An enquiry into the origins of the two cases of rabies infection confirmed in October and November 1969.

Ministry of Agriculture, Fisheries and Food.
Department of Agriculture and Fisheries for Scotland

An enquiry into the origins of the two cases of RABIES INFECTION confirmed in October and November 1969

Animal Health Division,
Hook Rise South,
Tolworth,
Surbiton,
Surrey

December 1969.

Price 6d. (2½p.) Net.

RABIES INVESTIGATION

Report on the detailed investigation into the circumstances in which the dog owned by Mrs. Hemsley of Kings Ride, Camberley, Surrey, contracted the rabies infection from which it died during the night of 17th-18th October, 1969, and also the circumstances in which the dog owned by Major Stapleton of Worthydown, Hampshire, contracted the rabies infection for which it was destroyed on 13th November, 1969.

Introduction

1. We were asked to enquire into the origin of the case of rabies in a dog at Camberley, Surrey, which was confirmed on 18th October, 1969. To this end we visited the Federal Republic of Germany, where the affected animal had been kept during the six months prior to its importation, and had discussions with veterinary officials of that country. We also visited the quarantine kennels at Caesar's Camp, Folkestone, where the dog underwent the statutory six calendar months' quarantine. To obtain up to date overall information on the epidemiology and control of rabies we visited the Headquarters of the World Health Organisation in Geneva and had discussions with public health veterinarians who are specialists on the disease. Current virological research was discussed with the Director of the Animal Virus Research Institute in this country and with the Director of the Federal Institute for Research on Animal Virus Diseases of the Federal Republic of Germany.

2. Whilst carrying out these enquiries a second case of rabies was confirmed in a dog which was nearing the end of its six months' quarantine period. This case occurred in the same kennel block at Caesar's Camp, Folkestone, in which the Surrey dog had been confined during its quarantine period. This dog was also imported from the Federal Republic of Germany. We were also asked to report on the source of infection in this case.

3. In our report we describe the disease, its history in this country and give a summary of our present quarantine regulations; this is followed by a history of the two cases, the results of our investigations, and our conclusions.

Rabies: The Disease

4. Rabies is a disease of widespread distribution affecting many species, with dogs, foxes, bats and carnivorous wild animals being of importance in the epidemiology of the disease especially as regards the hazard presented for man and his livestock. The disease is caused by a filterable virus which has a predilection for tissue of the nervous system with involvement of the salivary

glands with virus excretion in the saliva. Disease is transmitted to other individuals by the entrance of infected saliva into their tissues through wounds or abrasions. Generally this is accomplished through bite wounds but infection may also occur through contamination of existing wounds with saliva containing virus. The virus then spreads from the site of infection along the peripheral nerve routes towards the central nervous system.

5. There is evidence that, under exceptional conditions, the disease may be transmitted by non-bite routes. Work carried out in the United States of America has shown that infection may spread amongst susceptible wildlife species when in confined conditions conducive to high concentrations of virus being reached. The best known examples of this are the experiences recorded in the limestone caves in Texas which are inhabited by very large colonies of bats affected with rabies. Man, coyotes and foxes have all become infected in these caves under conditions excluding the possibility of transmission by bites. It is of note, however, that four dogs and four cats exposed in the same way did not become infected.

6. It has been demonstrated by several workers that virus may be present in the saliva of an infected animal for some days before recognisable signs of the disease appear. Although virus has been isolated from urine, the evidence is conflicting as to its importance in the epidemiology of the disease.

7. The virus outside the host animal is easily destroyed by sunlight and heat and its infectivity is quickly lost when exposed to ordinary environmental conditions, so that unless infected saliva is quickly brought into contact with broken epithelium of a susceptible animal the disease is unlikely to be transmitted.

Incubation Period

8. The incubation period varies widely in all species. Experimentally it has been shown that the period of incubation varies inversely with the amount of virus received and this, no doubt, is also a factor in the natural disease. In addition, bites by infected animals in the region of the head and neck, particularly those which result in severe lacerations, are likely to have a higher rate of infectivity and a shorter period of incubation than those which occur on other parts of the body. Although under these circumstances the incubation period may be as short as three to six weeks, longer periods are not infrequent; in rare instances periods of six months or more have been recorded.

