CONCLUSION: A PLEA FOR BACTERIOLOGICAL STUDY
AND RESEARCH.

In putting before you certain aspects of the present position of this branch of science, my aim has been to indicate that bacteriological knowledge, though already advanced to a prominent place in the forefront of human progress, still presents so many crucial problems that its further advancement must be continuously maintained. Effective teaching is vital to the progress of a science, and the student must be taught in the research atmosphere if he is to gain any real inspiration from his studies. In these respects the universities, as apart from the purely research institutes, present the ideal conditions for the advancement of science, and therefore, in inaugurating my work in this historic seat of learning which has contributed an important share to the world's stock of knowledge, I would venture to make an earnest plea for the fullest possible encouragement of bacteriological teaching and research, both in the immediate interests of medicine and in the greater and wider interests of human welfare.

SANITARY ADVANTAGES OF SOCIAL
AMENITIES.AN ADDRESS DELIVERED BEFORE THE METROPOLITAN
COUNTIES BRANCH,

BY

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THE County Borough of West Ham, which I have the honour to serve, is situate on the River Thames, but I doubt whether most of the members of the Branch, if given a drawing of its sinuous curves between Richmond Lock and Tilbury Fort, could place the borough in its correct position on the river bank, or could accurately describe its chief characteristics. Unkind folk have alleged that West Ham is readily recognized—witness the patronizer of the Belle steamers, plying in the summer between Fresh Wharf and Margate, who said he knew when he passed Silvertown by the row of chimneys belching forth black smoke; and there is a fairly authentic legend of an elegant young lady who, when the train came to a standstill in a thick fog and her mother said, "I wonder where we are," replied, "Oh, we are at Stratford; I can smell Pa's factory."

It will be my endeavour to enlist interest in the past history of the district—which, thanks to the patient labours of Katherine Fry, who with her eminent sister Elizabeth Fry lived there for many years, has been studied and placed on record—and to consider what bearing, if any, the changes that have occurred may or may not have had on the present-day problems of the inhabitants.

The River Lea, which separates the counties of Herts and Middlesex from Essex, and the River Roding some four and a half miles to the east, which enters the Thames near the ancient town of Barking, enclose, with the River Thames and the southern border of Epping Forest land, a quadrilateral area now occupied by the county boroughs of West Ham and East Ham, but formerly covered by the great Essex forest with some arable pasture and extensive marshes bordering the royal river. It is not surprising that Roman remains have been discovered, as the vicinal way passed through or a little to the north of the area, and Boadicea, Queen of the Icenii, who laid London in ashes A.D. 61, probably brought her forces through the same route.

One of the earliest references to the district occurs in connexion with the burial of St. Erkenwald, Bishop of London, who died at Barking Abbey in 685 while on a visit to his sister St. Ethelburga, the first Abbess. Visitors to Epping Forest even now in the height of summer can occasionally find themselves in a morass unexpectedly, and extensive floods from the swollen rivers before mentioned are still a burden to the district, and it would appear that an exceptional storm interrupted the passage of the Bishop's corpse on its journey from Barking to St. Paul's. A later writer,

gifted with greater love of the miraculous than of scientific investigation, records how

"All the people kneeled down and prayed devoutly and as they were in prayer they sawe the water divided lyke as it did to Moyses in the Red Sea and to the children of Israel goynge through into the deserte. In lyke wyse God gave a drye path to the people of London for to convey this holy body through the water to the Cytee and anon they took up the body with great honour and reverence and by one assent they hurried through the path, the water standyng up on every syde and so they came to Stratforde and set down the bere in a fair mede full of floures."

Every schoolboy knows how King Alfred in 895 stranded the ships of the Danes at Ware by cutting channels so as to divert the course of the River Lea, but few who cross them know that there are four streams passing through Stratford from a bend in the Lea which are traditionally the enlargement of Alfred's original undertaking. On this point it would be waste of time to argue with a Stratford man.

