.

8. The question was raised as to whether the Association should carry insurance covering libel and

slander. It was decided not to alter the present policy wherein such protection is not carried.

9. Regarding public liability insurance on non-owned property, it was recommended that the Executive Secretary increase considerably the public liability on such policies. Also, he was directed to determine the extra cost on added protection on auto liability and increase it considerably.

10. Also discussed was the matter of workman's compensation and employees liability. The Executive Secretary was directed to determine a suitable policy and costs for coverage. The Executive Board will then approve by mail ballot if the costs are reasonable for the protection obtained.

11. The matter of deferred liability of the Association was discussed. It was pointed out that the accountant estimated this at $7,500, which is for Journal subscriptions paid for in advance. It was pointed out this should be recognized as a liability, but in actual practice may be more realistically estimated at about three thousand dollars.

12. After discussion it was unanimously agreed to recommend the nomination of Dr. J. H. Shrader as first Honorary Member of the Association.

13. Regarding the registration fee for the current meeting, it was pointed out that the sum of $4.00 had already been agreed upon by Mr. Thomasson and the local arrangements committee.

14. The new Food Outbreaks bulletin was discussed. Several avenues of approach were suggested for greater advertising of the pamphlet. Mr. Thomasson is to send additional news releases to Journals, libraries, abstract services, World Health Organization, health departments and schools of medicine.

15. A discussion took place regarding the publication of the 3-A standard on HTST testing procedures. The discussion concerned the possibility of publication in sections in the Journal during a period of several months. This appeared to be too costly because of the voluminous size of this particular standard. It was agreed this matter should be further discussed by Ivan Parkin and H. L. Thomasson with the Executive Committee of the 3-A Sanitary Standards Committee. This discussion was to determine acceptability of a plan to publish an abstract in the Journal and announce that the standard would be available at a nominal price.

16. Harold Adams made a report of the Sanitarians Joint Council Meeting which is composed of representatives of NAS, APHA, and IAMFS. This Council has been established to explore common areas of interest to all Sanitarians. Mr. Adams has been elected chairman pro-tem, and another meeting is scheduled for November in Cleveland. Thus far the Council has agreed that all actions should have unanimous agreement of the three groups represented and that such agreements must have final endorsement by the respective Associations. Up to this point, the interest of the Joint Council has been with respect to development of a definition of a Sanitarian, the promotion of Registration and a model Registration Law.

17. A discussion ensued concerning the Food Equipment Committee and the NSF connection with its special devices testing. It was further pointed out that definite proposals to NSF to resolve this matter have been made and the matter now is pending.

18. James McCafferey extended an invitation from the Illinois Association to meet in Chicago at the Morrison Hotel in 1960. Pennsylvania apparently also was considering extending an invitation, according to Ivan Parkin. After discussion it was agreed that Pennsylvania should resubmit a more formal invitation for 1961 and the Chicago location be accepted for 1960. The meeting to be held during the three days prior to the Dairy Show. (Note: The following locations have also been selected, New York City, 1958 and Glennwood Springs, Colorado in 1959.)

19. H. L. Thomasson proposed a budget which was approved after a few changes and which will also be presented to the Council. The proposed budget anticipated operation in the black with a safety margin of two or three thousand dollars.

20. Franklin Barber reported on plans for the next annual meeting to be held in New York City at the Hotel New Yorker. This meeting will be held in conjunction with the New York Association and Cornell Dairy Conference. If possible some separate and concurrent sessions on milk and food will be scheduled. One night will be left open to provide for opportunity to visit local attractions. Numerous other details were discussed which indicated that an outstanding program is being arranged. The registration fee will be determined when additional information is available concerning anticipated convention costs.

21. The Executive Board met with the Local Arrangements Committee to review final details concerned with the meeting such as, banquets, luncheons, tours and program. The group had done an excellent job of organizing the meeting in advance which insured an outstanding convention.

22. After reading a letter from Dr. Ken Weckel, who was unable to attend this meeting for the first time in 18 years, due to a conflict of meeting with the National Research Council, the Executive Board discussed the long-range policies concerning the membership of the Association and the direction of emphasis in service, editorial policies and articles. It was agreed that the President appoint a Committee to make a study of the various Associations in fields related to our own regarding size, scope, etc., and

make recommendations for long-range policies of this Association.

23. Dr. J. C. Olson, Jr., Associate Editor reviewed the problems concerned with publishing a technically correct Journal. He pointed out the number of papers is increasing and the quality is greatly improved.

