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Survey of environmental sanitation at Imperial, Nebraska

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SURVEY OF ENVIRONMENTAL SANITATION AT IMPERIAL, NEBRASKA

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INTRODUCTION

Most discussions of environmental sanitation relate to large cities, and environmental sanitation in small towns has not been discussed much. And any studies in small towns in Nebraska that have been done are very limited.

In view of this, and of the fact that one day I plan to practice medicine in some small town and should be a leader in matters of community health, it seemed desirable to make a survey of environmental sanitation in the community in which I served my preceptorship, Imperial, Nebraska.

Imperial, Nebraska is located about 360 miles west of Omaha on U.S. highway No. 6. It has a population of 1,423 and there are 524 families.

RESTAURANT SANITATION

There are three restaurants operating in Imperial, Nebraska. Dr. Smith[1] of Imperial reports that the three owners are conscientious individuals and that there has been no known or detected difficulty from lack of sanitation. The State Director of Restaurant Inspection, Mr. Flagg,[2] said that there have been no cases of food poisoning from that section of the state for twenty years. This likely impossible situation means then that reporting of disease is poor or disease isn't being diagnosed. There is no way to guess how many people simply feel below par for a few days now and then because they ingested an extra quota of organisms at their favorite eating place. A review of the State Communicable Disease records revealed that five cases of Shigellosis were reported from Chase County (of which Imperial is a part) in 1959.[3] Shigellosis is usually but not always transmitted by food.

Personal inspection revealed that the windows and sidewalks were clean. On one inspected, the outer door was screened and self-closing to prevent the entrance of flies. The floor was constructed of wood

and a few unsealed cracks could be seen. The walls and ceiling were made of a smooth, light-colored material and were clean, but an odor of grease could be detected. The toilet opened directly off the kitchen and was only moderately clean. Soap was provided, along with hot and cold running water and sanitary towels. The counters and tables were free of dust. Dishes were washed by machine and the water temperature was 170 degrees F., as suggested by the United States Public Health Service.[4] The dishes were dried with drying cloths that were clean and used for no other purpose. The utensils were stored in a clean dry drawer. Wastes and garbage were kept in separate suitable receptacles and were not a nuisance. Kitchen working space seemed cramped but food was kept either hot or cold after preparation before serving. Food and drink on display were protected by glass. Perishable food and drink was kept in a refrigator at a temp-ature below 50 degrees F., as suggested by the United States Public Health Service.[5] Food was stored both on the floor and on shelves. Occasionally one would see a cracked coffee cup in use and sometimes the silverware was picked up other than by the handles. The most striking breach of sanitary

procedure noted, however, was the constant and repeated practice of waitresses picking up glasses by putting their fingers in the top and thus directly spreading organisms from customer to customer. Food handlers were not smoking, and their uniforms were clean. No rodents were noted and the presence of any was denied by the owners. All fluid milk served was Grade A from Roberts Dairy in Lincoln, Nebraska. No animals were on the premises.

Physical exams are not required for prospective employees, but this is not considered to be worthwhile because of the rapid turn-over of employees and the high cost to find the few who would be unfit for employment.[1] Neither are Chest X-Rays required before employment, but this would be more logical and probably should be made a routine condition of employment.

Periodical inspection of these food-handling establishments is an activity of the State. In Nebraska, restaurants are under a licensing system, and the smaller communities throughout the State, such as Imperial, that do not have an organized health department, are inspected and regulated by the Department of Agriculture, not the Department of Health.[6] According to the State Director of Inspection, Mr. Flagg,[2]

Imperial restaurants are checked only about twice per year. Less sanitary restaurants are inspected more often. Restaurants are not rated by the state but rather are either licensed and approved or are closed through court action.

While it is true that laws are necessary to help regulate sanitation in restaurants, they in and of themselves will not and cannot rectify shortcomings of the industry. Education is much more important. In Imperial, there is no good means of educating either the public to the value of good sanitation or is there means of educating restaurant owners themselves or their employees. Most food-handlers have had no education about health matters and many are of low economic status. Also, it is not unusual for an individual with no particular skill or trade who cannot find employment elsewhere to be employed by the food industry for some small task that involves food handling. It is therefore, extremely important to impart information to food-handlers regarding health and sanitation. This education can come from health inspectors and sanitarians, movies, and lecture-demonstrations.[7]

And since the final authority in any establishment

lies with the management, employer as well as employee must be educated and alerted to health hazards and problems. The employer too, is likely to know little or nothing about public health and to be concerned only with the profit from his business. But ultimately sanitation pays, and an employer will be more co-operative and willing to insist on higher health standards when he discovers this fact.

