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Treatment of Surgical Cases
of Tuberculosis by Koch's Remedy
by
Gilbert Barling

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ON THE TREATMENT OF SURGICAL CASES
OF TUBERCULOSIS BY KOCH'S REMEDY, WITH
ABSTRACTS OF FORTY-FOUR CASES.*

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GENTLEMEN—

It is now five months since Koch announced that he had discovered a remedy for Tuberculosis. More recently he has given an outline of the way in which this material is prepared, and we know that it is a solution in glycerine of the products derived from pure cultivation of the tubercle bacillus, and the remedy is now referred to concisely as Tuberculine. The time that has elapsed since the publication of Koch's first paper has been occupied by many of us in observing cases treated in England and elsewhere by his remedy, and it is evident that there is considerable diversity of opinion as to the value of Tuberculine as a therapeutic material. For this reason I think the Society has done well to arrange for this discussion.

In the brief time at my disposal to-night I shall confine myself mainly to the consideration of the broad questions whether Koch's statements are borne out by experience, and whether we

* Read at a meeting of the Midland Medical Society April 15th to open a discussion on Koch's treatment.

have a real remedial agent in our hands, or something which, whilst of surpassing interest to the physiologist and the pathological experimentalist, is of no value to us as practitioners of medicine and surgery. Many questions must remain for future solution—the regulation of the dose, both as to amount and as to frequency of repetition; whether some classes of cases are more suitable for the treatment than others; under what circumstances Tuberculine should be used in conjunction with operative measures; and perhaps most important of all, whether the present improvement in our patients will be permanent or not.

In his original paper Koch stated several propositions, amongst them the following:—

1. The healthy human being reacts either not at all, or scarcely at all, to 1 cg. of the fluid.
2. That tuberculous patients are affected by smaller doses than this, as shewn by general reaction or constitutional disturbance and local reaction.
3. That patients suffering from diseases other than tubercular are not more affected by the remedy than healthy people.
4. That the symptoms of reaction occur without exception in all tuberculous patients after a dose of 1 cg., and that therefore the remedy will form an indispensable *aid* to diagnosis.
5. That the remedy in lupus, gland, bone, and joint tuberculosis can be given in doses of 1 cg. for the first injection and in rapidly increasing doses.
6. That by the treatment in lupus, glandular, bone and joint tuberculosis, a speedy cure in recent and slight cases, a slow improvement in severe cases is to be obtained.
7. That phthisis in the beginning can be cured with certainty by this remedy.

I propose to say something briefly on all these points except the seventh, which will be more properly dealt with by Dr. Carter, who speaks after me. Having discussed these points, I shall describe to you the results of treatment in about forty cases, grouping these, as far as possible, into several classes.

Proposition 1. We come first to the quantity necessary to produce reaction in healthy persons, which is said to be 1 cg., and which we may conveniently term the physiological dose. My strong impression is that this physiological dose is not absolute, but varies considerably with the susceptibility of the individual. I have not been in the habit of injecting healthy people indiscriminately to prove this, but it is forced upon me by the varying effects produced by tuberculine in patients under treatment, in whom the amount of general reaction does not appear to be proportionate to the amount of mischief present, and by the fact that in case No. 6 a dose of 4 mg. produced a temperature of 104; in No. 2, 6 mg. produced a temperature of 100.8; and in No. 5 a dose of 3 mg. produced a temperature of 103, although there is not the faintest reason to suppose that either of these patients was tuberculous. It must however be observed that those who have been much in the *post mortem* room are familiar with the fact that quiet tubercular lesions are occasionally found there of which no clinical evidence existed during life, and some such may account for the general reaction which is apt to be attributed, in apparently healthy people, to the idiosyncrasies of the patients.

Proposition 2. That tuberculous patients are affected by smaller doses than the healthy, and that this is shewn by general and local reaction, appears to me to be very generally true. Of the forty-four cases in the tables, the majority were in the General Hospital, where I was able to see them at all hours. In every *certainly* tubercular case under my *immediate* supervision not one failed to give *general* and *local* reaction to Koch's physiological dose of 1 cg., and nearly all of them to a much smaller dose, several of them, indeed, to a dose of 1 mg., as can be seen by referring to the reports of cases.

It is necessary to say a few words about the Reaction. It is most important to separate this into the general or constitutional, and the local reaction. The general reaction consists in elevation of temperature, quickened pulse and respiration, headache, pains in the back and limbs, shivering perhaps, and

vomiting, somnolence also is often present. These symptoms are not in any sense *specific* to tuberculine, if I may so put it, but may be produced by the absorption into a patient's body, whether he be tuberculous or not, of products derived from the growth of other organisms besides the tubercle bacillus. We see this illustrated in the Sapræmia which occasionally follows parturition or instrumentation in the urethra. When therefore a patient has these signs of constitutional disturbance, with a small dose of tuberculine, say 5 mg., I am not prepared to accept this general change as certain evidence that tubercular disease is present, unless it is associated with local reaction. I therefore, you will see, exalt this local change into a much higher position than the general one.

In what does the local reaction consist? Well, it varies considerably in the different lesions. Nearly everyone is conversant with what occurs in lupus, of whatever variety, increased redness, tension, dryness, pain, giving place to exudation and perhaps to actual necrosis.

In laryngeal tuberculosis we are able to watch similar changes with the associated hoarseness to which they give rise.

In gland tuberculosis we have swelling, sometimes redness of the skin, and tenderness, and occasionally rapid breaking down into suppuration.

In joints we have swelling, heat, increased pain, and sometimes increased suppuration.

If we have to deal with a tuberculous ulcer in connection with hip disease, or after excision of a tubercular rib, the sore first becomes reddened at its margins, the granulations dry on the surface, and there is generally tenderness around; this gives place in a few hours to increased secretion *pro tem.* and the granulation surface cleans up.

In a case, No. 28, of tuberculosis of the urinary passages there was increased irritability of the bladder, increased pain in the loin, and increased separation of pus.

The question of local reaction in phthisis will doubtless be raised by other speakers.

Proposition 3. That patients suffering from diseases other than tubercular, are not more affected than healthy people, appears to be generally true, but I have not been pursuing this question at all extensively ; the rule, however, held good in cases No. 1, 2, 3, 5, 6, it being always kept in mind what I have said as to the necessity for local reaction as positive evidence that a suspected condition is tuberculous. That the rule is not absolute is shewn by the severity of the constitutional disturbance and the change in the local conditions in leprosy and actinomycosis, as recorded by competent observers.

Proposition 4. That the symptoms of reaction occur without exception in all tuberculous patients after a dose of 1 cg., has proved in patients whom I have been able personally to carefully supervise absolutely true, whenever the condition was diagnosed as certainly tubercular from its clinical aspects. As a corollary of this it is stated that the remedy will form an indispensable *aid* to diagnosis, and in this I am disposed to agree. The cases in which its use will be called for, for this purpose, will be few, but as examples I may refer you to cases No. 2, 31, and 22. I must, however, again remind you that I do not accept mere feverish disturbance as diagnostic, but that with it local change must also be associated.