24. The Executive Board met with associate editors, C. K. Johns, Luther Black, C. A. Abele, Fred Baselt and C. G. Leonard, and Dr. Olson continued his report of Journal activities. He reported that during the past year there had been published 45 manuscripts, 13 committee reports and 8 affiliate programs. Excellent cooperation of the Associate Editors was obtained in reviewing papers. Arrangements have been made to have summaries of disease outbreaks appear in our Journal. The question was again raised regarding the printing of all affiliate Association lists of officers each month. The matter was discussed but no action was taken since it appeared that reasons in favor outweighed those against continuation of the practice. To improve the News and Events part of the Journal, it was suggested the Executive Secretary, with Harold Adams assisting, investigate the matter of hiring an assistant, perhaps a student from the University of Indiana Journalism Department to help in improving this section of the Journal. It was clearly pointed out that improvement of quality will cost additional money and it is the responsibility of the Executive Board to decide where to draw the line on quality vs. expenditures.

25. The Executive Board met with Harold Wainess representing the Membership Committee of which he is Chairman. In the discussion it was pointed out that as the committee proceeds to contact potential members they should work with, or keep informed the local affiliate association secretaries insofar as possible. The present program of the Membership Committee is to get new members by obtaining lists from Health Departments and Departments of Agriculture, which should be obtained from the secretary, or president in that order, followed by direct action from the Membership Committee and Executive Secretary's office if local cooperation is not forthcoming. It was proposed that promotion take the form of three contact mailings using broachures and letters prepared with the aid of the Publicity Committee. The Executive Board approved the mailing to about 1,000 potential members to determine response.

26. Mr. Thomasson gave a report of his activities as Executive-Secretary and Managing Editor. His report was accepted and he was directed to publish it for the information of the entire membership.

27. At a final session, the new President, Harold Robinson, pointed out that appointments would be made at a later date for representation on the 3-A Symbol Council. He asked the concurrence of the Board in reappointing both Dr. Weckel and Mr. Abele. This was given.

28. The Executive Secretary was instructed to send out more membership brochures to local affiliate secretaries and work with them on recruiting additional membership.

29. President Robinson appointed Paul Corash to work with the newly elected Secretary-Treasurer, Vincent Foley, on reviewing the proposed Constitution and By-Laws change recommendations and submiting them to the membership by the procedures prescribed in the Constitution and By-Laws.

30. The President further asked for suggestions regarding committee chairmen.

31. There being no further business, the Executive Board adjourned at 5:30 P.M. October 10, 1957.

H. H. Wilkowske, Secretary-Treasurer

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## C-I-P MILKER PIPELINES AND TEMPERATURE OF CLEANING SOLUTIONS

The reader's special attention is directed to a paper in this issue by Dr. Harold E. Calbert, University of Wisconsin, entitled, *The Influence of Water Temperature and Hardness on the Cleaning of C-I-P Farm Milk Pipelines.*

Dr. Calbert has presented some very timely and useful information. C-I-P is relatively new in the milk production field and the more light that can be shed on this cleaning method, the better. His paper quite concisely answers the question which has been in the minds of a number of milk sanitarians about the temperature of detergent solutions. If the initial solution is, for example, 140° F. does this temperature need to be maintained throughout the wash cycle? The research done by the author indicates that a normal drop in temperature does not adversely effect cleaning effeciency and that, "C-I-P milk pipelines can be cleaned satisfactorily with temperatures of the cleaning solution starting in the range, 130-140°F and cooling as low as 90° F." To carry the point a step further, good results were demonstrated in waters with a hardness of 25 grains per gallon, or, over 425 ppm hardness when washing was done with a chlorinated detergent.

These results would indicate that the use of auxillary line heaters to maintain the washing solution temperature at 130°-140°F. are unnecessary.

Doubtless other research studies of this nature will be carried out but until such time as there appear data to the contrary, it would seem ill advised for milk control agencies to demand extra equipment and

expense on the part of the milk producer until there is demonstrable evidence that; (*a.*) pipelines are cleaner, or, (*b.*) sanitary milk quality is improved.

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## ORDINANCE AND CODE FOR FOOD SERVICE SANITATION UNDER GOING STUDY

A fifteen man committee representing state and local health departments, health officers and sanitarian associations, state and municipal public health engineers, the food, beverage and hotel industry and educational institutions, is working jointly with the U.S. Public Health Service to produce an extensive revision of the current ordinance and code: "Regulating Eating and Drinking Establishments." The document now under study was published in 1943 and is widely used by state and local regulating agencies.

The Committee has been divided into sub-committees, each with the task of developing new material and new approaches to the many problems associated with the food and beverage serving industry. A substantial amount of material has already been assembled representing new viewpoints and new concepts to cover advances in technology and operating methods.

