


8-1930

## The Incidence of Avian Tuberculosis in Mammals other than Swine

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AGRICULTURAL EXPERIMENT STATION  
RESEARCH BULLETIN 49

# **The Incidence of Avian Tuberculosis in Mammals other than Swine**

By L. VAN ES AND H. M. MARTIN

Department of Animal Pathology and Hygiene

**LINCOLN, NEBRASKA**

**August, 1930**

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# The Incidence of Avian Tuberculosis in Mammals other than Swine

By L. VAN ES AND H. M. MARTIN

A few years ago the Nebraska Agricultural Experiment Station undertook an investigation for the purpose of determining, if possible, the cause of the manifest increase of the incidence of tuberculosis among swine. This investigation was terminated early in 1925 and the results were published by the Station (53). It was shown that the type of swine tuberculosis largely responsible for the increased number of retentions at the abattoirs was in a conspicuous manner (88.5 per cent) due to infection by the avian variety of the tubercle bacillus. Not only did these results indicate a marked susceptibility on the part of a mammal to avian tuberculosis, but they likewise reflected the widely spread distribution of tuberculosis among the poultry of the region to which the investigation pertained. Concrete evidence of the latter fact was more recently shown by Hays (17, 18), who reported the tuberculin testing of 40,073 fowls belonging to 291 flocks in four precincts of three different counties of Nebraska. The test caused positive reactions in 3,760 fowls, 9.3 per cent of the total number tested. The disease was found to be present in 216 (74.3 per cent) of the 291 flocks examined.

The investigation having to do with the origin of swine tuberculosis not only showed that avian infection has an importance extending beyond the poultry yard, but was warrant also for the suspicion of a potentiality for mischief in other mammals. If tuberculosis could be so readily transmitted to swine, it did not appear to be beyond the range of possibility that cattle also might acquire tuberculous disease from an avian source, a factor which would certainly have to be reckoned with in the technique of eradication of the bovine disease.

The recognition of a very widespread and intense distribution of avian tuberculosis on the farms of a wide area of the United States, as well as the involvement of a mammalian species also, brought to the foreground the question whether or not the great prevalence of poultry tuberculosis could be of importance also from a public health point of view. This phase of the problem not only pertains to the people on the farms but likewise is of fundamental importance to the consumers of poultry produce. European authors had already identified the avian tubercle bacillus in human lesions, while in this country careless speakers outside the profession of

medicine and irresponsible journalists had made more or less sensational statements on the subject. The alleged public health phase of avian tuberculosis was regarded as warrant for an attempt to acquire more definite information on this subject.

The importance of the problem arising from the widespread distribution of avian tuberculosis and its demonstrated communicability to at least one mammalian species of economic importance justified an extension of the investigation and hence the Nebraska Agricultural Experiment Station undertook the inquiry, the results of which are set forth in the following account.

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The investigation was particularly concerned with the occurrence or nonoccurrence of tuberculous disease caused by the avian strain of the *B. tuberculosis* in cattle and in man. Efforts were also made to secure tuberculous material from other mammalian species. Nearly all the bovine material used for the purpose of typing consisted of tuberculous lesions placed at the Station's disposal thru the courtesy of various inspectors in charge at federally supervised abattoirs. For the human tuberculous material, medical practitioners, clinics, and organizations having to do with tuberculosis were appealed to. That these appeals were not in vain will be seen from the data submitted in this report.

In one investigational series lesions found in birds were also subjected to typing experiments for the purpose of control of the typing technique followed and incidentally to find an answer to the question whether or not chickens may contract tuberculosis thru contact with tuberculous mammals. When the project was nearly completed, another series of experiments was devoted to determining the typing behavior of tubercle bacilli associated with generalized cases of bovine tuberculosis. This series also served as a control experiment as well as a guide in the interpretation of results obtained with human lesions. In the typing experiments here reported the classification of bacillary types was based upon the differences in pathogenicity shown by the bacilli present in the material examined. Some isolations were also made but for purposes other than classification.

The authors recognized that by isolation and cultivation of the bacilli in conjunction with inoculations of animals, the risk of possible error in interpretation could be reduced, but it would then have been impossible, with the means available, to utilize more than a small portion of the material actually typed by the method adopted. As the principal object of this investigation could be attained by the differentiation between

the avian and mammalian bacillary strains, the error factor in typing as indicated could not be a very considerable one, and furthermore an abundance of evidence was deemed to be preferable to a reduced volume of data obtained by a more cumbersome, altho more exact, mode of procedure.

The routine of the typing experiments consisted of a trituration of the lesions received, the suspension of all or part of the material in physiologic salt solution, and its injection into the animals used for typing. The selection of the latter was based upon their differences in susceptibility toward the three principal strains of tubercle bacilli in accordance with the facts revealed by previous investigations.

This susceptibility may be expressed by the following schedule:

Bacillary strain	Degree of infection shown by		
	Cavias	Rabbits	Fowls
Bovine	+++	+++	0
Human	+++	+	0
Avian	0	+++	+++

Rabbits were not used in all of the series. As a rule the use of guinea pigs and fowls is quite sufficient to differentiate between avian and mammalian bacillary strains. The rabbits are, however, essential when differentiation between the two mammalian types is contemplated, and this species is also valuable when positive evidence obtained in fowls requires further support on account of a doubtful origin of the latter.

Not less than two animals of each species were injected and they were killed at the end of 90 days unless they died spontaneously or had to be destroyed for various reasons.

#### THE TYPING OF BACILLARY STRAINS ASSOCIATED WITH TUBERCULOUS LESIONS IN BIRDS

The material used in this series consisted of 110 consignments of tuberculous lesions of avian origin. In five of these it was not possible to demonstrate living tubercle bacilli and all inoculations yielded negative results. Analyzable results were obtained from 105 consignments originating in different localities. With the exception of two consignments of turkey lesions and another set from a pigeon, the material examined originated in the common fowl. Here follow the details of the typing experiments pertaining to this series.

**No. 7001.** Tuberculous spleen and liver of fowl.

## INOCULATION RESULTS

*Cavias*—One of the caviae died 33 days after inoculation. A necrotic focus at point of injection. Bacilli swarming in lesion. Few necrotic spots found in lungs but it was impossible to demonstrate bacilli. The other cavia was killed four months after inoculation and was found free of lesions.

*Rabbits*—The rabbits died respectively in 23 and 34 days with a Yersin type of tuberculosis.

*Fowls*—One of the fowls died 29 days after inoculation with a Yersin type of tuberculosis. The other fowl developed a very extensive, progressive tuberculosis of liver and spleen and marked lesions in lungs 47 days after inoculation.

Classification of infection type: Avian.

**No. 7086.** Specimen of fowl. Extensive tuberculosis of liver and spleen.

## INOCULATION RESULTS

*Cavias*—Negative.

*Fowls*—One fowl died 36 days after injection. The other fowl died 40 days after receiving virus. Both birds showed a very extensive, progressive, miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 7096.** Specimens of two chickens. Extensive tuberculosis in both animals.

## INOCULATION RESULTS

*Cavias*—Cavia No. 1 died 32 days after inoculation. Cavia No. 2 died 38 days after injection. Both died with a generalized, extensive, progressive tuberculosis.

*Fowls*—One fowl died 24 days after injection. The other died 31 days after inoculation. A Yersin type of tuberculosis was noted in each bird. Classification of infection type: Mixed.

Due to these findings it seemed advisable to ascertain whether the lesions in the caviae were the result of a mixture of mammalian and avian bacilli or mammalian bacilli only. Its determination was undertaken by inoculation with material from each cavia. The material from one of the caviae was injected into caviae and fowls. The suspension prepared from the second was injected into caviae, rabbits, and fowls.

## INOCULATION RESULTS

*Cavias*—The first cavia died 38 days after injection and at the end of 53 days all the caviae were dead. The four animals developed a generalized, extensive, progressive tuberculosis.

*Rabbits*—Both rabbits died 43 days after inoculation. Tuberculosis in both rabbits. Marked lesions in the lungs of one animal and very extensive tuberculosis of spleen and lungs in the other.

*Fowls*—One fowl died 37 days after inoculation. The second bird died 42 days after injection, and the two remaining birds were permitted to live for three months, at which time they were killed. One of the birds was negative. No macroscopic evidence of tuberculosis was found in the three remaining birds, but bacilli were found in the livers of these fowls.

Final classification of infection type: Mixed.



**No. 7120.** Spleen of tuberculous chicken.

## INOCULATION RESULTS

*Cavias*—One cavia died 46 days after inoculation and the other one was killed at the end of three months. The animal killed showed caseation of the inguinal lymphnodes near the point of injection.

*Rabbits*—One rabbit died 39 days after injection with a very extensive, generalized, progressive tuberculosis. The other rabbit, two months after inoculation, died with very extensive lesions of the spleen, liver, lungs, and serous membrane of the peritoneal cavity.

*Fowls*—Both fowls were dead 32 days after injection. Very extensive progressive, miliary tuberculosis of liver and spleen was noted.

Classification of infection type: Avian.

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**No. 7131.** Tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Both cavia killed three months after inoculation. Caseation of lymphnodes near point of inoculation in both animals. Bacilli were present in moderate numbers in the lesions.

*Rabbits*—One rabbit died 39 days after injection with very extensive tuberculosis of lungs. The spleen was much enlarged and caseated. The latter contained many bacilli. The other animal died 76 days after inoculation with an extensive tuberculosis of the peritoneum, marked lesions of the subcutis, and tuberculosis of kidneys and lungs.

*Fowls*—Both birds died 29 days after injection. In one fowl there was no macroscopic evidence of tuberculosis, but in the liver, spleen, and lungs bacilli were quite numerous. The liver showed marked degenerative changes. The other animal showed a very extensive miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 7188.** Marked tuberculosis of liver and spleen of turkey.

## INOCULATION RESULTS

*Cavias*—Both cavia were killed three months after inoculation. Tuberculous abscesses were observed at the point of inoculation in both animals.

*Rabbits*—The rabbits were killed three months after inoculation. There was a moderate degree of tuberculosis in the spleen of both animals.

*Fowls*—One bird died 61 days after injection, the other died 7 days later. There was an extensive tuberculosis of the liver and spleen of the first bird. The second one showed extensive lesions of the liver, spleen, and lungs.

Classification of infection type: Avian.

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**No. 7195.** Tuberculous turkey liver.

## INOCULATION RESULTS

*Cavias*—Both cavia were killed three months after inoculation. Tuberculous abscesses in subinguinal lymphnodes (site of inoculation).

*Rabbits*—Both animals died a month after injection. In one rabbit there was no macroscopic evidence of tuberculosis, but the spleen was much enlarged and bacilli were present in this organ. The other rabbit had a very extensive miliary tuberculosis of the spleen. No other macroscopic lesions were found.

*Fowls*—One bird died a month after inoculation with a much enlarged liver and spleen. There was a very extensive, miliary tuberculosis in the spleen and the liver was extensively caseated. The other chicken died 42 days after injection with a very extensive, progressive tuberculosis of liver and spleen.

Classification of infection type: Avian.

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**No. 7211.** Spleen of fowl with extensive tuberculosis.

INOCULATION RESULTS

*Cavias*—The caviae were killed three months after inoculation. Both animals showed tuberculosis of lymphnodes near point of inoculation.

*Rabbits*—One rabbit died 21 days after inoculation with a much enlarged liver and spleen. No macroscopic evidence of tuberculosis, but bacilli were numerous in liver and spleen. The other rabbit died a month after injection. This animal showed a marked tuberculosis of the lungs. The spleen was greatly enlarged and showed tubercles in their initial stages.

*Fowls*—One bird died 37 days after inoculation. No macroscopic lesions of tuberculosis present in the liver, but the spleen showed very small nodules throughout the organ. Bacilli were swarming in the liver and spleen. The other chicken died a day later with a very extensive, progressive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 7215.** Material from tuberculous fowl.

INOCULATION RESULTS

*Cavias*—One cavia was killed three months after inoculation and showed tuberculosis of the lymphnodes adjacent to the point of inoculation. The other cavia died prematurely and the cause of death was not determined.

*Rabbits*—Both rabbits were killed three months after inoculation and one animal showed slight tuberculosis of the liver, spleen, and lungs. The other rabbit showed no macroscopic evidence of tuberculosis, but bacilli were present in the spleen.

*Fowls*—One bird died 40 days after inoculation with miliary tuberculosis of the liver and spleen. The other fowl died 78 days after injection. There was a very extensive, progressive tuberculosis of liver and spleen. Marked lesions were noted in the lungs.

Classification of infection type: Avian.

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**No. 7269.** Tuberculous liver and spleen of fowl.

INOCULATION RESULTS

*Cavias*—Both caviae died three months after inoculation. One animal showed a slight tuberculosis of the inguinal lymphnodes on the side where injection was made. The other one was negative.

*Rabbits*—One rabbit was killed three months after injection and showed a slight tuberculosis of the kidney, also moderate lesions in spleen and lungs. The other animal died prematurely with pneumonia.

*Fowls*—One fowl died 46 days after inoculation and the other died at the end of two months. Both showed very extensive, miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 7295.** A fowl with extensive tuberculosis of the liver and spleen.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One animal died 26 days after injection. There was no macroscopic evidence of tuberculosis, but bacilli were numerous in the spleen. The other was killed at the end of 11 weeks and showed slight tuberculosis of liver and spleen.

*Fowls*—One bird died a month after inoculation. There was no macroscopic evidence of tuberculosis, but the spleen was swarming with bacilli. The other fowl died 42 days after injection with an extensive miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 7301.** Fowl affected with extensive tuberculosis of liver and spleen.

INOCULATION RESULTS

*Cavias*—Both caviae were dead 70 days after inoculation. There was slight tuberculosis of the superficial inguinal lymphnodes at the point of inoculation in each animal.

*Rabbits*—One animal died 52 days after inoculation. There was a very extensive, miliary tuberculosis of the liver, spleen, and lungs. The other died 62 days after receiving the virus. Marked tuberculosis of lungs and extensive lesions of the peritoneum and subcutaneous connective tissues were found.

*Fowls*—Both birds died 36 days after inoculation with a very extensive, progressive miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 7591.** Fowl with generalized tuberculosis.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 41 days after inoculation with marked tuberculosis of liver and spleen. The other rabbit died three days later with a very extensive, progressive tuberculosis of the liver, spleen and lungs.

*Fowls*—One fowl died with an extensive miliary tuberculosis of the liver and spleen 37 days after inoculation. The other bird died two days later with a Yersin type of tuberculosis.

Classification of infection type: Avian.

**No. 7612.** Two fowls with extensive tuberculosis.

INOCULATION RESULTS

*Cavias*—Both caviae died two months after inoculation. There was tuberculosis of the inguinal lymphnodes near the point of injection.

*Rabbits*—Both rabbits were killed at the end of three months. One showed marked lesions of the spleen and lungs and a slight degree of tuberculosis of the kidneys. The other showed slight lesions of the lungs only.

*Fowls*—One fowl died 43 days and the other 46 days after inoculation. Both showed a very extensive, miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 7924.** Material from tuberculous fowls.

## INOCULATION RESULTS

*Cavias*—Both caviae died 38 days after inoculation. In one animal there was caseation of the lymphnodes on injected side. Bacilli were present in moderate numbers in the lesions. The other cavia had many small tubercles in liver and marked caseation of deep popliteal lymphnodes. Bacilli numerous in the liver lesions.

*Rabbits*—One rabbit died 66 days after inoculation with a very extensive tuberculosis of peritoneum and spleen. Marked tuberculosis of lungs and pleura. The other animal died 69 days after injection. Extensive lesions of spleen and mesentery were noted.

*Fowls*—One fowl died 35 days after inoculation. There was marked miliary tuberculosis of liver and spleen. The other bird died two months after injection with an extensive miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 7947.** Spleen of tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—One cavia died 36 days after inoculation; the other was killed three months after injection. Both showed tuberculosis of superficial inguinal lymphnodes on injected side.

*Rabbits*—One rabbit died two months after injection; the other was killed at the end of three months. The animal killed showed slight tuberculosis of the lungs. The other showed no evidence of tuberculosis.

*Fowls*—The fowls were killed at the end of three months. Both showed extensive, progressive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 8000.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavias*—One cavia died 23 days after inoculation. This animal showed slight tuberculosis of liver and spleen and moderate lesions of lymphnodes on inoculated side. The other died four days earlier and was free of tuberculosis.

*Rabbits*—The two rabbits died 18 and 23 days after inoculation with Yersin type of tuberculosis.

*Fowls*—The birds died 25 and 26 days after inoculation with Yersin type of tuberculosis.

Classification of infection type: Avian.

**No. 8030.** Spleens of two tuberculous fowls.

## INOCULATION RESULTS

*Cavias*—The two caviae inoculated were both dead 23 days after the injection. One showed a slight and the other a moderate degree of tuberculosis of the superficial inguinal lymphnodes near the site of injection. No other macroscopic lesions. Bacilli were numerous in the inguinal lymphnodes of one and the other animal was found to have bacilli in the spleen. Due to the irregularity of these results two more caviae were inoculated. At the end of three months both animals were killed and found free of lesions on autopsy.

*Rabbits*—One rabbit died 89 days after injection with a miliary tuberculosis of lungs and spleen. The second rabbit was killed at the end of

three months and showed a few small calcareous nodules in the liver of doubtful character. Bacilli could not be found.

*Fowls*—Both birds were dead 63 days after inoculation with a very extensive tuberculosis of the liver, spleen and lungs.

Classification of infection type: Avian.

**No. 8181.** Material from fowl with extensive tuberculosis.

#### INOCULATION RESULTS

*Cavias*—The caviar were killed 74 days after inoculation. Both showed tuberculosis of the inguinal lymphnodes on the inoculated side.

*Rabbits*—One rabbit died 19 days after injection and the other died at the end of 29 days. Both died with Yersin type of tuberculosis.

*Fowls*—One bird died 26 days and the other 29 days after injection. Both animals showed the Yersin type of tuberculosis.

Classification of infection type: Avian.

**No. 8222.** Two tuberculous fowls.

#### INOCULATION RESULTS

*Cavias*—Killed three months after inoculation. Negative.

*Rabbits*—One rabbit died at the end of 29 days with a tuberculous septicemia. The other was killed at the end of three months. A moderate degree of tuberculosis was noted in the spleen.

*Fowls*—Both birds were killed at the end of three months. There was a very extensive tuberculosis of liver and spleen of each bird.

Classification of infection type: Avian.

**No. 8226.** Two tuberculous fowls.

#### INOCULATION RESULTS

*Cavias*—Both caviar were killed three months after inoculation. Negative.

*Rabbits*—Both rabbits were killed at the end of three months. One showed a marked but nonprogressive tuberculosis of the spleen. The other was free of lesions.

*Fowls*—One fowl died 55 days after inoculation and the other five days later. There was an extensive tuberculosis of liver and spleen in both fowls.

Classification of infection type: Avian.

**No. 8228.** Two tuberculous fowls.

#### INOCULATION RESULTS

*Cavias*—Caviar were killed three months after inoculation. Negative.

*Rabbits*—One rabbit died 23 days after inoculation and the other eight days later. Both died with a septicemic type of tuberculosis.

*Fowls*—One fowl died 28 days and the other 29 days after inoculation. Examination showed a septicemic type of tuberculosis.

Classification of infection type: Avian.

**No. 8282.** Material from tuberculous fowls.

#### INOCULATION RESULTS

*Cavias*—The caviar were killed three months after injection. Negative.

*Rabbits*—One rabbit died 47 days after inoculation. There was marked tuberculosis of the spleen and moderate lesions of the liver and

lungs. The other rabbit was killed at the end of three months at which time a very slight tuberculosis of the spleen was noted.

*Fowls*—Both fowls were killed three months after injection. An extensive tuberculosis of liver and spleen was found in both.

Classification of infection type: Avian.

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**No. 8310.** Material from fowl with generalized tuberculosis.

INOCULATION RESULTS

*Cavias*—Cavias killed three months after inoculation. Negative.

*Rabbits*—Both rabbits killed three months after inoculation. Marked tuberculosis of spleen and some small isolated tubercles found in the lungs and livers.

*Fowls*—One fowl died 58 days after inoculation with acute miliary tuberculosis of the liver and spleen. The other fowl died at the end of 79 days. An extensive tuberculosis of the liver and spleen was noted.

Classification of infection type: Avian.

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**No. 8390.** Specimen of fowl with extensive tuberculosis.

INOCULATION RESULTS

*Cavias*—Both cavias killed at the end of three months. Negative.

*Rabbits*—One rabbit killed 17 days after inoculation. No macroscopic tuberculosis, but spleen was teeming with bacilli. The other animal died at the end of 24 days. No visible lesions were noted, but the spleen was swarming with bacilli.

*Fowls*—One fowl died 31 days after inoculation with miliary tuberculosis of the spleen. The other bird died 36 days after injection. In this animal one visible tubercle was noted in the liver. There were no visible lesions in the spleen, but this organ was teeming with bacilli.

Classification of infection type: Avian.

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**No. 8408.** Lesions from two tuberculous fowls.

INOCULATION RESULTS

*Cavias*—Both animals killed three months after injection. Negative.

*Rabbits*—One rabbit died 55 days after inoculation. A few tubercles were noted in the liver. There was an extensive miliary tuberculosis of the spleen. The other rabbit died after three months with numerous tuberculous nodules in the liver and kidneys.

*Fowls*—One bird was found to be dead 35 days after injection. There was no macroscopic evidence of tuberculosis but the spleen contained many bacilli. The second fowl died 46 days after inoculation with miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 8626.** Material from two tuberculous fowls.

INOCULATION RESULTS

*Cavias*—Negative at the end of three months.

*Rabbits*—At the end of 40 days one rabbit was found dead with extensive, miliary tuberculosis of the liver, lungs and spleen. The other animal died 68 days after injection with a tuberculous pneumonia and marked lesions in the spleen.

*Fowls*—One fowl died 56 days after inoculation. There was extensive miliary tuberculosis of liver and spleen. The second bird was

killed after three months. A moderate degree of tuberculosis of the liver and spleen noted.

Classification of infection type: Avian.

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**No. 8632.** Tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Both caviae were found to be negative after three months.

*Rabbits*—One rabbit died 21 days after injection. No macroscopic evidence of tuberculosis, but the spleen was teeming with bacilli. The other rabbit died 4 days later with pneumonia without showing evidence of tuberculosis.

*Fowls*—The first bird died 29 days after injection and the other 13 days later. Both animals showed a tuberculous septicemia.

Classification of infection type: Avian.

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**No. 8679.** Material from a tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 18 days after inoculation. The second rabbit died 4 days later. No visible tuberculous lesions noted in either animal but the organs were teeming with bacilli.

*Fowls*—One bird died 29 days after inoculation. The liver was much enlarged, and the spleen was packed with very small tubercles in which bacilli were exceedingly abundant. The other fowl died 33 days after injection with a greatly enlarged liver. The spleen contained a large number of bacilli, but showed no classic lesions.

Classification of infection type: Avian.

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**No. 8786.** Material of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 21 days after inoculation without lesions. The second animal was killed after three months. Slight tuberculosis in kidneys and lungs, marked lesions in the spleen and extensive tuberculosis of testicles.

*Fowls*—Both fowls were killed after three months. Both birds had an extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 8984.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 39 days after inoculation with a very extensive miliary tuberculosis of liver and spleen. Also slight lesions in the lungs. Second animal killed after three months. A slight tuberculosis of liver and spleen, lungs and kidneys was noted.

*Fowls*—One fowl died 47 days and the other 61 days after inoculation. In both birds there was a very extensive miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.



**No. 9077.** Tuberculous spleens of two fowls.

INOCULATION RESULTS

*Cavias*—Both animals killed three months after inoculation. One was found to be free of tuberculosis while the other showed lesions at the point of inoculation.

*Rabbits*—One rabbit died 35 days after injection. Spleen was greatly enlarged and edematous. Bacilli were present in moderate numbers. The second rabbit died 14 days later with a very extensive miliary tuberculosis of the spleen. Many tubercles were also present in the peritoneum.

*Fowls*—One fowl died 23 days and the other one 32 days after inoculation with a Yersin type of tuberculosis.

Classification of infection type: Avian.

**No. 9092.** Tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Both cavias killed three months after inoculation. Negative.

*Rabbits*—The rabbits were killed three months after inoculation. Both animals showed generalized tuberculosis.

*Fowls*—One fowl died 68 days after injection. There was an extensive miliary tuberculosis of liver and spleen. The second bird was killed after three months and a very extensive tuberculosis of the liver and spleen was noted. Slight lesions were also present in the lungs.

Classification of infection type: Avian.

**No. 9107.** Tuberculous spleen from fowl.

*Cavias*—Negative.

*Rabbits*—Both rabbits were killed three months after inoculation. Both animals showed generalized tuberculosis.

*Fowls*—One fowl died 59 days after inoculation with a very extensive tuberculosis of the liver and spleen. The other fowl was killed at the end of three months and showed similar lesions.

Classification of infection type: Avian.

**No. 10,020.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—The first death occurred 54 days after injection. There was an extensive, miliary tuberculosis of the liver and spleen, marked lesions of the peritoneum and slight tuberculosis of the kidneys. The second animal died a month after the first one. Many small tubercles were found in the spleen and liver.

*Fowls*—One fowl died 47 days after inoculation. Large masses of very small tubercles were present in the liver and spleen. The other bird died 56 days after injection, with a very extensive, miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 10,072.** Tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit dead 28 days after inoculation with very extensive miliary tuberculosis of the spleen, and marked lesions of the lungs

and peritoneum. The second rabbit died 61 days after injection with a very extensive, progressive tuberculosis of the spleen and extensive lesions of the peritoneum, lungs and pleura.

*Fowls*—One fowl died 38 days and the other 39 days after injection with a tuberculous septicemia.

Classification of infection type: Avian.

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**No. 10,324.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One of the animals died 56 days after inoculation. Marked tuberculosis of the peritoneum. Miliary tuberculosis of liver and moderate lesions of the spleen. The other rabbit died after three months. An extensive tuberculosis of the peritoneum and moderate degree of tuberculosis of the lungs were noted.

*Fowls*—Both fowls died one month after inoculation. In each bird the spleen and liver were enlarged and the spleen was teeming with bacilli.

Classification of infection type: Avian.

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**No. 10,721.** Tuberculous spleen of a fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 25 days after inoculation with a tuberculous septicemia. The second rabbit died after three months. Very extensive tuberculosis of the lungs and slight lesions of the peritoneum, kidneys and spleen were observed.

*Fowls*—One bird died 30 days after inoculation; the second one the thirty-first day with a Yersin type of tuberculosis.

Classification of infection type: Avian.

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**No. 10,734.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—The rabbits died 20 and 23 days after inoculation with a tuberculous septicemia.

