Rat Extermination Urgently Necessary

Various Methods of Killing Recommended are Very Effective in Conjunction when Concerted Campaign is Launched

The rat is a great nuisance, but not a necessary one. He can be got rid of by concerted action and can be fought and kept within limits even by individual action. If means for the control of the pest are not taken, the rat's fecundity, combined with an increase of his food supply and hiding places as population becomes denser, will most certainly result in his becoming nothing less than a national menace. Indeed, he is that already and rats do an incalculable amount of damage wherever food is produced, stored or transported.

The various means at man's disposal for combatting this cunning and prolific rodent are:

A. The encouragement of the rat's natural enemies:

(1) Domestic animals, *e.g.*, cats, terriers and ferrets.

(2) Wild animals, *e.g.*, owls, hawks, snakes, weasels, etc.

As to cats, the ordinary pampered house pet is useless as a rat catcher, while a semi-wild cat is liable to be dangerous to game, poultry and small insectivorous birds. Nevertheless, the fact that the cat has been associated with man since the days of ancient Egypt shows that, on the whole, it has been found more beneficial than harmful. Terriers are commonly used by professional rat catchers and can be trained to be exceedingly expert. Female ferrets are used—the males being too large—to enter the holes of rats and either drive them forth or destroy them there.

It is strange that, though man harbours the cat, he should generally show such an antipathy to small wild carnivora. Few creatures are more beneficial to man than the owl. He preys principally on rats, mice, gophers, squirrels and other noxious rodents. The damage he does to poultry is negligible. Even the hawk, though he does take a chicken occasionally, does infinitely more good than harm. Only the Sharp-skinned and Cooper's hawks and the Goshawk are exceptions to this rule. The weasel and his congeners may indeed wreak sad havoc in a poultry-house, yet, if proper precautions are taken, they can be excluded and their bloodthirsty inclinations turned against vermin. As to snakes, the common species found in Canada are all non-poisonous. They certainly destroy many field mice and, if given a chance, there is no reason why they should not be valuable allies against rats.

B. Traps.

Rats are exceedingly cunning creatures and no trap has yet been devised which has been more than temporarily successful in any one locality. No doubt many rats can be caught with them by a skilful man, but, as a means of extermination, they are not to be seriously depended on.

C. Poisons, *e.g.*, arsenic, strychnine, squills, etc.

Mr. E. G. Boulenger, Curator of Reptiles, Zoological Gardens, London, states that, to kill rats, he has obtained the most satisfactory results with squill poison, which, in the small quantities necessary for rat destruction, is harmless to domestic animals. It is best used by soaking bread in a solution of the poison mixed with milk. Barium carbonate, of which 1½ to 2 grains kill a rat, though 10 to 15 grains are harmless to a chicken and 100 grains to a dog, is next best. It should be mixed with tallow and smeared on bread as it makes the rats thirsty. It can be used effectively with squills. After it has been put down, bowls with squills and milk should be placed where the rat will go to drink.

Strychine is too dangerous for general use. Phosphorus and arsenic are also very dangerous, and are less successful than squills and barium carbonate.

Since the war, the suggestion has been made that poison gas should be employed against rats. No doubt this would prove very effective in confined spaces, such as cellars and the holds of ships.

D. Bacterial cultures.

In Denmark, where a vigorous, national campaign has been waged against rats, a virus discovered by Dr. Neumann, of Aalborg, has been found very efficacious. Cultures of Neumann's bacillus are put up in tins under the name of "ratin". It is simple to use and has been found to be an attractive bait. Its harmlessness to domestic animals has been demonstrated. Among rats, however, except in isolated instances, it produces a virulent epidemic, with a very high mortality. Experiments with this culture in Scotland, Germany, and India are also reported to have proved satisfactory.

Rabbit Rearing a Neglected Resource

Rabits are as Profitable as Poultry and can be Raised in the City and on the Farm

Rabbits are valuable for their meat and for their fur. Their flesh is wholesome and tender and, when properly cooked, it is difficult to distinguish it from chicken. Not only are their pelts dyed to imitate more expensive skins, but those derived from some of the more handsome breeds are used in their natural colour. Rabbit fur is moreover, extensively employed in the manufacture of hatters' felt.

In northern France and Belgium, rabbits are as commonly kept on farms as poultry. It is therefore, only natural that several of the best utility breeds should have been developed in that part of the world. Enormous quantities of rabbits are consumed every year in England; indeed, the home supply has to be greatly supplemented by imports from Australia.