By the Domesday Book we learn that the quadrilateral area mentioned was labelled Hamme, and was, prior to 1066, in the ownership of two Saxon freemen, Alesxan and Leured, but soon after that fated year passed into the possession of two Norman Barons, Ralph Peverell and Robert Gernon. Little is known of the after-history of these worthies, but during the next two centuries the chief family connected with the district was that of Montfichet, which possessed extensive lands in Essex, including several manors in Hamme. Originally from the neighbourhood of Cerisy in Normandy, a Sire de Montfichet accompanied and aided William the Conqueror at the battle of Hastings. According to Stow he appears to have built "Montifiquet's Castle" a little to the west of Baynard's castle at Blackfriars, and to have been among the hunters in the New Forest when William Rufus was shot. Either he or his son came into possession by marriage, for in 1134 William de Montfichet II was a capital lord of Hamme, where he established the Abbey of Stratford Langthorne, endowing it with his demesne and two mills near Stratford Causeway. The most redoubtable member of this family was the last of his line, Richard de Montfichet II, who was a minor when his father died in 1202, but is named by Stow along with Robert Fitzwalter and Robert FitzRoger as "three most forcible and valiable Knights of England." He was one of the twenty-five Barons chosen to enforce the observance by King John of Magna Charta, was Sheriff and Forester of Essex, Governor of Hertford Castle, and assisted Henry III against Louis VII of France, and on more than one occasion against the turbulent Welsh. He died childless in 1267 and was buried in St. Paul's Cathedral, his extensive possessions ultimately being divided among the descendants of his three sisters, and what remained was subsequently acquired by smaller landowners, because by this time the greater part of West Ham had become the property of the monks of the Abbey of Stratford Langthorne.

In the meantime Queen Maude, wife of Henry I and daughter of Malcolm Canmore, King of Scotland (an additional title inserted for the benefit of Scottish members of the Branch), had suffered while crossing the Lea at Old Ford a similar disaster to that which befell the cortège of St. Erkenwald, and to avoid a repetition she constructed what is reputed to be the first bridge built with a stone arch in England at Bow, a second bridge over the Channelsea stream, and a causeway between the two. These bridges and causeway not only proved a great benefit to Hamme but also to London, which derived much of its food supplies, garden produce, potatoes, and especially flour from the several mills at Stratford, but they became a source of much contention and litigation from the time of Henry II to Queen Victoria. Queen Maude placed the maintenance and repair of the bridges and causeway in the hands of the Abbess of Barking, endowing them with certain lands and a mill. The Abbess transferred her trust, at his request, to the Abbot of Stratford Abbey on its foundation. Subsequent Abbots constantly neglected their responsibilities until forced by the courts to comply, and after the dissolution of the Abbey on March 18th, 1538, subsequent owners of what had been Abbey lands endeavoured to avoid their liability for the necessary repairs or for paying the Abbey land rate. The upkeep was finally taken over by the local board in 1876 (for a consideration), so that visitors who now motor to

Brentwood or Southend need not concern themselves with doubts as to the substantial character of the causeway between the Lea and the Channelsea, but they might profitably remember the virtues of good Queen Maude.

In Queen Elizabeth's reign our population grouped itself into three villages—a central one between the parish church and the site of the Abbey, a straggling hamlet round Stratford Green in the main Essex road, and a pleasant pastoral colony named Plaistow near the southern marshlands. The monks during their four hundred years' residence had established a trade with Italy in wool, while Stratford from its favourable situation and the numerous mills on the water-courses had long been famous for its bread-making, a trade largely carried on by the fair sex, for we read, I regret to say, of many bakeresses being fined for giving short weight, while, according to Stow, John of Stratford in the fourth year of Edward II, for making bread less than the assize, was with a fool's hood on his head and loaves of bread about his neck drawn on a hurdle through the streets of the city. The Earl of Leicester fixed upon Stratford as a suitable lodging for the Virgin Queen at the time of the Armada, but Her Majesty preferred to visit her troops at Tilbury by river trip. She possibly remembered a previous visit to the district when, as Miss Strickland tells us, in the youthful charms of her twentieth year she accompanied her step-sister, who was nearly double her age, from Wanstead to London on the occasion of Queen Mary's accession—a prelude soon to be followed by Elizabeth's incarceration in the Tower.

