AN ENQUIRY into the infectivity of Tuberculous meat to:
:gether with AN ENQUIRY into the methods of Tuberculous
meat-inspection adopted in Public Abattoirs, and a critic:
:ism of the Reports of the Royal Commission on Tuberculosis.

I N D E X.

B I B L I O G R A P H Y.

1. REPORT OF THE ROYAL COMMISSION APPOINTED TO ENQUIRE INTO THE ADMINISTRATIVE PROCEDURES FOR CONTROLLING DANGER TO MAN THROUGH THE USE AS FOOD OF THE MEAT AND MILK OF TUBER: :CULOUS ANIMALS, 1898. PARTS 1 & 2.

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2. TREATISE ON HYGIENE, STEVENSON and MURPHY.

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3. MEAT INSPECTION, WALLEY.

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4. CATTLE TUBERCULOSIS, LEGGE.

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5. REPORT OF THE ROYAL COMMISSION APPOINTED TO ENQUIRE INTO THE EFFECT OF FOOD DERIVED FROM TUBERCULOUS ANIMALS ON HUMAN HEALTH, 1895. PARTS 2 & 3.

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6. MANUAL OF BACTERIOLOGICAL TECHNIQUE AND SPECIAL BACK: :TERIOLOGY. BOWHILL.

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7. MANUAL OF BACTERIOLOGY. STERNBERG.

---

8. METHODS OF PRACTICAL HYGIENE. LEHMENN.

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9. APPLIED BACTERIOLOGY. PEARMAIN and MOOR.

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10. PRACTICAL HYGIENE. NOTTER.

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11. BACTERIOLOGY AND INFECTIVE DISEASES. CROOKSHANK.

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12. GUIDE/

12. GUIDE TO MEAT INSPECTION. STACPOLE.

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13. MANUAL OF VETERINARY SANITARY SCIENCE AND POLICE. FLEMING.

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14. THE COMPARITIVE ANATOMY OF THE DOMESTICATED ANIMALS. Mc:
:FADYEAN.

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15. VETERINARY ANATOMY. STRANGEWAY.

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16. THE THEORY AND PRACTICE OF MEDICINE. BRISTOWE.

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17. PRACTICAL PATHOLOGY. WOODHEAD.

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18. SYSTEM OF MEDICINE. ALLBUTT.

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19. BACTERIOLOGY AND ITS RESULTS. KOCH.

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20. MANUAL OF PRACTICAL HYGIENE. PARKES.

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21. TRANSACTIONS OF THE INTERNATIONAL CONGRESS OF HYGIENE.
PARKES.

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22. TRANSACTIONS OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF
SCOTLAND.

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23. HANDBUCH DER FLEISCHBECHAN. OSTERTAG.

---

24. LES TUBERCULOSES ANIMALES. NOCARD.

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25. RETURNS/

25. RETURNS OF BOARD OF AGRICULTURE.

26. PUBLIC HEALTH (SCOTLAND) ACT, 1897.

27. EDINBURGH MUNICIPAL AND POLICE ACTS.

28. TUBERCULOSIS A CURABLE DISEASE. A. M. TROTTER.

29. CONTAGEOUS DISEASES (ANIMALS) ACT.

J O U R N A L S.

1. JOURNAL OF COMPARITIVE PATHOLOGY AND THERAPEUTICS.

2. THE JOURNAL OF STATE MEDICINE.

3. THE BRITISH MEDICAL JOURNAL.

4. JOURNAL OF PUBLIC HEALTH.

5 LANCET.

6. SANITARY JOURNAL.

7. ANNUAL REPORTS OF REGISTRAR GENERAL.

8. VETERINARY JOURNAL.

9. VETERINARY RECORD.

10. THE THERAPIST.

INTRODUCTION.

The very great importance of the subject of meat inspection and the possible consequences resulting from it, if carried out in a partial or perfunctory manner, together with the great efforts which for some years past have been made in order to combat all forms of Tuberculous disease, have led me to utilise the mass of material with which I am daily coming in contact, as one means of throwing some light upon the much disputed subject of meat inspection, and of contributing what is possible towards a clearing of the various opinions which have been held and retained in connection with this subject.

Infection to man through the medium of meat and milk has long been recognised as a substantial reality, and little doubt has ever been expressed as to the danger which would be entailed in the consumption of the flesh from cases of cattle plague, Pleuro-Pneumonia, Anthrax, and such like diseases. Extraordinary though it may seem, the disease of all others which is more easily conveyed from animals to man, viz:- Tuberculosis has led to constant discussion. and is still a matter which is freely argued from both points of view.

While the before-mentioned diseases, cattle plague and others, lead without question to the total condemnation of the carcases involved, it must not/

not be forgotten that in some parts of the Country, these diseases are not regarded in the same light or with the same importance with which we are accustomed to regard them here, and the astonishing statement is made by the Author in the well-known book edited by Stevenson & Murphy, that "the meat of cattle suffering "from Epidemic Pleuro-Pneumonia is considered by some, "harmless, and a large quantity of this meat goes into "consumption; that of those suffering from foot and "mouth disease is also considered harmless. Cattle "plague in Belgium is considered to affect the meat dan: ":gerously; cases however, where no harm has resulted "from the consumption of such, are recorded.

"Doubt exists as to the danger of "the meat of animals suffering from Anthrax and Erysipe: ":las Carbunculosum. The organism in Anthrax is ren: ":dered innocous by exposure to a temperature of 55 C. "Bacilli would therefore be destroyed in the cooking, "and this result would explain the harmless consumption "of the meat in many cases". When such statements as those are made regarding diseases of animals, the harm: :less nature of which cannot for one moment be serious: :ly doubted, it is not surprising that the many opinions which have been refered to have been expressed regard: :ing the innocous nature of Tuberculous meat. The writer of the article which has just been quoted for: :gets to mention that while the Bacillus Anthracis may be/

be destroyed at a temperature of 55 C, it is well known that the Spores are the most resistent of all others, and can only be destroyed by heat which reaches the temperature of 180 C.

In approaching the subject to which I have more particularly devoted attention, it will be necessary for me to refer, (1st) to the various means by which man may become infected with Tuberculous dis: :ease, (2nd) to such statistics as exist which tend to throw any light upon the question of infectivity of ingested food, (3rd) to the various suggestions contain: :ed in the Reports of the Tuberculous Commission, (4th) to the methods of meat inspection adopted throughout the Kingdom, (5th) to the methods in this City, & (6th) to the recommendations which I have to offer, founded on experience, as to the more thorough and strict inspect: :ion as being the most certain means of dealing with Tuberculous disease.

The infective nature of Tuberculous disease was first demonstrated by Villemin in 1865, when he communicated it to healthy experiment animals with Tuberculous material. It had however been sus: :pected as of an infective nature long before that time, as we find that in 1810, Von-Bayle described little growths like millet seeds, which were considered to be characteristic of consumption. Laennec in 1834 made further observations; he considered that Caseous matter was/

was an essential of Tuberculosis. Virchow made spec: :ial study of the question, and then expressed the opin: :ion that genuine Tuberculosis could not be present un: :less accompanied by Miliary Tubercles. After Ville: :min's experiments, Cohnheim confirmed them by innocul: :ation into the Anterior chambers of the eyes of exper: :iment animals. In 1882, Koch discovered the Bacillus Tubercle, which is now known as the cause of Mammalian Tuberculosis.

S T A T I S T I C S .

Dr Tatham, Superintendent of Stat: :istics in the Registrar-General's Office, has furnish: :ed statistics showing that between 1851 and 1895 there has been a substantial and steady diminution in the mor: :tality of Tuberculosis, but he says that the import: :ance of this is obscured by better accuracy of Diag: :nosis; changes in Nomenclature, and by the greater extent to which deaths have been medically certified. "The fact also", he says, "is to be considered that im: :proved sanitary conditions, Medical and Surgical meth: :ods,&c have very greatly diminished the general death rate, and that therefore no very reliable statistical data exist as to the influence of Tuberculous animals when used as food; but however that the value of stat: :istics is not entirely destroyed by these consider: :ations, and that death from Tuberculous disease has fallen/

fallen from 3483 per million during 1851-1860 to 2122 during 1891-1895, a diminution of 39.1%.

Tuberculous diseases cause annually in the United Kingdom, 60,000 deaths, which are made up as follows:-

40,000 are due to Consumption.

6,000 are due to Tuberculous disease of In:
:testines & Mesenteric Glands.

6,500 are due to Tubercula Meningitis.

5,500 are due to other forms of Tuberculosis.

The death rate due to Phthisical conditions has no doubt within the past few years shown an unmistakable decline while another form of Tubercul:
:ous disease peculiar to children, namely:- Tabes Mes:
:enterica has shown a positive increase. Some cases extracted from the Registrar-General's Returns and ex:
:tending over a period of 44 years, between 1851 & 1895, bears this out in a conclusive manner, and these I ap:
:pend in order that the gradual and sure diminution of the Phthisical death rate, and the increase of the Glandular form may appear clearly and distinctly.

England & Wales.- Mortality from Tabes Mesenterica, in several periods, 1851-1895.

	Per Million living.	Per Million births.	Per Million living.
	All Ages.	Under 1 Year.	Under 5 Years.
1851-1860	260	3,169	1,625
1861-1870	295	3,800	1,856
1871-1880	318	4,467	2,028
1881-1885	289	4,356	1,852
1886-1890	265	4,462	1,764
1891-1895	238	4,046	1,577
Reduction or Increase per cent. between 1851-1860 and 1891-1895	-8.5	+27.7	-3.0

England & Wales.- Mortality from Phthisis, in several periods, 1851-1895.

Period.	Per Million living.								
	All ages.	Under 5 years.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 35.	35 to 45.	45 to 55.
1851-1860	2679	1305	572	1025	2961	4181	4317	4091	3466
1861-1870	2475	968	454	825	2651	3928	4243	4026	3340
1871-1880	2116	767	358	664	2036	3117	3619	3745	3132
1881-1885	1830	569	312	560	1695	2535	3154	3312	2849
1886-1890	1635	502	271	488	1420	2144	2691	2985	2656
1891-1895	1463	444	228	410	1253	1875	2342	2771	2440
Reduction per cent between 1851-1860 and 1891-1895.	45·4	66·0	60·1	60·0	57·7	55·2	45·7	32·3	29·6

England & Wales.- Mortality from ALL FORMS OF TUBERCULAR DISEASE, in several periods, 1851-1895.

Period.	Per Million living.											
	All ages.	Under 5 years.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 35.	35 to 45.	45 to 55.	55 to 65.	65 to 75.	Over 75.
1851-1860	3483	5764	1218	1359	3200	4361	4463	4208	3589	2986	2154	929
1861-1870	3240	5445	979	1094	2833	4053	4333	4102	3428	2767	1724	617
1871-1880	2863	5209	861	920	2205	3221	3693	3807	3197	2529	1572	537
1881-1885	2540	4547	874	865	1923	2695	3273	3413	2937	2290	1441	536
1886-1890	2322	4441	819	798	1652	2327	2829	3099	2757	2244	1450	605
1891-1895	2122	4155	762	725	1510	2081	2503	2912	2563	2057	1252	514
Reduction per cent. between 1851-1860 and 1891-1895	39·1	27·9	37·4	46·7	52·8	52·3	43·9	30·8	28·6	31·1	41·9	44·1

It would be of great interest and

and/

and would carry conviction with it, if it were possible to trace a diminution, in the death rate from Tuberculous diseases in those places where the precautions used in regard to Tuberculous meat and milk are of a very strict nature but the enormous numbers of side issues which present themselves, make it almost impossible that such statistics of anything like a reliable nature can in the meantime at least be collected. It is however of importance to remember that a Chart was issued by the order of the Grand Duchy of Baden in 1881, and published in Lydtin Fleming and Van Hertsen's Paper. This Chart applies to 52 towns, shows where Tuberculosis is prevalent among cattle, it is equally prevalent among the populace, and is particularly prevalent in those towns in which the numbers of low class Butchers is greatest.

The experiences of another place nearer home, namely, Dublin, also serves to throw a little light upon the subject. This City is almost wholly supplied by private slaughter houses, and according to Sir Charles Cameron, the meat inspection is almost nil. He adds significantly what we know to be the case, viz., that the Zymotic death rate for the last three(3) years has been below the mean of the 33 English Towns, and that the adult, and Phthisis death rates are very high, being 3 per 1,000.

From the experiences in the County of Chester, we also learn a considerable amount in this connection, as, according to Dr Vacher, the death rate from/

from Phthisis, for the County generally, has been the very average one of 1·30 per 1,000, living but incertain districts of the County in which the meat inspection has been very unsatisfactory. There he states that for years it has reached a very high ratio of 2·37 per 1,000.

It has again and again been put forward, by those who are sceptical, of the bad effects of Tuber: :culous meat, that whereas, within the past few years, the amount of meat consumed has decidedly increased, the Phthisical death rate has, in point of fact, dim: :inished, this being exactly the reverse of what they would have expected had the two occupied the relation: :ship of cause and effect. This argument was again and again used by the Commissioners during their exam: :ination of Witnesses before the Royal Commission, and it is constantly recurring in the Papers and Writings of those who are not yet convinced that the ingestion of Tuberculous meat means the risk of the life of the person eating it. It appears to be altogether overlooked that while Phthisical diseases have been diminishing during the years set forth in the foregoing table, other diseases of a Zymotic nature have also been concurrently diminishing to a proportionate extent. I take for example the death rate of Edinburgh from 1864 to the present time, and find that, beginning at the rate of 27 per 1,000 in the former year, the death rate has gradually and surely diminished each year, until it has reached/

reached its present proportion of about 17 per 1,000. While this is so in Edinburgh, it applies equally well to other places, and we are therefore face to face with the fact that ~~in~~ the Phthisisical death rate may be and is diminishing, although the cause of its production remains as productive as ever.

Some of the circumstances, which have unquestionably led to an actual diminution of 25%. in the case of Phthisis during the past ¼ of a Century, may be here enumerated.

(1st) Subsoil Drainage.

(2nd) General Improved Hygiene.

(3rd) The Higher General Standard of Comfort and Cleanliness.

(4th) Greater attention to Ventil: :lation and Construction of Dwellings.

(5th) Advances in Medical Science with its accompanying Super: :ior Medical Treatment.

(6th) Increased attention to Emig: :ration, and in this manner families with Phthisisical Histories have become separ: :ated.

(7th) Increased wealth, allowing Patiants the advantage of Travel, for purposes of treatment.

(8th) Better and more efficient Meat, Milk, & Cattle in: :spection.

(9th) Better Wages, Food, Clothing, and conditions of Labour.

(10th) The knowledge of the cause of the Disease, which now leads even Members of the Public to take the necessary pre: :cautions/

:cautions.

The effects of overcrowding were well brought out by Dr Tatham, Superintendent of Statistics, Registrar General's Office. The observations made by him were conducted in Salford. There, he found where all the houses were built back to back, the Phthisis death rate was 5·2 per 1,000.living. Where 66% of the houses so built, the rate was 3·6. Where 23, it was 3·3, and where there were no houses of this descrip: :tion, it was 2·8. Could anything be more convincing than these figures, or can we be surprised that the death rate of this disease has diminished very markedly of recent years, in consequence of the great improve: :ments, which have taken place in the general Hygienic conditions of the people?. The experiences in the City of London as regards this matter are also instructive. There, the better housing, as compared with what it was 50 years ago, has led to results of a markedly noticeable :able grandeur. Sir John Simon, writing in 1849, des: :cribed the haunts of infectious disease within the City, as "Marked by complicated turnings, narrow inlets, close parallels of houses, and high barriers,,preventing light and movement of air. He referred specially to "Courts "and Alleys hemmed in on all sides by higher houses having the possibility of no current of air, and worst of all, so constructed, back to back, as to forbid the advantage of double windows or back doors, and thus to render the house as perfectly a "Cul-de-sac", out of the Court/

Court, as the Court is a "Cul-de-sac" out of the next thoroughfare". These conditions continued, and writ: :ing again in 1865 as to the Metropolitan tenement dwellings, he says, that these evils continued to constitute "one monstrous form of nuisance where over: :crowding reached a proportion that no obtainable quantity of ventilation could keep the air of the dwell: :ings free from unhealthful contamination, and where the houses large but densely peopled were often without a means of ventilation either back or front, and where under the baneful effects of the absence of light and air, the influence was so degrading that to children born under its curse, it must often have been a very baptism into infamy.

It was stated by Sir Henry Littlejohn in his evidence given before the Royal Commission, that in his opinion a large proportion of the diminution of the Tuberculous death rate in this City was due to the fact that the Corporation had spent such enorous sums in pulling down old property, and creating thereby more free air space.

That a proportionate diminution has not taken place amongst children is easily explained by the fact that in them the resisting power is smaller, and therefore an improvement in Hygienic conditions which tends to increase the resisting power of adults will apply in their cases to a very moderate extent. In the meat-eating period of life from 15 to 45, it must be/

be remembered that while our Phthisisical Statistics are gleaned from those ages they also represent the very ages in which the power of resistence would be more certainly evidenced as the result of any improvement in general surroundings.

I am therefore driven to conclude that while Phthisis is diminishing, other diseases have also in like manner done so, and that diminution is due to the foregoing causes which have increased the power of resistence of the populace, and had it not been for the improved conditions described, the great probability is that Tuberculous disease of all sorts would have gone on increasing from year to year in consequence of ~~of~~ direct infection from the lower animals in which the disease has shown a tendency rather to increase than diminish.

METHODS OF INFECTION.

All Tuberculous forms of diseases in man must be due to one of the three succeeding causes.

(1st) Heredity.

(2nd) Inhalation of the Poison.

(3rd) Ingestion of the Poison.

1st. H E R E D I T Y.

The question of Hereditary transmission of Tubercul: :ous diseases may now be regarded in the light of a settled one, as very few authorities, if any, hold to the/

the old theory that the Tuberculous Organism is borne within the Foetus. In the evidence given before the Royal Commission on Tuberculosis, there was a concensus of opinion expressed by those of wide experience, that the Foetus, when born, inherits only a predisposition to Tuberculous disease, and in almost every case, is born without the seeds of the disease inherent in it. This may be well proved by the number of cases of so-called cured consumption, with which we are constantly meeting. In those cases, the disease has been caught like a fever, and the predisposition towards it having been absent, nature has stepped in and conquered the attacks of the organism. Dr Harris has published observations which have been made by him during a long series of Post-Mortem examinations, in which he has found that persons who have reached an age of between 60 & 70 years show evidences of cured consumption in a proportion of between 80 & 90%. Observations on the same matter were carried out by Rossal, Boudardel, Picini, in Germany, Italy, and France, in which no signs of Phthisis were shown during life. These observations were carried out quite independently, and about the same period of time, and they revealed the fact that from 40 to 60% of the bodies showed evidence of Tuberculous disease. Shortly after the publication of Dr Harris's results, I was so impressed by them, as to make observations myself upon the large number of cases, on which, at that time, I performed Post-Mortem examinations, and in/

in a total of some 500 cases, I found that evidences of healed Tuberculous disease were present in between 20 and 30% of the cases. These evidences showed themselves almost wholly in the Lungs, where, in some cases, many old Cicatrices existed at the Apices. In other cases the Cicatrices were puckered, and calcified nodules were found at their bases. In all cases how:
:ever, the conditions were of old standing, but other organs, at the time of the activity of the disease, had been healthy, and the cause of death was tracible to some other ailment, which had supervened many years afterwards, and indeed, in the majority of cases, when old age had been far advanced. This last observation appears to bear out Dr Harris, in his idea that those who have been at one time victims of the Tuberculous affection which they have outlived, are indeed of strong and healthy constitution with a long expectation of life, and seems to prove that no hereditary taint of a de:
:bilitating nature is inherent in them.

It is well known that several members of a family, the offspring of Tuberculous parents, may exhibit the disease, but this is no strong argument in favour of the inheritance of the Tuberculous organism itself, but rather of a predisposition towards it. If members of a family live together and die off suc:
:cessively, they are constantly surrounded by infective material, a danger of which is unappreciated by them.

Dr Martin, who conducted feeding and innoculation/

innoculation experiments on behalf of the Royal Com: :mission on Tuberculous, himself admits that the results attained by him, are very irregular, as in many cases, the experiment animals fed from infective meat from the same cow, did not act in the same manner, some taking Tuberculosis, others not. Dr Sims Woodhead, who has had large experience in making Post-Mortem examin: :ations on the bodies of young children, records that he has only made one in which Hereditary Phthisis could be said to have occurred. Nocard is strongly of op: :inion that only in very exceptional occasions is the Bacillus transmitted to the Foetus, and asserts that the tendancy to receive the germ is hereditary. Albutt describes a case in which two healthy calves were fed out of the same tub with 450C.C. of Sputem from two cases of Pulmonary Tuberculosis containing numerous Tubercle Bacilli. One calf was killed in 56 days, and 13 Nodules of Tuberculosis were found scattered through the Peyer's Patches of the small In: :testine. There was also Tuberculosis of the Mesen: :teris Glands, but of no other Glands or organs of the body. The second calf, which fed equally with the first, was killed in 138 days, and showed no Tuber: :culosis, every organ and gland in the body being quite normal. This, he says, is a good illustration of which many may be quoted, of animals exposed to the same degree of infection of Tuberculosis, one developing the/

the disease, the other not.

From these considerations and the fact impressed upon me by my own experience in examining a large number of young Foetus, both human and Bovine, I am driven irrestibly to the conclusion that the or: :ganism is not born with us, but received by us during life--time. I have examined a Tuberculous calf three months old, in which the disease was well advanced, but beyond this exceptional case, a few of which are record: :ed as curiosities, have never seen any evidence of it at a younger period of life. It appears that little further need be added by way of proving the proposition that the Progeny of a Phthisical stock inherits pre: :disposition to Phthisis, but do not inherit the disease itself.

(2nd) I N H A L A T I O N.

Inhalation however forms a very certain means by which the organism may find its way into the body of its victim, and the question presents itself as an all important one in connection with the matter under dis: :cussion, whether or not it is the chief method. If it were granted, and could be proved to our satisfact: :ion that the chief Tuberculous disease, namely Pul: :monary Consumption, is caused by the organism in gaining access to the Lungs through the Respiritory Passages, th then a large amount of our fears and precautions against the/

the dangers of meat and milk, infection would be comparitively useless. If only the Alimentary diseases were considered, we would find at least in the case of adults that these amount to such a comparitively small numberas to prevent to a great extent the heroic measures which have been adopted towards combating the possible source.

But I have considered it as by no means certain that Pulmonary Consumption, although it may exist as a primary form of Tuberculous disease, is due to the direct inhalation of the organism, but rather in a very large number of cases, to the organism being carried to those organs in its course through the body. This question will be dealt with more in detail in a future part of this work, and is mentioned at the present time in order that the share taken by inhalation may be at least minimised. That there is at least a doubt existing as to Inhalation being the pregnant scource of infection, that has been ascribed to it, Dr Sims Woodhead's remark may be quoted, when he stated that in his opinion "the evidence as to the mode of communication is nil", at least, he says,"evidence that would be conclusive to my mind".

Klein, Squire, and Barlow are agreed that the disease is very largely, if not wholly,,due to infection, and limits the scources to inhalation and ingestion, leaving Heredity to supply the predisposition, and so to provide the suitable Nidus.

If all causes of Pulmonary Consumption were/

were due to the organism being inhaled by the Air Pass: :ages, it would necessarily imply that the organism exists in the air, to a very much greater extent than it is found to do. That Inhalation however is a source, in at least a number of cases has been conclusively proved by experiments, which have been made on this subject. Tappiner, by spraying Tuberculous Sputum into a cage where dogs were confined, succeeded in in: :ducing Pulmonary Tuberculosis in some of the animals. A curious result followed in connection with this ex: :periment. In spite of repeated warnings, Tappiner's Servant, a very robust man aged 40, insisted in going into the cage, and contracting acute Pulmonary Tuber: :culosis, from which he died in 14 weeks. It may be freely admitted that the conditions in this case were not strictly parallel to those obtained under ordinary circumstances where the amount of Tuberculous dust in: :haled, must be very small. Yet the case demonstrates the possibility of man acquiring Tuberculosis by Inhal: :ation. All observers who have tried experiments by Inhalation upon animals, have admitted the difficulty with which Tuberculosis can be communicated to them by this means, a fact which Baumgarten maintains, is oppos: :ite to the theory of Koch, that the Tubercle enters the body by the Air Passages. After the discovery of the Baccillus Tuberculosis, the view was very gener: :ally expressed that the Parasite is ubiquitous, and that/

that everyone, especially in towns, must be frequently inhaling it, but careful and extensive research, con: :ducted in Berlin by Cornet, proved that the Baccillus is not so widely distributed as has been assumed.

The plan which Cornet adopted was to collect dust with sterilized instruments from the walls of Prisons, Hos: :pitals. Asylums, Private Houses, and from the Public Streets. This was mixed with sterilized broth, and injected with full Antiseptic precautions into the Per: :itoneal Cavity of Guinea Pigs. Many of the animals died rapidly of Septic Peritonitis, others remained in good health, and a certain number contracted Tuber: :culosis. The specimens of dust which communicated Tuberculosis to the animals were obtained from Private Rooms or Wards that had been inhabited by Phthisical persons, whereas in Surgical Wards, Outpatiant Depart: :ments, and Quarters not occupied by such, the dust, as regards Tuberculosis, gave negative results.

In the course of experiments made after Cornet's method, by Drs Heron and Chaplin, with dust from the Victoria Park Chest Hospital, only two out of a total of 100 Guinea Pigs innoculated were attacked by Tuberculosis. In both of these cases, the particular specimen of dust came from the Main Ventilating Shaft, which had not been swept for 40 years. Dust taken from the Wards, Outpatient Waiting Rooms, and Pathological Labatory failed to cause Tuberculous infection in a single/

single instance.

Dr C. T. Williams succeeded in detecting tubercle bacilli in the air of Brompton Hospital. His metod consisted in the exposure of glass plates smeared with glycerine in the ventilating shafts of a ward set apart for Phthisical patients. After some days the plates were examined microscopically, and a few bacille were found.

It must be freely admitted that inhalation is a possible and indeed frequent source of infection, but the few experiments detailed along with many others of a similar description go far to prove that it is not so common a one as is generally supposed. Little need be said about the experiments conducted by Villemin, Schottelius, and others, as these were carried out for the purpose of proving that the organism could gain access by means ofthe air passages, and this we know and admit to be not only a possibility but a certainty, the only point of doubt existing is as to the relative proportion of this method of infection.

I submit a photograph on the next page showing a very beautiful and undeniable example of in: :fection by inhalation in its early stage. The specimen represents the upper portion of the Trachea of a cow which was recently slaughtered in the abattoir of this city. The animal was in excellent condition, and in a perfect state of health, every organ and gland being free. from any suspicion of disease of a tuberculous nature. On opening the Trachea however the three small tubercular deposits which are well represented in the photograph were disclosed to view. In the specimen itself the appearance represented was exactly as if a cultivation of the or: :ganism was being made on an artificial media, medium

There can not be the slighest doubt there: :for as proved by this very convincing case, that Villemin and others were absolutely correct in the results of the laborious experiments conducted by them. Interest: :ing though the result of these and the one brought for: :ward by myself now undoubtedly are, they prove nothing beyond the fact which we will all acknowledge, that the organism if present in the atmosphere may be inhaled, but do not by any means prove that this means is the common or usual one by which the organism gains entrance to the body. This theory indeed is very much contra-indicated by those experiments detailed above in which investigat: :ions conducted upon the air itself gave very nearly negative results.

(3rd) I N G E S T I O N.

By this means tuberculous material readily gains access to the body, and finds its way first to the lymphatic system and afterwards by the circulatory system to every part. This wide-spread infection of course is doubted, and upon its truth or otherwise greatly/

greatly depends the solution of the difficulty, which at present exists, as to the extent of disease in cattle, which should justify the seizure of the whole carcase and the prevention of it passing for human food, as a dangerous disease-spreading scource.

