

Sanitation Problems in a Suburban Area

—Jackson County, Missouri—

By JACK K. SMITH, M.S.C.E.

JACKSON COUNTY, MO., is not a typical county. It may best be described as an urban-fringe area, or a girdle of homes, and schools, and shopping centers, of small industries, and small farms, and wide open spaces, which typically encircles a major city in the United States. Many of the workers in Kansas City, Mo., which lies within Jackson County's borders but not within its jurisdiction, have their homes in the residential communities which surround the city. With the growth and expansion of Kansas City, the problems of providing healthful living conditions for residents of the county become more and more complex. Sometimes these problems are not sufficiently known and are taken for granted.

Recently, the necessity for explaining the objectives of specific public health programs was brought forcefully to the attention of the Jackson County Health Department. Although the department had been in operation for more than 20 years, the Jackson County Court indi-

cated, when questioning the local unit about its purpose and activities, that in the thinking of the court, the activities of the health department centered around only one phase of health—the medical care of the indigent.

This lack of understanding on the part of the court, and undoubtedly on the part of the public, becomes all the more pertinent when one realizes that the Jackson County Court is not a part of the Missouri judicial system and that the term "court" is a misnomer—a vestige of the days when the judicial and administrative powers were combined in one local governmental unit. Apparently, the health department had temporarily failed in keeping the public, and likewise the court, continually informed about its purpose and its programs. It had failed, moreover, in explaining that its primary purpose is the prevention of sickness and that its activities were directed toward that end.

Community enlightenment is, of course, an essential ingredient of a health department's program. In Jackson County, as in other localities in the United States, the real purpose of a local sanitation program is improvement of the sanitary environment. But progress in any community program, let alone a health program, can be made only to the extent and at the pace desired by the residents of the community. No matter what value is placed on a local program by the professional health worker, the program, if it is to succeed, must have the support and understanding of the community.

Mr. Smith is in charge of waste disposal and stream sanitation in the bureau of public health engineering, Division of Health, Missouri Department of Public Health and Welfare. From October 1938 to May 1952 he was a public health engineer in the health departments of Jackson County and Jasper County, Mo. This paper is based on a presentation by Mr. Smith before the Illinois Public Health Association at its 1952 annual meeting in Springfield, Ill.

Some of the local sanitation programs in Jackson County have already benefited by public recognition of the need for their existence.

Milk Control Program

Jackson County's milk control program was inaugurated in 1940. It started slowly at first with an attempt to get the cooperation of the milk producers and dairies. A few, however, would not go along. One merchant in the vicinity of Kansas City made a "leader" of milk, which he obtained from any source and sold at a reduced price. County health officials explained to him that the milk control program was intended to assure a safe milk supply for the county, and told him to buy milk only from a rated source. The merchant, taking the attitude that the health department did not have the right to interfere, continued to sell ungraded milk.

At this point in the program, the health department decided to use enforcement as a means of education. Evidence of the merchant's selling ungraded milk was collected by the health department and presented to the magistrate's court, the lowest court in the county. The magistrate ruled in favor of the health department, and the merchant was fined. This was the only legal case involving the sale of milk which was ever tried in Jackson County.

The problem of milk control in the county area is diminishing because the large dairies in nearby Kansas City, Mo., are gradually taking over the distribution of milk. In 1940, there were about 50 small dairies in the county; most of these were raw milk dairies. Today, there are only 4 or 5 small dairies.

Because of overlapping milksheds, reciprocity in providing a safe milk supply was established with the Kansas City Health Department. The Kansas City Health Department now inspects all dairies selling milk within the limits of Kansas City; and milk plants licensed by the city health department are issued a permit by the county department. When Kansas City degrades a dairy, the county health department takes similar action. However, the few small pasteurization plants that are left—dairies that produce and pasteurize milk on the

farm—are under the supervision of the county department.

The cooperative inspection program between the city and the county extends beyond the city limits. Across the State line from Kansas City, Mo., is Kansas City, Kans., with a number of large dairies which have recently started to distribute milk in Missouri. Since these dairies are inspected and certified by the Kansas State Board of Health, the Jackson County Health Department decided to avoid duplication of inspection by accepting Kansas' certification. The Public Health Service through its regional office at Kansas City, Mo., provided a milk sanitation rating of the Kansas dairies desiring to sell milk in Missouri. Only dairies with a rating of 90 percent or higher were issued permits. It was mutually agreed that degrading by one State would call for similar action by the other. This agreement has been beneficial to both States.

