failure of co-ordination, although in walking it was observed that he occasionally knocked his heels together and tended to stumble.

He caught cold in London, and had a bad journey through France, and, on reaching Mentone, was quite unfit for exertion. He was confined to his room most part of the winter, and suffered much from diarrhoea and increasing debility. In the month of April I had the opportunity of seeing him in Mentone along with Dr. Rendall, and found him in all respects much worse. He was emaciated and anæmic, and his weakness was such that he could scarcely walk across his room. He was even unable to stand without assistance. When in bed he was able to move his feet about, although not vigorously, and he could write, although with effort and with but a poor and tremulous result. No satisfactory explanation of his diarrhoea was discovered, and there was no disease superadded, but the condition of the nervous system showed again an increase of the earlier symptoms.

It is clear that the history and features of this case do not conform to those of any well-recognised type of nervous disease. I have never seen a case of peripheral neuritis in which an increase of the patellar reflex existed, and the course of the case did not correspond to any example of neuritis that I have seen. The same remark applies to the suggestion which might be made that the case is one of locomotor ataxy; and in addition to the difficulty of the knee-jerk in such a diagnosis we have to recognise the absence of marked failure of co-ordination and of all that series of early symptoms which have been so familiar to the profession since the days of Trousseau. Neither is it referable to the category of Dr. Gowers's cases of ataxic paraplegia, in which the symptoms proper to locomotor ataxy are modified by the results of sclerosis of the antero-lateral columns of the cord. There is, however, a condition which has been described by Drs. Putnam and Dana—the former writing in March, 1889, the latter in April of the present year—which seems to correspond pretty closely to the symptoms met with in my patient.

Dr. Dana summarises the symptoms of the cases which he watched somewhat in the following way: The disease exhibited at its onset a numbness of the extremities, attended and followed by progressive enfeeblement: the enfeeblement was not attended by paralysis of any special groups of muscles, but culminates at last in paraplegia. In some cases there were ataxic symptoms, but spastic phenomena, with exaggerated knee-jerk and ankle-clonus, were more common. Anæsthesia was met with in some cases; girdle and lancinating pains were very rare. The arms were less affected than the legs. The vision and other special senses and the speech were not disturbed. Mental symptoms approaching dementia were observed in the terminal stage in one case, and the patient usually suffered from great emaciation; and anæmia, often attended by obstinate diarrhoea, was among the marked features. The general course was that of a rapidly progressive affection—rapid as compared with the ordinary system-diseases of the cord. It was more common among women than men, and was more apt to occur after middle life. The cause was not certainly determined. It did not seem, in the cases observed, to be due to syphilis or alcoholism. The pathological changes met with consisted in a combined sclerosis of the lateral and posterior column, ultimately associated with a softening at certain levels. Treatment had only been followed by temporary improvement, and the remedies which Putnam and Dana have found most useful were iron and other tonics.

The case which I have sketched manifestly corresponds in many of its features with those mentioned by the American authors whom I have quoted, and I publish these notes in the hope of drawing the attention of physicians in this country to this little-known form of disease.

AN anonymous donor has presented to the county of Surrey a convalescent home for male patients, at Seaford, Sussex. It has been erected at a cost of £25,000, including £10,000 set aside as an endowment, and will accommodate fifty patients. The President is the Duke of Cambridge; the Vice-Presidents, the Duke of Connaught and the Duke of Teck.

THE Hungarian Prime Minister has expressed himself in favour of the proposal to hold the International Hygienic Congress of 1893 in Buda-Pesth.

ON THE TREATMENT OF ANEURYSM OF THE AORTA BY IODIDE OF POTASSIUM.

By GEORGE W. BALFOUR, M.D., LL.D., F.R.C.P.E.
Physician to Chalmers' Hospital.