Rabies in Great Britain

9. No statistics of the incidence of rabies in Great Britain are available until after the introduction of the Rabies Order in 1886, but there are various references to the frequent occurrence of serious outbreaks in the eighteenth century. After 1886, 1,583 cases were confirmed in dogs and other animals in this country before the disease was eradicated in 1902. For the next sixteen years Great Britain was free from the disease. Towards the end of the First World War, rabies was reintroduced into Great Britain, it is thought by a dog smuggled in from abroad. It was not until 1922, and after 319 cases of the disease had been confirmed, that rabies was again eradicated. Since 1922, in nearly 100,000 animals imported under the regulations controlling the importation of dogs and cats, 27 cases of rabies have been confirmed in quarantine premises; in two of these cases the disease appeared after the elapse of the statutory six months' period (Appendix C, cases 6 and 16), and two other cases were detected just prior to the end of the period (cases 20 and 27); the only case to have occurred outside of quarantine is that of the dog in Surrey, which had been released one week prior to development of the disease. These statistics do not include a case of rabies in a Rhesus monkey imported for medical research in November 1965 and which died in January 1966.

Quarantine Requirements in Great Britain

10. Under the existing regulations, the Importation of Dogs and Cats Order 1928, all dogs and cats and exotic canines and felines imported into Great Britain are subjected to six calendar months' quarantine in approved premises which must be in the occupation of, or under the control of, a veterinary surgeon. Special provisions are made in respect of performing animals. Intending importers apply for the issue of an import licence to either the Ministry of Agriculture, Fisheries and Food Headquarters at Tolworth, or, if the animal is to be landed in Scotland, to the Department of Agriculture and Fisheries in Edinburgh. On receipt of the application the kennels nominated by the importer are asked if they are prepared to accept the dog or cat and when written acceptance is received by the Ministry or Department, an import licence is duly issued. Arrangements must also be made for an approved carrying agent to meet the imported animal at the port or airport and convey it direct to the quarantine premises in an approved container. The animal, on arrival, is examined by the veterinary surgeon in charge of the quarantine premises and he then reports its arrival and state of health to the Ministry or Department. Daily visits, except Sundays, are made by the veterinary surgeon in charge to the quarantine premises and any ill-health must be

immediately reported to the Ministry or Department. The veterinary surgeon is also required to make a weekly report to the Ministry or Department giving details of all dogs and cats held in the quarantine premises. Inspections are made by veterinary officers of the Ministry or Department at least once a quarter. A summary of the present standard requirements for approved quarantine kennels and the conditions to be observed by veterinary surgeons in charge of quarantine premises is at Appendix A.

The Case of Rabies at Camberley, Surrey

11. On the 14th October, 1969, an officer of the Royal Army Veterinary Corps, residing in Camberley, reported by telephone to the Animal Health Division at Guildford that he suspected a 2½-year old terrier to be affected with rabies. The animal was being held in his house. The dog, owned by a neighbour, Mrs. Hemsley, had been imported from Bielefeld, in the Federal Republic of Germany, on 4th April, 1969, and entered the quarantine kennels at Caesar's Camp, Folkestone, the same day. Throughout the whole of the six calendar months' quarantine period the animal, hereafter referred to as Fritz, remained healthy and was duly released on 4th October, 1969. At the routine veterinary examination of the dog the day before its release, on 3rd October, it was found to be healthy. Whilst in the quarantine kennels, the dog had continuously occupied one compartment of a range of thirty adjoining compartments, and was exercised in pens on the opposite side of an access corridor. A sketch plan of the range of kennels and exercise pens is attached at Appendix B.

12. For the first few days after its release from quarantine, Fritz behaved normally but, on the 11th October, seven days after its release, it was noted by its owner to be behaving in a peculiar manner. It hid itself under a bed and refused to come out. When dragged out from its hiding place, Fritz appeared to be semi-paralysed in its hind legs. It also refused all food and water. On the following day, the 12th October, it showed some improvement, taking a little food but refusing water. On the 13th October it became very excited, the sound of its bark had changed and it exhibited very aggresive tendencies. On the 14th October, at about 7.45 a.m., Fritz escaped from the house of its owner, killed a cat owned by a neighbour and, after biting the boot of a milkman, ran off and disappeared. At 8.35 a.m., some 50 minutes later, Fritz was seen climbing into a taxi full of school children. The owner recovered the dog from the taxi, being bitten in the hand and leg in the process, and held it until it was removed to the house of the Army veterinary officer who reported the case.