But in the last analysis the protection of health and raising of sanitary standards in restaurants depends on the public.[8] When an educated and sanitation-wise public becomes interested and wants to know if restaurant owners and employees really are attempting to protect their health and then insist on adequate protection, sanitation standards will rise sharply and the substandard restaurants will fail.

WATER SUPPLY

The city water supply comes from three wells, each about 290 feet deep. It is 120 feet to water level. Two of the wells pump 500 gallons per minute and one pumps 1,000 gallons per minute. Eight inch water mains carry it to the water tower which has an automatic shut off. On a hot summer day the city uses about one million gallons. Each year one gallon from each well is sent to the State Health Department for testing. The hole for each well is drilled 30 inches wide, and a 12 inch cassing is inserted. Gravel and HTH (a chlorine compound) are put between the casing and the side of the well. Each new well drilled is then allowed to pump 24 hours before connecting it to the city water mains. The water is not chlorinated or treated in any other way. A theoretical danger of back-siphonage exists should the pressure get too low, but this has not been known to have happened in Imperial and it is a rare occurence anywhere; there are no private wells within the city.[9]

Every thirty days a sample of water is drawn from a different part of town and sent to the State Health Department. Departmental rules and regulations

states:[10]

> Water furnished or offered for public use for drinking purposes shall be of satisfactory physical, chemical, and bacteriological quality. It shall be deemed of satisfactory quality if it be clear, free of odor, of normal color, if it contains no chemical substance in amount sufficient to endanger the health or well-being of any user and if it contains no bacteria or other form of living organism capable of inciting disease in humans or indicative of contamination with sewage material or any foul or unclean substance.

Chemical analysis reveals 0.8 parts per million of fluoride in the water.[9] The optimum amount of fluoride in water is one part per million.[11]

Bacteriological tests are run for coliform organisms because their presence indicates the presence in the water of material from the intestinal discharges of man or animal. An occassional sample contaminated with A. aerogenes is of minor significance. Contamination with E. coli is to be considered more serious. Contamination of a supply with E. coli is justification for chlorination or boiling the water before use. The Coliform testing has three possible steps:[12]

1. Presumptive test. Samples of different volumes are incubated in fermentation tubes for 48 hours at 35 degrees C. Gas formation constitutes a positive test.

2. Confirmed test. From the positive tubes, streak plates on EMB agar are incubated 24 hours at 35 degrees C. If colonies typical of the coli-aerogenes group are formed, the test is positive.

3. Completed test. From the agar plates, a colony is transferred to an agar plate and to a lactose broth fermentation tube; the test is positive if Gram-negative, non-spore-forming bacilli are found on the agar plate, and gas in the fermentation tube. Failure in either constitutes a negative test.

Repeated samples must be studied to give a reasonable basis for judging the bacteriological quality of water delivered during any given period of time.

SWIMMING POOL

There is a single Municipal Swimming Pool in Imperial, and it is a popular place of recreation. This pool is 55 feet by 83 feet and is made of concrete. The pool is managed by a 19 year old boy who has had that job for six years. He also is the life guard during pool hours. The City Council delegates this responsibility.[9]

This pool operates with a continuous flow of water passing through it from water which has been filtered and recirculated. The water is cleaned and recirculated in the following manner: a rapid-sand type of filter is used with three filters used in parallel. The water is pumped from the pool to the filter. A coagulant, alum, is added to form a cloudy, gelatinous floc. Suspended germs and other particles adhere to the floc and this aids materially in filtering out sediment and bacteria. After passing through the filter where all of the floc and sediment and most of the bacteria are removed, the water is forced back into the pool, being chlorinated with gaseous chlorine as it enters.

It is recommended that a slight excess of chlorine

over and above that necessary to satisfy the demands of the organic matter in the water be added. The excess recommended is 0.4 to 0.6 parts per million.[13] This is tested for by the orthotolidin test. In the presence of orthotolidin solution if the water to be tested turns to a lemon-yellow color it means a slight excess of chlorine is present. No color indicates too little chlorine and an orange-yellow color means an overdose of chlorine has been added.[14] Chlorine levels are checked daily at the Imperial pool.

The filters are cleaned by the simple process of reversing the flow of water through the filter. Thus the floc, sediment, and bacteria which have accumulated in the filter are run into the sewer. Only one filter is washed at a time. This procedure is repeated every other day.