The Committee held its first meeting in Washington, November 1956, at which time a general outline was developed and selected study assignments made. A second meeting is scheduled for early 1958 when further progress will be made on a preliminary working draft.

It is anticipated that the new edition of the ordinance and code will contain much more explanatory matter than the current edition. It is the intention of the Committee to give particular attention to those factors of greatest public health importance and to de-emphasize items which have less significance to food and beverage safety.

No firm date for release of the new ordinance and code has yet been established. The voluminous amount of material submitted by state and local health authorities and by the Committee itself will require a great amount of time for review and evaluation. It is expected that progress will be made in 1958 pointing toward possible publication in 1959.

The following are the Committee members and the Organizations they represent:

*Representative of National Health Organizations**

| | |
|---|---|
| Dr. Mack I. Shanholtz<br>Commissioner of Health for Virginia<br>Richmond, Virginia | Association of State and Territorial Health Officers |
| J. Robert Cameron<br>Denver Dept. of Health and Hospitals<br>Denver, Colorado | Conference of Municipal Public Health Engineers |
| A. H. Fletcher<br>New Jersey State Dept. of Health<br>Trenton, New Jersey | Conference of State Sanitary Engineers |
| John Fritz<br>District Health Department<br>Washington, D. C. | International Association of Milk and Food Sanitarians |
| A. Harry Bliss<br>School of Public Health<br>University of California<br>Los Angeles, California | National Association of Sanitarians |
| S. A. Coleman<br>American Hotel Association<br>50 Church Street<br>New York, New York | American Hotel Association |
| James J. Donovan,<br>National President<br>National Licensed Beverage Association<br>Cincinnati, Ohio | National Licensed Beverage Association |
| Cyril L. Kegler,<br>Director and Chairman<br>Committee on Public Health<br>National Restaurant Association<br>Cedar Rapids, Iowa | National Restaurant Association |
| Armin Kusswurm<br>National Restaurant Association<br>Chicago 3, Illinois | National Restaurant Association |

*Representatives from State and Local Agencies***

| | |
|---|---|
| John Andrews<br>North Carolina State Board of Health<br>Raleigh, North Carolina | State Health Department |
| H. J. Dunsmore<br>Pittsburgh Department of Health<br>Pittsburgh, Pennsylvania | City Health Department |
| W. V. Hickey<br>Paper Cup & Container Institute<br>New York City, N. Y. | (Initially appointed from Salt Lake City Health Dept.) |
| C. L. Senn<br>Los Angeles Health Department<br>Los Angeles, California | City Health Department |

*Representatives from Universities***

| | |
|---|---|
| H. S. Adams<br>Indiana University Medical Center<br>Indianapolis, Indiana | Educational Institution |

*Nominated by the respective organizations

**Nominated by the Bureau of State Services

Dr. W. L. Mallmann — Educational Institution
Michigan State University
East Lansing, Michigan

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## PAPERS PRESENTED AT AFFILIATE ASSOCIATION MEETINGS

**Editorial Note: The following listing of subjects presented at meetings of Affiliate Association is provided as a service to the Association membership. Anyone who desires information on any subject is encouraged to write to the Secretary of the Affiliate Association concerned for the address of the speaker. Information desired then may be requestd from the speaker (a copy of the paper presented may be available for the asking).**

### CALIFORNIA ASSOCIATION OF DAIRY AND MILK SANITARIANS

Mr. E. L. Samsel, *Sec.-Treas.*, San Jose City Health Department.

*Inhibitory Substances in Milk.* Calvin L. Strucker
*Let's Revaluate Our Tests for Quality and Safety Control for Dairy Products.* Dr. E. B. Collins
*Dairy Inspection from a Dairyman's Viewpoint.* Herman Grabow
*Reminiscences of a Dairy Inspector.* H. C. Eriksen
*I Think Dairy Inspection Services Should.* James Conaghan
*Operating Characteristics of Plate Heat Exchangers.* Dr. Walter Dunkley
*Let's Talk About Sediment Control.* M. L. Herndon
*Welded Pipelines; Installation and Cleaning.* James E. Ward
*Epidemiology of Food Poisoning.* Richard Dill
*Gathering Evidence and Its Effective Presentation.* Arlo Smith
*Let's Discuss Separators, Clarifiers and Vacuum Treatment.* Paul E. Teal
*Point of Origin and Terminal Inspection.* Colonel Richard G. Yule
*In-Place Cleaning of Tanks, Tankers and Lines.* Panel Discussion led by Walt Wilson P. J. Dolan
*New Legislation and Old Questions.* O. A. Ghiggoile
*Your Dairy Industry Advisory Board.* W. B. Woodburn
*Brucellosis Program Up to Date.* Dr. Chostain
*What Every Dairy Inspector Should Know About Veterinary Medicine.* Dr. John B. Enright
*New Ideas in Dairy Building Construction.* C. F. Kelly
*The Bureau of Milk Control Program.* Don A. Weinland

### KANSAS ASSOCIATION OF MILK SANITARIANS

(28th Annual Meeting November 6, 7, 8, 1957)

Mr. F. L. Kelly, *Sec.-Treas.*, State Board of Health, Topeka, Kansas.