*Fowls*—One chicken died 34 days after inoculation. The other died 48 days after receiving the virus. In both fowls the liver and spleen showed miliary tuberculosis.

Classification of infection type: Avian.

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**No. 11,912.** Specimen of tuberculous chicken.

INOCULATION RESULTS

*Caviae*—One cavia died 47 days after inoculation. Marked tuberculosis of the lymphnodes near point of inoculation. Enlargement of spleen without macroscopic evidence of tuberculosis. Material from this cavia was inoculated into another one and the latter with the remaining one of the series was killed three months later, without showing evidence of tuberculosis.

*Rabbits*—Animal No. 1 died 22 days after inoculation. The second rabbit died 26 days after injection. Both animals showed the septicemic form of the disease.

*Fowls*—One bird was found to be dead 24 days after injection and the other chicken lived 31 days. These animals also showed a septicemic form of the disease.

Classification of infection type: Avian.

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**No. 12,381.** Tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 44 days after inoculation. A moderate degree of tuberculosis of the spleen and peritoneum and extensive lesions in the lungs. The second rabbit died at the end of 61 days. Marked tuberculosis of the peritoneum and a moderate degree of tuberculosis of the pleura.

*Fowls*—Thirty-nine days after inoculation one bird was found to be dead. The other fowl died 51 days after injection. Both chickens had a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 13,271.** Spleen of a tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Twenty-three days after inoculation one rabbit died with the Yersin type of tuberculosis. The other animal died 35 days after injection. There was miliary tuberculosis of liver and spleen and marked tuberculosis of the lungs.

*Fowls*—One fowl died 13 days after injection. There was no macroscopic evidence of tuberculosis, but the spleen contained a moderate number of bacilli. The second bird died 42 days after inoculation with miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 13,903.** Consignment of tuberculous chicken spleens.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both rabbits killed at the end of three months. One showed slight tuberculosis of the lungs and spleen. Second animal had an extensive tuberculosis of lungs and moderate lesions in the spleen.

*Fowls*—Both fowls were killed 66 days after inoculation. In each case the liver and spleen showed a very extensive miliary tuberculosis.

Classification of infection type: Avian.

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**No. 13,644.** Tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One animal died 79 days after inoculation with marked renal and pulmonary tuberculosis. The second rabbit was killed after three months and was free of tuberculosis.

*Fowls*—The first chicken died 34 days after inoculation with a very extensive tuberculosis of the liver and spleen. The second bird died 55 days after injection. It had a very extensive miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 13,670.** Consignment of tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Negative.*Rabbits*—The rabbits were killed three months after inoculation. Both animals showed a moderate tuberculosis of spleen.*Fowls*—Both chickens were killed 77 days after inoculation. These birds showed a very extensive tuberculosis of the liver and spleen. In one of the fowls there were marked lesions in the lungs.

Classification of infection type: Avian.

**No. 13,680.** Spleen from tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Negative.*Rabbits*—One rabbit died at the end of three months with a miliary tuberculosis of the lungs and liver, and marked lesions of the spleen and peritoneum. The second rabbit was killed three months after inoculation. There was an extensive tuberculosis of the liver and lungs. Also marked lesions in the spleen.*Fowls*—At the end of 28 days one of the birds had succumbed to tuberculous septicemia. The remaining fowl died 73 days after inoculation. It had a very extensive miliary tuberculosis of the liver, lungs and spleen.

Classification of infection type: Avian.

**No. 13,915.** Consignment of tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Negative.*Rabbits*—At the end of 29 days one rabbit was found dead with marked tuberculosis in the spleen. The other died 41 days after inoculation. There was a very extensive miliary tuberculosis of the spleen and lungs.*Fowls*—One chicken died 42 days after injection and the second bird at the end of 46 days. Miliary tuberculosis of the liver and spleen was noted in the first case. In the second bird similar lesions were observed in the spleen only.

Classification of infection type: Avian.

**No. 13,925.** Tuberculous liver of fowl.

## INOCULATION RESULTS

*Cavias*—Negative.*Rabbits*—One rabbit died 43 days after inoculation with a very extensive tuberculosis of the liver, spleen and lungs. The second one died 59 days after injection with similar lesions.*Fowls*—Forty-six days after injection one died with a ruptured spleen. No gross lesions of tuberculosis were observed, but bacilli were very numerous in the spleen. The remaining bird died 51 days after injection with an extensive, miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 13,926.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—The first rabbit was found dead 39 days after inoculation with a very extensive miliary tuberculosis of the liver, lungs, spleen and mesentery. The remaining animal was killed 69 days after injection. There was a very extensive tuberculosis of the liver, spleen, kidneys and lungs.

*Fowls*—One chicken died 48 days after inoculation with a miliary tuberculosis of the liver and spleen. The second bird died 50 days after injection and showed similar lesions.

Classification of infection type: Avian.

**No. 13,932.** Consignment of two tuberculous spleens from fowls.

INOCULATION RESULTS

*Civias*—Negative.

*Rabbits*—Six days after injection one rabbit was dead. No visible lesions were noted but bacilli were plentiful in the spleen. The remaining two rabbits were dead 37 days after inoculation and both showed tuberculosis of the spleen.

*Fowls*—One chicken died 22 days and the other one 31 days after inoculation, with miliary tuberculosis of the spleen.

Classification of infection type: Avian.

**No. 13,939.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Civias*—Negative.

*Rabbits*—Both rabbits were killed at the end of three months. They showed marked tuberculosis of the spleen and slight lesions of the lungs.

*Fowls*—The chickens were killed three months after injection. Both birds had a very extensive tuberculosis of the spleen, and marked lesions of the lungs and liver.

Classification of infection type: Avian.

**No. 13,945.** Tuberculous fowls.

INOCULATION RESULTS

*Civias*—Negative.

*Rabbits*—The rabbits were killed three months after inoculation. In one there were no lesions of tuberculosis found. In the other there was a marked tuberculosis of the spleen, and slight lesions in the lungs.

*Fowls*—The first fowl died 44 days after inoculation and the second one the 64th day. Both birds showed miliary tuberculosis of the liver and spleen. The second chicken also showed miliary lesions in the lungs.

Classification of infection type: Avian.

**No. 13,946.** Liver and spleen of tuberculous fowl.

INOCULATION RESULTS

*Civias*—Negative.

*Rabbits*—Both rabbits were killed after three months. One showed slight tuberculosis in the lungs, the other showed extensive lesions in the same organ.

*Fowls*—One fowl died 42 days after inoculation, the other five days later. Both birds had a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 13,952.** Consignment of tuberculous liver and spleen of fowl.

INOCULATION RESULTS

*Cavias*—One cavia died and the other was killed at the end of three months. Tuberculosis of the lymphnodes near the point of inoculation was noted in both animals.

*Rabbits*—The rabbits were dead 28 days after inoculation and one of the animals showed a very extensive miliary tuberculosis of the spleen. The other had the Yersin type of the disease.

*Fowls*—One bird died 32 days after injection with a miliary tuberculosis of the liver and spleen. The other died eight days later with miliary tuberculosis of the spleen.

Classification of infection type: Avian.

**No. 13,999.** Tuberculous liver of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 18 days after inoculation. The spleen was much enlarged and bacilli were very numerous in this organ. The second rabbit was free of lesions at the end of three months.

*Fowls*—Thirty-one days after inoculation one fowl died with a septicemic form of the disease. The other chicken died six days later with a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,004.** Tuberculous chicken.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Rabbit No. 1 died 49 days after inoculation. There was a miliary tuberculosis of the liver, spleen, lungs and pancreas. The second one died 83 days after injection with a marked tuberculosis of the lungs and spleen.

*Fowls*—One chicken died 42 days after inoculation. The other one succumbed two days later. Both birds showed a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,210.** Tuberculous liver of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit was dead 41 days after inoculation. The second animal was killed 6 days later. Both animals presented a generalized tuberculosis.

*Fowls*—Twelve days after inoculation one fowl was dead. It had a much enlarged spleen in which bacilli were found. Fowl No. 2 died 45 days and No. 3 died 36 days after injection with an extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,219.** Consignment of tuberculous spleen from fowl.

INOCULATION RESULTS

*Cavias*—Both cavia died two months after inoculation. One of the cavia showed a slight tuberculosis of the liver and lymphnodes at the point of inoculation. The other animal was free of lesions.

*Rabbits*—The rabbits were killed three months after inoculation. There were slight lesions of tuberculosis in liver and spleen of one and only slight spleen lesions of the other.

*Fowls*—One fowl died with a very extensive tuberculosis of the liver and spleen three months after injection. The second bird was killed at the same time and showed similar lesions.

Classification of infection type: Avian.

**No. 14,220.** Tuberculous spleen from fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died two months after its inoculation with a marked tuberculosis of the spleen. The second rabbit was killed 26 days later and was found to be free of lesions.

*Fowls*—One of the fowls died three months after inoculation with extensive tuberculosis of the liver, spleen and lungs. Its mate was killed five days later. It showed a slight tuberculosis of the liver.

Classification of infection type: Avian.

**No. 14,221.** Spleens of three tuberculous fowls.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit was dead at the end of one month with a miliary tuberculosis of the spleen. The other one was killed two months later. There was extensive tuberculosis of the lungs, and marked lesions in the spleen.

*Fowls*—At the end of 62 days one bird was dead with a very extensive tuberculosis of the liver and spleen. The other fowl was killed a day later and a miliary tuberculosis of the spleen, liver and lungs was noted.

Classification of infection type: Avian.

**No. 14,222.** Tuberculous spleens of fowls.

INOCULATION RESULTS

*Cavias*—Cavia No. 1 died 68 days after inoculation with a very extensive tuberculosis of the liver and spleen. Marked lesions at the point of inoculation and slight tuberculosis of the lungs. Bacilli were swarming in the spleen.

Cavia No. 2 was killed three months after inoculation and was found to be free of lesions. Subsequent inoculations were made with material from cavia No. 1 into fowls and cavias. The fowls died a month after inoculation. One bird showed a much enlarged liver and spleen. The other had a much enlarged liver and miliary tuberculosis of the spleen. Bacilli were very numerous in the spleen of each animal. The two cavias presented no evidence of tuberculosis three months after inoculation.

*Rabbits*—One rabbit died 28 days after inoculation with a very extensive tuberculosis of the spleen. The second rabbit died two months following injection with an extensive tuberculosis of the peritoneum.

*Fowls*—One fowl died 31 days after inoculation. There was no evidence of macroscopic tuberculosis, but the spleen was swarming with bacilli. The other bird died with miliary tuberculosis of the liver and spleen 40 days after injection.

Classification of infection type: Avian.



**No. 14,223.** Consignment of tuberculous spleens from fowls.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both rabbits were dead at the end of 43 days. One animal showed miliary tuberculosis of liver, lungs and spleen, also marked tuberculosis of the kidneys. The other rabbit had extensive lesions of the liver and slight evidence of tuberculosis of the lungs and spleen.

*Fowls*—Both chickens died 31 days after inoculation with a miliary tuberculosis in the livers and spleens.

Classification of infection type: Avian.

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**No. 14,224.** Spleens of fowls affected with tuberculosis.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 33 days after inoculation with a Yersin type of tuberculosis. The remaining rabbit died 14 days later. It had a very extensive tuberculosis of the spleen and marked lesions of the peritoneum and lungs.

*Fowls*—Twenty-six days after inoculation one bird was found to be dead with tuberculosis of liver and spleen. The second fowl died three days later of a miliary tuberculosis of the same organs.

Classification of infection type: Avian.

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**No. 14,378.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavias*—Cavia No. 1 died 58 days after inoculation. There was tuberculosis of the superficial inguinal lymphnodes and slight lesions in the liver. Spleen was swollen, but bacilli could not be found. No. 2 negative.

*Rabbits*—Rabbit No. 1 died at the end of three months with a marked tuberculosis of the lungs, liver and spleen. The second animal was killed and a slight tuberculosis of the spleen and lungs was noted.

*Fowls*—One fowl died and the other was killed at the end of three months. Both birds showed a very extensive tuberculosis of the liver and spleen. One bird also showed extensive lesions in the lungs.

Classification of infection type: Avian.

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**No. 14,379.** Tuberculous spleen of a fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died at the end of two months with a miliary tuberculosis of the liver; also extensive lesions of the lungs, spleen and the peritoneum. The second rabbit was killed after two months. There was a marked generalized tuberculosis.

*Fowls*—One bird died 44 days after inoculation with a very extensive miliary tuberculosis of the liver, lungs and spleen. The remaining bird was killed at the same time. Miliary tuberculosis of the liver and spleen was observed.

Classification of infection type: Avian.

**No. 14,380.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 19 days after inoculation. There was no macroscopic evidence of tuberculosis, but bacilli were very numerous in the spleen. The second rabbit died 43 days after injection. The spleen was very much enlarged and ruptured. This organ was packed with bacilli.

*Fowls*—One bird died 35 days and the other 42 days after inoculation. A miliary tuberculosis of the liver and the spleen was present.

Classification of infection type: Avian.

**No. 14,497.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—Both rabbits died 22 days after inoculation. Septicemia tuberculosa was noted.

*Fowls*—One fowl died 27 days after injection with an extensive miliary tuberculosis of the liver and spleen. The other bird was killed the following day and showed similar lesions.

Classification of infection type: Avian.

**No. 14,547.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—The rabbits were killed at the end of three months. There was slight tuberculosis of the spleen of each animal.

*Fowls*—One fowl died 49 days after inoculation with a miliary tuberculosis of the liver and spleen. The second chicken was killed a month later. There was a very extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,548.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 19 days after injection with Yersin type of tuberculosis. The remaining rabbit died 35 days following inoculation. There was a very extensive miliary tuberculosis of the spleen and slight lesions of the liver and lungs.

*Fowls*—One fowl died 39 days after inoculation as a result of a ruptured liver. The other bird died 3 days later. Both fowls showed miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,577.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 19 days after inoculation. There was no macroscopic evidence of tuberculosis but many bacilli were present in the spleen. The second animal died 11 days later with a miliary tuberculosis of the liver and spleen.

*Fowls*—Both chickens died 80 days after inoculation. The one showed

marked tuberculosis of the liver and spleen. The other had a miliary tuberculosis of the liver and spleen and marked lesions of the lungs.

Classification of infection type: Avian.

**No. 14,578.** Spleen from tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 26 days after injection, with a tuberculous septicemia, The second one died 41 days following inoculation with a slight tuberculosis of the spleen.

*Fowls*—Death of one fowl occurred 36 days after inoculation, the other died 5 days later. Both birds had miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,579.** Consignment of tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—Eighteen days after inoculation one rabbit was found to be dead. An enlarged spleen was noted, but no visible tuberculous lesions. Bacilli were very numerous in this organ. The remaining rabbit died 50 days after injection. It showed a very extensive tuberculosis of the lungs and spleen, and marked lesions of the peritoneum.

*Fowls*—One fowl died 37 days after inoculation and the other 71 days. In both birds there was a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,583.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—Rabbit No. 1 died 22 days after injection. A Yersin type of tuberculosis was present. The second rabbit died seven days later with marked lesions of lungs and a miliary tuberculosis of the spleen.

*Fowls*—Fowl No. 1 died 53 days after inoculation and bird No. 2 was killed 71 days after injection. Both birds showed lesions of miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 14,584.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Caviae*—Negative.

*Rabbits*—One rabbit died 40 days after injection with an extensive tuberculosis of the lungs and spleen. The remaining rabbit was killed a month later. It had a slight tuberculosis of the lungs, kidneys and peritoneum.

*Fowls*—One fowl died with a very extensive miliary tuberculosis of the liver and spleen 36 days after inoculation. The second bird was killed four days later. Miliary tuberculosis was observed in the same organs.

Classification of infection type: Avian.

No. 14,598. Tuberculous spleen of fowl.

INOCULATION RESULTS

*Cavias*.—Negative.

*Rabbits*.—Negative.

*Fowls*.—Both fowls were killed three months after inoculation. No. 1 showed a slight tuberculosis of the spleen. No. 2 had a very extensive tuberculosis of the liver and extensive lesions of the spleen.

Classification of infection type: Avian.

No. 14,635. Tuberculous spleens of two fowls.

INOCULATION RESULTS

*Cavias*.—Negative.

*Rabbits*.—One rabbit died 29 days after inoculation with a septicemic form of tuberculosis. The remaining rabbit was killed at the end of 79 days. This animal showed an extensive tuberculosis of the spleen and peritoneum.

*Fowls*.—One fowl died 35 days after injection, the other died eight days later. Both birds showed miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

No. 14,640. Tuberculous spleen and lungs of fowl.

INOCULATION RESULTS

*Cavias*.—Negative.

*Rabbits*.—The rabbits were killed three months after injection. One showed no evidence of tuberculosis, the other showed slight lesions in the lungs.

*Fowls*.—One bird died 59 days after injection and the other died at the end of 65 days. Both birds showed miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

No. 14,652. Tuberculous liver and spleen of fowl.

INOCULATION RESULTS

*Cavias*.—Negative.

*Rabbits*.—After three months both rabbits were killed. No 1 was negative. No. 2 showed slight tuberculosis of the spleen and lungs.

*Fowls*.—Three months after inoculation both fowls were killed and showed a very extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

No. 14,721. Tuberculous liver of fowl.

INOCULATION RESULTS

*Cavias*.—Negative.

*Rabbits*.—One rabbit was found dead with a miliary tuberculosis of the liver and spleen 32 days after injection. The second was killed 78 days after inoculation. There was a very extensive tuberculosis of the liver, lungs, and spleen.

*Fowls*.—One chicken died 67 days after inoculation. There was an extensive miliary tuberculosis of the liver and spleen. The other bird was killed nine days later. An extensive miliary tuberculosis of the liver, spleen, and lungs was noted.

Classification of infection type: Avian.

**No. 14,805.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Eighteen days after inoculation one rabbit was found dead with the Yersin type of the disease. The other rabbit died at the end of 33 days. There was miliary tuberculosis of the spleen and slight lesions of the peritoneum.

*Fowls*—One fowl died 37 days after injection. The spleen was enlarged and teeming with bacilli. The second one died nine days later with a miliary tuberculosis of the spleen and liver.

Classification of infection type: Avian.

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**No. 14,923.** Tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Three months after inoculation one of the rabbits was found to be dead with an extensive tuberculosis of the lungs and pleura. There were also marked lesions in the spleen. The remaining rabbit was killed a few days later. There was slight tuberculosis of the kidneys and an enlargement of the spleen.

*Fowls*—Both chickens died 71 days following inoculation. There was a very extensive tuberculosis of the liver and spleen in each.

Classification of infection type: Avian.

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**No. 14,926.** Consignment of tuberculous spleens of fowls.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both rabbits were killed three months after injection. No. 1 was free of lesions. In No. 2 there was a moderate degree of tuberculosis of the lungs and spleen.

*Fowls*—One chicken died 41 days following virus injection and the other died five days later. Both birds had a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 14,930.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Rabbits No. 1 and 2 died respectively 18 and 26 days after inoculation, with a tuberculous septicemia.

*Fowls*—One fowl died 27 days after inoculation. There was miliary tuberculosis of the spleen. The other fowl died 10 days later with a miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 14,936.** Spleen of tuberculous fowl.

## INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 55 days after inoculation with a miliary tuberculosis of the liver and spleen and marked lesions of the lungs and peritoneum. The second rabbit was killed 93 days after receiving the virus. There was a generalized, miliary tuberculosis in this animal.

*Fowls*—At the end of 35 days one of the fowls was found dead; the other was killed 13 days later. Both birds showed miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 15,036.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—At the end of 33 days one rabbit was dead with a miliary tuberculosis of the spleen and liver. The other rabbit was found dead 78 days after inoculation with a miliary tuberculosis of the liver and spleen, and marked lesions of the peritoneum.

*Fowls*—One fowl died 52 days after inoculation with a miliary tuberculosis of the liver and spleen. The remaining chicken died 2 days later. Miliary tuberculosis of the liver, lungs and spleen was noted.

Classification of infection type: Avian.

**No. 15,059.** Specimen of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Sixty-seven days after inoculation, one rabbit died. A miliary tuberculosis of the lungs, liver and spleen was observed. There were marked lesions in the kidneys. The second rabbit was killed 9 days later. A very extensive tuberculosis of the liver and spleen was noted.

*Fowls*—Both fowls died 43 days after inoculation. Miliary tuberculosis of the liver and spleen was noted in both birds.

Classification of infection type: Avian.

**No. 15,119.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both rabbits were killed a month after inoculation. One showed an extensive tuberculosis of the spleen and the other the Yersin type of the disease.

*Fowls*—One bird died 21 days after injection, the other 8 days later. Neither animal showed macroscopic evidence of tuberculosis, but bacilli were numerous in the spleens.

Classification of infection type: Avian.

**No. 15,151.** Tuberculous liver of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both rabbits were killed three months after inoculation. In both animals there was tuberculosis of the lungs.

*Fowls*—One chicken died 37 days after injection with a miliary tuberculosis of the liver and spleen. The second bird was killed 71 days after injection. There was an extensive tuberculosis of the same organs.

Classification of infection type: Avian.

**No. 15,227.** Spleens of tuberculous fowls.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 42 days after inoculation. The liver, spleen and lungs showed an extensive, miliary tuberculosis. The second one died ten days later with similar lesions.

*Fowls*—Forty-nine days after inoculation, one chicken died. The other died four days later. There was miliary tuberculosis of the livers and spleens.

Classification of infection type: Avian.

**No. 15,450.** Tuberculous spleens of fowls.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—The rabbits died 55 days after injection with a miliary tuberculosis of the livers and spleens.

*Fowls*—Both fowls were found dead 42 days after receiving the inoculations. There was a miliary tuberculosis of the liver and spleen of each bird.

Classification of infection type: Avian.

**No. 15,616.** Spleen from tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit died 20 days after receiving the virus with a tuberculous septicemia. The second rabbit died at the end of 62 days with extensive tuberculosis of the lungs and slight lesions in the liver.

*Fowls*—One fowl was found to be dead 49 days after inoculation. Miliary tuberculosis of liver and spleen was noted. The other chicken died 21 days later. This bird had an extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 15,738.** Consignment of tuberculous spleens of fowls.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Nineteen days after injection one rabbit was found to be dead. The remaining animal died eleven days later. Both showed the Yersin type of tuberculosis.

*Fowls*—One fowl died 22 days following inoculation, the other 7 days later. A Yersin type of tuberculosis was noted in both birds.

Classification of infection type: Avian.

**No. 15,751.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—The first rabbit died 26 days after inoculation, the second one 16 days later. Both animals had developed the Yersin type of tuberculosis.

*Fowls*—One fowl died 34 days after injection with a tuberculous septicemia. The remaining bird died at the end of 46 days with a miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 15,757.** Spleen from a tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.



*Rabbits*—Negative.

*Fowls*—At the end of 42 days one fowl was found to be dead. The liver and spleen showed miliary tuberculosis. The other bird died 54 days following injection. Numerous tubercles were noted in the spleen and liver.

Classification of infection type: Avian.

**No. 15,773.** Specimen of spleen from tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Rabbit No. 1 died 38 days after inoculation. There was a marked tuberculosis of the lungs, kidneys and peritoneum. No. 2 died 51 days after inoculation. Very extensive lesions were found in the lungs.

*Fowls*—The first death occurred 35 days after injection with a Yersin type of tuberculosis. The second bird died four days later. Miliary tuberculosis of the liver and spleen was present.

Classification of infection type: Avian.

**No. 15,781.** Spleen from tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Forty days after injection one rabbit was found dead. The other one died 9 days later. Both animals had developed tuberculous septicemia.

*Fowls*—Chicken No. 1 died 23 days after inoculation. No. 2 died 49 days following injection. Both birds had a tuberculous septicemia.

Classification of infection type: Avian.

**No. 15,884.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—Both animals were killed after three months. Marked tuberculosis of the spleen and slight lesions of the lungs were noted in these rabbits.

*Fowls*—One bird died 66 days after injection with a miliary tuberculosis of the liver and spleen. The second bird was killed after three months. There was a marked tuberculosis of the liver.

Classification of infection type: Avian.

**No. 16,031.** Spleen of tuberculous fowl.

INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One animal was found to be dead after 80 days. There was a moderate degree of tuberculosis of the spleen and lungs. The second rabbit was autopsied after three months and found to be free of lesions.

*Fowls*—One fowl died at the end of three months. A moderate degree of tuberculosis of the liver, spleen and lungs was found. The second bird was killed a few days later. There was an extensive tuberculosis of the same organs.

Classification of infection type: Avian.

**No. 16,138.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavia*s—Negative.

*Rabbits*—One rabbit died 51 days after inoculation and was found to be free of lesions. The other rabbit died 3 days later. There was no evidence of tuberculosis except an enlarged spleen. Many bacilli were found in this organ.

*Fowls*—Both fowls died at the end of 33 days. Miliary tuberculosis of the liver and spleen was noted in these birds.

Classification of infection type: Avian.

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**No. 16,177.** Tuberculous liver of fowl.

## INOCULATION RESULTS

*Cavia*s—Negative.

*Rabbits*—Both rabbits were killed after three months. One showed marked tuberculosis of the spleen and lungs and slight lesions of the kidneys. In the second rabbit there was a moderate degree of tuberculosis of the lungs and spleen.

*Fowls*—At the end of 50 days one fowl was found to be dead with a miliary tuberculosis of liver and spleen. The remaining bird was killed after three months and showed similar lesions.

Classification of infection type: Avian.

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**No. 16,300.** Tuberculous spleen of fowl.

## INOCULATION RESULTS

*Cavia*—This animal was dead 44 days after injection. There was a slight tuberculosis of lymphnodes at point of inoculation. No evidence of tuberculosis in other organs. Bacilli were plentiful in the lymphnodes.

*Rabbits*—Rabbit No. 1 died 54 days after injection. Marked tuberculosis of the spleen was noted. No. 2 was killed after three months. There was a marked tuberculosis of the kidneys and peritoneum. Slight lesions were found in the lungs.

*Fowls*—One fowl died 44 days after inoculation. The other one died 6 days later. In both fowls there was miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 16,301.** Tuberculous fowl.

## INOCULATION RESULTS

*Cavia*s—Negative.

*Rabbits*—One rabbit died 34 days after injection with the Yersin form of the disease. The second rabbit was killed after three months. There was a very extensive tuberculosis of the lungs, peritoneum, kidneys, subcutis and pleura. Moderate lesions in the liver.

*Fowls*—At the end of 42 days one fowl was dead. The other succumbed three days later. Both birds showed miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 16,302.** Spleen of tuberculous fowl.

## INOCULATION RESULTS

*Cavia*s—Negative.

*Rabbits*—Death of one rabbit occurred 26 days after inoculation. The remaining rabbit died two months after injection. Both showed the Yersin type of the disease.

