lege of Surgeons of England are the lungs and bronchi of a child who died from the effects of a foreign body in the right bronchus; collapse of the lung below the obstruction is well shown, and there is emphysema of the unobstructed portion of the lung. Lichtheim in his experiments also found emphysema of the unobstructed portion of the lungs. I think that in cases where plugging is incomplete, but the entry of air much diminished, some collapse takes place, for the alveoli at the periphery of the lung are not likely to be affected by inspiration or expiration; the elasticity of the lung then comes into play, and the air becomes gradually absorbed. The same is seen in other morbid states.

The sudden and complete plugging of the bronchus thereby rendering a considerable area of lung tissue functionless does not, I think, necessarily bring about a fatal result immediately. In animals it certainly does not, for Lichtheim allowed days to pass after plugging a bronchus before killing the animal. That extensive collapse may of itself lead to a fatal result I think is clear, for in the case last referred to death took place twenty-four hours after the plugging of the right bronchus. These cases, in which the onset is acute, and an enormous amount of work is suddenly thrown on the heart and the remainder of the lungs, are not comparable with those cases in which disorganisation of the lung gradually takes place, for in these the circulatory and respiratory systems have time to adapt themselves to the altered conditions.

Before passing on to the consideration of the late stage, I should like to say something about tolerance. Poulet gives a few examples; two were in lunatics, the foreign bodies being discovered at the necropsies. As nothing was known about these cases, I do not think they are of much value. It seems to me to be improbable that a foreign body can stay in a bronchus without producing some changes; a few cases are reported in which a foreign body has been impacted in a bronchus for some time, but the changes produced were always considerable. In an article in the *Lancet* of last year, the authors² stated that they were only able to find thirty-one cases of recovery in which a foreign body had been retained in the trachea or bronchus for over one year before its removal. Furthermore, they found that the cause of death was tuberculosis in the great majority of cases that did not survive.

LATE EFFECTS.

The presence of the foreign body leads in time to inflammation of the bronchial passages with subsequent consolidation of the lung. Sometimes, but not often, the onset of these changes is sudden and takes the form of an acute lobar pneumonia.

In reading about these cases and in the specimens I have seen in several museums, I have been struck by the similarity of the morbid changes. The mucous membrane of the bronchus is ulcerated where it is in contact with the foreign body, the smaller divisions beyond are dilated, their walls are thick and filled with purulent secretion, and in places ulcerated; the lung presents various stages of consolidation, in some cases passing on to gangrene. The pleura is thickened, and the visceral and the parietal layers adherent. In the museum of the Royal College of Surgeons of England there are specimens⁶ which show these conditions; one is the lung of a child who died eight weeks after inhaling a piece of nut. The right lung is adherent to the chest wall, the divisions of the bronchi are dilated and the cut section of lung shows that it is solid, but it does not present the ragged, breaking-down appearance seen in another specimen.

The condition of bronchiectasis which I believe to be a common sequela is not mentioned in many of the references I have looked up. Mr. Rickman Godlee speaks of it in his lectures⁷ on the surgical treatment of pulmonary cavities, and there is an illustration in Gross⁸ showing the dilated bronchial tubes. It is interesting in two ways: in the first place as regards its causation, and secondly with reference to its diagnosis.

Of the two forms of bronchiectasis, cylindrical and saccular, the former is the one usually met with in these cases; whether this condition be due to the pent-up secretion or to the increased pressure during cough acting on the bronchial walls already inflamed and softened by the secretion, is not easy to say. That the latter is an important factor in its causation is

certain, for cases of chronic bronchitis and emphysema often show the bronchial tubes to be somewhat dilated; another explanation that has been offered for bronchiectasis—namely, that it is due to the contraction of the chronically inflamed lung tissue, does not, I think, hold good in these cases, for the lung in many cases shows signs of disintegration.

This condition of bronchiectasis may not be easy to diagnose. If in puncturing the chest wall a muco-purulent secretion is withdrawn, it shows that it comes from a cavity in the lung connected with the bronchial mucous membrane. After excluding tuberculous processes, I should think of a foreign body as a possible cause, particularly in children where the history is often indefinite and the presence of a foreign body may not be suspected.

The consolidation of the lung is a gradual process, and is not usually the result of an acute pneumonia which has never resolved, for acute pneumonia is not common, and the physical signs point to a more gradual onset.

