The accompanying photograph, kindly taken at this time by my friend Mr. Fitzgerald, of Folkestone, shows the site and condition of the growth.

The improvement continued, and on December 31st, the sore had nearly healed, its former site being represented by a red and depressed scar, covered in the centre by a dark scab. The eruption on the skin was nearly gone. There were some white mucous plaques on the under surface of the tongue. The throat was congested.

This case is of interest and importance to practitioners, on account of its rarity and the difficulties which surrounded the early diagnosis. The dark colour of the woman's complexion suggested the possibility of melanosis. Resemblance to epithelioma was also close, but the condition of the glands was a great aid to differential diagnosis. They lacked hardness and fixity, yet exhibited markedly the multiple indolent enlargement of syphilis. It is unusual to find primary sores on the skin of the face. Probably, in instances like the present, some abrasion of surface, as a scratched pimple, becomes accidentally inoculated in various ways, as by kissing, or conveyance of the virus on the finger. No doubt the application of caustics to this sore greatly increased its size, modified its appearance, and enhanced the difficulty of diagnosis. The vascularity of the parts involved, and the loose connective tissue of the cheek allowing of luxuriant cellular exudation, are other explanations of the uncommon size and appearance of the chancre in the case under consideration. When primary sores occur in curious positions, the history of contagion is wanting or unreliable. The diagnosis from malignant disease is often so doubtful that a positive opinion is impossible. A careful examination and consideration of the condition of the neighbouring lymph glands is, I believe, the surgeon's principal aid in arriving at an early and correct conclusion.

EXPERIMENTAL INVESTIGATIONS ON LEPROSY:

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ITS NON-COMMUNICABILITY TO ANIMALS.

THIS paper forms part of a Government report on leprosy in Trinidad. It is a digest of experiments performed on animals during the past two years. Though the results are practically *nil*, they may, perhaps, be not entirely without interest, seeing that the question of the contagion of leprosy appears not yet to have died out.

The methods employed have been four in number: 1. Scarification of the skin and application of material scraped from leprosy ulcers; 2. The introduction of portions of leprosy tubercles beneath the skin; 3. Vaccination with lymph taken from lepers; 4. Feeding the animal on tubercles and enlarged glands, and viscera obtained *post mortem*.

It will be found that all these methods have been equally ineffectual. The second method, by introduction of tubercles beneath the skin, appears to be the most crucial. The most characteristic product of leprosy is here chosen: a cutaneous tubercle, notably one in which the microscope shows quantities of bacilli. As soon as possible after removal from the living body, a portion of this tubercle is introduced beneath the skin of the animal selected, and the skin fastened over it by sutures. The leprosy material is thus brought into close relation with the tissues of the animal in such a way as to encourage, if possible, multiplication of the bacilli. To favour this still more, the subcutaneous tissues are lightly scarified before introduction of the tubercle. I can, perhaps, better illustrate this by selecting from the list two illustrative animals, a cat and a fowl.

OBSERVATION XVII. January 1st, 1885.—Tubercles were excised from the face of J. J., aged 16, and shown microscopically to contain bacilli. The hair having been cut short, a small incision was made over the nape of a cat's neck, and the skin being lifted up, two small pieces of tubercle were introduced. The incision was closed with two silk sutures.

January 3rd. There was some swelling at the site of incision, and the two sutures were removed. Laudable pus escaped, which showed some bacilli on staining.

January 4th. There is no further escape of pus. At the site of incision there is thickening about the size of a marble.

January 8th. There is still considerable thickening. The cat has managed to rub the neck, and there is a discharge of serum. Staining showed no bacilli in this.

January 11th. There is a firm cicatrix. The thickening beneath the skin is less.

January 22nd. A subcutaneous thickening, about the size of a millet-seed, is to be felt.

February 5th. A lump, about the size of a pea, is to be felt beneath the skin of the back near the haunch.

February 16th. No lump is to be felt in either situation, and the hair has grown again at the site of incision.

OBSERVATION XXVI. March 12th.—The cat was again vaccinated with pus from the vaccine pustule of L. C., aged 10 (tub.), and pure lymph from J. M., aged 19 (anæsth.). A scab had formed by the 23rd.

April 13th. The cat was accidentally poisoned. Dissection showed the subcutaneous tissue at the sites of the inoculations and vaccinations perfectly normal. There was no trace of thickening. The lungs were healthy, and all the other viscera normal. Magenta showed no bacilli in the heart muscle, or in blood from the heart.