*Fowls*—One fowl was found to be dead 28 days after inoculation. The second bird died 5 days later. The Yersin type of tuberculosis was noted.

Classification of infection type: Avian.

**No. 16,303.** Tuberculous spleen of fowl.

INOCULATION RESULTS

*Cavias*—One cavia died at the end of 45 days and was found to be negative. The other one died 2 days later. There was no macroscopic evidence of tuberculosis. The spleen was slightly enlarged and contained bacilli.

*Rabbits*—At the end of 45 days one rabbit was found to be dead. There was a very marked tuberculosis of the spleen. The second rabbit was killed at the end of three months and was found free of lesions.

*Fowls*—One fowl died 36 days after inoculation, the other died at the end of 55 days. Both animals showed miliary tuberculosis of liver and spleen.

Classification of infection type: Avian.

**No. 27,339.** Liver of pigeon. Spontaneous infection.

INOCULATION RESULTS

*Cavias*—Both cavias were killed three months after inoculation. Both animals showed tuberculous abscesses in the superficial inguinal lymph-nodes. Bacilli were present in the pus.

*Rabbits*—One rabbit died three months after inoculation. The other one was killed at the same time. The one that died showed extensive miliary tuberculosis of the lungs and spleen. The animal which was killed showed extensive miliary tuberculosis of the lungs, and moderate lesions in the spleen and kidneys.

*Fowls*—One bird died 35 days after injection; the other one died two days later. Both fowls showed extensive miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

TYPING RESULTS OF THE SERIES

Bovine .....	0
Human .....	0
Avian .....	104
Mixed .....	1
Total.....	105

**THE TYPING OF BACILLARY STRAINS ASSOCIATED WITH  
GENERALIZED TUBERCULOSIS IN CATTLE**

The tuberculous lesions used in the experiments pertaining to this series consisted of 58 separate consignments placed at the disposal of the Station by the inspectors in charge of the Federal Meat Inspection Service at Buffalo, N. Y.; Chicago, Ill.; Denver, Colo.; Indianapolis, Ind.; Milwaukee, Wis.; Omaha, Nebr.; and Sioux Falls, S. Dak. The material was collected between January 21 and June 20, 1929, and each consignment originated from a different shipment of cattle, mostly destined for slaughter in the course of the general campaign for the eradication of tuberculosis. The typing data obtained were as follows:

**No. 26,060.** Lymphnodes from a tuberculous bull.

INOCULATION RESULTS

*Caviae*—Both animals had an extensive, generalized tuberculosis.

*Rabbits*—In one rabbit there was an extensive, miliary tuberculosis of the lungs and spleen and slight lesions in the kidneys. Death occurred 21 days after injection. The second animal died 52 days after inoculation with a very extensive, generalized miliary tuberculosis.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 26,072.** Material from several organs of a generalized case of tuberculosis of a cow.

INOCULATION RESULTS

*Caviae*—Both caviae developed generalized tuberculosis.

*Rabbits*—The rabbits developed extensive, generalized, miliary tuberculosis. The rabbits died respectively 47 and 49 days after receiving the inoculum.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 26,939.** Tuberculous bovine lung of a generalized case.

INOCULATION RESULTS

*Caviae*—Both caviae developed an extensive, generalized tuberculosis.

*Rabbits*—One rabbit presented a very extensive tuberculosis of the lungs and kidneys, and slight lesions of the spleen. The remaining animal had very extensive lesions of the lungs and slight tuberculosis of the liver. The rabbits were killed respectively 91 and 111 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 26,949.** Lungs and mediastinal lymphnodes from a generalized case of bovine tuberculosis.

INOCULATION RESULTS

*Caviae*—The first cavia to die showed a very extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near the point of inoculation. The second cavia had an extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 had a slight tuberculosis of the lungs. The other developed a very extensive, generalized tuberculosis. The first died 42 days and the other rabbit was killed 91 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 26,950.** Lung and mediastinal lymphnodes from a case of extensive tuberculosis of a reacting bovine.

#### INOCULATION RESULTS

*Cavias*—In both caviae there was an extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a slight tuberculosis of the spleen and kidneys, and extensive lesions in the lungs. There were also large nodules on the parietal pleura. The pleura of the diaphragm was completely covered with tuberculous pearls. The mediastinum showed extensive lesions. The second rabbit had a very extensive, generalized tuberculosis. There were a few large subcutaneous lesions about the size of a navy bean. The rabbits were killed respectively 83 and 99 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,036.** Tuberculous bovine peritoneum.

#### INOCULATION RESULTS

*Cavias*—The first cavia to die showed a very extensive, generalized tuberculosis. The second had moderate lesions of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Both rabbits presented a very extensive tuberculosis of the lungs and extensive lesions of the kidneys and spleens. These animals died respectively 44 and 48 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,037.** Tuberculous pleura of a cow.

#### INOCULATION RESULTS

*Cavias*—One cavia developed an extensive, generalized tuberculosis. The other showed marked lesions of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—In one rabbit there was an extensive tuberculosis of the lungs and moderate lesions of the spleen and kidneys. The second rabbit had marked lesions of the lungs and extensive tuberculosis of the spleen. The first rabbit died 63 days after injection and the second one died after 48 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,044.** Tuberculous bovine lung.

#### INOCULATION RESULTS

*Cavias*—Both caviae presented a very extensive, generalized tuberculosis.

*Rabbits*—The first rabbit to die had an extensive tuberculosis of the lungs and marked lesions of the spleen, kidneys and the visceral lymph-

nodes. The remaining one had a marked, generalized tuberculosis. These animals died respectively 59 and 70 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,090.** Tuberculous bovine lung.

#### INOCULATION RESULTS

*Caviae*—One cavia presented a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second cavia had a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. Slight lesions were also noted in the lungs.

*Rabbits*—One animal showed a very extensive tuberculosis of the lungs and marked lesions in the spleen and kidneys. The remaining rabbit developed a very extensive tuberculosis of the lungs and slight lesions of the spleen. These rabbits died respectively 77 and 79 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,091.** Part of a tuberculous bovine lung.

#### INOCULATION RESULTS

*Caviae*—The first cavia died within a month after inoculation with a marked tuberculosis of the lymphnodes near the point of inoculation and also the sublumbar ones. The other one died with a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a moderate degree of miliary tuberculosis of the lungs, the other a very extensive, generalized tuberculosis. The first animal died 31 days after inoculation and the second one died at the end of 63 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,092.** Tuberculous bovine lung, liver and lymphnodes.

#### INOCULATION RESULTS

*Caviae*—One cavia died within a month after inoculation with a moderate degree of tuberculosis of the spleen and superficial inguinal and sublumbar lymphnodes. The other developed a marked tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—One rabbit showed an extensive tuberculosis of the lungs, slight lesions of the kidneys and swelling of the spleen. The remaining rabbit showed a very extensive tuberculosis of the lungs and marked lesions in the kidneys. The animals died respectively 72 and 93 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,124.** Tuberculous bovine lung.

#### INOCULATION RESULTS

*Caviae*—Both caviae died with an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits developed an extensive, generalized tuberculosis. The first animal died 91 and the other 109 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,137.** A lymphnode of a bovine reactor showing tuberculosis.

INOCULATION RESULTS

*Cavias*—There was a moderate tuberculosis of the lungs, spleen, and lymphnodes near point of inoculation in one cavia, and an extensive, generalized tuberculosis in the other.

*Rabbits*—In one rabbit there was a very extensive tuberculosis of the lungs and marked lesions of the spleen. The other animal had a very extensive tuberculosis of the lungs and pleura of the diaphragm. There were also marked lesions of the spleen and kidneys. These animals died respectively 88 and 91 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,191.** Tuberculous lung, pleura and mediastinal lymphnode of a bovine.

INOCULATION RESULTS

*Cavias*—Both caviae developed a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits had a very extensive tuberculosis of the lungs and kidneys, and extensive lesions of the spleen. The first rabbit died 83 days after injection and the other died 6 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,248.** Tuberculous lesions of bovine lung, spleen, peritoneum, pleura and bronchial lymphnodes.

INOCULATION RESULTS

*Cavias*—Both caviae developed extensive, generalized tuberculosis.

*Rabbits*—The first rabbit showed miliary tuberculosis of the lungs and spleen. The other had an extensive, generalized, miliary tuberculosis. One of the animals died 20 days after injection, the other one at the end of 33 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,249.** Mesenteric lymphnodes of a six-months-old calf, (reactor).

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis in both caviae.

*Rabbits*—In one rabbit there was a very extensive, generalized tuberculosis and an extensive, generalized tuberculosis in the second one. These animals died respectively 68 and 81 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,259.** Lymphnodes from fourteen bovine reactors.

INOCULATION RESULTS

*Cavias*—In both caviae a very extensive, generalized tuberculosis was noted.

*Rabbits*—One rabbit developed a marked generalized tuberculosis, the other a very extensive tuberculosis of the lungs and marked lesions

of the spleen, liver and kidneys. The two rabbits died respectively 38 and 47 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,336.** Tuberculous bovine lung.

#### INOCULATION RESULTS

*Cavias*—Both cavias had an extensive, generalized tuberculosis.

*Rabbits*—In one rabbit there was a moderate tuberculosis of the lungs. The second rabbit had an extensive tuberculosis of the lungs and marked lesions of the spleen. The first rabbit died 43 days after inoculation. The other one was killed at the end of 90 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,386.** Tuberculous bovine lung and mediastinal lymphnodes.

#### INOCULATION RESULTS

*Cavias*—Both cavias presented a very extensive, generalized tuberculosis.

*Rabbits*—The first rabbit had a very extensive, generalized tuberculosis with marked peritoneal lesions. The second one had extensive lesions of the lungs and spleen, and moderate lesions in the kidneys. These animals died respectively 52 and 58 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,434.** Tuberculous bovine lung, liver and spleen.

#### INOCULATION RESULTS

*Cavias*—There was an extensive, generalized tuberculosis in both cavias.

*Rabbits*—In one rabbit there was a very extensive, generalized tuberculosis. The other had a very extensive tuberculosis of the lungs and spleen, also slight lesions of the kidneys. The first animal died 41 days after injection and the other one the following day.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,435.** Tuberculous bovine lung, pleura and bronchial lymphnodes.

#### INOCULATION RESULTS

*Cavias*—One cavia had a very extensive, generalized tuberculosis. The second animal developed an extensive tuberculosis of the liver and spleen with marked lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—The first rabbit had a marked tuberculosis of the spleen and kidneys, also slight lesions in the lungs. The second one showed a very extensive, generalized tuberculosis. The animals died respectively 37 and 55 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.



**No. 27,488.** Tuberculous bovine lung and mediastinal lymphnode.

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis in both cavias.

*Rabbits*—In one rabbit there was an extensive tuberculosis of the lungs and spleen. In the other there was an extensive, generalized tuberculosis. These animals died respectively 49 and 57 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,500.** Consignment of tuberculous bovine lungs and lymphnodes.

INOCULATION RESULTS

*Cavias*—The first cavia died with a very extensive, generalized tuberculosis. The second one had an extensive tuberculosis of the lungs and marked lesions of the spleen, liver and lymphnodes.

*Rabbits*—Both developed an extensive, generalized tuberculosis. One died 68 and the other 94 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,513.** Tuberculous bovine material.

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis noted in both cavias.

*Rabbits*—An extensive, generalized tuberculosis was observed in both rabbits. These animals died respectively 52 and 68 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,514.** Tuberculous bovine material.

INOCULATION RESULTS

*Cavias*—In both cavias there was a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit had an extensive, generalized tuberculosis. The other showed a very extensive tuberculosis of the lungs and marked lesions in the spleen and kidneys. The first rabbit died 64 days after inoculation and the other one 13 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,542.** Tuberculous bovine lung and bronchial lymphnodes.

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis in both cavias.

*Rabbits*—Both rabbits developed an extensive, generalized tuberculosis. These animals died respectively 55 and 65 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,543.** Tuberculous bovine lung, liver, spleen, pleura and lymphnodes.

## INOCULATION RESULTS

*Caviae*—A very extensive, generalized tuberculosis developed in both caviae.

*Rabbits*—One rabbit showed an extensive tuberculosis of the lungs, kidneys and spleen. The second had an extensive tuberculosis of the lungs and spleen, also marked lesions of the liver. The first rabbit died 41 days after inoculation, the other one died a day later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,583.** Tuberculous bovine mediastinal lymphnodes from a case of generalized tuberculosis.

## INOCULATION RESULTS

*Caviae*—Both caviae had a very extensive tuberculosis of the liver and spleen. Marked lesions of the lymphnodes near the point of inoculation were noted.

*Rabbits*—One rabbit presented extensive tuberculosis of the lungs and marked lesions of the kidneys. The second one had a very extensive, generalized tuberculosis. The omentum and mesentery were very tuberculous. These animals died respectively 56 and 81 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,638.** Tuberculous mesenteric and portal lymphnodes, and section of lung from bovine reactor with generalized tuberculosis.

## INOCULATION RESULTS

*Caviae*—The first cavia died within a month after inoculation with a slight tuberculosis of the spleen and lymphnodes near the point of inoculation. The second cavia developed a very extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—Both rabbits showed a very extensive tuberculosis of the lungs and marked lesions of the kidneys and spleen. The rabbits died respectively 40 and 54 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,641.** Bronchial and mediastinal lymphnodes, and lung of generalized case of tuberculosis in a bovine reactor.

## INOCULATION RESULTS

*Caviae*—Both caviae developed a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit died 25 days after inoculation with a marked tuberculosis of the spleen and lungs. The remaining one presented a very extensive tuberculosis of the lungs, and marked lesions of the kidneys, 56 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,642.** Tuberculous bovine mesenteric lymphnodes and section of lung from a generalized case.

#### INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the spleen and of the lymphnodes near the point of inoculation. The second one presented a very extensive, generalized tuberculosis.

*Rabbits*—In one of the rabbits there was a very extensive tuberculosis of the lungs and marked tuberculosis of the liver, spleen and kidneys. In the other one there was a marked tuberculosis of the lungs and slight lesions of the spleen and kidneys. The first animal died 70 days after inoculation and the other was killed 19 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,671.** Tuberculous bovine lung and mediastinal lymphnode from a generalized case.

#### INOCULATION RESULTS

*Cavias*—In the first cavia a very extensive tuberculosis of the liver and spleen and marked lesions of the lymphnodes near the point of inoculation were noted. The second one had a marked tuberculosis of the lungs, spleen and lymphnodes near the point of inoculation.

*Rabbits*—One rabbit had an extensive tuberculosis of the lungs and marked lesions of the kidneys. The other rabbit had a slight tuberculosis of the lungs. The first rabbit died 88 days after inoculation. The other one was killed four days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,702.** Tuberculous bovine liver and mediastinal and portal lymphnodes.

#### INOCULATION RESULTS

*Cavias*—Both animals developed a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed a very extensive tuberculosis of the lungs and marked lesions of the kidneys and spleen 64 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,744.** Tuberculous material from a bovine reactor.

#### INOCULATION RESULTS

*Cavias*—One cavia had an extensive tuberculosis of the spleen and marked lesions of the lymphnodes near the point of inoculation. The second animal presented a very extensive tuberculosis of the spleen and liver. Marked lesions were also noted in the lymphnodes near the point of inoculation.

*Rabbits*—There was a very extensive tuberculosis of the lungs and marked lesions of the mesentery, kidneys and spleen of one rabbit at the end of 52 days. The second animal was killed at the end of three months and found to be free of lesions.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 27,745.** Portal lymphnodes, lungs and liver of a bovine reactor.

## INOCULATION RESULTS

*Caviae*—Both animals showed a very extensive, generalized tuberculosis.

*Rabbits*—Two rabbits had a very extensive tuberculosis of the lungs and marked lesions on the spleen and kidneys.

*Fowls*—One bird had many small tubercles in the spleen in which bacilli were present. The other bird was negative.

Classification of infection type: Bovine.

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**No. 27,756.** Tuberculous lung, spleen, liver and presternal lymphnode from a case of generalized tuberculosis.

## INOCULATION RESULTS

*Caviae*—Both caviae had an extensive, generalized tuberculosis.

*Rabbits*—In one rabbit a marked tuberculosis of the lungs and spleen was noted. The other showed an extensive, generalized tuberculosis. The first rabbit died 34 days and the other was killed 61 days after inoculation.

*Fowls*—One fowl had a marked tuberculosis of the spleen in which bacilli were present. The second bird was free of lesions.

Classification of infection type: Bovine.

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**No. 27,819.** Bovine tuberculous lymphnodes and lungs of a reactor.

## INOCULATION RESULTS

*Caviae*—The first cavia presented a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. The other animal had a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits developed a marked, generalized tuberculosis. One animal died 37 days after inoculation and the other one was killed at the end of 80 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,824.** Lung lesions of a bovine reactor with generalized tuberculosis.

## INOCULATION RESULTS

*Caviae*—There was a very extensive, generalized tuberculosis in both animals.

*Rabbits*—One rabbit died with a miliary tuberculosis of the lungs 24 days after receiving the virus. The other animal died 35 days after the injection, with an extensive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,888.** Tuberculous bovine lung and liver and mediastinal, mesenteric and portal lymphnodes.

## INOCULATION RESULTS

*Caviae*—The caviae both had a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit had a marked tuberculosis of the lung, spleen and kidneys. The other showed moderate lesions in the same organs. The first rabbit died 38 days after injection. The other one was killed 11 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,889.** Tuberculous bovine lung, spleen and peritoneum.

INOCULATION RESULTS

*Cavias*—One cavia had a marked, generalized tuberculosis and the other died prematurely.

*Rabbits*—One rabbit developed a very extensive tuberculosis of the lungs and marked lesions of the spleen. The other had a marked, generalized tuberculosis. The first animal died 58 days after inoculation and the other was killed 15 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,975.** Tuberculous lung and mediastinal lymphnodes of bovine.

INOCULATION RESULTS

*Cavias*—Both animals had a very extensive, generalized tuberculosis.

*Rabbits*—The first rabbit died at the end of 24 days with a moderate degree of tuberculosis of the lungs and spleen. The other one had a very extensive, generalized miliary tuberculosis. Death of this animal occurred 52 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,976.** Tuberculous bovine lung and mediastinal lymphnodes.

INOCULATION RESULTS

*Cavias*—Both animals had an extensive, generalized tuberculosis.

*Rabbits*—Both animals presented an extensive, generalized tuberculosis. These animals died respectively 56 and 57 days after receiving virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,991.** Tuberculous lymphnodes of bovine.

INOCULATION RESULTS

*Cavias*—Both animals had an extensive, generalized tuberculosis.

*Rabbits*—In one rabbit there was a moderate degree of tuberculosis of the liver and spleen. The second one had a very extensive, generalized tuberculosis. The first animal died 21 days after injection. The other one died 26 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,023.** Tuberculous bovine lung.

INOCULATION RESULTS

*Cavias*—In the first animal there was a marked tuberculosis of the

lungs and lymphnodes near the point of inoculation and moderate lesions of the spleen. The other cavia had a marked, generalized tuberculosis.

*Rabbits*—One animal had an extensive, generalized tuberculosis 64 days after injection. The second animal was killed after 71 days. It had extensive lesions of lungs and moderate lesions of the spleen and kidneys.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,024.** Tuberculous bovine lung.

INOCULATION RESULTS

*Cavias*—One animal showed a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation, and slight lesions of the lungs. The remaining one had an extensive, generalized tuberculosis.

*Rabbits*—There was a very extensive generalized tuberculosis in one animal. The second one had an extensive tuberculosis of the lungs, and marked lesions of the spleen and kidneys. The first animal died 73 days after injection. The second one was killed at the end of 78 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,025.** Tuberculous bovine lung.

INOCULATION RESULTS

*Cavias*—One cavia developed an extensive tuberculosis of the spleen and liver. The other one was lost.

*Rabbits*—In one animal there was a very extensive, generalized tuberculosis 74 days after inoculation. The second one was killed at the end of 92 days. It had a marked tuberculosis of the lungs and slight lesions of the spleen and kidneys.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,026.** Consignment of tuberculous bovine lungs.

INOCULATION RESULTS

*Cavias*—One cavia presented a marked tuberculosis of the liver, spleen and lymphnodes near point of inoculation. The second animal had an extensive, generalized tuberculosis.

*Rabbits*—The first rabbit died 67 days after injection and showed a very extensive tuberculosis of the spleen and slight lesions in the liver. The second rabbit showed a very extensive tuberculosis of the lungs and slight lesions in the liver and spleen 71 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,040.** Part of tuberculous lung and pleura of a cow.

INOCULATION RESULTS

*Cavia*—The cavia developed a marked, generalized tuberculosis.

*Rabbits*—One rabbit had a very extensive, generalized tuberculosis. The second animal showed an extensive tuberculosis of the lungs and marked lesions of the spleen and kidneys. These animals died respectively 68 and 71 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,041.** Tuberculous bovine lymphnodes.

INOCULATION RESULTS

*Cavia*s—One animal had an extensive, generalized tuberculosis. The remaining one died with a marked tuberculosis of the liver and spleen and the lymphnodes near the point of inoculation.

*Rabbits*—There was a marked tuberculosis of the lungs and moderate lesions of the spleen of one rabbit. The other had a very extensive, generalized, miliary tuberculosis. Both animals died 41 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,113.** Lung and lymphnodes of a tuberculous bovine.

INOCULATION RESULTS

*Cavia*s—One cavia had a marked tuberculosis of the spleen and lymphnodes near the point of inoculation and slight lesions of the liver and lungs. The two remaining animals had an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed a very extensive, generalized tuberculosis. These animals died respectively 46 and 58 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,114.** Tuberculous bovine lungs, spleen and lymphnodes.

INOCULATION RESULTS

*Cavia*s—Both cavia had an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits had an extensive, generalized tuberculosis. The first animal died 40 days after inoculation and the second one died six days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,115.** Lung, liver and lymphnodes of a tuberculous bovine.

INOCULATION RESULTS

*Cavia*s—In one animal there was a generalized tuberculosis. The other showed extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—There was a very extensive, generalized tuberculosis in one animal. The second had extensive tuberculosis of the spleen, also marked lesions of the liver. These animals died respectively 65 and 72 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,125.** Tuberculous bovine material.

INOCULATION RESULTS

*Cavia*s—One cavia had a marked tuberculosis of the spleen and of the

lymphnodes near the point of inoculation. The remaining one had an extensive, generalized tuberculosis.

*Rabbits*—The first rabbit died 68 days after injection and showed a generalized tuberculosis. The other one presented a very extensive tuberculosis of the lungs, and marked lesions of the spleen and kidneys. It died 91 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,126.** Tuberculous lesions of bovine animal.

INOCULATION RESULTS

*Caviae*—The spleen, liver and lymphnodes near the point of inoculation presented a marked tuberculosis in one *cavia*. The second animal had a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit died of an extensive, generalized tuberculosis. The other one was lost.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,129.** Mediastinal lymphnodes and lung of tuberculous bovine.

INOCULATION RESULTS

*Caviae*—Both animals showed an extensive, generalized tuberculosis.

*Rabbits*—A very extensive, generalized tuberculosis killed one rabbit 50 days after injection. The second one died 59 days after inoculation. It showed an extensive tuberculosis of the lungs and marked lesions of the parietal pleura and of the spleen, liver and kidneys.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,134.** Tuberculous lesions of a bovine.

INOCULATION RESULTS

*Caviae*—Both *caviae* developed a marked, generalized tuberculosis.

*Rabbits*—Only the spleen was moderately affected in one rabbit. A marked tuberculosis developed in the lungs, spleen and kidneys of the second animal. One died 34 and the other 46 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 28,138.** Tuberculous material from a bovine reactor.

INOCULATION RESULTS

*Caviae*—Both *caviae* died of an extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a marked tuberculosis of the lungs. Lesions were also noted in the liver and spleen. The second animal had an extensive tuberculosis of the lungs, kidneys and parts of the peritoneum. Slight lesions observed in the spleen. The first rabbit died 53 days after injection while the second one died 24 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.



No. 28,174. Tuberculous bovine lung, spleen and peritoneum.

INOCULATION RESULTS

*Cavia*—An extensive tuberculosis of the spleen and liver killed one *cavia*. The other one presented a very extensive, generalized form of the disease.

*Rabbits*—A very extensive tuberculosis of the spleen, liver and lungs killed one of the rabbits 54 days after inoculation. The remaining one died of a very extensive, generalized tuberculosis 62 days after receiving the inoculum.

*Fowls*—Negative.

Classification of infection type: Bovine.

TYPING RESULTS OF THE SERIES	
Bovine .....	58
Human .....	0
Avian .....	0
Mixed .....	0
Total.....	58

**THE TYPING OF BACILLARY STRAINS PRESENT IN HEMORRHAGIC LYMPHNODES OF REACTING BOVINE ANIMALS WITHOUT TUBERCULOUS LESIONS**

This series included 39 separate consignments of hemorrhagic lymphnodes found in so-called "no lesion" reactors. Each consignment was examined microscopically and in only two instances was it possible to demonstrate acid-fast organisms. Suspensions were also prepared and inoculations made into experimental animals (cavias and fowls). Negative results were obtained in each trial.

**THE TYPING OF BACILLARY STRAINS POSSIBLY ASSOCIATED WITH THE PREGNANT UTERI OF REACTING BOVINE ANIMALS WITHOUT MANIFEST TUBERCULOUS LESIONS**

Material from five pregnant uteri originating from reactor bovines was studied. The writers were unable to find lesions that resembled tuberculosis in the tissues. The material was also examined microscopically and no acid-fast organisms were noted. Animal inoculations (cavias and fowls) were made with material from two of the uteri. Negative results were obtained. The three remaining uteri were not used for animal inoculation.

**THE TYPING OF BACILLARY STRAINS ASSOCIATED WITH TUBERCULOUS LESIONS OF THE SKIN AND SUBCUTIS OF BOVINE ANIMALS**

In this group forty cases were examined, the majority of which originated from reacting cattle, by the usual typing method (with cavias and fowls). All of these consignments were found to be free of pathogenic tubercle bacilli. Smears were made from all of these cases and it was found that 36 contained acid-fast bacilli. In addition to the cases examined by animal inoculation, attempts were made in eleven instances to isolate tubercle bacilli from as many consignments, all of which resulted in failures.

Two pig-feeding experiments were also made. In one experiment the pigs were tested with bovine and avian tuberculin before and after the feeding trials. In the second experiment the pigs were similarly tested at the conclusion of the experiment. All the tests yielded negative results. In the first trial, skin lesions from 52 different cattle were fed to the pigs. Following the feedings the pigs were killed and a careful autopsy made. Both animals were found to be free of tuberculosis. The two pigs used in the second experiment were fed skin lesions originating from 25 bovines. They were killed and autopsied at the end of their feeding period and both were found free of disease.