The pool bottom must also be cleaned because of heavy sediment, foreign bodies introduced into the pool, and algae growth on the bottom and walls. Algae are harmless but unsightly. It would be too expensive to drain the pool and then scrub the sides and bottom. Therefore a vaccum type cleaner with a long handle is used to remove sediment from the water without draining the pool. This instrument contains a stiff

brush at the end. It is connected to the suction part of the recirculating pump and goes to the sewer.

Departmental regulations require that when the pool is in use, the water shall comply with the following conditions:[15]

1. The water shall be sufficiently clear to permit a submerged bather to be seen in ordinary day light in all parts of the pool.

2. The water shall be free from scum and floating materials on the surface.

3. The water shall be free of dirt, materials or objects on the pool floor.

4. The water shall be of normal color.

5. The water shall have no odor except perhaps a faint odor of chlorine.

6. The water shall have a free residual chlorine content of at least 0.4 parts per million parts of water by weight in all parts of the pool.

7. The water shall have a proper degree of alkalinity to avoid irritation of bathers, and to insure efficacy of the chlorine.

The bathers are routed from the dressing rooms to the toilets and then to the shower before they are supposed to get into the pool. Occasionally, however, a bather comes to the pool in his swim suit and slips into the pool without using the toilet

or shower. This probably is due to the lack of supervision and staff. If noticed, bathers with open wounds or other obvious lesions or infections, are prohibited from entering the pool. This is to prevent contamination of the water and to protect the bather himself. There is no footbath at the pool entrance to help prevent athlete's foot because it is of little or no value and according to the state Health Department, it is not recommended in Nebraska.[16] There is an elevated platform for the life guard but he has so many other duties that this safety provision is somewhat deficient. It is recommended that the total patronage at one time should not exceed one person for each 27 square feet of pool area in the deep portion and for each 10 square feet in the shallow portion.[17] Swimming pools are frequently the source of infection because too many bathe in too small a volume of water.[13]

RAIN WATER RUN-OFF

Imperial is so very flat that the water does not run anywhere very fast. It drains into storm sewer pipes and a small portion is carried into a tiny lagoon at the south edge of town. The remainder follows an open ditch one-half mile east of town near the airport, where it drains into another larger lagoon. After a heavy rain there are numerous pools of water that collect, and offer a good breeding ground for mosquitoes. This is called internal drainage. As regards rain water, the State Health Department recommends drain it, fill it, or chemically treat it.[16]

MILK

Some thirty years ago the milk supply was largely from local farmers. The milk was raw and only occasionally were the cows tested for brucellosis and tuberculosis. About 25 years ago a man put in a pasteurizing plant, but was forced out of business by public opinion. There was absolutely no cooperation from the people or city council, and it was not possible to make it illegal to sell raw milk. This state of affairs continued until about 15 years ago when gradually raw milk producers were forced out of business by public demand for pasteurized milk, which came about in a hurry and largely because Dr. Smith became ill with brucellosis.[1] He was hospitalized in the Immanuel Hospital in Omaha for a period of seven weeks and was sick for three months. He ran a fever of 103 degrees F. every day for six weeks. Thus, public knowledge of how sick one could get from infected milk did more for the demand of pasteurized milk than anything ever had before. Since this time Imperial has imported pasteurized milk form Roberts Dairy in Lincoln, Nebraska. There is no local plant at all. The office of the State Director of Milk Inspection in Lincoln has no

record of any local farmers who produce and sell raw milk in Imperial to even a limited patronage.[2] This practice is legal if it is marked "ungraded." (Revised Statues of Nebraska 1943, 1961 Cumulative Supplement, 81-263.30) All the local restaurants and grocery stores have only Grade A Milk.

Brucellosis, or undulant fever, is caused by an organism known as Brucella abortus, which is responsible for contagious abortion among cattle. Pasteurization of the milk is the best safeguard although efforts should be made to eliminate contagious abortion from dairy herds.

Other pathogens that may be transmitted to human beings in milk include tubercle bacilli, the virus of Q fever and the virus of hoof and mouth disease, streptococci, staphylococci, diphtheria bacilli, Salmonella, agents of torulosis and anthrax, bacillary dysentery, typhoid fever, paratyphoid fever, infectious hepatitis, polio, and possibly Coxsackie and ECHO virus disease.[18]

Milk legislation was first passed on a state-wide basis in 1953. In 1959 the Supreme Court of Nebraska held this Grade-A milk law to be invalid. But the cities having local milk ordinances still had

their laws in effect. This did not insure safe milk outside of these city limits or in localities that had no milk ordinances. On March 29, 1961 another Nebraska Grade A Milk law was approved, which is essentially copied from the United States Public Health Service.