In case 2 the diagnosis lay between epithelioma and lupus, and it was evidently undesirable to do thyrotomy if the latter condition was present. The absence of any local reaction excluded lupus.

In case 31, in which a complete diagnosis could not previously be made, and in which local treatment did no good, injections gave rise to local reaction, thus clearing up the diagnosis, and at the same time to great improvement in the voice.

In case 22 the diagnosis of tubercular bone mischief was absolutely established by the local reaction.

The fifth proposition, that in lupus, joint, bone, and gland tubercle the first dose of the remedy may be 1 cg., requires, I think, considerable modification ; but that it can be given in

rapidly increasing doses is, I believe, true in all cases. Whether this rapid increase is desirable is another question, which greater experience alone can answer. The question of dose is so important that I must take up a little of your time in discussing it and the way in which the injections are arranged.

At the General Hospital we are in the habit of using three dilutions of the original fluid—one in which the dilution is 500 times, a second in which the dilution is 100 times, and a third in which the dilution is 10 times, each of these being made with a $\frac{1}{2}$ per cent. solution of carbolic acid. This amount of carbolic acid does not appear to diminish the efficacy of the fluid, and the solution keeps good for some weeks without boiling or other precaution. The doses are administered with a hypodermic syringe, graduated in cubic centimetres and fitted with an asbestos piston that it may be easily cleaned.

In surgical diseases I think it is wise to commence with a dose of 1 mg. for adults and half that quantity for children, or even less if the children be feeble or very young. One can never foretell with any certainty whether in any given case the constitutional disturbance will be severe or not, and having thus felt one's way, it is easy to increase the dose until some definite conclusion is arrived at. The doses should be increased gradually and so as to produce but a moderate amount of fever, and they should be continued, I think, either till the lesion is healed or, at all events, so long as there is any local change produced by the injections. The earlier doses give rise to much more constitutional disturbance than the later, and, as a rule, after 2 cg. have been reached, the patients have little discomfort. A word of caution is necessary as to the increase of the early doses. It is not rare to find that the second and third injections of the same amount as the first—say, for instance, 2 mg.—may give rise to more constitutional disturbance than the first administration of that quantity.

Another point for consideration is to what extent the doses may be increased. Several of my patients have attained to a

decigramme, and some to more than that, and I am at present unable to assign any limit.

Several of the cases earliest treated, and who suffered very little from these large doses, are now coming up once a week as out-patients for an injection, they being enjoined to go home to bed after receiving their dose; but I should strongly object to administering the earlier doses to out-patients.

We come now to the sixth proposition, and here it is necessary to keep very closely to Koch's own words, they are that "a speedy cure may be obtained in recent and slight cases of lupus, glandular, bone, and joint tuberculosis, and slow improvement in severe cases."

On referring to my reports of cases you will find that they are divided into several groups, and it seems to me that the most suitable method of probing this momentous statement of Koch's is that I should draw your attention to the various classes of cases, commenting on the most interesting features.

The joint cases, thirteen in number, in the reports 7 to 19, comprise seven cases of hip disease, all of them of long standing. Case 10, the patient under treatment for the shortest time, and case 11, shew no improvement; all the rest are improved, especially cases 7, 12, and 13, to whom I wish to direct your attention.

Case 7 has been laid up by his disease for five years, the last year he has been confined to bed, with profuse suppuration and severe pain; the suppuration is now almost abolished, the pain is gone, and he will get up as soon as his Thomas' splint is ready.

Case 12 was anæmic to a degree, and suppurating profusely, in fact he had been going to the bad for some time; since injection his general condition has greatly improved, and his suppuration is not a fourth of what it was. I want you particularly to note that he suffered four months ago from severe erysipelas, which not only had no favourable influence on his hip, but made it much worse.

In case 13 there is similar great improvement: a very

important fact when we remember his advanced amyloid disease.

Case 14, sacro-iliac disease, is also greatly benefited, as you will see by the report of his case.

Cases 15, 16, and 17, are examples of ankle-joint disease. Case 15 you will notice had also mischief in the left wrist and phthisis; her joints have not benefited at all, but the mischief was advanced in both joints, and her general condition was bad. Case 16 benefited but slightly, so I scraped and drained his ankle, subsequently resuming injections, of the effect of which it is yet too early to say much. Case 17 is somewhat improved.

Case 18, wrist joint mischief has, I believe, benefited greatly. You will see that the operation freely opened up the wrist joint and that this was followed by suppuration extending to the front of the wrist. With the injections the openings healed up in six weeks, the swelling of the joint is steadily subsiding, there is no pain now; such is not one's usual experience in this complicated joint.

Case 19, elbow joint mischief with lupus and affection of the bones of the hands, is the earliest joint case I have treated. In the short time, five weeks, since injections were commenced, the swelling of the elbow joint has practically disappeared, and the movements are almost as free as they should be. The bones of the hands have also much improved.

Of the five bone cases, Nos. 21 and 22 have distinctly improved, and the latter is of considerable interest from a diagnostic point of view, having been regarded and treated as syphilitic, despite which the mischief extended. In case 20 it is of course open to question whether tuberculine or operation was most concerned in producing the cure. Cases 23 and 24 do not appear to have derived any benefit.

The gland cases, three in number, have given most satisfactory results. Case 25 appears to me to be cured; but in such it is likely that some slight thickening of the part may linger for a time, due to the unabsorbed and thickened gland capsules. Case 26, with other tubercular mischief besides that in the

glands, is one of those not well suited for operation owing to the widely disseminated gland affection, and the result of injection has been marked improvement. Case 27, tubercular glands in the popliteal space with old sinuses are cured, and this with rapidity. It will be noted that the os calcis was also diseased and had been operated on. The contrast between the healing process in this bone before the injections and after is enormously in favour of the latter, indeed I have never seen repair there so rapid, and the heel is now perfectly sound.

I should like to direct your attention to the glands in case 22 where they were affected in addition to bone. The effect of injection was to excite suppuration, and if this should occur in the chest or abdomen very unpleasant results might follow, but so far I have seen no such cases reported.

Case 28 is the only case with tuberculosis of the urinary passages that I have had the opportunity of injecting. Doses of $1\frac{1}{2}$ mg. produced sharp general and local disturbance, and there was considerable increase in the amount of pus for some time. I hesitate to say what amount of improvement, if any, exists; but there is one thing well worth noting, viz., that the patient is gaining weight. Suppuration still continues, and is likely to for some time however effective the remedy may be, as there are doubtless considerable excavations in the kidney, and on the bladder mucosa probably, which have to be filled up and obliterated by scar tissue before healing is secured.