**THE TYPING OF BACILLARY STRAINS PRESENT IN ISOLATED  
TUBERCULOUS LESIONS (MOSTLY LYMPHNODES)  
OF BOVINE ANIMALS**

The material classified in this group was selected from cattle in which, for the major part, only a small lesion could be found. They originated principally from the territory contributory to the abattoirs of Kansas City, Mo., Omaha, Nebr., and Sioux City, Ia., and were procured thru the cooperation of inspectors in charge of the United States Department of Agriculture Meat Inspection Service stationed at the points mentioned. A few came from more remote parts of the country. Most of the lesions pertained to lymphnodes found to be tuberculous in animals which had reacted to the tuberculin test.

Altogether the lesions of 164 animals were collected and used in the experiments. Of these 49 yielded negative results while in 115 it became possible to determine the bacillary type of tubercle bacilli involved. Here follows a detailed account of the typing experiments.

**No. 4,193.** Tuberculous cervical and mesenteric lymphnodes from a bovine.

INOCULATION RESULTS

*Cavias*—Tuberculosis of the spleen and liver of one cavia.

*Fowls*—Both birds showed a few isolated lesions, one in the liver and spleen, and the other in the liver only.

Due to the fact that both cavias and fowls developed tuberculosis it was decided to inoculate cavias and fowls with tuberculous material from the fowls. Here follow the results.

INOCULATION RESULTS

*Cavias*—In one cavia, a month after inoculation, there was tuberculosis of the liver. The other was killed after three months. In the inguinal lymphnodes there were caseo-purulent lesions and a few tubercles in the spleen.

*Fowls*—Both fowls showed extensive tuberculosis of the liver and spleen.

Classification of infection type: Mixed.

**No. 5,761.** A consignment of tuberculous bovine lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia showed nonprogressive atypical tuberculosis of the liver and spleen. Tuberculosis of the precrucial lymphnodes. The other showed an extensive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 5,802.** A tuberculous mesenteric bovine lymphnode.

INOCULATION RESULTS

*Cavias*—One cavia showed a small abscess in the precrucial lymphnode in which a few bacilli were found. The other one was free of lesions.

*Fowls*—Both fowls showed extensive miliary tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 5,814.** A mesenteric lymphnode which contained small tuberculous nodules.

INOCULATION RESULTS

*Cavias*—Negative.

*Fowls*—One fowl showed marked tuberculosis of the liver and moderate degree of tuberculosis of the spleen. The other bird showed a moderate degree of tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 5,914.** Tuberculous lymphnodes of reacting cattle.

INOCULATION RESULTS

*Cavias*—In one cavia there was marked tuberculosis of the lungs and extensive lesions of the liver and spleen. Tuberculosis of the deep inguinal and precural lymphnodes. The other showed tuberculosis of the spleen and marked tuberculosis of the liver, lungs and deep inguinal and precural lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 6,147.** Tuberculous prescapular lymphnodes.

INOCULATION RESULTS

*Cavias*—A diffused, nonprogressive tuberculosis of the spleen of one cavia and localized tuberculous nodules in spleen and liver of the other.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 6,223.** A mesenteric lymphnode of bovine animal.

INOCULATION RESULTS

*Cavias*—Very extensive, generalized tuberculosis of both animals.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 6,269.** Tuberculous lesions of bovine lymphnodes and lung.

INOCULATION RESULTS

*Cavias*—Extensive, progressive, generalized tuberculosis of both cavias.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 6,282.** Single tuberculous lesion in a mesenteric lymphnode of reacting bovine.

INOCULATION RESULTS

*Cavias*—In one cavia there was an extensive progressive tuberculosis of the liver, spleen and lymphnodes. In the other cavia there were slight lesions of the lungs and liver, marked tuberculosis of the spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,284.** Tuberculous bronchial lymphnode.

INOCULATION RESULTS

*Caviae*—Extensive, progressive, generalized tuberculosis in both *caviae*.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,329.** Tuberculous mesenteric lymphnodes from reacting bovines.

INOCULATION RESULTS

*Caviae*—Extensive, progressive tuberculosis of spleen, liver and lungs, also extensive lesions in various lymphnodes of both animals.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,488.** Tuberculous mesenteric lymphnodes of two reacting cattle.

INOCULATION RESULTS

*Caviae*—In one *cavia* there was a marked tuberculosis of the spleen and inguinal lymphnodes. In the second *cavia* there was an extensive, progressive tuberculosis of the spleen, liver, lungs and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,511.** Tuberculous mammary lymphnode.

INOCULATION RESULTS

*Caviae*—Both *caviae* showed a marked, nonprogressive tuberculosis of the lungs and spleen. Marked lesions of various lymphnodes and slight tuberculosis of the liver.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,825.** Consignment of mesenteric lymphnodes.

INOCULATION RESULTS

*Caviae*—One animal showed an extensive, progressive tuberculosis of the spleen and liver, also an extensive tuberculosis of the lungs and lymphnodes. The other *cavia* showed marked tuberculosis of lymphnodes, spleen, liver and lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,836.** Tuberculous lesions of mesenteric lymphnodes.

INOCULATION RESULTS

*Caviae*—Both animals showed a marked tuberculosis of liver, spleen, lungs and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 6,915.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Cavia*—One cavia showed marked tuberculosis of lymphnodes near point of inoculation, and slight lesions of the spleen. In the other animal there was a marked tuberculosis of the liver, lungs and spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,083.** Prescapular lymphnodes.

## INOCULATION RESULTS

*Cavias*—One cavia showed a slight tuberculosis of lymphnodes near point of inoculation and in liver. The spleen was much enlarged and contained bacilli in moderate numbers. The second cavia had an extensive tuberculosis of the liver and spleen. Lesions were also found in the lungs and lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,091.** Mesenteric lymphnodes.

## INOCULATION RESULTS

*Cavias*—Very extensive, progressive tuberculosis of the liver and spleen, and marked lesions of the lungs and regional lymphnodes of one cavia. The other showed marked caseation of lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,101.** Tuberculous prescapular lymphnodes.

## INOCULATION RESULTS

*Cavias*—In one animal there was a very extensive, progressive tuberculosis of the spleen, liver, lungs and various lymphnodes. The second cavia showed moderate caseation of superficial inguinal lymphnodes near the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,102.** Tuberculous sublumbar lymphnodes.

## INOCULATION RESULTS

*Cavias*—Both cavias showed very extensive, progressive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,196.** Tuberculous lesions of prescapular lymphnodes.

## INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive, progressive tuberculosis of the liver, spleen and regional lymphnodes; also slight lesions in the lungs. The second cavia presented a very extensive, progressive tuberculosis of the lungs, liver, spleen and various lymphnodes.

*Fowls*—One bird showed a moderate degree of tuberculosis of spleen. The second bird was free of lesions.

Since one bird was found to have a moderate degree of tuberculosis it was deemed advisable to inoculate another series of animals and include rabbits in the experiment. These animals were inoculated with a suspension prepared from the lesions of the above-mentioned bird.

#### INOCULATION RESULTS

*Cavias*—One cavia showed tuberculosis of inguinal lymphnodes on side of inoculation. The other cavia showed a marked tuberculosis of the spleen and lymphnodes. The liver showed slight lesions..

*Rabbits*—There was a moderate tuberculosis of the spleen, lungs and kidneys of one rabbit. The second rabbit showed slight tuberculosis of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,197.** Tuberculous mesenteric lymphnodes of five reacting bovines.

#### INOCULATION RESULTS

*Cavias*—Very extensive, progressive tuberculosis of liver and spleen of both cavias. Lesions were likewise noted in the lymphnodes near the point of inoculation.

*Fowls*—Both birds showed lesions of tuberculosis in the liver.

As both fowls showed lesions of tuberculosis it was deemed advisable to inoculate another series of animals with a suspension prepared from the lesions noted in the livers of the fowls mentioned above.

#### INOCULATION RESULTS

*Cavias*—Negative.

*Rabbits*—One rabbit showed slight lesions of the lungs and spleen. The second rabbit was free of lesions.

*Fowls*—One fowl died twelve days after inoculation with a Yersin type of tuberculosis. The second bird showed a marked tuberculosis of the spleen and liver.

Classification of infection type: Mixed.

**No. 7,229.** Tuberculous mesenteric lymphnodes.

#### INOCULATION RESULTS

*Cavias*—There was slight caseation of the lymphnodes at the point of inoculation in one cavia. The second one was negative.

*Fowls*—One fowl showed marked tuberculosis of the liver and spleen. The second bird showed a few small tubercles in the spleen and liver.

Classification of infection type: Avian.

**No. 7,230.** Tuberculous lesions of mesenteric lymphnodes.

#### INOCULATION RESULTS

*Cavias*—In one animal there was a marked tuberculosis of the spleen, liver, lungs and lymphnodes near the point of inoculation. The second cavia showed an extensive, progressive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. Marked lesions were also noted in the lungs.

*Fowls*—A few small tubercles were found in the liver and spleen

of one fowl. In the other bird only the liver was found to contain small tubercles.

Classification of infection type: Mixed.

**No. 7,231.** Tuberculous lesions of mesenteric lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia showed extensive tuberculosis of the liver, spleen and lymphnodes near point of inoculation. Lesions were also observed in the lungs. The remaining cavia showed marked tuberculosis of the spleen, liver, lungs and several lymphnodes.

*Fowls*—One fowl negative. The other contained a moderate number of small, nonprogressive tubercles in the liver and spleen.

Two series of animals were inoculated. One series was injected with a suspension prepared from tuberculous lesions from the infected fowl, and the other series with material from the above-described cavia.

Inoculum prepared from lesions of fowls.

INOCULATION RESULTS

*Cavias*—One cavia showed slight tuberculosis of the spleen and superficial inguinal lymphnodes. The second cavia had a very extensive tuberculosis of the liver and spleen. There were also marked lesions of the visceral lymphnodes and lungs.

*Rabbits*—In one rabbit there was a very extensive tuberculosis of kidneys and lungs, tuberculosis of peripheral lymphnodes, and marked lesions of the spleen and serous membranes. The other rabbit showed marked tuberculosis of the lungs and slight lesions of the spleen and kidneys.

*Fowls*—Negative.

Inoculum prepared from lesions of cavia.

INOCULATION RESULTS

*Cavias*—The first cavia found to be dead showed a marked tuberculosis of the liver and slight lesions of the lymphnodes at point of inoculation, and spleen. The other cavia contained many small tubercles in the liver and spleen. There was moderate tuberculosis of the lymphnodes at point of inoculation.

*Rabbits*—One rabbit died prematurely and did not show any evidence of tuberculosis. The other died with miliary tuberculosis of liver, spleen and lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,241.** Tuberculous post-pharyngeal lymphnodes.

INOCULATION RESULTS

*Cavias*—A very extensive, progressive tuberculosis of the liver and spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,299.** Tuberculous mesenteric lymphnodes of a reacting animal.

INOCULATION RESULTS

*Cavias*—One cavia showed very slight tuberculous lesions of the lymphnodes near point of inoculation. The second cavia showed no lesions.



*Fowls*—There was an extensive tuberculosis of the liver and marked lesions of the spleen of one fowl. The other showed marked tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 7,307.** Tuberculous retropharyngeal lymphnodes.

INOCULATION RESULTS

*Cavia*s—There was an extensive tuberculosis of the liver, spleen and lymphnodes at point of inoculation of one cavia. In the other there was a very extensive tuberculosis of the liver and spleen, and marked lesions of the lungs and lymphnodes at point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,308.** Tuberculous mediastinal lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia presented a very extensive tuberculosis of the liver and spleen, marked lesions of the lungs and regional lymphnodes. The second cavia showed a very extensive tuberculosis of the lungs, spleen and lymphnodes at the point of inoculation, also several others.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,309.** Tuberculous portal lymphnodes.

INOCULATION RESULTS

*Cavia*s—The first cavia that died showed a marked tuberculosis of the lymphnodes near point of inoculation and in liver and spleen. The other cavia presented an extensive tuberculosis of the liver, spleen and lymphnodes, also marked lesions of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,594.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia showed a marked tuberculosis of the liver, spleen and lymphnodes of inoculated side. The other animal had a tuberculosis of the inguinal lymphnodes near point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,595.** Tuberculous lesions of mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia had a marked caseation of lymphnodes near point of inoculation. In the other there was a very extensive tuberculosis of the liver, spleen and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 7,604.** Tuberculous bronchial lymphnodes.

INOCULATION RESULTS

*Cavia*s—There was a very extensive tuberculosis of the liver and

spleen, and extensive lesions of the lymphnodes near the point of inoculation in one cavia. The other showed marked tuberculosis of the liver, spleen, lungs and lymphnodes.

*Fowls*—Both fowls showed a few small nodules in the liver and spleen. Classification of infection type: Mammalian.

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**No. 7,605.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavias*—Both cavias had an extensive tuberculosis of the liver and spleen, and tuberculous lesions of the regional lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,606.** Tuberculous lymphnodes.

INOCULATION RESULTS

*Cavias*—Both cavias showed marked tuberculosis of the liver, spleen and lymphnodes. One of the cavias also had lesions in the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,943.** Precurral lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia showed lesions of tuberculosis in the liver and lymphnodes near point of inoculation. The second cavia had a very extensive tuberculosis of the spleen and liver. Extensive lesions of the lungs and lymphnodes at the point of inoculated side.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,966.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia died 25 days after injection. It showed slight tuberculosis of liver, spleen and lymphnodes near point of inoculation. The other cavia died a day later with a moderate tuberculosis at the point of injection and slight lesions of spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 7,968.** Tuberculous mesenteric lymphnodes from bovine reactor.

INOCULATION RESULTS

*Cavias*—Negative.

*Fowls*—One fowl negative. The other had 6 large tubercles in the liver.

Classification of infection type: Avian.

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**No. 7,979.** Tuberculous trachea.

INOCULATION RESULTS

*Cavias*—One of the cavias showed an extensive tuberculosis of the liver and marked lesions of the spleen and lymphnodes at the point of injection. The remaining cavia had a very extensive tuberculosis of the liver and spleen and marked lesions of the lymphnodes.

*Fowls*—One bird negative. The other showed no macroscopic evidence of tuberculosis, but bacilli were numerous in the spleen.

Classification of infection type: Mammalian.

**No. 8,022.** Three tuberculous lymphnodes.

INOCULATION RESULTS

*Cavia*s—There was a marked tuberculosis of the liver, spleen, and various lymphnodes of one *cavia*. The other *cavia* inoculated was found to be free of lesions.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,029.** Tuberculous lesions of reacting bull.

INOCULATION RESULTS

*Cavia*s—One *cavia* showed a marked tuberculosis of the spleen and lymphnodes on inoculated side. There were also many small tubercles in the liver. The second *cavia* showed an extensive tuberculosis of the liver and spleen; marked tuberculosis of the lymphnodes near point of inoculation.

*Fowls*—One fowl negative. The other presented a moderate degree of tuberculosis of the spleen.

A second series of animals was inoculated with the tuberculous material from the above fowl to determine whether or not the original material contained avian bacilli.

INOCULATION RESULTS

*Cavia*s—One *cavia* had an extensive tuberculosis of the spleen and marked lesions of the liver, lungs and lymphnodes. The remaining one had an extensive tuberculosis of the liver and spleen, the lungs and various lymphnodes.

*Rabbits*—There was a moderate degree of tuberculosis noted in the spleen of one rabbit. The other showed a slight tuberculosis of the lungs and spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,198.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—One *cavia* showed a slight tuberculosis of the spleen and lymphnodes at the point of inoculation. The second *cavia* presented an extensive tuberculosis of the liver and spleen, also marked lesions of lymphnodes near point of inoculation.

*Fowls*—There was a slight tuberculosis of the liver and spleen in one fowl. The other showed marked tuberculosis of the liver and spleen.

Because the above fowls showed lesions of tuberculosis it was decided to inoculate another series of animals in which *cavia*s, fowls and rabbits were used. The inoculum used was prepared from the lesions of the fowls.

INOCULATION RESULTS

*Cavia*s—Both animals showed extensive tuberculosis of the liver, lungs and spleen—also marked lesions of several lymphnodes.

*Rabbits*—One rabbit showed slight tuberculosis of the spleen and lungs. The other showed slight tuberculosis of the spleen and marked lesions of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,216.** Tuberculous mesenteric lymphnodes of reacting bovines.

INOCULATION RESULTS

*Cavia*s—Negative.

*Fowls*—Both birds had an extensive tuberculosis of liver and spleen. Classification of infection type: Avian.

**No. 8,303.** Tuberculous mediastinal lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia showed a very extensive, progressive tuberculosis of the liver and spleen. A few nodules in the lungs were also noted. The remaining cavia had an extensive tuberculosis of the spleen and liver.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,335.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—There was an extensive tuberculosis of the liver and spleen of both animals. One cavia showed extensive lesions in the lungs while the other had marked tuberculosis in this organ.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,352.** Mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia showed a moderate tuberculosis of the liver, spleen and lymphnodes at the point of injection. The second animal had a very extensive tuberculosis of the liver and spleen, and marked lesions of the lungs and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,385.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—In one cavia there was a marked tuberculosis of liver and spleen; a few nodules in the lungs and also lesions in several lymphnodes. The other cavia showed a marked, but nonprogressive tuberculosis of the lungs and spleen; also a few discrete lesions in the liver.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,428.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—The first cavia found to be dead showed marked tuberculosis of the spleen. The remaining animal presented a marked tuberculosis of the lungs and very extensive tuberculosis of the liver and spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,434.** Slight tuberculous lesions of bronchial and mediastinal lymphnodes.

INOCULATION RESULTS

*Cavias*—Both cavia showed very extensive tuberculosis of the livers and spleens.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,521.** Tuberculous mesenteric lymphnodes of calf.

INOCULATION RESULTS

*Cavias*—Negative.

*Fowls*—One bird showed extensive tuberculosis of the lungs, liver and spleen. The second fowl died prematurely and showed no lesions.

Classification of infection type: Avian.

**No. 8,605.** Tuberculous prescapular lymphnode.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the spleen and lymphnodes at point of inoculation. There was also moderate degree of tuberculosis of the lungs and liver. The remaining animal had a very extensive tuberculosis of the spleen and extensive lesions of the lungs, liver and lymphnodes at point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 8,685.** Tuberculous mesenteric lymphnodes from bovine reactors.

INOCULATION RESULTS

*Cavias*—In one animal there was a very extensive tuberculosis of the liver, spleen, lungs and lymphnodes near point of inoculation. The other cavia presented extensive lesions of the lungs, liver and spleen.

*Fowls*—There was extensive tuberculosis of the liver of one fowl. In the other bird very extensive lesions were present in the same organ and in the spleen.

Classification of infection type: Mixed.

**No. 8,841.** Lymphnode of laryngeal region.

INOCULATION RESULTS

*Cavias*—Both animals showed a very extensive tuberculosis of the liver, spleen and lungs. The lymphnodes near the point of inoculation also showed marked tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,052.** Tuberculous lesions.

INOCULATION RESULTS

*Cavias*—There was an extensive tuberculosis of the liver and spleen of both animals. Marked lesions of tuberculosis were also noted in the lymphnodes near point of inoculation in each instance.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,116.** Tuberculous mesenteric lymphnode.

## INOCULATION RESULTS

*Caviae*—One cavia presented a very extensive tuberculosis of the liver, spleen and lymphnodes near point of inoculation. There was marked tuberculosis of the lungs. The second animal had a marked tuberculosis of the spleen, lungs and lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,157.** Tuberculous lymphnodes.

## INOCULATION RESULTS

*Caviae*—One animal showed a very extensive tuberculosis of the liver, spleen, and lungs and marked lesions of the lymphnodes at the point of inoculation. The other showed very extensive tuberculosis of the liver and spleen and marked lesions of the lungs and lymphnodes of the inguinal region.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,176.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—There was a very extensive, progressive tuberculosis of the liver, spleen and lungs, also extensive lesions of lymphnodes at point of inoculation of one cavia. The second cavia had a marked tuberculosis of the liver, spleen and lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,566.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—One cavia showed a marked tuberculosis of the lungs, spleen, liver and lymphnodes near point of inoculation. The other presented very extensive tuberculosis of the liver, lungs, spleen and lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,568.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—The first animal to die showed marked tuberculosis of the liver and spleen. The second cavia had a very extensive tuberculosis of the lungs, liver and spleen. Marked lesions of the lymphnodes at the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 9,569.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—One cavia showed a very extensive, progressive tuberculosis of the liver, spleen and lymphnodes. There were also marked lesions of the lungs. The remaining cavia presented a very extensive tubercu-

losis of the liver, spleen and lungs. There was an extensive tuberculosis of the lymphnodes at the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 10,037.** Assortment of nine isolated lymphnodes.

#### INOCULATION RESULTS

*Caviae*—In one cavia there was an extensive tuberculosis of the spleen, liver, lungs and lymphnodes near point of inoculation. The second cavia showed a very extensive, progressive tuberculosis of the lungs, liver, spleen and lymphnodes at the point of inoculation.

*Fowls*—One fowl negative, the other had a slight tuberculosis of the spleen.

Because one fowl developed a slight tuberculosis of the spleen, another set of caviae and fowls were inoculated with material from the infected fowl's spleen.

#### INOCULATION RESULTS

*Caviae*—One cavia showed a very extensive tuberculosis of the liver, spleen and lungs. There was also marked tuberculosis of the lymphnodes near point of inoculation as well as the mesenteric nodes. The remaining cavia presented an extensive tuberculosis of the spleen, and marked lesions of the liver.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 10,057.** Posterior mesenteric lymphnodes with slight tuberculous lesions from a reacting bovine.

#### INOCULATION RESULTS

*Caviae*—One cavia showed a very slight tuberculosis of the superficial inguinal lymphnodes on injected side. The second cavia presented no evidence of tuberculosis.

*Fowls*—Both fowls developed an extensive tuberculosis of the liver and spleen.

Classification of infection type: Avian.

**No. 10,084.** Tuberculous bronchial lymphnodes.

#### INOCULATION RESULTS

*Caviae*—In one cavia there was an extensive tuberculosis of the liver, spleen, lungs and lymphnodes near the point of injection. The remaining animal had a very extensive tuberculosis of the lungs, spleen, liver and lymphnodes at the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 10,085.** Tuberculous mediastinal lymphnodes.

#### INOCULATION RESULTS

*Caviae*—The first cavia showed caseation of lymphnodes near point of inoculation. Marked pneumonia. The spleen was enlarged and contained a few tubercles. The second cavia presented an extensive tuberculosis of the liver, spleen, lungs and lymphnodes at the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 10,086.** Specimen of bronchial lymphnodes.

## INOCULATION RESULTS

*Caviae*—In one *cavia* there was an extensive tuberculosis of the lungs and spleen. Marked lesions of liver and lymphnodes at point of inoculation. The remaining *caviae*, negative.

*Fowls*.—Negative.

Classification of infection type: Mammalian.

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**No. 10,087.** Cervical lymphnodes.

## INOCULATION RESULTS

*Caviae*—The first *cavia* found to be dead showed a very extensive, progressive tuberculosis of the liver and spleen. Extensive tuberculosis of the lungs, mesenteric and deep inguinal lymphnodes and those near the point of inoculation. The second *cavia* had a very extensive tuberculosis of the liver and spleen, and marked lesions of the lungs and lymphnodes at point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 10,328.** Mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—One *cavia* developed a very extensive tuberculosis of the liver and spleen. Marked lesions of the lymphnodes near point of inoculation. The second *cavia* presented a very extensive, progressive tuberculosis of the liver, spleen and lungs. There were also marked lesions of the lymphnodes near point of inoculation.

*Fowls*—The first fowl to die showed no macroscopic evidence of tuberculosis, but bacilli were found in the spleen. The second fowl showed a slight tuberculosis of the liver. A few tubercles were also noted in the spleen in which bacilli were found in moderate numbers.

Because there was a slight amount of tuberculosis noted in the fowls inoculated with the original material it was considered advisable to inoculate *caviae* and fowls with the tuberculous material from the second bird which is recorded above.

## INOCULATION RESULTS

*Caviae*—In one *cavia* there was an extensive tuberculosis of the liver and spleen. Marked lesions of the lungs and lymphnodes at point of inoculation. The remaining animal showed a very extensive tuberculosis of the liver, spleen and lungs and marked lesions of the lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 11,015.** Tuberculous lymphnodes.

## INOCULATION RESULTS

*Caviae*—The first *cavia* showed a very extensive tuberculosis of the liver and spleen and extensive lesions of lungs and lymphnodes near point of inoculation. The remaining animal had an extensive tuberculosis of the spleen, liver, and lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.



**No. 13,928.** Tuberculous bronchial lymphnodes.

INOCULATION RESULTS

*Cavias*—Cavia No. 1 developed an extensive tuberculosis of the spleen and liver and marked tuberculous of the lymphnodes near point of inoculation. No. 2 showed a very extensive tuberculosis of the liver, spleen and lymphnodes at point of inoculation. There was also tuberculosis of the visceral lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 13,929.** Tuberculous cervical lymphnode.

INOCULATION RESULTS

*Cavias*—Both cavia showed a very extensive tuberculosis of the liver and spleen, and marked lesions of the lungs and lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 13,930.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia presented a very extensive tuberculosis of the liver, lungs and spleen, also marked lesions of the lymphnodes at point of inoculation. The remaining animal had a marked tuberculosis of the liver, lungs and lymphnodes at point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 13,987.** Tuberculous mediastinal lymphnodes.

INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive tuberculosis of the liver, spleen and lungs. Marked lesions of the lymphnodes near the point of inoculation. The second cavia developed a marked tuberculosis of the lungs, spleen, and lymphnodes at the site of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 13,988.** Tuberculous cervical lymphnodes.

INOCULATION RESULTS

*Cavias*—Both animals showed a very extensive tuberculosis of the liver and spleen. One of the above cavia also presented marked lesions of the lungs and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,212.** Lymphnode of a bovine reactor.

INOCULATION RESULTS

*Cavias*—One cavia developed an extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near point of inoculation. The second cavia showed a very extensive tuberculosis of the liver and spleen. There were marked lesions of the lungs and lymphnodes.

*Fowls*—One fowl had a slight tuberculosis of the spleen. The other negative.

Classification of infection type: Mammalian.

**No. 14,213.** Tuberculous lymphnode.

## INOCULATION RESULTS

*Caviae*—One cavia presented a very extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near point of inoculation, also slight lesions in the lungs. The remaining animal had a very extensive tuberculosis of the spleen and slight lesions of the lymphnodes at point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,231.** Mediastinal lymphnode.

## INOCULATION RESULTS

*Caviae*—Cavia No. 1 presented a very extensive tuberculosis of the liver and spleen. There was also a marked tuberculosis of the lungs and lymphnodes at the point of inoculation. The second cavia had a very extensive tuberculosis of the liver, spleen and lymphnodes at the injection point.