OBSERVATION XXIII. February 7th, 1885.—More tubercles were removed from the face of J. J., and again shown to contain bacilli. Incisions about three-quarters of an inch long were made about two inches behind each wing and under the left wing of a fowl, and pieces of tubercle about half an inch square and one-eighth of an inch deep were introduced beneath the skin, the subcutaneous tissue being lightly scarified. In consequence of the thin parchment character of the skin, it could be easily raised from the subjacent tissues, and the edges of the incisions sewed together with silk sutures, with little or no hæmorrhage. The skin was left on the pieces of tubercle, and the raw surface was placed downwards in order to favour, as much as possible, adhesion to the tissues of the fowl. The tubercle could be easily slipped about beneath the skin, and its dark colour made it readily recognizable.

February 8th. The incisions are dry, and there is no redness.

February 10th. The incisions are uniting well. Through the translucent skin there appears to be a little white deposit on the tubercles.

March 5th. The sutures are still in, but the edges of the incisions are quite united, and the cicatrices are inappreciable. The tubercles are about the same in size and position, except that the one behind the right wing is attached to the skin and superficially ulcerated. Another tubercle about three-quarters of an inch square and one-eighth of an inch deep (in which again bacilli were found) was introduced beneath the right wing, and three silk sutures were put in. The incision again healed by primary union.

March 18th. Small pink desquamating nodules, about one-eighth of an inch in diameter, were found on the eyelids. These had, however, disappeared by April 10th.

April 10th. The tubercles beneath the wings are in about the same state. The other tubercles behind the wings were not found. From this date till the end of the year, the fowl was fed at frequent intervals with tubercles from living subjects, and portions of viscera and enlarged glands obtained *post mortem*.

OBSERVATION XXXIV. April 21st.—The fowl was vaccinated beneath the left wing with lymph from A. A., aged 7 (anæsth.). The lymph did not take.

May 11th. The tubercles beneath the wings are about the same size, and freely movable.

October 9th. The fowl laid an egg. Magenta showed no bacilli in the area of examination.

December 28th. Beneath each wing is a small black nodule about a quarter of an inch in diameter, the skin being freely movable above them. The fowl is plump and in good plumage.

The nodule beneath the left wing was excised, and found to consist of a capsule of false membrane surrounding a mass composed of caseous material and much pigment. Magenta showed a few bacilli scattered amongst the caseous *débris*, rather more in the membranous capsule, but none in the blood or serum from the neighbourhood of the inoculated tubercle, or in the blood from the breast. This fowl is still under observation.

A considerable difference is here noticeable between the results in a mammal and a bird. In the former, the tubercle appears first to have disintegrated. It was then probably partly thrown off, as shown by the bacilli found in the pus two days after inoculation, and partly absorbed, as shown by the gradually decreasing subcutaneous nodule. *Post mortem* examination, three and a half months later, showed no remains of it. In the latter, on the other hand, no absorption appears to have taken place. The tubercles remained quietly beneath the skin, the incisions healed by primary union, and one of these tubercles, when removed eleven months later, was found to have undergone caseous degeneration and to be surrounded by a capsule of false membrane, beyond which no bacilli were found.

It must be noted, with reference to these two animals, that they

had other opportunities of becoming leprous. The cat was vaccinated three times from three different lepers, and the fowl was vaccinated once, and, in addition, was fed on a quantity of leprous material. On no occasion was any vaccine vesicle observed. It would appear that cats, fowls, and guinea-pigs are insusceptible to the virus of cow-pox. As to the fowls which were fed on leprous material, far from suffering from it, they became plump and in good plumage. Inoculation with scrapings from leprous ulcers gave equally negative results, the scarifications drying immediately and scabs forming.

So far, then, I have been unable to find even the localised growth of leprosy-tubercle described by Neisser, much less any general infection after inoculation.

I have a number of animals still under observation, and I hope to extend these experiments further by the aid of cultivation.

THE DISTRIBUTION OF THE LEPROSY BACILLUS.—This paper is based on 420 observations made without selection on 185 lepers who have been under my care in the past two years. The condensed results are given in three tables. To preserve uniformity, for the sake of comparison, the same method of staining, a modification of Ehrlich's, was pursued throughout; magenta being used, without a contrast stain, in order to save time. Table I gives a general analysis of the occurrence of bacilli in the total number of slides examined. It will be seen that they were numerous in fifty-six, generally diffused in twenty-one, and few in twenty-three; or, in short, that they were found in one hundred out of four hundred and twenty observations, or nearly 24 per cent. In fourteen observations they were doubtful, and in three hundred and six observations none were found.

Table II is arranged to show the relative occurrence of bacilli in the various forms of leprosy occurring in the one hundred and eighty-five patients examined. A great preponderance of bacilli in tuberculated cases will be observed. Thus, of the sixty-two patients in whom bacilli were found, forty-one were tuberculated; in twenty-eight of these the bacilli were numerous. In sixteen more the disease was mixed, in thirteen the bacilli being numerous. This leaves only five anæsthetic cases in which bacilli were found.