In a later stage complete disorganisation of the lung is found. A case is reported⁹ in which death followed thirteen weeks after the inhalation of a piece of grass. The lower third of the lung is described as a gangrenous mass, riddled with cavities, in one of which a piece of grass was found.

The changes in the pleura are clearly the result of inflammation spreading through the lung. In some cases the process is different. Round the foreign body pus forms,¹⁰ and gradually works its way to the surface and discharges, often carrying the foreign body with it. Even after removal of the foreign body it is by no means certain that the lung will recover, for it may be too disorganised, or the damaged portion may form the starting point of tuberculous processes, the frequency of which I have already drawn attention to.

CONCLUSION.

The effects of foreign bodies in the bronchi I have divided into two stages. In the first stage the most noticeable feature is the collapse of the lung; in the second stage the inflammatory changes predominate. Of these the most important are changes in the bronchial tubes, their dilatation with walls thickened and full of secretion, the consolidation of the lung and it may be its final disintegration, and the changes in the pleura, in some cases the formation of an abscess.

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- ⁴ Lichtheim, *Arch. Exp. Pathology*, 1879.
- ⁵ Drs. Bunch and Lake, *Lancet*, 1897, vol. ii, p. 784.
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- ⁷ Rickman Godlee, *Lancet*, 1887, vol. ii, p. 666.
- ⁸ Gross, *Foreign Bodies in the Air Passages*.
- ⁹ *Lancet*, 1880, vol. i, p. 89.
- ¹⁰ *BRITISH MEDICAL JOURNAL*, 1885, vol. ii, p. 1015.

ON THE HOT-AIR BATH, WITH ILLUSTRATIVE CASES.

By A. S. MYRTLE, M.D. EDIN.,
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IN my Note on the Hot-Air Bath in the Treatment of Arthritis, published in the *BRITISH MEDICAL JOURNAL* of December 10th, 1898, p. 1745, I promised to follow with the history of a few cases showing its value as a therapeutic agent. Between August 28th and December 31st, 1898, 680 baths have been given at our Royal Baths. I have received many letters from medical men asking me about superheated air baths. For their information I give a few general remarks on the different methods adopted till present date.

1. *The Tallerman*.—The heat is got from gas; it is a gas oven, can only be used for legs and arms, is cumbersome, and the products of combustion are distinctly felt.

2. *The Dowsing*.—The heat here is produced by electric lights similar to those used for house illumination. The light and heat from these is thrown from above on reflectors of glass and polished metal, but these cannot surround the part completely, as in

3. *The Greville*.—Here we have the sides, top, bottom, and ends supplying a steady glow all round from a very large number of small wires fixed in metal frame like the strings of a harp, and enclosed in a perforated aluminium case, which

is covered with a sheet of aluminium. This arrangement allows a slow, steady heat, which can be regulated and controlled with ease and safety; besides, Mr. Greville (31 and 32 Upper Berkeley Street, London, W.) has constructed every variety of bath, full length as well, so that there is no part of the body which cannot be successfully treated. All his chambers are so light they can be moved about as easily as one moves a chair.

CASE I.—M., aged 67, has been afflicted with gout for over twenty years. His attacks of late have been more and more severe and prolonged, lasting for six and eight weeks, in defiance of the most heroic treatment; otherwise strong and healthy. Saw him on August 16th, 1898, unable to move; could not turn in bed; hands, wrists, elbows, feet, ankles, and knees full of acute gout. August 28th: Persuaded him to have first Greville in his bedroom. Both legs were kept in for forty-five minutes; temperature 300°; neither pulse nor body temperature were affected. 29th: Had his second bath at 8 A.M. That afternoon I found him sitting up dressed. 31st: Was able to go to Royal Baths in chair, a distance of three-quarters of a mile. Could walk with assistance, was free from pain, had good night's rest. On September 3rd he went home, and since that date has been for the most part confined to bed and his room. I mention this case to show the rapid action of the bath and great and immediate relief afforded. Had he continued under the treatment I feel assured he would have been in a very different condition from the one he is in at present.