Under the heading Laryngeal Tubercle, commencing at No. 29, only three cases are grouped; but in Case 26 there was laryngeal as well as gland tubercle, and I have observed other cases of laryngeal tubercle with phthisis in our wards, for instance, No. 15. In no case has there been cure, but in every one such improvement as I have never seen from any other treatment; and it is yet too early to say that cure will not follow in some of the cases. Case 31 is of extreme interest from a diagnostic as well as from a curative point of view. It is of importance to recall that in none of these cases, nor in those of lupus of the larynx (to be presently mentioned), was

there any stenosis of the larynx requiring surgical measures for its relief, though if some of the lupus cases had received a dose of 1 cg. to begin with this might well have arisen. In such an emergency I should strongly urge intubation rather than tracheotomy.

In that rather ill-defined group aggregated under the term Lupus there are thirteen cases, beginning at 32, and a fourteenth example is supplied by Case 19. Most of these patients have been submitted to your inspection to-night, with drawings illustrating their condition before treatment, and they are so extremely interesting that, but for the scarcity of time, I should like to dwell upon them at length.

Of the fourteen cases, two may be described as slightly improved, eight as considerably improved, and four as much improved. I hesitate to use the word cure in connection with case 39 because of the remarkable tendency there has been in this patient to recurrence after operation, but at present the disease seems quiescent. The next best cases are 38 and 42, in each of which there is still some active disease, which is, however, slowly subsiding. Case 37 was shewn at this Society before treatment was commenced so that it is possible to contrast her present condition with that previously existing. The alternative treatment to tuberculine would have been free excision of the diseased area on the palate and the gums, and this would have involved the sacrifice of the front teeth.

It is an interesting fact that in five of the fourteen cases, lupus existed on the mucous membrane of the mouth or adjacent parts; in cases 34, 35 and 37, the larynx was extensively involved. This points to the wisdom of examining these parts carefully before injection. The effect of treatment on these parts was about the same as on the surface lesions of the same patients. Comparing lupus of the larynx with ordinary tubercle there, the effect of treatment is to give rise to less active changes in the affected area, especially there is less tendency to ulceration.

In what particular variety of lupus, tuberculine will be most effective, is to a great extent still doubtful, but at present I

regard the more superficial lesions, such as existed in case 38, as most amenable, the more distinctly subcutaneous ones, such as in case 33, as less amenable to the treatment.

In three cases, finding that some of the diseased patches seemed at a standstill, I used the lupus scraper to get rid of them, and I think it is probable that in the future operation and the subsequent use of tuberculine will often go together. Case 44 is an interesting one from this point of view, as it will be seen that the disease rapidly returned in the area scraped; whether a continuance of injections after the scraping would have prevented this recurrence is a question to be answered by further experience. The tendency at present is to regard tuberculine as a certain remedy for lupus whatever else it may fail to cure. My own belief is that we are not yet masters of the situation with regard to that inveterate disease, but that its *recurrence* will still be our bane in a large proportion of cases.

A few general comments remain to be made. It is unnecessary to recall the fact that tuberculine will not remove dead tissues, as for instance a sequestrum in bone, and that consequently sinuses will remain open, although no actual tubercular mischief exists; it is likely however that the remedy will promote separation of sequestra from the living tissues with which they are still connected.

Other methods of treatment, such as splints for joints, should not be neglected, and this is especially true of those measures which improve the patients' nutrition. Indeed I regard the state of any patient's nutrition as a most important factor in his well-doing under Koch's treatment; and speaking generally, I should say that evidence of feeble reparative power is at present a reason for withholding injections in any given case.

It is a very general experience that in the early days of treatment by tuberculine, patients lose weight. On looking at the reports of my cases, it will be seen that in many of them the weight before treatment was commenced and the weight at the present time are given, and it will be noticed that nearly all have eventually more than made up for the weight lost—a matter of great importance.

Another point worth attention is the rapid healing after operations for tubercular disease when tuberculine is injected, even though no active mischief appears to have been left.

But very few of my cases can be described as "early and slight cases of tubercular disease." Such examples as I have seen, on the whole, go to confirm Koch's statement that such can be cured by his remedy. In the advanced cases, such as some of the joints I have mentioned, there has undoubtedly been vast improvement, especially in those cases where the surgeon hesitates to interfere, because if he does, in operating, he must necessarily destroy what amount of repair already exists. *Should the improvement already obtained in the cases before you prove permanent*, I do not hesitate to say that we have reason to be profoundly grateful to Koch for the remedy he has placed in our hands.

In conclusion, it is only right to mention that in not one of the cases for which I have been responsible has there been such constitutional disturbance as to call for real anxiety; and of the several hundred injections given not one has caused an abscess.

I have to offer my sincere thanks to my colleagues, the physicians and surgeons of the General Hospital, for the liberal way in which they have placed cases at my disposal for the purpose of this investigation.

CASES INJECTED MAINLY FOR DIAGNOSTIC PURPOSES.

No. 1.—A. H., f., 6 years old. Epiphysitis great trochanter, about five weeks' duration. Injection of half milligram on Dec. 27th, 1890. At this time there was marked swelling and tenderness over the left great trochanter with limitation of movements of left hip-joint. Four injections were given, the last of 5 mg. on Jan. 5th, but there was neither general nor local reaction on any occasion. The child was kept at rest in bed with weight extension, and was discharged quite well on Jan. 25th.

Conclusion drawn, that the disease was not tubercular. This is confirmed by the fact that the trouble commenced with a rigor and high temperature on Nov. 28th, and that recovery took place in such a short time.—P.

No. 2.—U., m., 37 years. Thickening of left vocal cord, possibly early epithelioma, possibly lupus; about four months' duration; 1st injection, 1 mg. on Jan. 12th, 1891; 2nd injection, 3 mg. on Jan. 14th; 3rd injection of 6 mg. on Jan. 17th. This was followed for first time by a temperature of 100·8 with malaise, but repeated examinations with the laryngoscope after each of the injections failed to shew the faintest local changes. Subsequent thyrotomy shewed the condition to be a leucomatous patch on the vocal cord.

Conclusion drawn, that the absence of local reaction justified one in saying that this was not a tubercular condition. This was confirmed by the operation.—P.

No. 3.—C. D., f., 30 years. Keloid of right shoulder; about three years' duration. 3 mg. were injected on Jan. 16th, 1891; 6 mg. on Jan. 18th; 1 cg. on Jan. 20th; on no occasion was there any general or local reaction.—P.

No. 4.—H. R., f., age 26, skin lesion of face of doubtful nature, (?) Syphilis or tubercle, four months duration. The patch was about two inches long by $1\frac{1}{2}$ inch wide, diffusely red, with some distinct nodules in it, no ulceration. Considerable doses of iodide of potassium, alone and combined with mercury were given without any change. Jan. 26th, first injection of 2 mg. gave no reaction, and it was only when 1 cg. was reached that general reaction was obtained, but the existence of local reaction even then was very doubtful and has remained so, although 5 cg. has been administered as a dose. Weight before injection 7 st. 9 lbs., now 7 st. $7\frac{1}{4}$ lbs. The patient thinks her skin lesion is improved, but this is doubtful. The colour of the patch varies remarkably; at times it is comparatively pale, at others deep red. Injections are now discontinued.—P.