Under the Stuarts and the Hanoverians the district was largely devoted to sheep-farming and market gardening, being specially noted for its potato crops; while at the same time it grew in favour with the wealthy citizens of the metropolis as fashion prescribed a country residence, so that many handsome mansions, surrounded by gardens and coverts, were dotted throughout its area. Unfortunately the proximity of the Forest offered exceptional opportunities for highway robbery, and West Ham afforded domicile during some period of their depredations both to Henry Cook, who doubled the characters of highwayman and shoemaker at Stratford and was hanged in 1741, and to the more famous Dick Turpin, who was apprenticed to a butcher in Plaistow, was hunted from his fastness in Epping Forest, and ended his career on the gallows at York in 1739. Possibly both these evil-doers on occasion consulted Dr. Samuel Jebb of Stratford, the father of Sir Richard Jebb, Physician in Ordinary to George III. Opinions will differ as to whether it is a mere coincidence or a natural consequence that the locality which once harboured Dick Turpin now contains many firm believers in the Capital Levy. As a set-off we lay claim to distinguished past residents in the persons of the Duke of Somerset, Protector during the minority of Edward VI; of Edmund Burke, who lived some time in Balaam Street, Plaistow; and we are still the proud possessors of Upton House, in which Lord Lister was born (1827).

When Queen Victoria came to the throne the population had not reached 12,000, but in 1847 the Eastern Counties Railway established their works in the northern part at Stratford, and in 1866 the Victoria Dock was constructed in the south; there followed rapid increase in factory building, congeries of streets and swarms of people, changing in fifty years a rural arcady into a busy manufacturing town, the growing areas extending from north and south as from two epiphyses, to join with what was originally the main central village.

It would be interesting to know the sanitary conditions affecting the population during the various phases of the past, but the indications afforded by the scanty records that remain lead one to conclude that, despite its reputation for sylvan amenities, the district did not escape epidemic disease. During the great plague West Ham, like other country districts, was considered a haven of refuge, and the City Fathers had their exchange at a local hostelry called the Spotted Dog, still flourishing, especially on football afternoons; probably the building was chosen because many merchants resided in the vicinity. The entries of burials in the parish registers show a fair proportion of deaths from plague. Small-pox, too, is no respecter of

localities or of unvaccinated persons, and in our parish church is a fine monument recording the deaths in 1709 of Amherst Buckeridge, aged 28, and of his sister Eleonore. The inscription states:

"Amherst and Eleonore lived to be remarkable for their great dutifulness to their parents, for their most affectionate kindness for one another, and for their being inoffensive and obliging to everybody. These both died of Small-pox in 15 days' time, one after the other, and whether the grief of Eleonore for the loss of her brother or the small-pox contributed most to her death is uncertain."

Sir Thomas Browne informs us that "some think there were few consumptives in the old world when men lived much upon milk and that the ancient inhabitants of this island were less troubled with coughs when they went naked and slept in caves and woods than men now in chambers and feather beds." Perhaps that is why Richard Mead, two centuries ago, adopted the open-air treatment by sending his consumptive patients to live on Plaistow marshes. At present we send our consumptives to live somewhere else, not because the marshes were unsuitable, but owing to their disappearance, for our present temporary sanatorium is erected in a district of a similar character.

Civilization and communal comfort have advanced apace since Edwin Chadwick, Southwood Smith, John Simca, and their associates forced on public attention the dangers arising from the grosser examples of insanitation, accompanied by annual death rates of 30 or more per 1,000 of the population in urban areas—impure water, decaying hovels, foul streets, want of sewage disposal—all of which reduced to a common denominator meant filth, and we are enjoying the benefit of the fulfilment of their prophetic vision.