In Jackson County, the disposal of the waste connected with milk production is a problem. Outside the limits of Kansas City, there are few public sewers. Dairies do not have access to these sewer systems. One large milk plant utilizes a high-rate trickling filter for the treatment of wastes, but results have not been satisfactory because of overloading and inadequate maintenance and operation. The small milk plants have no facilities for treating wastes. A simple, efficient, and inexpensive type of waste disposal system is greatly needed.

County Water Supplies

Water supply in Jackson County is primarily supplied by the municipal water plant in Kansas City, Mo., which serves the city and surrounding area through public water supply districts. There are eight such districts in Jackson County. Each district has its own board of directors. Each district has the power to vote bonds and extend the mains within its area. Water purchased from Kansas City is resold by the public water district. Thus, the municipal water plant serves about 95 percent of the population of the entire area. By this arrangement, the people of Jackson County have access to a water supply managed and operated by qualified technical personnel. Bac-

teriological samples from the eight districts are examined routinely by the Missouri Division of Health laboratories.

It would be difficult to develop individual water supplies in the county. There is no suitable underground supply except in the Missouri River bottoms, where ample water is found at a depth of 20 feet. The Missouri River forms the northern boundary of Jackson County. Sand-point-driven wells produce satisfactory water from a bacteriological standpoint. Away from the Missouri River, wells are seldom satisfactory. There are a few low-producing drilled wells, but a good drilled well is rare in the northern part of Missouri.

The water supply problem in the county is increased because the area is largely underlaid with creviced limestone, which permits little filtering action. Contamination from barnyards, septic tanks, privies, and other sources, enters the water stream through outcropping limestone ledges. Cisterns are used at many private homes and small public schools. Most of the water for these is hauled from one of the water districts. Water haulers are instructed to chlorinate each tank of water they transport. For one school with about 200 students every drop of water must be hauled. The school is otherwise completely modern, with flush toilets and a cafeteria. Several thousand dollars have been spent in unsuccessful drilling for wells. There simply is no water available in the ground.

Sewage Waste Disposal

The waste disposal problem resulting from the numerous housing developments in Jackson County presents a significant challenge to the county department. In April 1951, the Missouri Division of Health adopted a regulation for septic tank installations which requires a minimum lot area of 15,000 square feet with a minimum lot width of 75 feet, although 100 feet is preferred. This has helped to reduce the septic tank problem. The developer wishing to erect 50 or more houses is advised that he may use a lot size of 7,500 square feet if he installs a sanitary sewer system and a disposal plant. Several builders have done so. After completion, the disposal plants are maintained

and operated by the county sewer department.

A county of the first class can levy a maintenance tax for sewered areas and provide satisfactory maintenance. Counties are limited by law to one-fourth of 1 percent of the assessed valuation as the maximum that can be charged for operation and maintenance of a sewer system. A development needs at least 50 houses in order to bring in enough revenue to operate even the simplest type of disposal system.

In a subdivision of 50 to 75 houses the simplest type of sewage disposal system is a large septic tank, dosing chamber, and open sand filter. When given proper maintenance, the sand filters work very well. A sand filter requires continual maintenance and cleaning, but it produces a satisfactory effluent. Expensive to operate, the sand filter is a partial solution to the sewage problem because the disposal system is then centered at one point rather than dispersed among separate lots and individual owners.

The arrangement for the county to assume control of the sewage disposal system has worked out satisfactorily. Sometimes complaints are made that the revenue is not enough to take care of the expense, but this can be overcome largely by efficient operation. Personnel from the county health department make routine inspections of the disposal plant and report the deficiencies they find to the county sewer department.

Other Disposal Systems

There are other types of sewage disposal plants. In a development of 550 houses, a primary settling tank, separate sludge digester, trickling filter, and final settling tank have been installed to accommodate 275 houses. The system will be expanded to accommodate the ultimate capacity of 550 houses. The developer will operate the system until its completion and then deed it to the county.

The big problem, of course, is inducing the developer to put out that much money at one time. The cost, when the price of land is considered, usually will justify a community disposal system, and an appeal to the developer's pride has resulted in having some builders provide a sanitary sewer system.

Individual septic tank installations produce

many problems. The type of soil in Jackson County is not readily adaptable for the installation of soil absorption systems. A percolation rate of 10 minutes per inch is very good, but in almost all subdivision lots the percolation rate is the maximum permitted by the county, 30 minutes per inch. When the percolation rate exceeds the maximum, the builder is instructed to use some other type of system such as a sewer collection system with central treatment works or an installation of individual sand filters on each lot.

