glean a philosophy of life peculiarly suited to the needs of a physician. There are at least a dozen or more works which would be helpful in getting that wisdom which only comes to those who earnestly seek it. A conscientious pursuit of Plato's ideal perfection may teach you the three great lessons of life. You may learn to consume your own smoke. The atmosphere of life is darkened by the murmurings and whimperings of men and women over the non-essentials—the trifles that are inevitably incident to the hurly burly of the day's routine. Things cannot always go your way. Learn to accept in silence these minor aggravations; cultivate the gift of taciturnity, and consume your own smoke with an extra draught of hard work, so that those about you may not be annoyed with the dust and soot of your complaints. More than any other man the practitioner of medicine may illustrate the second great lesson, that we are here not to get all we can out of life for ourselves, but to try to make the lives of others happier. This is the essence of that oft-repeated admonition of Christ, "He that findeth his life shall lose it and he that loseth his life for my sake shall find it," on which hard saying if the children of this generation would only lay hold there would be less misery and discontent in the world. It is not possible to have better opportunities to live this lesson than you will enjoy. The practice of medicine is an art, not a trade, a calling, not a business—a calling in which your heart will be exercised equally with your head. Often the best part of your work will have nothing to do with potions and powders, but with the exercise of an influence of the strong upon the weak, of the righteous upon the wicked, of the wise upon the foolish. To you as the trusted family counsellor the father will come with his anxieties, the mother with her hidden griefs, the daughter with her trials, and the son with his follies. Fully one-third of the work you do will be entered in other books than yours. Courage and cheerfulness will not only carry you over the rough places of life, but will enable you to bring comfort and help to the weak-hearted, and will comfort you in the sad hours when, like Uncle Toby, you have "to whistle that you may not weep."

And the third great lesson you may learn is the hardest of all—that the law of the higher life is only fulfilled by love or charity. Many a physician whose daily work is a daily round of beneficence will say hard things and will think hard thoughts of a colleague. No sin will so easily beset you as uncharitableness towards your brother practitioners. So strong is the personal element in the practice of medicine, and so many are the wagging tongues in every parish, that evil speaking, lying, and slandering find a shining mark in the lapses and mistakes which are inevitable in our work. The opportunities are numerous, but there is no real reason for discord and disagreement, and the only way to avoid trouble is to have two plain rules. From the day you begin practice never under any circumstances listen to a tale told to the detriment of a brother practitioner. And when any dispute or trouble does arise, go frankly ere sunset and talk the matter over, in which way you may gain a brother and a friend. Very easy to carry out you may think. Far from it—there is no harder battle to fight. Theoretically there seems to be no difficulty, but when the concrete wound is rankling, and after Mrs. Jones has rubbed in the cayenne pepper by declaring that Dr. J. told her in confidence of your shocking bungling, your attitude of mind is that you would rather see him in purgatory than make any advance towards reconciliation. Wait until the day of your trial comes, and then remember my words.

And in closing may I say a few words to the younger practitioners in the audience whose activities will wax, not wane, with the growing years of the century which opens so auspiciously for this school, for this city and for our country? You enter a noble heritage, made noble by no efforts of your own, but by the generations of men who have unselfishly sought to do the best they could for suffering mankind. Much has been done, much remains to do; a way has been opened, and to the possibilities in the scientific development of medicine there seems to be no limit. Except in its application as general practitioners, you will not have much to do with this. Yours is a higher and a more sacred duty. Think not to light a light to shine before men that they may see your good works; contrariwise, you belong to the great army of quiet workers—physicians and priests, sisters and nurses—all over the world, the members of which strive not neither do they cry, nor are their voices heard in the streets, but to them is given the ministry of consolation in sorrow, need, and sickness. Like the ideal wife of whom Plutarch speaks, the best doctor is often the one of whom the public hears

least; but nowadays in the fierce light that beats upon the hearth it is increasingly difficult to live the secluded life in which our best work is done. To you, the silent workers of the ranks, in villages and country districts, in the slums of our large cities, in the mining camps and factory towns, in the homes of the rich and in the hovels of the poor—to you is given the harder task of illustrating in your lives the old Hippocratic standards of learning, of sagacity, of humanity, and of probity. Of learning that you may apply in your practice the best that is known in our art, and that with the increase in your knowledge there may be an increase in that priceless endowment of sagacity, so that to all everywhere skilled succour may come in the hour of urgent need. Of a humanity that will show in your daily life tenderness and consideration to the weak, infinite pity to the suffering, and a broad charity to all. Of a probity that will make you under all circumstances true to yourselves, true to your high calling, and true to your fellow man.

The Bradshaw Lecture

ON

TUBERCULOSIS OF THE NERVOUS SYSTEM.

Delivered before the Royal College of Physicians of London.

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My first duty is to acknowledge the honour done to me in asking me to give this lecture and to express the hope that I may prove worthy of it.