CASE II.—F., aged 75, always enjoyed the best of health, but for many years has suffered from rheumatism in both hips and knees. Now the hips are very stiff and painful; the knees swollen, painful, and almost incapable of any motion. This condition has been gradually increasing. Has been at Buxton, Bath, Aix-les-Bains, and other spas, without benefit. Ordered sulphur water internally, and thermal sulphur baths alternate with the Greville. At the end of a fortnight was much improved. In another fortnight could rise from chair with ease, and with assistance walk a little way. Pain in hips entirely gone, but still suffers in both knees. She felt perfectly satisfied that she had received more good from Greville treatment than all she had undergone previously.

CASE III.—M., aged 73, never had gout or rheumatism, but been very seriously ill with liver attacks. For some months has suffered from pain outside of left foot, with cramp of toes. This was followed by acute pain in outer and inner side of leg below knee, the pain coming on during the night whilst in bed, preventing sleep entirely. Had been under treatment for this without the least good following. The first Greville gave relief, and each following did more and more; after six the pain was completely gone, also the pain in foot and cramps. Six weeks have passed; there is no return, and he can walk as well as any man of his age.

CASE IV.—M., aged 60, twenty years ago showed very distinct symptoms of locomotor ataxy; this increased, exhibiting all the usual signs for two years, then became stationary, and has thus remained: is very gouty, bilious, and never entirely free from eczema; can hobble for one or even two miles with two sticks. Six months before I saw him he noticed his left leg begin to swell, and gradually this increased until it was exactly twice the size of its fellow. The swelling went from the foot to the body, was uniform, not in any way discoloured or painful, did not pit on pressure, or cause any inconvenience. After he had three Greville baths slight changes began to show themselves; the limb perspired freely for the first time; he felt something give way, and after three more baths the limb was the same size as the other, and has continued the same ever since. The symptoms, I believe, arose from block of lymphatic vessels. The limb looked and felt just as in phlegmasia dolens. Three months have elapsed and the cure continues.

CASE V.—M., aged 63, of very gouty family; has been subject to attacks for twenty years at least; for last five years hands, wrists, and fingers have been gradually getting worse. Rheumatoid arthritis (?); great disfigurement, pain, and helplessness. Often cannot do a thing for himself, sign his name, or hold his paper. Has been a regular visitor to Harrogate, and always found great good from the waters and baths. This year combined these with the Greville. After the first, right wrist felt softer, and showed signs of decrease in the wrinkled skin; pain much less. After the third could move fingers and wrist; can write and hold his book. He had altogether nine baths, and when he left volunteered the statement that his hands were better than they had been for years.

CASE VI.—M., aged 70. Enjoys perfect health, but for eighteen months has suffered from severe rheumatic pain in muscles above right elbow and in the joint itself; pain extends half-way up the arm. Has been treated thoroughly for it, and gone to several spas for douches and massage. After second Greville found considerable ease, and three more completely rid him of the pain. I saw him a fortnight ago, and he still felt all right.

CASE VII.—F., aged 31, delicate looking; gout very prevalent on father and mother's side; has no complaint except pains in both hands and feet. Pain in feet so great as to be unable to walk any distance; pain in hands incapacitates her from doing anything with them. There is no swelling in either hands or feet; occasionally the latter are reddish. Has been treated for gout during the last two years, but without benefit. She was sent to me by her doctor, in order to have a course of water and sulphur baths; these she had regularly for three months without change. I then tried the Greville, and she had six, temperature going up to 320°, without the slightest relief. I heard from her six weeks after she left, and she remains in the same condition.

CASE VIII.—F., aged 37; right shoulder swollen, painful; cannot extend arm at all, or raise hand to head, any attempt at either causing great suffering. This has been going on getting worse for the last three years, shoulder-joint measuring from above underneath armpit 1 inch larger than the left, and when you move the arm in any direction the scapula moves, shoulder is fixed; had gone through the usual course of treatment, including baths, galvanism, massage. After thirteen Grevilles, beginning at 300° and going up to 375°, the swelling gone. Can stretch out arm, raise it with ease to head, place it behind her back, and write for short time comfortably. I name this case whilst still under treatment, because it was pronounced incurable before she came to me.