IN March, 1887, a clergyman entered my consulting room with the words: "I have been perfectly well for over a year; I have been doing half duty for the last three months, and, with your permission, I intend doing full duty henceforth." His history was as follows: On December 24, 1885, the Rev. W. A. called upon me, and gave me the following account of his case, written out by his own medical attendant, Dr. Gorman, of Rutherglen:

"On several occasions during the last few years, and at intervals usually of many months, the Rev. W. A. has been attacked with sudden disturbance of the heart's action. Generally this has occurred without any evident cause, and under various circumstances. When out visiting, when reading quietly at home, or when lying in bed, the heart would begin to beat more rapidly and forcibly, and this would go on increasing till the pulse rose to 140, and a jarring impulse was communicated to the whole body. This condition was accompanied by a distressing tight feeling in the chest, but there was no marked difficulty of breathing or feeling of suffocation. This would continue for a short time, and then subside so quickly that at the end of an hour not a trace of any disturbance was discoverable. Inhalation of nitrite of amyl gave no relief, but brandy always speedily brought the attack to a close whenever it was tried. When I saw him after the attack there was no unusual murmur, nor anything abnormal to be detected. Rather more than two months ago—October, 1885—had a cold with a raw throat and a slight cough, and for this he kept indoors for two days. Then early one morning he awoke—about 3 A.M.—with a feeling of suffocation, and a strong desire to cough; but the attempt to cough brought on a violent laryngeal spasm, under which he struggled for fully ten minutes, as I was informed, before he got relief. By the time I arrived the spasm was gone, his voice was a little rough, his pulse quick, and his whole body and bedclothes soaked with excessive perspiration. Early in the morning of the seventh day following this attack, Mr. A. had another and a more severe paroxysm of a similar character. During the interval he had been out of bed, but not out of his bedroom, and had been troubled with a little cough, which was, however, soft and loose. Eight days subsequently Mr. A. had a third attack, lasting longer and more severe than ever. After this there was more cough, and at the end of each cough an attempt at laryngeal stridor. At this time a child in the house began to cough suspiciously like whooping cough, and it was suspected that Mr. A. might have whooping cough. I heard him cough several times; there was no true whoop, not even a repeated coughing, but after one or two harsh expiratory sounds, a slight—not croupy—stridor was heard. I consulted with Dr. Joseph Coats, the pathologist, who is also an expert laryngoscopist. He only found slight increased vascularity of the larynx and of the rima glottidis. On getting out of bed to be examined by Dr. Coats, Mr. A. was seized with a fourth attack, slight and short in comparison to his previous paroxysms, as we were told. To me it seemed like a fit of whooping cough, the cough ending in laryngeal stridor, exactly like what is popularly termed a "dumb kink." Dr. Coats did not think the appearances in the larynx sufficient to account for the attacks; he thought there was slight dulness on percussion over the first rib on the left side close to the sternum, and was inclined to suspect a commencing aneurysm of the aorta pressing on the recurrent laryngeal nerve. The pulsation behind the left sterno-clavicular articulation seemed to him to be abnormally increased. No *bruit* of any kind could be detected, nor was the systolic sound at the cardiac apex markedly prolonged. Dr. Coats thought that the action of the vocal cords during inspiration was insufficient. I examined Mr. A.'s larynx on several occasions, both before and after this, but I never could detect paralysis of either of the abductors. The neck was swollen and puffy, the thyroid body large but soft. Fomentations were applied and iodine liniment painted on, which somewhat reduced this swelling.

"At first Mr. A. was treated with inhalations of steam, afterwards with steam from an infusion of hops, along with bromide of potass, etc. After the second attack he had a mixture of chloroform and ether to inhale, latterly chloroform alone, the hop inhalations being continued. The merest sniff of chloroform stopped the cough, and it was resorted to at once on the slightest sensation of laryngeal irritation. Mr. A.'s own impression is that but for the chloroform he would have many more of his distressing paroxysms. Dr. Coats, having the idea of aneurysm in view, prescribed large doses of iodide of potass, to which I had the less objection that it is often useful in asthma. At first I gave 90 grains in the day, combined with the bromide of potass; latterly he has been taking only 40 grains in the day. He has improved under this treatment. What we wish decided is the question of aneurysm and the condition of his heart."

This letter was brought to me by Mr. A. on December 24th, 1885. He seemed a strong, healthy-looking man of 49, with equal pulses at both wrists. The left side of the face was a little more puffy than the right, and upon stripping him, the left side of the neck, especially just above the clavicle, was seen to be markedly puffy compared with the right side; the apex beat was nearly below the left nipple. On percussion, the only abnormality detectable was that there was slight dulness in the first interspace on the left side, extending outwards for about half an inch from the sternum. On auscultation, no abnormal murmurs were anywhere detectable; the systolic sound in the mitral area was loud and distinct but well closed; the second sound in the pulmonary area was not accentuated; in the aortic area it was distinctly accentuated, and still more markedly so over the left sternal-clavicular articulation, the sternal end of the first rib on the left, and in the left carotid artery; over these parts also the systolic pulsation conveyed through the stethoscope was unusually forcible.