It is interesting to note that only scattered reports of milk borne epidemics have occured since 1934, because most states have had milk inspection since that time.[19] But inspection must continue to guard against the aforementioned diseases as well as against excessive doses of antibiotics used in the treatment of cattle, and contamination from insecticides and weed killers used around dairies. Recently there has been much concern about contamination with radioactive fall out. But so far no dangerous amounts have been found in Nebraska milk.[19]

GARBAGE AND REFUSE

For a long time the collection and disposal of refuse were left up to the individual. The whim of the individual is usually not in the best interest of public health and sanitation. Formerly refuse and garbage were not separated and discarded together. People were hauling it to the city dump or incinerating it. Refuse includes rubbish, ashes, street sweepings, and the like while garbage comprises waste products from home kitchens, restaurants, hotels, groceries, and markets. Then about five years ago, largely through the efforts of Dr. Shopp of Imperial,[20] an ordinance was inacted making it mandatory for every business place and home that had garbage to have a suitable metal container with a tight lid. A penalty can be levied ($100) if one fails to comply. This ordinance is not strictly enforced, however. All garbage is to be carefully drained and wrapped and placed inside the can, making sure to replace the lid tightly. Ideally the cans should be on a suitable rack or stand and kept clean by washing them regularly. Rubbish is to be placed in another receptacle.

Rubbish, and to some extent garbage, is still

sometimes burned at home in large burning barrels or incinerators. These burning barrels still need to be done away with as they attract flies and rats, make smog, and are a fire hazard. The regulations governing the treatment of wastes must be brought to the attention of the householder and businessman to insure compliance.

Imperial has a system of municipal collection, rather than collection by contract, thus presumably assuring that public welfare is not secondary to profit. Garbage is collected only once a week in Imperial. For the best results it should be collected not less than three times per week in summer and twice weekly in winter.[21]

CITY DUMP

It is necessary to establish a point of disposal and this is the Imperial City Dump which is located about one mile east and one-half mile south of town. It is about forty feet from the road and is surrounded by farm land. There are three huge piles of rubbish occupying approximately eight acres of land. There are always a few smoldering fires and the dump is teeming with rats. The State Health Department has recommended that this dump be abandoned or converted into a sanitary landfill.[16] A sanitary landfill is a method of disposing of garbage, rubbish, and ashes on land without nuisance, fire, or public health hazard. The refuse is dumped, compacted, and then covered with compacted earth.[22] Or better still, the State Health Department suggests purchasing a new piece of ground and starting a sanitary landfill, which according to Dr. Yaw completely disregards the financial status of the town.[23] Garbage alone is unsuitable for dumping and is nothing more than a "care package" for flies and rats if so disposed. Therefore, for the past few years Imperial has been attempting to use a sanitary landfill for garbage only.

Dump locations should be carefully chosen so that there will be a minimum chance of complaint from nearby residents rather than being surrounded by good farm land. The nearby farms all have rats in their fields.

Ehlers and Steel[24] give the following instructions for the care of dumps:

1. The dump should be filled so as to limit the length of the dumping edge as much as practicable. The exposed edges are the most objectionable parts because of the difficulty of covering them.

2. A sufficient quantity of ashes, street dirt, building excavation, or borrowed earth should be secured to cover and level the dump properly.

3. Completed portions of the dump should be seeded and partly parked, as is frequently done.

4. No scavenging should be allowed at the dump at any time, except by city employees.

5. Portable rubbish burners should be kept at the dump to burn large, bulky portions of rubbish not suitable for filling.

6. A water pipe should be laid to each dump to supply water for putting out fires and preventing dust.

7. A sufficient supply of kerosene, cresol solution, or other fly germicide should be kept on hand, so that fly maggots may be killed before developing into flies. In addition, fly traps should be kept at the dumps.

8. Only such garbage as cannot be readily kept separated from other refuse should be allowed to be dumped.

9. The used portions of each dump should be enclosed with a light, movable board fence, to facilitate control and prevent paper and dust from blowing away.

10. The dump should be in charge of a uniformed foreman with authority to enforce the regulations.

The dump is intensely infested with rats. In fact a favorite sport is to shoot rats with pistols and rifles. Many large rat burrows are easily detected. Rats are continually gnawing and gnawing marks can be seen. Rats follow a specific pathway time after time producing what is known as runways. Their droppings can be seen along these runways and in areas where they feed. Foot-prints are also discernable in the dust.