Little really after all of importance attaches to the question as to whether the organism is spread by means of the Lymphatic or Circulatory System. Let us take for example the remarkably common condition, in fact, one of the commonest amongst Tuberculous cattle, viz:- Tubercular Mesenteric Glands. This may or may not be attended bydiffusion of the organism over the Serous Membrane, with its resulting Tubercular Peritonitis. However,thee question may be argued as to the mode of entrance of the Tuberculous Bacillus in cases in which the organism shows its presence at first in the Lungs, there is certainly a Consensus of opinion, that where the Mesenteric Glands are first affected, it has gained access to the body by ~~the~~ means of ingestion. Let us now follow the course pursued by the organism in the case in which the Abdominal Glands have been found first affected. The Tuberculous Bacillus passes down the Pharynx, reaches the Stomach, and then enters the small Intestine. On entering its wall, they may there set up a Tuberculous Ulceration or may be taken up by the Lacteals, and passed on to the Mesenteric Glands. By contact, a slight amount of Peritonitis may/

may and usually does follow, and in the same manner as Tuberculosis of the Pleura affects first the Supra Ster: :nal and Prepectoral Glands by way of the Lymphatics, so here the inflammation of the Peritoneum by direct Lymphatic infection must infect the Hepatic, Splenic, Lumbar, Iliac, Precrural, and Supra Mammary Groups. These are all connected by the Lymphatics, and must of necessity share in the circulation of the same fluid. In such a case then, where a slight amount of Peritonitis exists, we surely wish no more in order to justify the opinion that the carcase is a dangerous one, on account of its containing Glands, which of necessity harbour the organism.

When the internal organs or any of them are infected, it is too much to suppose that they have been so by means of Lymphatics. The organism has certainly by that time reached the Blood Stream, and has been carried, say, to the Liver through the Portal Vein, having gained access to a branch of it from a Tubercular Lesion, or which is more probable, by the Hepatic Artery, through the Medium of the general Blood Stream. The same course will be followed in the case of all the other Internal Organs, and while the Arterial Blood circulating to them gives this undeniable evid: :ence of the presence of the organism, it cannot then be denied that every other part of the animal is being deluged with the same poison-laden fluid. But why, we are/

are asked, should evidence not exist of this presence in other parts, such as the Muscles?. It must be re: :membered that Muscular Tissue is acid in its re-action, which acidity is formed during contraction, and that the Tubercle Bacillus can not grow in an acid medium. Much has been made of the absence of apparent Tubercles from the Muscles, as being an evidence of the absence of the organism from them, and therefore of the safety of them for the food of man, but however freely the organism is flowing over the muscular tissue we can not expect to find naked-eye evidence of their presence. A few cases are recorded, in which Tubercles of the Muscle have been seen, but in years of experience in the exam: :ination of carcases, I have never yet come across it, and have the assurance of the Superintendent of the Edinburgh Abattoir, that after many years close obser: :vation, he has only seen it once in the Muscle of the pig, although some 50,000 carcases pass annually under his review.

From the smaller Lymphatic Vessels, Lymph is carried by the two great Lymphatic Trunks to the Venous System at the root of the neck, and then become dispersed in the general circulating blood. It is suggested by some Observers that the Internal Organs of an animal are frequently infected by means of the Lymphatic System, but this is distinctly disproved by the almost general infection of these organs, the whole tissue/

tissue of them having become involved.

The rapidity and certainty with which the organism reaches the circulation and becomes disseminated, may be gathered from a case recorded by Allbutt, in which death from Pulmonary Consumption followed Innocul: :ation through a cut finger.

The free circulation through the Lymph: :atic System, may be gathered by a case recorded by Allbutt, in which there was disease of the Lungs and Mesenteric Glands. In this case there was Ulceration of the Intestine, invasion of the Mesenteric Glands, Lungs, Bronchial, and Post Mediastinal Glands, ~~and then again to the Lungs.~~ In this case he says the Glands of the Lesser Omentum are those first affected, and the disease spreads thence to the Liver, Post Mediastinal Glands, and Bronchial Glands, and thence again to the Lungs. Here then is a case of General Organic Infect: :ion by means of the Lymphatic System, but so completely is this System involved that the General Circulation must also have aided in the spread, and carried the organism to every part of the animals body. While this case is mentioned by Allbutt, it is only an example of a form with which I am daily coming in contact, and is not in the least extraordinary, but in a manner in: :structive, as showing the wide-spread influence which may and does follow the invasion of even the slightest part of the Lymphatic System.

As a further proof of the close connection between/

between the Lymphatic and Circulatory Systems, a case is recorded in which a healthy pig was fed with ~~the~~ a Kilogram of meat from a Tuberculous cow. The animal was killed in 203 days, and Tuberculosis of the Mesent: :eric Glands, Omentum, Coeliac, Bronchial, and Post Mediastinal Glands was found, as well as of one Epidid: :ymis. In this case the mode of Invasion was through the upper parts of the Gastro-Intestinal Tract, as all Lymphatic Glands in connection therewith were affected. The affection of the Bronchial and Posterior Mediastinal Glands is probably to be ascribed to infection from the Abdominal Glands, but the chief interest of the exper: :iment rests on the fact that the Epididymis, far re: :moved from any connection by means of Lymphatics with the Glands affected, was Tuberculous. In this case, unquestionably, the disease is to be ascribed to in: :fection carried by the Blood Vessels, as Secondary to, and in direct communication with, the Lymphatics.

It is not necessary that Local Lesions should be discovered in parts of the Alimentary Tract, in order to prove that the virulent material has gained access by this means, as feeding experiments to a large extent, have shown that Tuberculosis of the Glands and other organs, thereby resulted, and no trace of a Local Lesion remains in the Bowels, the organism simply having passed through without having left any trace upon it.

It is important to note that the organ: :ism does not settle down at the point at which it gains/

gains access to the body, and therefore the Lungs may be and are the favourite site, even although it is in: :troduced by Ingestion. Such a case is seen where affections occur of distant parts, such as Tuberculous Knee Joints, Testicle Epididymis, &c. The organism has certainly not gained access at these parts, but simply elects to settle there. A weakened organ by injury or otherwise may be sufficient to determine this site. It can therefore by no means be concluded that in Tuberculous disease of the Lungs, the organism has been inhaled, while in Tuberculous disease of the In: :testine, it has been ingested, as so many cases of Tuberculosis occur in parts of the body, most certainly remote from the Channel of infection. That Tuberculosis of the Lungs does not necessarily imply access of the organism by inhalation is not, in my opinion, finally and decidedly proved by Innoculation and Feeding exper: :iments, in which the Lungs have been found to become primarily invaded. It has indeed been demonstrated by C Cornil, that by the Lymphatic System, the Circulatory System in Tuberculosis became involved, and subsequent: :ly each remote part of the animal.

The ease and rapidity of the spread of the Tuberculous organisms from the Lymphatic to the Vacular System, and through that to every part of the body, need hardly be dwelt upon, and we have only to remember that the Lymphatic System consists of a series of Tubes,,which absorb and convey to the Blood certain fluids/

fluids; a number of Glandular bodies through which the Tubes frequently pass, and the fluids themselves which are Lymph, and Chyle in order fully to realise this close connection, and fully to appreciate how the production of ingested material, find their way with certainty to every part of the organism. Laennec considers, and his view in a very slightly modified form has been advocated by Dittrich and Niemeyer, that a degenerate mass of Tubercle (Caseous Lymphatic Gland for example) is a common, if not the invariable, source of General: :ised Tuberculosis, that the degenerate particles, taken up by the Blood, become distributed by it and then, act as specific irritants to the parts which they affect. Allbutt states that Tubercle is a Local affection, which naturally tends to undergo either a Fibrous or Caseous transformation. In the latter condition, it may break down; the Bacillus-containing debris, being thereby liable to become diffused throughout the body, by the Lymphatic or Vascular Channels. In acute mil: :iary Tuberculosis, the extensive collections of the gray granulations and their close relation to the Vessels, at once suggest the Blood Current as the course by which they reach the Serous Cavities, whatever may be the exact way by which they reached the Blood Stream.

A very important case, and probably the only one on record, which proves how specially liable to Tuberculous affections the Lungs of human beings are, irrespective of the mode of entrance of the organism, has/

has been recorded by Allbutt. In this case the patient was dying of ef Gangrene of the Leg, and the opportun: :ity was taken to innoculate him with Tuberculous Sputum. His death occurred three weeks later, and upon examin: :ation, a few recent Tubercles were found in one Lung. There can be little doubt, that had the origin of in: :fection not been thus assured, this case would have been put down like so many others to Tuberculosis caused by Inhalation.

M. Airlong, Director of Lyons Veterinary College, in writing on the subject of the wide spread nature of the organism however introduced, says that "Tubercle of the Lungs occurs in the rabbit as well after innoculation of the Virus into the Jugular Vein as into the Subcutanuus connective tissue of the Thigh, where it would be taken up by the Lymphatics, and since in this animal, the Lymphatic path, followed by the Virus, is not forcibly marked out by the Tubercular Lesions, it is impossible, in presence of a rabbit affected with Pulmonary Tuberculosis, to know whether the Bacilli are disseminated by means of the blood or the Lymph." Assuredly, when the Virus penetrates by the Intestine, the Lymphatic Glands are generally invaded in the first place, then the Lesions extend to the Serous Membrames of the Thorasic Cavity, but the infection does not march invariably in this manner, it can involve simultaneously in the Abdomen and the Lungs. When the Lesionsaree established/

established in an organ, it is not necessary that they should be either very extensive or softened, in order to throw into the circulation, a certain quantity of Microbes. The sudden explosion of most cases of Men: :ingetis or Tubercular Peritonitis, coincidently with Pulmonary Lesions of slight extent, and but little ad: :vanced, furnishes the proof of this. The animal that presents any Tubercular Focus whatever is constantly in eminent danger of Generalisation, and nothing shows at the moment of slaughter that the Capillary Network of the Muscles is not traversed by the Bacilli in search of a place propitious for their multiplication.

Dr Sims Woodhead has written that an infection may apparently take place from any part of the Alimentary or Respiritory Tracts in animals, and as we find Lesions in man, which would indicate that hee also is liable to infection from similar points, and under exactly the same conditions, it must be held that so long as Tuberculosis can be produced in animals in any of the ways mentioned, so long does the same material remain capable of setting up Tuberculosis in the human subject.

It has before been remarked, and is a matter of very great importance in considering the means, by which the organism gains entrance into the body, that in numerous cases where feeding experiments have been carried out no trace of Tuberculous infection, has been found in Intestines or Abdomenal Organs, and yet/

yet, the Lungs have been infected by the disease. Dr Martin's experiments, carried out for the Royal Commision on Tuberculosis, again and again proved this to be the case, and observers, both before and since, have met with similar results.

Dr Clyne and Dr Powell, in their evid: :ence given before the Royal Commision, have both stat: :ed, as the result of their experience, that the Tuber: :cle Bacillus may enter the Stomach, and its principal manifestation may be in the Lungs, while Dr Ransome, a Physician of great experience, in Consumptive cases in Manchester Hospital, stated that he should say there is a possibility of persons taking Phthisis from eating diseased meat.

Dr Goodheart, Physician to Guy's Hospital, so far bears out this contention by stating that children are affected by Tuberculosis in the Glands, while adults are affected in the Lungs, and that a connection may be brought about between these by material getting into Blood, and and becoming circulated.

The difficulty of proving that Tubercul: :ous disease of the Lungs is caused by Ingestion in many cases, of course is great. The Royal Commision on Tuberculosis again and again asked Witnesses who appeared before them, if they knew of a case in their experience, in which eating Tuberculous material had set up Phthisis of the Lungs, but of course the connect: :ion is necessarily difficult to prove, and the possib: :ility/

:ility of it must be sufficient for those with any know: :ledge of Anatomy and Physiology. When this possibil: :ity exists, the question is at least to them, satis: :factorily answered, and they do not require to trace the history of individual cases, a task ~~of~~ little short of impossibility, as the organism involved is of slow growth, and its manifestation long of appearing.

Prof. Walley, in his excellent Book on meat inspection, states that many of the organisms pass from the Mucous Surface or Inner Lining of the Bowels and Lungs into the surrounding tissues, and are carried thence by the Lymphatic Vessels to the differ: :ent Groups of Lymphatic Glands, which are found scatt: :ered here and there along their course, and through which the Vessels pass. That process goes on to a very large extent, as shown by the fact that the Glands situated in the Abdomen and Chest are often found to be extensively affected without there being any trace of the disease in any of the organs of the body, and it is highly probable that so long as these Glands retain the Bacilli and their Spores, so long does the general system remain unaffected. This however is a mere speculation, ~~specimen~~, and in any case there comes a time when the Bacilli and their Spores escape from the Meshes of these Glands, and are conveyed by the outgoing Lymphat: :ic Vessels into the Blood Stream, thereby contaminat: :ing the whole system. He has frequently seend Med: :iastinal and Mesenteric Glands affected, without any other/

other trace being present in Organs or Serous Membrames, but who could give any guarantee that the Organisms had not gained access to the circulation.

Laennec asserted that diffuse Miliary Tuberculosis had its origin in the pre-existance of a Caseous Centre, and Walley has frequently found Mil: :iary Tuberculosis,,without at first glance being able to account for its presence, until carefully examining the deep Glands, which revealed extensive Tubercular Adenatis.

Mr Robinson, F.R.C.V.S., who is a corres: :ponding Member of the Central Society of Veterinary Medicine in Paris, and who has very wide experience, and has devoted much study and investigation to this subject, has stated that he regards the disease as af: :fecting the whole system, and that in his opinion for every one cause of Tuberculosis, as a result of Inhalation, there are 50 or 60 due to Ingestion. He believes the spread among cattle to be ingested by a coughed up getting on to the food.
Sputum/ The infection, he says, may travel along the Alimentary Tract, from there, reach the Thorasic Duct, and thence, with the Blood, reach the Lungs.

The Late Prof. Coats of Glasgow, has stated, that when Tuberculosis occurs on the Pleura, the organism must be carried by the Blood, it was im: :possible to tell where it could and could not be carr: ;ied. "It was"in fact" he says, "carried throughout the/

the body".

Mr Legge, Secretary of the Royal Commis: :ion on Tuberculosis, in his Work, entitled "Cattle Tuberculosis", has stated that general Tuberculosis implies a spread of the disease by the passage of the Tubercle Bacilli into the Main Blood Stream or into the Thorasic Duct, and its conveyance to different parts of the body, such as the Lungs Liver, Spleen, Kidneys, Bones, and Muscular Tissue. If the Bacilli enter in large numbers into the Blood Stream, "then", he says, "acute Milliary Tuberculosis or Galloping Con: :sumption results, but it by no means follows, that in general Tuberculosis, all the Organs and Tissues become equally affected. Some Tissues offer a part: :icular resisting power to the organisms. s The Lungs are always attacked, then come in order, the Abdomenal Organs, the Serous Membrames, the Lymphatic Glands of the Muscular Tissue, the Udder, Kidneys, and lastly, the Bones. "From a primary infection," he says, " all the Organs in the body may become infected".

From my own experience and observations, I am perfectly satisfied that the organism, which gains access by the Alimentary Tract, shows its primary affect: :ion in by far the majority of cases, in the respiritory system. Certainly, it must be admitted that some of the Mesenteric Glands are first involved, but these, in many cases, are so to a very slight extent, and the acute/

acute disease has settled in the Respiritory Tract of the animal. The presence of the affected Glands gives undoubted evidence of the mode of entrance and the grav: :ity of the Pulmonary condition, at once reveals the partiality of the organism to those organs in which it settles immediately after gaining entrance to the cir: :culation.

The popular, and what may be called "the popular Medical Theory" regarding Tuberculosis of the Lungs, is certainly in favour of Inhalation having proved the means of access, but from a careful study of the manner in which the disease is disseminated through: :out the ~~the~~ bodies of animals, I am strongly convinced that Ingestion forms a very common mode of entrance, both in the Human and the Bovine Species, even although the chief manifestation be in the Pulmonary Organs. Were the Lungs affected only after the organism had travelled through the whole of the Lymphatic System, we would naturally expect to find every Gland affected, but the inumerable cases which exist, in which one of the Mes: :enteric Glands ~~are~~ is infected and the Lungs hopelessly so, together with the observations and experiments which have been previously quoted, drive me to the conclusion, that in the desire to avoid the spread of Pulmonary disease in cattle and human beings, we must guard the Alimentary rather than the Respiritory Tract.

I have devoted myself chiefly in the foregoing/

foregoing remarks, to the various means by which the organism may gain access to the body, and generally to the behaviour of that organism when it has thus gained access, and I now propose to regard the subject from the point of view of the danger implied by the In: :gestion of Tuberculous meat however apparently local: :ised the Tuberculous manifestation may be.

L O C A L I S E D T U B E R C U L O S I S.

This question is one of the very greatest importance, and as, for some years in Edinburgh I have had the opport: :unity of studying Tuberculous disease of all forms in cattle, and now and for some time have been responsible for the condition of these animals, from the time they are living in their Byre to the time they reach the Sale-yard, and again to their treatment and their exam: :ination in our Abattoirs, from there to the Butcher's Shop in the City, in which I again see them, I may safely state that from the Breeder to the Consumer, they are constantly under my observation. When it is remembered that about 30,000 of the Bovine Species pass annually through our Abattoirs, some idea may be gathered of the material which I have had the opport: :unity of studying, and it will be my duty, while de: :tailing the system of meat inspection observed here, to produce reasons in favour of the total seizure of Tuberculous carcases, however apparently slightly af: :fected, after to regard this in the light of the recommendations of the Royal Commision on Tuberculosis, and/

and to critisise the methods of inspection which are adopted in the enormous number of Abattoirs throughout the Kingdom, an extensive enquiry regarding which I have carried out.

The Report of the Royal Commision on Tuberculosis, states, "in the Edinburgh Public Slaughter Houses, we witnessed meat inspection carried out on more nearly the enlightened system of the best Contin: :ental Abattoirs, than it was our fortune to see in any other part of the United Kingdom, though the stan: :dard by which meat of Tuberculous carcases was judged appeared to us, unnecessarily severe". It may at once be stated, that roughly speaking, 30,000 cows are an: :nually slaughtered in Edinburgh, and that every car: :case is seized and destroyed if affected by Tubercul: :osis, to however slight an extent. This is done on the theory which I hold to be the correct one, that when the organism has gained access to the body, what: :ever may be its manifestation, there is the danger of its reaching every part of the carcase, although its presence may not be rendered evident to the naked eye, or even by means of a Microscope.

It is quite useless to expect to find Tubercular Growths in the Muscles of the chief edible por: :tion of the animal, for the reason which has been previously enlarged upon. Prof. Walley has said that actual Tubercular Growths are not often found in Mus: :cular/

:ular Structure, or at least are not sufficiently large to be visible to the naked eye, but notwithstanding this fact, there is abundant to show that the juice of the flesh of Tuberculous animals contains the germs of the disease, and amongst those ~~he~~ who first pointed this out, was Toussaint, a Veterinary Teacher at Lyons, who re: :produced the disease by innoculation with juice pressed out of the centre of an underdone Steak from the body of a Tuberculous animal, and in like manner the Late Prof. Bouley transmitted Tubercle to a Pig by innocul: :ating with meat juice from one of the Thigh Muscles of a Cow. We know this to be possible, and experiments which have been made, have reduced it to a certainty, that although no Tubercle is evident in the meat itself, Innoculation and Feeding experiments from that meat, are attended by positive results. It is important therefore, Dr Hope has put it, that a proper inspection of meat is rendered necessary, not only with the view of the rejection of what is evidently unwholesome, but also of doubtful kinds, in order to ensure the health of the community.

M. Arloing has pointed out that the nocuity of the flesh of Tuberculous animals has been proved by two sets of experiments:- (1st) By Ingestion of Tuberculous flesh, having all the appearances of healthy flesh, and (2nd) By the Innoculation of the Juice from such flesh. Johne fed 35 animals with flesh/

flesh from Tuberculous animals, and 22·5% became Tuber: :culous, and again in repeating the experiment in 46 animals, 13·1 were affected. M. Peuch fed 2 Pigs on flesh from Tuberculous animals, and both were affected after 2 or 3 months. Nocard, Chouveau, Arloing, Gal: :tier, and Vessiere also carried out experiments by innoculation with positive results.

M. Arloing is strongly of opinion that the flesh of all Tuberculous animals, whatever be their condition, whether fat or lean, may conceal the germs of Phthisis, and Walley has maintained that all affected animals should be destroyed.

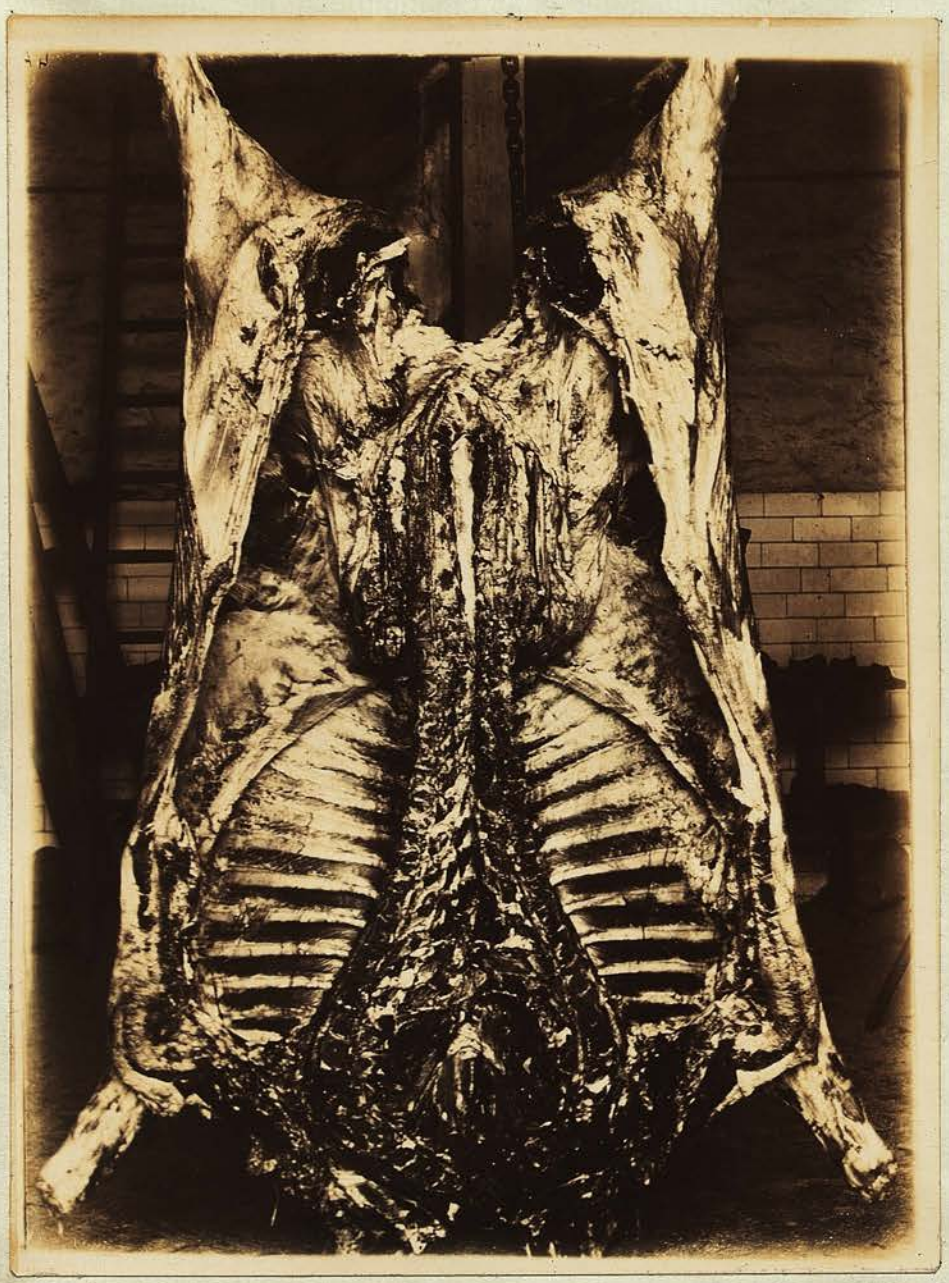
In a letter received as to the methods of meat inspection adopted in India, a description is given of the very close scrutiny to which meat is sub: :jected, when intended for the use of Troops. The letter goes on to state that Legislation regarding the inspection of meat for Civilians is extremely unsatis: :factory, and the inspection adopted is lax in the ex: :treme. On the question of the relative proportion of Tuberculous affections, the Writer, who is one of very prolonged Military experience adds, "I cannot say that there is any excess of Tuberculous cases amongst the Troops, but there is amongst the Eurasians who are a rather dirty, unwholesome race, and have not the advan: :tages of inspection of articles of food, that the Soldier has". My object in obtaining the information, was/

was to find whether the strict system of meat inspection there was attended by good results, in preserving the Troops from Tuberculous disease, and we find that un: :doubtedly it is so when contrasted with the case of the others, for whom no such strict system obtains.

Dr. Russell, Medical Officer of Health for Glasgow, has stated that the organism is rarely to be found in the Blood, and of course we know, not only on his authority, but as a matter of general ex: :perience, and on the authority of other observers, that this is so. It does not however by any means imply that the organism is not in the Blood, and as before stated, its manifestations in the organs of the body of themselves, prove its presence in the Blood Stream. I need hardly point out how difficult it is in many cases, to detect the Tuberculous Bacillus, even in the organ visibly affected, unless indeed the affection is an advanced one. If this is so, the difficulty of recovering it from the enormous quantity of Blood in the carcase of a Cow, must be evident. I have had very great difficulty in detecting the organism in the Udder of the Cow, of which I give a Photographic Re: :presentation. (Photograph No 4).

This animal was found by me accompanied by a Veterinary Surgeon, in one of our City Byres, giv: :ing milk in the ordinary course. The Udder being sus: :picious, I at once ordered her removal to the Slaughter House. On Post-Mortem examination, which I superintended the/

(Nº 4)



the following day, the aftermentioned conditions were re:
:vealed.

Pleura and Peritoneum absolutely clear.

Lungs only pea-like Nodule or two.

Pharangeal and Lyrangeal Glands much infiltrat:
:ed, and in many instances, Caseous.

Mesenteric Glands enormously enlarged and Tub:
:erculous.

Udder large granulation masses with Tuberculous
Nodules.

Microscopic Specimens of this were taken by me, and examination showed the presence of Tubercle Bacilli, but some difficulty was experienced in detecting them, and a skilled Microscopist, to whom I have submitted the organ, admitted the common difficulty, and the fact at which he was not surprised, that he had to examine for hours 8 or 9 specimens before detecting the organism.

It may here be remarked that the carcase itself looked inabsolutely good condition, and when the organs were removed, no trace of the Tuberculous con:
:dition could be detected. Hopelessly infiltrated though it was, it would have undoubtedly have been passed in many places as fit for food, as it will be pointed out hereafter many Witnesses before the Royal Commission held the opinion that the appearance of the meat alone ought to be the test by which a carcase was passed or con:
:demned. Knowing as I did however the affected condit:
:ion of this animal, I cut into the deep Lumber Region and/

and exposed a much enlarged Gland deeply infiltrated with Tuberculosis; this Gland is shown in the Photograph.

Dr Goldie, Medical Officer of Health, at one time, of Leeds, has gone so far as to state that he passes as fit for food Tuberculous animals in which both Pleura and Peritoneum are affected, and contents himself with stripping off the affected Membrames, thousands of which he admits having stripped. The more than danger implied in this statement, does not require to be en: :larged upon.