The lungs were healthy, no cough, only the history of laryngeal paroxysms, and no marked paralysis of the left vocal cord. Nevertheless, I considered the signs and symptoms to be sufficient to justify me in confirming Dr. Coats's suspicions and affirming the existence of an aneurysmal dilatation of the aorta, with a small bulging at its left, just where the left carotid comes off, chiefly in front but also extending slightly downwards, so as to distend the loop of the left recurrent laryngeal nerve upon any accidental rise in the blood pressure, and so initiate laryngeal spasm.

Many years ago I had a patient with a small aneurysm of the posterior part of the arch of the aorta, about the size of half a walnut, which in its ordinary condition pressed only slightly on the right bronchus, producing a slight rise in pitch of the percussion note all over the right lung, with comparative faintness of the breath sounds. When from any cause the blood pressure rose, the aneurysm dilated and pressed right across the lower part of the trachea, and in one of those attacks the patient died from suffocation; so that the idea of occasional paroxysm of laryngeal spasm due to a permanent cause of this character was quite justifiable. The localised dulness was limited but well marked; the swelling on the left side of the face and neck indicated the position of the tumour, chiefly on the anterior surface of the aorta, pressing upwards and outwards upon the innominate vein, blocking chiefly the current through the internal jugular vein, and that but incompletely, while the localised accentuation of the aortic second sound was quite sufficient to indicate the aneurysmal character of the tumour, the absence of a *bruit* being of no consequence, as intrathoracic aneurysms seldom have any *bruit*. The heart was nearly normal, being only slightly dilated and hypertrophied.

I recommended Mr. A. to resign his connection with the church, that he might be for ever removed from all the excitements of clerical life, including preaching. This he was unwilling to do, so in the meantime I recommended three months' perfect rest either in bed or on a sofa. Alcohol in every form was strictly forbidden, plenty of milk enjoined, and a good supply of plain nutritious food. To cure or even to improve an aneurysm the patient must not be starved, but well fed if he is to have any iodide. Starvation interferes with the cure, which is brought about not by coagulating the blood within the sac, but by hypertrophying the walls of the sac. Possibly the iodide may have some effect in producing

hypertrophy of the fibrous tissues; indubitably its most important effect is to cause a permanent lowering of the intra-arterial blood pressure. An aneurysm is produced by an injury to the middle coat, or to the two internal coats of the artery, so that at that affected spot the walls of the vessel are enfeebled and distend under the influence of the normal blood pressure. But if we lower the blood pressure beneath the normal, then the vessel behaves itself like a hollow muscle opposed to an obstacle it can cope with—it no longer dilates, it hypertrophies. The pulsation and pressure symptoms diminish more or less completely, and the patient is restored to life and comparative comfort; and though perfect health is out of the question, it is remarkable how much exertion some of these patients are fit for. There is one old patient of mine who has plied as a cabman on the streets of Edinburgh for more than ten years, not only driving, but lifting luggage about without any trouble. Now and then he comes into Chalmers' Hospital for a week or two of rest and treatment, and then goes back to work.

To obtain so important an improvement it is not needful to give large doses of the iodide, but we must give enough. The proper course is to put the patient in the recumbent posture for a couple of days, so as to get his normal pulse in recumbency always five or more beats lower than when erect. Next we begin with five grains of the iodide of potassium (the iodide of sodium has not the same effect) in some bitter infusion, preferably chiretta, every eight hours; this dose is continued for two or three days, the pulse rate being taken at the same hour daily. After two or three days the dose of the iodide is raised to 10 grains every eight hours for three or four days, the pulse rate being carefully taken in the same manner. In this way the dose may be gradually increased until a dose is reached under which the pulse rate is found to rise, then we must stop the medicine for a day and go back to the previous dose. The moment the pulse rate rises the benefit ceases, and the constitution begins to suffer. Only seldom is it needful or advisable to raise the dose over 10 grains every eight hours; commonly enough 5 grains is quite sufficient. The maximum of benefit is obtained by a dose just below that which lowers the blood pressure so far as to cause the pulse rate to rise. Two, or at the most three, weeks is quite long enough to continue the remedy every eight hours. Afterwards it is sufficient to administer it every twelve hours, and to continue it from three to six months to put the patient in a very comfortable position. The length of time the remedy has to be continued depends very much upon the size of the aneurysm when the treatment is commenced.

