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ERADICATION METHODS FOR RATS AND MICE

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ERADICATION METHODS FOR RATS AND MICE

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The most effective methods for the control of rats are: rat-proofing of all buildings, preventing the animals from securing food, poisoning, and trapping. One of these methods may be selected as the most suitable, depending upon local conditions, or several methods may be tried simultaneously or in succession. Rat-proofing of all buildings is most desirable as a fundamental step. Then the animals inside of the buildings can be exterminated. This accomplished, traps may be set to take care of those which may enter later because of accident or carelessness.

Rat-Proofing

The best means of rat-proofing a building is by the liberal use of concrete construction. It is best to use foundations and outside walls of concrete or of stone and brick laid in mortar. Foundations should be carried below frost line and to load-bearing ground, and should extend above the floors. Stores, warehouses, markets, and stables should be floored with concrete. The use of double walls with a dead air space between should be avoided, or if this is impossible, such walls should be rat-proofed by filling the open spaces between studs and floor joists with cement, metal strips, or other non-combustible material. Hollow concrete blocks are often used for walls. The air spaces may be sealed at top and bottom with concrete, closing all openings. Figures 1 and 2 show other means of rat-proofing farm buildings.

All openings through which rats might enter a building should be closed. Rats are agile climbers, persistent gnawers, and clever diggers, and often secure entrance in unsuspected ways. All doors should fit tightly, especially at the bottom, and doors likely to be left open unintentionally should be self-closing. All windows, ventilators, or other openings should be screened. A 16 or 18 gauge wire is preferable for screens because of its strength and durability, and the mesh should not be larger than one-half inch. Openings made in the walls to admit plumbing or wiring should be closed with concrete immediately after installation. (Figures 3 and 4.) Openings for the same purpose in wood walls or floors should be screened.

Buildings without concrete foundation walls should be raised two feet or more above the ground and left open underneath. If this open space is kept free from rubbish, or accumulations of any sort, rats will be unable to find a hiding place. Rats, mice, and sparrows may be excluded from corn cribs by the use of either an inner or an outer covering of wire netting strong enough to resist the teeth of rats and fine enough to prevent sparrows from entering.

Cities should compel the rat-proofing of all buildings as a necessary part of municipal sanitation. Rat-proofing of existing buildings is not usually very expensive, and, in most cases, the lessened damage from rats will soon