The Medical Officer of the City of London however, Dr S, Saunders, says that undoubtedly he would not hesitate to condemn a carcase with the slightest appearance of Tuberculosis, as he believes Tuberculosis to be represented by a certain Bacillus in the Blood of the animal, and of course in its general tissue, and anyone eating any portion of the carcase, through which the Blood passes, would be liable to get a dose of Bac: :illus, but significantly adds, that he does not quite follow what is known as Localised Tuberculosis. The Senior Inspector of Leadenhall and Smithfield Markets, seizes a carcase, wherever the slightest trace of Tubercle exists, and states that in many cases, in which the Glands are affected, the meat is in very good condition.

My own experience in this matter is decid: :edly of a like nature. The appearance of a carcase is by no means the slightest criterion of its condition, so far as Tuberculosis is concerned. Splendid specimens of/

of Prize Stock and others, have, in hundreds of cases, come under my notice, in which no suspicion of the dis: :ease existed during life, and yet on Post-Mortem exam: :ination, the carcase has been found in almost every organ, to be infiltrated.

A great number of Witnesses before the Royal Commission, chiefly Butchers, but unfortunately also some Medical Authorities, have dwelt upon the pro: :priety of regarding meat only as the test of condemnat: :ion. If this were done, we at once lose sight of the fact that the cause of Tuberculosis is an organism, that this organism is of slow growth, and that it may be pre: :sent in the body for weeks, before a Macroscopic man: :ifestation becomes evident.

Dr Hope, of Liverpool, has recorded in this connection, that he has seen a splendid Heifer car: :case which was in splendid condition, but had the Glands filled with Tubercle.

Dr Bond, Medical Officer of Health and Meat Inspector of Holborn/Market, states that wherever there is Tuberculosis to any extent, that it is obvious that there is also Tuberculosis of the Lymphatic Glands. On enlarging upon this subject, he goes on to state, that from his wide experience, the affection of any of these Glands means affection of the carcase, which it is im: :possible to see without cutting into the carcase thor: :oughly, and examining each of the Glands individually. In his experience, almost all carcases, in which Tuber: :culosis/

:culosis exists to however localised an extent, the Glands of the carcase are also involved. My own exper: :ience bears this out in a marked degree, and I hold strongly from my own observations, that wherever Local: :ised Tuberculosis exists, Glands both Superficial and Deep are liable to be affected, and are so in at least 90% of the cases examined. To this I have paid very particular attention, feeling satisfied that the question of infectivity of a Localised Tuberculosis largely de: :pends upon the condition of the Glands, as a positive factor, apart altogether from the question of the general distribution of the organism to every part of it.
From a list of a large number of cases, to which I will hereafter refer, it will be obvious that, taken at ran: :dom, from the animals slaughtered in our Abattoirs, this statement is fully borne out.

Dr Sydney Marsden, Medical Officer of Health for Birkenhead, is in the habit of passing car: :cases as fit for food in which the organs are diseased, if the flesh itself is free from Tubercle, but at the same time admits, that he never cuts into nor examines the Glands, but if he did so, he feels perfectly certain many would be riddled with Tubercle. My experience says 90% would be riddled with Tubercle, and yet, these carcases, with so-called Localised Tuberculosis, are freely passed for human consumption. The inconsistency of such a method of examination, and the enormous danger implied by it, may be gathered by Dr Marsden's admission that/

that while this is his habit, he believes that if there is a sign of Tuberculosis in the Glands, no person can be sure that it has not gone through the system, and that his lenient line of action is purely due to the recomm: :endation of the Royal Commission. His own opinion, against which he meantime acts, is in favour of total seizure. He has frequently got carcases where the Glands are affected, but the organs are not. He seized a fine Prize Cow, and made feeding experiments with pieces of the Brisket and Muscle, and some cases of Tubercle re: :sulted. His experience regarding Glandular Disease, while the organs themselves are healthy, is one of every day occurence with myself. There is absolutely no rule as to which Glands may show infiltration. If one single one is at all affected, ~~and~~ then only on going thoroughly over the whole carcase, are others at a distant point, almost invariably revealed. Sir Chas. Cameron of Dublin holds exactly the same opinion as Dr Marsden and myself, but admits that he has been led by the Royal Commission to altering his procedure, which was formerly a seizure of all Localised conditions. He very significantly adds the important point, that if Tuberculous carcases are only condemned when the flesh itself is affected, to such a degree as to be evident to the naked eye, we are altogether leaving out of account any danger existing as to Tuberculosis itself. Some idea may be gathered regarding the dangers to which the Public are subject by the ingestion of meat of a Tuberculous nature, when such/

such a lax system as those alluded to is in force, when we consider the admission of Dr Robertson, Medical Officer of Health, St. Helens. This gentleman, before the Royal Commission, admits that his habit is to pass car: :cases if the flesh looks good, and in one year he has allowed 100 animals to be stripped. When pressed for a description of the kind of carcase he is in the habit of passing, he actually admitted having passed one with the following lesions:-

(1) Both Lungs very extensively indeed diseased.

(2) One Pleura affected.

(3) Diaphragmatic Pleura affected.

(4) Covering of Liver and some portions of Stomach and Intestines affected.

(5) Tubercular matter over Peritoneum.

There can be no doubt that this carcase was literally infiltrated with living organisms, and based upon feeding experiments, carried out with animals affected to a much slighter degree, it is perfectly certain that, had this been adopted with the meat from this carcase, every result would have been a positive one. In accord: :ance with this and a large number of other Authorities, who act in a similar manner, an enormous number of Tuber: :culous carcasesare daily finding their way into our Markets, and daily spreading disease and death among the people.

Dr Chalmers of Glasgow has done much to: :wards working up what Statistics are available in con: :nection/

:nection with this matter, but has to admit that these are highly indefinite. He feels certain however that Ph: :thisis swells our death rate in consequence of the in: :gestion of Tuberculous meat, he of course admits that it impossible to estimate to what extent this is so. Like myself, he holds that Tuberculosis to any extent, even if on the Pleura, exists, we are warranted in be: :lieving that it ~~is~~ has pretty extensively infiltrated, other organs, and that it is impossible to know to what extent it has infiltrated the Glandular System. I am able to a very great extent to clear up the diffic: :ulty which exists as to the infiltration of the Gland: :ular System, having devoted much time in view of this contribution to the Systematic Examination of the Gland: :ular System of carcases with Localised Tuberculosis, and as previously set forth, I found that the Glands of distant parts are more or less infected, even frequently in the Deep Muscular Tissue, in about 90% of all cases. A statement of a large number of these conditions will be hereafter referred to.

A very useful work, entitled"Food Inspect: :ors' Handbook, By Vacher of Chester, ridicules the idea of such a condition as Limited Tuberculosis, and strong: :ly advocates the seizure of all carcases in which it takes place. He supposes the Localisation to take place for example in the Lungs, and points out the free cir: :culation through these organs, and the certain infiltration to/

to the Circulatory System. This of course bears out my ideas, and the same remark regarding Lungs may be made regarding every organ and Muscle in the Body. Another example may be cited, in which a Medical Officer of Health, viz:- Dr Gourlay of West Hartlepool, is com: :pelled by the recommendation of the Royal Commission to act contrary to his better judgement. He is strongly of opinion that Tuberculous meat is dangerous, that it contains the germs of the disease, and that in the case of the Localised Tuberculoses, which he himself has passed, he would not like to use the meat, or to allow in whom he was interested
others/to use it. A very interesting corroboration of my investigation on the Glandular System of animals, with the disease localised, was furnished by one of the Commissioners, who was a Member of the Royal Commission. This gentleman stated, that in their Continental Travels, with the view of gaining information upon this subject, they saw several cases where there was very little affect: :ion of the internal organs, nothing certainly that would lead to condemnation in this Country, and yet Glands, 6 inches deep in the carcase, were found affected.

Every person admits that where Miliary Tubercle exists, the organism must have been carried by the Blood Stream, and if they could go one step further, and admit that after reaching the Blood Stream the organ: :ism must be deposited for 2 or 3 weeks in the organs of tissues of the animal, before any sign of its presence is evident, then they would require in Logical Sequence to/

to advocate the total seizure of a carcase in which this possibility existed, in the shape of a patch of Tuber: :culous disease.

A very interesting case, as proving how the Glands may be affected although no disease exists in the organs themselves, occurred recently in our Edinburgh Abattoir. A very fine specimen of a Cow, the property of Sir Thos. D. Gibson Carmichael, had been innoculated with Tuberculin, and had re-acted to this test. After slaughter, no evidence of Tuberculosis could be found, and in presence of a number of Veterinary experts, who had gathered specially to see the result, every organ was carefully and critically examined. The result of this was per: :fectly negative, and the case looked puzzling. Each Gland was then carefully examined, and in cutting into the deep ones in the Muscle, one or two of these were found infiltrated with the disease.

It has been frequently urged that the total seizure of cases of Localised Tuberculosis would involve great dissatisfaction among Butchers and Dealers in Cattle, but it is of importance to record that where we, in this City, seize all, there is no complaint amongst these classes, and no dissatisfaction exists. From my inquiries regarding this matter in other places, I find that dissatisfaction is the greater, the more leniency is shown , and in St. Helens, where this leniency is carried to a degree, the Butchers complain bitterly. A Representative of the Scottish Chamber of Agriculture, Mr/

Mr John Dobbie, who is himself a Farmer, states that he is quite satisfied with the Edinburgh Inspection, and that his Chamber took it for granted that the re: :sult of the Royal Commission enquiry would be a great: :ly increased stringency in the application of the con: :fiscation of carcases.

Some experiments were made recently by Prof. Julius Dreschfield, Professor of Pathology and Physician to the Manchester Royal Infirmary, with the view of determining the infective nature of the Mus: :cle in cases of Localised Tuberculosis, and in a large number of cases, positive results were obtained. This gentleman was a Witness before the Commission, and was asked the following question:- "We know you "have great experience; do you wish us to understand "that when healthy meat is exposed in a Butcher's Shop, "it may be consumed without danger, although if sub: ":jected to experiment, Tuberculosis might be discov: ":ered?", and he answered, "Tuberculosis may be found "in the Lungs, the Pleura, the Liver, or the Glands "of the Abdomen, despite the healthy appearance of the "animal, and in such a case, it ought to be condemned "as food". There may be Tuberculosis in the inter: ":ior of the animal that would condemn it for food, "and yet the meat would look healthy and good. If "you are to prevent the spread of disease, you must "prevent diseased meat going into the Market". He

being/

being asked again if he had any doubt that infection might be caused by the consumption of animals as an art: :icle of food, he says, "No; there is always a risk, "and meat should be condemned if the animal is at all "affected, as it is very difficult to draw the line "between Local and General Tuberculosis". On being asked if a man may eat diseased meat and not show Tub: :erculosis of the Lungs, he says that a person may un: :doubtedly have Tuberculosis of the Lungs, set up by what he eats. In adults, he states, the Lungs appear to be primarily affected. This exactly bears out what I have main- retained in the preceding pages regard: :ing the course pursued by the organism in the Body, and its apparent partiality for the Pulmonary Organs by whatever method it is introduced into the System.

Dr Sims Woodhead has made a number of Feeding and Innoculation experiments with Tuberculous material, and he is a recognised authority on this sub: :ject. No one can doubt the dangers which exist when Tuberculous Milk from a Cow with Tuberculous Udder and containing the Tuberculous Organism is ingested by the human being, and Dr Woodhead has expressed the opinion that very similar conditions pertain with re: :gard to a possible infection through the medium of meat. In fact, he goes a step further than most people, and says that he does not consider there is any differ: :ence between meat and milk, so far as infectivity is concerned. Sometime ago he made five Innoculation ex: :periments/

:periments, one on a Guinea Pig, and four on Rabbits. The animal experimented upon suffered with a Tuberculous condition of the Pleura, but all of the Organs and Mus: :cles were apparently healthy. In all of the cases Tuberculosis resulted, and he adds, "In order to pre: ":vent the risk of infection from meat, I should re: ":quire the compulsory inspection and slaughter of all "Tuberculous animals, as I am of opinion, that by the "adoption of proper regulations, Tuberculous disease "could or might be entirely stamped out, both from anim: ":als and man". It is interesting to find that Dr Woodhead's opinion is so strongly in favour of this measure.

I may here remark that while I have in: :cidently made reference to Milk, it is not my intention to dwell upon this part of the subject, as I take it that the dangers from this substance are so perfectly evident, that no contribution is required, now, in this direction. I will content myself with recording the bald fact, that in this City, during the past year, I have discovered within the Byres, between 20 and 30 Cows with Tuberculous disease of the Udder, which, up to the time of inspection, had been daily supplying milk to the Citizens. In each of these cases I have examined the milk microscopically, and in every in: :stance, have found it swarming with Tubercle Bacillus Organism. I think no experiments therefore, Innocul: :ation or otherwise, are required with regard to the dangers/

dangers in connection with Tuberculous Milk. Were I to enlarge upon this subject, it would be rather upon the lines of attempting to prove with Ernst, Hirsch: :berger, Bullinger, Bang, and others, who have made experiments to prove the infectivity of milk in cases of Localised Tuberculosis, in which no Udder disease existed.

The evidence and experience of Dr Klein are well worthy of weight in connection with the question of the dangers to Human beings from Tuberculous meat, and he states that flesh from a Tuberculous animal is dangerous, "Because" he says, "we know that where no Tubercle "exists in the Lung and Abdomenal Viscera, although no "apparent Tubercles are in the flesh, there may be "Tubercle Bacilli in the Marrow of the Bones, and this "shows it is possible for them to be circulated through "the Blood and Muscles." "If there are Tubercle Bac: :illi in the Internal Organs", he says, "there is cer: ":tainly a risk in eating what is apparently wholesome "meat from the carcase", and he adds that he is cer: :tainly of opinion that any animal with the smallest amount of Tuberculosis, may contain in the circulating Blood, the Tubercle Bacilli, in transit to different parts of the body, and therefore its flesh should not be eaten, and this risk is existant even although the meat looks well, and is hanging in a Butcher's Shop. He adds, "I should certainly go so far as to say, that "I would prohibit the sale, for food, of all meat that "came/

"came from Tuberculous animals, I should not say that "meat was free because it showed no Nodules, but if I "found Nodules in the Lungs, I would then look for dep: ":osits in the other Viscera or Glands, and if I found "them in the latter, I would condemn the meat".

I am much interested that Dr Klein refers to the danger of this question of Glands, which my ob: :servations have led me to recognise, as being affect: :ed to so large an extent. He also, I notice, holds to the idea which I have maintained in the preced: :ing pages, when he adds, "Phthisis may be contracted "by eating Tuberculous meat, as well as by inhaling "the organism".

Such a well-known Authority as Prof. Vic: :tor Horsley, Professor of Pathology, London, has given his strong opinion in favour of the condemnation of all cases of Localised Tuberculosis. He goes so far as to say, that no more experiments than those already made,,are necessary, and conclusively show that Tuber: :cular disease of any kind and to any extent, although the meat may not present any appearance of that disease, is attended with danger, if consumed by a Human Being.

Some observations have been made by Prof. McFadyean as to the means of recognising Tuberculosis in animals during life, and he has accordingly done much in the examination of the Blood, to discover if the organism exists there. He has found it in a pro: :portion of cases, but this is almost to be wondered at;

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and by no means disproves its presence in those cases, in which it was not discovered. In his Report to the Royal Commission on this matter, he states that in his investigations, he examined all of the Cows in the Byres in Edinburgh, and found about 50 of them with in: :flamed Udders. In only 18 of these however, it was considered necessary to examine the Milk, and in no case was the Tubercle Bacillus discovered by him. Looking at this statement in the light of what I have mentioned as my experience in this matter, the result appears an extraordinary one, my Record of between 20 and 30 Tuberculous Udders in the Byres of this City during the past year, and my Microscopic examination revealing the presence of the organism in all of them, hardly appears consistent with those previous invest: :igations. It need only be added in connection with this Report, which was founded upon by the Royal Com: :mission, that the third Diagnostic, namely:- Tuberculin, referred to by Prof. McFadyean as an uncertain test, has since then been reported upon by him as an almost infallible one.

The infective nature of Tuberculous mat: :erial of course cannot be doubted, the experiments of Villemein, Cheaveau, Clebs, Gerlach, Gunther, Leisering, and a host of others, have conclusively decided the point, on which now no doubt remains. The only diff: :iculty, and the difficulty to which I am addressing myself, is one of the greatest importance, namely, the amount/

amount of infectivity of the carcase following Local: :ised infections of the various organs. These, in fact, are the so-called cases of Localised Tuberculosis, in which the carcases pass freely into out Markets all over the Kingdom.

In Dr Martin's experiments, performed for the Royal Commission on Tuberculosis, he fed 13 Pigs on the flesh of animals in which there was no evidence of Tuberculosis, and 2 died of this condition. He next fed 6 Guinea Pigs on flesh from a carcase in which the Mesenteric Glands and Udder were affected, and all of them gave positive results, although, as is significantly added, the meat used contained no Tuber: :cle, was firm, and had good colour.

This experiment is the most convincing one to myself, and has the greatest bearing upon the contention I am now striving to establish, viz:- that Tuberculosis(Localised) means infection of the Body Glands in varying degree, and in regions quite apart from any connection with the Localised condition, and renders the carcase a Focus of danger. It is almost unnecessary to refer to any more of the experiments which were made by Dr Martin, and verified by Dr Sims Woodhead. Again and again the fact was proved that the condition of the meat and its naked eye appearance were no criterion of the dangers that lurked within it. What could be more convincing for example, that the experiment of innoculation 12 Guinea Pigs with good

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and apparently healthy meat, and with positive results in all cases.

It is very interesting, after reading Dr Martin's evidence, to note that he still advocates that a carcase should be passed as fit for food if the disease is limited to one Body Cavity. Let us take that as being a correct decision, and imagine for a moment that disease to be limited, so-called, to the Chest Cavity, in which it may be, both Lungs are al: :most solid with Miliary Tubercles, the Pleura shows a mass of Tubercular Deposits, it may be the size of a closed fist or even larger. The Glands, Mediastinal and Pharangeal, infiltrated with the disease; and accord: :ing to Dr Martin, this carcase can safely be consumed as food. In such a case as the one just explained, nothing can be of more absolutely certainty, than, that the organism has by that time in the Circulatory System, reached every Organ and Portion of this animal's body. The point I contend for is that while we recognise the fact that such a circulation of the organism is occurring, we must not expect to find, and do not find, large secondary Foci, until weeks have passed, during which the organism has had time to develop. It is in the Blood however and is settled in the Organs, and although its presence may, at that time, not be rendered evident, its danger is the same to Human Beings consuming it. There can be no doubt, from my very extended observations, on this matter, that long ere the Macroscopic manifestations be: :come evident in the organs as secondary Foci, the other Glands/

Glands of the carcase, deep and Superficial, are, with hardly an exception, constantly involved. That this matter has not been dwelt upon sufficiently as a substancial danger depends largely on the fact that carcases have, as a general rule, been subjected to a more or less Superficial examination for the disease, and a critical and thorough examination of all the Glands of every condemned carcase, has not previously been undertaken.

It is of interest to find that Dr Martin strongly advocates the condemnation of the whole carcase, if either the Kidneys, Lumbar, or Pelvic Glands are involved. "These", he says, "show that the disease "is becoming generalised". In at least 90% of the cases of so-called Localised Tuberculosis, wheresoever situated, some, or all, of these Glands have been found by me to be affected with the disease. Dr Martin states that in many cases ~~of~~ meat from Tuberculous Cattle has been found by him to be infected, when it was impossible to demonstrate, after an exhaustive examination, that it contained any Tubercular Lesions. "The difference in the results", he says, "obtained in" the innoculation of obviously Tuberculous material, and of that which cannot be shown to be so, and yet is infective, is instructive". In one case selected by Dr Martin, he used the flesh of an animal with the local affection of the Pleura and Thorasic Glands, and the result was positive. Certainly it must be admitted that in 18 other experiments with the same material, he failed

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to get a positive result, but it must be noted in con: :nection with feeding and innoculating animals, that all do not show the same predisposition towards the dis: :ease, and in fact the same infective material will not attack the same organs in different classes of animals, and constant
Guinea Pigs and Pigs showing very evident/differences in these respects.

Both Dr Martin and Dr Sims Woodheadhave attached very great importance to the dangers which may exist from contamination of the meat by the hands, and instruments of Butchers, and the former attempts to mod: :ify the importance of some of the positive results ob: :tained by him, by stating that in all probability the infection was conveyed owing to the meat employed having been so contaminated. When it is remembered that these samples were all carefully trimmed with Laboratory precision, that all Tendons, Fat, and Outer Surfaces were removed, it must, I think, be admitted that these con: :ditions can never be carried out in ordinary life, and that the question of infection by contamination only adds another and very substantial danger to the exist: :ing positive danger, which is inherent in the carcase itself. So great an importance indeed does Dr Martin attach to this matter, that he advocates the seizure of carcases suffering from Generalised Tuberculosis, not, be it noted, on account of any danger from this condition, but as he says, "Simply from the contamination of the "meat", I think such a conclusion vitiates very mater: :ially/

:ially any adverse opinions, which have been expressed by this observer.

Dr Sims Woodhead, who was appointed by the Royal Commission to make feeding experiments with Dr Martin, obtained results very similar to those pre: :viously detailed, but it is noteworthy, that all through his subsequent examination and from his various writings before and subsequently, he is a strong advocate of the seizure of carcases where any disease is present. In: :deed, on talking on the subjects of contamination, he states, that while he finds it extremely general, it on: :ly adds another to the very grave risks attending the use of Tuberculous meat, in which the Tubercle Bacilli have been in the carcase. In reference to the exper: :iments, he further assures us that many more positive results would have been obtained if these had been carried out wholly on Pigs instead of Guinea Pigs. The differ: :ence between these has been previously referred to, and we can only conclude, that while these experiments are instructive, they do not finally serve to indicate to us, the actual dangers to which Human Beings are subjected, when they unknowingly subject themselves to like risks.

It is very remarkable to find that even Dr Woodhead attaches the same importance as Dr Martin to naked-eye evidence to Tubercle, because he advocates the removal of an organ where this is seen. It does not appear clear why none of these observers have indicated any danger as existing between the time of the deposit

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of an organism and the appearance of its labours.

I am fortified in my advocacy of the seizure of all Tuberculous carcases, however apparently slightly involved, by Dr Woodhead, when he expresses the opinion as he has done, that where it is found that sev: :eral parts of the body, and widely separated, are dis: :tinctly affected, the carcase, except in very rare cases, should be condemned. "It would be advisable", he says, "to give Inspectors instructions, that when the organs "not usually affected, except in Generalised Tuberculosis, "such as the Popliteal, Lumbar, and Axillary Glands are "affected, and there is any doubt in his mind as to "whether the carcase is fit for human food or not, he "should condemn it rather than give it the benefit of the "doubt;" and in referring to the large number of positive "results obtained by himself and Dr Martin, he states, "that the comparitively large number of positive results indicates beyond possibility of doubt, the presence of infective material in the meat as it is sent out from the Slaughter Houses, and shows that extreme care is necessary in the after treatment of it, in order to render it innoc: :ulous, "for it must be borne in mind", he states, "that "we have to guard against affecting not only healthy in: ":dividuals but those, both children and adults, suffer: ":ing from the Catarrhal or other affection, diseases or "injury of the Alimentary Tract, in which the Mucous Sur: ":faces are so altered, that any Tuberculous material "applied to them bears much the same relation to them, "that/

"that Innoculated material bears to the unprotected tis:
":sues, into which it is introduced".

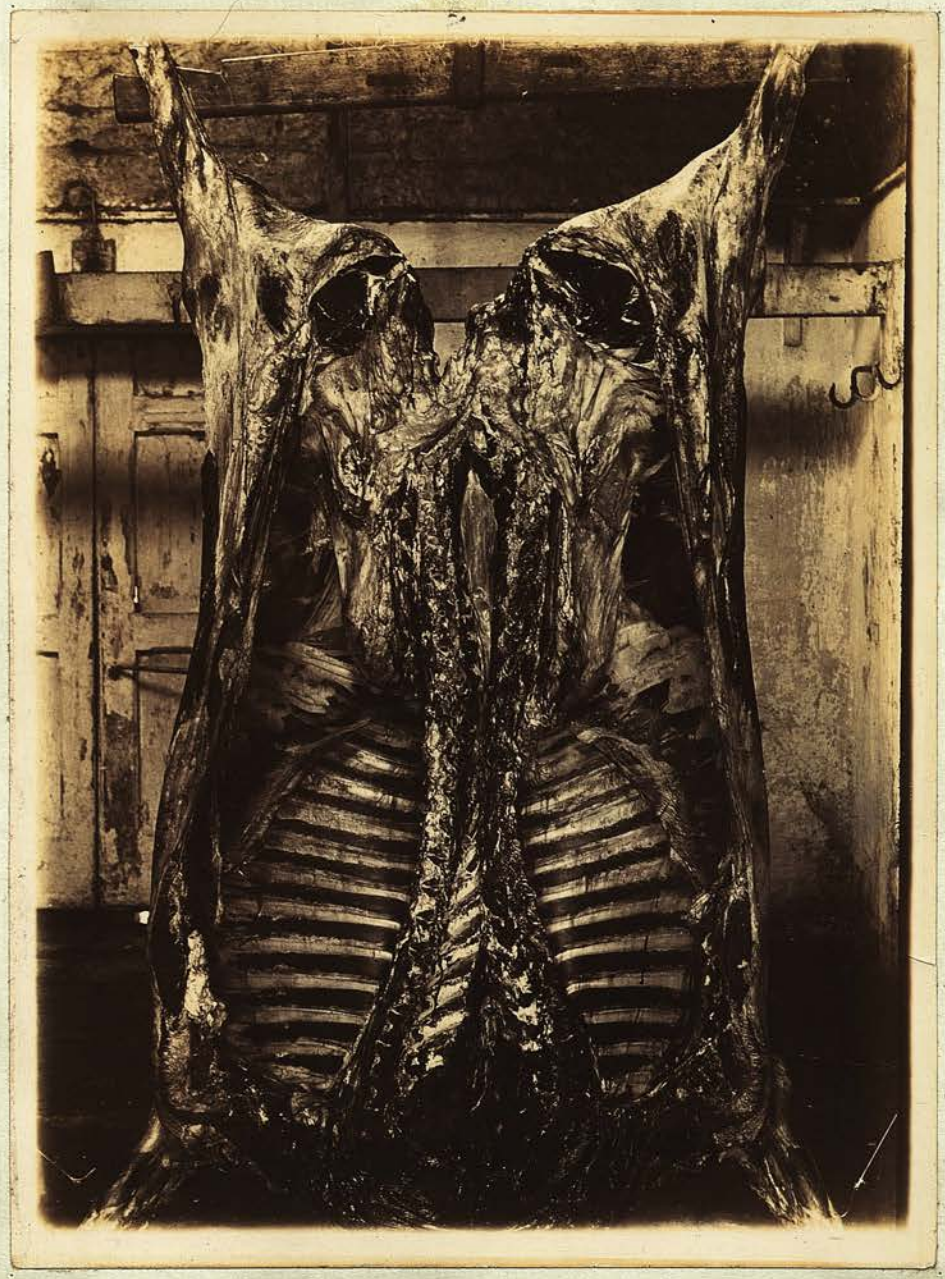
M. M. Veyssiere and Humbert have, amongst many others, added their experiences gleaned from innoc:
:ulating animals with apparently good meat, and both re:
:port that they have obtained positive results in every case from carcases, in what they described as, "in very "good condition".

The great importance of the observations made by me in regard to the conditions of the Glands of affected animals is much accentuated by Dr Woodhead's Boiling experiments, and whilst this will be referred to hereafter, ~~which~~ it is of importance meantime, to quote from him the following important statements:- "It should "be noted that Raw Tubercular Glands contain the most "virulent material that was ever obtained by us in Solid "form, when roasted, this material still remained infected".