*Fowls*—One fowl had a slight tuberculosis of the liver, but bacilli could not be found. The other bird was free of lesions.

Classification of infection type: Mammalian.

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**No. 14,232.** Mesenteric and cervical lymphnodes.

## INOCULATION RESULTS

*Caviae*—The first cavia developed a moderate degree of tuberculosis of the spleen. The remaining cavia showed an extensive tuberculosis of the spleen, liver and lungs. Lesions in the lymphnodes near the point of inoculation were also noted.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,233.** Submaxillary lymphnode.

## INOCULATION RESULTS

*Caviae*—Both caviae had a very extensive tuberculosis of the liver and spleen and marked lesions of the lungs and lymphnodes near point of inoculation.

*Fowls*—One chicken died without lesions, but bacilli were numerous in the spleen. The second fowl was negative.

Classification of infection type: Mammalian.

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**No. 14,475.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—Negative.

*Fowls*—One fowl presented a slight tuberculosis of the liver and spleen. The remaining bird had a marked tuberculosis of the liver and spleen.

Classification of infection type: Avian.

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**No. 14,476.** Tuberculous mesenteric lymphnodes.

## INOCULATION RESULTS

*Caviae*—In cavia No. 1 there was an extensive tuberculosis of the liver and spleen, and marked lesions in the lymphnodes near the point of inoculation. The second animal had a marked tuberculosis of the

liver, spleen and of the lymphnodes at the point of inoculation. There was also slight tuberculosis of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,534.** Tuberculous mass from omentum of nonreacting bovine.

#### INOCULATION RESULTS

*Cavias*—Negative.

*Fowls*—One fowl showed a very extensive, miliary tuberculosis of the liver and spleen. The other one had a miliary tuberculosis of the same organs.

Classification of infection type: Avian.

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**No. 14,570.**—Tuberculous mesenteric lymphnodes.

#### INOCULATION RESULTS

*Cavias*—The first cavia found to be dead had an extensive tuberculosis of the liver, spleen and lungs as well as of the lymphnodes at point of inoculation. The second one developed an extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes at the injection site.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,571.** Tuberculous mesenteric lymphnodes.

#### INOCULATION RESULTS

*Cavias*—In one cavia there was an extensive tuberculosis of the liver and spleen, also marked lesions in the lungs and of the lymphnodes at the point of inoculation. The remaining animals showed an extensive tuberculosis of the lungs, spleen and liver. It also had a marked tuberculosis of the lymphnodes at the point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,572.** Tuberculous mesenteric lymphnode.

#### INOCULATION RESULTS

*Cavias*—One cavia died with a very extensive tuberculosis of the liver, lungs, spleen and of the lymphnodes near point of inoculation. The other cavia was found to be free of lesions.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,574.** Mesenteric lymphnode.

#### INOCULATION RESULTS

*Cavias*—Both cavia had a very extensive tuberculosis of the liver, lungs and spleen. One also showed very extensive lesions of the lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,575.** Tuberculous mesenteric lymphnode.

INOCULATION RESULTS

*Cavia*s—One animal showed a very extensive tuberculosis of the spleen and liver, marked lesions of the lymphnodes near the point of inoculation, also slight tuberculosis of the lungs. The second one presented a very extensive tuberculosis of the liver, spleen, and lungs, also marked lesions of lymphnodes at point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,576.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1 developed an extensive tuberculosis of the liver, spleen, lungs and lymphnodes at the point of inoculation. The other cavia had an extensive tuberculosis of the liver, spleen, lungs and lymphnodes at the point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,734.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—Both animals showed an extensive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,778.** Tuberculous precural lymphnode.

INOCULATION RESULTS

*Cavia*s—The first cavia developed a very extensive tuberculosis of the liver and spleen. Lesions were also noted in the lungs. The remaining animal had an extensive tuberculosis of the liver, spleen and lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,780.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia had a moderate degree of tuberculosis of liver, spleen, and marked lesions of lymphnodes near point of inoculation. The second cavia presented very extensive tuberculosis of liver, lungs, spleen and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

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**No. 14,834.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—In one cavia there was an extensive tuberculosis of the liver, spleen, lungs, and lymphnodes at the point of inoculation. The remaining cavia developed a marked tuberculosis of the spleen and liver, also extensive lesions of the lungs and of the lymphnodes near the point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,854.** Tuberculous bronchial lymphnodes.

## INOCULATION RESULTS

*Caviae*—The first cavia showed an extensive generalized tuberculosis. The other presented a very extensive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,855.** A tuberculous mediastinal lymphnode.

## INOCULATION RESULTS

*Caviae*—There was a marked tuberculosis of the spleen of one cavia. The other had a very extensive, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,913.** Tuberculous prescapular lymphnode.

## INOCULATION RESULTS

*Caviae*—Both animals had an extensive tuberculosis of the spleen, liver and lymphnodes at the point of inoculation, and marked lesions of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 14,948.** Several lesions from a group of bovine reactors.

## INOCULATION RESULTS

*Caviae*—Both caviae developed extensive, generalized tuberculosis.

*Fowls*—One fowl had a slight tuberculosis of the lungs in which one bacillus was found. The other fowl was free of disease.

Classification of infection type: Mammalian.

**No. 15,056.** Tuberculous precrural lymphnode.

## INOCULATION RESULTS

*Caviae*—In one cavia there was an extensive tuberculosis of the liver and spleen. No. 2 presented a marked tuberculosis of the spleen. There was a slight tuberculosis of the liver and lungs and extensive caseation at point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 15,057.** Tuberculous prescapular lymphnodes.

## INOCULATION RESULTS

*Caviae*—Cavia No. 1 developed an extensive tuberculosis of the liver and spleen. Cavia No. 2 showed a moderate degree of tuberculosis of the lungs and spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 15,727.** Lymphnodes of a bovine reactor.

## INOCULATION RESULTS

*Caviae*—Cavia No. 1 negative. The remaining cavia had a marked but nonprogressive tuberculosis of the spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 15,803.** Tuberculous mesenteric lymphnodes.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1, negative. The second cavia had tuberculosis of the spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 15,807.** Tuberculous mesenteric lymphnode.

INOCULATION RESULTS

*Cavia*s—In one cavia there was a marked tuberculosis of the lungs and the lymphnodes at the point of inoculation. Moderate lesions of tuberculosis were noted in the spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 15,808.** Tuberculous mediastinal lymphnode.

INOCULATION RESULTS

*Cavia*s—Both cavia developed extensive tuberculosis of the liver and spleen. One of these animals also showed extensive lesions of the lungs.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**Nos. 16,026 and 16,027.** Tuberculous lymphnodes (bronchial, cervical and mediastinal).

INOCULATION RESULTS

*Cavia*s—Two cavia yielded negative results, but the two remaining cavia had a slight tuberculosis of the livers and spleens.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,028.** Isolated tuberculous lesions in the posterior mediastinal lymphnode.

INOCULATION RESULTS

*Cavia*s—Both cavia showed a very extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,048.** Tuberculous bronchial lymphnode.

INOCULATION RESULTS

*Cavia*s—One cavia which died early in the experiment had a slight tuberculosis of the spleen. The other had a very extensive tuberculosis of the liver and spleen, with marked lesions of the lungs and lymphnodes near the point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,217.** Tuberculous lymphnode.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1 presented a very extensive tuberculosis of the liver, spleen and lymphnodes. Cavia No. 2 had a very extensive tuber-

culosis of the liver and spleen and marked lesions of the lymphnodes at the point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,273.** Tuberculous mediastinal lymphnodes.

INOCULATION RESULTS

*Cavias*—Both cavia developed a very extensive tuberculosis of the liver and spleen; also slight lesions of the lymphnodes at the point of injection.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,274.** Cervical lymphnodes.

INOCULATION RESULTS

*Cavias*—Both cavia developed a very extensive generalized tuberculosis.

*Fowls*—Both fowls had one or more tubercles in the spleen which contained acid-fast debris.

Classification of infection type: Mammalian.

**No. 16,275.** Tuberculous mediastinal lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia showed marked tuberculosis of the liver, spleen and lymphnodes near point of inoculation. The second one presented a very extensive tuberculosis of liver and spleen, and marked lesions at the injection site.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,276.** Tuberculous bronchial lymphnode.

INOCULATION RESULTS

*Cavias*—One cavia had a slight tuberculosis of the spleen and moderate tuberculosis of the lymphnodes at the point of inoculation. Cavia No. 2 showed no lesions.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,278.** Tuberculous cervical, bronchial and mesenteric lymphnodes.

INOCULATION RESULTS

*Cavias*—The first cavia presented a moderate tuberculosis of liver and spleen, and marked lesions of the lymphnodes at the point of inoculation. The other one had marked tuberculosis of the liver and lymphnodes at the point of injection, and extensive lesions of the spleen.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,511.** Tuberculous bronchial lymphnode.

INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive tuberculosis of the liver, spleen, and mesentery, and marked lesions of the lungs as well

as the lymphnodes at the injection site. The second one developed an extensive tuberculosis of the spleen and lymphnodes at the point of inoculation. Marked lesions were noted in the lungs and liver.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 16,514.** Tuberculous lymphnodes.

INOCULATION RESULTS

*Cavia*s—The first cavia to die had tuberculosis of the inguinal lymphnodes at the point of inoculation. The second cavia developed a very extensive tuberculosis of the lungs, liver and spleen, and marked lesions of the lymphnodes near point of inoculation.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 18,110.** Tuberculous material from two reacting bovines.

INOCULATION RESULTS

*Cavia*s—One cavia presented an extensive tuberculosis of the liver, lungs and spleen. The other one had a very extensive tuberculosis of the lungs and marked lesions of the spleen and lymphnodes.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 27,250.** Mesenteric lymphnode of reacting calf.

INOCULATION RESULTS

*Cavia*s—Negative.

*Fowls*—There was a moderate degree of tuberculosis of the spleen of one bird and moderate tuberculosis of the lungs and spleen of the other.

Classification of infection type: Avian.

**No. 28,136.** Tuberculous lymphnodes.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1 negative. Cavia No. 2 developed a marked, generalized tuberculosis.

*Fowls*—Negative.

Classification of infection type: Mammalian.

TYPING RESULTS OF THE SERIES

Mammalian .....	100
Avian .....	11
Mixed .....	4
Total .....	115



### THE TYPING OF BACILLARY STRAINS ASSOCIATED WITH TUBERCULOUS LESIONS IN MISCELLANEOUS MAMMALS

Attempts were made to secure tuberculous lesions from as many species of mammals as could be collected. Only a few were thus obtained. The animals furnishing the lesions were sheep with one specimen, horse with two specimens, silver fox with two specimens of which one gave negative results, and monkeys with six specimens of which two failed to disclose living bacilli.

The typing data furnished by this material are as follows:

**No. 7,199.** Tuberculous lesions in spleen and lungs from a sheep.

#### INOCULATION RESULTS

*Cavias*—Both caviae were killed at the end of three months. One animal had a marked tuberculosis of the liver and spleen and of the precaval lymphnodes on both sides and inguinal lymphnodes near the point of inoculation. The second cavia had an extensive tuberculosis of the spleen. Marked lesions were noted in the liver and inguinal lymphnodes near the point of inoculation, and the precaval lymphnodes (bilateral).

*Rabbits*—The two rabbits were killed at the end of three months. In one there were slight lesions of the lungs and spleen. The second one showed slight tuberculosis of the kidneys, spleen and lungs.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 13,596.** Specimen of pure culture of acid-fast bacilli isolated from lungs of a horse.

#### INOCULATION RESULTS

*Cavias*—One cavia showed a very extensive tuberculosis of the liver and spleen. Extensive tuberculosis of the lungs and lymphnodes at the point of inoculation, mesenteric and other visceral lymphnodes inclusive of Peyer's patches. The remaining cavia developed an extensive tuberculosis of the liver, spleen and lymphnodes at the point of inoculation. There was also a marked tuberculosis of lungs.

*Rabbits*—There was an extensive tuberculosis of the lungs and marked lesions of the spleen of one rabbit. In the other rabbit there was a very extensive, progressive tuberculosis of the liver, spleen, kidneys and mesenteric lymphnodes. These animals died respectively 26 and 28 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 28,170.** Consignment of tuberculous lesions of a horse which reacted to the tuberculin test.

#### INOCULATION RESULTS

*Cavias*—One cavia developed an extensive tuberculosis of the liver and spleen. Marked lesions were also found in the lungs. The second cavia had a very extensive, generalized tuberculosis.

*Rabbits*—The first animal had an extensive tuberculosis of the lungs and kidneys. There were also slight lesions in the liver and spleen. The remaining rabbit had a very extensive tuberculosis of the lungs

and extensive lesions of the kidneys. There was also marked tuberculosis of the spleen. The first animal died 58 days after injection. The second one died 30 days later.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,192.** Parts of tuberculous organs of silver fox. Bacilli were numerous in the material.

#### INOCULATION RESULTS

*Cavias*—Both cavia developed an extensive tuberculosis of the spleen and marked lesions in the liver and lymphnodes near the point of inoculation.

*Rabbits*—In one rabbit there was an extensive miliary tuberculosis of the lungs. The spleen was much enlarged. The other animal showed an extensive generalized, miliary tuberculosis. These animals died respectively 20 and 42 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 25,969.** Spleen of monkey infected with experimental material.

#### INOCULATION RESULTS

*Cavias*—In one cavia there was a slight tuberculosis of the superficial inguinal lymphnodes. The remaining animal developed a slight tuberculosis of the spleen and lymphnodes near point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,022.** Material from monkey with spontaneous tuberculosis.

#### INOCULATION RESULTS

*Cavias*—Both cavia showed extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed marked tuberculosis of the lungs and spleen, the other extensive, generalized tuberculosis. These rabbits died respectively 78 and 88 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,123.** Specimen of lung, liver and lymphnodes of a case of spontaneous tuberculosis in a monkey.

#### INOCULATION RESULTS

*Cavias*—One cavia had an extensive tuberculosis of the lungs and spleen and marked lesions of the liver and lymphnodes near the point of inoculation. The second animal presented an extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—Both rabbits showed a very extensive, generalized, miliary tuberculosis. These animals died respectively 33 and 38 days after inoculation.

*Fowls*—Negative.

No. 27,227. Specimen of tuberculous lesions from a monkey with spontaneous disease.

#### INOCULATION RESULTS

*Cavia*—The first cavia to die presented an extensive tuberculosis of the spleen, liver and various lymphnodes. There were also slight lesions of the lungs. The remaining animals had a very extensive tuberculosis of the liver and spleen, and marked lesions of the lungs.

*Rabbits*—In one rabbit there was a marked tuberculosis of the liver and spleen. The second one had an extensive tuberculosis of the lungs. These animals died respectively 24 and 71 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

#### TYPING RESULTS OF THE SERIES

Types	Sheep	Horse	Fox	Monkey
Bovine .....	1	2	1	3
Human .....	..	..	..	1
Avian .....	..	..	..	..
Mixed .....	..	..	..	..
Total .....	1	2	1	4

## THE TYPING OF BACILLARY STRAINS PRESENT IN TUBERCULOUS LESIONS OF MAN

For the greater part these lesions originated from cases of extra-pulmonary tuberculosis. Altogether, material of 393 cases was obtained, of which 166 yielded negative results. Of the 227 specimens of which the typing results were analyzed, eight pertained to cases of generalized tuberculosis, 44 to bone and joint cases, 99 to tuberculosis of the kidney, 25 to tuberculous lymphnodes, 13 to spinal fluid containing bacilli, 11 to abscesses, and 27 to miscellaneous tuberculous lesions.

By the addition of rabbits to the typing sets it was also possible to ascertain the presence of bacilli of bovine origin as well as bacilli of the avian strain. The following results of the typing experiments were recorded.

**No. 6,146.** Material from tuberculous peritoneum of a 31-year-old female.

## INOCULATION RESULTS

*Cavias*—Both caviae had a diffused tuberculosis of the liver and spleen. Lesions were also noted in inguinal lymphnodes near site of inoculation.

*Rabbits*—Both rabbits showed a localized nonprogressive tuberculosis of the liver. No other lesions noted. These animals were killed 97 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 6,192.** Tuberculous submaxillary lymphnodes from a female 56 years of age.

## INOCULATION RESULTS

*Cavias*—One cavia died with extensive, progressive tuberculosis of the liver and spleen and visceral lymphnodes. The second one showed no evidence of disease.

*Rabbits*—Both rabbits presented a slight tuberculosis of the liver 92 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 6,258.** Pus, containing tubercle bacilli, from chest wall of female 43 years old.

## INOCULATION RESULTS

*Cavias*—Both caviae showed an extensive, generalized tuberculosis.

*Rabbits*—There was a slight, nonprogressive tuberculosis of the lungs of one rabbit. In the other one the same type of lesions were noted in the lungs and liver. Both animals were killed 110 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 6,482.** Tuberculous pus from a cervical abscess.

INOCULATION RESULTS

*Cavias*—Both animals showed an extensive, generalized tuberculosis.

*Rabbits*—These animals were killed 93 days after injection. There was a moderate, nonprogressive tuberculosis in the lungs of one rabbit. The other one had slight lesions in lungs and liver.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 6,523.** Tuberculous pulmonary and pleural lesions of an adult.

INOCULATION RESULTS

*Cavias*—One cavia had an extensive, progressive, generalized tuberculosis of the spleen and lungs. Also tuberculosis of the various lymphnodes.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 6,550.** Tuberculous lesions from an adult affected with a diffused pulmonary tuberculosis.

INOCULATION RESULTS

*Cavias*—Both animals showed an extensive tuberculosis of the spleen and marked lesions of the liver, lungs, and several lymphnodes.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 6,652.** Tuberculous cervical lymphnode from a male, 30 years old.

INOCULATION RESULTS

*Cavias*—Both animals showed a slight degree of tuberculosis of lymphnodes and livers. Also moderate lesions in spleens and lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 6,868.** Tuberculous lymphnodes.

INOCULATION RESULTS

*Cavias*—One cavia developed an extensive, progressive tuberculosis of the liver and spleen, and marked lesions of the lungs and lymphnodes. The second one had a very extensive tuberculosis of the spleen, and marked tuberculosis of the lymphnodes at point of inoculation and in liver.

*Rabbits*—The rabbits were killed 106 days after injection. Both had small tuberculous lesions in the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 7,125.** Tuberculous mesenteric lymphnodes of a case of pulmonary tuberculosis in an adult male.

## INOCULATION RESULTS

*Caviae*—One cavia showed a marked tuberculosis of the liver and spleen, a few nodules were also noted in the lungs. The second cavia had an extensive tuberculosis of the liver and spleen; also marked lesions of the lungs and lymphnodes near the point of inoculation and deep inguinal lymphnodes.

*Rabbits*—One rabbit was free of lesions. The other one had a marked tuberculosis of the lungs, moderate lesions of the kidneys and slight tuberculosis of the spleen. Both animals were killed 94 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 7,134.** Tuberculous cervical lymphnode of adult male.

## INOCULATION RESULTS

*Caviae*—One cavia had an extensive, generalized tuberculosis. The other one had a marked tuberculosis of the spleen, lungs and regional lymphnodes.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 7,257.** Tuberculous mesenteric lymphnodes of adult male.

## INOCULATION RESULTS

*Caviae*—There was a very extensive, generalized tuberculosis in one cavia. The second one had a moderate degree of tuberculosis of the liver and spleen, and marked lesions at the point of inoculation.

*Rabbits*—Both rabbits had a slight tuberculosis of the lungs. These animals were killed 93 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 7,811.** Sediment from tuberculous urine.

## INOCULATION RESULTS

*Caviae*—One cavia had a marked tuberculosis of the spleen and lymphnodes at point of inoculation. The second cavia had marked lesions of the spleen, liver and lymphnodes near the point of inoculation.

*Rabbits*—One rabbit, negative. The other had a few small tubercles in the lungs and a tuberculous abscess in the spleen. Both animals were killed 85 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,034.** Tuberculous mesenteric lymphnodes of adult male.

## INOCULATION RESULTS

*Caviae*—One cavia, negative. The other one had a slight tuberculosis of the liver, spleen and lymphnodes of inoculated side.

*Rabbits*—The rabbits were killed 84 days after injection. No. 1 was negative. No. 2 had a small tubercle in the lung.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 8,201.** Material from a tuberculous kidney of a female 45 years of age.

INOCULATION RESULTS

*Cavias*—Cavia No. 1, negative. The remaining one showed a marked, but nonprogressive tuberculosis of the spleen and slight lesions of the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,202.** Tuberculous lesions of axilla of female 50 years of age.

INOCULATION RESULTS

*Cavias*—In one cavia tuberculous lesions were noted. The other one had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,206.** Tuberculous mesenteric lymphnode of adult male.

INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the liver, spleen and lymphnodes of injected side. The second animal had a very extensive, progressive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,209.** Material from tuberculous knee joint, male 31 years of age.

INOCULATION RESULTS

*Cavias*—One cavia had a marked caseation of the lungs and slight tuberculosis of liver and spleen. The other cavia had a very extensive, progressive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,334.** Tuberculous lesions of liver and lymphnodes.

INOCULATION RESULTS

*Cavias*—There was a marked tuberculosis of the liver and spleen of one cavia, and nonprogressive lesions of tuberculosis in the spleen of the other.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,936.** Tuberculous material obtained from an autopsy of an adult male.

INOCULATION RESULTS

*Cavias*—Very extensive, generalized tuberculosis in both caviae.

*Rabbits*—A very slight tuberculosis was noted in the lungs of one

rabbit. The other was free of lesions. Both animals were killed 95 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 8,944.** Material from tuberculous knee joint, male, age 33 years.

#### INOCULATION RESULTS

*Caviae*—Both *caviae* showed tuberculosis of the spleen, marked lesions of the lymphnodes near point of inoculation and slight lesions of the liver and lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 9,171.** Urinary sediment.

#### INOCULATION RESULTS

*Caviae*—Both *caviae* developed an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 9,263.** Tuberculous material from adult male.

#### INOCULATION RESULTS

*Caviae*—Both animals showed a very extensive tuberculosis of the liver and spleen and extensive lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 9,558.** Material from tuberculous abscess from abdominal region.

#### INOCULATION RESULTS

*Caviae*—One *cavia* developed a marked tuberculosis at the point of inoculation, and slight lesions of the spleen and liver. The second *cavia* had an extensive, generalized tuberculosis.

*Rabbits*—There was a very slight tuberculosis of the lungs of one rabbit. The other one had slight lesions of the lungs and spleen. These animals were killed 96 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 9,560.** Urinary sediment which contained tubercle bacilli.

#### INOCULATION RESULTS

*Caviae*—There was a moderate degree of tuberculosis of the liver, spleen, lungs and lymphnodes near the point of inoculation of one animal. The remaining one had a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. Slight lesions also noted in the lungs.

*Rabbits*—Negative.



*Fowls*—Negative.

Classification of infection type: Human.

**No. 10,074.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Cavia*s—One cavia developed a very extensive tuberculosis of the spleen, liver and lymphnodes near the point of inoculation. The second animal had an extensive, generalized tuberculosis.

*Rabbits*—The rabbits died prematurely.

*Fowls*—Negative.

Classification of infection type: Mammalian.

**No. 10,075.** Urinary sediment.

INOCULATION RESULTS

*Cavia*s—One cavia developed an extensive, generalized tuberculosis. The second one had a very extensive tuberculosis of the liver and spleen, and marked lesions of lymphnodes near the point of inoculation.

*Rabbits*—There was an extensive, generalized tuberculosis of one rabbit. The other one had a very extensive tuberculosis of the lungs and spleen. There was a miliary tuberculosis of the liver. These animals died respectively 33 and 40 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Bovine.

**No. 11,010.** Pus from a tuberculous cold abscess of spinal column.

INOCULATION RESULTS

*Cavia*s—In one cavia there was a marked tuberculosis of the spleen, lungs and lymphnodes near the point of inoculation. The second cavia had an extensive generalized tuberculosis.

*Rabbits*—One rabbit showed a slight tuberculosis of the lungs. The other one was free of lesions. These animals were killed at the end of 96 days.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 11,891.** Tuberculous material from adult male.

INOCULATION RESULTS

*Cavia*s—One animal had a very extensive, progressive, generalized tuberculosis. The second animal developed an extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—There was a slight tuberculosis of the lungs of one rabbit. The other one was free of lesions. Both animals were killed 88 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 13,590.** Sediment of catheterized urine from tuberculous kidney.

INOCULATION RESULTS

*Cavia*s—Both cavia showed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 13,591.** Fluid from a tuberculous knee.

INOCULATION RESULTS

*Caviae*—Both caviae developed a very extensive, generalized tuberculosis.

*Rabbits*—One animal showed no evidence of tuberculosis. The other one had a slight tuberculosis of the lungs. These rabbits were killed 93 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 13,908.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Caviae*—One cavia had a very extensive, generalized tuberculosis. The other had very extensive lesions in the spleen, and marked tuberculosis of the lungs and liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 13,910.** Tuberculous urinary sediment from catheterized kidney.

INOCULATION RESULTS

*Caviae*—One cavia had an extensive tuberculosis of the spleen and marked lesions in the liver. The second cavia had a very extensive tuberculosis of the liver and spleen and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—In one rabbit there was an extensive tuberculosis of the lungs and mesentery, and slight lesions of the kidneys and spleen. The remaining animal had a very extensive tuberculosis of the lungs, the mesentery and marked lesions of the kidneys and spleen. These animals were killed 86 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 13,911.** Tuberculous urinary sediment from catheterized kidney.

INOCULATION RESULTS

*Caviae*—One cavia developed a slight tuberculosis of the spleen. The second cavia was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 14,017.** Tuberculous urinary sediment from a bladder.

INOCULATION RESULTS

*Caviae*—In one animal there was a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. There was a slight tuberculosis of the liver and lungs. The second cavia had a moderate tuberculosis of the spleen, lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

---

**No. 14,018.** Specimen of tuberculous urinary sediment from bladder.

INOCULATION RESULTS

*Cavia*s—Both cavia had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 14,592.** Tuberculous mesenteric lymphnodes of a child. No other gross lesions were found.

INOCULATION RESULTS

*Cavia*s—Both cavia developed an extensive tuberculosis of the livers, spleens, and lymphnodes at the point of inoculation. There were also slight lesions of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 14,596.** Urinary sediment containing tubercle bacilli.

INOCULATION RESULTS

*Cavia*s—One cavia developed a moderate degree of tuberculosis of the spleen and lymphnodes near the point of inoculation. The other one had a marked tuberculosis of the liver and spleen and the lymphnodes at point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 14,597.** Urinary sediment from tuberculous kidney.

INOCULATION RESULTS

*Cavia*s—There was a slight tuberculosis of the spleen, liver and lymphnodes near the point of inoculation. The second animal was free of lesions.