Rats may become infected with bubonic plague. It is transmitted from rat to rat by flea bites. While the fleas prefer rats, they will take a human host. If the flea is infected, a human case of plague may result. There is also danger of pneumonic plague, which may develop from bubonic plague and is transmitted from man to man by droplet infection. While plague is the most important disease with which rodents are concerned, they are also involved in other diseases. They are

reservoirs of murine typhus--the flea being the vector to man. Rats frequently are found to have tapeworms, other intestinal parasites, and are also involved with the spread of infectious jaundice to man by infecting food with their urine. Many are found to harbor trichina worms. Then too, rats may pick up and carry almost any infectious matter to human food.[25]

But fortunately, these rats at the dump have not come to town, perhaps because there is plenty of food for them at the dump.

From time to time Warfarin has been used at the dump in an attempt to control the rat problem. This compound is useful because of the low dosage (0.1 per cent) that is needed.[26] Warfarin is an anti-coagulant that first causes the rat to become drowsy and walk with a slow gait. Finally, without suffering, they die of internal hemorrhage, and other rats are not warned of the poison. This method, however, has only reduced rather than eliminated the population because with the good food supply the survivors are able to multiply rapidly. The State Health Department recommends poisoning the rats with arsenic, strychnine, phosphorus, barium carbonate, or compounds containing one or more of these poisons.[16]

If the rats migrated into town or if plague were threatened, it would be easy to obtain public co-operation in rat control at the city dump. But it is extremely difficult to take any action under ordinary circumstances. A sanitary landfill would do much towards eliminating the rat problem.

SEWAGE

Until four years ago the activated sluge system was the method of sewage destruction in Imperial, but at that time was discontinued because of maintenance expense and odor; the oxidation pond method was instituted. There are two ponds each of which is 3½ feet deep and has 4½ acres of surface area. All sewers drain to one lift station in which there are two pumps that alternate in pumping the raw sewage into the oxidation ponds. There is no odor, but the water has a light green color. In the winter the surface freezes and ice skating on them is a popular outdoor activity.

These waste stabilization lagoons, as they are sometimes called, have recently become very popular in the treatment of sewage, especially among smaller communities because of the low operating cost.

This process of sewage treatment consists of the interactions of bacteria and algae. Bacteria digest and oxidize the sewage and render it innocuous. Algae utilize CO_2, NH_3, and other materials from bacterial action and by photosynthesis produce oxygen needed for aerobic bacterial action. During the period of detention, the objectionable characteristics of the sewage

disappear.[27]

Until about 1952 the use of lagoons as the sole treatment of sewage was not regarded as good engineering practice. Now they are a proven method of satisfactory waste disposal and according to the Nebraska State Department of Health,[16] it is the treatment of choice. About one acre of water surface area is needed for every 150 people, not counting industrial waste.[27] Thus this method is sometimes impractical for larger municipalities because of the large amount of land that would be needed.

NURSING HOMES

Even in the absence of illness human vitality declines with age. Some authorities state that most people are mentally and physically effective at age 65 but at age 70 a very definite decline is noted. And sooner or later the older person needs help and supervision even for the activities of daily living. But if he can be given peace of mind, is satisfied with living conditions, and can engage in some sort of activity, his decline can be greatly retarded. Commonly, older people experience a loss of companionship and are isolated from the world of activity. Then too, many older people have financial problems and are afflicted with some disease process. Ill health not only causes expense but adds to the woes of life. The needs of the aged are common to all people but are often lacking. These needs include such things as companionship and respect by others, financial security, reasonably good health, activity, and a home.

Community efforts of assistance are in an embyronic stage. The community of Imperial is currently attempting to pass a bond issue that would approve the building of a 50 bed unit with full nursing care available. Presently, however, there are three small nursing homes in Imperial, which strictly speaking are care homes rather

than nursing homes as there is little or no regular nursing care. In fact one operator said, "If they can't take care of themselves and of their own 'pills' I don't want 'em." Thus the community is poorly equipped to care for its chronically ill. Two homes have a bed capacity of three and one has a bed capacity of five. All three nursing homes are operated by elderly women who keep the patients in their own home, which is an old residence and not designed for group living or for providing facilities to meet the needs of old people. Most old people are helpless and often are broken in spirit so that they are willing to accept without protest any kind of accomodations no matter how wretched. Basic standards for operating nursing homes that are adequate are set forth in a booklet of "Rules and Regulations" promulgated by the State Department of Health.