This is still further borne out in Table III, which shows the material in which bacilli were found. Out of one hundred successful searches, in fifty-nine observations the bacilli occurred in the juice squeezed or scraped from fresh tubercles. In this connection it may be noted that twenty-seven observations on material taken from vaccine vesicles, or pustules in lepers, tuberculated, anæsthetic and mixed, failed to show bacilli in any of them. This is a point of interest with reference to the alleged communication of leprosy by vaccination.

Thirty-four observations were made on the blood in the different forms of leprosy, but in no case were bacilli found. In twelve of these observations the blood was examined during the fever accompanying a fresh outbreak of tubercles, but these observations were equally unproductive. Next to tubercles, the femoral glands and larynx were most fruitful in bacilli, the former showing them in thirteen cases, the latter in eight. In the testes they were only found twice, as also in the median nerve.

I do not wish to claim these observations as being in any way conclusive. Errors of experiment are so easily made, that one series of observations is not enough to decide the localisation of bacilli in leprosy. The figures may, however, give a rough idea of the distribution of bacilli in the different forms of leprosy and in the various tissues and organs. If bacilli are as common in the viscera as some writers seem to think, they are, at any rate, much harder to find by the ordinary methods; for whereas magenta showed them very frequently in juice scraped from tubercles, it never undoubtedly showed them in scrapings from kidney, liver, spleen, or brain. In the four cases in which bacilli were found in phthisical lungs and sputum, it may fairly be doubted if they were not tubercle bacilli. This point I hope to be able to decide by cultivation in similar cases in the future.

TABLE I.—Showing the Proportion of Observations which yielded Bacilli to the Total Number of Observations.

Numerous	..	..	..	..	56
Generally diffused	..	..	..	..	21
Few	..	..	..	..	23
Doubtful	..	..	..	..	14
None	..	..	..	..	306
Total	..	..	..	..	420

Present in 13%, or nearly 24 per cent.

TABLE II.—Showing the Proportion of Patients in whom Bacilli were found, to the Total Number of Patients examined.

	Tub.		Anæsth.		Mixed.		Total.		Grand Total.
	M	F	M	F	M	F	M	F	
Numerous	19	9	—	—	10	3	29	12	41
Generally diffused	5	2	3	1	1	—	9	3	12
Few	4	2	1	—	2	—	7	2	9
Doubtful	2	—	5	—	—	—	7	—	7
None	15	6	60	22	8	5	83	33	116
Total	..	..	..	..	..	..	..	..	185

Present in 13%, or 1/4 of the patients examined.

TABLE III.—Showing the Relative Occurrence of Bacilli in the various Fluids and Tissues which yielded them.

	Numerous.								Generally Diffused.								Few.								Grand Total.								
	Tub.				An.				Mix.				Total.				Tub.				An.					Mix.				Total.			
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F	M	F				
Juice of tubercle	18	8	—	—	7	2	25	10	5	7	—	—	1	—	6	7	6	3	—	—	2	—	8	3	—	—	59						
Discharge from suppurating tubercle	—	1	—	—	4	—	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5						
Discharge from ulcer	—	—	—	—	1	—	1	—	—	—	—	—	1	—	—	1	—	1	—	—	—	—	—	—	—	1	3						
Discharge from pustule	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	2						
Scraping from larynx	1	—	—	—	3	1	4	1	2	—	1	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	8						
Scraping from femoral gland	1	2	—	—	3	—	4	2	—	1	—	1	—	—	2	1	—	1	1	2	—	4	1	—	—	—	13						
Scraping from phthisical lung	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	—	—	—	3						
Phthisical sputum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1						
Scraping from exuberant granulation-tissue	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	2						
Scraping from testes	—	—	—	—	1	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	2						
Scraping from median nerve	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—	2						
Total	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	100						

OUTBREAK OF ENTERIC FEVER IN AN ISOLATED CLUSTER OF HOUSES AT MEXBOROUGH.

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THE following history is, I think, interesting, because it supplies: (1) some data as to the time required for the development of the effective enteric poison in excrement; (2) a good example of an outbreak of the fever traced to faecal exhalations alone; and (3) an example of modification in the type of the disease, when caused by air-pollution only.

The following is a rough plan of the houses affected.

Up to November 26th there had been no cases of enteric fever in these buildings for six months. On that date, No. 13 (marked with cross in plan) hitherto unoccupied, was taken by E. D., a collier, aged 26, who was not feeling well at the time. He had come from the house of a brother-in-law in a neighbouring village, where he had