I propose to address my remarks (1) to the forms which the tuberculous infection may assume in the nervous system, (2) to the mode of infection of the brain and meninges, (3) to some points in diagnosis connected with spinal puncture, and finally to the possibility of recovery. I have to express my obligations to my colleagues on the staff of the Leeds General Infirmary for permission to use the records of 114 fatal cases which have occurred during the past twenty years in that institution. I must also thank Dr. Ursula Chaplin for much able help in laboratory work.

THE FORMS OF TUBERCULOUS INFECTION.

The various forms of tuberculosis of the nervous system consist of tuberculosis of the dura mater, tuberculous meningitis in its more general and limited forms, tuberculous masses in the brain and cord, and a possible miliary tuberculosis of the brain itself.

An old question raised many years ago by Rilliet and Barthez¹ has been much discussed lately, as to whether it is possible to have a tuberculous meningitis without the presence of tubercles, or, at any rate, with only a minimal tubercle formation. Such an affection has been compared to certain benign tuberculous affections of joints and serous membranes, and the name of "tuberculous meningopathy" has been suggested to distinguish it from the ordinary fatal form of tuberculous meningitis. Poncet,² Patel,³ Sepet,⁴ Galliard⁵ are the chief exponents of this view, and the subject has been well summarized by Bouclier⁶ in a recent Lyons thesis. Among the Leeds cases there are 14 in which thickening or exudation is noted at the base of the brain without visible tubercles. Cerebral symptoms were present before death in 12 of these cases, and abundant tuberculous lesions elsewhere in the body in all. I think it is fair to conclude that tubercle formation was at its minimum—or even absent, in some of these cases at any rate—and that the changes noted were a manifestation of the tuberculous infection, and were responsible for the symptoms. It has been suggested that the poisons of the tubercle bacillus may cause this more exudative or serous form of meningitis. Armand Delille⁷ has separated a poison which produced in his experiments productive tissue changes. In three instances of intracranial injection of measured quantities of tuberculin I found no local effects, but progressive wasting, ending, in one guinea-pig, in death. More information is obviously wanted about this benign form of tuberculous meningitis and its anatomical counterpart.

The limited meningitis described by French authorities

(Chantemesse,⁴ Combe,⁹ Monnier,¹⁰ and others) consists of a great thickening with tubercle formation over a limited portion, usually of the motor cortex. It is said to occur in phthisis, and its symptoms, as Combe points out, differ from those of ordinary tuberculous meningitis. There are 9 cases in my series in which such localized thickening over a limited area of the cortex was noted; the most marked case was in a boy of 7. The plaque occurred over Broca's convolution, and difficulty in speech was noted during life. In this case there were miliary tubercles in the lung, and in 3 other cases phthisis. This localized lesion may be produced experimentally (Sicard), and I have myself seen an instance of it.

Tuberculous masses in the brain are not infrequent. They were present in 33 of the 114 cases. In 15 they appeared to be recent and but little antecedent to the existing meningitis. In only 17 of the 33 cases were they multiple, a smaller proportion than usual. The largest number present in one case was 4. In size they vary from a millet seed up to an orange and larger. They are mostly well defined, and shell out with ease. Minute tubercles are often visible in their bed and on their surface, making recognition easy. They are often surrounded by an area of vascular engorgement, but as a rule there is no definite capsule. They vary in consistency, and when laid open display mostly a yellowish and caseating centre and a peripheral growing zone made up of recent tuberculous tissue. Tubercle bacilli may or may not be found in this peripheral zone. As a rule these masses show little tendency to break down, still less to calcify. Except in the pons, medulla, and cord, where they are usually surrounded by nervous tissue, they most often project on to the surface. The infection of the cerebro-spinal fluid is thus easily brought about, as Ziegler¹¹ points out. In as many as 23 of my 33 cases there was present a tuberculous meningitis. In one of my cases there was a loose tumour in the fourth ventricle undoubtedly tuberculous, although no giant cells or tubercle bacilli have been seen in it. There were other tuberculous lesions in the body. Tuberculous tumours of the spinal cord are not common. Dr. Barrs had this drawing made of one and I have brought the other, which came from a child of three with other similar masses in the brain.

In one of the Leeds cases an abscess, possibly tuberculous, was found in the pons along with other tuberculous masses in the brain. There is at present a beautiful specimen on view in St. George's Hospital museum, which shows multiple tuberculous masses breaking down into abscesses containing tubercle bacilli. The relatively rare tuberculous tumours of the dura are nearly invariably multiple and grow from its inner vascular surface in the posterior fossa or from the falx cerebelli. One of the two specimens from our museum came from a child of 6 with tuberculous cavities in the lungs, caseous, bronchial, and mesenteric glands and intestinal ulceration. Miliary tubercles were noted twice, once by Dr. Wardrop Griffith, to whom I am indebted for many valuable comments upon the necropsies made by him.