The individual sand filter creates problems too because the effluent from each filter must be carried away. In some instances a small sewer system is required. The cost of the individual filter installation exclusive of effluent drain is approximately \$150 more than that of the conventional absorption system. Numerous individual sand filters have been installed in spite of additional cost and effluent drainage problems. Builders and developers sometimes request permission to build 1 large filter to serve 5 or 6 houses, but this permission is not granted because it involves too large a maintenance problem.

However, the use of a common collection tile or sewer is permitted. It involves a minimum amount of maintenance. As yet no difficulties have been encountered with this type of drain, although some of the installations were made 5 years ago.

Jackson County has a readily available source of sand for use in sewage filters, but care in selecting the type of sand used is necessary. An effective size of from 0.6 to 0.8 millimeters, with a uniformity coefficient of less than 4, is required. Considerable labor is involved in producing sewage-filter sand. Ordinary building sand will give good results, but only for a short time because of its tendency to clog.

School Sanitation Progress

In a sprawling suburban area, the construction of schools lags behind the expanding population. Jackson County schools are overcrowded and probably will be so for some time. However, school districts are being consolidated. Gradually being eliminated are the small, one-room schoolhouses with their prob-

lems of cross-lighting, inadequate water, inadequate sewage disposal facilities, and other conditions not compatible with good health. School architects in the county have been cooperative in submitting school building plans and specifications to the health department. In reviewing the plans, the department checks the lighting, ventilation, drinking fountains, toilet facilities, accident and fire hazards, food service facilities, and water supply and sewage disposal facilities.

Schools with an enrollment of 200 to 300 students have difficult sewage disposal problems. Because most small towns lack public sewerage systems, the school has to develop its own sewage treatment plant. Usually, the installation consists of a septic tank, a dosing chamber, and an open sand filter. One public school has an absorption system with more than 5,000 linear feet of tile. Wherever possible, an open sand filter is used. With proper maintenance, very satisfactory results are obtained.

The high cost of school buildings has one advantage from the health department's viewpoint: New schools are being constructed without basements. It has been difficult to convince architects and school boards that a cafeteria or kitchen should not be placed in the basement. Newer schools now have well-lighted and well-ventilated cafeterias above-ground.

The importance of checking the complete set of school plans has been borne out by experience. Recently, an architect supplied for review only the plans of the sewage disposal system, which he thought were the only ones needed. The plans were satisfactory and provided for an absorption system of adequate capacity with a tile field in excess of 5,000 feet. However, when final inspection of the disposal system was made, it was found that the laterals were laid on top of a foundation drain. The submitted plans had not shown the foundation tile, but the complete set did. When the disposal system was constructed, the laterals were placed only a few inches above the foundation drain. As soon as the siphon discharged, the sewage seeped into the lower drain and then into the street. The contractor had to re-lay the foundation drain, removing it from beneath the laterals.

Nursing Home Inspection

In order to obtain a permit or license to operate a nursing home in Jackson County, certain minimum requirements must be met. The State legislature enacted a law regulating nursing homes in 1941. Inspection of nursing homes is the responsibility of the county health department and requires the services of the health officer, the sanitary engineer, and the public health nurse. The nursing home program includes investigation of the sanitation of the premises; patient care and treatment; record-keeping; fire, electrical, and physical hazards; food-handling practices; sources of milk and food; water supply; and sewage disposal.

One legal case involved a nursing home which was well operated and maintained but whose owners believed that they were not subject to the health department regulations. The home was not violating any sanitation regulations, but it refused to submit monthly reports, and also disapproved of health department inspection. In the ensuing litigation, the circuit court judge ruled that the State nursing home law was unconstitutional because it excluded homes healing by faith. However, the decision applies only to this home in Jackson County.

The failure of certain nursing homes to meet minimum requirements necessitated other court cases. The procedure in such instances is to inspect the home, interpret the findings to the operator, and allow sufficient time to make necessary adjustments to fulfill the requirements for licensing. At the end of this period, the home is reinspected; and then, if the recommendations have not been carried out, and there is no intention of following them, the case goes to the county prosecuting attorney.