*Sanitation.* V. D. Foltz
*Automation in the Food Industry.* Bernard L. Durben
*New Insecticides.* Richard Lyness
*Chemical Properties of Water Supplies in Kansas.* Russel Culp
*Atomic Contamination in Food.* Ray McClure
*Frozen Desserts.* Jim Newton
*Detection of Mastitis by Strainer Pads.* Murphy Courtney
*Obtaining Milk Samples for the Milk Ring Test. Vaccination for Mastitis.* Louis Smith
*Plastics in Plants.* Milton Held
*Pipeline Installations on the Farm.* Irving Schlafman
*Present Status of Photophase Tests. Sterilized Cream, Cream and Milk.* Dr. Blaine Glendenning
*Swab Tests and Shipping Samples.* Dick Ripper

### VIRGINIA ASSOCIATION OF MILK AND FOOD SANITARIANS

(Twelfth Annual Conference November 14-15, 1957)

Mr. J. Farrar Pace, *Sec.-Treas.*

*Dairy Farm Sewage Disposal.* J. W. Robertson
*Insect and Rodent Control in Milk and Food Establishments.* R. E. Dorer
*Farm Bulk Milk Holding and Cooling Tank and Pick-up Tanker Regulations.* Dr. J. A. Hailman
*Better Relations Through Coordinated Cooperative Effort.* T. Edward Temple
*Safe Food Service.* Panel Discussion, H. E. Henderson Moderator
*Proper Approach to an Effective Food Inspection Program.* Lee Everett
*Methods and Application of an Effective Cleaning Progarm in Food Establishments.* Robert B. Traweek
*Approved Methods of Sanitization of Eating Utensils in all Types of Food Establishments.* Joseph Fishel
*Problems Association with Food Supply Sources.* James W. Smith
*Food and Drink Vending Devices: Public Health Service Code; Its Intserpretation and Application.* James A. Westbrook
*Recognition of Vending Machines and Equipment on Display.* M. K. Cook
*Food Establishment Equipment Standards.* James W. Smith
*Food Poisoning Studies in Virginia.* Joseph W. Moschler
*Use and Mis-use of Antibiotics in Milk and Food Products.* Dr. S. L. Kalison
*Current Trends in Cleaning and Bactericidal Treatment Procedure.* C. A. Abele
*Chemical Developments in Fly and Insect Control.* Bayard F. Bjornson

### RHODE ISLAND ASSOCIATION OF DAIRY AND FOOD SANITARIANS

(November 6, 1957)

Dr. Richard M. Parry, *Sec.-Treas.*, 158 Greenwich Ave., Warwich, R I.

*The Chemistry of Cleaning Food Equipment.* Bernard J. Scheib
*Importance of Bacterialogical Control for High Quality Foods.* Robert Jensen
*Nutritional Value of Milk.* Dr. William L. Leet

### WISCONSIN ASSOCIATION OF MILK AND FOOD SANITARIANS

(Thirteenth Annual Meeting September 10, 11, 1957)

Mr. L. Wayne Brown, *Sec.-Treas.*, 421 Chemistry Bldg., Univ. of Wisc., Madison 6, Wisc.

*The Wisconsin Association of Sanitarians.* Rod Kalling
*The Work of the 3-A Symbol Council.* C. A. Abele
*Recent Research in C.I.P.* Dr. H. E. Calbert
*Is Your Moose Call in Tune?* William H. Fagerstrom
*Our Changing Agriculture and Its Effect on Sanitarians.* Walter H. Ebling
*Legislation Affecting the Dairy and Food Industries.* William KasaKaitas
*Making Field Inspections on C.I.P. Farms.* James Meany
*Various Methods of Cleaning Milking Machines.* Dr. J. C. Flake
*The U.S.D.A. Inspection Program.* Harold K. Linden
*Automative Cleaning in the Dairy Industry.* Robert K. McGinn
*Checking Bottle Milk and Farm Milk Samples for Antibiotics.* Robert M. Keown