13. On examination by a veterinary officer of the Animal Health Division, the tentative diagnosis of rabies was confirmed. As there was no satisfactory means of detaining the dog at Camberley arrangements were made to move it in a nose and paw-proof crate to quarantine kennels at Hackbridge, Surrey, where it was isolated in a locked kennel in a locked building and was the only animal in that building. On the following day the dog was again seen by a veterinary officer, who reported that the dog exhibited all the classical symptoms of furious rabies, being violently aggressive, with dilatation of the pupil and refusing food and water. It was found dead on 18th October and the carcase was taken to the Central Veterinary Laboratory, Weybridge, for post-mortem and laboratory examination. The diagnosis of rabies was confirmed.

Confirmed Case of Rabies in a 4-year old Black Labrador dog whilst undergoing quarantine at the Quarantine Kennels, Caesar's Camp, Folkestone, Kent.

14. The dog, hereafter referred to as Whiskey, entered quarantine on 16th May, 1969, from Celle, near Hanover, in Western Germany. On 11th November, the dog appeared to be stiff while in the exercise run and later in the day muscular tremors were observed in the shoulder region with some inco-ordination of movement. Although it ate and drank, rabies was suspected. The following day the dog showed similar clinical signs as on the previous day, but with some restlessness and excessive panting. Within the next 24 hours the dog was unable to eat and at the owner's request was destroyed that day, 13th November. The diagnosis of rabies was confirmed on 15th November, following post-mortem and laboratory examination at the Central Veterinary Laboratory. Throughout its quarantine period the dog was held in the same compartment which was in the same block of the kennels in which Fritz had been held during its quarantine period.

Possible Sources of Infection of the Camberley case of Rabies confirmed on 18.10.69 (Fritz) and the case in Quarantine Kennels confirmed 15.11.69 (Whiskey), both dogs having been imported from the Federal Republic of Germany.

15. The sources of infection in the case of these two dogs imported from Germany would normally be expected to be by direct contact with a rabid animal in that country in which, during recent years, there has been a high incidence of rabies. This possibility has been investigated and will be discussed. In view, however, of a dog imported from India dying from rabies in the quarantine kennels during the period of detention of Fritz and Whiskey, we have also investigated the possibilities of direct and of indirect trans-

mission of the disease within the kennels.

The possibilities of direct contact in Germany in the case of Fritz

16. The dog Fritz, a cross-bred terrier, was bought as a puppy in Germany and from 1st October, 1968, was kept by its owner and her husband in officers' quarters of the British Army at Bielefeld, a town of some 100,000 inhabitants midway between Dusseldorf and Hanover.

17. We have been impressed by the statements of the owner's husband that the dog had been kept under close surveillance and was restricted to the vicinity of their home. The dog was taken outside the Bielefeld area on only a few occasions and at no time did there appear to have been an opportunity for it to have been in a situation in which contact with a potentially dangerous animal was probable. The potentially dangerous animals in Germany, as far as rabies is concerned, are principally foxes, the disease being essentially one of wildlife with dogs being only relatively infrequently infected.

18. The German Veterinary Authorities have informed us that there has been no case of confirmed rabies in Bielefeld since 1964. The town is part of the administrative region of Detmold, and in that region from 1st October, 1968 to 30th April, 1969, twelve cases of rabies were confirmed, nine in foxes, one in a marten, one in a deer and one in a dog. Within a 50-mile radius of Bielefeld, 74 cases of rabies were confirmed between 1st October, 1968 and 30th April, 1969. The information which we have obtained does not suggest any connection between the movements of Fritz and the places where these cases occurred. As, however, this is a region where rabies is prevalent, the possibility cannot be excluded of undetected cases occurring at any place, especially in wildlife.