The prosecutor writes to the nursing home operator, calling for a hearing at which the operator and a representative of the health department are present. The points in question are discussed. The prosecutor advises the operator to meet the requirements of the law. A reasonable time is given for compliance. If, at the end of that time, the operator has not complied, a warrant is issued for his arrest. Usually, the hearing concludes the matter.

The health department, of course, tries to

avoid hearings, principally because of the amount of time they take.

Taxing Trailer Residents

Along with other States, Missouri has sanitation problems peculiar to the people living in trailers. Trailer parks have presented a serious sanitation problem during World War II. The number of trailers has increased since the war. People are continuing to live in trailers. Their income frequently is high, and they choose to live in trailers not for economic reasons, but because they like it.

Almost all the sanitation problems common to a small city are found in a trailer park. Water supply, sewage disposal, garbage, and refuse disposal are the major items requiring supervision by the health department. Fortunately, all trailer parks in Jackson County are served by an approved public water supply. Where trailer parks are not served by public sewer systems, the trailer park sewerage systems consist of collection systems, septic tanks, dosing chambers, and open sand filters. In the county, there are 15 trailer parks varying in size from a 10- to 100-unit capacity. A water supply connection and a sewer connection must be provided for every trailer space.

In most instances, the older trailer parks were not properly planned, and little consideration was given to the location of waste disposal facilities. As a result of this lack of planning, there is insufficient area for waste disposal facilities and a need for pumping sewage. Odor problems are common because of the proximity of trailer spaces to the sewage filter beds. Use of chemical masking agents in sewage dosing chambers has provided some relief.

A large percentage of new trailers are equipped with showers, lavatories, kitchen sinks, and flush toilets. These improvements require sanitary sewer and water supply connections for the trailers. The central bathhouse of the typical park is rapidly disappearing. Centralized laundry facilities are, of course, still necessary. Laundry waste is treated with other sanitary sewage and has created no special problems.

Garbage and refuse collection and sewage disposal practices vary from good to bad. Ex-

perience indicates that the most satisfactory system is to provide a fly-tight metal container for each trailer unit and to accomplish disposal either by sanitary landfill or by incineration at a remote location. Most of the owner-made incinerators have not been successful. Central refuse containers require almost constant supervision to avoid abuse of the facilities.

The inherent problems of the older trailer parks created by the small unit spaces are being alleviated by the need for accommodating the new, larger trailers and the development of trailer park standards by the National Association of Trailer Coach Manufacturers.

Real estate interests and school authorities in the county strongly object to trailer parks. School authorities object because little, if any, tax revenue is obtained from the trailer occupants. A small school, or even a fairly large one, with a park of 150 trailers within its district, faces the problem of educating 50 to 75 extra pupils without adequate funds for additional space, equipment, or teaching personnel. The school board and others protest to the zoning board against a proposed trailer park and usually find a sympathetic audience.

Probably trailer park residents would not object to being taxed, but there is now no legal way in Missouri to tax them. The trailer coach manufacturers have asked the legislature for legislation to tax trailers for school purposes, but so far the State has adopted none. This problem will continue to exist until some form of legislation permits taxation of trailer occupants. (Note: The 1953 legislature passed legislation permitting counties to tax trailers for school purposes.)

The real estate interests have stated that trailer parks lower real estate values in their vicinity. But we believe that there should be a place in any county or community for well-

organized, sanitary trailer parks. Zoning authorities should select areas for such purposes so that there will be better trailer parks, rather than those which have just grown up from 2 or 3 trailers, adding to their original facilities in a hodgepodge fashion. Parks which are built according to a definite plan can be assets to the community. Health departments must face their obvious responsibilities toward the people who live in mobile homes.

Nuisance Adjustments

Many nuisance complaints can be adjusted during a careful interview with the complainant. Some complaints turn out to be purely personal grudges. Sometimes they are disagreements about a property line or a fence, and the health department is used as a moderator.

The first question asked the complainant is "Have you talked to your neighbor about this insanitary situation?" Generally, the answer is "No." The representative of the health department then tries to persuade the complainant to speak to the neighbor and remind him that otherwise he must sign a written complaint and perhaps testify in court.

This procedure stops many complaints before it becomes necessary even to write a letter. When a condition cannot be remedied peacefully, an inspector checks the sanitation facilities of both parties. When conditions warrant, the owner receives a letter asking him to make certain corrections and giving him a reasonable amount of time in which to do so. If the corrections are not made within that time, a hearing before the county prosecutor is requested. If the hearing fails to bring results, the case is taken to court. Actually, not many cases reach that stage.