There are licensing requirements but no educational requirements for operators.[28] They, therefore, are not alert to the needs of older people or how to meet these needs. An educational program for operators should be instituted that includes training in nutrition, safety, sanitation, care of illness, rehabilitation, and the psychology of the elderly.

Licensing of homes in Nebraska first started in 1943.

Homes for the aged are of recent vintage. Reasons for these homes are:[29]

1. An increased incidence of degenerative disease.
2. An increased growth of pension funds in industry.
3. Modern type living has no provision for keeping older people in our homes which are already crowded.
4. It is easy for a small business man to get licensed to manage a home.

Two of the homes in Imperial charge $100 per month and the third one charges $115 per month. Housekeeping is generally poor with a prevailing odor due to poor ventilation. One home has a pet dog which is in violation of the Rules and Regulations.[30] There is one operator in particular who is unacquainted with good housekeeping methods. Dishes are washed by hand and rinsed in hot water in single vat sink. All patients are on the ground floor, which should help reduce accidents due to falls. There is no nursing care provided in any of the homes and no nurses or practical nurses are employed. Physicians do not visit them regularly but come when called. In small communities such as this where there is no organized health department, the physician backed with prestige and authority can be a powerful force in stimulating and educating operators. Regulations require that charts be

maintained for each patient, but these records are very minimal.

The over-all picture is rather dismal. It seems clear that nursing home operators are not alert to the needs of the patients and the potential benefits of current methods. Medical attention is not solicited often enough, and that such attention when rendered often deals with a single episode rather than with the broad problem that involves the whole living situation. There seems to be two outstanding needs in care for the aged in this part of the county; (1) more facilities that are adequate for the needs of the residents and that are divided according to level of need, and (2) a social service that would help the residents in all matters lying within the scope of this service.

MOSQUITOES

The city of Imperial has a mosquito problem that has yet to be successfully controlled. Imperial is an agrarian community and irrigation is extensive. This is the chief source of the mosquitoes. Also the valley is wide and flat and has extensive residual water-pooling sites which adds to the problem.

According to Dr. Yaw,[23] it was recommended by the State Health Department that Imperial purchase a good spraying machine preferably of the fogging type. This was not done and as a substitute the whole town was sprayed by airplane early in the morning before the day's activity began.

But both of these methods kill only the adult, winged mosquito that is directly hit with the spray. The most important mosquito-control measures are those which are directed against the mosquito larvae and pupae.[31] These are the stages of the mosquito's existence which are most responsive to control measures. Efforts toward extermination of mosquitoes after they have wings are of less value. Drainage, oiling, the use of larvicides, and even natural enemies of mosquitoes such as the top-water minnow are useful against the aquatic stage of the

mosquito. An insecticidal program can be conducted though while the source elimination program is being carried out.

In general, mosquito control can best be carried out by:[32]

1. Pinpointing major mosquito production sources.
2. Devising a feasible area-evaluation and surveillance program.
3. Concentrating on source elimination activity.
4. Using insecticides judiciously and effectively.

AIR POLLUTION

Public Health laws guard the purity of food and water supplies and now the same degree of protection is being extended to air. Comfortable, healthful living requires an unlimited supply of relatively clean air. Man consumes about 30 pounds of air daily.[33] He can refuse suspected water or food but not polluted air. He can live weeks without food and days without water, but only minutes without air.

The major sources of air pollution stem from human activites and lies in combustion processes such as heating with coal or oil, and combustion vehicles.[34] The chemical processes of industry and atomic bomb explosions are other noteworthy sources of pollution.

Fortunately, Imperial has no air pollution problem. There is no industry whatsoever in the community and coal is not used for heating, thus eliminating these sources of air contamination. Of course the air still has the carbon compounds from auto exhaust and tobacco smoke and the radio-active fallout from atomic bomb testing, but this is no greater than anywhere else.

Public education is needed to point out the in-

dividual's contribution to air pollution and to bring about cooperation in such things as rubbish disposal, automobile motor tune-ups and adjustment of home heating units. If the public is informed correctly and continuously about air pollution and its control, cooperation is more readily given.

HOUSING

It was not possible in the course of this study to make a systematic survey of housing. No house-to-house inspection was carried out and no specific information is available. It can be said in general, however, that the community of Imperial has no slums, tenements, tenement-like apartments, or houses without sewage and that housing is not a community problem.