No. 5.—E. D., f., 48 years. Rodent ulcer of face, said to have commenced as lupus about 16 years ago. Scraped eight times, freely excised twice. When injection was first made the disease shewed an ulcer nearly the size of one's palm, involving the superior maxilla, its edges were everted and indurated, in two spots it shewed attempts at cicatrization; there were no

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enlarged lymphatic glands. The first injection of 1 mg. was given at *noon* on March 30th; the sore examined 9 hours later, 24 hours later, and 48 hours later shewed no local change whatever, although the temperature rose to 101. The second injection of 2 mg., on April 2nd, produced a temperature of 101.4, but there was no local change 24 hours after. The third injection of 3 mg., on April 5th, produced a temperature of 103, but there was no local change 20 hours and 30 hours after.—P.

No. 6.—R. H., m., 15 years. Old burn of leg, duration sixteen months. Extensive scars of right thigh, leg, and foot. An indolent ulcer $2\frac{1}{2}$ inches long and $1\frac{3}{4}$ inches wide in centre of right calf, with irregular, unhealthy granulations. First injection on March 20th, 1 mg.; no reaction general or local. Second on March 23rd, 2 mg.; slight rise of temperature (100), no local reaction. March 26th, 4 mg.; followed by severe general reaction, temperature 104, shivering, headache, etc. No change in appearance of wound, except an increase in quantity of discharge the next morning. There has been no increased healing power.

CASES OF TUBERCULAR JOINT DISEASE.

No. 7.—H. P., m., 25 years. Hip disease, duration about five years; no excision. When injections were commenced the limb was as follows:—1 inch shortening, very limited movement, one sinus, and one extensive wound $4\frac{1}{4}$ inches long, from both of which there was *profuse suppuration*; great thickening of the soft tissues around; *severe pain* in joint. First injection of 1 mg., on Feb. 6th produced temp. of 103.6 with local reaction. Total number of injections 20; largest dose 16 mg. Duration of treatment 63 days.

Result.—The large wound and the sinus are more than half healed, the suppuration is reduced four-fifths, the thickening around the joint has greatly diminished, pain has disappeared, and the patient is to get up shortly, after a year in bed.

No. 8.—N. H., m., 5 years. Morbus coxæ, duration eighteen months. Excision of joint, Oct. 17th, 1890. Condition when

injections were commenced :—Sinus on outer side of trochanter and excision wound ; $\frac{3}{4}$ inch shortening of limb ; marked thickening around trochanter ; suppuration very moderate. First injection on Feb. 15th, of $\frac{1}{2}$ mg., followed by no general reaction, but a crop of vesicles and erythematous rash around wounds. First general reaction, with temperature of 101.6, after 2 mg. Number of injections 10. Largest quantity given 9 mg. Duration of treatment 54 days. Weight before injections 2 st. 5 lbs. ; after, 2 st. 6 $\frac{1}{2}$ lbs.

Result.—Discharge slightly diminished.

No. 9.—L. S., m., 8 years. Morbus coxæ, duration fifteen months. Excision of joint, May 13th, 1890. Condition when injections were commenced—1 inch of shortening, movements very limited ; three sinuses and anterior excision opening ; very moderate suppuration ; soft thickening round joint. First injection on Feb. 6th of half mg., producing no general reaction, but distinct local change, consisting of erythematous rash around the wounds and increased discharge. After second injection of 1 mg., complained of feeling of pins and needles about the wounds ; temperature rose to 100 three hours after injection. Number of injections 19. Largest quantity given 3 cg. Duration of treatment 63 days. Weight before injections 3 stone 2 $\frac{1}{4}$ lbs. After, 3 stone 2 $\frac{1}{2}$ lbs.

Result.—Sinuses healing, suppuration somewhat diminished.

No. 10.—A. F., m., 13 years. Morbus coxæ, duration fifteen months. Joint excised, Oct. 31st, 1890. When injections were commenced there were two sinuses and the excision wound a large gaping aperture, $3\frac{1}{4} \times 1\frac{1}{2}$ inches ; profuse discharge from all these. Considerable swelling and thickening around joint, the pus apparently infiltrating the whole of the inter-muscular tissues ; the condition appears to be mixed septic and tubercular. On March 4th, injected with 1 mg. Temperature reached 103 seven hours after injection, no pain or change in wound. Number of injections 11. Largest quantity given 5 mg. Duration of treatment 37 days.

Result.—No improvement, no extension of mischief. General condition the same.

No. 11.—M. W., f., 7 years. Morbus coxæ, duration nearly three years. No excision. Condition on commencement of injections:—1 inch of shortening in limb; movement extremely limited; four small sinuses from which there was moderate suppuration. On Feb. 13th, first injection of half mg., followed by a rise of temperature to 100·4, but no other symptoms of general reaction or any local change. Number of injections, 15. Largest quantity given 3 cg. Duration of treatment 56 days.

Result.—No improvement.

No. 12.—J. H., m., 11 years. Morbus coxæ, duration 19 months. Joint excised June 12th, 1890. When injections were commenced the limb was as follows:—Much thickening around joint, and œdema of whole limb. There are some half dozen sinuses around the joint, including excision wound, with raw surface of 1½ inches length. Discharge profuse. First injection on Feb. 8th of ½ mg. Amount of discharge less next morning, slight blush, no pain in joint, no general reaction. Number of injections 18. Largest quantity given 16 mg. Duration of treatment 61 days. Two months before the treatment commenced the patient had an attack of erysipelas; the amount of suppuration was increased rather than lessened as the result of this.

Result.—Most of the sinuses and the excision wound have healed considerably, the discharge has greatly lessened, the boy's general condition is much improved.

No. 13.—H. W., m., 8 years. Morbus coxæ, duration 3 years. Joint excised, and subsequently amputation at hip July 1st, 1890. When injections were commenced stump was as follows: Stump riddled with sinuses, and when pressed between the hands, pus oozed out as if the tissues were made of sponge; also collects above Poupart's ligament. Progressing amyloid disease of liver and kidneys. Discharge very profuse and offensive. First injection of ½ mg., on Feb. 15th, produced no reaction; 1 mg. produced a general reaction, with temperature of 100·6. The first local reaction observed was after injection of 4 mg., and consisted of increased amount of

discharge, which was sanguineous. Number of injections 17. Largest quantity given 9 mg. Duration of treatment 54 days. Weight before injection 1 st. 11 lbs. Present weight 1 st. 13 lbs. Patient had remained at 1 st. 11 lbs. for some weeks before injection.

Result. — Great diminution of suppuration, thickening of stump less, sinuses healing, general condition improved.