The possibilities of direct contact in Germany in the case of Whiskey

19. The dog, Whiskey, a black Labrador, had been kept by its owners for the six months prior to its importation in a small village in the neighbourhood of Celle, which lies some 20 miles N.E. of Hanover. The owners have stated that the dog was allowed to roam freely, being on occasions away from home for several hours. During the period 1st October, 1968 to 30th April, 1969, ten cases of rabies were confirmed in the administrative area of Celle, namely 5 in foxes, 2 in cats, one in a badger and two in species not named. There would, therefore, appear to have been opportunity for Whiskey to have been in contact with a rabid animal within a short period of time prior to its importation into this country.

Possibility of transmission of Rabies within the Quarantine Kennels

20. The quarantine kennels at Caesar's Camp, Folkestone, have been approved as quarantine premises for over thirty years. At present it has quarantine accommodation for 108 dogs and 24 cats and separate boarding accommodation for 20 dogs. Occasionally when the boarding section of kennels is full local dogs are boarded in the quarantine section of the kennels. Whilst there, they are subject to the same conditions as quarantined animals.

21. The kennels are under the direct charge of Mr. M. R. Dexter, M.R.C.V.S., and are owned by Mr. and Mrs. Ruthwell who employ seven kennel maids. All the kennel maids have been employed by Mr. and Mrs. Ruthwell for a considerable time and the girl mainly responsible for the care of the dogs in the block in question has been their employee for seven years.

22. We were informed that the daily routine at the kennels is as follows:-

8.00 a.m.	Dogs let out for two to three minutes.
8.00 a.m. to 10.00 a.m.	Cleaning routine and general kennel duties
10.30 a.m. to 12.00	Feeding
12.30 p.m.	Exercise of dogs
2.00 p.m. to 6.00 p.m.	General kennel routine, including exercising, cleaning feeding bowls, cleaning kennels, etc.

It should be noted that normally only one attendant is in any one block of kennels at any one time, with handling of dogs restricted to one at a time.

23. The block of kennels in question comprises 30 compartments and an access corridor; seven outdoor exercise pens open off this corridor and thus relate groups of from two to six compartments to each pen. One dog from each group of compartments is, in turn, taken to the opposite exercise pen and the door of the exercise pen closed. The dog may or may not be leashed depending upon its familiarity with the routine. This procedure starts with one and is worked serially through the other six groups, one dog at a time. Thus up to seven dogs, each in its own separate exercise pen, are being exercised at any one time.

24. After exercise, which is normally provided some five or six times a day, the dogs are returned one by one to their own compartments, the compartment door closed, and the next dog in each group led out to exercise. At times, when one group of compartments contains a maximum number of dogs and another fewer than the maximum, then a dog from one group may have

been taken to an exercise pen other than that one opposite its group of kennels.

25. The possibility of transmission of rabies within the quarantine kennels must be considered in view of the occurrence of a case of rabies during the period of detention of Fritz and Whiskey, Fritz entered quarantine on 4th April, 1969, and Whiskey on 16th May, 1969. On 26th July, 1969, a collie dog which had been imported from India on 17th April, 1969, and held in the same block of kennels died after showing clinical signs of rabies for six to seven days. The diagnosis was confirmed following post-mortem and laboratory examination at the Central Veterinary Laboratory on 28th July, 1969. Enquiries were made at that time by veterinary officers of the Animal Health Division as to the possibility of direct contact having occurred within the kennels between this dog and any other animal. Intensive questioning of all employees and the veterinary surgeon in charge of the quarantine kennels revealed no suggestion that direct contact had taken place. We have also visited the kennels since Fritz died of the disease and have made further enquiries as to the possibility about direct contact. The construction of the kennels and the system of management would, in our opinion, prevent direct contact between dogs, except as a result of a deliberate action by an individual in contravention of the regulations. We have formed the impression that there is absolutely no reason to suspect that this had occurred.

Possibilities of indirect contact in the Quarantine Kennel

26. The whole system of management of quarantine kennels for the prevention of the introduction of rabies into Great Britain has been based on the universally accepted view that the bite route is essential in dogs and cats for the transmission of the disease. There is opportunity for indirect contact within any quarantine kennel. Exercise runs are used consecutively by a number of dogs and are not cleansed and disinfected between each dog; only faeces are removed. Grooming tools may not be reserved specifically for any one animal and although food and water bowls are washed daily in a disinfectant solution, they are not necessarily returned to the same animal. In addition, one kennel attendant deals with a number of dogs and contamination of hands and clothes could occur.