MODE OF INFECTION OF THE BRAIN AND MENINGES.

It is admitted that a complete examination almost invariably reveals an older tuberculous focus somewhere in the body. In only 6 cases was no such focus found, and here the notes are incomplete. Under congenital tuberculosis I need only refer to Demme's well-known and almost unique case of a tuberculous cerebellar tumour in an infant aged 23 days.

If our knowledge of the infection of meninges and brain were at all complete, which is by no means the case, we should know where the infecting focus is, what brings about the mobilization of the tubercle bacillus from it, what channels it travels by, and what determines its settling down in any given area in the brain. The actual infecting focus may exceptionally be small and easily overlooked, and it is obvious that the oldest lesion is not necessarily the infecting one.

A direct infection through the nose is believed to be possible, as in Demme's case, quoted by Cornet.¹² A spread from tuberculous disease of the ear may take place, though not quite direct, because the ear would appear to be infected through the lymphoid tissue of the naso-pharynx. Grimmer,¹³ who has worked at the subject, puts down tuberculosis as the cause of middle-ear disease in 65 to 70 per cent. in children under five, and 16 per cent. above that age. Ten of my 114 cases had obvious ear disease, and were mostly admitted under Mr. Secker Walker and Mr. Whitehead. Although the ear disease was not proved to be tuberculous, it is interesting to note that in 7 of these cases there was another

old, possibly infecting, focus in the body, and in another 2 the state of the glands is not noted. Experimentally I believe it is very difficult to infect the brain and meninges through the accessory cavities. In spinal caries I take it that a general tuberculous meningitis is not a common occurrence. There are only 4 such cases in my series. In 2 the organs are said to be normal, in 1 the mesenteric glands are said to be enlarged, and in the other the glands are not noted at all. Miliary tubercles on the inner surface of the dura were noted in one case. In Dr. Churton's case of a large tuberculous tumour in the frontal lobes the spread from the bone to the dura and brain seemed obvious. Poli¹⁴ maintains that the dura mater is an important barrier against this inward extension. In a single experiment devised to test this view, I quite failed to confirm it.

The lungs were normal in 28 cases. It has been proved that tubercle bacilli may pass through the lungs without leaving an obvious recognizable lesion. A miliary tuberculosis of the lungs was noted in 54 cases; 18 cases presented the lesions of phthisis, together with a miliary lesion in 8 of them. Phthisis is said to be the most common cause of tuberculous meningitis in the adult. Personally I have had very little experience of this complication in obvious clinical phthisis, although during the past four years I have had the opportunity of watching the course of phthisis in a considerable number of cases in connexion with the Leeds Tuberculosis Association. One case I saw with Dr. Wainman I have reason to remember, as I failed to assign the quite early vomiting to its proper cause.

Joints and bones were affected in 23 out of the 114 cases—namely, the hip in 13, the ankle in 3, the knee, elbow, and wrist each in 1. In 4 cases 2 joints were involved. The hip disease was old in 2 cases. The bones affected were the spinal column in 4, and the frontal bone and ribs each in 1 case.

In 4 cases the kidney was the seat of extensive tuberculous disease. It was associated in 1 case with pulmonary and laryngeal phthisis, in another with hip disease, and in a third with ear disease. The generative organs, no doubt not always examined, are noted as diseased in 2 cases, once in a man with a tuberculous testis and vas deferens, and once in a woman with tuberculous Fallopian-tube disease and tuberculous peritonitis. Simmonds's statistics¹⁵ show an extraordinarily high percentage; thus in 60 cases of tuberculous meningitis one-third had genital tuberculosis; 35 of the 60 were men, and here the proportion was one-half.

Ordinary tuberculous peritonitis was noted in 8 cases, and intestinal ulceration, mostly recent, in 28 cases. In another case there was extensive tuberculous ulceration of the colon and rectum.

The relation of the lymphatic glands to tuberculous meningitis is of the first importance; unfortunately my records are distinctly incomplete in this respect. The lymphatic system constitutes a most important defence, especially in the child, against a general tuberculous infection. Manfredi and Fresco¹⁶ have been able to demonstrate, even in so susceptible an animal as the guinea-pig, the important rôle they play. Glands, it must be remembered, may contain virulent tubercle bacilli, and yet appear as normal to the naked eye. The glands which stand in the most direct relation to tuberculous meningitis are the mediastinal. Haushalter and Fruhingsholz¹⁷ have recently found old and caseating lesions in the pretracheo-bronchial glands in 63 out of 67 cases of tuberculous meningitis. It is a particularly striking fact that in as many as 40 cases (35 with miliary tuberculosis) no old focus was present other than the adenopathy. This close relationship can only be connected with the all-important fact that the lungs constitute the port of entry of the tubercle bacillus in the large majority of these cases. Carrière¹⁸ believes that the mesenteric glands may be the infecting focus in a goodly number of cases of tuberculous meningitis. It should be remembered that the infection of the mesenteric glands in a retrograde fashion from the mediastinal glands is obviously an anatomical possibility. We are obliged to appeal to this retrograde infection to explain some features in the spread of experimental tuberculosis. This mode of infection is more likely to be effective if there is any pressure upon the thoracic duct by enlarged and caseating mediastinal glands.