*Rabbits*—Negative.

*Fowls*—One fowl died 13 days after inoculation. The spleen was found to contain a few bacilli, but there was no macroscopic evidence of tuberculosis. The other fowl showed no lesions.

Classification of infection type: Human.

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**No. 15,093.** Tuberculous urine.

INOCULATION RESULTS

*Cavia*s—Tuberculous lesions were noted in liver and spleen of each cavia.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 15,094.** Tuberculous urine.

## INOCULATION RESULTS

*Caviae*—One cavia was free of tuberculosis. The other one had a marked, but nonprogressive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 15,095.** Fluid from a sinus of the neck.

## INOCULATION RESULTS

*Caviae*—One cavia developed a slight tuberculosis of the spleen. The other animal was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 15,236.** Tuberculous urinary sediment of catheterized kidney.

## INOCULATION RESULTS

*Caviae*—In one cavia there was an extensive tuberculosis of the liver and spleen. The second animal had a nonprogressive tuberculosis of the liver, spleen and lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 15,237.** Tuberculous urine.

## INOCULATION RESULTS

*Caviae*—There was an extensive generalized tuberculosis of one cavia. The second one had an extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 15,239.** Tuberculous urinary sediment.

## INOCULATION RESULTS

*Caviae*—In one cavia there was an extensive tuberculosis of the liver and spleen. The other one had a marked, nonprogressive tuberculosis of the liver, lungs and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 15,240.** Urinary sediment from tuberculous kidney.

## INOCULATION RESULTS

*Caviae*—One cavia had a very extensive tuberculosis of liver, spleen and lymphnodes near the point of inoculation. There were marked lesions of the lungs of both animals. The second cavia also had an extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,205.** Tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—One cavia had a very extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near the point of inoculation. The remaining animal had moderate lesions of the liver and spleen. Marked tuberculosis of the lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,206.** Specimen of tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—One cavia had a slight tuberculosis of the spleen and of the lymphnodes near the point of inoculation. The second animal developed a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,207.** Tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—There was a moderate degree of tuberculosis of the spleen and lymphnodes near the point of inoculation of one cavia. The second one had a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,890.** Tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—One cavia had a marked tuberculosis of the lymphnodes near the point of inoculation, and slight lesions in the spleen. The remaining animal developed an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,892.** Tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—In one cavia there was a slight tuberculosis of the spleen and lymphnodes near the point of inoculation. The second animal had an extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 16,893.** Material from tuberculous abscess.

## INOCULATION RESULTS

*Cavia*s—One cavia showed a moderate degree of tuberculosis of the

lungs and spleen. The remaining animal had a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit showed a slight tuberculosis of the lungs. The other was free of lesions. Both animals were killed 93 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 16,894.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—In one animal there was a very extensive, generalized tuberculosis. The other *cavia* had a marked, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 16,895.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—One animal had an extensive tuberculosis of the spleen and marked lesions of the lymphnodes near the point of injection. The second one showed an extensive tuberculosis of the liver and spleen and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 17,754.** Tuberculous material from ileum, adrenal, and spleen.

INOCULATION RESULTS

*Caviae*—There was a very extensive, generalized tuberculosis of one *cavia*. The other one had extensive lesions of the liver and spleen and marked tuberculosis of the lymphnodes near the point of inoculation.

*Rabbits*—Both animals were killed 96 days after injection. One had slight lesions of the lungs and the other was free of lesions.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,530.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—There was a marked, generalized tuberculosis in one *cavia* and an extensive, generalized tuberculosis in the other one.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,531.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—In one *cavia* there was a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. Slight lesions were noted in the liver and lungs. The second *cavia* had an extensive tuberculosis of the lungs and spleen, and marked lesions in the liver and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,533.** Pus from a tuberculous knee.

INOCULATION RESULTS

*Cavias*—Both cavia had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,534.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Cavias*—There was a marked, generalized tuberculosis in one cavia. The other one had a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed a slight tuberculosis of the lungs. These rabbits were killed respectively 60 and 101 days after receiving virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,535.** Sediment of tuberculous urine.

INOCULATION RESULTS

*Cavias*—Both animals had a marked, generalized tuberculosis.

*Rabbits*—Two rabbits had a slight tuberculosis of the lungs. These animals were killed 104 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 18,536.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Cavias*—One cavia showed an extensive, generalized tuberculosis. The other showed similar lesions.

*Rabbits*—In one rabbit there was a slight tuberculosis of the lungs. The other had moderate lesions in the same organs. Both rabbits were killed at the end of 101 days.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 19,537.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia showed marked tuberculosis of the spleen. The other one had marked lesions of lungs, spleen and lymphnodes near the point of inoculation. There was also slight tuberculosis of the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 19,538.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—In one cavia there was a marked, generalized tuberculosis. The other one had a moderate degree of tuberculosis of the spleen and

lymphnodes near the point of inoculation. There were also slight lesions in the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 19,541.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—Both animals showed a marked, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. Both animals were killed 89 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,185.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The second one showed an extensive, generalized tuberculosis.

*Rabbits*—In one rabbit there was an extensive tuberculosis of the lungs and marked lesions of the spleen and kidneys. The second rabbit showed a very extensive tuberculosis of the lungs and marked lesions of the spleen and kidneys. The animals were killed three months after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 21,241.** Pus from tuberculous spine. Female, 13 years of age.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The second one was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,242.** Pus from a tuberculous osteomyelitis of the femur. Female, age 14 years.

INOCULATION RESULTS

*Cavias*—In one cavia there was a moderate degree of tuberculosis of the liver, spleen and lungs. The remaining animal was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,243.** Pus from tuberculous spine of male six and a half years old.

INOCULATION RESULTS

*Cavias*—One cavia had a marked, generalized tuberculosis. The remaining one died prematurely.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.



No. 21,254. Pus from tuberculous hip. Female, 7 years of age.

INOCULATION RESULTS

*Caviae*—There was a very extensive, generalized tuberculosis of one animal. The remaining one was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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No. 21,316. Tuberculous urine.

INOCULATION RESULTS

*Caviae*—In one cavia there was a marked tuberculosis of the lungs, spleen and lymphnodes near the point of inoculation. The second animal had a marked tuberculosis of the lungs and moderate lesions at the point of inoculation.

*Rabbits*—Both rabbits had a slight tuberculosis of the lungs 94 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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No. 21,317. Tuberculous urinary sediment.

INOCULATION RESULTS

*Caviae*—Both caviae developed an extensive tuberculosis of the spleen, marked lesions of the lungs and lymphnodes near the point of injection.

*Rabbits*—There was a slight tuberculosis of the lungs of one rabbit. The other was free of lesions. These animals were killed 93 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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No. 21,318. Tuberculous urine.

INOCULATION RESULTS

*Caviae*—There was a very extensive tuberculosis of the lungs and spleen of one cavia. The second one had a moderate degree of tuberculosis of the lungs and lymphnodes at the point of inoculation.

*Rabbits*—In one rabbit there was a marked tuberculosis of the lungs and slight lesions of the liver. The other one had a slight tuberculosis of the lungs. The first rabbit died 80 days after injection. The second one was killed 15 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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No. 21,319. Urine which contained clumps of bacilli.

INOCULATION RESULTS

*Caviae*—One cavia showed very extensive, generalized tuberculosis. The other one had an extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1, negative. No. 2 had a slight tuberculosis of the lungs. The first animal died 58 days after injection. The second one was killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,320.** Tuberculous urine.

## INOCULATION RESULTS

*Cavias*—Both cavias had a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a slight tuberculosis of the lungs. Rabbit No. 2 negative. Both animals were killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,321.** Discharge from sinus of tuberculous thigh.

## INOCULATION RESULTS

*Cavias*—One cavia showed many tubercles in the spleen. The other one developed a very slight tuberculosis of the lungs, liver and spleen, and marked lesions of the lymphnodes near point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,350.** Tuberculous material from the sacro-iliac region of a female, 12 years of age.

## INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive tuberculosis of the liver and spleen. Marked lesions of the lungs and lymphnodes at the point of inoculation. The second one had an extensive tuberculosis of the lungs and marked lesions of the lymphnodes.

*Rabbits*—One rabbit developed a very extensive tuberculosis of the lungs and moderate lesions of the kidneys and omentum. The second rabbit showed marked tuberculosis of the lungs. The first rabbit died 50 days after injection. The other one was killed at the end of 79 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 21,410.** Tuberculous urine. Adult female.

## INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive tuberculosis of the liver and spleen, marked tuberculosis of the lungs and lymphnodes at the point of inoculation. The second animal had a very extensive tuberculosis of the spleen, and marked lesions of the lungs, liver and lymphnodes at the point of inoculation.

*Rabbits*—Both rabbits had a slight tuberculosis of the lungs. These animals were killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,411.** Tuberculous pus from shoulder joint, female, age 23 years.

## INOCULATION RESULTS

*Cavias*—There was a slight tuberculosis of the spleen of one cavia. The other one had an extensive tuberculosis of the spleen, and slight lesions of the lungs and liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,507.** Tuberculous material from male.

INOCULATION RESULTS

*Cavias*—There was an extensive, generalized tuberculosis of one cavia. The other one had a marked, generalized tuberculosis.

*Rabbits*—Both rabbits developed a slight tuberculosis of the lungs. One died 60 days after injection and the other died twelve days later.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,508.** Tuberculous pus from cervical lymphnodes of an adult 32 years of age.

INOCULATION RESULTS

*Cavias*—Both cavias had an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,598.** Tuberculous pus from open sinus of inguinal region. Female 11 years old.

INOCULATION RESULTS

*Cavias*—There was a marked, generalized tuberculosis of one cavia. The other one developed a slight tuberculosis of the spleen and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—One animal died with a marked tuberculosis of the liver and lungs. Enlargement of the spleen was also noted. This rabbit died 15 days after injection. The other one was killed 88 days after inoculation and showed no evidence of lesions.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,599.** Tuberculous pus from sinus in the region of the ankle joint. Arthritis. Male 12 years old.

INOCULATION RESULTS

*Cavias*—One cavia showed a very extensive tuberculosis of the lungs and spleen. The other one had a marked, nonprogressive tuberculosis of the liver and spleen.

*Rabbits*—There was a marked tuberculosis of the lungs of both rabbits. One animal also had a small nodule in the spleen. These rabbits were permitted to live respectively 75 and 92 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,600.** Tuberculous material from a female.

INOCULATION RESULTS

*Cavias*—There was a very extensive tuberculosis of the liver and spleen of one cavia. The other one showed very extensive lesions of the liver, and slight tuberculosis of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,610.** Tuberculous axillary lymphnodes.

INOCULATION RESULTS

*Cavia*s—One cavia presented a very extensive, generalized tuberculosis. The other one was free of lesions.

*Rabbits*—Rabbit No. 1, negative. Rabbit No. 2 had a slight tuberculosis of the lungs. Both animals were killed 108 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,685.** Urine from tuberculous kidney of female, age 8 years.

INOCULATION RESULTS

*Cavia*s—One cavia developed a marked tuberculosis of the lungs, and moderate lesions in the lymphnodes near the point of inoculation. The second one had a generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,686.** Tuberculous material from knee joint of adult female.

INOCULATION RESULTS

*Cavia*s—Both cavia showed a marked tuberculosis of the spleen and slight lesions of the lungs. One cavia also developed a slight lesion of the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,687.** Pus from a tuberculous osteomyelitis of toe of female, two years of age.

INOCULATION RESULTS

*Cavia*s—In one animal there was a marked tuberculosis of the spleen, and lesions of the liver. The second animal had a marked tuberculosis of the liver and spleen. These lesions were of a nonprogressive type. Slight lesions were also observed in the lungs.

*Rabbits*—Rabbit No. 1, negative. No. 2 had a slight tuberculosis of the lungs. These animals were killed 105 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,695.** Tuberculous urine.

INOCULATION RESULTS

*Cavia*s—In one cavia there was a slight tuberculosis of the lymphnodes and spleen and marked lesions of the superficial inguinal lymphnodes. The second cavia showed a very extensive tuberculosis of the liver and spleen.

*Rabbits*—In rabbit No. 1 there was a slight tuberculosis of the lungs.

Rabbit No. 2, negative. The first animal died 103 days after injection. The other one was killed a day later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,696.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the liver and spleen. Slight tuberculosis of the lungs was also observed. The remaining one had a marked tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,698.** Tuberculous pus from femur.

INOCULATION RESULTS

*Cavias*—One cavia developed a marked tuberculosis of the liver. The remaining one had a very extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,767.** Tuberculous liver, spleen and lymphnodes of an adult male.

INOCULATION RESULTS

*Cavias*—There was an extensive tuberculosis of the liver and spleen of one animal. The second one had extensive lesions in the same organs and marked tuberculosis of the lymphnodes near the point of inoculation.

*Rabbits*—In one rabbit there was a moderate degree of tuberculosis in the lungs. Rabbit No. 2 negative. These rabbits died respectively 62 and 70 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,774.** Tuberculous urine from female, age 65 years.

INOCULATION RESULTS

*Cavias*—Cavia No. 1 had a very extensive tuberculosis of the spleen. Marked lesions of the liver and slight tuberculosis of the lungs. Cavia No. 2 negative.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,775.** Tuberculous pus from femur of 7-year-old female.

INOCULATION RESULTS

*Cavias*—Both cavia had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,797.** Pus and fluid from an abscess in the thigh of a male three years of age.

INOCULATION RESULTS

*Cavias*—In one cavia there was a marked tuberculosis of the spleen and slight lesions of the liver and lymphnodes at the point of inoculation. The second one had an extensive tuberculosis of the spleen and marked tuberculosis of the liver and lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,799.** Material from pectoral abscess (mediastinal tuberculous adenitis). Female, 12 years of age.

INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the liver and spleen. Slight lesions of the lungs and lymphnodes near the point of inoculation were also observed. The second cavia developed a very extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,847.** Tuberculous kidney.

INOCULATION RESULTS

*Cavias*—In one cavia there was a marked tuberculosis of the lungs, and slight lesions of the lymphnodes near the point of inoculation. The remaining cavia had a very extensive tuberculosis of the lungs and slight lesions of the spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,848.** Tuberculous material from female, age 3½ months.

INOCULATION RESULTS

*Cavias*—There was a very extensive tuberculosis of the liver and spleen of one cavia. The second animal had a very extensive tuberculosis of the liver and spleen, also marked lesions of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 21,849.** Tuberculous material from female, 15½ months of age.

INOCULATION RESULTS

*Cavias*—In one cavia there was a slight tuberculosis of the spleen, lungs and lymphnodes at the point of inoculation. The second cavia had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,866.** Urine from tuberculous kidney. Female 50 years of age.

INOCULATION RESULTS

*Caviae*—There was a marked tuberculosis of the lungs and superficial inguinal lymphnodes of one cavia. The second one had a very extensive tuberculosis of the lungs, and marked lesions of the spleen, liver and lymphnodes at the point of inoculation.

*Rabbits*—Both rabbits had a slight tuberculosis of the lungs. These animals were killed 99 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,897.** Pus from tuberculous ankle, male, 42 years of age.

INOCULATION RESULTS

*Caviae*—One cavia showed a very extensive tuberculosis of the liver and spleen, marked lesions of the lungs. The second cavia had a marked tuberculosis of the liver, a very extensive tuberculosis of the spleen, and slight lesions of the lungs.

*Rabbits*—Both rabbits had a circumscribed tuberculosis of the lungs. The rabbits were killed 94 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,899.** Tuberculous material from a thumb of female, 1½ years of age.

INOCULATION RESULTS

*Caviae*—Cavia No. 1 negative. No. 2 had a marked tuberculosis of the liver, extensive tuberculosis of the spleen and slight lesions of lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,922.** Tuberculous material from wrist.

INOCULATION RESULTS

*Caviae*—Both animals had an extensive tuberculosis of liver and spleen.

*Rabbits*—Rabbit No. 1 negative. No. 2 showed slight tuberculosis of the lungs. One animal died 55 days after injection. The other one was killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,925.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—Tuberculous lesions were found in the spleens of both caviae.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. The first rabbit was killed at the end of 40 days. The second one died 57 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 21,942.** Tuberculous urine from female, age 26 years.

INOCULATION RESULTS

*Caviae*—One cavia developed a very extensive tuberculosis of the

liver and spleen. The second showed an extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 marked tuberculosis of the lungs. The animals died respectively 76 and 77 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,012.** Pus from small tuberculous sinus of leg. Female, three years of age.

#### INOCULATION RESULTS

*Cavias*—One cavia was free of lesions. The remaining one had a marked tuberculosis of the lungs, spleen and lymphnodes at the point of injection. Moderate lesions were noted in the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,014.** Tuberculous urine from female, age 43 years.

#### INOCULATION RESULTS

*Cavias*—There was a marked tuberculosis of the spleen and liver of one cavia. The second one had an extensive tuberculosis of the liver and spleen, also slight lesions of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,041.** Tuberculous pus from kidney of adult female.

#### INOCULATION RESULTS

*Cavias*—In one cavia there was an enlarged spleen in which bacilli were found. The second animal had an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits developed a marked tuberculosis of the lungs. These animals were killed 120 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,042.** Tuberculous pleural fluid of female.

#### INOCULATION RESULTS

*Cavias*—One cavia had a very extensive, generalized tuberculosis. The other one showed marked tuberculosis of the lungs, spleen and lymphnodes.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a marked tuberculosis of the lungs. The first animal died 73 days after injection and the other was killed 24 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,188.** Pus from tuberculous spine of male, age 16 years.

#### INOCULATION RESULTS

*Cavias*—In one cavia there was an extensive tuberculosis of the liver and spleen, also of the lungs. The second animal had an extensive, generalized tuberculosis.



*Rabbits*—One rabbit died without lesions. The second one was killed after three months and showed a moderate degree of pulmonary tuberculosis.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,189.** Tuberculous material from draining sinus of a foot. Male three years of age.

#### INOCULATION RESULTS

*Cavia*—One cavia showed a very extensive tuberculosis of the spleen and liver, also slight lesions of the lungs. The second one had a very extensive tuberculosis of the spleen, and extensive lesions of the liver and lungs.

*Rabbits*—Both animals were killed 74 days after inoculation. One was free of lesions and the other one had a slight tuberculosis of the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,190.** Material from a case of Pott's Disease, female, age 6½ years.

#### INOCULATION RESULTS

*Cavia*—There was tuberculosis of the lungs and the lymphnodes near point of inoculation of one cavia. The second animal had marked lesions of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,233.** Tuberculous urine.

#### INOCULATION RESULTS

*Cavia*—One cavia developed a moderate tuberculosis of the spleen and lymphnodes at the point of inoculation. The remaining animal had extensive tuberculosis of the spleen and marked lesions of the liver, lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,241.** Mesenteric lymphnodes, male, 2 years of age, tuberculous leptomeningitis and generalized miliary tuberculosis. No foci in the lungs.

#### INOCULATION RESULTS

*Cavia*—One cavia showed a marked tuberculosis of the liver and spleen. The second one had a marked tuberculosis of the spleen and slight lesions of the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,285.** Material from a draining sinus. Tuberculous bone lesions. Female, age nine years.

#### INOCULATION RESULTS

*Cavia*—Cavia No. 1 negative. Cavia No. 2 showed an extensive

tuberculosis of the liver and spleen, marked lesions of the lymphnodes near the point of inoculation and moderate tuberculosis of the lungs.

*Rabbits*—The first rabbit died 87 days after injection and was found to be free of lesions. The second one was killed 15 days later and showed a moderate degree of tuberculosis in the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,288.** Tuberculous pus from cervical abscess of male, four months of age.

#### INOCULATION RESULTS

*Cavias*—One cavia was free of lesions. The second one had a very extensive tuberculosis of the liver and spleen. Moderate lesions were also present in the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,290.** Tuberculous pus. Adult, male.

#### INOCULATION RESULTS

*Cavias*—In one cavia there was a very extensive tuberculosis of the liver and spleen. The second one had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,384.** Blood and pus from a tuberculous abscess of leg, Pott's Disease, lumbar area, female, age 14 years.

#### INOCULATION RESULTS

*Cavias*—One cavia had a very few small nodules in the liver. The second one developed an extensive tuberculosis of the liver and spleen, and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,387.** Tuberculous pus from draining sinus. Suppurative arthritis, elbow, female, age seven years.

#### INOCULATION RESULTS

*Cavias*—Cavia No. 1 negative. No. 2 showed extensive tuberculosis of the spleen, marked lesions of the liver and lymphnodes at the point of inoculation.

*Rabbits*—Rabbit No. 1 negative. No. 2 had slight tuberculosis of the lungs. These animals were killed three months after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,509.** Tuberculous material from knee; male, 8 years of age.

#### INOCULATION RESULTS

*Cavias*—Each cavia had an extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,510.** Specimen of peritoneum of diaphragm. Male, 35 years of age. Generalized tuberculosis.

INOCULATION RESULTS

*Cavias*—One cavia had a few very small tubercles in the spleen. The other one had a very extensive tuberculosis of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,541.** Tuberculous spinal fluid. Female, three years of age.

INOCULATION RESULTS

*Cavias*—Cavia No. 1 negative. No. 2 had a moderate degree of tuberculosis of the spleen and lymphnodes. Slight lesions of the liver noted.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,577.** Tuberculous pus from abscess in the region of the thigh. Middle aged female.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the spleen and miliary tuberculosis of the liver. The second animal had a slight tuberculosis of the lungs.

*Rabbits*—Rabbit No. 1 negative. No. 2 had slight tuberculosis of the lungs. The first animal died 36 days after injection and the other one was killed after 102 days.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,634.** Tuberculous pus from kidney of male, 18 years of age.

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis of one animal. The other one had marked lesions of the liver, spleen and lymphnodes at the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,646.** Tuberculous tissue and pus from kidney of male, age 15 years.

INOCULATION RESULTS

*Cavias*—There was a marked generalized tuberculosis of one cavia. The other one had marked lesions of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 22,682.** Tuberculous pus from lumbar region of female 17 years of age.

INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the spleen and a very extensive tuberculosis of the liver and lungs. The second cavia developed lesions in the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,736.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia had a moderate degree of tuberculosis of the liver, spleen and lymphnodes at the point of inoculation. The other animal was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,737.** Fluid from tuberculous knee.

INOCULATION RESULTS

*Cavias*—In one cavia there was a slight tuberculosis of the spleen and lymphnodes near the point of inoculation. The second cavia was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,776.** Material from a male, five years of age. Bilateral tuberculosis of the kidney.

INOCULATION RESULTS

*Cavias*—Cavia No. 1 negative. No. 2 had a marked tuberculosis of the spleen and moderate lesions in the lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,782.** Pus and blood from axillary region. Tuberculosis of axillary lymphnodes. Female, age 8 years.

INOCULATION RESULTS

*Cavias*—One cavia showed extensive, generalized tuberculosis. The second one developed marked lesions of the lungs, spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,856.** Autopsy material, consisting of part of lung, liver and spleen. Infant 2½ months of age.

## INOCULATION RESULTS

*Cavias*—There was a marked, generalized tuberculosis in one cavia. The second one had slight lesions of the liver and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,964.** Fluid from a tuberculous hip of a female five years of age.

## INOCULATION RESULTS

*Cavias*—Cavia No. 1 negative. The second cavia developed marked tuberculosis of the spleen, lungs and lymphnodes near the point of inoculation. Slight lesions of the liver.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,965.** Material from tuberculous kidney of female, 36 years of age.

## INOCULATION RESULTS

*Cavia*—No. 1, negative. No. 2 showed tuberculosis of the lymphnodes at the point of inoculation and slight lesions of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 22,982.** Tuberculous pus from pleural cavity of female.

## INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive tuberculosis of the liver and spleen. Marked lesions in the lymphnodes near point of inoculation were observed. The second one was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,056.** Kidney, spleen, lung and lymphnodes from a case of miliary tuberculosis. Female, age 2½ years.

## INOCULATION RESULTS

*Cavias*—One cavia showed an extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second animal developed an extensive, generalized tuberculosis.

*Rabbits*—The two rabbits were killed 95 days after inoculation. They both showed a slight tuberculosis of the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,187.** Tuberculous urine from ureter.

## INOCULATION RESULTS

*Cavias*—One cavia had a marked tuberculosis of the spleen and lymphnodes at the point of inoculation. Slight lesions of the liver and lungs were also present. The second cavia developed an extensive tubercu-

losis of the spleen, and marked lesions of the liver, lungs and lymph-nodes at the point of inoculation.

*Rabbits*—Both rabbits were killed 91 days after injection. Rabbit No. 1 negative. Rabbit No. 2 presented a moderate tuberculosis of the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,190.** Tuberculous urine.

INOCULATION RESULTS

*Cavia*—Cavia showed a marked tuberculosis of the lungs, spleen and lymphnodes at the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,191.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—Both cavias showed a moderate degree of tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,211.** Tuberculous tissue from left kidney of female, 35 years of age.

INOCULATION RESULTS

*Cavias*—Both animals developed a generalized tuberculosis.

*Rabbits*—Each rabbit showed a marked miliary tuberculosis of the lungs and a moderate degree of tuberculosis of the kidneys. These animals were killed 94 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 23,447.** Pus from tuberculous hip of male, age 47 years.

INOCULATION RESULTS

*Cavias*—Both cavias showed a very extensive tuberculosis of the liver and spleen. Marked lesions of the lymphnodes at the point of inoculation were noted. One animal showed marked lesions of the lungs.

*Rabbits*—Both rabbits developed a slight tuberculosis of the lungs. These animals died respectively 88 and 96 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,448.** Spinal fluid. Patient had tuberculous meningitis.

INOCULATION RESULTS

*Cavias*—One cavia had a slight tuberculosis of the spleen and marked lesions of the lymphnodes near the point of inoculation. The second animal showed a moderate tuberculosis of the lungs, spleen and lymph-nodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,608.** Pus from a draining tuberculous hip of female, 11 years of age.

INOCULATION RESULTS

*Cavias*—There was an extensive tuberculosis of the liver, spleen and lymphnodes near the point of inoculation in one of the cavias. The remaining one had an extensive tuberculosis of the lungs and spleen; also lymphnodes near the point of inoculation. Marked lesions of the liver noted.

*Rabbits*—Both rabbits developed tuberculosis of the lungs. These animals were killed 101 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,614.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—Both cavias showed marked tuberculosis of the spleen, liver and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,615.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia had a very extensive tuberculosis of the liver and spleen. Marked lesions of the lymphnodes near the point of inoculation. The remaining one showed a very extensive, generalized tuberculosis.

*Rabbits*—No. 1 was negative. No. 2 had a marked tuberculosis of the lungs. These animals were killed 98 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,617.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia developed an extensive, generalized tuberculosis. The second one had a marked tuberculosis of the spleen and moderate lesions of the lungs and lymphnodes.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,618.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—Both cavias showed generalized tuberculosis.