27. The occurrence of a case of rabies in a dog in the quarantine kennels clearly provides opportunities for the kennel compartment, the drainage channel, the corridor, the exercise pen, the kennel utensils, etc., to become contaminated. It has, however, never been considered necessary to avoid such contamination taking place in view of the hitherto absence of evidence that it might be of importance in the transmission of rabies. We are unable,

therefore, to conclude unreservedly that indirect transmission of the disease was responsible for the infection of Fritz and Whiskey, as there appear to be no records in any country of indirect transfer of rabies infection occurring in dogs. Indirect transmission is known to have occurred in other species (see paragraph 5), which it may be assumed are more susceptible to rabies infection than the dog. In such a biological situation resistance or susceptibility is dependent upon the balance of the host/virus relationship. Any increase in virulence of a strain of virus capable of infecting, say, the more susceptible fox, might well prove capable of infecting the more resistant dog. Unfortunately, the known characteristics of rabies virus provide no help to the investigator attempting to determine the origin of an outbreak of disease. In the case, for example, of poliomyelitis, influenza or foot-and-mouth disease, the existence of distinct types and sub-types of the viruses may permit the geographical origin or the animal species origin of the infection to be determined.

28. Having learned that preliminary work on attempting to distinguish between strains of rabies virus of different origins was now in progress, discussions were held with the Director of the Animal Virus Research Institute, Pirbright, Surrey, and the Director of the Federal Animal Virus Research Institute at Tubingen, Germany. As a result, arrangements have been made for samples of the original brain tissues from the collie dog from India and the two dogs from Germany to be examined for similarities or dissimilarities in the biological characteristics of the viruses isolated. This may help throw light on whether indirect transmission of rabies did occur in the quarantine kennels. Unfortunately the results will not be available for some months.

29. In considering indirect transmission as a tenable possibility, it should be noted that, excluding Whiskey, of the 26 cases of rabies that have occurred in quarantine kennels (see Appendix C) four, Nos. 3, 16, 19 and 20, died of rabies following the occurrence of another case in the same kennels (Nos. 1, 14, 18 and 19). Excluding Fritz and Whiskey, Nos. 3, 16, 19 and 20 account for four of the six longest periods between importation and death that have been recorded, namely, 5¾, 7¾, 4½ and 6¼ months respectively. We do not propose to make more of these incidents than this mention. In view of the period of more than twenty years that has elapsed since the last of these cases, it is impossible to assess adequately their circumstances. It is on record, however, that for Nos. 14 and 16 and Nos. 18, 19 and 20, there were no suggestions of direct contact having occurred. It is also relevant to note that none of the some hundreds of dogs that must have been at risk contracted the

disease when in the same kennels as the other cases listed in Appendix C.

CONCLUSIONS

30. From our investigation into the possible sources of infection in the case of Fritz and Whiskey, the following points emerge:-

(i) No evidence has been found in the case of the quarantine kennels at Caesar's Camp, Folkestone, of any contravention of the requirements of the rules and regulations applicable to such premises.

(ii) Both dogs were imported from a country where rabies is prevalent, but in the case of Fritz, it would appear that there was only a remote opportunity for it to have become infected because of the owner's surveillance and the absence of known cases of rabies in the area around Bielefeld. In the case of Whiskey, however, there were opportunities for infection because of the known incidence of disease in the vicinity where it had been kept prior to its importation into this country.

(iii) In both cases the disease appeared at approximately six months after their importation. This implies an unusually long period of incubation but cases as long as this incubation period have been recorded.

(iv) There is no suggestion that direct contact took place between Fritz, Whiskey and the collie dog which died in the same block of kennels on 26th July.

(v) There was ample opportunity for indirect contact to have occurred in the block of kennels concerned, but as stated previously, there are no recorded cases of transmission by any non-bite route in the dog. The circumstances in these cases lead us to conclude, however, that on the balance of probabilities we cannot exclude the possibility that Fritz in particular became infected by indirect contact in the kennels and, indeed, Whiskey might also have been so infected. We emphasize, however, that such indirect transmission in the dog would be a rare phenomenon.

(vi) The results of the examination of brain material from these three dogs may provide some further information but no results can be expected for several months as the exercise is one of research, not of the performance of routine tests.