A community is interested in good housing for several reasons. Among them are the relation of housing to health, the esthetic appearance, and the relation of good housing to property value of near by buildings.[35]

The practicing physician, who is in a position to observe bad housing and its harmful effects, may make many valuable contributions to improve city housing. He can use his influence in supporting or prodding community action, and any major problem areas beyond the control of residents may be brought to the attention of appropriate agency personnel. Education in proper housekeeping and cleanliness is needed among those of lower income groups. Experience has shown that good housing can be turned into shambles by occupants of low social and moral standards.

IONIZING RADIATION

Public protection against excessive exposure to ionizing radiation is the concern of all practicing physicians and health departments.

Man's exposure to ionizing radiation may be divided into the following categories:[37]

1. Natural sources such as cosmic radiation and naturally occuring radioactive materials.
2. Medical and dental roentgen exposures and medical therapeutic exposures to radioisotopes.
3. Occupational sources, such as roentgenologists, radium dial painters, and industrial and research users of radioisotopes.
4. Environmental contamination sources from detonation of nuclear weapons.

In Imperial there is no exposure because of industrial uses or laboratory radioisotopes. The exposures due to natural sources of ionizing radiation and those due to fallout from atomic weapons testing present no problem beyond what we have throughout the country. The use of ionizing radiation for medical purposes is the largest single source of exposure to the general population. It must, therefore, be used as sparingly as possible, consistent with good medical pradtice.

OTHER HEALTH NUISANCES

There are still 6 houses of the 524 that are not connected to the city sewer.[38] But these houses are not occupied and the owners are not residents of Imperial. There is, however, no reason why these dwellings could not be occupied at some future date and the out-houses once again put into use. So eradication of these is still a problem.

A sheep herder who lives at the edge of town in an old Pabst Blue Ribbon beer truck is another health nuisance. The truck has no windows or toilet, is dark, dank, dirty, and has an extremely foul odor. According to Dr. Yaw,[23] it has been recommended by the State Health Department that this small plot of ground which is owned by said sheep herder be condemned. But this is a laborious legal procedure (except for the state if it wants to put a road through the best farm land in the community under the right of eminent domain) and has not yet been accomplished. He is a chronic alcoholic and spends most of his time in the County Jail. Upon interviewing this wretched individual he said that he spent so much time in jail only because the "cops have it in for me." While he would agree not to live there anymore he remained

steadfast in refusing to let the beer truck be removed from the premises because "it is a good storehouse" and "it is a free country." His only source of income is a monthly Social Security Check which amounts to $40.00.

Several years ago a man kept sheep, horses, and hogs on his premises which were within the city limits. This problem was quickly eliminated by a District Court Order and lack of resistance by the person involved.[20] Since then, animals in the city have not been a problem. All pet dogs must have rabies and hepatitis shots to get licenses.. If not licensed they are picked up, and if not claimed they are destroyed.

LOCAL BOARD OF HEALTH

Revised Statutes of Nebraska, 1943, 17-208 establishes boards of health in villages consisting of: the mayor, who is chairman; the marshal, who is secretary and quarantine officer; and one other member who shall be a physician when one resides permanently in the village. The board is responsible for safeguarding the health of the people of the city, and is required to enact rules and regulations for this purpose. The public health department of local governments should be the front-line responsibility for the health protection of citizens.

The members of the Imperial local health board receive no pay and except for the physician have had no education whatsoever in health matters. Like most local boards of health in small rural communities, it is relatively inactive and there is no real program.

The members fear creating any ill-will toward themselves and are, therefore, reluctant to enforce regulations. They try to be all things to all people and the result is that little is done beyond hearing individual complaints. There are no mechanisms for studying health problems and no personnel knowledgeable in public

health matters. So whatever is done is done after the fact and no one has the responsibility to observe or correct. A possible answer would be a paid public health officer or organized health department. Even if it had to be on a multi-county basis, there would be a focus for health education and a mechanism for action.

Ideally, the functions of a local health department may include any or all of the following:[39]

1. Prevention and control of communicable diseases.
2. Supervision of water supply and waste disposal systems.
3. Inspection of milk-producing and processing facilities.
4. Supervision of food preparation in eating places.
5. Inspection of health conditions in industry and commerce.
6. Conducting public health education.
7. School health services, including health instruction and physical examination of school children.
8. Collection of vital statistics.
9. Maintenance of public health nursing service.
10. Operation of disease-detection clinics and immunization services.
11. Provision of laboratory service to aid private physicians in diagnosis.