*Typical Causes of Foodborne Ourbreaks.* Dr. W. L. Loving
*The Green Bay Meat Inspection Standards and Procedures.* Karl Mohr
*Inspection and Control Problems in Itinerant Food Operations (Fairs, Carnivals, etc.* M. A. Deaver and Kenneth K. Thiede
*New and Potential Reservoirs of Foodborne Infections.* L. C. Peckham

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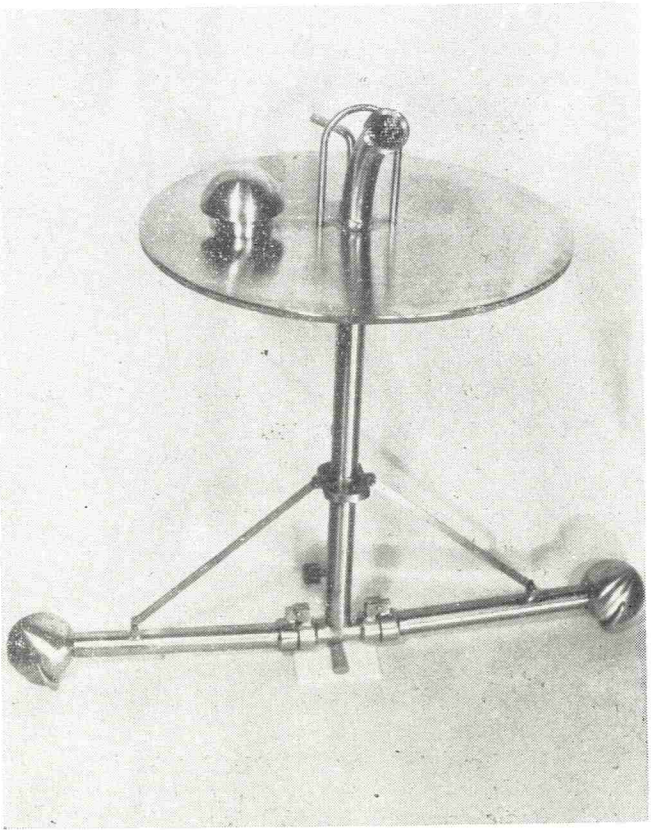
## PICK-UP TANK WASHER DEVELOPED BY KLENZADE

The new Klenzade Automation Bulk Pick-Up Tank Washer is the result of considerable engineering and development work and performance testing under actual field conditions. The company has perfected a simplified spray ball unit with collapsible arm, (see illustration) that will clean tankers up to 20 feet in length. The unit is made of stainless steel with sanitary construction throughout, light in weight and easily handled. A wide rubber gasket is provided under the cover plate and recessed gaskets on the distributing arm. The removable cap of each ball is drilled to assure proper coverage of all interior surfaces. A locking handle holds the balls in position, extended or folded. The entire unit weighs less than 35 lbs. Illustrated folder is available from, "Klenzade Automation Cleaning Systems", Klenzade Products, Inc., Beloit, Wisconsin.



Klenzade Automation Bulk Pick Up Tank Washer

## HELPFUL INFORMATION

**Editorial Note: Listed below are sources of information on a variety of subjects. Requests for any of the material listed should be sent by letter or postcard to the source indicated.**

*General Background of Sanitation Problems.* Free bulletin available from Klenzade Products, Inc., Beloit, Wisc.

*Food Poisoning.* A book by G. M. Dack. 3rd edition, 251 pages. University of Chicago Press, Chicago, Ill. Price $6.00.

*Control of Psychrophylic Bacteria in Farm Milk Supplies.* Free circular available from The Diversey Corp., 1820 Roscoe St., Chicago 13, Ill.

*How to Make Rinsing Easier.* Free folder available from Oakite Products Co., Dept. JMFT, New York, N.Y.

*Livestock Pest Book and Methods of Pest Control.* Free booklet available from California Spray Chemical Corp., Richmond, Calif.

*Mexican Bean Beetle and Its Control.* Bulletin. Revised 1956. Cat. No. A 1.9:1624/6. Available from Supt. of Documents, Washington, D. C. Price 10 cents.

*A Study of Plastic Pipe for Potable Water Supplies.* 90 page bulletin. By W. D. Tiedeman and N. A. Milone. Available from National Sanitation Foundation, School of Public Health, U. of Mich., Ann Arbor, Mich. Price $1.00.

*Good Bye, Mr. Roach.* 16mm. sound and color movie on roach development, habitat and control. 10 minutes. Available from Velsicol Chemical Corp., Dept. JMFT, 330 E. Grand Ave., Chicago 11, Ill.