As showing the very speedy and direct man:
:ner in which the Tubercle organism reaches the circul:
:ation, it may be well here, to refer to the condition of Tuberculous disease of the Udder, which, by all authorities, who have ~~retained~~ written upon this subject, is ~~remarked~~ agreed as a very advanced stage of the disease, and/which one certainly does not occur except in cases in which the organism is con:
:veyed to the Udder by means of the circulation. All of these authorities are of opinion then, however they may differ in other respects, that when this organ be:
:comes affected, the carcase should be at once condemned.

Several/

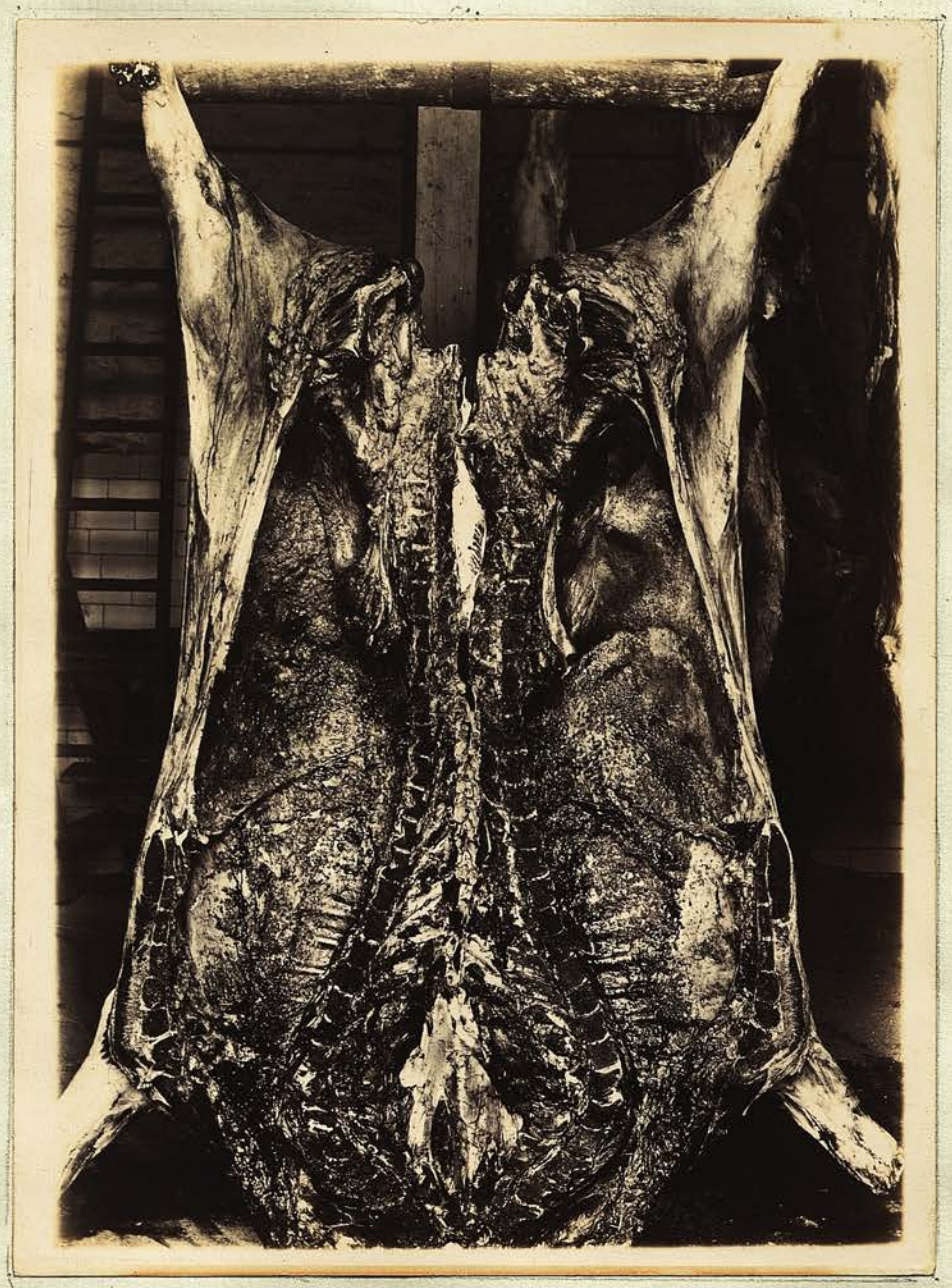
(Nº 6)



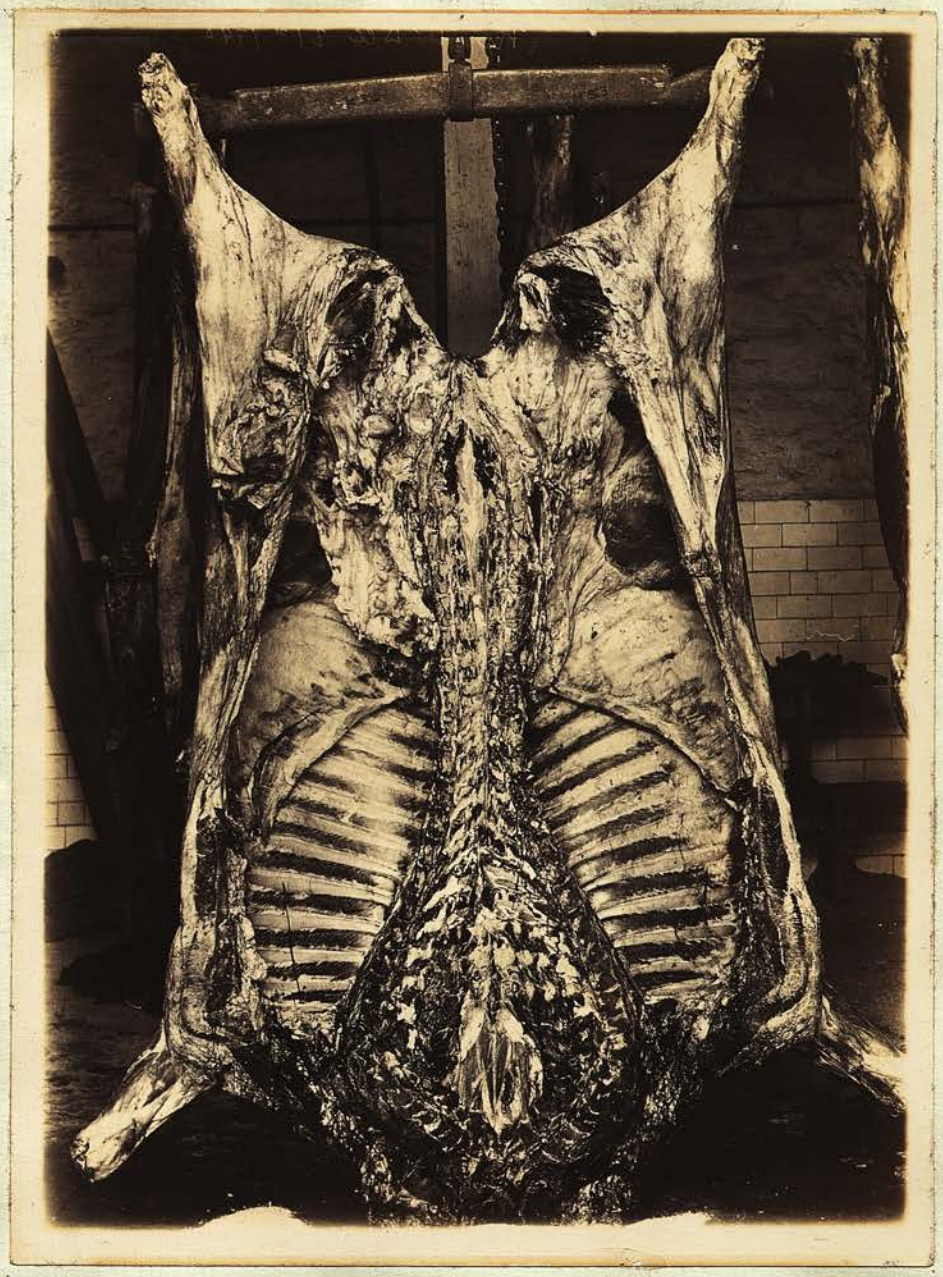
Several cases have occurred in my own experience in this City, in which that organ was the only one, and apparent:
:ly the primary one, infected. Certainly, in accordance with my previous observations, a few Glands were also in:
:volved, but these apparently were secondary to the Udder condition. A few months ago a Cow was seized in one of our Cattle Yards when exposed for sale. Her condition was absolutely good, but the Udder was infiltrated through:
:out with Tuberculous matter, in fact, it was a case of almost Solid Milliary Tuberculosis. (Photograph No. 6) On examining the milk microscopically, I found it swarming with Bacilli. All of the organs of this animal were found in a perfect:
:ly healthy, at least, of course, apparently healthy con:
:dition, and the flesh apparently excellent, the Glands however, as usual, were here and there involved, and the carcase was at once condemned. In this case, it is per:
:fectly evident that the primary infection, be it by means of ingestion or inhalation, had reached the Mesen:
:teric Glands, and after passing through the Lymphatic System, only some parts of which it slightly affected, it then reached the Circulation, and was carried at once by it to this distant organ, the Udder. The Milliary nature of the condition at once proved the vehicle by which the infection had been carried, and conclusively proves how speedily the Circulatory System becomes in:
:volved, although contrary opinions have been held regard:
:ing this. There can be no doubt that the same Blood which carried this organism to this distant organ, had deluged/

(Nº 9)

(Nº8)



(Nº 7)



deluged the other organs and Muscles with the same Fluid and Poison, and had this animal been allowed to live, the seed thus planted would assuredly have shown itself in the form of Foci scattered throughout the whole car: :case. Another case of a very similar description may here be cited by me. A very splendid specimen of a Cow was found by me housed in a Byre in the City, and daily supplying milk for consumption. (Photograph No. 7) The condition of the Udder led to my taking a sample of the milk and examin: :ing it microscopically. Bacilli being present in large numbers, I at once ordered the removal of the animal, and Post-mortem examination revealed the meat itself in apparently magnificent condition. A few very slight Nodules were evident in the Lungs, the Pleura, Peritoneum, and all organs were perfectly clear, the Udder however showing enormous Tuberculous masses, fully the size of three closed fists; the Glands here, as usual, of course, were more or less infiltrated. This case bears the same construction and proves the same point as has been dwelt upon in the preceding.

I show in Photographs numbered 8 & 9, other two specimens, in all points identically similar to the others just detailed. In Photograph No.11, I show another remarkably interesting case. This Cow was also removed from a Byre in this City, and showed a suspicious Udder. As in the preceding cases, the examination of the milk revealed the presence of the organism, and on Post--Mortem examination, the Udder was literally full of Milliary/

Milliary Tubercle. The carcase was in a most lovely condition, fat and good, and not a speck of Tubercle was apparent in any of the other organs, some of the Glands were, as usual, slightly involved; In this case, so good was the appearance of the carcase, when the affected part had been removed, that some discussion had taken place amongst the Inspectors as to the disposal of it before I arrived and condemned it, as is our custom here.

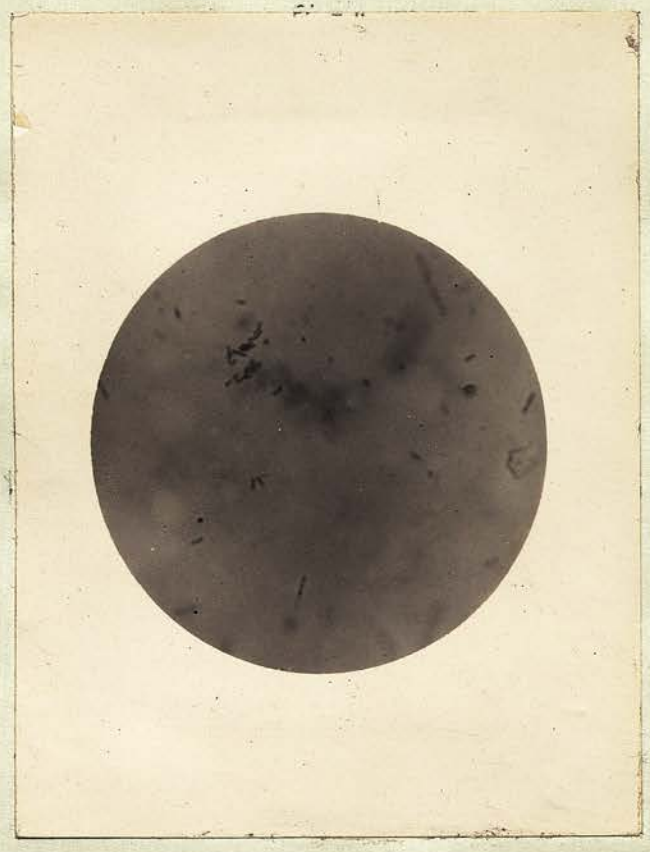
In Photographs Nos. 12 & 13 I submit re: :presentations of this case; No. 12 being a Cover Glass specimen from the Udder, and No. 13, that of the milk.

That more stringent measures were not advocated by the Royal Commission in dealing with infected carcases is very remarkable when we find them admitting that the actual amount of Tuberculous disease amongst certain classes of food animals is so large as to afford to man frequent occasions for contracting Tuberculosis through his food. As to the proportion of Tuberculosis acquired through these means, "we can" they say, "form no definite opinion but, "we think it probable that an appreciable part "of the Tuberculosis that affects man is obtained by this "means". It surely amounts to a matter of very small importance in what proportion man is thus affected, the fact that he is so should be quite sufficient for those of us who are engaged in preventive medicine, and should compel us to take up the firm position, that hereafter, man shall receive no more of this death-dealing poison, either in his food or milk.

One/

(Nº 11)

(Nº 12)



(Nº 13)

One more remark of the Royal Commission immediately succeeding the one previously referred to may be quoted, viz:- "The circumstances and conditions with "regard to Tubercle in the food animal, which lead to a "production of Tuberculosis in man, are ultimately the "presence of active Tubercular matter in the food taken "from the animal and consumed by man in a raw or insuf: ":ficiently cooked state". That this is absolutely not so and that it has been disproved by every experiment and observation on cooking will be referred to when I notice the few points in connection with that process.

The infective nature of the flesh of ani: :mals suffering from Localised Tuberculosis, and yet with a healthy appearance, has been demonstrated in rather an extraordinaryway by Steinheil, working under the direction of Bollinger. This gentleman's observations are recorded in the "Deutsch Zeitschrift für Thiermedicin", December, 1889. These experiments were made from the Muscles of human beings who died from consumption. Expressed Juice from the Psoas and Thigh Muscles was injected into 33 Guinea Pigs, and all developed well-marked Tubercular Lesions. If the organism then so certainly reaches the Muscles of the human being, suffering from Pulmonary disease, it as certainly reaches those of the Bovine Species. We may however be met with the difficulty that these persons had died from the condition, and in slaugh: :tered animals it had not the opportunity of extending so far. This to a certain extent is true, but it must be/

be admitted, that if the way is clear and the possibility exists, time is all that is necessary to assure the re: :sult, and how are we to judge when this time has arrived at which the Muscles become deluged by the Organism and Spores. No Tuberculous Lesions were certainly present in these Muscles, and yet the organism existed in them. This fact renders it foolhardy and unscientific to wait until Tubercles develop before we admit that the flesh of animals is not a dangerous condition.

A very important trial took place in Glas: :gow a few years ago, when two Butchers were charged with exposing for sale two carcases which were unfit for human food, and much scientific evidence of great interest was led in connection with the question. It should be stated that in both cases the animals were suffering from the disease in a Localised ~~condition~~ form, small Nodules existing in the Lungs and Pleurae of both. The Medical Officer of Health for Glasgow - Dr Russell - expressed his opinion that the use of flesh of Tuberculous animals to whatever extent, was dangerous, and that the whole flesh of such ought to be condemned. Once the Bacillus was in the system of an animal, there was, he thought, every probability that the whole of it might be injurious. The Local change visible to the naked-eye began in Mic: :croscopic changes, and might be anywhere throughout the system where appropriate soil was got. It has been found that the Marrow of Bones contains the Bacillus before there was any Pleural affection or anything visible to the/

the naked eye. His former system of passing the unaff: :ected portions of a carcase was done on the assumption that there were no changes and no Lesions whatever, but those which were external and visible to the naked eye. That assumption he now knew to be totally incorrect and dangerous to the Public health.

Prof. Coats, whose opinion on this sub: :ject has previously been quoted in another connection, gave his opinion that multitudes of cases of Tuberculosis were communicated by food, and he thought that the risk was not obviated by merely removing the affected parts of the animal, and Prof. Limont of Glasgow Veterinary College bore out this view. It is particularly inter: :esting to notice Prof. McFadyean's name as a Witness in favour of condemning these particular carcases, and much more scientific and Veterinary evidence being given in the same direction, the carcases were duly ordered to be destroyed, and the exposers of them were convicted. The Interlocutor issued by Sherriff Berry, andy of course, founded on the evidence led, is of such unusual interest, and fully bears out the remarks effered by me of the pre: :ceding pages, that I think it of great importance in this contribution to quote it in full.

"Having considered the petition and proof and whole proceedings, and heard counsel for the parties, and it being admitted that the carcase of the Bullock referred to in the petition was intended for human food, finds it proved that the said carcase was unfit for the food of man; therefore in the terms of the Public Health (Scotland) Act/

Act, 1867, orders the same to be destroyed, or so disposed of as to prevent the same being exposed for sale, or used for such food, and that at the sight or to the satisfaction of the petitioner, and decerns".

The following note is appended to the In: :terlocutor:- "This petition, at the instance of the Clerk to the Magistrates and Council of Glasgow as the Local Authority for the City under the Public Health Act, after narrating the seizure on 9th May last, in the Moore Street Slaughter House, of the carcass of a Bullock belonging to the respondent Hugh Couper, Wholesale Butcher, Glasgow, which ap: :peared to the Sanitary Inspector to be unfit for human food, prays for an order under the Act that the same may be destroyed or so disposed of as to prevent its being exposed for sale or used for human food. On the case coming before me on 24th May, it appeared that the parties were at issue on the question whether at the time when the seizure was made the carcass was unfit for human food, and there: :fore, in terms of the Act, I ordered a proof to be taken on that point. A proof was accordingly taken on 28th May and following days to the 1st June in: :clusive. I have since, on 17th June, had the bene: :fit of a full review of the case as presented on the proof by counsel for the parties. At the time when the Bullock was slaughtered it had, as the evidence/

evidence shows, all the appearance of a prime bull: :ock in good condition. It was one of a lot of twenty bullocks bought by the respondent on 8th May at a price averaging above £22 a head. The animal was slaughtered on that day; and Mr M'Lellan, In: :spector of Police, who has the duty of supervising the passing of meat in the Slaughter-House, having observed what he described as an inflammatory rash on the left side like the formation of tuberculosis, and acting in accordance with instructions which had been given to him on 26th April by the Chief Constable, called the attention of Dr Russell, Prof. M'Call, and Dr Young to its condition. These gen: :tlemem inspected the carcass on the same day, 8th May, and in his evidence Dr Russell described the symptons which he saw. The statement given by him was to the effect that the Pleural surfaces of both sides, and especially of the left side, were dis: :eased, the disease, in his opinion, being tubercul: :osis, the under or pleural surface of the diaphragm presenting the most characteristic appearances. There was also tuberculosis on the costal pleura on the left side, and also, although to a less degree, on the right side. The disease he regarded as acute. The surface of the left Lung was covered with in: :flammatory lymph, and it had apparently been ad: :herent to the walls of the chest. That resulted from the inflammatory action of pleurisy, the pleur: :isy/

:isy having, in his opinion, been caused most pro:
:bably by the irritation of the tubercular virus, and the disease known as tubercular pleurisy being that which was the matter with the left Lung. There was some congestion of the substance of the lung, and on the posterior border of it there were nodules perceptible to the touch. The costal pleura, or lining of the ribs, and the pleural surface of the diaphragm were also, in his opinion, affected with tuberculosis. His conclusion was that the bullock at the time when it was slaughtered was suffering from acute tuberculosis, and that the car:
:case was unfit for human food. The evidence of Prof. M'Call was to a similar effect. He stated that, besides tubercular exudation, there were small tubercular nodules on the costal pleura and the diaphragm, and also small caseating tubercles in both lungs. The evidence of Dr Young, the third of the three gentlemen who examined the carcase on 8th May, was to a different effect. He did not, he said, observe any nodules or tubercles, and he thought that Prof. M'Call was wrong in saying that there were symptons of acute tuberculosis. The animal, or portions of it, were on subsequent dates examined by different gentlemen on behalf of both of the petitioner and the respondent. The evidence of those called as witnesses for the respondent may be described generally as negative in as far as regards any appearances of tubercular disease.

While/

While admitting the existence of evidences of in: :flamation and of adhesion of the pulmonary pleura to the costal pleura as the result of inflamation, they stated that they saw no symptons leading to the conclusion that the disease had been tubercular pleuritis. It may be offered as an explanation of this marked difference between the two sets of wit: :nesses for the respondent/that they did not see the carcase until 16th May, and in the interval between the 8th and the 16th parts of the carcase had been taken away for microscopical examination. This explan: :ation, however, does not entirely account for the discrepancy, seeing that Dr Wallace, the Medical officer of health for Greenock, who was called as a witness for the petitioner, did not examine the carcase till the 17th of May, and he stated that he then found in the lung of the bullock a small tub: :ercular nodule, about the size of a small horse bean, in a state of caseation, and that he also found another nodule, about the same size surrounding a vein with recent inflammatory exudation surrounding the part. From these appearances he arrived at the conclusion that the animal had been suffering from tuberculosis. Apart from the symptons of tuber: :culosis which are thus spoken to by the witnesses to whom I have referred, it is important, more es: :pecially in view of a distinction which has been taken between localised and generalised tuberculosis, to/

to attend to the results obtained, according to some of the witnesses, from examination under the examination under the microscopic. Mr Robinson, the inspector under the Local Authority of Greenock, a gentleman whose training and studies in veterinary science have been of a very complete character, stated that, besides examining the carcass on 9th May, he took away with him portions of the diaphragm of the left lung, and of the mesenteric glands, and that on making a microscopical examination he found in the lung the bacilli characteristic of tuberculosis, and, although not bacilli, he found signs indicating the commencement of tuberculosis in one of the mesenteric glands. He concluded from the symptons thus presented to him that tuber: :culosis had begun to spread through the whole vas: :cular system. Mr M'Geoch, the inspector of the Local Authority of Paisley, stated that he cut into the carcase between the first and secong ribs, and removed one of the prepectoral glands situated about 18 inches from the part of the chest which manif: :ested tubercular lesions. Along with Professor Limont of the Glasgow Veterinary College, he exam: :ined a specimen of the gland under the microscope; and he saw in it the bacilli of tuberculosis. He was therefore of opinion that generalisation of tuber: :culosis had begun. The evidence of Mr M'Geoch is corroborated by Professor Limont, and their evid: :ence/

:ence has special importance in this respect, that, apart from its showing that the disease had begun to spread through the animal's system, the prepect: :oral gland is a part of the animal which should be sold for food, and which would not be removed by the process of stripping the carcass, a process which, according to some of the witnesses, would have been a sufficient safeguard against risk. Evidence confirmatory of the conclusions from micros: :copical examination come to by the witnesses whom I have mentioned was given by other witnesses, and in particular by Mr Maylard and Dr Coats. To the significance and the importance of the bacilli of tuberculosis having been seen in different parts of the animal, it is hardly necessary for me spec: :ially to advert. I take it to be established by the evidence as now the accepted view of most scientific men who have investigated the subject that the disease known as tuberculosis is not only accompanied but caused by a minute specific organ: :ism, the bacilli tuberculosis, and that the bac: :illus in the tuberculosis of oxen as well as in the tuberculosis of some others of the lower anim: :als is the same as that which is found in tuber: :culous diseases in human beings. Most of the lead: :ing witnesses of the respondent, while saying that no symptons of tuberculosis were found in the bull: :ock by them, admitted that if bacilli, or as some of/

of them expressed it, the virus of the disease, were shown to exist in the meat or the lymphatic glands, the carcase ought to be condemned. That view was in effect expressed by Dr Goldie, Dr Imlach, Dr Hime, and Dr Hill. The general opinion entertained by Dr Hime is expressed shortly in a small work by him, entitled, "Handy Guide to Public Health", pub: :lished in 1884, in which he says that the meat of an animal with infectious disease communicable to man, under which head he places tuberculosis, should be regarded as unfit for food. He stated in evid: :ence that he adhered to the opinion so expressed. This view, that tuberculosis is a disease commun: :icable from one of the lower animals to man, must, as the evidence shows, be regarded as an es: :tablished scientific fact. The disease is comm: :unicable in various ways-by inhalation, by in: :gestion(swallowing), and by innoculation. Opin: :ions seem to differ as to whether ingestion is the most commonway in which it is communicated. In support of the view that it is not a very common mode of communication, the fact is relied on that in the human subject tuberculous disease is gener: :ally found in the lungs in the form of pulmonary phthisis, while tabes mesenterica, the form in which it appears as affecting the mesenteric glands - that is, the glands leading from the alimentary canal - is relatively not so common. . It is also the case that/

that the bacilli of tuberculosis are rarely found in the muscle or flesh of an animal. On the other hand, the bacilli, as is shown by the microscopical examinations in the present case, appear in the glands which are used for food, and the fact that phthisis is the most common form of the disease in man loses much of its significance when it is considered that the bacilli may be readily carried from one part of the body to another by the circul: :ating fluids, by the blood, or by the Lymphatic stream, or, as has been suggested by Koch, the dis: :coverer of the tubercle bacillus, by the help of what are termed wandering cells. But whether ingestion be or be not the common way in which the disease is communicated, it must certainly be regarded as one mode of its communication. A Departmental Comm: :ittee, which was appointed by the Lord President of the Council in April, 1888,"to inquire into the "nature and extent of tuberculosis, and the means "to be adopted to arrest its progress", and which reported on 16th July, 1888, expressed it as their opinion that "although the bacilli may be found "but rarely in the flesh, still the chance of their "being present either there or in the blood is too "probable to ever allow the flesh of a tubercular "animal being used for food under any circumstances "either for man or for the lower animals". The opinion thus recorded by the Departmental Committee condemning/

condemning the flesh of a tubercular animal as un: :fit under any circumstances for food either of man or of the lower animals has an obvious bearing on the question with which I have to deal in this case. But my immediate object in referring to the paragraph is for the purpose of emphasising the conclusion that tuberculous disease is communicable by ingestion. If it were not so communicable, the view of the Committee would have no foundation to support it. I take it, however, that there really is little dispute as to the communicablity of the disease by ingestion. It was admitted at the debate on the part of counsel for the defence that the disease may be communicated by the drink: :ing of milk,and if that be so it is impossible to maintain that it cannot be communicated by the eat:: :ing of flesh. Indeed,one need not look further than to the practice of condemning the meat of tuberculous animals as hitherto practiced in Glasgow and elsewhere in order to see that the transmissib: :ility of the disease by ingestion has long been recognised. Except on the footing that the meat was the medium of the transmission of the disease it would be unnecessary and wasteful to exclude from the food supply the carcasess of animals which had suffered from tuberculosis, however generalised and extensive. Still the question remains, in accord: :ance with the view expressed by the Departmental Committee/