Each succeeding age rests upon the shoulders of its predecessor, and we are able to recognize a series of sanitary strata in the life of the nation, as the archaeologists point to layers of towns on the site of Troy—periods of time remarkable for various developments in the direction of public health amenity. Individual sanitarians, specializing on one or more factors of a harmful character, have so focused the interest of their fellows upon their own pet hobby as to secure legislation affecting groups of diseases or classes of the community, with the result that one period stands out as an apostolic age firm in the faith of vaccination against small-pox, another period as pioneer in the isolation of infectious diseases, a third fascinated by the need for factory legislation, and a fourth devoted to the eradication of tuberculosis. The fact that earlier prophecies with regard to the disappearance of tuberculosis still await fulfilment—owing, partly to the war and partly to exuberant optimism—need not damp our ardour, especially since Professor Dreyer's research into defatted antigens; nor need we cease our duty to secure proselytes because a later generation has lost some of its faith in vaccination. Rather let us rejoice that, acting on the advice of Shakespeare, "Wise men ne'er sit and wail their woes, but presently prevent the ways of wail," the pamphlet on *Small-pox and Vaccination* issued by the British Medical Association is evidence that we intend to keep the flag flying.

The increasing knowledge of the causes of disease, the extension of bacteriological investigation, and the romance attending the part played by insects in the conveyance of maladies in tropical and temperate climes, have led the present generation one stage higher by the recognition that all medicine is ultimately preventive and that the claim of the community to protection from sickness overrides the claim of the individual to personal liberty, with the necessary corollary that mass sanitation and group hygiene must be supplemented by organized inspection and treatment of their several units—a policy finding a partial practical consummation in the joint action of central and local authorities in connexion with tuberculosis, venereal diseases, and schemes for maternity and child welfare, and the medical treatment of school children.

Sir George Newman has championed the modern policy with no uncertain voice in his public statements, and with forceful language in his illuminating reports, and few will cavil at his recent insistence upon the essential need for levelling up the individual medical practitioner, and, I humbly admit, especially some individual medical officers

of health, in order to ensure the healthiest life for each individual man and woman; and even for each foetus to be given an equality of opportunity—so far as that is possible.

So far I have dealt with general principles, but what are the particular amenities of my own district? Like the generality of mundane conditions they are a mixture of good and bad, sunshine and shadow, homely joys, and destiny obscure. Our comparative youth gives us freedom to some extent from some of the worst evils of slumdom; but our rapid growth during the early building boom, when many houses may be said to have been stuck in the mud, has accentuated the universal difficulties of dealing with the present housing problem. The limitation of most of our dwellings to two stories affords the lion's share of sunlight, but this advantage is discounted by the incense which we and our neighbours offer up to the heavens in the form of black smoke; as the greater part of the area is below Trinity high-water mark it may well be supposed that our respiratory functions are subjected to and affected by a denser atmosphere than pertains in more elevated districts, though doubtless rigid research would be required to demonstrate deleterious effects.

Our chief characteristic, however, remains that we are one of the largest and possibly poorest of industrial towns which, taken as a group, compare very unfavourably in respect of their mortality with the country as a whole or with other groups of towns, and *prima facie* West Ham should exhibit an exceptionally heavy death rate. But such is not the case. I will not weary you with statistics—they are recorded by the Registrar-General—but merely make the assertion. The administrative county of London, our immediate neighbour and rich relation, is acknowledged to be one of the healthiest cities in the world, and was rightly claimed by my predecessor to be the triumph of medicine; but while allowing London to be *facile princeps* I claim that West Ham is *proxime accessit*. For a long series of years the annual death rate of the borough has compared not unfavourably with that of the administrative county; the few exceptions have been not more than one or two units per 1,000 of the population, and in some instances merely a decimal point higher. Incidentally you may be assured that the attention of the borough council has been directed to those rare occasions when the death rate was below that of Brighton. Similarly with regard to the deaths among infants, in respect of which a heavy death roll is generally exacted from industrial towns, the decline in infant mortality which has been a distinguishing feature throughout the country during recent years has been equally marked in West Ham, where it has sunk to a figure which at the beginning of the century would have been considered phenomenal.