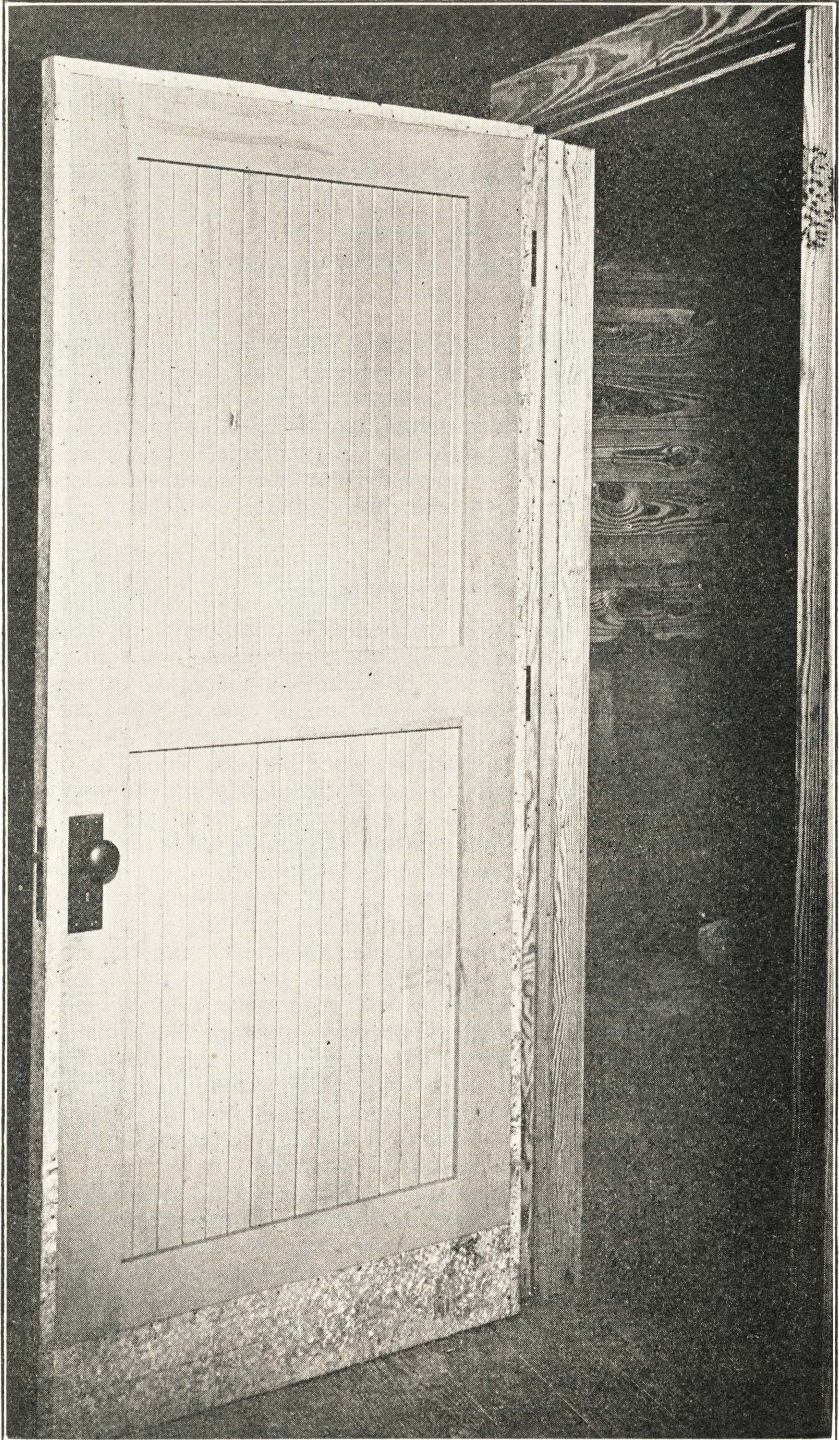


Fig. 1.—Entrance to a rodent-proofed grain bin in a well constructed dairy barn. Notice the galvanized iron strips on all four edges of the door. The type of construction used in the walls and floor of this bin is shown in Fig. 2.

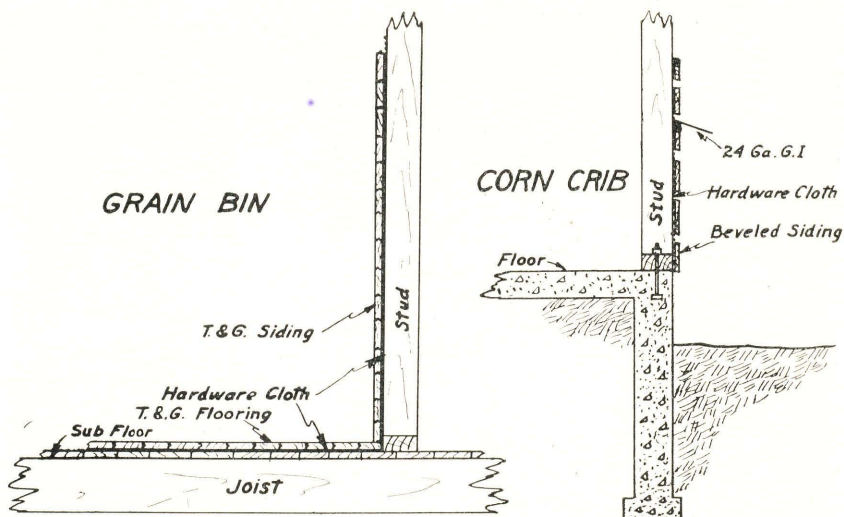


Fig. 2.—These diagrams show effective means of excluding rodents from grain bins and corn cribs. The floor of the grain bin consists of tongue and groove flooring, and a subfloor, with a single layer of hardware cloth between the two. The wall of the bin comprises one layer of tongue and groove siding with the floor layer of hardware cloth continued upward between the studs and siding. The door of this bin is shown in Fig. 1.

