

milk has brought into prominence the following questions: Where are the sources of milk-infection to be sought for? How are the physiological influences of the bacteria to be checked—or, in other words, how can milk, which so readily spoils, be rendered proof to injurious influences? Besides the micro-organisms of a harmful character, there must be others possessing useful properties; and, indeed, the bacteria which produce lactic acid, having proved to be of this kind, now play an important part in the production of butter.

The reply to the two questions stated above was, for the collection and further treatment of milk, conclusive from a hygienic point of view. Cleanliness in every respect and every manipulation of the milk, till it reaches the consumer, is the first and most important principal for obtaining milk which will keep. Cleanliness on the part of the staff of the dairy in their clothing, which should be adapted to the work, and a perfectly sound constitution on the part of every milker are points not to be overlooked. Before milking, the udder and adjacent parts of the belly should be rubbed with a damp linen cloth, and all necessary utensils, perfectly clean, having been put in their proper places, the hands of the milker must be carefully washed, before the milking of every cow, with lukewarm water and soap. Milking must be done with dry hands only; wetness of the hands must, owing to facility of infection, be absolutely avoided. The first three or four jets should be thrown out. The milk, when obtained, must at once be removed from the dangerous atmosphere of the cowhouse, brought into an airy room, and strained to free it of foreign bodies. The feeding of the cows at milking time must in any case be prohibited, the fodder being rich in micro-organisms capable of destroying the keeping qualities of the milk; and the carrying out of dung at that time is equally unallowable.

The stabling should be so arranged that fresh air can always enter and polluted air go out, that sufficient light is always to be had, and that the foundation of the cowhouse is not exposed to the penetrating wet. Care must further be taken to remove animal excrements from the air of the cowhouse as soon as possible. The stall for each cow must be sufficiently large, and the animals must always have enough pure water as they require it. Cleanliness and care in every point connected with the stabling are the chief necessities for obtaining milk which will keep well and be hygienically unexceptionable.

In the dairy the milk should be cooled as much as possible, either with water in a cooler or by means of machines; the cooler the milk is when put into the transport cans, the cooler it reaches the consumer, and the greater the guarantee for its keeping well. To preserve the milk, heat may be employed as well as cold; it may be pasteurised at 80-85° C., or sterilised at 98° C., perhaps at 100° C. or upwards. Both the latter methods produce more or less change in the raw milk; the albumins coagulate, the dissolved calcium salts are precipitated, the milk sugar is caramelised, the milk acquires a disagreeable taste, and its utility for cheese-making purposes is much decreased, while its marketable quality is lost. Perfectly sterile milk can only be procured under pressure, at a temperature of over 100° C., and is chiefly valuable for scientific investigations.

SUPPRESSION AND EXTIRPATION OF RABIES.

By Professor M. CASPER, M.D., Breslau.

THE question of checking rabies has not come into discussion since the second International Veterinary Congress at Vienna in 1863. At that Congress, the committee resolved "*That the introduction and strict execution of a rational supervision of dogs was the surest means of preventing and ultimately*

extirpating rabies, and that, consequently, the institution of such a supervision, as far as possible uniform, in the different countries was to be desired."

The plan proposed by the present writer for such a supervision of dogs was accepted by the Congress in the form returned in the chief report.

The question of suppressing rabies has not come into discussion at any subsequent Congress. This may be ascribed to the number of cases of rabies having markedly decreased till about the middle of the ninetieth year (1994), and to the opinion prevailing, that the disease could be limited, and finally extirpated, by means of the existing legal regulations. But *from the middle of the ninetieth year* there was, in almost all countries, *a grave increase* in the numbers to record; so that at present (except in Great Britain and Switzerland), rabies prevails to a disquieting extent.

The present writer gives, from carefully compiled tables, a view of the numerical distribution of lyssa in the different countries, and of the prevalence of rabies cases among animals within the last decades. The most exact figures relating to all sorts of domestic animals are those returned from the German Empire and Hungary. In Prussia, as the statistics show, *the Eastern Provinces, especially the districts on the Austrian and Russian frontiers*, have long been the most infested with hydrophobia; furthermore, those districts of the Kingdoms of Saxony and Bavaria which lie on the frontier of Austria are also much infested.

According to statistics, *France, Hungary, and Germany* are next to be regarded as much infected. Hydrophobia is exceedingly prevalent in Russia, but exact statistics for that country are not to be had. Austria, especially Bohemia and Galacia, Belgium, Italy, Spain, and Roumania have also numerous cases of rabies to report.

In Great Britain of late years the number of animals affected by rabies has been continually decreasing; this is to be attributed to stringent regulations and a special law, forbidding the import of dogs except under six months' quarantine.

In the suppression of rabies, the tasks incumbent on the veterinary police are, to lessen as much as possible the chance of infection among men and animals, thus limiting the dissemination of hydrophobia; and to destroy the sources of contagion. The dog is notoriously the chief disseminator of rabies; the danger of infection with this disease would therefore be most surely removed if it were possible to send every dog out of the world. As this is not practicable, and as the proposal made by some, to submit all dogs to obligatory protective inoculation, is also, for reasons fully gone into by the present writer, impossible to carry out in practice, we must content ourselves with those measures which tend, firstly, to *decrease the number of dogs* as much as possible, and, secondly, to limit their *uncontrolled roamings* and their *opportunities for biting*. To attain the former object, we have the dog-tax in connection with a control of dogs, while biting and roaming about at will may be limited respectively by the *muzzling order* and *confinement*, or *leading with a string*. In addition to these general regulations, special provisions should be put in force whenever required by the presence of the epidemic, as provided in the *laws relating to Infectious Diseases*.