*General Features of Algal Growth in Sewage Oxidation Ponds.* Paper by M. B. Allen. 46 pages. 1956. Available from State Printing Division, Documents Section, Sacremento 14, Calif. Price 75 cents.

*The Determination of Toxic Substances in Air.* Paper by N. Strafford, C. R. N. Strouts and W. V. Stubbings describes methods for determining 49 toxic substances in the atmospheres of industrial plants. xxvii & 226 pages. Available from W. Heffer & Sons, Ltd., Cambridge, England. 1956 35/-

*Control of Off-Flavors in Pasteurized Milk, and Slime in Cottage Cheese, Due to Psychrophilic Bacteria.* Free Bulletin. Available from Diversey Corp., 1820 Roscoe St., Chicago 13, Ill.

*Instrument - Webb and Gilbert HTST Tests Kit.* Circular available from Wisner Mfg. Co., 122 Hudson St., New York, N.Y.

*Selecting a Program for Butterfat Sampling.* Circular No. 11, Farmer Cooperative Service, U.S. Dept. of Agric., Washington 25, D.C.

*Oakite Coordinated Sanitation Program.* Free booklet available from Oakite Products, Inc., 30 Rector St., New York 6, N.Y.

*Know Your Packaging Materials.* Series No. 46. Available from American Management Assoc., 1515 Broadway, New York 36, N.Y. 123 pages. $1.25.

*Dairy Cattle and Milk Production.* Book by C. H. Eckles and E. L. Anthony. 5th Ed. 587 pages. MacMillan Co., New York, N.Y.

*Pen and Stanchion Barns.* Agric, Expt. Sta. Bulletin No. 483. Univ. of Mass, Amherst, Mass. Free

*Farm to Plant Bulk and Can Milk Hauling Costs.* Free Service Report No. 18. J. M. Cowden, Farmer Cooperative Service, U.S. Dept. of Agric., Washington 25, D.C.

*The Hungry Horde.* 16mm color movie of a Grain Sanitation Battle with Insects. Available from Douglas Chemical Co., 620 E. 16th Ave., No. Kansas City, Mo.

*Domestic Flies and Their Control.* Bulletin Available from Dept. of Health, Education, and Welfare, Washington 25, D.C.

*Vitamin Fortification Procedures and Vitmain Utilization.* Free regular mailing of newsletters. Write Dept. JMFY, Vitex Laboratories, Harrison, N.J.

*Studies on Separation of Weevil Infested from Noninfested Wheat by Flotation.* Available from Agric. Marketing Service, U.S. Dept. of Agric., Market Research Div., Washington, D.C.

*Al-Dhubab (The Fly).* 16 mm color film. 15 minutes. Available from Arabian-American Oil Co., Dept. JMFT, 505 Park Ave., New York, N.Y.

*Food Consumption of Households in the United States.* Bulletin. Available from Supt. of Documents, Washington, D.C. 196 pages. 1956-1957. Price $1.25.

*Basic Course in Emergency Mass Feeding.* Pocket Manual. 1957. Available from Supt. of Documents, Washington, D.C. Price 55 cents.

*Radiation Sterilization of Foods.* Bulletin of testimony given at hearings before subcommittee on Research and Development of Joint Committee on Atomic Energy. Available from Supt. of Documents, Washington, D.C. 1955. Price 20 cents.

## UP-TO-DATE MILK PLANT MANUAL NOW AVAILABLE FROM MIF

The "Manual for Milk Plant Operators", has just been revised by the Milk Industry Foundation and was made available on September 15th of this year. This second edition has been brought completely up to date, describing many modern techniques of milk plant operations.

This practical guide was planned and written as a reference book for the milk plant operator and as a textbook for college students and trainees in the industry. It is the combined work of many technical specialists of the dairy industry, each an authority on his phase of the industry.

Published by the Milk Industry Foundation and written especially for those engaged in the fluid milk industry, the handsomely-bound book contains 700 pages of informative facts, illustrations, and statistical tables on all phases of the operation of modern milk plants.

Operating milk plants efficiently and maintaining high quality products are stressed in the how-to-do-it and why manual. There are seven general divisions of the book. They are: Physical Aspects of the Plant, Utilities, Equipment, Laboratory Fundamentals, Processing and Quality Control, Housekeeping, Cleaning, and Maintenance, and Personnel.

Cost of the manual to MIF members is $8.00 each, while non-members may purchase the book for $10.40, FOB, Washington, D. C.

Orders may be placed with the Milk Industry Foundation, 1145-19th St., N.W., Washington 6, D.C.

## SUPPLEMENT TO POULTRY PLANT SANITATION PUBLISHED

An eighty-page supplement to Poultry Plant Sanitation has just been published by the Institute of American Poultry Industries, according to A. J. Steffen, chairman of the Sanitation Committee of the Institute's Research Council.