31. We wish to express our thanks to all those who have helped us in this enquiry and, in particular, to Mr. Roy Moss, Divisional Veterinary Officer of the Animal Health Division, who served as our technical secretary (Appendix D).

Signed

W. M. Henderson
Director, Agricultural Research Council,
Institute for Research in Animal Diseases,
Compton.

A.G. Beynon,
Director, Veterinary Field Services

25th November, 1969

APPENDIX A

Summary of Standard Requirements for Approved Quarantine Premises

1. The premises must be in the occupation, or under the control of a veterinary surgeon.

2. The construction of quarantine premises must be such that no animal detained in it may escape from the premises.

3. In addition, the premises must be so constructed that it is impossible for an animal in quarantine to have contact at any time with any other animal. There must be no opportunity for "nosing or pawing" other animals.

4. Side partitions and divisions between individual compartments should be solid and extend to the roof or at least 6 feet from the ground and bench.

5. Windows in kennels, unless well out of reach, must be protected by wire netting.

6. The exercise ground should, so far as is practicable, adjoin the kennels and be reserved for exercising each imported dog separately.

7. The exercise ground must be surrounded by a closed fence of wood, galvanised iron or brick, etc., or a double fencing of wire netting at least 6 feet high. All fencing under 10 feet should be provided with a wire netting guard 2 feet wide along the top on the inside of the fence, set an an angle of 45 degrees and fixed in position by arms or staves secured to the inside of the fence. The mesh must not be greater than 2 inches.

8. All gates or doors must be provided with adequate locks.

Summary of Conditions to be observed by Veterinary Surgeons in charge of Quarantine Premises

Responsibility

1. The veterinary surgeon has entire charge of the animals and is solely responsible to the Ministry or the Department for the safe custody and strict isolation of each animal throughout the period of detention and for ensuring that there is no breach of the regulations.

Access

2. The only persons who may be allowed access to animals undergoing detention are:-

(a) the veterinary surgeon or his authorised representative (e.g. kennel man);

(b) a person continuously accompanied by (a) above; or

(c) a person unattended by (a) above but who has agreed to remain within the kennel or exercise run (which must remain locked).

Notification of arrival

3. The arrival of an imported animal at the place of detention must be reported forthwith by the veterinary surgeon to the Ministry or Department.

Detention, Isolation and Release

4. Every animal in the quarantine kennels must be kept strictly isolated from all other animals during the period of detention unless prior approval has been given by the Ministry or the Department for the kennelling together of dogs or cats belonging to one owner.

5. An imported animal must not be removed from the place of detention for any purpose whatever during the prescribed period of six calendar months' detention unless its removal therefrom has been authorised by the Ministry or Department. After a period of six calendar months' detention an animal becomes free from the conditions of the landing licence. No special authority is required for its release after that date.

Attendance by Veterinary Surgeon

6. The veterinary surgeon must attend the premises daily from Monday to Saturday and on Sunday when necessary. Arrangements must be made for another veterinary surgeon to deputise for him in his absence. The name of the deputy must be notified to the Ministry or Department beforehand.

Weekly Returns

7. The veterinary surgeon is to render to the Ministry or Department a weekly return.

Illness in Quarantine

8. The veterinary surgeon must report to the Ministry or Department concerned, and to the owner by letter, if an animal is ill on arrival or becomes ill