Committee and the practice adopted by some Local Authorities in Scotland, the condemnation ought to extendto the cases of every animal shown to have been affected with tubercular disease, or at all events whether the rule hitherto followed in Glas: :gow can be considered as a sufficient safeguard. In Glasgow the practice has been, in cases where the disease, as far as appeared to the naked eye, ~~was~~ confined to the internal organs, to "dress" or"strip" the carcass - that is, to strip away the pleura or lining membrane of the chest cavity and the internal organs, and to allow the rest of the carcase to pass into the Market for food. My conclusion from the evidence is that that is not a sufficient pro: :tection against the risk of communication of the disease by ingestion. There may be no appearance visible to the naked eye of the action of the tub: :ercular bacillus in a particular part of the animal, and yet it may not improbably be there. The pre: :sence of the agent of the disease must precede the visible results of its action. Indeed, the pre: :sent case affords an illustration of the danger of inferring, from the abscence of symptons visible to the unaided eye, that the disease is localised.. As far as could be judged by such symptons, there was but little in: :dication of disease beyond the internal organs. Yet, on examination under the microscope, bacilli were seen in the prepectoral gland - a part of the animal/

animal which, although the carcass had been stripped, would have been passed out into the market as fit for the food of man. A good deal has been said in the course of the case as to the degree of protection against danger which may be afforded by the meat of an animal affected with tuberculosis being cooked. The conclusion come to be the Departmental Committee, to whose report I have referred, was that "the ord: ":inary methods of cooking are often insufficient to "destroy the bacilli buried in the interior of the "limbs". The evidence in this case leads me to the same conclusion. It seems, indeed, that the life of the bacillus may be destroyed by exposure to a temperature even considerably under the boiling point of water, provided the exposure is for a lenghtened time; but a large portion of cooked meat is used for food without having been subjected to the action of a high temperature for any great length of time, and, in the case of roasted meat in particular, it is often eaten underdone, with the juices little affected by the action of heat. Besides this, one mode in which the bacilli are pro: :pagated is by spores, and, in the opinion of scientific men, the spores, like the seeds of veget: :ables, are less easily affected by heat than their parent bacilli. Consequently, the spores may sur: :vive an amount of cooking which might be fatal to the bacilli themselves. The evidence leads me to the conclusion/

conclusion that it would not be proper to trust to cooking as a sufficient protection. The conclusion which I have formed, on a careful consideration of the whole evidence is, that at the time when the carcass of the bullock was seized it was unfit for the food of man, and therefore that the prayer of the petition should be granted. In support of that conclusion, I do not think that I require to take up the position that the carcase of every an: :imal shown to have suffered from tuberculosis, however limited in degree or apparently in locality, must be condemned. That position has the sanction of the recordéd opinion of the Departmental Committee which I have quoted - an opinion to which great re: :spect is due, and in which I should be sorry to have it inferred that the evidence does not lead me to concur. But the present case does notrest merely on the probability or chance of the bacilli having been present in parts of the animal beyond the in: :ternal organs, or those portions which would have been removed by stripping. The disease is shown to have been not merely local; it was so far generaliseds as to extend to the lymphatic glands, and to parts which would have gone out into the market for food. It is right also for me to say that I do not pro: :ced on the view that the appearance of the flesh of the bullock to the naked eye was such as would justify its being condemned. It is true that some of the evidence/

of the evidence for the petitioner might seem to support such a view. I may refer in particular to the statement of Dr Littlejohn to the effect that the flesh near a tuberculous deposit which he saw on the pleura was soft and deficient in colour and inconsistency, and exhibited iridescence, which he has found to be associated with previous illness. I am far from suggesting that the witness did not observe the local symptons which he describes; but the evidence as a whole does not bear out the view that the flesh presented such an appearance as would show that it was unfit for food. My judgment on the case is based on this, that tubercular disease is shown to have existed in the animal at the time when it was slaughtered, and to have already begun to spread through the system. In coming to the conclusion that the prayer of the petition should be granted, I have been deeply sensible of the responsibility of condemning as unfit for food meat which - under the practice hitherto followed in Glasgow, and still observed, as the evidence shows, in various large towns in England - would apparently have beeb allowed to pass out for consumption. That practice, however, I am led to think, is attended with danger to the public health. Reference has been made in the course of the case to the fact that of late years ~~there has been made in the course of the case to the fact that of late years~~ there has been a marked diminution in/

in the mortality from tuberculous diseases in Glas:
:gow and in the country generally, while at the
same time there has been an increase in the con:
:sumption of butcher meat. It is suggested, there:
:fore, that there can be no great reason for inter:
:fering with the system under which butcher meat
is being sold for food. The improvement, however,
which has taken place, and for which we may be thank:
:ful, affords no ground for abstaining from the re:
:moval of any danger or any impediment to further
improvement which may be shown to exist. Diseases
of the tuberculous class are widespread and varied
in form, and entail very grave consequences.
They still contribute too largely to the mortality,
besides involving much suffering and distress, even
in cases where fatal consequences do not ensue; and,
unless the evidence of men of high scientific author:
:ity is to be disregarded, one of the means by which
they are propagated is the consumption of the meat
of tuberculous animals. It may be that some per:
:sons are disposed to assign too great an import:
:ance to that source of danger, and to overestimate
its consequences; and against the weight to be given
to their views must be placed a certain economic
loss which will be involved in allowing them effect.
Just, however, as there is possibly a disposition
on the part of some to over-estimate the injury
to the public health which may arise from allowing
the/

the meat of tuberculous animals to go into the mar: :ket, so on the other hand there may be an exagger: :ated apprehension of the extent to which the con: :demnation under the new rule adopted by the Local Authority will operate. It appears from the evid: :ence that only about one-half per. cent. of the cattle exposed in the Glasgow market are affected with tuberculosis, and of those so affected about one-half are condemned under the system which has hitherto prevailed, while about one-hald are passed. In other words, a condemnation of all the animals so affected would only involve the additional con: :demnation of a quarter per cent. The loss even of that proportion of the food supply is much to be regretted. But in weighing its importance I am of opinion that it is insufficient to overcome those considerations in the interest of the public health which must be regarded as paramount".

A very little need be added to the fore: ;going upon the localised subject of tuberculosis, but I have just noticed an article in the "Pathological Journal", by Prof. McFadyean, in which he says, "the distinct: :ion between localised and generalised tuberculosis "is one of considerable importance from the point "of view of meat inspection, for while there is room "for difference of opinion as to the degree of local: :ised tuberculosis, compatible with the safe con: :sumption/

":sumption of the apparently healthy parts of the animal "it is obvious that when the disease has become general: ":ised, no portion is fit for human consumption. A "certain time after the act of generalisation is required "for the development of such lesions as may be determined "by the bacilli thus dispersed throughout the body, and "until such a time has elapsed, there will be nothing to "indicate what has happened. After the lapse of 2 or 3 "weeks, however the lesions excited by bacilli that have "been arrested from the blood will have attained micros: ":copic dimensions, and the case will then be apparent "on Post-Mortem examination".

Ostertag, in his "Handbuch der Fleisch: :beschan", says, that although in most cases of general: :isation the muscular ~~lesions~~ tissue is free from tuber: :cular lesions, other parts of the carcase, such as the lymphatic vessels, glands, and bones, may be affected, and from a sanitary point of view the flesh of such animals is to be regarded in the same light as tuberculous organs.

The propositions which I have before laid down namely, that the healthy appearance of the flesh or or: :gans in the case of localised tuberculosis cannot in any sense be accepted as evidence of their freedom from the tubercle bacillus, was very conclusively proved by three experiments which were recently made by Prof. McFadyean and recorded by him at the latter part of last year. His object in view was to demonstrate the actual effect of injecting tuberculous material into the circulatory system/

system of an animal and for purpose he did so into the veins of three healthy cows. On slaughtering these animals shortly afterwards only the lungs and a few glands were found affected, the livers being specified as of healthy appearance and with no evidence of tubercle pre: :sent in them. After subsequent microscopic examination however in two of the cases he states that in the first, the liver was found to contain "a small number of tubercle", and in the second, "out of 20 sections examined, fifteen "contained one tubercle in each".

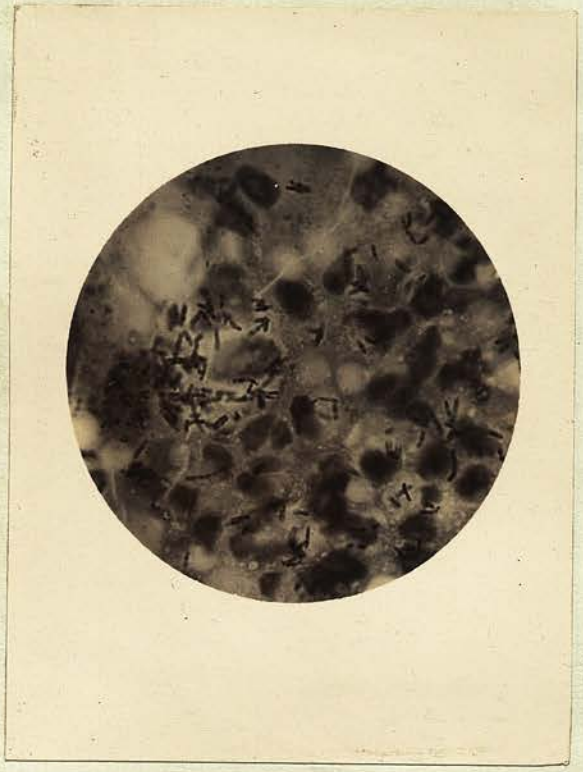
Here then is conclusive evidence of the fallacy of recording the apparent presence of tuberculous deposits as the index of danger. It is perfectly evid: :ent from this as well as from previous experiments de: :tailed that the danger unquestionably exists when any local affection reveals to us the presence of the organ: :ism in the body, its detection in other parts of the body may be and is difficult until it reveals itself by secondary growths which invariably occur. Up to this time there can be no doubt that the danger of flesh as food has been wholly judged by the appearance of the lesion present, and the fact has been altogether overlooked that the inherent danger lies not at all in such but in the accompanying infiltration of glands which have been heretofore overlooked, and the presence of the organism in the blood, which such experiments as the foregoing conclusively proves to exist.

The detection of the presence of the

tubercle/

tubercle bacillus actually existing in the flesh of the animal has very seldom been made, but while I am contend: :ing for its Theoretical certainty, I also propose to give here a case which proves as an unquestionable cer: :tainty that it does exist. A good specimen of a cow was brought into the Edinburgh Slaughter House, and after being dressed the carcase was discovered to be affected by tubercular disease of the mesenteric glands. On re: :moval of the organs no appearance of the disease remained, and the carcase would undoubtedly have been passed according to all the recommendations for inspection which have heretofore been laid down. As is the custom in Edin: :burgh however under my instruction the glands of the carcase upon being examined showed tubercular infiltration. These were removed and an endeavour was now made to re: :cover the tubercle bacillus from the flesh itself, every precaution was adopted to prevent any possibility of surface contamination or of carrying the organism in: :wards by means of the instruments used. A piece of the deep lumbar muscle was excised, the juice was ex: :pressed, and large numbers of the organism were dis: :covered on microscopic examination. This result is most instructive, and I do not hesitate to state that it is the best one which has been obtained up to this date. Woodhead and McFadyean record single organisms recovered in this manner, but the case which I have just referred to far eclipses all of these observations and renders the fact undoubted as to the presence of the organism/

(No 15)



organism in the muscular system of an animal with no apparent disease other than tubercular invasion of the mesenteric glands, and therefore, according to the pre: :sent views of the subject, a carcase which might safely pass for human consumption. I submit a photograph of the microscopic result in this important observation.

An experiment was made by Prof. McFadyean in order to prove the infctive nature of the muscle and organs which have no apparent secondary growth and give every evidence of being in a healthy condition. In this he innoculated blood muscle juice and extract from organs into guinea pigs, and in many cases, obtained positive results. It should be remembered that the animals thus experimented with only showed a slight affection of the lungs and a few of the glands in con: :nection with them, a combination which many authorities choose to call a localised affection. Prof. McFadyean winds up his Record of these experiments by stating "the "results of the experiments serve to give emphasis to the necessity for a systematic scientific inspection of animals slaughtered for food. In the absence of the lungs and thorasic glands, two of the four carcases experimented with might have been sold anywhere as sound and healthy, and yet, as the experiments proved, living virulent tubercle bacilli were diffused throughout them.

Such experiments are of the very greatest importance for us to bear in mind, when we consider at a later/

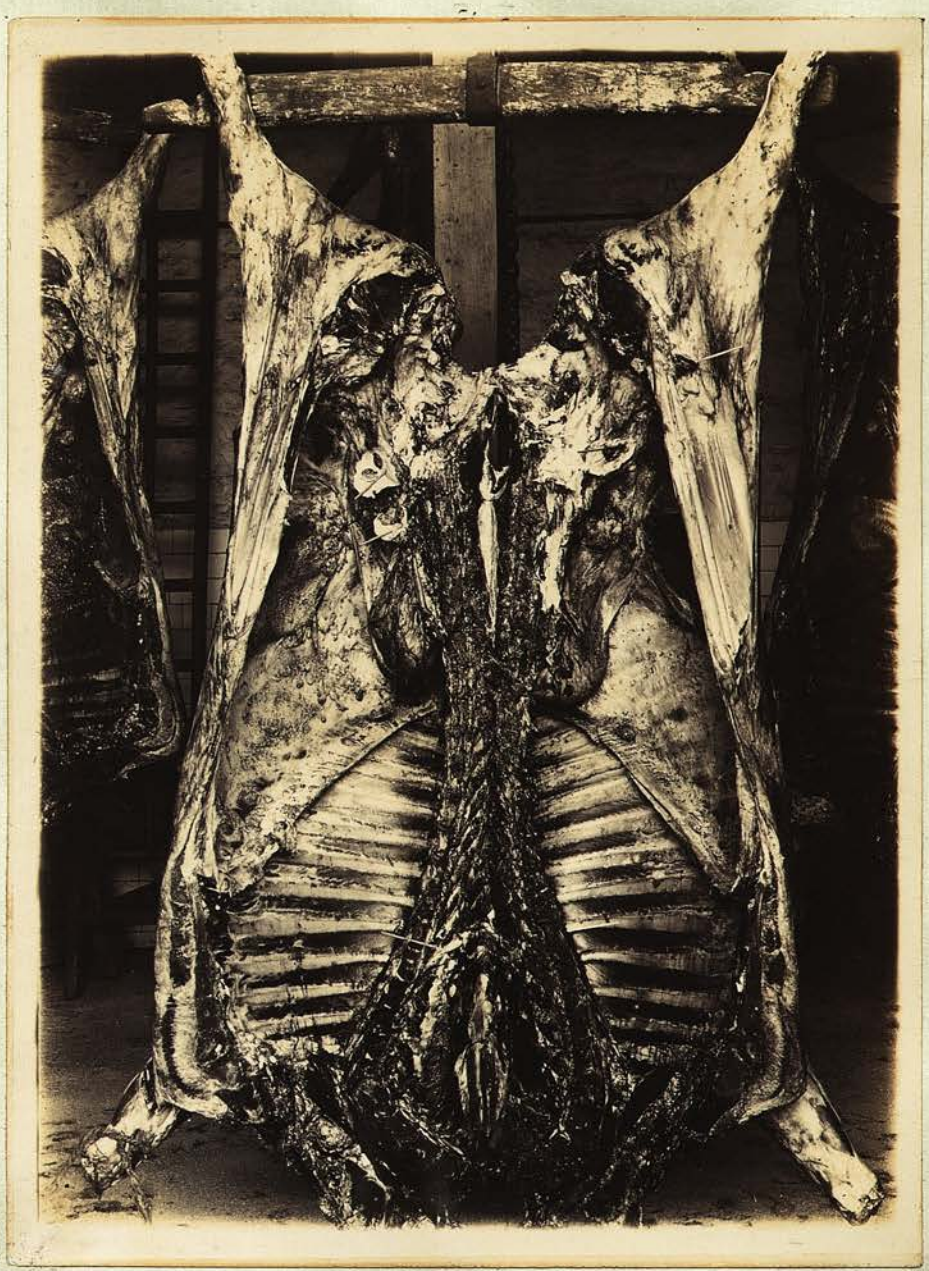
later period of this work the various recommendations which have been made by the Royal Commission on Tuber: :culosis and by the Governments of several Countries as a Guide to meat inspectors, as to the amount of in: :fection which must be present in a carcase before that animal is seized and destroyed, judged in the light of such positive and convincing experiments as these, apart altogether from the other circumstances which it is my duty to detail in this Record, we have unquestionably an enormous quantity of tuberculous meat deluging our markets all over the Country, and most certainly spread: :ing disease and death wherever consumed.

Again and again opinions have been ex: :pressed, and these, I regret to say, by so-called auth: :orities and of quite recent date, that no matter what the condition of the internal organs of the animal may be, the index as to whether or not the carcase is fit for food, lies wholly in the appearance of the flesh itself. This opinion would hardly be considered by me worthy of re: :futing, were it not that it has been recently expressed by those whose opinions may be supposed to carry some weight with them. I could enumerate case after case representing many hundreds per annum in order to show the absolute fallacy of this method of meat inspection, but such a one as the following may be taken from a mass of similar ones.

On 29th November last a beautiful Ayr: :shire Cow 10 years of age was sent to our Public Abatt: :oirs/

(N° 1)

(Nº 5)



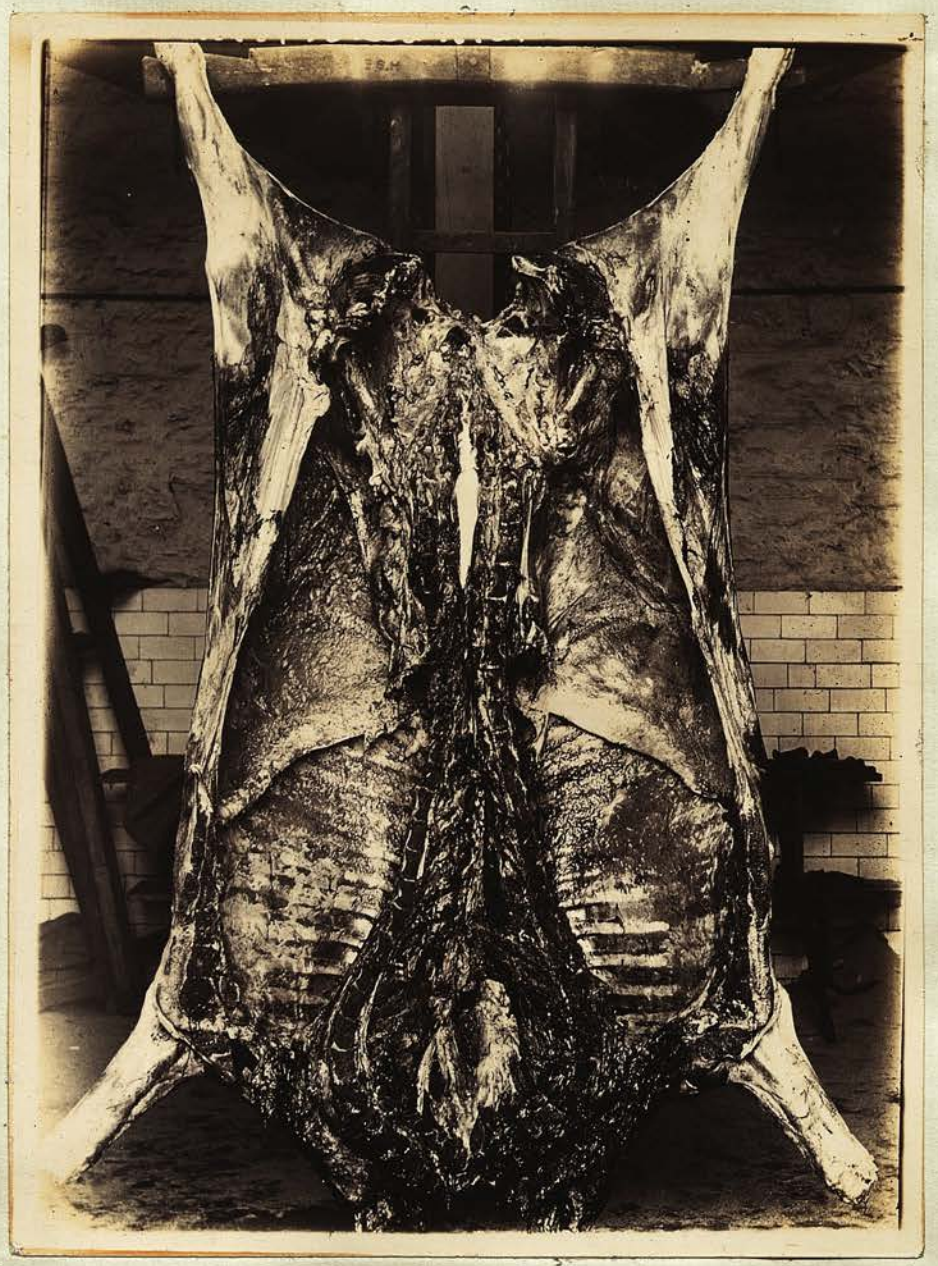
:oirs. The animal was inprime condition, but on Post-:
:-Mortem examination, the peritoneum and abdomenal organs were literally covered with huge masses of tubercle, the uterus also showed tubercular deposits, the pleura and lungs were infiltrated, and the glands throughout the whole carcase were much affected. The meat of this carcase was not absolutely good, and no person however experienced a judge, would have suspected for one mom:
:ent that anything was wrong. (Photograph N^{o} 1)

Another case may here be quoted. Towards the close of last year an animal similar to the fore:
:going was found to present the very slightest amount of tubercular deposit on the pleura and peritoneum. These were so small in area as together to be represented by the size of a 5/- piece, the slightest amount of scraping would have sufficed to remove all apparent trace of the disease, and in Abattoirs where lenient or ignorant inspection is carried out, this carcase would unquest:
:ionably have been scraped and passed for food. This would have been the more certain indeed, on account of the apparent excellence of the condition of the flesh. On minute examination however the whole of the glands of the carcase were found deeply infiltrated.(Photo N^{o} 5)

My observations have led me in closely studying this subject to the irresistible conclusion that the course followed throughout the body by the tuberculous poison is absolutely without rule, and I may here give one or two cases in order to prove this fact. On 1st December/

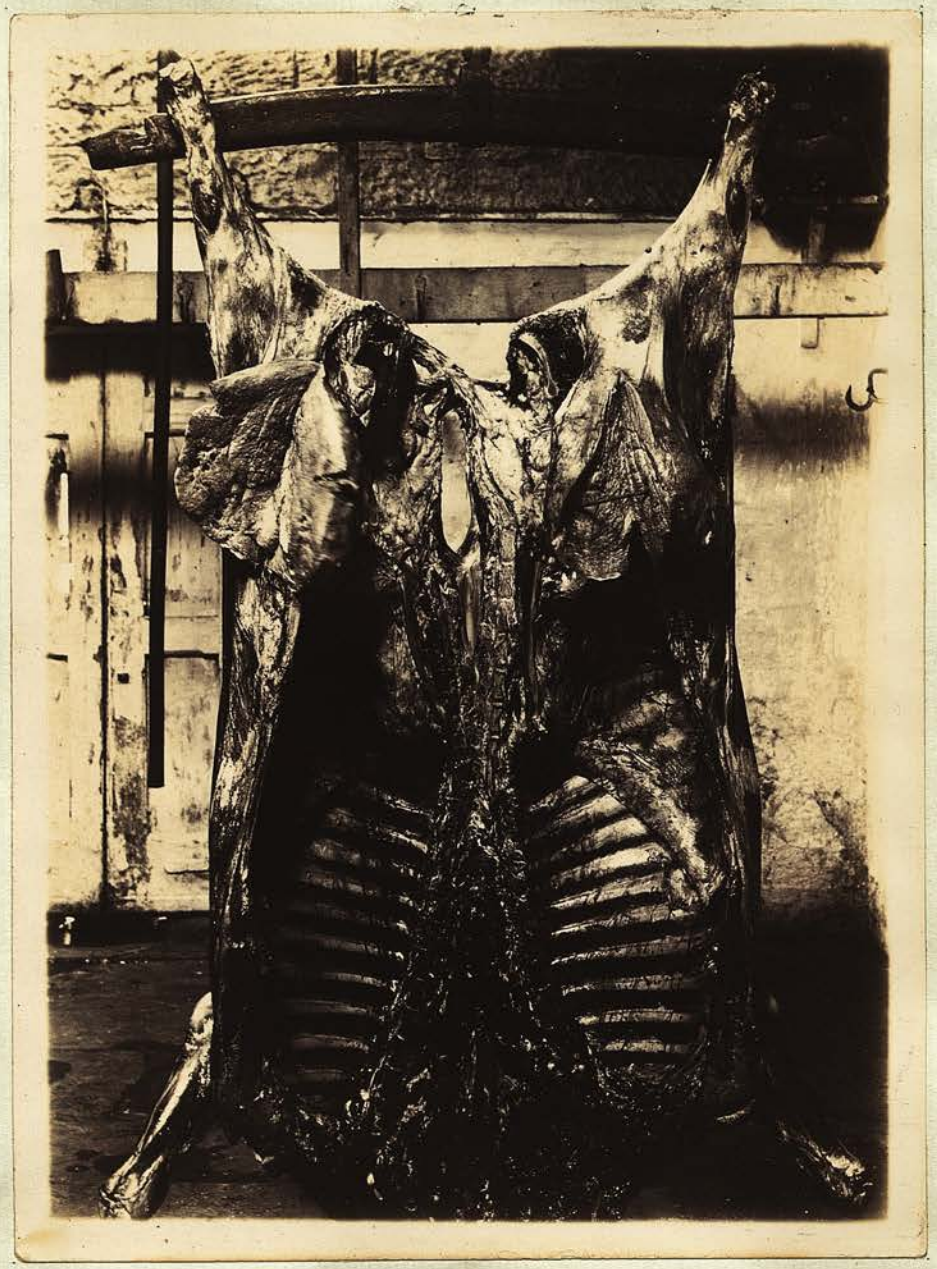
(Nº 2)

(Nº 3)

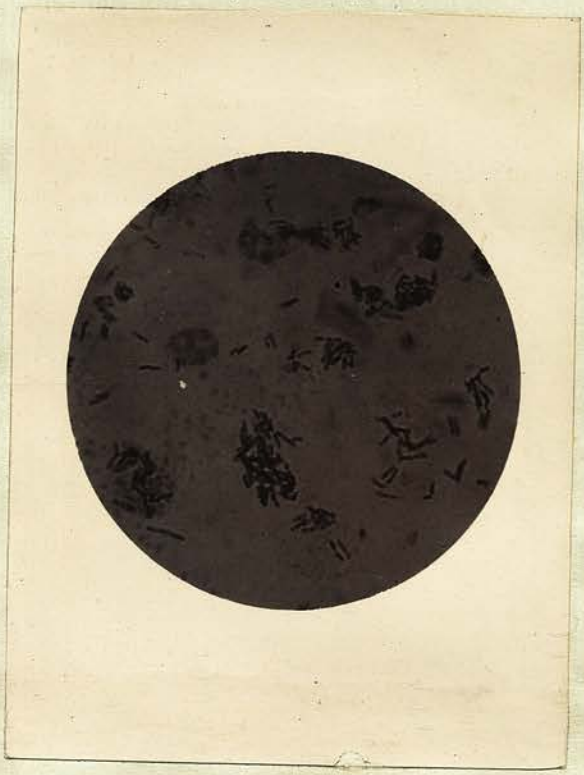


(Nº 3 - Same carcase)

(No. 10)



(No 10a)



December last a carcase in very fine condition showed a considerable amount of tubercular pleurisy. The peritoneum was quite clear, the lungs were in a healthy condition, and the carcase was also free from suspicion. A few of the mesenteric glands were infected, but the deep glands of the carcase as well as all of the superficial ones were infiltrated throughout./ (Photo Nº 2) A few days after the preceding case, I examined the carcase of a cow which had just came in from the country. The pleura and peritoneum showed tuberculous affection, and the deep glands and kidney were much infected; these latter are well shown in the photographic representation. (Photo Nº 3)