No. 14.—A. R., m., 8 years. Sacro-iliac disease, (?) duration 2 years. When injections were commenced there were two large granulating wounds, one over great trochanter 4 in. long, the other over the left sacro-iliac joint $2\frac{1}{2}$ in. long, with a sinus 2 in. deep leading apparently into joint. The suppuration was profuse. No rigidity; no pain. On February 15th injected with $\frac{1}{2}$ mg. Distinct but delayed reaction after $\frac{7}{16}$ mg. Temperature reaching 103. Locally diminished suppuration. Number of injections 17. Largest quantity given $1\frac{1}{2}$ mg. Duration of treatment 54 days. Weight before injections 2 st. 13 lbs.; after, 2 st. 12 lbs.

Result.—The wounds are two-thirds healed; the profuse suppuration is reduced to a very small amount. Altogether, the improvement is great.

No. 15.—R. V., f, 19 years, tubercular arthritis, left ankle, tarsus and wrist, phthisis, laryngitis. The ankle appears to have first given rise to trouble about three months before admission, in six weeks abscesses opened spontaneously. When treatment was commenced the ankle was suppurating a good deal, and there were tubercular ulcers over the ankle and tarsus; the wrist was swollen and fluctuating on dorsum, both joints were very painful. Phthisis well marked at right apex; larynx generally injected, especially on inter-arytenoid fold and along outer margin of left vocal cord. Injection of 1 mg., on Dec. 31st, gave general and local reaction. Total number of injections, 27, largest dose given 12 mg.

Result.—At first rapid cicatrization of ulcers on foot; then increase of suppuration in tarsal joints; foot amputated on January 30th. Wrist at first shrinking, subsequently extension

of suppuration, and, on March 14th, evacuation of large abscess, the carpal bones being carious ; this joint requires amputation. Larynx improved. Injection was followed by ulceration to the left of inter-arytenoid fold, this has since healed, and there is less vascular injection. Dr. Wilson states that on the whole the lung condition is not worse than it was before injection. During the last six weeks the patient has lost 2 lbs. This patient was regarded as an unfavourable one from the first, but the injections do not seem to have hastened the advance of her disease.—P.

No. 16.—G. H., m., 28 years. Tubercular arthritis of left ankle, duration about 7 months. Treated by fixation and rest, steadily getting worse. When injections were commenced, there was much thickening all round the joint, the foot was extended, very fixed, and all attempts at movement were painful ; there was no evidence of suppuration (see cast). No distinct local or general reaction until 1 cg. was given on January 4th, and throughout, the reactions have been very mild. Total number of injections, 26 ; largest dose, 1 dg. Weight before injections, 9 st. 8 lbs. ; now 9 st. 3 lbs. On March 21st, as the joint had but slightly improved, and was at a standstill, it was incised, drained, and partly scraped out, injections being then resumed. Since the operation, there has twice been more pain in the joint after injection, but there has been no feverish disturbance. Duration of treatment, 100 days. Looking to the loss of weight, and the doubtful improvement in the joint, the result is not satisfactory.—P.

No. 17.—K. C., f., 21 years. Tubercular arthritis of left ankle, two years' duration, treated by rest, fixation, and counter-irritants. There was swelling in front of the ankle-joint, and round both malleoli, much tenderness on pressure, and pain on every movement ; the foot was somewhat extended on the leg, no sinus, the leg muscles extremely wasted. First injection of 1 mg. on March 18th, 1891, gave neither local nor general reaction. Distinct general and local reaction to 4 mg. on March 23rd. Number of injections, 8 ; highest amount administered, 7 mg. Weight before injection, 8 st. 5 lbs. ; now 8 st. 2¾.

Result.—The duration of treatment—22 days—is too short to allow of any very marked results, but the movements are certainly less painful, the joint is less tender, and there is slight diminution in the measurements of the affected part.—P.

No. 18.—J. G., m., 18 years. Tubercular arthritis of left carpus and metacarpus, commencing as an osteo-myelitis of 3rd metacarpal about five years ago. September, 1890, the interior of this bone was gouged out, and the cavity was nearly healed, but then broke out again. Before injections were commenced there was a sinus over the 3rd metacarpal leading to dead bone; there was a swelling involving the ends of 2nd, 3rd, and 4th metacarpals, and the carpo-metacarpal joints, and the movements of the wrist joint proper, were limited and painful. On February 17th, some carious bone was removed from the metacarpal and carpal bones; this was followed by suppuration, and pus was let out from the front of the wrist. Subsequently distinct local and general reaction was obtained with 2 mg. on Feb. 22nd, since which time injections have been regularly continued, 15 having been given. Largest dose 1 cg. Weight before injection, 6 st. 11 $\frac{1}{4}$ lb., now 7 st. 3 lb. Duration of treatment 47 days.

Result.—The operation wound and the openings subsequently made in front and at the side of wrist healed in five weeks; the thickening over the carpus and metacarpus is steadily lessening; the tenderness is gone. The joint may be described altogether as much improved.—P.

No. 19 —A. E., f., 13 years. Lupus nose, forearm, and fauces, tubercular *disease of elbow*, metacarpal bone, and phalanges, about eighteen months' duration. When injected, two crusted nodules on nose, a patch on forearm 1 $\frac{1}{2}$ inch diameter, eyelid puckered from four previous operations for lupus, left elbow swollen, limited in movement, especially in extension, and tender, bones of hands enlarged and tender. First injection of $\frac{1}{2}$ mg., on March 9th, gave rise to sharp general and local reaction. Total number of injections 11; largest dose 3 mg. Weight before injection 5 st. 10 lbs.; after, 5 st. 12 lbs. Duration of treatment 34 days.

Result.—Elbow almost free from swelling, movements hardly at all limited, no tenderness now, bones of hands considerably less swollen, lupus patches much better.—P.

CASES OF TUBERCULAR BONE MISCHIEF.

No. 20.—W. B., m., 19 years. Tubercular epiphysitis of left femur, two years' duration. Incised and scraped on Dec. 9th, 1890. First injection of 1 mg. on Dec. 27th, the wound then looking like a tubercular sore; it was $2\frac{3}{4}$ inches long by $\frac{3}{4}$ inch wide. Mild general and local reaction was produced by 3 mg. In all 12 injections were given, 1 cg. on Jan. 20th, failing to give reaction, when treatment was discontinued.

Result.—The wound was soundly healed on the 12th day after the first injection, and the measurement round the condyles in three weeks was the same as on the opposite side. At the time of operation it was an inch more. How much of the improvement was due to the operation, and how much to injection, it is difficult to apportion. The healing was most rapid after injections were commenced.—P.

This case was reported in extenso, *Birmingham Medical Review*, February, 1891.

No. 21.—C. T., m., 18 years. Tubercular periostitis of ribs, several years duration; no operations. When first injected, a sore on front of left chest, $1\frac{5}{8}$ inch long by $\frac{3}{4}$ inch wide, with some boggy thickening under pectoral muscles into which a probe passed, but did not feel bone, also a sinus of some depth on left anterior axillary fold. First injection of 1 mg. on March 11, gave no reaction, on March 15th there was distinct local reaction to 6 mg., and on March 17th with injection of 1 cg., there were both local reaction and general, the temperature being 102. Total number of injections 14. Largest amount administered 6 cg. Weight before injection 8 st. $10\frac{1}{2}$ lbs., now 9 st. $2\frac{1}{4}$ lbs.