The following cases are reported by Dr. James Myrtle:

CASE A.—M. E., aged 48. Sciatica, affecting the left leg. Had a full course of sulphur waters and baths before the Greville bath was introduced. He then stayed, and had three of them. During the six weeks he had been here he slowly improved in his walking power, and also had distinctly less pain. His was the first case in which the Greville bath was used. He saw me after his third bath, when I said, "Well, how are you?" He stooped down without fixing his knee, pretended to loose his boot, drew himself up, and said, "I have not been able to do that for seven years." I saw him six weeks after he left the place, and he told me the improvement still continued, and that had he any return he should go to London and have a few more baths.

CASE B.—T. B., aged 46. Case of acute double sciatica. This gentleman was introduced to me by Dr. Blason, with the object of trying the Greville bath. At the time I saw him he was quite unable to get up from his chair without great effort. When up he was unable to move without crutches. He had been in this state for nine weeks. I ordered a bath, and saw him crawling with the aid of a friend and crutches down to it. When he left the bath he walked a distance of three-quarters of a mile to his hotel without the use of crutches or stick, and was able after that first bath to discard the use of his crutches, and after three or four more walked freely and well without a stick. He had a course of twenty-one baths, and walked daily five or six miles at a stretch with comfort, all his pain in both nerves having totally disappeared.

CASE C.—W. S., aged 42, consulted me as to the advisability of taking these baths on account of locomotor ataxia of three years' standing. When I first saw him he was unable to walk 150 yards without resting and with the aid of a stick, and could not go up any steps without the assistance of a rail or stick. He suffered markedly from diplopia. I advised him to come to Harrogate and try the effect of these baths. He had a course of twenty-four at the rate of four a week, and when he left the place was able to walk four miles at a stretch, and could mount the stairs of a three-storey building in comfort. His sight, also, had greatly improved. He told me that after his first bath he was able to put his hands behind his back and dip his head in a basin of water, a thing he had not been able to do for nearly three years. The improvement in this case still continues, although two months have elapsed since he took a bath.

CASE D.—E. G., a keen sportsman, aged 66, consulted me in September about a gouty stiffness in both his hands, the wrists, and joints of the fingers. I advised him to try the effect of the Greville bath. He had a course of six, and left with perfectly free movement in all the joints previously affected. This improvement, he told me at the end of last month, is still maintained.

CASE E.—Mrs. I., aged 55, suffering from chronic rheumatism, affecting the muscles of the calves, the knee, and ankle-joints. She had a full course of the sulphur water and baths, with marked improvement so far as muscular pain went, but the joints did not answer so readily to the sulphur bath as is usual in most cases. I therefore tried her with four of the Greville baths. The swelling and stiffness decreased rapidly with each bath, and she left the place, as she said, completely cured. The extraordinary relief from pain which all my patients have expressed after the first of these baths, and that this relief is maintained during the two or three days intervening between each bath, is to my mind one of its most remarkable features.

FILARIA DEMARQUAI IN ST. LUCIA, WEST INDIES.

By OTHO GALGEY, M.R.C.P.I.,
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IN the BRITISH MEDICAL JOURNAL of December 25th, 1897, Dr. Manson draws the attention of the profession to the different varieties of the filaria sanguinis hominis found in the blood of man in tropical countries, and enumerates six embryo nematode worms discovered up to date. These are filaria nocturna, filaria diurna, filaria perstans (Africa), filaria Demarquai (St. Vincent), and two possibly new filariae recently met with in Demerara, which he grouped together under the provisional name, filaria Ozzardi (British Guiana). These minute worms present such different characteristics under the microscope that Dr. Manson and other authorities believe them to be distinct species.

Filaria Demarquai is described in the same article, and Dr. Manson states that he found it only on blood slides sent to him by Dr. Newsum, of St. Vincent.¹ He failed to find it in blood forwarded to him from St. Kitts and Montserrat. Dr. Daniels, in his recent article in the *Journal of Tropical Medicine*, confirms this by saying: "I have not found the filaria Demarquai in any of the West Indians (102 cases), including 6 from St. Vincent. These statements prove that F. Demarquai is not universally distributed throughout the West Indies, and that not very much is known respecting it; in fact, the only literature on the subject which I have been able to discover are the articles above mentioned in the BRITISH MEDICAL JOURNAL, and a short reference to it in the *Manual of Tropical Diseases*, also by Dr. Manson.

The study of filariasis is exceedingly interesting and absorbing, and, therefore, the discovery of another habitat