Mr. A.'s case was an extremely favourable one: the aneurysm was obviously very small, and had not existed long. He never had another spasm after the treatment was commenced. On March 29th, 1886, I saw Mr. A. for the second time; the swelling of the face and neck was much lessened, but the local accentuation of the second sound and audible systolic local thump were still well marked. There had been no recurrence of the spasms. I advised the continuance of the iodide, with quiet life in the country for other three months. I saw him again at the end of the following June, when the aneurysmal signs were found to be very much modified; there had been never any return of the spasm, and he was practically well. I saw no more of Mr. A. till March, 1887, when he saluted me with the words with which this history is commenced. I never saw him again, and his subsequent history is a somewhat sad one. After thirteen months' silence Mr. A. commenced to preach half the day—that is, to take one full service including a sermon each Sunday—visiting the sick for a few hours daily during the week. Gradually, as his strength returned, he increased his labours, doing full duty, including two sermons each Sunday, besides his weekday work. In this way he succeeded in rebuilding his large congregation. During February, 1889, he had a week of evangelistic meetings addressed by a friend, at all of which, however, he was present, taking part in the prayers only. Towards the close of these meetings, on February 22nd, he came home about 10 p.m., in the highest spirits. He took supper, read a little, and went to bed. Shortly after 11 he awoke with a headache, asked his wife to sponge his head, and before she could get vinegar and water for the purpose he was speechless, was paralysed on the right side, and speedily became unconscious. He died after fifteen hours' illness,

during the last three of which he was violently convulsed. It is possible that this seizure was embolic in character, but considering that during the last year of his life he had been getting stouter, and that he had been complaining very frequently of severe headaches, it seems much more probable that his sudden death was due to rupture of a vessel, induced by the mental excitement of the few last days of his life. I regret there was no *post-mortem* examination. His father, I may mention, had an apoplectic seizure at the same age (52), which he survived for ten years, crippled by paralysis. It is very satisfactory to note that so far as the aneurysm is concerned he was practically cured and restored to usefulness, having had no recurrence of his serious symptoms from the moment he was put under appropriate treatment. The completeness of the cure of course depended largely upon the patient having put himself under treatment at an early period of his disease, and this again was due to the severity of his symptoms. But even when an aneurysm has made much greater progress than in Mr. A.'s case, the treatment by iodide of potassium, properly carried out, is capable of relieving suffering and prolonging life.

At this moment I have under my care a lady who, twelve years ago, was found to have an aneurysm springing from the upper part of the descending aorta, pressing backwards and projecting with a fluid pulsation through the ribs, between the left scapula and the spine. The tumour was not only eating away the ribs, but into the spinal column and pressing on the nerve roots. Numbness and tingling were constantly present on the left side, and every now and then acute nerve storms of almost unbearable pain shot through the nerves up the neck and down to the finger tips and points of the toes, also round the left intercostals, and often terminating in a violent fit of uncontrollable sickness. Unfortunately there was not a single narcotic in all our then repertorium that the patient could tolerate; one after the other was tried in vain, they only complicated matters and made the patient worse. By-and-by, however, the iodide told, the sac began to contract and the pressure symptoms to diminish, the sufferings gradually and slowly ceased. Bedridden for ten years, and often suffering the most intense agony, the patient for the last two years has been moving about free from pain, except when this is excited by some accidental twist or over-exertion. All the objective signs of the aneurysm are still evident enough, though modified from what they were. The pulsating tumour is diminished in size and firmer in character, and the subjective symptoms have slowly and gradually disappeared, coincident with the shrinking of the sac. There could not possibly be a case more instructive, or one in which the remedial powers of the iodide of potassium could be more severely tested or more evident.

APPARENTLY SUCCESSFUL CULTIVATION OF THE BACILLUS LEPRÆ.

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AND

SURGEON-MAJOR A. BARCLAY, M.B.,

Members of the Leprosy Commission.

[A Preliminary Communication.]