Without doubt the practical application of the increasing knowledge supplied by scientific workers towards combating all forms of sickness, and especially what Osler called the four killing diseases, has operated as one factor in reducing the death rate by the postponement of death; but just as the four elements—earth, air, fire (in the form of sunshine), and water—are still as potent factors in the economy of Nature as in the days of Hippocrates, so are there still several widely diffused deleterious influences which tend to communal shipwreck and to which it has been my object to direct your attention, as they are not only germane to my subject but appear to offer some answer to my proposition.

Since I prepared these notes Sir Arthur Newsholme, in an address on things that matter in public health, has insisted again upon the direful effects of these influences, and urged that to reach the goal of civic salvation we must sweep away the obstructions of poverty, intemperance, ignorance, and vice. In a few words let me try to show that the various authorities in West Ham are and have been working on these lines according to their ability.

With regard to vice in general, while willing to admit that we are no better than we ought to be in Stratford, we boldly maintain that we are not so bad as some of our neighbours. As for the specific vice of venereal disease we have not only organized, in association with the National Council for Combating Venereal Diseases, special

propaganda campaigns, but before the appointment of Lord Trevelth's committee the county borough council passed a resolution in favour of allowing pharmaceutical chemists to sell drugs for self-disinfection. That a legal decision prevented the chemists from adopting the decision does not detract from the good intention of the council, which, judging from the said committee's report, was merely a little premature.

Ignorance implies want of either general or special education, both of which are only of social value if they beneficially influence conduct. West Ham has to educate not only the children of its own workers, but also those of many of the workers in London, and is notoriously one of the most necessitous areas in the matter of levying an education rate. During the year 1920-21, while the cost per child for elementary education in 82 county boroughs averaged £213, the cost per child in West Ham amounted to £282, which amount was only exceeded by Bradford and Halifax. I am not aware that any complaint has been lodged that we are extravagant, and may therefore place my town among the wranglers in any list of education authorities claiming to be stalwart fighters of ignorance. The introduction of hygiene into the syllabus of the schools has greatly increased the power of the teachers to aid social amelioration, while with regard to conduct one must not forget the devoted bodies of religious and social workers, the value of whose services resemble the silent forces of Nature—frequently unobserved but none the less incalculable.

There is no need in an assembly such as this to stress the evils of intemperance, nor do I wish to discuss the question of total abstinence. Suffice it to say that while some of us may not be prepared to accompany our abstaining colleagues all the way into the arid confines of prohibition, we may all agree that if the means to do ill deeds make ill deeds done the reasonable reduction of facilities for alcoholic abuse will diminish its evil effects, and in this respect our industrial town is somewhat exceptional. In 1887, when the administration of the licensing laws was transferred to the justices, the population was 186,000; in 1922 it was 300,905. In 1887 the number of licences was 366, in 1922 it was 295; so that while the population increased by 114,905 the licences decreased by 71. Again, last year (1922), in the fifteen largest county boroughs in England the average population to each on-licence was 604; in West Ham the average population was 1,583, or two and a half times as great. The convictions for drunk and disorderly conduct sank from 2,261 in 1911 to 602 in 1921, and he would be a particularly uninformed or prejudiced medical practitioner who would deny even without examining the returns that during the same period the Pale horse of the Apocalypse met a diminishing number of sufferers from alcoholic diseases to pass behind him to Hades.

The poor we have always with us, and in a factory and dock district even in flourishing times casual labour and poverty go hand in hand. Boswell records a dictum of Dr. Johnson thus:

"A decent provision for the poor is the true test of civilization. Gentlemen of education were pretty much the same in all countries; the condition of the lower orders, the poor especially, was the true mark of national discrimination."