Corn cribs should have cement floors and foundations. Hardware cloth should extend upward from the floor for about 20 inches between the studs and siding. An inclined strip of 24-gauge galvanized iron sheeting running clear around the crib at the upper edge of the hardware cloth and $2\frac{1}{2}$ to 3 feet above the ground, will prevent rats and mice from reaching the unprotected parts of the crib.

pay for the cost of the work. Harboring-places for rats are frequently found under board sidewalks and under old piles of lumber or rubbish. These places, as well as old sheds, should be eliminated from cities and farm yards.

Preventing Rats From Securing Food

The importance of measures designed to restrict the food of rats should not be overlooked. Food shortage naturally reduces the number of rats in any locality and tends to limit the rate of increase. Hungry rats are much more easily destroyed by traps or poisons.

Whenever possible, food stored in buildings should be kept in containers through which rats cannot gnaw. It is important that rats be prevented from securing water within buildings, for without water they must leave the building. Ordinarily, they obtain water at sinks, closets, or leaks in plumbing. All liquid food, such as milk, should be kept securely out of the reach of rats.

In country slaughter houses, it is a common practice to leave the offal of slaughtered animals to be eaten by rats and swine. This practice should be absolutely prohibited, as such practices produce not only centers of rat propagation, but are one of the chief causes for the perpetuation of trichinae in pork.

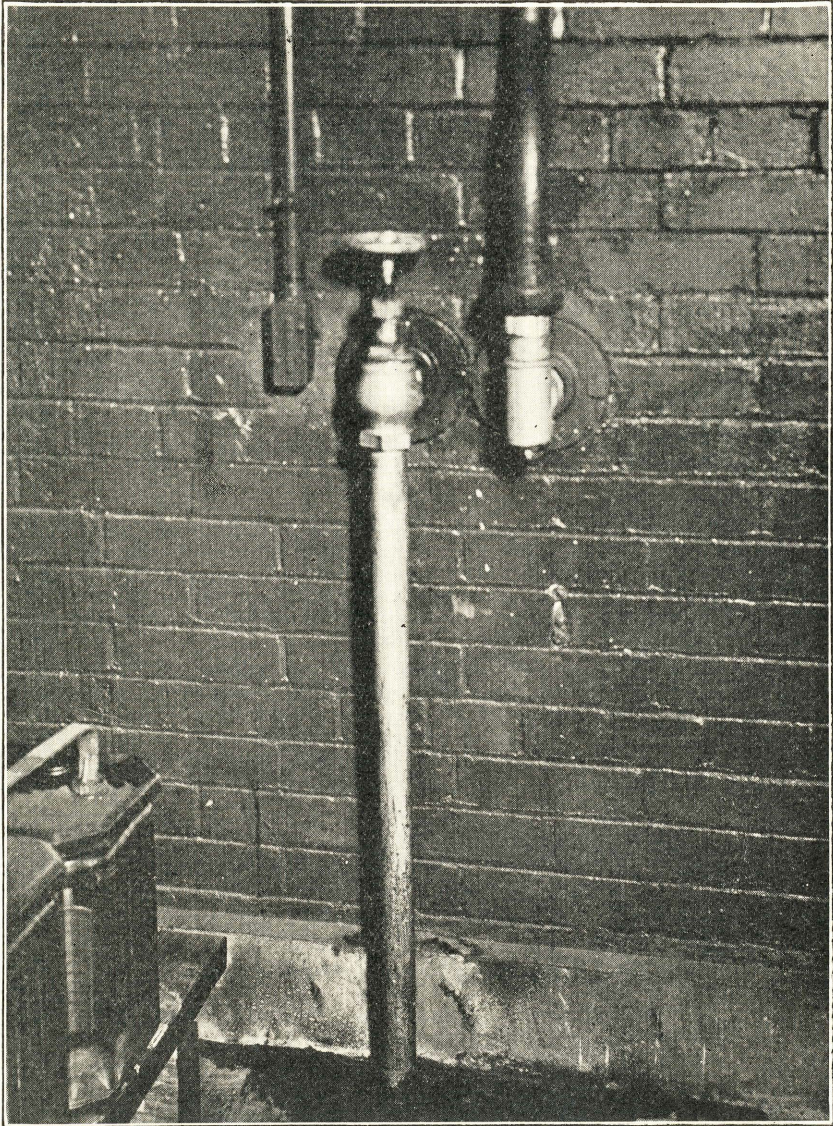


Fig. 3.—Such plumbing offers no opportunity for rats or mice to get into the building. Note that where the pipes penetrate the floor or wall they are closely surrounded by cement, bricks, or a metal collar.