WE have succeeded in isolating and cultivating from leprosy tissues, removed under all aseptic precautions from patients *intra vitam*, a bacillus which may fairly claim to be the true bacillus of leprosy. The original material was obtained from three lepers, whose ears were enormously thickened. In each of the three cases the lobe of the ear was cut off with sterilised knives, after all the parts had been scrupulously cleaned in the ordinary manner. Then the removed mass, which was about as large as a good-sized pigeon's egg, was divided into two parts with another sterilised knife, and from the centre of the mass a small piece was removed and at once dropped into ordinary nutrient *bouillon*. Three tubes were thus charged, one from each case. One of the tubes became contaminated with the staphylococcus albus, but the other two remained pure and have given the same results.

Examining these two latter tubes three days later, the *bouillon* was seen to be clear, and cover glass preparations

showed free bacilli, morphologically identical with the bacilli of leprosy, which also resisted the decolorising power of nitric or hydrochloric acid; in fact, they could easily be stained by the Koch-Ehrlich method. No other bacilli could be discovered by the microscope, and subsequent agar-agar plate cultivations showed this bacillus alone to be present in the *bouillon*. A glycerine agar tube was now inoculated and kept at body temperature for several days. After twenty-four hours a minute colourless transparent nodule resembling a dewdrop was noticed on the surface of the agar, and by the fourth day slight growth in the depth of the nutrient medium was visible. The interstitial growth never, not even after weeks, became very well marked, the bacillus being strongly aerobic. By the fifth day the surface of the agar was covered by a greyish-white pellicle, resembling dew-drops. The microscope at this stage revealed a small and slender bacillus, which reacted to Koch-Ehrlich's method of staining, and undoubtedly was a pure cultivation of the bacillus found in the *bouillon*. It differed from the leprosy bacillus as found in the tissues in this: that (a) it took up aqueous methyl blue much more rapidly, and (b) did not retain the fuchsin with such tenacity; otherwise, morphologically and in other respects, it resembled this bacillus closely. Stained by Gram's method, the gentian violet was well retained.

The other *bouillon* tube which had not been contaminated gave exactly the same results. Several agar tubes were now inoculated from the original growths on agar. It was, however, found that though at first the bacilli reacted well to Koch-Ehrlich's method, they gradually lost this power. With advancing age, however, they regained it more or less, and now, that is, after a month, in every specimen a goodly number of bacilli is found to retain the red stain well.

It was soon ascertained that the bacilli grew exceedingly well at the ordinary (Indian) temperature, and this facilitated matters much. Gelatine and glycerine *bouillon* tubes were now inoculated from the original agar cultivations. The gelatine soon liquefied, and after a week or so a pellicle like the one on the agar covered the liquefied gelatine. Before the pellicle was formed, the bacilli did not react well to the Koch-Ehrlich method of staining. But as soon as the pellicle was well marked, the great majority of them reacted well, and the bacilli in fact were unmistakably like the leprosy bacilli in the tissues, and they now took up the methyl blue less rapidly, as before. In the glycerine *bouillon* tubes also a week or ten days later a similar pellicle was observed, the *bouillon* remaining clear, and the liquid in the immediate neighbourhood of the pellicle being mucoid andropy. The bacilli in their morphological and chemical characters were identical with those obtained from the gelatine. It was found that as soon as this pellicle was well marked on either gelatine or glycerine *bouillon*, then the Koch-Ehrlich reaction offered most success, and aqueous methyl blue the worst. It must, however, be remarked that in some specimens the fuchsin was rather badly retained, in others almost all bacilli retained it well. Gram's method always gave good results at this stage.

On potatoes, which were sterilised in test tubes, and prepared according to the methods recommended by Roux and Hueppe, not even after four weeks was any growth visible. As potatoes are in the majority of cases acid, a growth was attempted on neutral and faintly alkaline potatoes, but with no result. Eggs, inoculated after the manner employed by Professor Max Wolf (Berlin) for actinomycetes are at present under observation; and animals are likewise being experimented on. The bacilli, as might have been expected, showed, in a hanging drop, sluggish spontaneous movements.

We consider our bacillus to be a pure cultivation of the bacillus lepræ, for the following reasons: (a) The manner in which the material was obtained excluded contamination from outside; (b) two cases under exactly the same conditions gave absolutely identical results; (c) in the original tubes free bacilli, which undoubtedly were leprosy bacilli, were found, and these gave rise to a growth on agar-agar, which, chemically and morphologically, agreed with the bacillus of leprosy with the slight differences stated above; (d) cultivations on gelatine and glycerine *bouillon* were still more convincing.