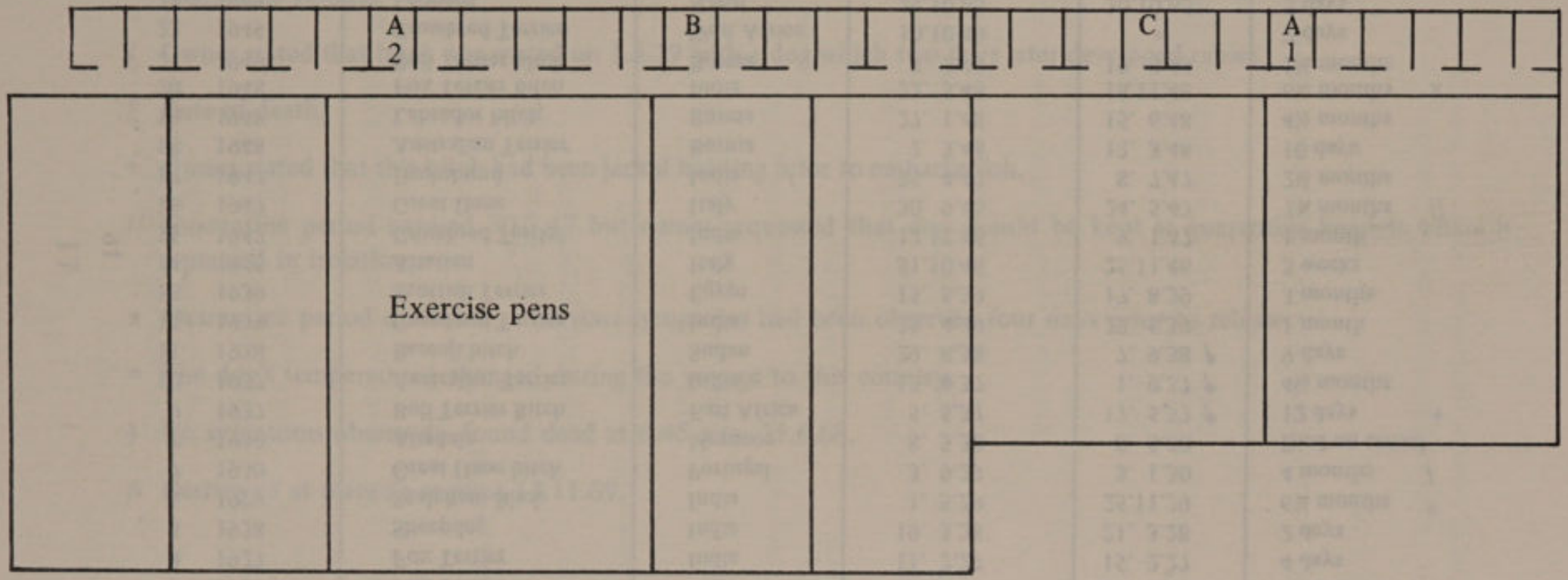
from any cause whatever (including fretting or pining), whilst under detention.

Deaths in Quarantine

9. The veterinary surgeon must report to the Ministry or Department concerned the death of any animal or offspring by telegram or telephone stating the cause of death. The owner also must be informed. The death must be included in the next following weekly return.

10. The carcase must be retained until the Ministry or Department has informed the veterinary surgeon, whether he or a veterinary officer will be required to conduct a post-mortem examination.

Plan of front part of Home Range block of the Quarantine Kennels, Caesar's Camp, Folkestone



A. Pen occupied by collie which died of rabies in quarantine on 26th July, 1969. It was moved from pen A1 to A2 on 22nd July, 1969.

B. Pen occupied by the dog which died of rabies in Camberley, Surrey, on 18th October, 1969.

C. Pen occupied by dog which was proved positive for rabies on 15th November, 1969.

Note

1. Dividing walls between exercise pens are of concrete block to 4 feet with double chain link fencing, 4″ apart, up to 7 feet with an internal overhang.