12. Investigation of health-hazard complaints.

13. Advising on local legislation pertaining to health matters.

14. Control of air pollution sources.

15. Inspection of radiation hazards.

16. Medical consultation to other units of governments.

SUMMARY

By way of summary, Imperial is a small, agrarian, southwestern Nebraska community consisting of 1,423 people. There are three restaurants all of which are fairly sanitary. The most obvious and most common breach of sanitation was the habit of waitresses picking up glasses and cups by putting their fingers in the top. These restaurants are inspected about twice per year and regulated by the Department of Agriculture. Education of the public, employees, and restaurant owners as to the value of good sanitation is needed to raise sanitation standards.

The city water supply comes from three deep wells, and is not chlorinated or treated in any way. Once a month a sample from a different part of town is sent to the State Health Department for bacteriological tests.

The single swimming pool uses filtered and recirculated water that is chlorinated as it enters the pool. The pool bottom is cleaned with a long-handled vaccum cleaner to remove sediment. Bathers with wounds or infections are prohibited from entering the pool.

Because Imperial is so flat, rain water tends to pool and offers a good breeding ground for mosquitoes.

All of Imperial's milk supply is imported from Roberts Dairy in Lincoln, Nebraska. Public demand for pasteurized milk came about as the result of the illness of Dr. Smith, a prominent citizen, who became ill with brucellosis and the resultant public knowledge of how sick one could get from infected milk. Nebraska's Grade A Milk Law was approved in 1961 and is essentially copied from the United States Public Health Service.

Imperial has a municipal system of collecting garbage and refuse once a week. Every home and business place that has garbage is required by City Ordinance to have a metal garbage can with a tight lid, but this ordinance is not strictly enforced.

The City Dump, which is teeming with rats and flies, is the worst eye sore and public health hazard at Imperial. The State Health Department has recommended that this dump be abandoned or converted into a sanitary landfill, whereby the refuse would be covered with earth. This problem has yet to be met.

The sewage is destroyed by the oxidation pond method in which bacteria digest and oxidize the sewage and render it innocuous. This is a popular method because of the low operating cost.

Imperial has three nursing homes, all of which

are poorly equipped to care for the aged and chronically ill. No nursing care is provided and the operators are not alert to the needs of the patients. More facilities are needed as well as a social service that would help the residents, and an educational program for operators.

A mosquito problem exists in Imperial because of extensive irrigation and residual water-pooling after a rain. Mosquito-control measures should be directed toward source elimination with judicious use of insecticides.

There is no problem of air pollution, housing, or ionizing radiation in Imperial.

A health nuisance is created by an alcoholic, sheep herder who lives on his own property in an old beer truck that has neither windows nor plumbing. Condemning this property is a laborious legal proceedure which has not been accomplished as yet.

The Local Board of Health consists of the mayor, marshal, and a physician. The members receive no pay and there is no real ongoing program for health education or any mechanism for action.

CONCLUSION

In conclusion is can be said that the environmental sanitation of Imperial, Nebraska is, in general, good but not excellent. In view of the deficient and incomplete reporting of disease, it is difficult to ascertain whether or no Imperial is paying a price for any sanitary shortcomings. Appended is a copy of the record of reported communicable diseases from Chase, County, of which Imperial is only a part, from the file of the state office of Communicable Disease Control. It is interesting to note, that five cases of Shigellosis were reported from this county in 1959, which chances are came from food. But both the local physicians and Mr. Flagg, Director of Restaurant Inspection, denied any knowledge of food poisoning from this community.

And it is the physician who makes, or who should make, a key contribution to the public health and be among those supporting many community measures to promote the general health.

COMMUNICABLE DISEASES

COUNTY CHASE

DISEASE	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Brucellosis		5	14	4											
Chickenpox			2					3							
Diphtheria							1								
Encephalitis		1					1						1		
Erysipelas															
Hepatitis														1	
Influenza															
Measles	2	1	4	1	2			23							
Meningococcal Inf.															
Mumps		3	4		2			1							
Pertussis			1	1											
Pneumonia			1												
Poliomyelitis	2		1		5	2	3	1	1						
Rabies (Animal)															
Salmonellosis															
Streptococcal Inf.		1													
Tetanus															
Tuberculosis		3	2		1					1					
Tularemia															
Typhoid Fever			3			2		1	1						
Shigellosis Dysentery					1									5	
Chancroid															
Gonorrhea	2	3	1	1											2
Granuloma Inguinale															
Lymphogranuloma															
Syphilis	4	2	1	10	6		1								

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