Now to test the discrimination of our local board of guardians in respect of outdoor (that is, domiciliary) relief it may be proper to deal with a normal period rather than with a time of exceptional distress, as exists at present from super-unemployment, in which an average weekly cheque of £6,000 for relief has on occasion risen to £22,000. Taking, therefore, the last normal year—that ending March 31st, 1920—the average weekly cost of domiciliary relief per person in receipt of relief was nearly 5s. 7d. for England and Wales, as compared with 6s. 2d. in West Ham. Sixpence a week may appear a trivial sum, but to a widow with three or four dependent children the 2s. or 2s. 6d. weekly it means to her represents an appreciable amount of her total income available for the sustenance of her self and family. To-day in such a case the scale of relief has risen to 5s. weekly for each child and 10s. or 15s. for the mother, with a rent allowance according to circumstances. This may,

appear to err on the liberal side, but the guardians, rightly or wrongly, hold the view that relief should be adequate to the needs of the applicant, and particularly in the case of children, who, well fed rather than half-starved, are much less likely later on to fall victims to sickness and be thrown again on local rates. This surely is an enlightened policy which is followed by the borough council in supplying dried milk free under a liberal wage scale to nursing mothers and young children, as well as by generous provision of convalescent treatment for ailing youth. Carping critics allege that relief schemes foster indifference and mendicancy. It may be so in isolated cases, and occasionally one meets with what at first sight appears to justify the criticism. For instance, my chief clerk, crossing the hall corridor, met a little vulgar boy. "Well, my little man, what do you want?" said he. "Please, sir, mother says will you put on a piece of paper what's given away?" His mother's request was not granted, but I fancy assistance followed investigation, and those who practically deal with relief know that the black sheep in every flock are few.

The Autocrat of the Breakfast Table said that no fresh truth ever got into a book, and I have merely been telling you what you know. With much you must agree; from some you may differ—a happy result if it lead to a stimulating discussion, for the man who proudly boasted that he had not had a disagreement with his wife for twenty-five years was promptly told by a sensible woman present that he had led a milk and water existence. In any case, whether I be charged with endeavouring to kill the slain or with setting up West Ham in rivalry with Epidauros and Cos, I care not; my good intention (not a paving stone, I trust, in this case) has been, in legal phraseology, to obtain a writ certiorari that while it is given to the few to achieve greatness and associate their names with some definite hygienic advance, each one of us, whether medical or lay, official, burgess, or representative (if we only have power to live up to our ideal), by lending our aid to wisely directed efforts to eradicate the social evils I have referred to, can definitely improve the public health of the community among whom we dwell and help on the world in its slow but sure journey to ultimate goodness.

In the stirring language of a recent writer to the *Times*, "The ideal is the only real and lasting fact of life, and a man's worth is conditioned by the effort he makes to attain it. He who has given up belief in the certitude of our manhood's perfection must sink back to the indignities of the man with the muck-rake, with eyes bent to earth, forfeiting the true wealth of reality for the glitter of things which leave their possessors in final beggary."

THE TREATMENT OF TUBERCULOUS DISEASES:

THE EFFICACY OF SODIUM MORRHUATE INJECTIONS COMPARED WITH OTHER TREATMENTS.

BY

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Of all the treatments used for the arrest or cure of tuberculous diseases, apart from or in conjunction with sanatorium treatment, that by means of injections of tuberculin or other chemical preparations has probably been most widely and often most successfully employed. Having had a fairly large experience, extending over nearly twenty years, of these methods, and finding that as time went on I was able steadily to improve upon my procedure, is my excuse for writing this paper.

TUBERCULINS.

Many will remember the time when, in 1890, Professor Robert Koch, somewhat against his own wish and before he had completed all his investigations and experiments, was forced by the Government to publish the outline of his new treatment by injections of a "lymph" which he called tuberculin, and which is still known and used under the name of O.T. or old tuberculin.

I have before me a pamphlet, published by the late Professor Anderson Stuart of the Sydney University in

1901, entitled *A Report to the Governments of New South Wales, South Australia, and New Zealand on the Koch Method of Treating Tuberculosis*. The report is interesting but disappointing as regards some of the results. We thought that at last a remedy had been found to exterminate this dread disease. People afflicted with it flocked to Germany from all parts of the world, full of hope, a few to return with their disease arrested, many never to return at all. A treatment which with all its failures could in some cases bring about such startling recoveries was so remarkable that it would have been surprising if it had been altogether shelved. Far from it. It is the foundation stone on which the whole structure of our modern tuberculin treatments has been built.