2. Floors of all exercise runs are of concrete.

APPENDIX C

RABIES IN ANIMALS *IN QUARANTINE* - CASES SINCE 1922

Importation of Dogs and Cats Order of 1928

	Year	Breed of Dog or Species of Animal	Country of Origin	Date of Landing in Gt. Britain	Date when symptoms first observed	Period between landing and death of animal
1	1924	Bull Terrier	India	31.12.23	4. 4.24	3 months
2	1924	Fox Terrier	Egypt	3. 4.24	6. 4.24	3 days
3	1924	Fox Terrier	India	22.12.23	13. 6.24	5¾ months
4	1927	Fox Terrier	India	11. 2.27	15. 2.27	4 days
5	1928	Sheepdog	India	19. 3.28	21. 3.28	2 days
6	1929	Sealyham Bitch	India	1. 5.29	25.11.29	6¾ months *
7	1930	Great Dane bitch	Portugal	3. 9.29	3. 1.30	4 months /
8	1930	Airedale	Morocco	8. 5.30	8. 5.30	Died on arrival
9	1937	Bull Terrier Bitch	East Africa	5. 5.37	17. 5.37 /	12 days +
10	1937	Australian Terrier	India	13. 4.37	1. 9.37 /	4½ months
11	1938	Basenji bitch	Sudan	29. 8.38	7. 9.38 /	9 days
12	1939	Crossbred Terrier	India	25. 4.39	27. 5.39	1 month
13	1939	Scottish Terrier	Egypt	15. 5.39	17. 8.39	3 months
14	1946	Alsatian	Italy	31.10.46	25.11.46	3 weeks
15	1947	Crossbred Terrier	India	12.12.46	9. 1.47	1 month
16	1947	Great Dane	Italy	30. 9.46	24. 5.47	7¾ months //
17	1947	Dachshund	India	25. 4.47	8. 7.47	2½ months
18	1948	Australian Terrier	Burma	2. 3.48	12. 3.48	10 days
19	1948	Labrador bitch	Burma	27. 1.48	15. 6.48	4½ months
20	1948	Fox Terrier bitch	India	22. 5.48	18.11.48	6¼ months x
21	1949	Bull Terrier bitch	Burma	8. 2.49	19. 3.49	1½ months
22	1949	Crossbred Terrier	West Africa	10.10.49	=	2 days
23	1965	Leopard	Nepal	29.10.65	30.10.65	5 days
24	1968	Dachshund bitch	Nigeria	1. 6.68	✈	20 days
25	1969	Rough Collie dog	India	17. 4.69	20. 7.69	3¼ months
26	1969	Female Tabby cat	Kenya	2. 4.69	22. 7.69	4 months
27	1969	Labrador	W. Germany	16. 5.69	11.11.69 ⊨	5¾ months

* Quarantine period expired 1.11.29 but bitch was in season and, at request of owner, was kept in isolation at the same quarantine kennels.

/ Owner stated that bitch was mated on 1.8.29 with a dog which two days later developed rabies.

/* Date of death.

\+ Owner stated that this bitch had been jackal hunting prior to embarkation.

// Quarantine period expired 30.3.47 but owner requested that dog should be kept at quarantine kennels where it remained in isolation.

x Quarantine period extended as nervous symptoms had been observed four days prior to release.

= The dog's temperament changed during the voyage to this country.

-/- No symptoms observed; found dead at 6.45 a.m. 21.6.68.

≠ Destroyed at owner's request 13.11.69.

APPENDIX D

List of persons interviewed and those persons with whom we have had discussions

Great Britain

Dr. J. B. Brooksby	Director, The Animal Virus Research Institute, Pirbright, Surrey.
Dr. F. Brown	Head of the Biochemistry Department, The Animal Virus Research Institute, Pirbright, Surrey.
Mr. M. R. Dexter	Veterinary Surgeon in charge of the Quarantine Kennels at Caesar's Camp, Folkestone.
Mrs. Ruthwell	Joint owner of the Quarantine Kennels; Caesar's Camp, Folkestone.
Major J. Hemsley	Husband of the owner of Fritz.
Major G. G. Stapleton	Owner of Whiskey
Major K. R. Morgan-Jones	Royal Army Veterinary Corps.
Professor C. Kaplan	Department of Microbiology, University of Reading.

World Health Organisation, Geneva, Switzerland

Dr. M. Abdussalam	) Veterinary Public Health,
Dr. K. Bogel	) Division of Communicable Diseases.

Federal Republic of Germany

Bonn

Dr. W. Eckerskorn	Chief Veterinary Officer, Federal Republic of Germany.
Dr. Giessler	Deputy Chief Veterinary Officer, Federal Republic of Germany.
Dr. Quandar	Chief Veterinary Officer, Nordrhein and Westphalia.

Bielefeld

Dr. Greve	Regional Veterinary Officer, Detmold.
Dr. Brocke	District Veterinary Officer, Bielefeld.
Dr. Nicolai	District Veterinary Officer, Bielefeld.
Dr. Mennemeier	District Veterinary Officer, Paderborn.
Dr. Tunsmeyer	District Veterinary Officer, Paderborn.
Colonel J. H. Wilkins	Royal Army Veterinary Corps.
Captain P. M. Dalton	Royal Army Veterinary Corps.

Professor M. Mussgay	Director, Federal Institute for Research on Animal Virus Diseases, Tubingen, Germany.

Note: Professor Mussgay was seen whilst in Great Britain.