*Rabbits*—One rabbit developed a slight tuberculosis of the lungs. The other one a moderate tuberculosis in the same organs. These animals died respectively 49 and 81 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 23,770.** Tuberculous urine from adult.

INOCULATION RESULTS

*Cavias*—Both animals developed a generalized tuberculosis.

*Rabbits*—One rabbit showed marked tuberculosis of the spleen. The other one a marked tuberculosis of the lungs. These animals died respectively 30 and 54 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 23,772.** Tuberculous spinal fluid.

INOCULATION RESULTS

*Cavias*—One cavia had an extensive tuberculosis of the spleen and marked lesions of the liver, omentum and lymphnodes at the point of inoculation. The second cavia showed a very extensive tuberculosis of the liver and spleen and marked tuberculosis of the lymphnodes near the point of inoculation.

*Rabbits*—Rabbit No. 1 died 54 days after inoculation and was found to be free of lesions. No. 2 was killed at the end of 102 days. Slight lesions were noted in the lungs.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,073.** Tuberculous spinal fluid from a male, age 19 months.

INOCULATION RESULTS

*Cavias*—Cavia No. 1, negative. No. 2 showed a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. There were slight lesions in the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,093.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The other one had an extensive, generalized tuberculosis.

*Rabbits*—One rabbit showed slight tuberculosis of the lungs and spleen. The other one had an extensive tuberculosis of the lungs. These animals died respectively 44 and 91 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,094.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the lymphnodes near the point of inoculation, also slight lesions of the liver and an enlarged spleen. The second one had a marked tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.



**No. 24,462.** Material from tuberculous knee of male, ten years of age.

INOCULATION RESULTS

*Caviae*—In one *cavia* there was an extensive tuberculosis of the liver and spleen, and slight lesions of the lungs and lymphnodes near the point of inoculation. The second one had a very extensive tuberculosis of the spleen and marked lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,470.** Pus from tuberculous knee of male.

INOCULATION RESULTS

*Caviae*—One *cavia* had an extensive tuberculosis of the liver and spleen, and slight lesions of the lymphnodes. The second animal developed a very extensive tuberculosis of the liver and spleen, and marked tuberculosis of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Both animals showed a slight tuberculosis of the lungs. One rabbit died 79 days after inoculation. The other one was killed 21 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,471.** Tuberculous urine from an adult.

INOCULATION RESULTS

*Caviae*—One *cavia* had a moderate degree of tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second *cavia* showed an extensive tuberculosis in the same organs.

*Rabbits*—Slight tuberculosis was noted in the lungs of both rabbits. The first animal died 33 days after inoculation. The second one was killed at the end of 100 days.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,733.** Specimen of tuberculous urine.

INOCULATION RESULTS

*Caviae*—Generalized tuberculosis was noted in one *cavia*. The second one had a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit showed a marked miliary tuberculosis of the lungs. The other rabbit had an extensive tuberculosis of the lungs and marked lesions of the kidneys. The first rabbit died 59 days after injection and the second one was killed at the end of 96 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 24,734.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—Both *caviae* showed a marked tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,735.** Specimen of tuberculous urine.

INOCULATION RESULTS

*Caviae*—In one *cavia* there was a marked tuberculosis of the lungs, spleen and lymphnodes near the point of inoculation. The second one had an extensive tuberculosis of the liver and spleen. There were marked lesions of the lungs, sublumbar lymphnodes and lymphnodes near the point of inoculation.

*Rabbits*—Rabbit No. 1, negative. No. 2 had a slight tuberculosis of the lungs. Both animals were killed 96 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,736.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—One *cavia* showed a very extensive, generalized tuberculosis. The other one had very extensive lesions of the spleen and marked tuberculosis of the liver, lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,737.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—One *cavia* had a moderate degree of tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The other animal was free of lesions.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,739.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—Both *caviae* had a marked tuberculosis of the lungs and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 24,740.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—Both *caviae* showed a marked tuberculosis of the lungs and spleen.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 25,586.** Tuberculous material from a male.

## INOCULATION RESULTS

*Cavia*s—There was a very extensive, generalized tuberculosis of one *cavia*. The second one had marked lesions of the spleen and lymph-nodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,591.** Tuberculous urinary sediment.

## INOCULATION RESULTS

*Cavia*s—Both *cavia*s showed extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,634.** Tuberculous kidney of a male, 58 years of age.

## INOCULATION RESULTS

*Cavia*s—One *cavia* showed a marked tuberculosis of the spleen, liver and lymphnodes near the point of inoculation. The second *cavia* had an extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a very marked, miliary tuberculosis of the spleen and lungs. The second one showed an extensive tuberculosis of the lungs. The first rabbit died 61 days after injection, the second one was killed at the end of 94 days.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 25,968.** Tuberculous material.

## INOCULATION RESULTS

*Cavia*s—Both *cavia*s developed an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed a slight tuberculosis of the lungs. These animals were killed 94 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,971.** Tuberculous material from male.

## INOCULATION RESULTS

*Cavia*s—*Cavia* No. 1 negative. No. 2 showed a very extensive tuberculosis of the liver and moderate lesions of the spleen, lungs and lymph-nodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,992.** Tuberculous urine.

## INOCULATION RESULTS

*Cavia*s—Both *cavia*s developed an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 25,993.** Tuberculous urine.

## INOCULATION RESULTS

*Cavias*—In both caviae there was an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits developed a slight tuberculosis of the lungs. The first animal died 65 days after inoculation. The second one was killed 26 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,994.** Urine from patient affected with renal tuberculosis.

## INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis of one animal. The other one showed marked tuberculosis of the lymphnodes near the point of inoculation and slight lesions of the spleen.

*Rabbits*—One rabbit presented a moderate degree of tuberculosis of the lungs. The other one had a marked tuberculosis of the same organ. Both animals were killed 91 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,996.** Tuberculous urine.

## INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. The second one had a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had slight tuberculosis of the lungs. The first animal was killed at the end of 68 days, and the other 23 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 25,997.** Tuberculous urine.

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The second one showed a very extensive tuberculosis of the spleen and marked lesions of the lungs, liver and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 26,007.** Tuberculous spinal fluid.

## INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis of one cavia. The second one had an extensive tuberculosis of the liver and spleen and marked lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 26,008.** Tuberculous cervical lymphnodes of female 29 years of age.

INOCULATION RESULTS

*Cavias*—One cavia showed a very extensive, generalized tuberculosis. The second one was free of lesions.

*Rabbits*—There was a marked miliary tuberculosis of the lungs of one rabbit. The second one developed slight lesions of the lungs. The first animal died 62 days after inoculation and the second one was killed 40 days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 26,009.** Tuberculous urine.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second one developed a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits had a moderate degree of tuberculosis of the lungs. These animals were killed 95 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 26,968.** Tuberculous kidney.

INOCULATION RESULTS

*Cavias*—One cavia showed a very extensive, generalized tuberculosis. The other one had an extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed a moderate tuberculosis of the lungs. The second one showed a slight tuberculosis of the lungs and spleen. Both animals were killed 91 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 26,972.** Tuberculous pus from male.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second one was free of lesions.

*Rabbits*—There was an extensive tuberculosis of the lungs and spleen of one animal. The second one had very extensive lesions of the lungs and kidneys, also extensive lesions of the spleen. These animals died respectively 40 and 58 days after injection.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 26,990.** Tuberculous pus.

INOCULATION RESULTS

*Cavias*—Both cavia developed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 26,991.** Tuberculous material from hip.

INOCULATION RESULTS

*Cavia*s—Both cavia developed a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. The first animal died at the end of 31 days. The other one was killed 104 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,004.** Tuberculous material from axillary sinus.

INOCULATION RESULTS

*Cavia*s—Both cavia showed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,024.** Tuberculous spinal fluid.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1, negative. No. 2 showed a marked tuberculosis of the spleen, lymphnodes and lungs.

*Rabbits*—Rabbit No. 1 negative. No. 2 showed marked tuberculosis of the lungs. Both were killed 92 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,025.** Pus from tuberculous hip of female, age seven years.

INOCULATION RESULTS

*Cavia*s—One of the cavia developed an extensive tuberculosis of the liver and spleen and moderate lesions of the lungs and lymphnodes near the point of inoculation. The second had an extensive tuberculosis of the spleen and marked lesions in the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,025.** Pus from tuberculous hip of female, age 7 years.

INOCULATION RESULTS

*Cavia*s—One cavia developed an extensive tuberculosis of the liver and spleen and moderate lesions of lungs and lymphnodes near point of inoculation. The second had an extensive tuberculosis of the spleen and marked lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,026.** Tuberculous bladder urine.

INOCULATION RESULTS

*Cavia*—In one cavia there was a very extensive tuberculosis of the

liver and spleen, and marked lesions of the lungs and lymphnodes near the point of inoculation. The other had developed a marked tuberculosis of the spleen and lymphnodes.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,043.** Tuberculous epididymus of a 48-year-old patient.

INOCULATION RESULTS

*Cavia*s—*Cavia* No. 1 negative. No. 2 had an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,063.** Tuberculous material from sinus of ankle.

INOCULATION RESULTS

*Cavia*s—There was a very extensive, generalized tuberculosis of one *cavia*. The second one showed a marked tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,064.** Tuberculous urine.

INOCULATION RESULTS

*Cavia*s—Both animals developed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,065.** Tuberculous urine.

INOCULATION RESULTS

*Cavia*s—One *cavia* developed a very extensive tuberculosis of the spleen and liver. The second animal showed a moderate tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,098.** Tuberculous material from lumbar abscess.

INOCULATION RESULTS

*Cavia*s—In one *cavia* there was a very extensive, generalized tuberculosis. The second one had an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 27,099.** Tuberculous material from a female child.

INOCULATION RESULTS

*Cavias*—One cavia showed a slight tuberculosis of the spleen and marked lesions of the lymphnodes near the point of inoculation. The second animal developed an extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a marked tuberculosis of the lungs. The rabbits were killed respectively 88 and 113 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,100.** Tuberculous material from a female child.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The second one showed extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,132.** Liver of male, six years of age. Generalized military tuberculosis.

INOCULATION RESULTS

*Cavias*—Both cavias showed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,134.** Tuberculous material from a male.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis of the spleen and marked lesions of the lungs, liver and lymphnodes near the point of inoculation. The second animal had a very extensive tuberculosis of the spleen and liver, and marked lesions of the lungs and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,135.** Tuberculous spinal fluid of male.

INOCULATION RESULTS

*Cavias*—Both cavias showed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,136.** Tuberculous material.

INOCULATION RESULTS

*Cavias*—One cavia showed an extensive tuberculosis. The second



one presented marked lesions of the spleen, liver and lymphnodes near the point of inoculation; also slight tuberculosis of the lungs.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,197.** Tuberculous kidney.

INOCULATION RESULTS

*Cavia*s—One cavia developed an extensive, generalized tuberculosis. The other one had a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed moderate lesions of tuberculosis in the lungs. The animals were killed 99 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,198.** Tuberculous urinary sediment.

INOCULATION RESULTS

*Cavia*s—Cavia No. 1 negative. No. 2 showed an extensive tuberculosis of the spleen and marked lesions of the lungs, liver and lymphnodes near the point of inoculation.

*Rabbits*—Both animals had a slight tuberculosis of the lungs. These animals were killed respectively 76 and 99 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,453.** Tuberculous kidney from adult. Patient had history of tuberculous spine.

INOCULATION RESULTS

*Cavia*s—One cavia showed an extensive tuberculosis of the liver and spleen. The second one developed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,459.** Tuberculous liver and spleen.

INOCULATION RESULTS

*Cavia*s—Both animals developed a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. Both rabbits were killed 107 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,473.** Tuberculous material.

INOCULATION RESULTS

*Cavia*s—One cavia developed an extensive, generalized tuberculosis. The other one had a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,512.** Tuberculous pus from a male.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The other one showed similar lesions.

*Rabbits*—Rabbit No. 1 showed a slight tuberculosis of the lungs. The other was negative. These animals were killed respectively 94 and 95 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,588.** Tuberculous material from a cold abscess in acromion region. Female, 13 years of age.

INOCULATION RESULTS

*Cavias*—Both cavias developed a very extensive, generalized tuberculosis.

*Rabbits*—Each rabbit showed marked lesions of the lungs. Both were killed 84 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,589.** Tuberculous spinal fluid of male, age 35 years. The patient also showed evidence of pulmonary tuberculosis.

INOCULATION RESULTS

*Cavias*—One of the cavias showed a very extensive, generalized tuberculosis. The second one developed marked lesions of the lungs, spleen and lymphnodes near the point of inoculation.

*Rabbits*—There was a marked tuberculosis of the lungs of one animal. The remaining one was free of lesions. These animals died respectively 86 and 94 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,590.** Tuberculous lymphnodes from axillary region. Male, age 10 years.

INOCULATION RESULTS

*Cavias*—Both cavias developed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,591.** Tuberculous tendosinovitis above the wrist. Male 40 years of age.

INOCULATION RESULTS

*Cavias*—Each cavia developed a very extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 27,592.** Tuberculous material of cold abscess from region of thigh, male, 35 years of age.

INOCULATION RESULTS

*Cavias*—The cavia showed a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits developed a slight tuberculosis of the lungs. One of the animals died 38 days after injection. The other one was killed three months after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,593.** Spinal fluid from a patient affected with tuberculous meningitis and probably tuberculosis of the chest. Male 35 years of age.

INOCULATION RESULTS

*Cavias*—One cavia developed a very extensive, generalized tuberculosis. The other one showed an extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a moderate tuberculosis of the lungs. These animals were killed 93 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,594.** Pus and spinal fluid from case of tuberculous empyema following thoracic Pott's tuberculous meningitis. Male 30 years of age.

INOCULATION RESULTS

*Cavias*—One cavia showed a marked tuberculosis of the liver, spleen and lymphnodes near the point of inoculation. The second cavia developed a very extensive, generalized tuberculosis.

*Rabbits*—Both rabbits presented a slight tuberculosis of the lungs. The rabbits were killed three months after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,595.** Spinal fluid from adult male patient affected with advanced pulmonary tuberculosis; also terminal tuberculous meningitis.

INOCULATION RESULTS

*Cavias*—In one cavia there was a marked tuberculosis of the lungs near the point of inoculation, and extensive tuberculosis of the spleen. A marked generalized tuberculosis was noted in the second cavia.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. These animals were killed respectively 88 and 92 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,596.** Spinal fluid from an adult male patient affected with pulmonary tuberculosis and terminal tuberculous meningitis.

INOCULATION RESULTS

*Cavias*—One cavia showed an extensive, generalized tuberculosis. The second one developed a marked generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a moderate tuberculosis of the lungs. The first animal died 86 days after inoculation. The other one was killed eight days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,597.** Pus from psoas region of male patient affected with tuberculosis of the sacrum. No evidence of pulmonary tuberculosis.

#### INOCULATION RESULTS

*Caviae*—Both caviae developed a marked generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,599.** Spinal fluid from female, 30 years of age. Patient affected with advanced pulmonary tuberculosis and terminal tuberculous meningitis.

#### INOCULATION RESULTS

*Caviae*—A very extensive, generalized tuberculosis was noted in one cavia. The second one showed a marked generalized tuberculosis.

*Rabbits*—Rabbit No. 1 died 91 days after injection. It had a marked tuberculosis of the lungs. No. 2 was killed three days later and was free of lesions.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,600.** Pus from tuberculous cervical lymphnodes of a female 21 years of age. No pulmonary involvement.

#### INOCULATION RESULTS

*Caviae*—Both caviae developed a very extensive, generalized tuberculosis.

*Rabbits*—The rabbits both showed a slight tuberculosis of the lungs. The animals were killed 92 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,601.** Spinal fluid from a female patient, 41 years of age, affected with tuberculous meningitis.

#### INOCULATION RESULTS

*Caviae*—Both animals showed a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 developed a very slight tuberculosis of the lungs. Both animals were killed 115 days after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,602.** Spinal fluid from a male patient, 11 months of age, affected with tuberculous meningitis. No pulmonary involvement.

#### INOCULATION RESULTS

*Caviae*—Both animals showed an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,604.** Tuberculous pleuritic fluid from female, 22 years of age, affected with pleurisy. No involvement of lung parenchyma.

#### INOCULATION RESULTS

*Cavias*—Both cavias showed an extensive, generalized tuberculosis.

*Rabbits*—One rabbit developed an extensive tuberculosis of the lungs and marked lesions of the kidneys. The second rabbit had very slight lesions of the lungs. The first rabbit died 49 days after receiving the virus. The second one was killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Bovine.

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**No. 27,605.** Pus from cold abscess of chest wall, which extended from tuberculous ribs. Patient also showed localized empyema. Never had shown evidence of pulmonary tuberculosis. Male 84 years of age.

#### INOCULATION RESULTS

*Cavias*—One cavia showed a tuberculous abscess of lymphnodes near point of inoculation. The second cavia had a moderate tuberculosis of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. Both animals were killed three months after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,606.** Tuberculous axillary lymphnodes of female patient 35 years of age.

#### INOCULATION RESULTS

*Cavias*—Each cavia developed a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a slight tuberculosis of the lungs. Both rabbits were killed 53 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,607.** Pus from cold abscess resulting from a tuberculous osteomyelitis of the tenth rib. Patient also had chronic pulmonary tuberculosis. Male 70 years of age.

*Cavias*—Both cavias developed an extensive, generalized tuberculosis.

*Rabbits*—Each rabbit showed a slight tuberculosis of the lungs. These rabbits were killed respectively 80 and 93 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,628.** Tuberculous urine.

#### INOCULATION RESULTS

*Cavias*—Both cavias showed a very extensive, generalized tuberculosis.

*Rabbits*—Rabbit No. 1 had a moderate tuberculosis of the lungs. No.

2 negative. The first animal died 93 days after injection and the second one was killed a day later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,636.** Pus from tuberculous empyema.

INOCULATION RESULTS

*Cavias*—Both caviae developed a very extensive, generalized tuberculosis.

*Rabbits*—One rabbit showed a very extensive tuberculosis of the lungs. The other one had moderate lesions in the same organ. The first animal died 90 days after injection. The second one was killed two days later.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,643.** Tuberculous pus from male, 17 years old.

INOCULATION RESULTS

*Cavias*—Both caviae had a marked tuberculosis of the spleen and lymphnodes near the point of inoculation. One of the caviae also showed marked lesions of the lungs.

*Rabbits*—Both rabbits presented a slight tuberculosis of the lungs. These animals were killed three months after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,644.** Material from tuberculous hip of female.

INOCULATION RESULTS

*Cavias*—One cavia showed a very extensive, generalized tuberculosis. The second one developed extensive lesions of the spleen and marked lesions of the lymphnodes near the point of inoculation.

*Rabbits*—Rabbit No. 1 negative. No. 2 had slight lesions of the lungs. These animals were killed respectively 77 and 92 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,645.** Tuberculous cervical lymphnode.

INOCULATION RESULTS

*Cavias*—Both caviae presented a very extensive, generalized tuberculosis.

*Rabbits*—There was a slight tuberculosis of the lungs in both animals. These rabbits were killed respectively 96 and 102 days after injection.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,681.** Tuberculous urine from male.

INOCULATION RESULTS

*Cavias*—The caviae both developed an extensive, generalized tuberculosis.

*Rabbits*—Both rabbits showed a marked tuberculosis of the lungs. These animals died respectively 72 and 92 days after receiving the virus.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,682.** Tuberculous pus from a sacro-iliac sequestrum.

INOCULATION RESULTS

*Caviae*—One animal had a slight tuberculosis of the lungs and spleen and marked lesions near the point of inoculation. The second *cavia* developed extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,703.** Specimen of tuberculous urine.

INOCULATION RESULTS

*Caviae*—There was a marked tuberculosis of the lungs, spleen and lymphnodes near the point of inoculation of one *cavia*. The second one showed a very extensive, generalized tuberculosis.

*Rabbits*—There were a few tuberculous nodules in the lungs of each rabbit. One of the animals died 54 days after injection. The other one was killed at the end of 88 days.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,705.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—There was a very extensive, generalized tuberculosis in one *cavia*. The other one had marked lesions of the spleen and lymphnodes near the point of inoculation.

*Rabbits*—Rabbit No. 1 negative. No. 2 had a moderate tuberculosis of the lungs. Both animals were killed three months after inoculation.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,706.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—One *cavia* showed a slight tuberculosis of the spleen and marked lesions of lymphnodes near the point of inoculation. The other animal had marked lesions of the liver, spleen and lymphnodes near the point of inoculation.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

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**No. 27,707.** Tuberculous urine.

INOCULATION RESULTS

*Caviae*—Both *caviae* showed an extensive, generalized tuberculosis.

*Rabbits*—Negative.

*Fowls*—Negative.

Classification of infection type: Human.

**No. 27,925.** Tuberculous kidney.

INOCULATION RESULTS

*Cavias*—There was a very extensive, generalized tuberculosis in both cavias.

*Rabbits*—Both rabbits developed moderate lesions of tuberculosis in the lungs. One of the animals died 54 days after injection. The second one was killed at the end of three months.

*Fowls*—Negative.

Classification of infection type: Human.

TYPING RESULTS OF THE SERIES

Bovine .....	9
Human .....	217
Mammalian .....	1
Avian .....	0
Total.....	227



## THE TYPING OF BACILLARY STRAINS POSSIBLY ASSOCIATED WITH CASES OF HODGKIN'S DISEASE

Material derived from three cases of Hodgkin's disease was studied. No evidence of tuberculosis of any type could be revealed by animal inoculation.

### OBSERVATIONS OF THE BEHAVIOR OF BACILLARY STRAINS IN THE ANIMALS USED IN THE TYPING EXPERIMENTS

While the literature on the pathogenicity of three common varieties of the *Bacillus tuberculosis* in the various animal species is already abundant and presents much evidence useful in their determination, a brief review of observations made in the course of the experiments here related may not be entirely superfluous.

To a large extent the evidence here presented supports the findings and conclusions of previous investigators which have been published since the beginning of the present century or even before. It also brings to light that in the differentiation of certain bacillary types, variations in the intensity of the disease produced by inoculation may give rise to difficulty in the interpretation of the typing results and tend to leave something to be decided either by supplementary methods or to the arbitrary judgment of the observer.

*Cavia*.—The guinea pig proved to be very susceptible to either one of the two mammalian strains of the tubercle bacillus and showed itself as markedly resistant, altho not absolutely so, to the avian type of the organism. This animal serves as a valuable reagent in any experiment having for its purpose the differentiation between mammalian and avian bacillary varieties.

The bovine tubercle bacillus, as well as the human one, practically without exception gave rise in the *cavia* to a severe, progressive, and fatal tuberculosis. The fact that bovine infection produced a more rapidly developing form of disease in this animal than the human bacillary strain, as observed by other authors, was also apparent in our material, but was certainly not of such a conspicuous character as to be useful in distinguishing between the two types mentioned.

As already pointed out, the guinea pig is conspicuously exempt from tuberculosis arising from the inoculation of tubercle bacilli of avian origin. Its resistance, however, is not a perfect one. After subcutaneous inoculation, the avian bacillus quite frequently gave rise to abscess formation at the point of inoculation or to a degree of tuberculous involvement of the regional lymphnodes. Bacilli were regularly present in such lesions. There was no tendency observed on their part

to disseminate altho in a very small number of our guinea pigs one or two isolated tubercles were found in the spleen or in the liver. A single cavia showed a marked individual susceptibility to the avian virus. This animal was part of the typing set-up in No. 14,222 of the avian series and it was clearly shown that it was an avian bacillary strain which was accountable for the extensive tuberculosis encountered in this guinea pig.

*Rabbits.*—Intravenously inoculated rabbits showed susceptibility to tuberculosis caused by any one of the three bacillary types, but with such specific variations in degree that this animal is of the greatest value in the differentiation between the two mammalian strains of the *Bacillus tuberculosis*, while used in conjunction with the cavia it can be made to serve also in the identification of the avian strain.

The rabbits showed a marked susceptibility to infection with the bovine bacillus and a rather marked resistance to that with the organisms of human type. This specific difference in susceptibility has by previous investigators been shown to be more marked after subcutaneous inoculations than after the intravenous ones practiced in the series here reported. The latter were not primarily designed to survey the incidence of the causes of mammalian tuberculosis in the various groups examined, but were more concerned with that of avian infection sources. For this purpose, rabbits, also markedly susceptible to bird tuberculosis, were used as a control on results obtained in fowls used as typing animals and as a source of contributory evidence useful in interpretation. The preference of intravenous inoculations to subcutaneous ones was based on the fact that the original material was used as inoculum and that by injecting as indicated, troublesome abscess formations could be avoided. Observations on the subcutaneously inoculated caviae confirmed the wisdom of this procedure.

In the experimental series in which material from 58 cases of generalized tuberculosis in the bovine was used for typing, the majority of the rabbits developed extensive, generalized, visceral tuberculosis. A few of the animals also showed lesions of the subcutis.

As a rule, infection with the bovine bacillary strain produced lesions in more than one body cavity and the animals succumbed to the infection much earlier than those inoculated with human material. (See Tables 1 and 2, page 122.)

In the series in which material of 227 human cases of tuberculosis was used for typing, 298 (65.63 per cent) of the 454 rabbits used showed no lesions at all. Of the remaining 156 rabbits, 19 belonging in serial numbers were diagnosed

as due to bovine or mammalian strains and of the 137 recognized as infected with the human bacillus, the resulting lesions were found to be local in 127 and present in more than one body cavity in 10 of the animals.

The difference in the liability to tuberculous infection by either one of the two mammalian strains is also well shown by the periods during which the rabbits survive after inoculation. (See Table 2.) More than half of the rabbits inoculated with bovine material died before the end of the second month after inoculation, while of those injected with material containing the human bacillary type, slightly more than 90 per cent were still alive at the expiration of this period.

In the attempt to differentiate between the two mammalian strains of bacilli present in the original material, difficulty was encountered in four border-line cases. In one of these, bacilli recognized as belonging to the human variety were found to be quite virulent to at least one rabbit. The latter developed a marked tuberculosis of the lungs, a moderate degree of tuberculosis of the kidneys, and slight lesions of the spleen, while its cage mate remained free of any evidence of the disease.

In another number of the series, typed as due to human bacilli, one of the rabbits developed a very extensive tuberculosis of the lungs and a few tubercles in the kidney, while three other rabbits inoculated with the same material remained healthy.

Of two cases eventually recognized as being caused by infection of bovine origin, the first showed one of the two rabbits dead within a month after inoculation. This animal had developed a marked tuberculosis of the spleen. Its mate died within two months with marked lesions of the lungs. In the second case, one rabbit succumbed at the end of a 44-day period after inoculation, with a slight tuberculosis of the lungs, and its cage mate died three months after inoculation with an extensive pulmonary tuberculosis.