Some of the first books published on this subject by Camac Wilkinson (1908), Bandelier and Roepke (1911), Riviere and Morland (1912), and others, were all based on Koch's original discoveries. All these authors recommended treatment by Koch's method in a more or less modified form, by subcutaneous injections of various tuberculins in gradually increasing doses at intervals regulated by the resulting reactions (see Appendix A). Of patients treated by me by this method from 1905 onwards there are still a good many alive and well. In contrast to the milder treatment recommended by Sahli I shall call this Koch's treatment.

A few histories of patients with rather advanced disease will suffice.

Case 1.—1905. Mrs. G., aged 30 years, weight 41 kg.; ill five years; pronounced tuberculous family history. Both apices affected. Right lung, first stage (Turban's); left lung, second stage; frequent hæmorrhages and severe asthma. Sputum contained tubercle bacilli (Gaffky X). Disease arrested after two courses of tuberculin injections. Relapses in 1909 and 1920 easily remedied, the first by tuberculin, the last by sodium morrhuate injections. Weight 79 kg. All this time this patient lived in Sydney, which, on account of its warm and moist north-east winds in summer, is rather inimical to patients suffering from tuberculosis. Practically all the other patients whose history is given were treated under the same climatic conditions.

Case 2.—1909. Bro. J. M. Left apex, third stage. Tubercle bacilli in sputum (Gaffky X). Treatments with O.T., P.T.O., and P.T. Quite well to-day and sputum free from tubercle bacilli.

Case 3.—1909. Mr. L. L., aged 28 years. Urine contains pus and tubercle bacilli. Diagnosis: Tuberculosis of right kidney. One course of treatment with P.T.O., P.T., and T.B.E. injections. Apparently well. Urine quite clear. Relapse 1914. Treated with P.T.O. and P.T. injections. Quite well at present date. Looks picture of health.

Case 4.—Mrs. L. L., wife of last patient, was treated in 1910 for tuberculosis pulmonalis. Has had no recurrence since.

Case 5.—October, 1909. Mr. J. H., aged 36 years, weight 63.5 kg. Right apex, second stage. O.T. test positive. Ill twelve months. Diagnosis: Tuberculosis pulmonalis. Six months' treatment with T.B.E. and P.T. Well in May, 1910. Weight 73.5 kg. February, 1911, O.T. test negative. Quite well to-day.

Case 6.—February, 1912. Mrs. J. H., wife of previous patient. Aged 25 years; weight 52 kg. Right apex, second stage. O.T. test positive. Ill two months. Diagnosis: Tuberculosis pulmonalis. Eight months' treatment with T.B.E. Weight 59 kg. Well to-day.

Case 7.—February, 1912. A. H., daughter of the two previous patients, aged 10 years; weight 29 kg. Right apex, first stage. Von Pirquet test strongly positive. Ill six months. Three months' treatment with T.B.E. Well; weight 32 kg. August, 1916: O.T. test negative; weight 52.5 kg. Strong and well to-day.

Case 8.—February, 1916. Mr. J. J. S., aged 32 years, weight 57 kg. Right apex, third stage; left apex, first to second stage. Sputum contained tubercle bacilli (Gaffky X). Sent out from England as incurable. Seemed almost hopeless case. Diagnosis: Tuberculosis pulmonalis. After twelve months' treatment with P.T.O. and P.T. quite well; weight 62 kg. Has just returned from a trip to England well.

I could quote many other histories of patients treated many years ago who are still in good health. All I want to show is that by means of Koch's treatment it is possible to bring about more or less lasting arrest of advanced tuberculous disease. Still, in spite of all these successful results I was never quite satisfied, as in some cases, however small in number, Koch's treatment seemed to fail. Some patients did not improve at all, while others after an initial improvement seemed to relapse. Besides, it did not seem a suitable treatment for ambulatory cases, as patients sometimes during a severe reaction had to lay up for a day or two. On the whole patients afflicted with tuberculosis pulmonalis in all stages seemed to do better than so-called "surgical" cases—a term which I only use because up till