The Dog-Tax.—The dog-tax has been generally introduced into several countries, while in others its adoption is a matter for local authorities. The imposition of a *general dog tax, sufficiently high*, produces an effectual diminution in the number of dogs. But it is only effectual when sufficiently high and connected with official control of dogs, so that evasions may be punished. Experience has shown in many countries that the dog-tax there was too low, and had only a passing effect in decreasing the number of dogs (England, France, Prussia, Saxony, Baden). The best effects of the dog-tax are to be recorded for Bavaria, as the present writer shows in detail.

The Muzzling-Order.—The muzzling-order is an important and excellent means of suppressing rabies; when properly drawn up, it prevents biting, and therefore the possibility of infection of men and animals. The objections urged against the muzzle are unjustifiable. As with the dog-tax, so success attends the muzzling-order only when the regulations are strictly carried out; when all dogs encountered without a muzzle are impounded, and either confined or destroyed.

Obligatory muzzling, on the appearance of epidemic hydrophobia, has everywhere been always attended with favourable results; as is shown fully by examples from Berlin, Wurtemberg, and Saxony.

Legislative Regulations at Periods of Prevalence of Hydrophobia.—Most civilised states possess laws for the suppression of animal epidemics, which laws coincide in the essential points. The chief points of the regulations for the suppression of hydrophobia, current in the German Empire, are the following:—

1. *Obligatory Notification* by owners in case of hydrophobia or suspicion thereof.
2. Measures before the action of the police; confining or killing of the rabid or suspected dog or cat
3. Police ascertainment of the fact of an outbreak.
4. *Keeping dogs in confinement.*
5. Compensation for domestic animals destroyed by order of the police (but not for dogs).
6. Institution of penalties.

The success of the law relating to infectious diseases varies in the different countries. In *Germany* the legal provisions have on the whole proved adequate and effective; this is illustrated by several facts. Only in the border districts do cases of hydrophobia, due to the entrance of rabid animals from neighbouring countries, continually recur.

The results of legislative enactments would be decidedly more favourable still, if the regulations were carried out with sufficient strictness. The fault of this lies partly with the public, partly also with the executive.

That hydrophobia can be successfully combated by energetically carrying out the police regulations, while on the contrary their neglectful execution entails the wider spreading of the epidemic, is most obviously shown by the history of hydrophobia in England and in Paris (here the writer goes into full particulars).

The question now arises, what regulations to adopt against hydrophobia from the point of view of international suppressive measures against epidemics, so as to limit and finally to extirpate it; and whether, and if so how far, existing enactments need improving.

As the *first requirement* it can hardly be sufficiently emphasised that *suppression in every country* should be based on the same principles, and carried out with the same strictness. Particularly against rabies is no Continental country capable of protecting itself, since it is impossible to keep it out at the frontier.

The duty of compulsory notification, hitherto prescribed only for cases of rabid or suspected dogs, must be extended to include cases of animals bitten by such dogs. Not only the owners, but all persons having any knowledge of the case, must be obliged to notify.

Finally, it is to be considered whether the legal limitation of the cordon to 4 km., and of the duration of quarantine to three months, is not too narrow.

The writer, on the grounds he has explained, proposes the following final resolutions:—

- I. Measures for the suppression and final extirpation of rabies in a

Continental country can only be successful when the veterinary police protective regulations in neighbouring countries are also adequate and strictly executed. It is therefore urgently necessary that the action of the veterinary police in all countries, with regard to hydrophobia, should be based on the same principles.

II. Compulsory notification, hitherto held necessary only for cases of actually rabid or suspected animals, must henceforth be extended to animals bitten by rabid or suspected dogs. This obligation shall be incumbent, not only on the owners, and on all persons included under Section 9 of the law of Infectious Diseases, but also on all such persons as know that animals have been bitten by such dogs.

III. It is to be considered whether it be not desirable to extend the quarantine for dogs to a wider space than hitherto, and to a longer time than three months.

IV. It is desirable that a law, equally valid in all countries, and strictly executed, should be introduced, for the control of dogs; and that this law should contain the following provisions:—

1. Every dog in town or country, without exception, is to be registered, and entered in a list for assessment.

2. All dogs registered are to be provided with a badge on the collar, such badge bearing the name of the owner and the dog's number in the assessment list.

3. All dogs are to be provided with a well-fitting muzzle, so constructed as to render biting impossible, but not preventing them from eating and drinking.

4. Dogs without badge or muzzle are to be impounded, and, unless claimed within a certain period, destroyed.

RULES FOR JUDGING THE REACTION TO MALLEIN.

By M. J. TÁTRAY, Veterinary Inspector, Budapest.

IN the task of accomplishing a total extirpation of glanders in infected studs, and that in the shortest time and at the smallest material sacrifice, mallein, as a means of diagnosis, plays an important part.

It has been found by practical experience that concealed glanders may develop into the pronounced form in an infected horse within six months following the infection.

This circumstance, as well as the necessity of establishing a diagnosis for animals suspected of suffering from glanders, rendered necessary, in Hungary, the ministerial ordinance, whereby the mallein test must be made in the infected studs by employés of the State.

This decree provided, according to the circular ordinance of the Minister of Agriculture in 1900, No. 4000, that suspected animals, in case the mallein reaction were found to occur, were at once to be destroyed; while, in case it did not occur, they escaped quarantine, with this limitation, however, that they might not for sixty days be sold into any other district. The animals reacting uncertainly must, in extended quarantine, be treated with mallein a second time after sixty days, and eventually a third time after a further sixty. At present, however, a third mallein test is never undertaken, as animals giving the typical reaction are destroyed—seldom after the first mallein test merely,