Rabbits proved to be quite susceptible to infection with the avian type of tubercle bacillus. They showed a marked variation in the lesions produced, a phenomenon in the cause of which the richness of the inoculum, no doubt, played a more or less prominent part.

The character of the lesions ranged between strictly localized infection foci and the acute form of tuberculous septicemia. The latter or Yersin form of tuberculosis proved to be a distinct attribute of the avian bacillus in the experimental series here reported.

Of the 188 rabbits inoculated with avian tuberculous ma-

terial, not less than 52 (27.66 per cent) died early with the septicemic form of the disease; 55 (29.25 per cent) showed miliary tuberculosis, while the 81 rabbits remaining presented lesions ranging from localized and benign to extensive and progressive.

That individual susceptibility also plays a part in determining the character of avian tuberculosis encountered in experimental rabbits is well shown in the animals belonging to No. 13,999 of the avian series. One of the rabbits died of the Yersin form of tuberculosis 18 days after inoculation, while its cage mate, inoculated with the other half of the syringe-ful of inoculum, when killed more than three months after the injection, was found to be entirely free of lesions.

In avian infection in the rabbit a greater range of organs was shown as presenting tuberculous lesions than in the rabbits infected with bacilli of mammalian origin. In the order of frequency, lesions were encountered in the spleen, lungs, liver, lymphnodes, kidneys, peritoneum, pleura, subcutis, testicles, and uterus.

The cases of Yersin tuberculosis were often characterized by a stupendous number of bacilli distributed thruout all parts of the body. In the spleen, in which they were probably most numerous, they were commonly found to occur as rosette-like clumps.

Conspicuous also was the tuberculous involvement of the peritoneum in some of the rabbits, the membrane being covered by a continuous layer of conglomerated tubercles having the appearance of a coat of adipose tissue. In another group of rabbits inoculated with avian bacillary strains, the subcutis was extensively diseased, the tuberculous mass appearing as a dense shield covering the body surface beneath the skin.

*Fowls.*—The common fowl must be regarded as extremely resistant to experimental infection with the mammalian bacillary strains. The evidence submitted in this report quite fully sustains this contention. This resistance, however, does not appear to be an absolute one. In one of the series here reported, the one dealing with the bacillary types associated with isolated lymphnode tuberculosis of cattle, the presence of one or two small, nonprogressive lesions in the liver or spleen of the inoculated fowls could be recorded.

In most instances only one of the two birds was so affected, but in the case of two numbers of the series, both fowls presented evidence of slight tubercle formation. In all these cases the caviars of the groups involved had become thoroly tuberculous in the manner to be expected after an inoculation with mammalian material. Tubercle bacilli were always found to be present in the fowl lesions.

In a number of such cases, but not in all, the material obtained from such lesions was used in a supplementary typing experiment, and wherever this was done the mammalian character of the infection could be demonstrated, the caviae becoming tuberculous and the fowls of the group failing to develop any evidence of the disease.

In the 227 typings with material of human origin, as well as in the 58 with material taken from cases of generalized tuberculosis of cattle, not one of the fowls used (approximately 570) showed even a suggestion of tuberculous infection. On the other hand, the fowls used in the experiments invariably developed tuberculosis after an intravenous inoculation with living tubercle bacilli of the avian type. In the series pertaining exclusively to the typing of bacilli present in tuberculous lesions of naturally infected fowls, turkeys, or pigeons, the results of the inoculation could be studied in 218 chickens forming part of the typing set-up. Forty-six of these birds (21.10 per cent) died with the Yersin form of tuberculosis. One hundred and forty-two (65.10 per cent) showed lesions of miliary tuberculosis, and the remainder had developed a more moderate degree of the disease. The fowls dying of tuberculous septicemia in the majority of the cases succumbed between the twentieth and forty-first day after inoculation, thus at a later period than the similarly affected rabbits.

The earliest death of a fowl from this cause occurred 12 days and the latest one 90 days after inoculation. One fowl died with miliary tuberculosis 22 days after inoculation, while the majority of the birds showing this form of tuberculosis succumbed after the fortieth day.

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Used in conjunction with the guinea pig, fowls constitute an almost infallible means by which avian and mammalian strains of tubercle bacilli may be differentiated. However, in the face of the marked prevalence of tuberculosis in poultry, extraordinary care must be exercised in the selection of the birds to be used in typing experiments. Not only must such birds be young and obtained from flocks without a history of tuberculosis, but in addition they must always be challenged by a tuberculin test.

Typing results cannot be valued at par unless evidence of these precautions is definitely presented. In all typing experiments reported in this publication, more than ordinary care, based upon these considerations, was taken in the selection of the fowls used. The addition of the rabbit to the typing set constitutes a further safeguard against erroneous conclusions.

TABLE 1.—*The distribution of lesions in rabbits inoculated with bovine, human, or avian bacillary strains*

Infection strain	Lesions developed in:	
	One body cavity	Two body cavities
	<i>Per cent</i>	<i>Per cent</i>
Bovine .....	7.01	92.98
Human .....	92.70	7.29
Avian .....	28.19	71.80

TABLE 2.—*Time of death of rabbits showing tuberculous lesions, after being inoculated with bovine, human, or avian bacillary strains*

Periods within which deaths occurred	Bacillary types causing lesions		
	Bovine	Human	Avian
<i>Days</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
6-20	.....	0.73	7.99
21-30	5.40	.....	20.21
31-40	9.90	2.19	10.11
41-50	18.91	1.46	11.70
51-60	18.01	5.11	9.04
61-70	36.93 <sup>1</sup>	2.19	5.32
71-90	.....	12.41	5.85
Killed after 90 days	10.81	75.90	29.79

<sup>1</sup> Percentage within the 61-to-90 group.

TABLE 3.—*Summaries of typing results*<sup>1</sup>

Origin of material used	Bacillary types found in lesions						Total
	Mammalian	Bovine	Human	Avian	Mixed	Negative	
Avian. Fowls, turkeys and pigeons	..	..	..	104	1	5	110
Bovine. Generalized	..	58	..	..	..	..	58
Bovine. Hemorrhagic lymphnodes	..	..	..	..	..	39	39
Bovine. Pregnant uteri	..	..	..	..	..	5	5
Bovine. Skin and subcutis	..	..	..	..	..	40	40
Bovine. Isolated single lymphnodes	100	..	..	11	4	49	164
Sheep. Lungs and spleen	..	1	..	..	..	..	1
Horse. Culture and lesions	..	2	..	..	..	..	2
Fox. Lesions	..	1	..	..	..	1	2
Monkey. Lesions	..	3	1	..	..	2	6
Human. Lesions, largely extrapulmonary	1	9	217	..	..	168	395
Human. Hodgkin's disease	..	..	..	..	..	3	3
Swine. <sup>2</sup> Mostly isolated lymphnodes	12	..	..	199	14	33	258
Total							1083

<sup>1</sup> This final statement supersedes the tentative statements previously issued.

<sup>2</sup> In part, previously reported. (For details see Neb. Agr. Exp. Sta. Res. Bulletin 30, 1925.)

## EPICRITICAL CONSIDERATIONS

*Bacillus tuberculosis* stands not alone among obligate parasites as one capable of forming varieties with a more or less selective affinity or pathogenicity for certain definite host species. The phenomenon may be regarded as evidence of the variability common to all biologic forms and as such is but a means to render the existence of the species more secure. This selective pathogenicity of the tubercle bacillus is expressed by a given variety thriving in an optimum host without having lost its capacity to exist also in another one belonging to a different species.

In the latter case the propagation of the germ may be more difficult than in the optimum host and as a result there may not arise the same progressive, generalized lesions, such as may be encountered in the species to which the bacillary strain had become most thoroly adapted. The tuberculous disease produced by such heterologous bacillary types is varying in degree of lesions and extent. It ranges in character and severity from the rare, benign lesions seen in fowls after a mammalian infection, or in the cavia after an avian one, to the generalized, progressive tuberculosis which develops in rabbits, guinea pigs, swine, and other animals after the introduction of the bovine bacillary type.

The susceptibility to heterologous strains of the tubercle bacillus shown by the various animal species is never entirely absent. It may be almost nil, but the fact remains that evidence is not lacking which shows that even in species manifestly resistant to one of the three better known varieties of the tubercle bacillus individual animals are occasionally encountered which are liable to develop progressive and extensive lesions if the heterologous bacilli gain entrance into their tissues. In the general problem presented by tuberculosis it is quite apparent that a variability in specific host susceptibility must be considered as well as the variability shown by the *Bacillus tuberculosis* in regard to its host relations and its pathogenicity.

Many forms of heterologous tuberculous infection present no problem of importance when merely considered from an economic, livestock sanitation, or public health point of view. On the other hand it has been abundantly shown that in some concrete instances of frequent occurrence, tuberculosis due to bacillary types other than the one commonly associated with the species concerned, must be given the most serious consideration. Furthermore, the phenomenon of variability shown by tubercle bacilli in their pathogenic qualities and the variation in susceptibility of hosts touch upon a fundamental aspect of the tuberculosis problem so far as livestock sanita-



tion and the maintenance of the public health are involved. Tuberculosis caused by a specific entity among microparasites is, after all, but a single manifestation of morbidity in spite of the distinct variations of the etiologic factor and the pathologic reactions to which they may give rise in different host species. Coping with only one phase of tuberculosis, however hygienically sound this may be and however urgent the necessity, will never be sufficient with any degree of finality, because the variability of parasite and host is ever apt to cause new adaptations, new problems.

The morbid reaction to which the name tuberculosis has been given, like many other biologic phenomena, is, in its epizootologic or epidemiologic aspects, a mutable one and hence there is warrant, even a need, that from time to time the part played by heterologous as well as by homologous tuberculous infection be subjected to experimental inquiry. The investigations here reported were undertaken with this need also in mind. While an attempt was made to secure for typing purposes, lesions from as many mammalian species as possible, only those of bovine and human origin were obtained in numbers sufficiently large to constitute valid evidence with reference to the bacillary types found. The addition of a series dealing with avian tuberculous material served largely for control purposes and helped to establish a certain criterion useful in the interpretation of typing results.

It is to be regretted that not more species were represented in the typing experiments, but because tuberculosis in farm livestock other than cattle, swine, and poultry has in this country not assumed an economic importance, the problem connected with bacillary types is not a pressing one. As has been seen from the data presented in this report, it was possible to subject to typing experiments the bacillary strains associated with tuberculosis in cattle in a number of cases large enough to be representative of their actual occurrence and distribution.

That avian tubercle bacilli may have an etiologic relationship to tuberculous disease in cattle has already been shown by de Jong (9), Elder and Lee (11, 12), Plum (41, 42, 43, 44), and others. Schalk (48), in showing that cattle are readily sensitized by exposure to avian infection, also demonstrated by a series of tuberculin tests of feeder cattle in transit, that this sensitization could be demonstrated to have taken place in 15.5 per cent of the 507 animals challenged. In view of the knowledge which had already become available thru the work of others and in the light of observations made of the prevalence of tuberculosis in poultry flocks (17, 18), as well as the high incidence of avian infection of swine (53),



the occurrence of avian tuberculosis among the cattle of this country might well be challenged by experimental efforts.

The bovine material secured for typing purposes presented above and summarized in Table 3 was divided into certain groups according to the nature and localization of the lesions. It could be shown that in all the material originating from generalized cases of tuberculosis, the bovine bacillary type only was found to be present.

Living tubercle bacilli could not be demonstrated in the hemorrhagic lymphnodes of cattle reacting to tuberculin in the small number of pregnant uteri of reacting animals or in the tuberculous lesions of the skin and subcutis. The latter were typically tuberculous and with only a few exceptions all the specimens examined contained acid-fast bacilli not to be distinguished from the ones present in the virulent lesions in the other groups. These bacilli were apparently dead and the material fed to pigs failed to sensitize them to tuberculin of mammalian and avian origin. A fair proportion of the cattle from which the lesions were taken had reacted to the tuberculin used in the campaign of eradication.

In most cases the lesions examined were the only ones to be found after slaughter. It is not impossible that this type of lesion is caused by bacilli which, during a prolonged existence in soil or manure, have lost their original capacity to maintain themselves in the animal tissues even if they are able to initiate lesions.

Bacilli of the avian type were encountered in the experimental series in which tuberculous, isolated lymphnodes were used. Most of these were mesenteric lymphnodes and in eleven of the 115 specimens successfully typed, the avian bacillus could be demonstrated. In four of the specimens avian as well as mammalian bacilli were present, and in the material of the remaining 100 cases bacilli of mammalian type were encountered. It is quite apparent thus that the avian bacillary strain not only is capable of adaptation to a bovine host, to become the cause of tuberculous lesions, but that avian tuberculosis in cattle is by no means uncommon in this country.

As in those of swine, the tuberculous bovine lesions caused by avian bacilli are benign and nonprogressive. Whether or not a more perfectly developed adaptation of the avian bacillus to bovine tissue would tend to render the tuberculosis produced by it more malignant or more apt to spread is at this time a matter of speculation. Such a potentiality must, however, not be left out of the consideration if the biologic and the livestock sanitation phases of the tuberculosis problem are to be solved.

The possible part played by the avian tubercle bacillus as a cause of tuberculosis of cattle or the mere sensitization of the latter to tuberculin has suggested that contact with avian infection sources could possibly be a factor in tuberculin reactions in animals without lesions of the disease. Schalk (48) reported that 75 per cent of the cattle experimentally exposed to fowl tuberculosis became sensitized to avian tuberculin, but not to a tuberculin prepared with mammalian bacilli. On the other hand, Plum (41) points out that while cattle infected with avian tuberculosis but rarely react to a bovine tuberculin subcutaneously administered, in the case of a similar tuberculin intradermally applied, positive reactions are more frequent. Elder and Lee (12) showed that calves which had been injected with virulent avian tubercle bacilli and had developed local lesions, gave good, positive reactions to a tuberculin used in the testing of cattle, when intracutaneously introduced.

It is not yet possible to assert with any degree of assurance that sensitization to avian infection is or may be a factor making for confusion in the testing technique as applied to cattle. The problem, however, is worthy of further inquiry. In the absence of more complete information, it appears quite significant that of the eleven cases here reported as being due to avian bacilli, six pertained to reacting bovines sent to slaughter for that reason. One was a nonreactor, another one was from the regular kill, and of the remaining three the history was not made available. The evidence here reported adds to the importance of avian tuberculous infection and should serve as an indication that the tuberculous poultry flock must be reckoned with in any scheme of eradication.

It was shown that tubercle bacilli of avian origin are capable of causing tuberculous disease in such species as swine and cattle. Avian infection has also been encountered in the horse by MacFadyean (36), Nocard (39), Watson and Heath (58), and others. On the whole, it appears that most mammals do not supply optimum host conditions to the bacillus of poultry tuberculosis. In the case of some of the mammalian species the avian strain of *B. tuberculosis* meets with a very positive resistance. Such a resistance may, however, be only a relative one, as was shown by Feldman (14, 15), who could induce avian tuberculous disease in remote organs by inoculating the bacilli intracerebrally into guinea pigs and dogs, animals ordinarily highly resistant to infections by this bacillary strain.

With these facts in mind, the great prevalence of tuberculosis among poultry over a large area of the country of which Nebraska is a part, acquires a new significance. The

possibility of exposure of the people on farms and of the consumers of poultry products has added a public health aspect to the problem of poultry tuberculosis already of great economic importance. A possible public health aspect of avian tuberculosis was further emphasized by reports in medical literature of cases of tuberculous disease in human beings in which the avian bacillus appeared to have been etiologically implicated.

Jansco and Elfer (19), Joannovic (20), Lipschütz (28), Löwenstein (34), Volk (56), and a few other authors have reported the presence of a tubercle bacillus of avian strain in human lesions. In only a few of the cases reported in medical literature was evidence submitted that the observer was actually confronted with the avian bacillary strain. As a general rule, the very common distribution of tuberculosis of fowls was not given consideration and hence the birds used for typing were not challenged by the tuberculin test necessary to eliminate errors arising from a preinoculation tuberculosis. Nor were the typing series always supported by the inclusion of rabbits, valuable as a control on the inoculation results obtained in fowls. In some cases of human disease reported as being due to avian infection, the experimental evidence points more strongly to an aberrant human than to an avian bacillary type and in at least one instance the probability of bovine infection was greater than of avian. In other articles the possibility of an avian infection is merely suggested by the authors and in one article avian infection is not even mentioned. Yet bibliographers and reviewers have not always hesitated to quote such writings as evidence of the occurrence of avian tuberculosis infection in man.

Notwithstanding the questionable nature of some of the evidence submitted, the fact remains that avian infection was found in certain cases of human tuberculosis. This occurrence, no doubt, tends to show a certain potentiality on the part of the avian tubercle bacillus, which, in connection with its importance as a cause of tuberculosis of farm livestock, justifies the opinion that in the general struggle against the disease, measures directed against its spread among poultry must not be omitted.

So far as the valid evidence available in literature permits any conclusions, however, it is apparent that even in the region where most of the alleged European cases originated, avian infection in man is but rarely observed in comparison to tuberculous disease caused by other bacillary strains. In this country the part played by avian tuberculosis as an infection source of human disease is even more obscure. Thus far, no case of tuberculosis of avian origin in man has

been recorded within the United States as diagnosed by means of an adequately safeguarded typing technique.

That such cases may actually exist and may occasionally be brought to light is a possibility that cannot be denied. In a large region of the United States, poultry tuberculosis shows a conspicuously high incidence and it can scarcely be doubted that avian tubercle bacilli may find their way into the human body. Yet, in spite of this possibility, in none of the lesions of 227 cases of human tuberculosis and in none of the three cases of Hodgkin's disease included in the typing experiments undertaken by the Nebraska Experiment Station, was even the slightest indication of avian infection encountered. These wholly negative results become even more significant when consideration is given to the fact that most of the cases concerned originated in the part of the country where the tuberculosis morbidity rate of poultry is the highest.

The enormous stock of tuberculous infection of avian strain present in the poultry yards of a great area of the United States is economically of the greatest importance. For that reason, steps tending toward the suppression and eradication of poultry tuberculosis are fully warranted. It is, on the other hand, quite apparent that considered from a public health point of view, avian tuberculosis, for the present, at least, can be disregarded with a high degree of safety.

In the series having to do with the typing of human tuberculous material, rabbits were used in order to strengthen whatever evidence might be forthcoming with regard to the part played by the avian bacillary strain. The use of the rabbit also permitted a survey of the extent of bovine infection present in the cases examined, altho this phase of the general tuberculosis problem was not the primary object of the experimental project.

The 227 cases of human tuberculosis, for the greater part of an extra-pulmonary localization, included nine cases in which the bovine bacillus could be demonstrated, thus slightly less than 4 per cent. This relatively low incidence of bovine infection in a fairly representative group of cases of human tuberculosis other than pulmonary, may indicate a rather favorable situation with reference to bovine infection sources. In the absence of earlier data pertaining to the incidence of bovine tuberculous infection among the population of the region from which the typing material was largely obtained, it would be rash to draw definite conclusions based upon the findings here related.

One observation, made in connection with the cases from which material after typing experiments revealed the presence of the bovine bacillary strain, may be worthy of mention.

This pertains to the fact that the greater part of this material came from adults and not from patients belonging to the age group which ordinarily shows the highest incidence of bovine infection.

It was not possible to secure data regarding the ages of all the cases which furnished the lesions used, but it could be estimated that about 40 per cent belonged to the age group of 0 to 15 years. Only two of the nine cases with bovine tuberculous infection belonged to the latter group. No evidence of bovine infection was observed in material obtained from 31 children of less than ten years of age and of which the age was accurately known. In these the human bacillary strain only was found to be associated with the lesions. The total number of tuberculous children (extra-pulmonary cases only) which supplied the material for typing purposes was about 69, including the 31 of known age mentioned, and none of these showed evidence of bovine infection.

The numbers involved in this part of the typing results are so small that the factor of error must be given considerable weight. Yet it is apparent that the children of the groups mentioned had contracted human tuberculosis. Was this the case because all these children had been in contact with active human carriers and acquired tuberculous disease before they could do so from cow's milk, or was it because the latter did not contain the living bacilli of the bovine disease?

For adequate reasons it was predicted, many years ago, that the elimination of the tuberculous dairy herd and the sanitary supervision of the milk supply could only have a beneficial effect on the incidence of bovine tuberculosis in children. The facts brought to light by the typing results here recorded may serve as evidence that the prediction is being fulfilled. If this be actually the case, the preponderation of adults among the nine cases of bovine tuberculous infection may be looked upon as evidence of the retention and final localization of bovine tubercle bacilli acquired during the more susceptible age periods. It is apparent that the kidney is the organ where the infection is most likely to survive and maintain itself.

Owing to a statement by Löwenstein (32) that the kidney is one of the optimum sites of the avian bacillus when it infects man, special efforts were made to obtain for typing purposes as much kidney material as possible. In all, the material of 99 cases of renal tuberculosis was collected and typed. This number yielded six of the nine cases of bovine infection encountered in this series.

The most striking results obtained in the typing of human material is, without doubt, that in the tuberculosis peculiar

to man, even in the nonpulmonary form of the disease, the human bacillary strain must be reckoned with as the most prolific cause of mischief.

### CONCLUSIONS

1. The avian strain of *Bacillus tuberculosis* was determined to be a cause of tuberculous disease in cattle.
2. Avian tuberculous infection of bovine animals was found only in solitary lymphnode lesions in nearly 10 per cent of the cases furnishing lesions of this type.
3. All bovine lesions originating in cases of generalized tuberculosis were shown when typed to contain the bovine bacillary strain only, and no evidence of avian infection was encountered in this class of material.
4. Some evidence obtained indicates that infection due to the avian bacillary strain may be a factor of confusion in the interpretation of tuberculin test results.
5. In the material supplied by 227 cases of human tuberculosis no evidence was encountered which would tend to implicate the bacillus of avian tuberculosis as a cause of tuberculous disease in man.
6. While a certain potentiality for mischief may be attributed to the avian bacillary strain, it is not apparent that avian tuberculosis has at this time assumed importance as a menace to the public health.
7. On the other hand, the prevalence of avian tuberculosis on farms must be looked upon as a positive hazard to other livestock.

### ACKNOWLEDGMENTS

The writers gratefully acknowledge the valuable help and co-operation of those who made the typing investigations possible by the collection and forwarding of the materials necessary for the pursuit of the inquiry. Without their help the latter could not have been undertaken with any prospect of success. The following contributors are thankfully remembered:

Dr. A. R. Abel (1),<sup>1</sup> Sioux City, Iowa; Miss Dorothy Ashland (2), Fargo Clinic, Fargo, N. D.; Mr. Paul Bancroft (2), University College of Medicine, Omaha, Nebr.; Dr. M. F. Barnes (4), State Department of Agriculture, Harrisburg, Penn.; Dr. B. A. Beach (1), University of Wisconsin, Madison, Wis.; Dr. R. E. Behnke (62), Inspector in Charge, B.A.I., Sioux City, Ia., and Milwaukee, Wis.; Dr. Frank Breed (1), Kansas City, Mo.; Dr. A. C. Broders (4), Mayo Clinic, Rochester, Minn.; Dr. H. Busman (68), Inspector in Charge, B.A.I., Omaha, Nebr., and Chicago, Ill.; Dr. G. W. Covey (2), Lincoln, Nebr.; Dr. G. M. Dorman (3), Inspector, B.A.I., Sioux City, Ia.; Dr. C. Emerson (1), Lin-

<sup>1</sup> Numbers in parentheses in this paragraph indicate the number of specimens sent in.



coln, Nebr.; Major J. Vincent Falisi (9), Fitzsimmons General Hospital, Denver, Colo.; Dr. W. H. Feldman (2), Mayo Foundation, Rochester, Minn.; Dr. W. H. Frakes (9), Inspector, B.A.I., Lincoln, Nebr.; Dr. H. Gross (19), State Department of Agriculture, Lincoln, Nebr.; Dr. W. D. Hays (1), Health Officer, Sioux City, Ia.; Dr. W. C. Herrold (28), Inspector in Charge, Wichita, Kan.; Dr. David Hilton (1), Lincoln, Nebr.; Dr. Frank Jelen (27), Inspector in Charge, B.A.I., Omaha, Nebr.; Dr. J. S. Jenison (29), Inspector in Charge, B.A.I., Omaha, Nebr.; Dr. J. J. Keegan (1), University of Nebraska College of Medicine, Omaha, Nebr.; Dr. S. E. Lambert (1), Spokane, Wash.; Dr. H. J. Lehnhoff (2), Lincoln, Nebr.; Dr. E. R. Long (234), University of Chicago, Chicago, Ill.; Miss L. B. Love (1), Baltimore, Md.; Dr. T. B. Magath (119), Mayo Clinic, Rochester, Minn.; Dr. H. E. Marston (1), San Quentin, Calif.; Dr. J. H. Mayhew (3), Lincoln, Nebr.; Dr. O. W. Noyes (1), Inspector, B.A.I., Kansas City, Mo.; Dr. J. W. Parker, Inspector, B.A.I., Kansas City, Mo.; Dr. H. A. Reagor (1), Nebraska Department of Agriculture, Lincoln, Nebr.; Dr. S. O. Reese (4), Lincoln, Nebr.; Dr. T. S. Rich (10), Inspector in Charge, B.A.I., Lansing, Mich.; Dr. T. A. Shipley (37), Inspector in Charge, B.A.I., Sioux City, Ia., and Denver, Colo.; Dr. L. L. Stanley (2), San Quentin, Calif.; Dr. J. B. Stocker (2), Inspector in Charge, B.A.I., St. Joseph, Mo.; Drs. Tronnes and Hagen (2), Fargo, N. D.; Drs. Welch, Rowe and Lehnhoff (4), Lincoln, Nebr.; Dr. P. B. Wende (13), Inspector in Charge, B.A.I., Buffalo, N. Y.; Dr. A. D. Woltz (1), Philadelphia, Pa.; Dr. H. C. Wright (1), Inspector, B.A.I., Kansas City, Kan.; Dr. C. J. Young (32), Inspector in Charge, B.A.I., Sioux Falls, S. D.

Thanks are due to Dr. C. H. Hays, Chief, State Bureau of Animal Industry, Lincoln, Nebr., for his helpfulness and friendly interest in the pursuit of this investigation.

Last, but not least, do the writers acknowledge the substantial help received from the National Association for the Study and Prevention of Tuberculosis which, thru its Research Committee, furthered the collection of human material by a grant placed at the disposal of Dr. E. R. Long of the University of Chicago. To the chairman of the Research Committee, Dr. Charles Wm. White, Washington, D. C., the writers express their deep gratitude for his support and stimulating interest in the work from its inception to its conclusion.

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