Result.—Steady diminution of the boggy thickening under the left pectoral muscles with increased suppuration, which is now subsiding. Duration of treatment 26 days.—P.

No. 22.—A. M., m., 18 years. Tubercular necrosis of cranium, tubercular ulcers on chest, (?) Periostitis of ribs. Tubercular glands. The cranial mischief of 18 months duration, that on the chest wall has existed several years. When injected there was a circular perforation through both layers of the frontal bone, about the size of a shilling, at the bottom of which the dura pulsated freely, there was an undermined area around, about 3 inches in diameter, from which numerous sinuses discharged pus, particles of bone occasionally separated, enlarged glands over each zygoma and in each sub-maxillary region; on the chest were four slowly healing sores of irregular size and shape. The first dose of 1 mg., on March 8th, gave rise to a most characteristic general and local reaction. The total number of injections has been ten, the largest dose 3 mg. Duration of treatment—35 days. Weight before injection 8 st. 8 lbs, now the same.

Result.—The glands over the right zygoma and the left sub-maxillary region have suppurated. The discharge from the sinuses on the forehead is steadily diminishing, and the perforation in the frontal bone which was extending is now filling up. The sores on the chest are now practically healed.—P.

No. 23.—A. R., f., 14 years. Tubercular disease of head of tibia, duration 11 months. Bone trephined September 10th, 1890. Condition when injections were commenced was as follows:—Over inner side of head of left tibia there is a scar which is dry, although it was discharging a few days ago; above and a little anterior to this there is a diffuse swelling and tenderness. There is a little thickening of the tibia, girth being half an inch more than on the other side. First injection, on Feb. 8th, of 1 mg. produced temperature of 100.2, and the wound started suppurating. Complained of headache and feeling unwell, with temperature of 101.6, six hours after injection with 5 mg. Number of injections 14. Largest quantity given 3 cg. Duration of treatment 61 days. Weight before injections 6 st. 2½ lbs.; after, 6 st. 2 lbs.

Result.—It is doubtful if any improvement has resulted from the injections.

22 *Surgical Cases of Tuberculosis by Koch's Remedy.*

No. 24.—H. T., m., 27 years. Psoas abscess; duration 6 years. When injections were commenced there was a sinus in right groin, through which a probe passed seven inches upwards and backwards to a spot opposite right hypochondriac region, from which there was a quantity of discharge, and severe pain deep in right hypochondriac region. First injection of 1 mg., on February 6th, produced no rise of temperature; no local reaction. There was slight but distinct reaction, general (T. 100.4) and local blush and pain, after a second dose of 2 mg. Total number of injections 18; largest dose given 8 cg. Weight before injections 9 st. $7\frac{1}{4}$ lbs.; after, 9 st. $10\frac{3}{4}$ lbs. Duration of treatment 63 days.

Result.—Some diminution in discharge and gain in weight.

CASES OF TUBERCULAR GLAND MISCHIEF.

No. 25.—J. F., m., 17 years. Tubercular glands in neck, about five years' duration, one incised. When first injected there were several glands enlarged and producing a mass the size of a small orange; one appeared to be breaking down, and over another there was a discharging sinus. The first injection of 2 mg. on Dec. 29th produced no distinct reaction locally, but there was elevation of temp. to 101.5; 4 mg. on the 31st Dec. produced considerable swelling of the affected glands; and 8 mg. on Jan. 2nd produced sharp general and local reaction. Total number of injections 28; largest dose given 1 dg. Treatment was interrupted in this case for three weeks by an injury to patient's head. When injections were resumed the glands were very much less, and no reaction was obtained from 1 cg. nor from rapidly increasing doses up to 1 dg. Duration of treatment 71 days.

Result.—The enlarged glands, except the lymphatic over the tonsil, have disappeared. The scar of the small incision is free from puckering.—P.

No. 26.—G. W., m., age 41. Tubercular glands in neck for some years, especially troublesome during last twelve months; chronic laryngitis, (?) tubercular, slight phthisis right apex (?)

When injected, some of the glands had suppurated, others were commencing to, and some not. The larynx was as follows :—both cords, red and ulcerated at posterior extremities, thickening and doubtful ulceration on inter-arytenoid fold, dry adherent mucus on both the above-mentioned parts. The first injection of 1 mg., on March 8th, gave a fair local and general reaction. Total number of injections, 14; largest amount given, 3 cg. Weight before injection, 9 st. 2½ lbs.; now, 9 st. 1 lb. Duration of treatment, 33 days.

Result.—Marked improvement in all the glands. Larynx, much improved, free from mucus; cords paler, and almost healed.—P.

No. 27.—J. P., m., 8 years. Tubercular disease of os calcis and of popliteal glands. Duration, 16 months. Cavity in bone scraped out December 17th. Condition on commencement of injections :—On outer side of right foot, large wound leading into a cavity in os calcis, size of small walnut. Sinus on inner side of left femur, a little way above knee, and another in popliteal space, with gland thickening. Also, old ulceration in left groin, now dry. First injection, on Feb. 6th, of two-fifths mg., followed by no general reaction, but slight erythematous rash around wounds, no pain, no change in amount, or character of discharge. Number of injections, 13; largest quantity given, 1 cg. Duration of treatment, 56 days. Weight before injection, 2 st. 9 lbs.; weight after, 2 st. 12 lbs.

Result.—The sinuses about the popliteal space healed rapidly, the thickening has disappeared, and the os calcis has healed soundly.

TUBERCULOSIS OF URINARY ORGANS.

No. 28.—S. P., f., 33 years. Tubercular disease of bladder and kidney, duration about 9 months. When injections commenced patient's condition was as follows: patient complained of shooting pains in right lumbar region, some scalding in urethra, no incontinence. *Urine* contained a sediment of about 3v. of pus in the 24 hours; acid, no blood. With *Cystoscope*

on posterior wall a vascular area, $1\frac{1}{2}$ to 2 inches diameter, surface abraded but not deeply ulcerated, and from this particles of pus are constantly being shed. On floor, especially the anterior part of trigone, are numerous nodules semi-translucent and pink in appearance but not ulcerated. First injection, on February 6th, of 1 mg. produced temperature of 100, 10 hours later, preceded by profuse sweating, flushing of face and pain in right lumbar region. The next evening at the same time temperature rose to 101 and patient complained of increase of pain on micturition; $1\frac{1}{2}$ mg. produced some severe reactions. Number of injections, 19; largest quantity given, 1 cg.; duration of treatment, 63 days; weight before injection, 8 st.; after, 8 st. 3 lbs.