More puzzling yet than some features connected with the infecting focus is the mobilization of the tubercle bacillus from it. It has been suggested that tuberculin may bring about this effect. Rutimeyer's¹⁹ case of phthisis, in which tuberculous meningitis appeared at the close of a course of

tuberculin treatment, is very suggestive. I am aware that Cornet,¹² in his admirable work on tuberculosis, will have none of this explanation. Dr. Simmonds has seen cases of genital tuberculosis in which tuberculous meningitis ensued within a few weeks to months after marriage.

Tuberculous meningitis occurred shortly after an operation in 8 out of the 114 cases. The interval between the operation and the meningeal infection forcibly reminds one of the incubation period in experimental tuberculosis. This interval has varied from one up to six or seven weeks; at least one case must be excluded as the interval is too short. The operations were upon the cervical glands, the ankle and hip-joints, also a laparotomy, etc. Some have thought that tubercle bacilli have been liberated in the field of operation and have then gained access into the blood current. No doubt this view should receive practical attention. In the parallel case where an early phthisis blazes out after an operation into a fatal activity, of which I have recently seen two cases (one with Dr. Gordon Sharp), an explanation appears to me to be at hand. It may be attributed to an actual inhalation infection of hitherto sound parts of the lung brought about by the deep inspirations caused by the anaesthetic. Rodocanachi²⁰ has also recently published two cases of a fatal aggravation of the pulmonary lesion after operation. It has been suggested in cases of tuberculous meningitis following rapidly upon injury as in a recent case by Mollard, quoted by Bouchier, that the actual mechanical concussion may have led to an escape of tubercle bacilli from the infecting focus, but this is not by any means convincing. There appears to be no satisfactory explanation of the occurrence of the disease at an interval after measles, whooping-cough, etc.

The route by which the bacilli travel from the infecting focus to the meninges or brain is far from satisfactorily worked out. It is either by the blood or lymphatic vessels. A striking fact in connexion with tuberculous meningitis is the marked alteration in the blood vessels. In one case under Dr. Barrs the Sylvian artery was blocked. Similar lesions have been recorded by several observers. In Cruchet's²¹ case of at least a temporary recovery from tuberculous meningitis there were abundant old tubercles about the posterior cerebral and basilar arteries, the latter being almost occluded. In laying open the branches of the Sylvian arteries in one case I could see tubercles in the vessel walls. Sicard²² has shown experimentally that the meninges may be infected, though with some difficulty, by injecting tubercle bacilli into the carotid artery. A pulmonary tuberculosis, however, is the common result unless the jugular veins are tied. Cornil, Bezancon, and Grifon²³ have studied the changes in the brain after injecting tubercle bacilli into the carotid artery of rabbits. No bacilli were found in the arterioles, but they had multiplied in the perivascular sheath, which were filled with large swollen cells. The process illustrates, according to the authors, the development of tubercle at the expense of the lymphatic sheath. On the other hand, Sicard states as the result of his investigations that it is impossible to infect the meninges through the lymphatic system. These changes in the vessels along with the experimental evidence make it appear almost certain that the tubercle bacilli arrived by way of the blood stream. If they arrive in numbers they produce an ordinary general tuberculous meningitis; if few in numbers (or perhaps attenuated), they give rise to tuberculous tumours or even a meningitis *en plaque*, an expression of a less virulent infection. Occasionally, and then, I think, almost only in the pons, the tuberculous tumour looks as if it had been formed, or is forming, by the coalescence of several foci of infection. Broca and Souques²⁴ endeavour to explain the relative frequency of cortical tuberculous masses in the paracentral lobule (and Dr. Churton²⁵ some years ago recorded a well-marked case of the kind) by the rich vascular supply and the slowing down of the blood current here. It is curious that the lesions of the ordinary tuberculous meningitis should usually mainly focus themselves about the middle cerebral artery and its branches, whereas tuberculous tumours are more frequently found in the distribution of the basilar and posterior cerebral arteries.

EXAMINATION OF SPINAL FLUID.

Undoubtedly a most important addition to our resources in diagnosis consists in the examination of the cerebro-spinal fluid by Quincke's spinal puncture. During this year I have examined the fluid from 5 cases of tuberculous meningitis.

1. In one case of a boy aged 6 in the infirmary whom I saw by the kindness of Dr. Chadwick there was a pleural effusion present when the cerebral symptoms supervened; 10 c.cm. of clear fluid were drawn off.