Needless to say, all garbage should be kept in rat-proof receptacles, since careless garbage disposal may destroy the value of the most elaborate anti-rat measures taken within doors. (Figure 5.)

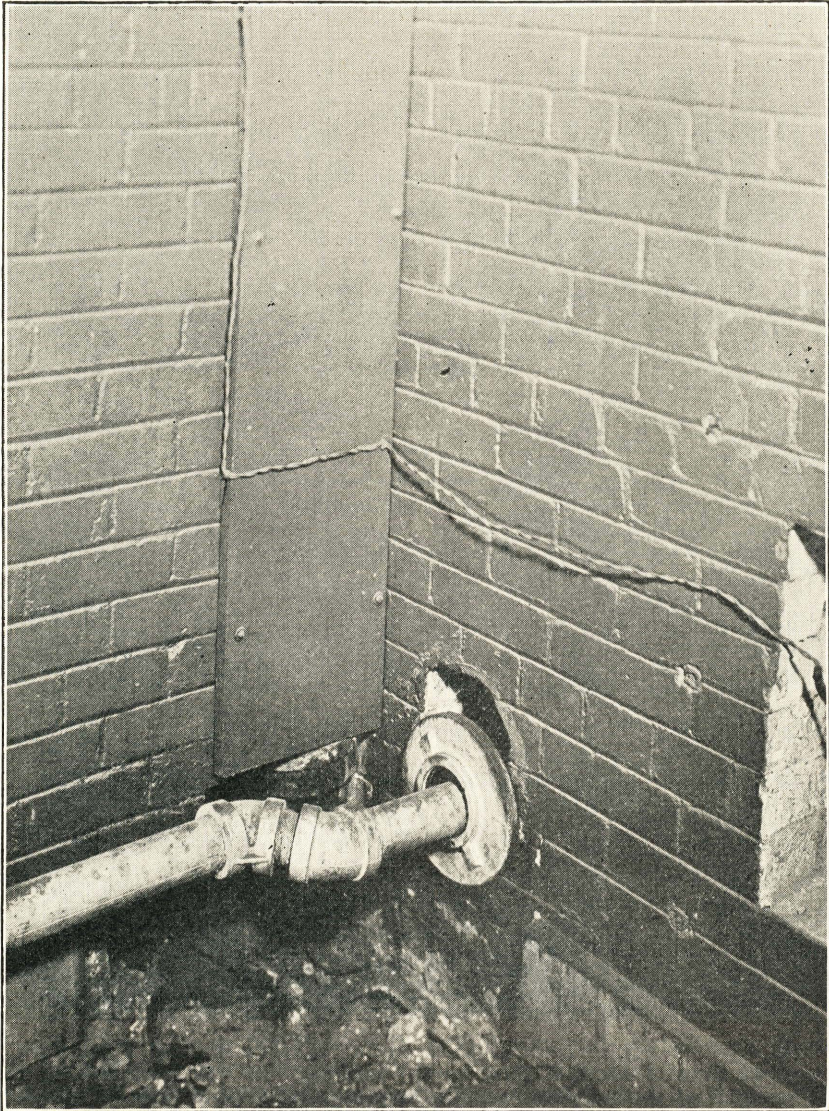


Fig. 4.—This is a careless piece of plumbing. Rats and mice may gain entrance to an otherwise well constructed building through such openings around steam, water, and gas pipes. Such holes should be carefully filled with cement, bricks, or other rodent-proof material.