Result.—The suppuration was considerably increased for the first month and occasionally at intervals now is more than it was, but the presence of mucus makes it difficult to estimate the pus except roughly. The most noticeable feature in the case is the variation in weight, from 8 stone she dropped to 7 st. 5 lbs., but now has regained this and has added 3 lbs.

CASES OF LARYNGEAL TUBERCLE.

No. 29.—F. O., m., 29 years. Tubercular laryngitis, phthisis, duration of former about seven months. Condition of larynx before injection: inter-arytenoid fold swollen and reddened, there is a warty patch in the middle of it from which a crescentic fold passes down on either side inclosing an ulcerated area, both cords pink and thickened, the pink margin of each being frayed; there is redness and swelling over the anterior part of the cricoid. The first injection of $\frac{1}{2}$ mg. produced no change, but 1 mg. on March 15th gave rise to temperature of 101.3. The larynx was not examined then for local reaction, but on March 22nd, there was distinct local change, including ulceration of the thickening over the cricoid. Total number of injections 10; largest dose 1 mg.; duration of treatment 32 days. Weight before 8 st. 11 $\frac{1}{2}$ lbs.; after, 8 st. 11 lbs.

Result.—General slight improvement in all parts of the larynx. The swelling noted over the cricoid ulcerated, and has now healed again.—P.

No 30.—G. I., m., 32 years. Tubercular laryngitis, phthisis, duration of former about four months. Condition before injection:—Left ary-epiglottic fold much swollen, pale grey in colour, and œdematous, much thickening of ventricular band on left side, which is partly hidden by adherent mucus, the left vocal cord is hidden by the v. band, and the left arytenoid is quite fixed. The first injection of 1 mg., on March 19th, gave no general reaction, and it was only when 8 mg. were given that the temperature rose to 100·7; and as I saw the patient only occasionally I am unable to say anything about the local reaction. Total number of injections 14; largest dose 8 cg. Duration of treatment 22 days. Weight before treatment 8 st. 6¼ lb., now 8 st. 5 lb.

Result.—Ulceration of ventricular band and adjacent part of ary-epiglottic fold, which is now healing again. The ary-epiglottic fold is less swollen, and there is distinct movement of the left arytenoid cartilage now.—P.

No 31.—K. H., f., 28 years. Chronic laryngitis, (?) tubercular, about 2½ years' duration. When treatment by tuberculine was first commenced the condition of larynx was as follows:—Both cords very pink, with velvety thickening; on phonation, failing to meet in posterior half; some ill-defined thickening on inter-arytenoid fold; slight redness and thickening over left arytenoid; no ulceration anywhere; marked aphonia; no evidence of tubercle in the lung. First injection of 2 mg., on January 18th, caused slight increase of redness, and sense of discomfort, but there was no fever until 1 cg. was given on the 22nd, but after all the earlier injections pain and dryness in the larynx was complained of, and aphonia became more marked. On Jan 28th, ulceration was found on the inter-arytenoid fold, just above each vocal process. Total number of injections 19; largest amount given 5 cg. Weight on admission, 8 st. 2½ lbs.; now 8 st. 4 lbs.

Result.—The thickening on the inter-arytenoid fold and over the left arytenoid has disappeared, the cords are considerably paler; the aphonia has given place to a very fair speaking voice.—P.

CASES OF LUPUS.

No. 32.—E. J., f., 16 years. Lupus of nose, fauces, eyelid, and tubercular nodule of iris. Duration about two and a half years. Diseased parts scraped on two occasions. Condition when injections were commenced. — *Nose*: Lower half was occupied by dirty red irregular tubercles covered with dried yellow discharge, also right side and centre of upper lip similarly affected. *Right eye*: Marginal keratitis with small white infiltrations and new vessels on cornea, general iritis, and a small nodule on lower surface of iris. Muco-purulent discharge from lachrymal sac, yellowish white raised patches size of pin's head to nearly half a pea on conjunctival surface of upper lid; general injection of conjunctiva. *Pharynx and Larynx*: Uvula affected by previous destructive changes. On left post pillar of palate and right tonsil active changes—thickening and ulceration. Doubtful fulness and secretion on inter-arytenoid fold of larynx, slight cicatrisation on posterior wall of pharynx. Tonsillar lymphatic glands enlarged on both sides. First injection of 1 mg., on January 20th, caused a very marked general (T. 103, vomiting) and local (pain in eye and nose, with increased secretion, swelling, and red areola) reaction. Number of injections 25; largest quantity given 4 cg. Duration of treatment 80 days. Weight before injections 8 st. 3¼ lbs.; after, 8 st. 11½ lbs.

Result. — Nose moderately improved; fauces moderately improved; eyelid moderately improved; eye much improved—the superficial and deep congestions have disappeared, and the nodule on the iris is represented only by an adhesion.—P.

No. 33.—M. E., f., 22 years. Lupus of forearm and hand, subcutaneous. Duration, 21 months. Condition when injections were commenced:—A large patch over dorsal aspect of 4th and 5th metacarpal bones of left hand, containing raised nodules, some with small yellowish centres; another large patch over posterior, ulnar aspect of arm at the elbow. There are some similar small patches on the posterior aspect of the forearm. First injection of 1 mg., on Dec. 27th, produced slight general

(T. 100, pain in back) and local (redness, increased tenderness) reaction. The injections were continued until January 24th, fourteen in all being given; largest dose, 5 cg. These injections were discontinued, as all patches seemed quiescent. They were resumed on February 25th, with dose of 5 mg., as fresh nodules were noticed at the bend of elbow and on the forearm, anterior surface. Number of injections after the interval, 11; largest quantity given, 7 cg. Duration of treatment since, 44 days. Weight on February 9th, 7 st. 2½ lbs.; now, 7 st. 8 lbs.

Result.—On April 1st, as there appeared to be no improvement in some of the nodules, and as others, apparently fresh ones, were discovered, all these were erased; these nodules were entirely subcutaneous. Many of the patches, active before injections were commenced, appear to be cured by the remedy. The patient has become quite stout.—P.

No. 34.—S. W., f., 30 years. Lupus of nose and cheek, rather erythematous in character, five years' duration. Three operations; ulcerating lupus now on hard and soft palate and uvula; epiglottis and inter-arytenoid fold involved. Doubtful phthisis right apex. First injection of 1 mg. on January 24th, gave good local and general reaction. Total number of injections 24; largest quantity given 6 cg. Weight before injection 7 st. 3 lbs.; now 6 st. 11 lbs. Duration of treatment 76 days.

Result.—The patch on the cheek is improved, the nose and palate only slightly so, the larynx is also a little better.—P.

No. 35.—L. S., f., 17 years. Lupus of neck, about two-and-half years' duration, following glandular suppuration, doubtful patches on knee and shoulder. Lupus of hard and soft palate; epiglottis, ary epiglottic fold and ventricular band on left side. First injection of 1 mg. on February 17th, 1891; severe general and local reaction of all affected parts. Total number of injections 15; largest amount given 13 mg. Weight before injection 7 st. 8¼ lbs.; now 7 st. 11½ lbs. Duration of treatment 52 days.