It contained a faint cloud of albumen and in the deposit lymphocytes were alone found but no tubercle bacilli. A small quantity of fluid, less than 2 c.cm. injected subcutaneously tuberculinized a guinea-pig.

2. Another case, seen with Dr. Roper, of Leeds, occurred in a boy at 7 years, who had just passed through an attack of scarlet fever. The urine contained albumen, and the vomiting in the very early days suggested to us a uraemic origin for the symptoms. On the second occasion on which I saw him there was a slight facial paralysis and the nature of the case seemed obvious. The clear spinal fluid contained very little albumen, the deposit showed many polymorphonuclear cells but no tubercle bacilli were found. The inoculation test gave a positive result.

3. In a third case of a girl at 4 years whom Dr. Norman Porritt, of Huddersfield, asked me to see, lymphocytes were present but no tubercle bacilli were found. The inoculation test also gave a positive result.

4. In another infirmary case the fluid was obtained after death. Albumen was present and lymphocytes were found in the deposit but no tubercle bacilli.

5. A quite recent case occurred in a lad at 16 whom I saw with Dr. McCann, and who was transferred to the infirmary under my care. He was punctured at my request by Dr. Watson, resident medical officer, on three separate occasions, and 15 c.cm., 35 c.cm., and 13 c.cm. were drawn off on the second occasion. The pressure ($\frac{1}{4}$ in. in terms of the fluid) was estimated by Kronig's apparatus. Death occurred about the seventeenth day. There was miliary tuberculosis of the meninges, peritoneum, and upper lobe of the left lung. The bronchial glands were caseating and the mesenteric glands enlarged. The fluid was clear, with a few small flocculi in it on two occasions, and on the third it was more straw-coloured. It was slightly alkaline, and contained a considerable amount of albumen (3 pro mille Esbach). The specific gravity was 1006. The cellular elements were few but consisted solely of lymphocytes. Some of the fluid was incubated at 37° after Langner's method, and flocculi were withdrawn from time to time and examined, but no tubercle bacilli were found. 0.1 c.cm. was inoculated upon serum agar and glycerine agar. About 2.5 c.cm. were injected subcutaneously, 2 c.cm. intraperitoneally, and about 1 c.cm. intrameningeally into guinea-pigs. These three tests were made with a view of comparing the results, as there has been a discussion about the best method. (As yet there has been insufficient time to obtain results from the culture and inoculation tests.) The cryoscopic point was 0.53 as against 1.03 obtained in some hydrocephalic fluid which was in my laboratory. The chlorides (one estimation) were 0.177 per cent. as against 0.223 (five estimations) in the hydrocephalic fluid. The permeability test was negative.

It will be seen from the above that I have never once been able to find the tubercle bacillus in the deposit. In 4 of the 5 cases lymphocytes were alone found, and in 1 only polymorphonuclear cells exclusively. The inoculation test gave a satisfactory result in 3 out of the 4 cases, and is as yet incomplete in the fourth case.

The points of importance in the examination of the spinal fluid are the presence of the tubercle bacillus and lymphocytes in the deposit, and the results of the inoculation test. I look upon the cryoscopic and permeability tests as of small significance. The finding of the tubercle bacillus in the deposit is by far the best test for clinical purposes. It requires little time, and it has given positive results in the hands of various observers up to half to three-quarters of the cases. I look upon my want of success as a matter of accident. The inoculation test is very valuable, but the disadvantage is the delay. Slawyk and Manacatide²⁶ recommend the injection of 4 c.cm. intraperitoneally. Hellendall²⁷ advises lumbar inoculation as requiring less fluid. No doubt negative results may be due to the use of too small a quantity of fluid, but less quantities than those named above have answered my purpose. It is well, however, to be on the safe side. I take it that if an acid and alcohol-fast bacillus resembling the tubercle bacillus is found in the deposit from spinal fluid obtained from a case with symptoms of meningitis, the nature of that meningitis is determined, even if the inoculation test should subsequently give a negative result. Therefore, I do not quite see the reason for M. Chipault's²² hesitation in a case subsequently to be referred to. The tubercle bacillus may be cultivated from the spinal fluid. Slawyk and Manacatide recommend the use of a fairly large quantity of the fluid for this purpose. Langner (quoted by Hellendall²¹) incubates the fluid at 37°, and in eight days there is a rapid multiplication of the tubercle bacillus. In one of the cases where I tried this method I obtained a considerable streptococcus growth which I looked upon as a terminal infection. Much has been written lately about lymphocytosis in tuberculous meningitis. It certainly badly misled in Rendu and Gerand's²⁸ case. Nobécourt and Voisin,²⁹ Simon,³⁰ etc., have found it in cases of tuberculous tumour without meningitis. They look upon it as a sign of irritation of the membranes. If any polymorphonuclear cells are present a differential count should be made, as recommended by Achard and

Laubry.³¹ Leri³² pointedly remarks that if the clinical and cyto-diagnosis are not in agreement, the cyto-diagnosis is not always right. This applies to one of my cases, though fortunately the inoculation test settled it.