Poisoning

Poison may be used effectively in barns or other outbuildings, but the odor from the dead animals makes the method impracticable in dwellings. Rats are very resistant to poisons and are also shy about taking poisoned baits. No known kind of poison has proven effective under all circumstances, and a



Fig. 5.—“We won't visit this place again. There's nothing doing here.” Such are the sentiments of these hungry foraging rats which are looking for a free lunch at the boarding house garbage can. The use of a metal garbage can with a tightly-fitting cover reduces the chance of rat invasion in a dwelling.

change in the kind of poison and bait, from time to time, is often desirable. Experience has shown that in general the kinds of bait used are more important than the kinds of poison. Hence, the greatest care should be used in selecting, preparing, and distributing baits. Arsenic, barium carbonate, phosphorus, and red squill are probably the best rat poisons. Strychnine, formerly widely advocated, has not been satisfactory. Phosphorus is somewhat dangerous to use on account of its inflammable character. Arsenic and barium carbonate, while easy to secure, and fairly effective against rats,

are open to objection because they cannot be freely distributed without endangering other creatures.

A simple but effective formula for an arsenical poison follows:

White arsenic	one part by measure
Cornmeal or other meal	eight parts by measure
Sugar	eight parts by measure

Mix thoroughly and place a teaspoonful in each rat runway.

Powdered barium carbonate should be worked into cereal or ground meat bait in the proportion of one part barium carbonate to four parts of the bait. Add sufficient water to make the bait moist. A teaspoonful in each rat runway should prove effective.

Another excellent method of using either of the preceding poison mixtures is to place a little of the mixture in a piece of newspaper or wrapping paper and tie in a small packet. Rats do not hesitate to gnaw through the paper in order to get the poison, and other animals are less likely to get the poison than if it were openly displayed. Such packets should be labelled POISON, and so be less likely to be used accidentally by people. Rat baits should be distributed in the evening so that they will be fresh when the rats are feeding during the night.

Both arsenic and barium carbonate are *dangerous poisons* and should never be placed where there is any possibility of their being inadvertently taken by children or domestic animals. As an antidote for either of these poisons give an emetic of either mustard or salt dissolved in water, or induce vomiting by inserting the finger into the mouth and against the back of the throat. Follow vomiting with a liberal dose of physic. After these first aid measures have been applied, send for the doctor.

Red squill has the great advantage of being almost harmless to human beings and to domestic stock but acts as a specific poison to rats. Its taste is apparently objectionable to most animals and usually inducing vomiting when taken in large amounts. Rats, however, take it freely and do not vomit under ordinary circumstances.

Red squill may be obtained either in the liquid or the powdered form and is effective in either form. The powdered form is more easily handled and keeps better, so it is probably the better of the two for ordinary use.

Red squill may be mixed with any cereal meal in the proportion of one part by weight of red squill to 10 parts of meal. One teaspoonful of red squill to 16 tablespoonfuls of meal is about the right proportion. Powdered red squill may also be placed in a pepper shaker and dusted over slices of fruit or fresh vegetables should such baits be preferred to meal baits. The directions already given for use with arsenic or barium carbonate apply equally well to red squill.

In poultry yards or stables, poison may be placed under boxes having openings at the ends just large enough to admit a rat. A board, set lengthwise against the wall of an outbuilding, with sufficient slant to permit a rat to pass between the board and the wall, offers an excellent place to poison rats or to trap them, as rats are almost sure to use such a runway whenever possible. Such runways should be marked, and unused poison baits should be removed when the work is discontinued.

Trapping

If persistently followed, trapping is one of the most effective methods of destroying rats. The coiled spring snap-traps with a wood or metal base are probably the best. Those made entirely of metal are the most durable.

The wire-cage traps, if of large size and made of heavy wire, sometimes make large catches, although the rats often avoid them entirely. It is generally advisable to cover the traps with a sack or with some hay or straw.

Rats can frequently be caught with the ordinary steel trap, No. 0 or 1. These traps may be set in a trough of water, leaving the pan of the trap exposed for the rat to step upon in crossing or drinking. Narrow runways used by rats, or the board runway mentioned in the last paragraph under "Poisoning" are also good places in which to set steel traps.