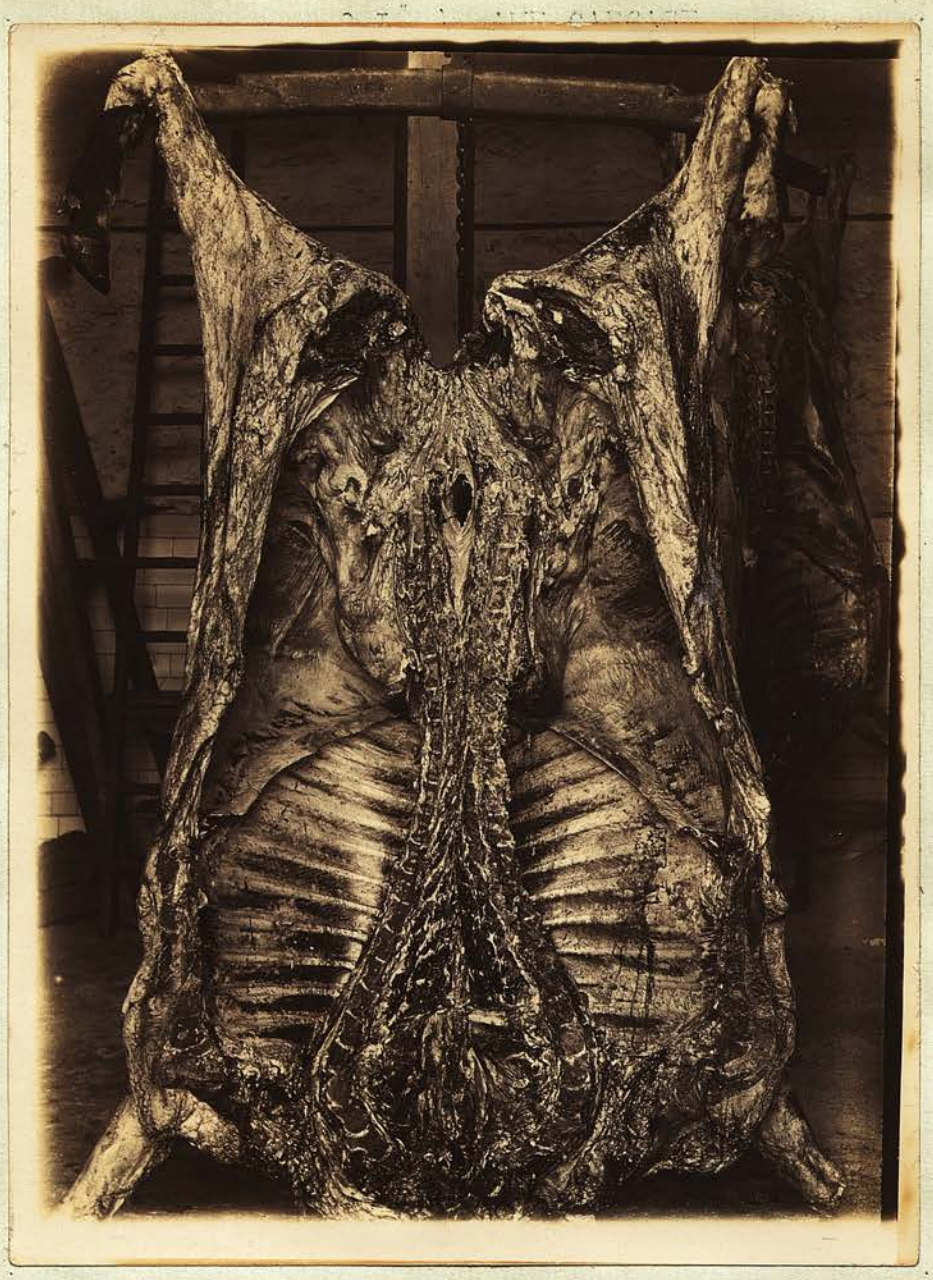
On the 7th January a very fine cow was examined, the whole of the four quarters of the udder showed almost a solid mass of miliary tuberculosis, while very slight affection existed in the pleura and lungs. The carcase was in very good condition, and there was a large amount of fat evident throughout. In spite of this fact, all of the glands, on careful examination, showed hopeless infiltration. This cow had been milked in a Byre in Mid-lothian up to the date of slaughter, and on microscopic examination, tubercle bacilli were found literally swarming in the milk. (Photos Nos. 10 & 10a)

On the 17th of January, a cow was sold in a public sale. It was in prime condition, and gave rise to no suspicion. Shortly after the sale a slight swelling was discovered in the udder, and the animal was returned under dispute to the sale-yard. I examined

some/

(No 14)

(No 14 - Same carcase)



some of its milk, and, finding the tubercle present, at once ordered its removal to the slaughter house. On examination the lungs were found very slightly infil: :trated, but the udder markedly tuberculous, the glands, as usual, were hopelessly infiltrated. This also is a case in which advocates, favourable to the passing of localised conditions, would have passed this carcase which in itself was in such good condition, but we know that by the blood and that means only could the organism have travelled between the first point of danger , and whether by inhalation or ingestion, to the last point infected; namely, the udder.(Photograph No 14)

On 6th February a case occurred in which a very good looking animal on being slaughtered was found to have tuberculous ulceration of the small in: :testines, mesenteric glands, lungs, and udder, the liver was free, as were the pleurae and peritoneum. When the internal organs were removed the carcase was evidently without a flaw, and yet the infection had been carried by the circulation to the most extreme and distant points.

A carcase examined by me in December last showed a tuberculous infection of the mesenteric glands, the lungs and pleura being very slightly affected. This is a remarkably common condition and proves a contention which I am striving to prove, namely, that ingested material of a tuberculous nature reaches the lungs at the earliest period, and simulates an infection by in: :halation./

:halation. Immediately thereafter the organism gaining access to the circulation was diffused everywhere, and I found that although the udder was free from infection, the deep pelvic and other glands of the carcase were much involved.

While cases could be multiplied by me ad infinitum in proof of my contention, that in apparently localised conditions, invariably other structures, or at least glands, in distant parts of the body are involved, I do not consider it necessary to produce more than I have re: :ported in the foregoing. I would finish this part of my subject by placing in a concise form arguments against the propriety of passing carcases as fit for food in which tuberculous infection exists to any ex: :tent whatever.

(1) A localised tuberculosis indicates the presence in the body of the tubercle bacillus.

(2) The lymphatic and circulatory systems are in direct communication with the affected part and every other part of the system.

(3) In every localised condition, accord: :ing to careful observations made by myself on many thousands of cases, the glands not only in close proximity to and in direct commun: :ication with the affected part, are infiltrated, but also those of/

are infiltrated, but also those of a distant part, and that these in: :filtrations follow no rule what: :ever, as to the site selected.

(4) According to Veyssiere, Airlong, and others, very few cases exist which can be strictly classified as local: :ised tuberculosis, according to my own experience, none exist which can be so described.

(5) The affection of the glands which invariably exists entails a danger of the very worst description, as they, of all organs of the body, are more resistent to the effect of boiling, Woodhead's experiments having shown that their contents were virulent after being roasted.

(6) The feeding and innoculation exper: :iments which have been made, clear: :ly prove that organs and muscles, in apparently healthy condition, are highly virulent.

(7) The knowlege which we possess as to the slow growth of the tubercle bacillus, makes us deciseively certain that the organism is de: :posited in the body for weeks before/

before its presence is rendered evident.

(8) The very fractional number as will be shown here after which represents the difference between seizures of carcases however slightly affected, and those with general infection, would be so small as to entail very slight loss in our food supply.

(9) The certain presence of the organism in the blood stream.

(10) The certain fact that it is impossible to remove completely the affected portion without grave risk of con: :tamination.

(11) The inefficiency of ordinary cooking.

RESOLUTIONS PASSED BY DIFFERENT BODIES IN CONNECTION WITH THIS MATTER.

Various Societies and learned bodies have discussed the subject of danger arising in connection with tuberculous flesh, even if it existed in the form of an apparently localised condition in the animal, and they have in most instances agreed as to the danger which such a course entails.

A large and representative body of the North of Ireland Branch of the British Medical Association who had appointed a Committee to investigate this whole question/

question which they did remarkably well and with great fullness, afterwards passed the following resolution that "in view of the recent discoveries with regard to human and bovine tuberculosis, and of the opinions held by many eminent and scientific authorities concerning the communicability of tuberculosis from man to animal and from animal to man, and in view of the enormous pre: :valence of the disease in one form or another among mank :kind, this Meeting of the North of Ireland Branch of the British Medical Association dissapproves of the practice of allowing any part of the carcase of an animal which has been shown to be affected with tuberculosis to be sold as sound and wholesome food".

A very much more important resolution, or at least one emanating from a much more important source, was that passed at the International Congress of Vet: :erinary Medicine at Paris, after a full discussion among famous Foreign experts. This resolution was to the following effect, "the flesh of tuberculous animals, mammals and birds, ought to be excluded from consumption by man and animals, no matter what may be the degree of tuberculosis and the apparent qualities of the flesh".

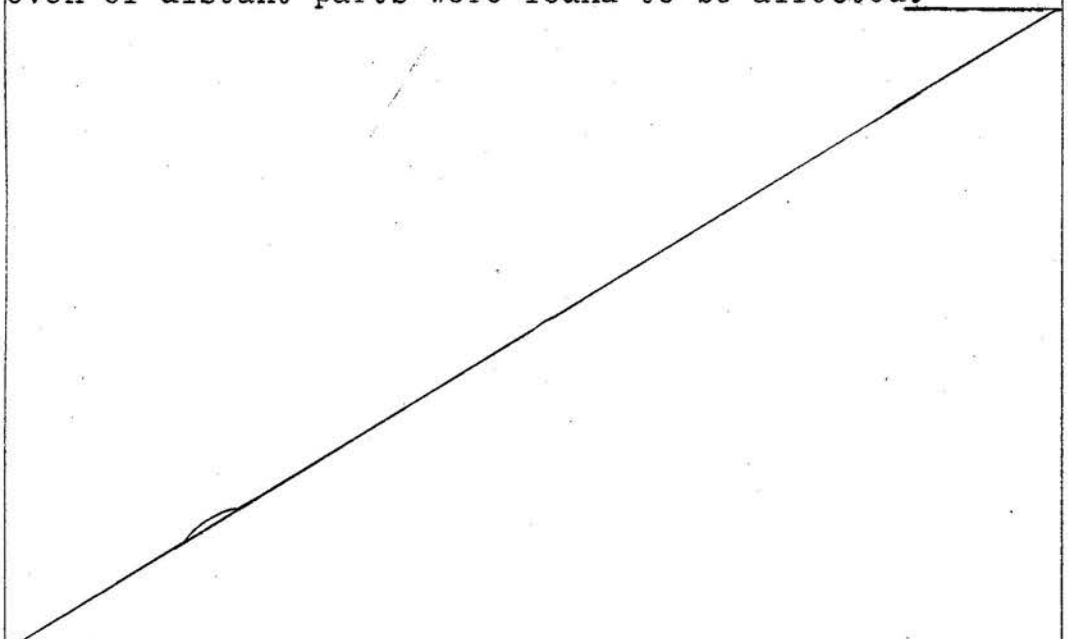
At an earlier period a resolution was passed at another Congress of the same description held at Paris in 1888, to the following effect, "there ought "to be pursued by every means comprising the compensating of those interested, the application of the principle of total seizure and destruction of all the flesh derived from/

from tuberculous animals whatever may be the extent of the specific lesions found on this animal".

M. Airlong, in reporting and commenting upon this resolution with which he agreed, reminds us that this Congress was International in character, and included such names as Prof. Bang, Copenhagen; Thomasen, Utrecht; Van Hertsen and Degive, Brussels &c. He goes on to add that scientific prudence requires that we should regard as injurious at all times and in all conditions the flesh of animals in which the lesions of tuberculosis are present.

INVASION OF GLANDS IN TUBERCULOUS ANIMALS.

I now proceed to submit a list of consecutive cases taken at random by me and representing carcases of animals which had been condemned in the Edinburgh Abattoirs in a period of 4 Months, from which it will be observed that in all, however local the affection may have appeared, the glands on close scrutiny even of distant parts were found to be affected.



TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date	Description of Animal.	age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other Organs
1898.											
Novr. 1.	Shorthorn Cow (Burntisland)	9		Consid--erably.		Several Clusters.	Slightly.	Slightly		Infiltrated	
" 2.	Ayrshire Cow (Kirkliston)	8	Villous Growths.	Severely		Partly covered.		Free		Do.	
" 5	Shorthorn Cow (Edmonstone)	8		Consider-ably.		Slightly		Free		Do.	
" 7	Shorthorn Cow (Edinburgh)	8		Extensive-ly.		Both sides covered.	Consid-erably.	Partly covered		Do.	
" 9	Ayrshire Cow (Slateford)	9		Severely		All covered	Severely	Nearly covered	Severely affected through-out.	Do.	

TUBERCULOUS CARCASES IN EDINBURGH

Organs affected and to what extent.

Date 1898.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Novr. 14.	Shorthorn Cow (Glairmiston Mains)	10.		Severely		Partly covered	Several spots	All covered		Infiltrated	
" 14.	Shorthorn Cow (Liberton House)	8		Consider-ably		Several patches	1/3 invaded	Partly covered		Do.	
" 18.	Ayrshire Cow (Binnythorn)	9		Consider-ably		Small patch on one side	Consider-ably	Free	Hind Quarters affected	Do.	
" 19.	Ayrshire Cow (Edinburgh)	12		Partly invaded & Mediastinal Glands		Small nodules on both sides	Slightly affected	Nearly all covered		Do.	
" 19.	Irish Cow (Mid-Calder)	8		Severely		Nearly covered	Slightly	Partly covered		Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1898.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Novr. 22.	Cross Cow (Leith)	10		Slightly		Slightly	Capsule covered	one side covered other side slightly		Infiltrated.	
" 28.	Ayrshire Cow (Blinkbonny)	9		Considerably		Slightly	Capsule covered	all covered	affected throughout	Do.	
Decr 1.	Shorthorn Cow (Juniper Green)	7		Considerably		½ of both sides		Slightly	Slightly		Do.
" 3.	Ayrshire Cow (Slateford)	9		Very bad		all covered	Surface covered	all covered			Do.
" 6.	Ayrshire Cow (Edinburgh)	10.		Slightly		Quite free	Quite free	Quite free			Do.

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1898.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Decr. 7.	Shorthorn Cow (Saughton Hall)	9		Severely		Covered	Surface all covered	nearly all covered		Infiltrated.	
" 7.	Ayrshire Cow (Gorgie Road)	10.		Severely		One side covered	Free	Free		Do.	
" 8.	Galloway Ox	4 mos.		Severely	Pericardium & heart muscle	all studded over		Considerably	Nearly all covered	Do.	Kidneys affected
" 13.	Cross Cow (Edgehead)	8		Bad		Very bad		Very bad		Do.	
" 13.	Ayrshire Cow (Leith)	14		Slightly		Slightly	Slightly	Bad		Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1898.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other orga
Decr. 15.	Cross Cow (Wilkieston)	7		Slightly		Bad			Infiltrated		
" 19.	Cross Cow (Gorgie Road)	7		Slightly					Hind Quarter bad	Do.	
" 19.	Cross Cow (Edinburgh)	7		Bad		Very bad	Slightly	Very bad		Do.	
" 19.	Ayrshire Cow (Haddington)	8							Hind Quarter very bad	Do.	
" 20.	Cross Cow (Leith)	7		Bad		Very bad	Slightly	Very bad		Do.	
" 21.	Ayrshire Cow (Leith)	7		Slightly		Bad	Slightly	Very bad acute		Do.	
" 21.	Bull Polled (Roslin)	2½		Bad		Very bad	Bad	Very bad		Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1898.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Decr. 22.	Cross Cow (Edinburgh)	5		Slightly						Infiltrated.	
" 22.	Ayrshire Cow (Edinburgh)	7		Slightly	Very slight				one quarter slightly	Do.	
" 23.	Gross Cow (Portobello)	7		Slight	Bad					Do.	
" 23.	Gross Cow (Portobello)	8							Bad	Do.	
" 23.	Gross Cow (Slateford)	7		Very bad						Do.	
" 23.	Cross Cow (Davidson's Mains)	6		Bad	Very bad		Slight	Very bad		Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1898.	Description of animal.	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Decr. 23.	Cross Cow (Davidson's Mains)	6		Bad		Very bad	Slight	Very bad		Infiltrated.	
" 24.	Cross Cow (Corstorphine)	6		Slightly		Free			Very bad	Do.	
" 24.	Cross Cow.	8		Very bad		Bad	Very bad	Bad	Free	Do.	
" 29.	Cross Cow (Davidson's Mains)	7		Slightly		Bad				Do.	
1899.											
Janry. 4.	Shorthorn cow (Gorgie Road)	6		Bad		Slightly	Slightly	Bad		Do.	Spleen bad
" 4.	Ayrshire Cow (Bonnyrigg)	10		Slightly			Bad	Bad	Very bad	Do.	Do.

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1899.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Janry 5.	Cross Cow (Craigmillar Castle)	7		Slightly						Infiltrated	
" 9.	Ayrshire Cow (Edinburgh)	6								Do.	
" 10.	Cross Cow (Edinburgh)	7		Slightly		Slightly	Bad	Slightly		Do.	
" 10.	Cross Cow (Leith)	6		Very bad		Very bad	Very bad	Very bad		Do.	Spleen bad
" 10.	Cross Cow (Craigend)	8		Very bad		Very bad	Slight	Bad	Bad	Do.	
" 12.	Cross Cow (Bow Bridge)	7		Slightly		Free	Free	Free	Free	Do.	Spleen affected
" 12.	Ayrshire Cow (Edinburgh)	9		Few small nodules		Free	Slight	Slight	Bad	Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1899.	Description of animals	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organ
Janry. 12.	Shorthorn Cow	6		Miliary	Free	Slight	Free	Free	Very bad	Infiltrated.	
" 12.	Shorthorn Cow (Cattle Market)	5		Slight	Pericardium bad	Slight	Bad	Slight	Very bad	Do.	
" 21.	Cross Cow from (Perth District)	6		Bad	Free	Slight	Free	Slight	Free	Do.	
Feb. 2.	Cross Cow (Balerno)	7	Free	Miliary	Free	Miliary	Affected	Bad	Glands of Udder softened & swollen	Do.	Kidneys & spleen free
" 3.	Cross Cow (Gorgie Road)	6	Free	Miliary	Free	Miliary bad	Slight	Miliary bad	Infiltrated		Spleen bad
" 6.	Cross Cow (Edinburgh)	7	Free	Bad	Free	Free	Invaded	Free	Bad	Do.	Free
" 7.	Cross Cow (Sunnybank)	6	Free	Mediastinal glands & lungs very bad	Free	very bad	Slight	Very bad	Very bad	Do.	Kidneys free, spleen very bad.

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1899.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other glands
Feb. 7.	Cross Cow (Gilmerton)	6	Free	Mediastinal glands & lungs very bad	Pericard-uim. bad	Very bad	Bad	Very bad	Bad	Infiltrated,	Kidney & spleen bad tuberculosis of.
" 7.	Ayrshire Cow (Carrick Knowes)	5	Free	Bad	Free	Bad	Free	Free	Bad	Do.	
" 15.	Ayrshire Cow (Edinburgh)	6	Free	Miliary	Free	Bad	Slightly	Slight	Free	Do.	
" 23.	Aberdeen Angus Heifer	3½	Free	Miliary	Pericarduim bad	Very bad	Very bad	Very bad	Free	Do.	Kidney splee Uterus very bad.
" 23.	Cross Cow (From the Country)	7	Free	Slight	Free	Slight	Slight	Very bad	Free	Do.	

TUBERCULOUS CARCASES IN EDINBURGH.

Organs affected and to what extent.

Date 1899.	Description of animal	Age	Larynx	Lungs	Heart	Pleurae	Liver	Peritoneum	Udder	Glands	Other organs.
Feb. 23.	Shorthorn Cow. (Portobello)	8	Free	Slight	Free	Free	Free	Free	Free	Infiltrated	Spleen slightly
" 25	Cross Cow from the country	10	Free	Slight	Free	Slight	Slight	Slight	Free	Do.	Do.
" 25	Cross cow from the country	9	Free	Bad	Free	Very bad	Slight	Free	Free	Do.	
" 27.	Cross Cow (Edinburgh)	7	Free	Bad	Free	Slight	Free	Slight	Free	Do.	
" 28.	Cross Cow (Edinburgh)	8	Free	Very bad	Slight	Very bad	Slight	Bad	Free	Do.	Spleen bad.

This list I have limited to the number just shown as they form a fair index of all the carcases which for some years I have carefully studied, and I am therefore able to assert as I have done in the fore: :going pages that tuberculosis of a strictly localised type is a condition so rare as practically never to exist.

PREVALENCE OF TUBERCULOSIS.

A very large number of highly exaggerated statements have been made regarding the extent to which tuberculosis exists among cattle in this country. These statements have been largely based upon the results of observations which have been made on cattle after slaugh: :ter in Foreign Countries, but it would be unsafe in the extreme to calculate from these results, differing very widely as they do, as to the actual pravelance of the disease in our own land. In Saxony for example the statistics of 29 towns were collected in 1893, and the tuberculous animals were found torepresent a proportion of 18·26%. In Bavaria, while the proportion of tuber: :culous animals at the Abattoirs in Munich was 12·5 per 1,000, it did not exceed 1·6% over the whole Territory.

In the Grand Duchy of Baden the proportion was 8 per 1,000 among the animals slaughtered, and 2·2% over the whole country.

In Bordeaux, according to M. Baillet, the proportion is 2 per 1,000.

In Rouen, according to M. Veyssiere, the proportion is 1·43 per 1,000.

In Montauban/

In Montauban, according to M. Bayrou, the proportion is 4·07 per 1,000.

In Paris, out of 500000 cattle slaughtered annually, the proportion is 2·60 per 1,000.

In Copenhagen in 1891, 16·60%; and in Berlin during the same year, 12%.

In Switzerland during 1889, the proportion was 5%; and in Spain and Brussels, during the same year, it was much below this.

Throughout France the statistics from many of the Abattoirs have been collected, and these clearly show that the amount of tuberculosis present is very much below the exaggerated estimate, which is usually taken in regard to this matter.

In Villette and Grenelle for example, the proportion is 6 per 1,000. In Lille, 1·05 per 1,000; in Mulen, 4·31 per 1,000. In Cambria, 5 per 1,000. In St. Etienne, 5 per 1,000.

Inspector McLellan, who has been in charge of Moore Street Slaughter House, Glasgow for the last 17 years, states that he weekly examines 1,000 carcases, and his experience is that in every 1,000 of them he finds 4 or 5 which show to any extent whatever evidence of tuberculosis.

It must be remembered that while in differ: :ent countries a comparitively large number of tuber: :culous carcases are found at the Abattoirs, no calcul: :ation can be based upon this as to the prevalence of the/

the disease throughout the Country, as it is usually in these Foreign Parts to send for slaughter the most sus: :picious members of the herd.

The great outcry which has been raised regarding the prevalence of the disease, has been founded upon, (1st) The occasional use of tuberculin as a test, and, (2nd) The extraordinary amount of tuberculosis which has certainly been found to exist in certain For: :eign Countries where the conditionsof cattle-rearing are far from satisfactory.

So far as the 1st question is concerned, viz:- results obtained from tuberculin test, it may be observed that while that test is undoubtedly a correct one, it cannot be taken as an index of the amount of tuberculosis which will be found present in cattle when they have been fattened for slaughter purposes. We have before dwelt upon the fact that ~~while~~ tuberculous dis: :ease in man is in the large majority of cases temporary in its nature, and we well know as an elimentary/Medical fact in the treatment of the condition, how much depends upon the loss or gain of weight in the case of the patient under treatment. If extremely ~~and~~ nourishing/and fattening food ~~is~~ are given and can be assimalated, the acute condition in by far the mojority of cases is usually overcome, and we well know how anxiously the Medical Attendant watches week by week the results which are conveyed to him by means of the weighing scales. He truly and correctly judges off the progress of his patient more by an in: :crease/

:crease of weight and improved general condition than by physical signs obtained from time to time through Steth: :oscopic or other examination. So fully recognised is this that several authorities in charge of recently est: :ablished Fresh Air Consumptive Hospitals, have informed us that no matter how far the tuberculous condition may advanced, be, if the power of assimalation remains good, little fear is entertained as to the ultimate result.

When we keep these facts in view, and re: :member what has been previously referred to as to the large number of human beings who at one time of their lives, have had tubercular disease of the lungs, it is not to be wondered at that the tuberculin test has re: :vealed in unfattened cattle a large proportion of the herd re-acting to the test. The process of fattening to which they are all subjected before being sold for market purposes, will by analagy with the case of man cure a very large proportion of them and account for the comparitively small numberwhich are actually found tub: :erculous after slaughter.

The 2nd reason given in explanation of the large number of tuberculous animals occasionally found, is traceable wholly to the methods adopted in the treat: :ment and rearing of cattle in certain Foreign Countries. These can not be taken as any index to the amount of tuberculosis amongst cattle in this country, which ac: :tual statistics undoubtedly show to exists a very markedly smaller extent than it does in them. It will be necess: :ary/

:ary therefore in regarding the extent of the disease, to do so from the point of view of the returns found in the United Kingdom, and to disregard altogether those which have been recorded as founded upon results obtained by the tuberculin test.

Having thus detailed the number of tuber: :culous cattle which would require to be condemned wholly if localised tuberculosis were taken as a sufficient cause for condemination, it will have been observed that this number falls very far short of what it is usually supposed to be represented by, and I now propose to sub: :mit my experience of this matter as found to exist in Edinburgh, a place in which beyond all others, meat in: :spection is most rigidly carried out.

It may again be recalled that the Royal Commission on tuberculosis expressed opinions after ex: :amining our system as adopted here that in this city they find that the system of meat inspection approached more nearly the enlightened Continental system, than they had found in any other part of the Kingdom. This is most certainly to be expected when we consider that here we have no Private Slaughter Houses, and the Staff of Inspectors is a better equipped one than, in pro: :portion, exists in any other place in the Kingdom, there being 4 Veterinary Surgeons upon the Staff, myself in charge of them, with public health and medical ~~health~~ exper: :ience, a Superintendent and Assistant in the Slaughter House itself, and both of those latter having had a long course of training as Practical Butchers. With such a Staff/

Staff and the strict Professional inspection which is thereby obtained, statistics formed as a result of our work may be regarded as of very material importance.

I append a list showing the number of cattle slaughtered and the number found tuberculous during the five years, from 1893 to 1897 both inclusive, round
In numbers it may be taken that 30,000 cattle are slaughtered, and between 120 and 180 of these or a fraction % are found tuberculous, to any extent whatever. No fallacy can be suggested as existing here, the number involved is certainly not too small upon which to base a conclusion, and the comparitive agreements of the figures from year to year is indicative of a uniformity of condition and inspection. Very strict instructions
thorough
are carried out in regard to a ~~Theory~~ examination of every part of the carcase, and, as I have before indicated, this examination has revealed to me the very important observation which I have elsewhere brought forward as to the extent of glandular infection in apparently localised conditions.

S E I Z U R E S.

1893.

Total number slaughtered======28,261.

Do do tuberculous=========126.

1894.

Total number slaughtered======28,976.

Do do tuberculous=========156.

1895.

1895.

Total number slaughtered======30,197.

Do do tuberculous=========144.

1896.

Total number slaughtered======30,161.

Do do tuberculous=========193.

1897.

Total number slaughtered======29,125.

Do do tuberculous=========118.

1898.

Total number slaughtered======30,250.

Do do tuberculous=========124.