The study of the spinal fluid obviously yields results which are of the first importance in the differentiation of the various forms of meningitis. If aspiration is avoided, there is no danger in it in meningitis, and I see no reason why it should not be used as a routine method in suspected cases of this disease.

RECOVERY FROM TUBERCULOUS AFFECTIONS OF THE NERVOUS SYSTEM.

Very occasionally one has the good fortune to meet with recovery from symptoms of grave organic disease of the brain where a tumour has been suspected and syphilis can with almost certainty be excluded. I have notes of two such cases in children treated in the infirmary, and possibly of a third. Recovery is often incomplete, blindness remaining. Some great authorities (such as Gowers³³ and others) say that in tuberculous tumours arrest is not uncommon. Presumably, some of the recoveries referred to above may be of this nature. It is, therefore, interesting to inquire what pathological evidence is forthcoming in favour of this view. In 2 cases from the records of the Leeds Infirmary with healed phthisis there was in 1 case a nodule in the left lenticular nucleus which Dr. Barrs regarded as a healed tuberculous lesion, and in the other a calcareous mass of the size of a pea attached to the dura. Sufficient proof as to the exact nature of these lesions is not forthcoming. I have only been able to find in literature a few cases of recovery from tuberculous tumours. In Dr. Williamson's³⁴ case there was a small yellowish mass, which had caused Jacksonian epilepsy four years previously; in Dr. Ashby's³⁵ case a small cyst with cretaceous walls; in Dr. Bristowe's³⁶ case a hard mass in the cerebellum; and in Kahlmeyer's³⁷ case a cicatrix in the cerebellum, in a man who had cerebellar symptoms eleven years previously. In the first 3 cases there were other masses in the brain, and the patients died of tuberculosis, and in the fourth case there was phthisis. The quiescent lesion showed a dense fibrous capsule in the first 3 cases. Oppenheim³⁸ says that these tumours may calcify and then become encapsulated, as, if encapsulation were, as it probably is, the most important process. Calcification is nearly always a very limited process in the mass, and other encephalitic lesions, as Oppenheim points out, may calcify. By the kindness of the authorities of the London Hospital Museum I have looked through a relatively large number of tuberculous tumours, but I cannot say that I have seen any which could be looked upon as definitely healed. The very slender possibility of recovery from a tuberculous tumour is no doubt established by the above-named cases, but as Dr. Ashby well points out, we must set off against this chance the possible developments of other masses in the brain, or the child may die of tuberculous meningitis or other form of tuberculosis. Tuberculous tumours are sometimes latent until the symptoms of meningitis suddenly appear, as in Dainville's cases.³⁹

In considering recovery from tuberculous meningitis a distinction must be drawn between the ordinary more generalized form and the limited meningitis *en plaque*. Monnier and others strongly recommend operation for the latter.

Dr. Gee⁴⁰ in his article on tuberculous meningitis in 1868 graphically described recovery as a matter of science. Many great clinicians have related cases of recovery, but up to recently the absolute proof was wanting unless the patient died later and anatomical demonstration of the healed lesion was provided (Rilliet,⁴¹ Barth,⁴² Politzer,⁴³ Cadet de Grassicourt,⁴⁴ Carrington,⁴⁵ and others, and more recently Jannsen,⁴⁶ and Rocaz and Cruchet⁴⁷). Another proof, but not so satisfactory, is the presence of choroidal tubercles controlled by a skilled ophthalmologist as in the cases of Dujardin-Beaumetz⁴⁷ and more recently of Thomalla.⁴⁸ The presence of an unmistakable tuberculous lesion such as phthisis elsewhere in the body as occurred in the cases of Cuffier (quoted by Chantemesse) and Chappet (quoted by Bouclier) make the diagnosis almost certain. Mr. Ward had a case in the Leeds Infirmary with tuberculous disease of the ankle which developed the symptoms of meningitis. The child recovered, though unfortunately blind, and is living still.

Bacteriological proof of the nature of the meningitis has been provided in the cases of recovery recorded by Freyhan,⁴⁹ Henkel,⁵⁰ Barth,⁵¹ Gross,⁵² Winter and Gohl (quoted by Chipault),⁵³ since tubercle bacilli were found in the spinal fluid in all these cases. The diagnosis in the cases of recovery

reported by Rocaz (subsequently anatomically proved by Cruchet), Mottard (quoted by Bouclier), and Sepet, rest on the Courmont-Arloing serum reaction, the value of which is not by any means universally accepted. In October last Parrenin (*Thèse de Bordeaux*, 1903) ascertained that the cases of Thomalla,⁴⁸ Henkel,⁵⁰ Barth were living and well; Gross's case showed signs of early phthisis; Freyhan's case, well in 1899, had not been heard of since.