The best bait for use with rat traps is usually some kind of food which the rats cannot easily obtain in the locality. Rolled oats or cornmeal scattered on or under the trigger have proven successful. Pieces of wienerwurst or bacon, or a raisin fastened to the trigger make good alternative baits. A slice of apple or peach tied to the trigger is also an effective bait. The bait should be kept fresh and attractive, and the kind of bait changed when necessary. Baits and traps should be handled as little as possible, and the traps should be frequently cleaned. Heating them over a blaze is an excellent method and is very quickly and easily done. Good results cannot be expected unless care is exercised in the choice of location for setting traps, unless baits are changed frequently, and above all, unless *plenty* of traps are used *persistently*.

Fumigation

Rats may be destroyed in their burrows by the use of fumigants. Carbon bisulfid is placed on a wad of cotton or other absorbent material; this is pushed into the burrow, which is then closed tightly with earth. About an ounce of the liquid is sufficient for each burrow. The burrows may have several openings; in which case, each opening must be found and closed. Carbon bisulfid is inflammable and must be kept away from flames. Sulphur dioxide may be used in the same way, but it is slow in action and has not been very successful.

The most effective fumigant is undoubtedly the dust of calcium cyanide. This may also be obtained in a commercial preparation under the name of "Cyanogas."

Calcium cyanide dust is extremely poisonous, and must be handled with care. The dust may be forced into rat burrows or hiding places by means of a portable dusting pump with a hose for insertion into the burrow or hole. In burrows with but a single opening the dust may be placed in a dish or on the ground inside the burrow, and the entrance packed with dirt. The fumes are heavy, and will penetrate the entire burrow. It is very dangerous to breathe the fumes or the dust, which restricts the use of this fumigant to outdoor burrows or openings. It may be used to fumigate corncribs or other grain storage buildings by inserting a pipe or tube into the grain from the outside and pumping in the dust. There is little danger of poisoning the grain in this way, as the fumes are dissipated in a few hours, and the dust left as a residue is non-poisonous.

The U. S. Bureau of Biological Survey in a recent news report advise that the extensive use of calcium cyanide fumigants be attempted only by pro-

fessional vermin killers. Nevertheless, its use in certain circumstances by responsible men need not be particularly dangerous.

Other Methods

Dogs, especially the terriers, may be trained to hunt rats, and some become very efficient as rat catchers about stables and feeding pens. Very few cats become really good rat catchers, and frequently rats and mice swarm in the same building with several cats. Cats in general seem to prefer young birds or chickens to rats, or are too lazy to catch anything for themselves. Ferrets have not been very effective rat destroyers in America, as their use requires a great deal of experience and usually involves the use of trained dogs to work with the ferrets. Rat viruses or bacterial diseases are sometimes useful, although they are expensive, uncertain, and have little if any advantage over the common poisons. Some States have prohibited the use of such methods because of possible danger in causing human disease. The wild enemies of rats, snakes, hawks, owls, weasels, and skunks, cannot be relied upon to control the rats, although they undoubtedly do assist in reducing their numbers in the fields and open places. Many compounds are said to be distasteful to rats because of their odor, and these may at times prevent rats from reoccupying deserted burrows, but on the whole the use of such compounds will not prove of very much value.

Control of House Mice

House mice may be controlled by the same methods which are successful against rats. Mice are much smaller than rats and therefore all doors should fit very tightly especially at the bottom. Mice and rats frequently enter houses under basement doors, and then pass from room to room under other doors. House mice are more easily poisoned or trapped than are rats. The same poisons may be used for both. The best traps for mice are inexpensive snap mouse traps.

In conclusion, it may be stated that the best results in rat or mouse eradication can be obtained only by community action. The general rat-proofing and mouse-proofing of buildings, the sanitary disposal of garbage and waste materials, and the removal of breeding places outside of buildings are all matters for concerted community cooperation. However, any building can be kept free from the pests by proper construction combined with care and perseverance in trapping and poisoning. More detailed information regarding the control of rats and mice can be obtained from Farmers' Bulletin No. 1533, *Rat Control*; and Farmers' Bulletin No. 1638 on *Rat Proofing Buildings and Premises*; published by the U. S. Department of Agriculture, Washington, D. C.