In cities, pigs are objectionable because they are malodorous and chickens because they are noisy; rabbits are clean and quiet, as well as easily kept. True, they will not devour the house garbage in any considerable quantity, nor is it good for them, yet they can be cheaply fed. They will eat many weeds, such as dandelions, couch grass, shepherd's purse, vetches and plantain. From the table they can be given the leavings of cereals, cooked potatoes, and milk. But their staple diet should be hay, wheat or oat straw, clover and carrots.

Rabbit hutches should be divided into a sleeping chamber, which should be tight and free from draughts, and a more open space, protected by wire netting. A small hutch may have a floor space 6 feet by 2 feet and the floor should be raised off the ground. For larger rabbitries, courts are used; these may be either paved or grass courts surrounded by a fence sunk deeply enough into the ground to prevent the animals burrowing out.

Boys and girls generally take an interest in feeding and caring for these animals. Work of this kind would have an educational value and would have the further merit of enlisting the sympathies of the younger generation in the campaign for greater production. Rabbit-rearing on a more extensive scale can also be made a profitable occupation for adults.

Future of Pulp and Paper Industries

Depletion of Supplies Already a Grave Problem—Practice of Forestry Essential

While there will inevitably be a large development of the pulp and paper industry in the Rocky Mountain states and a great increase of existing developments in the Pacific Northwest, including particularly Oregon, Washington, and British Columbia, pulpwood supplies in Eastern Canada and the eastern states will always have the material advantage of higher value, owing to proximity to the great centres of population, with consequent saving in freight rates upon the manufactured products.

Authorities in Canada are already becoming alarmed at the increasing difficulty of securing, in the eastern provinces, adequate supplies of pulpwood readily accessible to existing developments Already, in too many cases, pulpwood placed in the water for driving does not reach the mill until the second year after cutting. This adds to the cost of transportation and to loss by sinkage *en route*, and is inevitably reflected in higher prices to the consumer.

Great areas of the most accessible pulpwood lands have been so denuded by wasteful methods of logging and by fire, that they are now in an absolute or relative condition of unproductiveness. This is exactly the reason why the pulpwood supplies of the eastern states are so near exhaustion that many mills are largely dependent upon imports from privately owned timber lands in Canada. This heavy exportation from private lands in Canada of course correspondingly decreases the supplies that would otherwise be available for manufacture in Canadian mills.

It is obviously of the greatest importance to Eastern Canada that its great pulp and paper industries shall be permanent, rather than transitory, as is proving to be the case in the eastern states. To accomplish this end, however, it is necessary to make fully effective the view point that the forest is a crop, which can, with proper care, be produced time after time upon the same land. This means the practice of forestry.—*Clyde Leavitt*

Misleading Reports about Water Powers

Instances of Contradictory and Exaggerated Reports on Power Possibilities—Methods Employed in British Columbia

In an official report descriptive of certain areas in British Columbia, occur two references to Long river, tributary to McLeod lake. One explorer characterizes it as "a large stream" with "an enormous amount of power," while the other explorer states that it is "a small stream" and that "there is not sufficient water to use this for power purposes."

An engineer of the Ontario Hydro-Electric Power Commission was told by prospectors that the falls on the Kawashkagama river were capable of developing 30,000 h.p. at low water, and a surveyor assured him that the Kawashkagama would yield as much power as the Kaministikwia. Accordingly, the engineer undertook a hard journey to investigate but found only 317 h.p. instead of the 30,000 h.p. reported.

These instances demonstrate the great importance of accurate data respecting water-power possibilities. It is also necessary that judgment be not formed on measurements taken during high-water stages. For this reason, the field engineers of the Commission of Conservation, engaged in compiling data for the report on "Water Powers of British Columbia," were not sent out when the streams were either at or near their flood stages. The effect was to curtail the season during which investigations could be carried on and thus to delay the publication of the report but, as over-estimates, occurring in an official report dealing specifically with water powers, would be particularly dangerous, it was a case where time had to be sacrificed to accuracy.

CENTRAL POWER STATIONS

The present coal consumption, *for power purposes*, in the United Kingdom is at least 80,000,000 tons yearly. By proper co-ordinated and centralized systems of power production and distribution for the whole country, it is estimated that 55,000,000 tons of coal per annum might be saved, in addition to other important advantages.