In inquiring under what conditions recovery has taken place it is only necessary to mention large doses of iodide, creosote, without confounding cause and effect. Spinal puncture, though possibly of value in a simple meningitis (Hirsch),⁵⁴ is of quite doubtful utility in tuberculous meningitis. The cases of Freyhan, Barth, and of Winkler and Gohl were punctured once each, whereas in the cases of Henkel and Gross the puncture was repeated three times. Chipault is inclined to attribute some value to it in Winkler and Gohl's case, but only a small quantity of fluid was drawn off. In Gross's case the patient felt much relieved after it. In my case (referred to above) three punctures were made, and 63 c.cm. in all drawn off, with no real effect. Excess of fluid is not responsible for all the threatening symptoms, as Peron⁵⁵ points out from his experimental investigations. Experimentally Martin⁵⁶ noted an improvement in a rabbit after withdrawing 2 c.cm. fluid, but it was only temporary. Some of my experiments were undertaken with this object, but mostly very little fluid was found. Operations have been undertaken for the relief of this disease by Lannelongue and Keen (quoted by Barlow),⁵⁷ Ord and Waterhouse,⁵⁸ Parkin,⁵⁹ Paget,⁶⁰ Kendal Franks,⁶¹ and others. A case under Dr. Churton and Mr. Mayo Robson⁶² has been quoted by some authorities as a possible recovery from tuberculous meningitis, although neither of these authors described it as such. I was resident medical officer at the time this girl was in the infirmary, and she attended my out-patient room with epilepsy for several years previous to her death last year. She was trephined on account of focal symptoms, which it was thought might be due to abscess secondary to ear disease. The case was obscure and occurred during the influenza epidemic of 1889-1890. In her subsequent history she contracted syphilis, but never showed any manifestation of tuberculosis.

Notwithstanding the above-mentioned remarkable recoveries from severe tuberculous meningitis, the prognosis must still be looked upon for practical purposes as hopeless. If a benign type of disease really exist, systematic examination of the spinal fluid in possible cases should bring it to light. With such a prognosis before us, prophylaxis is worthy of the closest attention. The danger which a careless phthisical patient is in his own home has been placed beyond doubt (Cornet,¹² Coates,⁶³ and others). This danger specially menaces susceptible young children who crawl about the floor stirring up infected dust. Dieudonné⁶⁴ has actually found tubercle bacilli on the hands of children in phthisical homes. Clinical evidence has also furnished some striking examples (Variot⁶⁵ and others) in the same direction. The tubercle bacillus is thus inhaled, and a potential infecting focus is established in the bronchial glands. The notification of phthisis with disinfection, and the isolation in special hospitals of confirmed consumptives from careless homes, especially where there are young children, are indispensable steps in the prevention of tuberculous meningitis and generalized tuberculosis. I am glad to say we are about to open an institution of this kind in the centre from which I come.

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An Address

ON

THE INSTITUTIONAL TREATMENT OF INEBRIETY.

Delivered before the Society for the Study of Inebriety.

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I AM here to-night not as a volunteer but under compulsion. The amiable impertinence of your indefatigable Secretary has not only commanded my attendance, but has prescribed the subject of my paper. I do not myself claim to know enough about the treatment of inebriety to presume to lecture others on the subject. But the speaker and the subject having been both the selection of another I am accordingly relieved of all responsibility.

It is rather from the administrative than from the therapeutic point of view that I approach the question. I have seen something of the treatment of disease with and without the ordinary use of alcohol; in a city hospital flowing with port and brandy; and in the severe austerity of the institution in the Hampstead Road.

I have as a visitor of Aylesbury Gaol shared the slender privileges and duties cautiously confided to such functionaries by the Home Office, as well as the superadded anxieties attaching to the recent establishment of the adjacent State Inebriate Reformatory. As a county councillor I have watched the potent influence of drink in replenishing our asylums, and during the last few years I have assisted in the inauguration and management of their certified reformatory. These are insufficient grounds, in my judgement, upon which to attempt, with any approach to finality, to dogmatize upon the treatment, institutional or otherwise, of the large, increasing, and heterogeneous class covered by the general term "inebriate."

The treatment of the inebriate, indeed, is not a thing by itself; the new departures which recent legislation has sanctioned open up questions involving our whole penological system.

PRISON REFORM.

When Samuel Romilly set himself the uphill task of ameliorating our criminal code, he encountered the active hostility of Sir William Grant and other unbending pillars of the constitution, who were never weary of praising the "wisdom of our ancestors," and were content to take refuge in the comfortable doctrine of letting things alone. On one of these occasions it having been alleged, in reply to Romilly, that a certain enactment dated from Edward I, and not, as he had alleged, from Henry VIII, Romilly incontinently retorted, "What care I whether this law was made by one set of barbarians or another?"