"This first supplement," said Mr. Steffen, "is a working handbook for sanitarians and poultry plant workers. It covers sanitation programs for both poultry and egg processing plants."

In addition to covering basics of a sanitation program - - built-in sanitation, training programs, detergents, sanitizers, insecticides, rodenticides - - the booklet gives detailed cleaning procedures for plants.

"Sound sanitation does three things for a processing operation, all highly essential if efficiency and sales are to be maintained at profitable levels," the Institute said.

"It extends the shelf life of products by eliminating factors which make them deteriorate in quality. This means less spoilage, lower marketing costs. It creates higher consumer acceptance for products, enhancing sales appeal and value. And sound sanitation builds better morale among employees by providing more desirable working conditions for them."

The supplement is available at $1.25 each from the Institute of American Poultry Industries, 59 East Madison, Chicago 2, Illinois.

## TRAINING COURSES OFFERED BY PUBLIC HEALTH SERVICE

Eleven training courses in radiological health, air pollution, water pollution and food sanitation have been scheduled for January, February, and March, 1958 at the Robert A. Taft Sanitary Engineering Center in Cincinnati. The Sanitary Engineering Center is the prime environmental research laboratory of the U.S. Public Health Service.

The training courses, part of a continuing program, cover not only basic education in the environmental engineering field, but also advanced work in specialized subjects.

The first quarter schedule and a brief summary of each course follow:

*Basic Radiological Health,* Jan. 13-24 for engineers, scientists, and others with responsibility in the radiological health field, designed to provide the basic

terminology, theory, and methods pertinent to environmental and occupational health. About half of the time will be devoted to laboratory work with the remainder for lectures and demonstrations.

*Environmental Health Aspects of Nuclear Reactior Operations,* Jan. 27-31, for personnel having responsibilities for environmental health and safety off-site from nuclear reactors, fuel processing plants or related reactor operations. Major topics will include principles of reactor operation, disposition of radioactive wastes, site selection, safety, monitoring, and administration.

*Detection and Control of Radioactive Pollutants in Air,* Feb. 17-21, to familiarize engineers, scientists and others engaged in air pollution control activities with current and potential public health problems as regards air-borne radioactive contaminants. Air monitoring methods are stressed.

*Detection and Control of Radioactive Pollutants in Water,* Feb. 24-28, to familiarize water supply and water pollution control personnel with existing and potential problems associated with radioactive contamination of water supplies and to provide laboratory practice with the instruments and techniques most commonly used in the radioassay of water. Major emphasis is placed on monitoring.

*Sanitary Engineering Aspects of Nuclear Energy,* March 17-28, for sanitary engineers generally, to acquaint them with the hazards and uses of ionizing radiation and with water supply and waste problems associated with the nuclear energy industry. Approximately a third of the program will be laboratory exercises and demonstrations. Time will be allowed during lecture periods for discussion of specific problems.

*Atmospheric Sample Analysis,* Jan. 13-24, for chemists and other scientists with air pollution control responsibilities. Laboratory analysis of particulate and gaseous samples is covered in discussion and exercise. Instruments for analysis of samples are explained and used.

*Air Pollution Effects on Vegetation,* March 10-12, for scientists, engineers, and others involved in assessment of the effects of air pollution on vegetation. The problems relative to sampling a plant population and the interpretation of data will be stressed. Characteristic plant damage caused by specific pollutants also will be studied.

*Microbiological and Chemical Examination of Milk* and Dairy Products, Feb. 3-7, for professional personnel with a wide background in sanitary bacteriology who are responsible for milk analyses and dairy products examination at state or local level. The course includes laboratory experiments in special procedures employed in detecting bacterial groups or species of special signifigance in the control of milk quality.

*Laboratory Methods for Prevention and Control of Food-Borne Disease,* Feb. 10-14, presenting advanced technical information of special interest to laboratory and supervisory personnel concerned with examination of foods for bacterological or chemical contaminants. Emphasis will be given to the methods, standards, and operating procedures applicable to a food sanitation program. The relation of the laboratory to inspection, grading, and licensing of food establishments will be included in the study.

*New Techniques in the Bacteriological Examination of Water,* Jan. 27-31, for professional bacteriologists and others with a wide background in sanitary bacteriology who are in responsible positions in state, municipal and other laboratories engaged in water analysis. Subjects include discussion and laboratory demonstration and evaluation of the membrane filter technique of water examination, as well as examination of water for the coliform group and the enterococcus group by fermentation methods.