It may be pointed out that the strictsystem here adopted of total seizure, so far from causing dis: :satisfaction and dispute with Butchers and Farmers, is found to work with absolute harmony. The system is recognised, and when disease in any form is detected, the owner at once resigns all claim to the carcase. In some places it has been found that where localised con: :ditions are passed, much friction exists between the authorities at the Abattoirs and the cattle owners, this friction being wholly dependent upon the question as to where a localised condition ends and a generalised be: :gins, but when the strictness of inspection has been increased, it has been again and again noticed that ob: :jections on the part ofowners gradually disappear. It might be supposed that such a system of strict in: :spection/

:spection would cause owners to send their cattle else:
:where for slaughter, and so tend to disseminate the danger, but this is certainly not found to be the case here and we have an excellent opportunity of proving this by having in our City such large Live Stock Sales, the history of animals sold there being so easily followed.

Mr James Scarlett, President of the Pais:
:ley United Fleshers Society, has stated upon this sub:
:ject, that although the inspection there is of very strict nature, it has not in any of his experience re:
:sulted in any disinclination on the part of Butchers to who submitted their animals for slaughter.

It is to be noted that our Edinburgh ex:
:perience which discloses such a smallnumber proportion:
:ately of carcases affected with tuberculosis, was very fully borne out by a large number of witnesses who were examined before the Royal Commission on tuberculosis. All of those without exception, who were what may be termed practical, agreed that in their experience extend:
:ing over many years, they had actually lost very few tuberculous animals through seizure at the slaughter house. Mr Field, M.P., for example, who is a large Butcher in Ireland, admits only the loss of a very few tuberculous animals during the whole of his experience as a Butcher, and many others concurred with him as to this proportion. Such a statement was so new to the members of the Commission, that they again and again during the course of their enquiry remarked upon it as they/

they had apparently been in the habit previously of hold:
:ing the popular opinion as to the enormous prevalance of the disease and the consequent insurmountable loss which would be sustained by breeders of cattle in this coutry if any extra stringency were recommended in the seizure of tuberculous animals.

APPROXIMATE COST OF THE TOTAL SEIZURE OF TUBERCULOUS CATTLE IN THIS COUNTRY.

I propose to show that the opinions held in regard to the extent to which the disease exists amongst slaughtered animals has led to an altogether absurd estimate of the expense which would be incurred were all tuberculous meat at once seized and destroyed, and this branch of danger, in any case, removed from our midst.

Prof. Dewar, Principal of the Veterinary College, Edinburgh, has stated in a Lecture recently delivered by him before a Congress of the Royal Institute of Public Health, that he has seen the majority of the cases that have been condemned in Edinburgh under what the Royal Commission has termed rather "unnecessarily severe" inspection, and he makes a liberal allowance in saying that even were the method of inspection which was recommended by the Commission adopted not one sixth / of these carcases, would have escaped condemnation.

This is entirely in concord with my ex:
:perience although an estimate of one sixth / is much more than I should/

should be prepared to accede to. While holding as pre:
:viously stated that a localised condition is rarely, if
ever, seen, I have no hesitation in stating that even
if we accept the ~~reems~~ rules of inspection as recommended by
the Commission, the merest fraction of those now con:
:demned would escape under a properly constituted and
strict method of inspection such as is carried out here.
Let us however for the purpose of argument represent the
number which would escape condemnation as ¼ of those
found to be affected with the disease. What amount and
value of meat would that represent?. Estimating these
carcases as weighing about 500 lbs each, which may be
taken as a very liberal estimate, and looking to the
number of tuberculous animals condemned in 1897, viz:-
102, we have then, roughly speaking, 14,250 lbs at say
4½d per lb for cow beef, which amounts to an aggragate
of £267;3;9. Now this seems to be a somewhat start:
:ling calculation, but it is most certainly borne out
by experience founded on ~~the~~ system which is second to
none in this country. It can be most unhesitatingly
asserted that the Royal Commission's recommendations,
while opening up many possibilities of passing carcases
of a so-called localised tuberculous nature which had
certainly to be wholly condemned, does extremely little
towards saving a substantial amount of meat for food pur:
:poses, and this indeed is represented by a very small
amount in money as has been shown above.

Now if in Edinburgh where tuberculosis is

held/

held to be very prevalent, only the carcases of below 1% of the entire number of animals slaughtered are con: :demned for this disease, how many would be condemned throughout the United Kingdom?.

Few statistics, if any, have been avail: :able as to the number of animals slaughtered throughout the United Kingdom, I myself for the purpose of this record have made many enquiries and compiled information which will be submitted hereafter, but let us take mean: :time as an approximate estimate, that given in the re: :turns of the Board of Agriculture, The number of cattle in the country does not vary materially from year to year, the number of calves therefore must be in proportion to the number of animals slaughtered. In 1897 the num: :ber of animals returned as under one year old is 1,284,147, and making the very liberal allowance of 5% that may die or prove worthless or at least never reach the Abattoirs, we are left with the resulting number presented by 1,219,939 animals which are home bred and home fed and doomed to be slaughtered in Gt. Britain every year. Assuming that this number are slaughtered annually in Gt. Britain, and that, let us say •40% of the carcases are condemned for tuberculosis; assuming also that these carcases weigh 500 each and that under the method of inspection recommended by the Royal Com: :mission on tuberculosis, one fourth of these were allowed to pass into the market as healthy wholesome food, what weight and what value of meat does this add to the nat: :ional food supply?. At •40% we would thus have 4,879 carcases/

carcases condemned for tuberculosis. Allowing one fourth / of these each weighing 500 lbs would equal 609,500 lbs of meat, each at 4½d per lb, would represent the value of £11,428;2;6.

This may appear a considerable sum, but extending it over the United Kingdom it does not re: :present the enormous outcry which has been raised against the great loss which would be entailed were total destruction of tuberculous carcases adopted throughout the country.

There can be no question that <u>generalised</u> conditions must be regarded in the light of a loss, as no two opinions exist as to the propriety of the ~~as to the~~ seizure and destruction of these, but the point I am now arguing in favour of is, apart from the question of danger in localised conditions with which I have dealt alsewhere, the actual amount of food saved in dealing leniently as regards these matters is of a strikingly smaller degree than has before been suspected.

The calculation just made by me is of considerable interest when we regard the evidence of Mr William Field, M.P., who as a Butcher and a represent: :ative of many Butchers' Associations, gave his evid: :ence before the Royal Commission with a considerable amount of knowledge of the subject. Amongst other points brought out by him he stated that during the last 6 years in England and Scotland, seizures of tuberculous meat had caused Butchers a sum of £10,000, this estimate on the part of a practical Butcher of such wide experience and/

and Representative of so many others of his class, is of very great importance in bearing out the estimate which has been formed by himself, and has a further bearing upon the correctness of the statistics, astonishing though they may appear, as made up by us from our ex: :periences in this City.

I would desire in furtherance of this subject to add an estimate which has been formed by a writer in Allbutt's system of Medicine. After detailing some figures with reference to the prevalence of the disease in Foreign Countries, where it may be stated the proportion is abnormally high, he dwells upon the actual proportion as found to exist over the whole of France, and goes on to make the following statement, "it may be estimated that the proportion of tuberculous anim: :als among adult animals in France is roughly 5 per 1,000. The Minister of Agriculture gives the number of cattle in France as 9,000,000. Taking 5 per 1000, we find that 45,000 are tuberculous. Estimating the mean value at 300 francs, we would get the total loss which would thus be spread over the whole Country". Such a small pro: :portion and so comparitively small a loss does surely not justify us in casting throughout the Country a supply of meat which is of more than questionable danger.

EFFECTS OF BOILING TUBERCULOUS MEAT.

Nothing has been more definitely proved than the fallacy which has so long existed as to the safety which results from the process of boiling or roasting/

roasting meat. Advocates of a lax system of meat in: :spection have throughout systematically urged that al: :though risks which they cannot deny may be implied by such a system, these risks altogether disappear owing to the fact that meat before consumption is subjected to such a temperature as is sure to destroy all of the hurtful organisms which it may contain. The enormous number of observations and inspections which have been made upon this subject entirely disprove this fallacious theory, and so one-sided is the result of this exper: :iment that it would almost serve my purpose in this con: :tribution were I simply to make the assertion that the amount of danger implied and conveyed to members of the public by ingestion of questionable meat, is represented by exactly the amount inherent in the carcase when it leaves the slaughter house, as only a very small pro: :portion of the organisms contained in it, will fall victims to the cooking process and the number which re: :main will perfectly suffice or may perfectly suffice to do untold injury.

I propose however to refer here for pur: :poses of completeness to a few of the experiments which have been made upon this subject and which so conclusive: :ly prove the before mentioned assertion.

Johne boiled tuberculous flesh for between 10 minutes and quarter-of-an-hour; he then engaged in feeding experiments involving altogether 62 subjects, and as a result, 35·5 became infected.

Nocard,/

Nocard, Chauveau, Airlong, Goltier, Peuch, and Vessiere all performed innoculation experiments from meat which had been boiled, and the aggragate results of these showed an infection in 9·4 of the cases exper: :imented upon.

Dr Newsholme of Brighton has well said that boiling a piece of meat of over 6 lbs in weight will not suffice to destroy the organisms in the central portions, as the temperature there does not reach the height required.

Gerlach of Berlin fed 15 animals on cooked tuberculous matter, and 10 became infected. He also boiled tuberculous growths, an inch in diameter, for half-an-hour, and found them infective even then, but of course to a very diminished extent, and he therefore expressed the strong conviction that it is possible to contract infection of a tuberculous nature by eating meat from a tuberculous animal, even if it has been thoroughly boiled.

Prof. Victor Horsley, Proffessor of Path: :ology at University College, London, while referring to the well-known fact that the gastric juice has little or no action on a tubercle bacilli, states that he has seen a well marked virulent tuberculous nodule in the centre of a cooked joint of meat, and he does not consider that roasting would ensure the destruction of the tubercular virus, and does not consider that this process should be regarded as sufficient for disinfecting purposes.

The/

The observation of Prof. Horsley was peculiarly enough subsequently verified by Prof. Horsley, Professor of Pathology, University of Aberdeen, who upon 2 occasions found a tubercular gland in the centre of a joint served at table.

Forster has also made observations with regard to the infective nature of boiled tuberculous meat, with, in a large number of instances, positive results.

Sir Richard Thorne Thorne has been much impressed by the value of the various cooking experiments which have been made on tuberculous meat, and in his recent Harben Lectures, states that the most forcible contention in favour of stringent measures, involving the seizure of all carcases affected to any extent with tuberculosis, is based on the cooking and smearing experiments which were made at the investigation of the Royal Commission on tuberculosis. He winds up however by making the somewhat extraordinary suggestion that the only way to provide against this is to have the affected parts "skillfully removed", and this, he says, can only be done by abolishing private slaughter houses.

The impossibility of this skilful removal even if it were attempted in <u>public</u> slaughter houses, can be best proved by the fact as will be here: after referred to, that the skilful removal of the outer portions of small pieces of meat with all the skill and care inseparable from Laboratory work were adopted in many of the experiments carried out and proved inefficient as a means/

means of getting rid of the danger.

One of the findings of the Royal Com: :mission on tuberculosis in reference to this matter may be here referred to in view of the many experiments which were made not only for themselves but by so many other observers throughout the Country, The finding there expressed can hardly be considered to be consistent with this. "They Say "provided every part that is the seed "of tuberculous matter can be avoided and destroyed, and "provided care can be taken to save from contamination "by such matter, the actual meat substance of a tuber: ":culous animal, a great deal of meat from animals affect: ":ed by tuberculosis may be eaten without risk to the "consumer. Ordinary processes of cooking applied to "meat which ~~is caught~~ has got contaminated on its surface "are probably sufficient to destroy the harmful quality. "They would not avail to render wholesome any piece of "meat that contained tuberculous matter in its deeper "parts".

The Commission here certainly provided for many circumstances which can never in reason be ex: :pected to be carried into effect, and we therefore have to face the fact that meat, if tuberculous, involves a danger that the unsuspecting public have no right to be subjected to.

Fleming, in his "Veterinary Sanitary Science and Police", classifies tuberculous meat along with Anthrax and Glanders, and states that on no account should this be used as food without the greatest pre: :cautions/

:cautions as to cooking "and not even then except from :extreme hardship, as the risk of injury is too great". The hardship would certainly require to be considerable before a person would knowingly eat a portion of a car: :case affected with Anthrax, and it would certainly ap: :pear that if any hardship exists it would lie in the eating of it and the consquenterisks involved very much rather than in the abstainging from it as an article of food. He is however certainly correct in his estimate as to a danger existing in a tuberculous carcase as it does in an Anthrax one, and there are no imaginable cir: :cumstances which can justify scientists and others en: :trusted with a care of the public health in passing for human consumption any carcase or portion of a carcase of an animal affected with either the one or the other of the diseases mentioned.

Dr Sims Woodhead's experiments, conducted specially for the Royal Commission ontuberculosis, may now be briefly referred to. These experiments were very complex in nature and very wide in their range, almost every imaginable condition having been submitted to an experimental result. Amongst others he boiled tuberculous material such as tuberculously invaded glands, and after the boiling process was complete, he fed 40 guinea pigs and 1 pig with the material, and thereby in: :fected 4 of them. He afterwards roasted material of a similar description, and onfeeding 5 guinea pigs with it, 3 were found to have developed tuberculosis. He very significantly adds that it must be borne in mind, and we have/

have ample evidence of it in such experiments as the foregoing, that <u>each separate part</u> of the tubercular material must be subjected to the direct action of the boiling temperature in order that its activity may be completely destroyed, for as in the case of udder slices, ½ an inch thick, subjected to five minutes boiling, the centre portion though no longer capable of producing tub: :culosis when taken into the alimentary canal of a guinea pig, was still capable of setting up the disease when innoculated into the subcutaneous tissues; while in an: :other case the lung boiled for 50 minutes still remained infective in a remarkable degree, even when used for feeding experiments.

These conclusions are of the very great: :est importance when we remember the very great risk which is thereby proved to exist in the case of the in: :fected glands of a carcase, these portions having been before referred to by me frequently, as being infected to a remarkable degree in almost every case of tuber: :culosis however apparently localised that may be.

Heat and boiling ~~has~~ have almost no effect upon these, and while they are the most common portions of the carcase to be affected with tuberculosis, they are also the most difficult to detect in the examination, and last, but not least, they are the portions of all others which have been proved by experiments to be the most resistent to the effects of heat.

The smearing experiments which were per: :formed at this time emphathise the very grave risks which/

which are attendant upon possible contamination of a carcase in which the condition itself may be an appar: :ently localised one. These smearing experiments gave rise to a large number of positive results, and Dr Wood: :head has referred to these that "the cooking experiments, both boiling and roasting, carried on with joints over which virulent tubercular material had been purposely smeared, left no doubt in my mind that it was not possible to rely upon cooking methods as usually carried out in the kitchen, to thoroughly disinfect or to render per: :fectly innocous such tubercular material as might be present accidentally or artificially enclosed within the meat".

I may at once dismiss this part of the subject by adding that the further series of experiments conducted in order to observe the results which would be obtained by boiling and roasting joints, gives abund: :ant evidence that the temperature reached in the centre of these joints was such as finally to preclude any ex: :pectation of destroying organisms contained within them. This was finally and definitely proved by the use of fusible metal which was inserted into the centre of the meat, and from this it became evident that where the weight of the meat reached that of the very ordinary joint, viz:- 6 lbs or over, the temperature at the centre of it seldom reached 60°C. In Dr Woodhead's own words, "it at once becomes evident that in only the very small "number of cases could the heat to which the fusible "metal was exposed, have been sufficient to render tuber: ":cular/

":cular material innocuous" and he adds as his conclusion which together with the other remarks made in the fore:
:going appeared to finally determine the innefficiency of cooking by any means as a method of safeguarding the public against the grave risk of contracting the disease through the medium of meat. The conclusion drawn by Dr Woodhead is as follows:-

> "It is evident that in the boiling and roasting experiments as ordinarily carried out in the kitchen, the temperature, however high it may be near the surface, seldom reaches 60°C in the centre of the joint, except in the case of joints under 6 lbs in weight. Ordin:
> :ary cooking is quite sufficient to destroy any smeared material that remains on the outer sur:
> :face of meat, but it cannot be relied upon in the slighest degree to render innocuous the same smeared material when in the centre of a roll. As these rolls are always subject to a great deal of handling and cutting during the process of making up, they are correspond:
> :ingly more liable to contain such smeared mat:
> :erial than ordinary joints, and the risk of their carrying infection is to that extent in:
> :creased".

These conclusions completely contra-indic:
:ate as a possibility in this Country, the very question:
:able system adopted in Belgium and Germany of submitting portions/

portions of infected carcases to the effects of steam at 100° C, and thereafter disposing of it at a reduced price, this method while more than a questionable one in these Countries is beyond all question impracticable in this. Meat is not so dear here, and there can be no doubt that the somewhat factidious tastes of the people would prevent the possibility of such a quality of meat obtaining a market. It is to be noted further as an objection against such a highly reprehensible system that the amount of meat so treated is in proportion remarkably small, and therefore that the saving is not at all one which could compensate for the slightest risk that might be implied, and further we have to bear in mind that the very persons who buy and use such meat are on account of their poverty and accompanying insanitary surroundings the very persons who are most liable to become affected as a result of the ingestion of food of this description. It does not require very much argument to prove that whilst such persons would unquestionably be the first to suffer all other members of the community who are constantly associated with and largely dependent upon them, would in turn be liable to receive infection from them. It must be remembered that this class provides us with attendants in byres, nurses, and other domestic servants, who are constantly within our houses, and in fact perform a-thousand-and-one other offices which render them in all respects very much "always with us", and compel us in time to share their ailments.

METHODS/

METHODS OF SEIZURE ADOPTED IN THIS AND OTHER COUNTRIES.

I now propose to review the methods which are adopted here and elsewhere in the seizure of car: :cases affected with tuberculous disease. Very extended inquiries have been instituted by me throughout the whole Kingdom in regard to this, and I findtthat the ~~recent~~ re: :commendations of the recent Royal Commission have gone far to induce local authorities to minimise the dangers connected with the ingestion of tuberculous meat. This is difficult to understand in the light of the evidence which was led throughout the whole enquiry, but the fact remains as admitted to me very frequently in response to my queries, that inspection now is much less stringent than it was before the Royal Commission Report was issued.

In view of the observations which I have made upon the carcasesin our own Abattoirs, ~~these~~ which amount roughly to 30,000 annually, I have been able to affirm in the foregoing pages that the glandular condition is such, apart altogether from the question of the presence of the organism throughout the body as to justify the total seizure of all affected carcases. Some of the recommendations issued by the Royal Commission are ~~fully~~ entirely without foundation. For example, only the affected part is recommended to be seized when the disease is con: :fined to the liver. In all my experience and amongst all my investigations I have never yet seen, heard, or read of such a condition being present, and would refuse to/

to believe that such a possibility existed as the pre: :sence of a tuberculous liver without dissemination to other parts of the carcase and most certainly to, the glands. A second series of cases in which they recommend a partial seizure only, is when lesions are confined to the lungs and lymphatic glands. I do not hesitate from my experience of examining carcases to affirm that if any in which the only apparent organs affected, viz:- the lungs and lymphatic glands, were passed as fit for food, then cent per cent of such cases will most cer: :tainly be infiltrated throughout by the tuberculous or: :ganism, and the glands in different parts of the car: :case, if properly inspected, will be deeply infiltrated.

A third series recommended by them to be passed as fit for food are those in which the Pharangeal ~~and~~ Lymphatic glands only are affected. The remarks made by me in regard to the first series apply with equal force to this, and I deny most strongly that any car: :case can be produced in which those glands only will be found infected.

The fourth and last series of cases which the Commission recommend should be passed after the af: :fected portions have been abstracted, is, "where the "lesions are confined to any combination of the fore: ":going but are collectively small in extent". This really implies that where the organism has gained access to the circulatory system, has passed through the lungs and lymphatic glands, and has eventually reached the liver, that is to say where the organism has been present, and

is/

is present both in the circulatory and lymphatic systems, the carcase is in the opinion of the Commission one so free from danger as to justify all parts being used, ex: :cepting those portions in whichthe disease is so evid: :ent, that no person in possession of their sight could fail,to detect it.

With such recommendations as these the mind fails to grasp any reason which could be advanced by the Royal Commission in favour of the appointment of thoroughly qualified meat inspectors, asAs these con: :ditions which they have set forth as implying inspection could certainly be detected by any person who possessed the smallest possible modicum of intelligence. The real necessity for qualified inspection lies in the additional scientific knowledge possessed by a good Veterinary Sur: :geon or Medical Man, as these know the far reaching nat: :ure of a disease where with very small and apparently insignif: :icant evidence are brought under their notice.

The methods adopted abroad are certainly unsatisfactory, and judged by remarks contained in the preceding pages, a very large quantity of meat of a dan: :gerous nature passes into use.

In Prussia for example meat is passed as not being injurious to health even if two or more organs are affected, if the animal is otherwise well nourished.

In Saxony, unless the appearance of the carcase is emaciated and the meat itself evidently bad, and unless the tuberculous condition is present in a high degree/

degree the carcase is allowed to pass for human consumpt: :ion.

In Belgium the carcase is allowed to pass if fairly fat if only a few tubercular deposits are found in the cavities. It is an interesting commentary upon this that the Royal Commission admit that they saw at Antwerp the freshly killed carcase of a remarkably fine Zeeland cow, which, while alive, betrayed no sympton of anything but perfect health. When slaughtered the animal, which was rich with fat, was found to be exten: :sively affected with the disease in the pleura and in: :ternal organs. The Post-Pharangeal glands etc. and the whole carcase were condemned. In Germany however they say that probably such a carcase would be sterilized and sold on the Frei-Banc.

In Germany the meat is divided into five classes and sold very much as it appears, irrespective of danger, but in proportion to the wealth of the purchaser. The poor purchaser who is most liable to the disease gets meat of a dangerous quality, while the rich are able to obtain meat of what is termed first class quality; These classes it may be noted are based upon the amount of infection which the meat possibly may conceal, and not at all upon the actual quality of the meat itself; For purposes of interest they may be here enumerated.

(1). Flesh that is above suspicion. This cor: :responds to what is called "bankwurdiges", flesh in the regulations for meat inspection in South Germany.

(2),/

(2). Flesh which can only be offered for sale under a declaration of its condition as "bad" within the meaning of the law on food stuffs. This corresponds to the "nicht bankwurdiges", flesh of the South German regulations.

(3). Flesh that is strictly injurious to health, as to which even the making it access: :ible for human food is an indictable offence.

(4). Flesh that is injurious to health under certain conditions, but which, when cooked, sterilized, or pickled, &c., may have its in: :jurious qualities removed. This may be sold, after some measures have been taken, as "bad" within the meaning of the law on food stuffs.

(5). Lastly, flesh must be distinguished as bad, which, without being injurious to health, has lost all its qualities for human food; for example, flesh that is dropsical, and flesh and organs that are markedly infected with par: :asites. This is to be regarded as unsuitable, and is bad within the meaning of section 367 of the penal code, in which the sale, or offer: :ing for sale, of such meat, is forbidden.

In Bavaria so called localised conditions are passed as fit for food, while generalised are condemned.

In Saxony the system of inspection is ex: :tremely lax, and the disease requires to show itself to a very marked degree in the various organs throughout the/

the different cavities of the body, before the carcase is seized at all.

In France a carcase is passed if the dis: :ease exists in both cavities although not of an exten: :sive nature. Nothing more absurd than this method of judging a carcase by the actual quantity or extent of the apparent infection can hardly be imagined.

It is very important to note that in a number of those Countries where the system of inspection is so lamentably lax, there is shown by them an appreciat: :ion of the grave risks which attend the disease as is evidenced by the remarkable strict regulation which many of them make regarding the importation of animals suffer: :ing from tuberculous disease. An example of this may be given in the case of France whose enactments in this matter are of a stringent nature, as follows:-

"MEASURES TO BE TAKEN IN REGARD TO ANIMALS IMPORTED FROM FOREIGN COUNTRIES"

(3). Every animal intended for importation must be visited on its entry (at the expense of the importers), and marked with a sign giv: :ing the date of its importation.

(4). When an animal, presented for importation on the frontier line by land or by ~~land~~ sea, is recognised as affected with, or suspected of, tuberculosis, the veterinary inspector in charge of the sanitary control must require, through the agency of the chief of Customs, the im: :porter/

:porter or transporter to remove the animal immediately to the country from whence it came, af: :ter having marked it.

When the importer or transporter refuses to do this, or when its re-entry into the country from whence it came is refused, the veterinary inspector must isolate the animal until it is slaughtered, without compensation, at the hands of the owner, or, on his default, of the local authority. The slaughter should take place as soon as possible, and at latest three days after the decision taken by the veterinary sur: :geon.

(5). Where tuberculosis exists in a foreign country, the Minister may forbid the entrance of animals coming therefrom.

In case he should not adopt this step, he may take such measures as may seem to him nec: :essary to submit the animals to the tuberculin test at the point where they enter the country. This test is made at the expense of the inter: :ested party.

In the case of those animals found affect: :ed with tuberculosis, as the result of this test, proceedings shall be taken as set forth in the article preceding.

In Ontario the Municipal Act contains several regulations regarding meat inspection, which, if followed/

followed out, would certainly lead to the total condemna: :tion of all affected carcases, as they say seizure has to follow if the disease be generalised, and this they define as being tubercular modules or abcesses in the greater part of a viscus or organ. Under such a system of inspection there can be no doubt that every tuberculous animal would betreated in the manner which I am now ad: :vocating.

In Victoria all wasted animals are con: :demned no matter how slight the tuberculous condition, and also all of those when large masses of tubercle are found even in one organ.

In Copenhagen I find that the system adop: :ted is a very enlightened one and as very nearly akin to that which is adopted here, and which I desire to see enforced throughout this Country. Tuberculous animals are thoroughly inspected there and the carcases are cut up, every organ and gland is examined. If the disease is local the carcase is kept for further inspection, and the inspectors thereafter confer regarding it. In cer: :tain instances, if very slight, the carcase is passed, but Dr Sims Woodhead, who has visited and inspected this system, informs us that those very inspectors who are required to occasionally pass such localised conditions most strongly object to the system, and state that it is a mistake, and that if they had the power which they now desire, they would destroy the whole of the carcases so affected. Dr Woodhead goes on further to significantly remark/

remark that if the Copenhagen strict system were adopted in this Country, there would be fewer victims of consump: :tion, although of course we would still be left with the danger attendant upon inhalation.

In Algeria whenever tuberculosis is diag: :nosed, the Mayor or Administrator of the Commune issues a decree prescribing the slaughter of the animals affect: :ed, and the flesh cannot be used for consumption.

In this Country the systems in force are as various, unsatisfactory, and unscientific, as those just detailed, and I propose now to submit a list showing the systems in a large number of places throughout the Kingdom.

METHODS OF INSPECTING TUBERCULOUS CARCASES.

DISTRICTS.	number of Bovine carcases slaughtered annually	No. showing Tuberculosis in any form	No. condemned annually	Extent of disease which is followed by total seizure.	Method adopted in regard to local: :ised conditions.
Aberdeen.	42000	170	103	When the tubercle is in any measure generalised as ev: :idenced by the presence of tuber: :cle in the pleura or the lining mem: :brames, and in the lymphatic glands.	If by localisat: :ion is meant confinement of the disease to a few internal organs, and if the flesh other: :wise is in good condition, the car: :case is passed.
Bristol.	3000	---	---	There are no public Abattoirs in Bristol, all slaughtering being done at 120 private slaughter houses, except Foreign cattle, which are killed at the Docks when disembarked. Proper inspection being thus ren: :dered almost impossible. The quest: :ion of providing Public Abattoirs is now engaging the attention of the Health Committee.	
Bath Urban.	Not known.	---	---	All the slaughter houses are priv: :ate, but under regular inspection.	