Result.—Moderate improvement in skin, palate, and larynx.—P.

No. 36.—A. A., f., 36 years. Tubercular skin condition (lupus) of thigh stump after amputation for tubercular knee,

inoculated from a sinus; duration about 2 years. Slight phthisis of right apex. When treatment was first commenced there was an oval patch, $4\frac{1}{2}$ in. by 2 in., a good deal raised, warty, and in places suppurating slightly. The first injection of 1 mg., on February 19th, gave no reaction of any kind, and it was only when 6 mg. were reached, on February 24th, that a distinct local reaction was attained, with a temperature of $100\cdot2$. The total number of injections has been 15; the largest dose 8 cg. Duration of treatment 50 days.

Result.—Moderate improvement. The area of the disease is not lessened, but it is very much less raised, much of the tubercular tissue has necrosed, and there is some attempt at cicatrisation.—P.

No. 37.—M. P., f., 25 years. Lupus, hard palate, gums, nose, larynx and face; duration, about five years. Various local remedies used to palate without benefit. When treatment was commenced there was an extending ulcer over the anterior part of the hard palate which involved the mucous membrane deeply, but did not perforate; the gums of the corresponding incisors and canines were reddened, warty, and in places ulcerated, the teeth were loose, there was a patch of lupus on the septum of the nose, the epiglottis was a good deal destroyed and there was thickening of the inter-arytenoid fold. There was a nodule on the right cheek, the size of a pea. The first injection of 1 mg., on January 22nd, gave rise to distinct local reaction and to a temperature of $100\cdot2$. The total number of injections has been 24, and the largest dose 1 dg. Weight, a week after first injection, 8 st. 2 lbs.; on leaving hospital, 8 st. 12 lbs. Duration of treatment as an in-patient, 39 days; as an out-patient, 39 days.

Result.—The palate is almost healed as are the gums and nose. The nodule on the face has disappeared. The laryngeal thickening is much less.—P.

No. 38.—W. L., m., 23 years. Lupus of face; five years' duration; eight times scraped and cauterised and once freely excised. When first injected the left cheek, the whole of the

nose, and part of the right cheek were covered with a warty scabbed lupus, active everywhere and causing a terrible disfigurement. The first injection of 2 mg. on Jan. 16th gave marked local and general reaction. The total number of injections has been 25, the largest dose 1 dg. Weight before injection 10 st. $4\frac{3}{4}$ lbs., now, 10 st. $11\frac{1}{4}$ lbs. Duration of treatment, as an in-patient 59 days, as an out-patient 25 days.

Result.—All the lupus appears to be quiet except small patches on the cheeks and one on the tip of the nose, but these are still improving. The rest of the diseased area is converted into soft red scar.—P.

No. 39.—F. F., m., 12 years. Lupus of face, ten years' duration; sixteen times scraped and cauterised. When first injected there was an active area on the right cheek, the nose, and upper lip. The first injection of 1 mg., on Dec. 27th, gave very slight local or general reaction, but after injection of 3 mg., on Dec. 29th, both were well marked. Total number of injections 26; largest dose 6 cg. As a small patch on the *upper lip* seemed at a stand still, this was scraped on Feb. 25th, and injections subsequently continued. Duration of treatment, as an in-patient, 86 days; as an out-patient, 16 days.

Result.—All the lupus seems to be cured, there are now no nodules, ulceration, or infiltration.—P.

No. 40.—H. M., m., 26 years. Tubercular disease of glands and skin, and formerly of metatarsus; several years' duration, during which time several operations were performed. When first injected there was some active mischief in gland of neck, in skin of this part, in both groins, on the right leg and foot. The first injection of 2 mg., on December 29th, gave distinct general and moderate local reaction. Total number of injections 28; largest dose given 8 cg. As some of the patches in the groins and on the leg seemed at a standstill, on February 14th these were scraped with a spoon.

Result.—There has been moderate improvement in all the affected areas; but, despite the scraping and injections, two small patches remain unhealed.—P.

No. 41.—W. S., m., 16 years. Lupus left cheek, following tubercular gland mischief; about three years' duration. First injection, of 5 mg., on Jan 10th, 1891, at which time the disease consisted of a nearly circular patch, about 3 inches in diameter, raised, nodular, and thickened. The first injection produced sharp general and local reaction. Total number of injections 24; largest amount administered 1 dg. Weight before injection, 6 st. 11 lbs.; present weight, 7 st. 5½ lbs. Duration of treatment, 90 days.

Result.—Marked improvement, but necrotic patches still follow each injection, although there is no constitutional disturbance of any kind.—P.

No. 42.—H. S., m., 29 years. Lupus of right cheek, of 24 years' duration; some years ago was treated with caustic. First injection of 3 mg., on January 5th, 1891, at which time the diseased area was 2¾ inches by 1¾ inches, nodular, indurated, but not ulcerated. The first injection gave distinct local reaction, but no general reaction was obtained until the second injection of 5 mg. Total number of injections, 30; largest amount administered, 15 cg. Duration of treatment, 95 days. Weight before injection, 9 st. 6 lbs.; after, 10 st. 4 lbs.

Result.—Greatly improved; the cicatrix at the margin is extending, but there are two small nodules which still react to injection, although there is *no* constitutional disturbance.—P.

No. 43.—J. B., m., age 13. Erythematous lupus of left side of face, chin, and neck; duration 7 or 8 years; no operation; suspicion of phthisis right apex. When injected the lupus had an active margin, and the whole area affected was curiously indurated, feeling like bacon rind. The first injection of ½ mg., on March 14th, gave a typical general and local reaction. The total number of injections has been 10; the largest amount administered 6 mg. Weight before injection 4 st. 9¾ lbs.; now, 4 st. 11 lbs.

Result.—Improvement, as shewn by paling and by marked lessening of the induration. Duration of treatment 27 days.—P.

No. 44.—W. L., m., 11 years, Lupus of hand, about ten

years' duration ; it has been treated by erasion. First injection 2 mg., Dec. 29, 1890, at which time the diseased area was about $2\frac{1}{2}$ inches long by 1 inch wide, partly scabbed and ulcerated, partly warty. This gave no general reaction, but there was slight local reaction and injection of 5 mg. on Jan. 2nd, gave sharp general reaction. Temperature 102.5, and mild local change. 12 injections altogether ; highest amount $1\frac{1}{2}$ cg. Weight before injection 5 st. $7\frac{3}{4}$ lbs. ; after, 5 st. 11 lbs.

Result.—Cicatrization of about half of lupus patch, the rest smouldering on ; the part remaining was scraped and excised on Feb. 6th right into subcutaneous tissue and the wound healed, but since, the part operated on has broken out again, the patch which healed under the injections remains sound.—P.

P. indicates that the case was watched by myself for symptoms of reaction.—G. B.