*Advanced Training for Sanitary Engineers in Water Supply and Water Pollution,* March 3-14, for sanitary engineers and others with a wide background in water quality management. The course includes study of the organization and operation of water pollution and industry waste surveys. The bacteriological chemical and biological phases of sanitary engineering problems are integrated with the engineering aspects. The administration of stream pollution abatement programs and the interpretation of data are discussed. Opportunity is provided for presentation and discussion of local problems.

Admission of qualified individuals to all courses is governed largely by priority of application. No tuition fee is charged. Application should be sent to Chief, Training, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

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## MICHIGAN STATE TO HOLD ENGINEERING CONFERENCE

The Sixth Annual National Dairy Engineering Conference will be held February 25-26, 1958 at Kellogg Center, Michigan State University, East Lansing, Michigan. The Departments of Agricultural Engineering and Dairy are to be co-sponsors of the Conference. Further information may be obtained by writing to either of the above departments.

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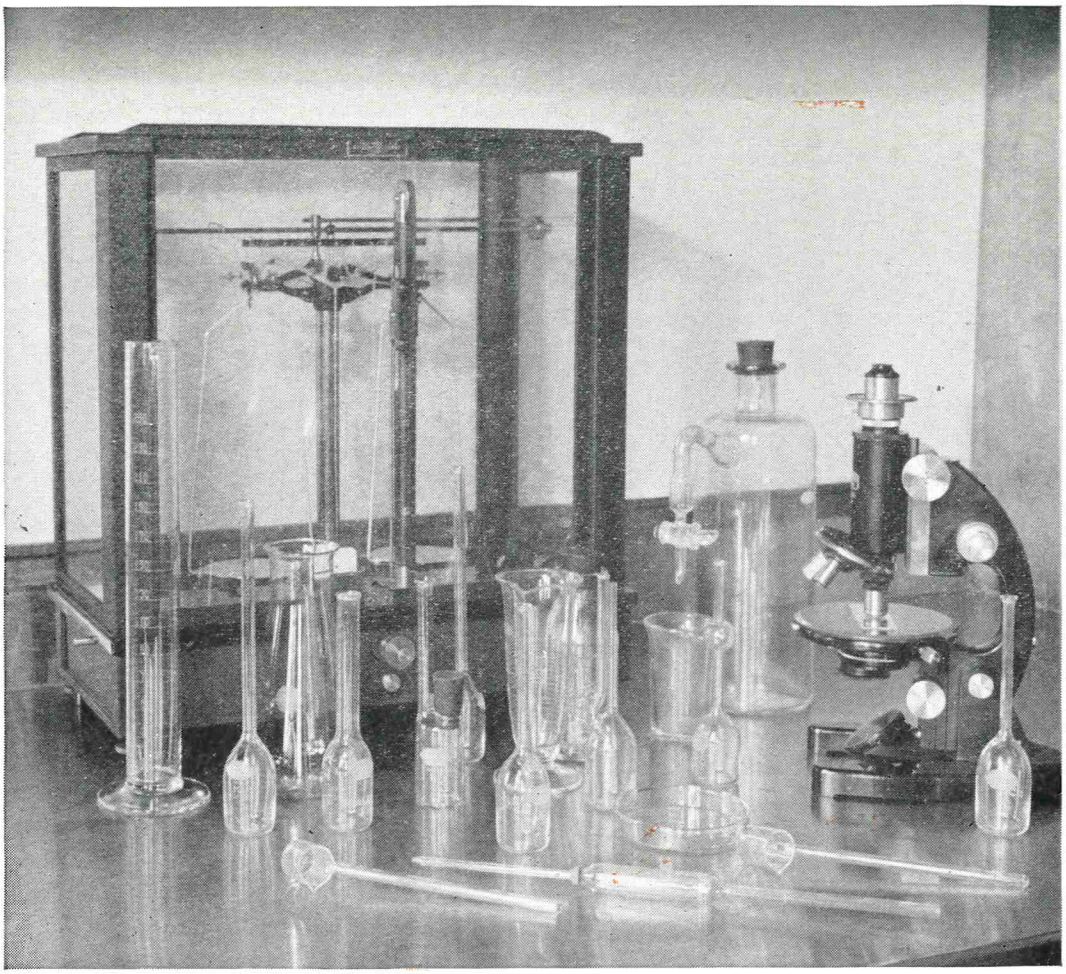

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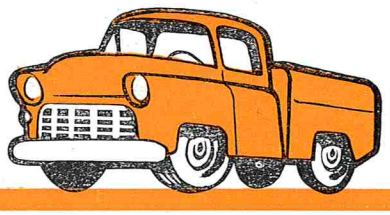

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