If the criminal law and its application and administration in the eighteenth, and part of the nineteenth, century may be taken as an example of the aforesaid "wisdom of our ancestors," we might derive satisfaction from the thought that at least in our dealing with social offenders we may be wiser than our forefathers; and it does not require the knowledge or the eloquence of a Romilly to denounce their methods as "methods of barbarism."

When John Howard in 1773 was appointed High Sheriff of Bedfordshire it was a bad day for the "letting-things-alone" party and for insolent officialism and bumbledom all over the country. Disgusted at the iniquitous fee system which he found in vogue in Bedford Gaol, he was led to investigate the prisons, asylums, and lazarettos of Europe, travelling 50,000 miles notebook in hand, spending some £30,000, and dying a martyr to his mission in the Crimea. It was fitting that this

life-mission, which initiated that prison reform and amelioration of the prisoner's lot that has been going on ever since John Howard's death should have begun in the very gaol in which a century earlier the kindred spirit of John Bunyan was immured for twelve years, purging his offence against the divine right to do wrong, making tag laces, and composing for all time the soul-stirring and most popular epic in our vernacular.

THE GROWTH OF HUMANITY IN POLITICS.

Readers of J. R. Green's *History* will recall how he traces with convincing clearness the growth of humanity in British politics, and shows us how that larger sympathy of man with man which took origin in the darkest days of the eighteenth century drew its strength from such influences as the names of Bunyan, the Wesleys, and Whitefield, and Howard and Romilly stand for. The force of that crusade, though running in a hundred channels, is not spent yet. The prison, the asylum, the hospital, the reformatory, the school, indeed our social life at every turn, have felt its benignant influence. Instead of the squalor and brutality that Howard noted and Hogarth portrayed, we have the model prison, the aseptic ward, the palatial asylum, the inebriate retreat, the farm colony, and we may add—the garden city. A thousand agencies, individual, corporate, municipal, or State-directed, are competing, and sometimes conflicting, for the betterment of the physically and mentally afflicted, for saving the sinner and the sot, and reforming the reprobate. Instead of thrusting out of sight and mind the fever-stricken and the village fool for the selfish reason that they were calculated to displease or damage the King's people, Lazarus nowadays is sought out for altruistic reasons, and, even when he has brought misfortune and disease upon himself, is the object of compassion and disinterested solicitude. Indeed there are those who think the process of amelioration has gone far enough, who have little patience with the offender, are loud in advocacy of the cat and the gallows, regret our lavish expenditure on the insane, and with a Spartan rigour, impartially directed against all save themselves, denounce the softness which characterizes this degenerate dispensation.

I should be the last to deny that in administrative matters softness of heart is a sorry compensation for the lack of hardness of head. I am sometimes oppressed by the want of symmetry in our arrangements for those who are State or rate supported, social parasites as they have been called. We are often lavish in one direction and parsimonious in another, penny-wise in our cures and pound foolish in our prevention of social ills. I have some sympathy with the critic who complains of the care that is taken of the evildoer who, by his own persistence in self-indulgence and his suicide of self-respect, has qualified for an asylum, a hospital, or an inebriate reformatory, while the struggling labourer who does not tittle, and is not vicious, has to keep body and soul together, and perhaps maintain a wife and family in a couple of rooms, at 8s. or 9s. a week, out of an average wage of 21s. to 24s. If rents for the temperate sane were to a fractional extent paid out of rate, the journals who vouchsafe to lecture us on orthodox economics would be eloquent in denunciation of the municipal socialism thereby disclosed. But, while our Poor Law remains unreformed and indiscriminating, and old-age pensions for the industrious aged are as unsubstantial as a dissolving view merely cast on the screen at election times and then forgotten, some force will remain in the criticism that the ways of the transgressors are relatively too soft. It is, indeed, alleged that an inmate of a model prison in New York State, in a letter to a friend, recorded his commiseration of the sad lot of the neighbouring villagers, whom he watched from the gaol window on a winter's night, entering their miserable homes, while he was writing in brightness and warmth, with the pleasant odour of the prison supper regaling his olfactorys.

I have approached the subject which I have been invited to discuss by this somewhat circuitous route as I desire to insist on the need there is to regard the question of dealing with the inebriate as but part of a larger question, as one of extreme complexity, and, above all, as one on which many lines of thought should be brought to converge and focus if any approximation to a successful experiment is to be made. For as an experiment I approached the question, and as an experiment I still regard our work, though assuredly one deserving to be well and faithfully tried. The infallible method in dealing with this problem is the happy and exclusive prerogative of the charlatan and the quack.

As I have said elsewhere, "the prison, the asylum, the