Blackburn. Blackburn.	6,000 to 7,000.	40.	34.	Follow pretty well the suggestion of the Royal Commission.	Completely remove, and destroy after written consent of owner.
Brighton.	From 10,000 to 11,000.	70.	15.	This is carried out on the lines laid down in the report of the Royal Commission on tuberculosis, issued April, 1898.	
Bradford.	76,409	27.	27.	In mild cases the meat is passed, subject to the lungs &c being destroyed.	
Barnsley.	-----	15.	2.	When slightly effected the parts are cut away and destroyed.	
Ayr.	2,897.	31.	29.	When the disease is confined to the lungs with slight adhesions to the pleura but the glands free from disease, we cut off and destroy the quarter affected. It is, however, in well conditioned carcase only that we do this, and particular attention is directed to the glands around the kidney fat at the base of the shoulders and in the thighs. All other tuberculous carcases are seized and destroyed.	
Banff.	1,424.	4.	--	If the disease is organic or membranel the carcase is allowed to pass, the V.S.Inspector certifying it fit for human food, otherwise it is destroyed.	
Birmingham.	-----	--	--	Unable to supply answers.	
Brentford.	-----	--	--	No seizures of tuberculous meat.	
Cardiff. 1897=6,400 1898=7,231		5. 9.	5. 9.	Generalized tuberculosis practically as recommended by Royal Commission, 1895.	Voluntary destruction of part affected.
Carlisle.	3,680	40.	37½	The practice which has all along been followed in this city is on the same lines as that recommended by the last Royal Commission.	
Carnarvon.	1,455.	---	2.	----------	
Chichester.	----------			----------No record.----------	
Coatbridge.	3,872.	--	44.	Generalized and Impoverised.	When localised and carcase in good condition, we strip the pleura and pass the carcase.
Coventry.	----------			Reccommendations of the Royal Commission on tuberculosis page 22. No public abbattoir.	
Crewe.	4,000	--	20.	Last report of Royal Commission closely adhered to.	Affected portions to be removed and destroyed in presence of Inspector or given to him together with a written request for their destruction.

Dalkeith/

Dalkeith.	-----	---	---	-----	-----
Derby.	-----	---	---	This is determined in each case separately. No public slaughter houses are private.	Entire removal and destruction of diseased parts.
Dumfries.	2,100	7.	7.	The principal observed in examining carcases affected with tuberculosis are those recommended by the Royal Commission, 31-3-98.	Affected parts only condemned.
Dundee.	1896=13548 1897=12641 1898=14033	---	89. 94. 119.	When tuberculosis is found to exist in a lean or impaciated carcase seizure follows; In carcases in good condition when deposits are found on costal pleura or on lining membrane of abdominal cavity or both, seizure follows.	If localised in internal organs they are destroyed. Stripping chest or abdominal cavity not resorted to.
Dunfermline.	6,650	16.	16.	If tuberculous, whether generally or locally, the animal is condemned.	
Eastbourne.	-----	---	---	If beyond lungs.	-----
Exeter.	13570	30.	6.	Generalised.	Diseased portions destroyed.
Folkstone.	630.	20.	None	When lungs or liver are extensively diseased and carcase was: ted.	The diseased organs destroyed where it is recognised in its incipient stages.
Galashiels.	-----	-----	-----	There is no possibility of knowing the correct number.	
Gateshead-on-Tyne.	-----	-----	-----	Carcases condemned whenever signs of the disease are found attacked. Internal organs always destroyed. All private slaughter houses.	No special precautions yet established.
Great Grimsby.	-----	-----	-----	As recommended by the tuberculosis Commission (vide report) and the advice of M.O.H. All private slaughter houses.	
Greenock.	6,000	95.	44.	When the trunk is affected.	When vescera is affected it only is rejected.
Halifax/					

Halifax.	8,789	---	2.	Depends on extent and organs affected.	Organs affected destroyed, rest passed.
Hamilton.	2,676	No record	29.	----------	----------
Harrogate.	----------	----------	----------	No information to hand.	----------
Hartlepool.	----------	----------	----------	All private slaughter houses.	
Hereford.	8,421	Nil	Nil	----------	None.
Huddersfield. 1897=3,412 1896=3,445 1895=3,978 1894=3,681		---	3.	When carcase is very emaciated all along with generalised tuberculosis. When tuberculosis Nodules found in several of the glands serious parts of body and internal organs.	As complete excision of all infected areas found as possible.
Inverness.	3,000	--- offal in addition.	6, & several	The practice here has been almost similar to those in the report, presented last April.	on lines
Kilmarnock.	1,562	4.	4.	If the disease is noticed at all. No dressing allowed. The Superintendent sees as many of the carcases as possible. No doubt an expert may evade his inspection at an odd occasion, but if the disease is at all noticed, the whole carcase is condemned, because we hold here that the existence of the disease in the carcase renders it unsound and unfit for food. Of course we have condemned other carcases for other reasons (3) which rendered the same unfit for food. I may say that the supervision of the Public Slaughter House results in a very small proportion of diseased animals being attempted to be killed here. If they are suspected they are generally killed without the Burgh and in this respect we sometimes experience difficulties.	
Kirkcaldy.	2,700	5 per thousand	10.	Unless very slight and confined to lungs, or to the liver, the carcase is taken.	There is no passing one part of a carcase and seizing a part.
Leeds. No	No record	14.	14.	At the present moment I would leave these unanswered.	
Lancaster/					

Lancaster.	2,743	21.	21.	~~Decided by M.O.H.~~ Decided by M.O.H.	We have only had 3 carcases wholly condemned during the last 4 years. In all the other cases the M.O.H. has condemned the lungs, heart, kid: :neys, &c., and those we cremated.
Leicester.	26000	No re: :cord	42.	All carcases sei: :zed, except slig: :ht localised cas: :es, but the an: :imals in the latter case must be in good con: :dition.	In localised cases, such as the lungs, &c., if slightly affected, and the animal is in good condition after re: :moving the affect: :ed parts, the rest may pass as fit for food.
Lichfield.	----------			No one in the District able to ans: :wer queries.	
Liverpool.	----------			Copy of annual report sent, see pages 71-75 and 83.	
Londonderry.	-----	3.	3.	----------	----------
Macclesfield.	2,000	[illegible]	5.	--------2--------	Nothing done.
Maidstone.	No record	---	None	We only see a carcase now and again, and when we have brought cases be: :fore the Magistrates, no convict: :ions followed, so that it seems little use to trouble at any rate at present.	
Malvern.	-----	---	---	Very few animals slaughtered, and consequently no seizures have been made.	
Middlesbrough.	5200	1 per cent	6.	If the disease is more than loc: :al and the meat emaciated.	The portion of the meat is destroyed.
Motherwell.	2,534	8.	4.	Until recently the whole carcase was condemned whenever tuberculosis was present, but since the report of the Royal Commission was published, the recommendations contained therein are carried out.	
Newcastle-on-Tyne.	--	--	---	Unable to furnish the information.	
Nottingham.	Unable to an: :swer owing to private slaughter houses being still in use.	~~te~~	10.	Generalised tub: :ercle in any im: :portant organ or part or infection of lymphatics to any considerable extent.	The affected parts are excised and the rest of carcase passed.
Paisley/				Generalised to/	We have no method/

Paisley.	4,500	54.	45.	Generalised to the extent of af: :fecting two or more organs.	We have no method of dealing with localised condit: :ions. All carcas: :es so affected are passed in whole.
Perth.	4,227	No re: :cord	15.	These questions cannot be answered meantime owing to the fact that the late M.O.H. inspected the carcases, and the new M.O.H. has not yet en: :tered on his duties.	
Port Glasgow.	578.	5.	1.	General.	Affected parts con: :demned.
Reading.	No record.		Nil.	Recommendations of the Royal Com: :mission followed.	
Richmond.	-----	---	---	All cattle killed in London.	
Sheffield.	13312	No rec: :ord	30.	All general tub: :erculosis Local if and more than or: :gan involved. Condition of carcase taken into ac: :count.	All tubercle organs removed.
Stockport.	-----	---	---	We have very few cattle killed in Stockport; Most of it is killed in Birkenhead and Liverpool and passed by Veterinary Surgeons before coming into town.	
Sunderland.	Unknown.		11.	If the kidneys & glands are affec: :ted with other organs. The large majority of the butchers slaughter in their own shops, there being about a dozen separate slaugh: :ter houses. We have no systematic shop to shop inspection, but one of the Asst. Sanitary Insp. (who was a butcher) devotes such time as he is able to spare from his other work.	The affected local parts are destroyed after inspection by M.O.H.
Croydon.	-----	---	---	Most of our meat comes from London Market.	This question is at the present time under consideration by the M.O.H. and Sanitary Comm.
Stafford.	15 weekly	Nil	Nil	According to the Act.	We have a number of slaughter houses in various parts of the town, which are inspected about once a week.
Salisbury.	------	---	--1.	If required apply to the Sanitary Inspector.	
St. Helens/					

St. Helens.	3,088	188	19.	The recommendat: :ions of the Roy: :al Commission are carried out in this respect.	Organs affected with tuberculosis are seized, and ple: :ura and peritoneum if affected, are stripped off.
Torquay.	----------			Cannot supply information.	
Wakefield.	----------			No information.	
West Hartlepool	4117	21.	4.	When the organs are affected and the pleura and peritoneum espec: :ially in old cows, or either extensively. The butcher in such cases is only al: :lowed the Hide and Tallow.	If the organs are clean, and the car: :cases show tuber: :culosis slightly in its first stage on the pleura or peritoneum. The affected part is cut away or skinned off, and the re: :mainder passed for food.
Wigan.	4,360	2 or 3 we: :ekly	12.	General tubercul: :osis.	If very slight al: :lowed to strip portion.
Winchester.	34766	No rec: :ord	56 carcases 73 Quarters 119 Pieces	General tubercul: :osis and also when acute (al: :though localis: :ed) if found in an emaciated car: :case.	Diseased parts are condemned, remain: :der cut up in the usual way of the trade. If lymphat: :ic glands are found healthy it is then passed.
Wolverhampton.	No record	9.	9.	Whole. Too many private slaughter houses.	
Worcester.	3,600	Nil	Nil	Under consideration.	
York.	10400	No rec: :ord	2.	When there is tu: :berculosis in both lungs, or when tuberculous lesions are found in the muscular system and lymph: :atic glands, or when the tuber: :culous lesions are found in any part of an emac: :iated carcase.	Complete removal of diseased parts.

COMPENSATION.

The difficulty of dealing with tuberculous car:
:cases in such a way as to mete out equal justice both to
owners and the public, has been, and is, one very sub:
:stantial reason for the laxity of the systems that pre:
:vail in condemning carcases which present evidence of
inherent danger. The question therefore of compensation
to owners of affected animals is an all-important one.
Of course it may at once be taken for granted that no
question of expense ought to be considered where the
health of the community is endangered to the slightest
extent, and the evident duty devolves upon those in auth:
:ority to see to it that no such consideration would det:
:er them from performing their very small duty in regard
to such a matter. The strict measures adopted here,
and I am glad to note in a few other places, may at first
sight appear despotic, and too strict for this age. It
must be borne in mind however that the principle of pre:
:venting a person from injuring the person or property
of another is an accepted and necessary one, and there:
:fore the harshness to a great extent disappears. It
may still further be added that this apparent harshness
may in reality be, towards the owner, kindness in disguise,
if we enter his byre and see or order away his affected
animal, as of course it is accepted that the presence
of a tuberculous member in the herd will assuredly lead
to the affection of others in the same herd, and there:
:fore to a still greater loss to the owner. The Public
Health/

Health Scotland Act 1897 empowers Inspectors to seize live animals while suffering from tuberculous disease or other disease which may render them unfit for the food of man if such be exposed for sale, and we in this City enjoy further powers under our Municipal and Police Acts, which justify us in entering byres and examining the cows contained therein. In the event of any of them being found to suffer from tuberculosis or other dis: :ease which would render their milk injurious to health, we can at once order the removal of such animal from the premises. This power is so useful and exists in no other place except Glasgow, as to cause other local authorities fortunately to be now moving in the same direction. Some idea of the value of ~~the~~ such enactments may be gathered from the fact that acting under the powers contained in these clauses, I have during the past nine months in this City caused to be seized some 30 cows while exposed for sale for the food of man, and in a large number of these instances the owners have been heavily fined for an offence against the Act. Further, between 20 and 30 cows during the same period have been de: :tected in our City byres while suffering from tuber: :culous disease of the Udder, these have been ordered away, and invariably slaughtered within 24 hours. A microscopic examination which I constantly make has re: :vealed the presence in all cases of the tubercle bac: :illus, and the subsequent Post-mortem examination has as constantly proved the correctness of the diagnosis and/

and the wisdom of the sections quoted. It

It is to be noted that no opposition has is found here on the part of butchers, and almost none on the part of other owners. The witnesses who represented these cases before the Royal Commission Enquiry very generally concurred in the wisdom of seizing infected meat and milk, but one and all were strongly of opinion that when these are seized in the public interest the public ought in justice to requite the owner for the loss sustained. A very great deal can be said upon both sides of this subject, and it is of interest to note that upon it the members of the Commission were divided in opinions.

We are well aware that seizure and slaugh: :ter is, as has been seen in other diseases, such as cat: :tle plague, the most certain and prompt means of ex: :tinguishing a contagious disease and generally the most economical; but unless compensation is given it is stated above, that it might appear a hardship and injustice and might lead to every kind of deception and evasion on the part of cattle owners. Indeed this could not well be otherwise. Calculations were put forward by various Members of the Royal Commission, showing how almost im: :possible it would be to have Inspectors all over the Country, keeping up such a constant inspection of Dairy cattle, as to ensure the detection of those diseased in time to prevent harmful effects accruing to those who used their milk and meat. It is admitted that evidence of unmistakable disease in the form of tuberculosis of the udder/

udder may develop and show itself between two visits of an Inspector even if these are paid at regular fort: :nightly intervals, and my own experience very forcibly bears this out.

It would therefore belong to an expense which renders the proposition preposterous to expect such a supervision of byres in wide-spread country districts throughout the Kingdom. On this mere question of ex: :pense then, compensation would prove to the utmost de: :gree economical, as by such a measure the co-operation of owners would be assured, and without it, any attempt to stamp out this dire malady will be rendered almost impossible, indeed it can not be otherwise.

A contagious disease invades the cowshed of a poor man. If its existence becomes known the an: :imals therein which may constitute his entire fortune will be slaughtered, and he will be ruined. At the best, he knows he is unable to dispose of them for food, or he then would be committing an offence against the Public Health Act, for which he would certainly render himself liable to heavy punishment. As a matter of self preservation then, he conceals the outbreak to the eminent danger of the rest of his own and his neighbour's animals, and perhaps to those of the whole country, when ul: :timately he is driven to send his stock to a neighbour: :ing market to be there sold as milk producers and not for the food of man. In this way he introduces fresh foci of infection to a neighbouring market among hundreds of other animals, and when ultimately sold they are doomed/

doomed to spread infection over a still wider area through being transferred to another district, perhaps some 100 miles off.

In acting thus he cannot be said to be grossly culpable. There is no Law to prevent his act:ing in this manner, as the peculiar anomaly exists that a tuberculous cow may be sold to give milk but not for the food of man.

The compulsory slaughter of the whole of a farmer's stock in some districts would be utter ruin to him, and he is certainly excusable in endeavour:ing to avert such a catastrophe, especially if the dis:ease has just manifested itself. If he cannot legally dispose of the animals in the market or elsewhere, even at a sacrifice, he has every reason to believe that they will not all die if left to nature, and whatever number may remain, will keep himself from beggary. He will not so much consider his neighbour's loss from the spread of the contagion as his own under such circumstances, as there are but few men who would destroy their own fortune to preserve that belonging to others.

If the destruction of an individual's pro:perty is necessary for the public welfare, then cer:tainly the public should recompense him to the extent that of the value of property, any other measure would assuredly lead to fraud and concealment, both of which are most potent agents in the spreading of the disease.

The compensation for owners cattle follow:ing their seizure for the purpose of slaughter being then/

then a measure of the greatest public utility, mere jus: :tice, to say nothing of policy, demands that public compensation to the integral value of every animal so sacrificed, be awarded. The more liberally and equitably this is carried out, the more liklihood is there of ob: :taining every assistance from those whose aid is al: :ways of the utmost moment, namely, the proprietors.

But now the question arises as to the actual value of a tuberculous cow. It can not be re: :garded as of value for its milk-producing capabilities, because there is no question and ~~there~~ it is not argued that milk from a tuberculous cow possesses such danger as to ren: :der itself absolutely without value, and as to any value attachable to it on account of its meat, it is to be hoped that strict inspection will render this practically nil in whatever stage of tuberculosis the animal may happen to be. As it is a menace to the rest of the herd, it might be considered that its removal was a positive advantage to the owner, but as he might not possibly regard the matter in this light, we would be thus face to face with the ~~concealment~~ difficulties of concealment and fraud, before mentioned.

It must therefore be taken for granted that compensation, the amount of which would vary with circumstances, must be equitably paid in order that a successful issue may be expected. It is certainly better to err on the score of liberality.

For animals which are apparently healthy during life a higher rate would be given than for those which/

which are diseased and might probably die shortly after being brought under the notice of the authorities. Ot: :hers again which had recently been purchased at a low figure, and had not been in the owner's possession for a time to be fixed, would be dealt with in the strictest possible manner, in order effectually to put down any possibility of a trade in so called "Piners" being car: :ried on., These matters could be adjusted with the greatest ease, and difficulties which have been suggested on this score as forming arguments against the whole question of compensation, need not for a moment be entertained.

From an intimate acquaintance with the large cattle markets in this City, and from the oppor: :tunities enjoyed by me in watching closely the whole methods in force in the passage of cattle from breeders to dairy: :men, from them to Fat Stock sales, from these again to the slaughter houses, from there to the butchers' shops, and from them to the consumer, I am strongly of opinion that ~~any~~ no difficulties would arise in the question of adjustment in the amount of compensation to be paid. The utilization of certain parts of the carcase, such as the hide, horns, &c., could of course be considered in this valuation.

A great apparent difficulty has been suggested against compensation, to the effect that such would ~~keep~~ prevent dairymen and others providing ~~to~~ proper sanitary requirements in order to minimise the chance of other stock contracting this disease which is notor: :iously/ their

:iously aggravated by overcrowding and dirt. This ob:
:jection appears to me to be without any foundation whatever. Sanitary Authorities can with the greatest ease, even in wide districts, provide as to the measures necessary for the prevention of such defects, and very unqualified Inspectors indeed, can superintend the carry:
:ing out of these byre. Further a power once properly con:
:structed to the satisfaction of the local authority has the minimum chance of becoming very objectionable between two visits of an Inspector, even if those are unduly delayed beyond the time when they are supposed to be made.

Much, if not all, of the great outcry re:
:garding the insanitary, dirty, and unhealthy condition of byres and cowsheds is due purely and simply to struct:
:ural defects, for which the Local Authorities and their Officers are directly responsible, so that such matters could be rectified with the greatest ease by stricter regard to the preliminary necessities of cow byres, and a license granted only to those which were provided with the necessary qualifications.

This is a matter of common every-day ex:
:perience, and I need hardly record how frequently I have visited byres which, so far as the dairy keeping was concerned, were not by any means in a cleanly con:
:dition, and yet the atmosphere remained apparently pure, and the place might almost appear clean to a casual ob:
:server. This result is purely tracible to its general structure. Other byres, converted probably from old cartsheds/

cartsheds, stables, or such like buildings, I have seen in which the Keeper acted well up to the requirements of the regulations, and yet, despite them all, the pla: :ces appeared filthy,and most appreciably contained the warm hurtful organic atmosphere so,certain, in spite of the best efforts of the dairyman to ~~re~~dis-plenish his stock.

The strength of this argument still fur: :ther fails, when it is remembered that owners of cattle, dairymen, and others, appear as a class to have no know: :ledge of, or believe in, the value of sanitary measures, and they therefore would not be the less likely to adopt them with the set purpose as has been suggested,,of in: :juring their stock. The only measures which in the vast majority of cases are adopted by them are under the strict law of compulsion, and surely this could be carried out after compensation were in force as well as now. I consider indeed that it should and would under those circumstances be carried out very much better than now, and I would use this very argument in favour of the proposed measure, because it would certainly have the desirable effect of awakening Local Authorities to their great responsibilities in connection with these matters, and this would be the more likely to certainly result when the rates were to be called upon to yeild compensation for any laxity in regard to it. I con: :sider this part of the question is an all important one, and a strong argument in favour of compensation being paid out of the local rates, and not in any sense as has been suggested, out of imperial funds.

Another/

Another question has been raised as a supposed difficulty in the way of granting compensation. It has been suggested that a large City, such as, for instance, Edinburgh, with its large Abattoirs, would be taxed for all carcases seized there, although the anim: :als belonged to a Country Butcher, who had intended, in the event of their being passed, to transfer them to his own Country Shop. Should Edinburgh then be taxed ~~for~~ they ask, for preventing those country inhabitants from using injurious meat. The answer is unquestionably "No", and further there is no necessity for Edinburgh or any other City being so taxed. The owner's name and address is in every instance taken when he brings his animal to the slaughter house, and in the event of it being condemned a certificate would willingly be grant: :ed by the Inspecting Officer, upon which the owner would at once found a claim against his own Local Auth: :ority. The argument, in fact, is a purely imaginary one, and would present no more difficulties than are at pre: :sent metewith by Parish Authorities in contributing towards the maintenance of their own paupers resident in other districts or cities. Practically the system, it is found, works admirably, no injustice is done, and the interests of every small Parish are safeguarded wherever its pauper residents may find themselves throughout the Kingdom. The cases are very synomymous, and it is diff: :icult to understand how the question has been put for: :ward as presenting such a insuperable difficulty.

In/

In granting compensation, all who were engaged in the trade could be made to understand that the person entitled to receive such was the person to whom the animal belonged at the time of seizure, and therefore all question of tracing original owners would be at once got quit of.

In this connection it may be well now to express the view that seizure and slaughter of tuberculous animals is the only method by which we can hope to cope with and suppress this devastating disease. It is elsewhere in this contribution suggested that estimates regarding the enorminity of the sum of money entailed by such a proposal, has been grossly exaggerated, but its propriety might best perhaps be judged if we regard the experience which this Country has had in reference to other forms of contagious cattle diseases. Such a procedure is intended to preserve the property of individuals, the health of mankind, and to avert from helpless animals a painful and fatal disease. It also reduces to the smallest possible dimensions, when resorted in time, what might become, if neglected, a national misfortune.

Let us look at the experience of this Country in regard to cattle plague. In 1865-66 it was introduced here, and supposed to be brought by one or two sick animals. Within the first few days, it is admitted, that the sacrifice of a few dozen animals might have arrested the scourge, but this was not done, and within a year 500,000 died, involving a loss of close upon Eight/

Eight Million Pounds, Sterling (£8,000,000). Twelve or Fourteen infected animals were sent to Holland, and that Country acted in the matter as our own had done, with the resulting loss of 165,000 cattle. The disease then threatened Belgium, but active measures were there adopted; affected animals and those in contact with them were at once seized, and the scourge was overcome at a marvelously small sacrifice.

Our experience with regard to Pleura: :pneumonia, Swine Fever, etc. is a strong argument in favour of this method, as although according to the Secretary of the Board of Agriculture, these diseases have not been stamped out by the measures adopted, ~~but~~ he fully anticipates that the results are only now and in the near future going to repay the cost that they have necessitated. It may further be said that although the Country ~~is~~ has not by this meansfinally got rid of these diseases, they would probably ere now have swept away our entire cattle population, had such not been adopted.

It is of passing interest to hark back to what was done more than 200 years ago in such matters, as is gathered from the following extract written in 1877 by the great Haller to Vicq de'Azyr, "with regard to "Epizoötics, it is only with our neighbours they can "exist. Our method is to kill without remission all "the infected cattle, and by this very simple means we "have constantly prevented the malady from extending in "our Country, although our frontiers are always tormented; "your frontiers particularly are so mixed up with our "mountains/

"mountains, that there is extreme difficulty in keeping "the latter free from contagion".

It is of interest to record how fully the preceding remarks are concurred in as set forth in an article which recently appeared in the "Journal of Comparitive Pathology" on this subject. In this, the writer says, "there is no doubt that the outcry raised "in favour of compensation is out of all ~~value~~ proportion "to the value of the carcases condemned on account of "tuberculosis. Notwithstanding numerous requests to "be supplied with evidence as to actual cases of sub: ":stantial loss incurred in this way, hardly any of the "Witnesses who came before the Royal Commission could "tell of more than two or three such seizures during "long periods involving sales of hundreds and even thous: ":ands of carcases. A fair measure of these losses is "found in the fact that even in these places where the "system of inspection and condemnation is exceptionally "and unnecessarily severe, a premium of 3d per head for "bullocks and 6d per head for cows, proved quite suffic: ":ient to cover the losses through condemnation of tub: ";erculous carcases".

C O N C L U S I O N.

In the foregoing contribution I have striven to show that the Etiology of this disease serves to indicate the various methods by which infection may be conveyed to man, and I have tried to prove that the prevailing opinion regarding the frequency of infection by inhalation/

by inhalation is not borne out by the condition found present pr in the carcases of animals which to the ex: :tent of 30;000 a year come under my notice." That in: :halation exists as a cause I do not for a moment dis: :pute, but the enormous proportion of cases in which the mesenteric glands are affected together with general infiltration of the lungs, drives me to the conclusion that infection by ingestion holds a much larger place in the causation of the condition than has been hitherto accepted. I have further shown by experiments which have been made upon this subject that the presence of the organism in the air is by no means of so wide-spread a nature as has been imagined heretofore.

So far as statistics can be gathered I have tried to prove that from such as are available the conclusion is evident that much tubercular disease in cattle, with laxity of meat inspection, run concurrently with a high tuberculous death rate among the human race.

I have shown that the popular estimate re: :garding the extent of tuberculous disease amongst cattle is grossly exaggerated, and that consequently the diff: :iculty of meeting and coping with the danger is by no means so great as many would have us believe.

I have shown from my wide experience on this subject that so-called cases of localised tuber: :culosis in cattle are of the rarest occurence, if indeed they ever occur at all, and I have indicated the results of my observations which clearly lead to the conclusion that/

that in such localised conditions the glands of distant parts are infected in almost every instance, and by the observations conducted by me, I have been enabled to submit a microscopic representation showing clearly the undoubted presence of the organism recovered from the deep muscle of a carcase visibly slightly affected and to all appearance in splendid condition.

I have tried to prove that the total seiz: :ure and destruction of all carcases however slightly affected would amount to very little additional loss of meat as a food substance, and basing a calculation upon our experience in Edinburgh, I have reduced this to an amount which, looking to the gravity of the subject at issue, is an extremely small one.

I have eritisised much of the evidence led before the Royal Commission on tuberculosis, and I have tried to prove that the conclusions which they arrived at and the recommendations which they made as based upon this evidence, were not in keeping with the opinions expressed by it.

I have shown the systems adopted in var: :ious Foreign Countries, and have submitted the results of extended enquiries made by me throughout this Kingdom, as to the systems adopted in it, and I have strongly ad: :vocated and urged the total seizure of all affected carcases as being at least one step, and in my opinion, one of the most important in combating the ravages of made by diseases of a tuberculous nature amongst the human population./

population.

These observations are, I conclude, of no small importance in connection with this absorbing sub: :ject, when it is remembered that I have devoted an enor: :mous amount of time and observation upon the amount of material treated under the strict system of supervision which is not to be surpassed in this Kingdom, and the results therefore thereby obtained may well be received as an index of what might be expected if the same system prevailed throughout the Country.