Etiology of tubercle, with comments on Doctor Robert Kochs bacilli / by Henry Mac Cormac.

4

ETIOLOGY OF TUBERCLE,

WITH

Comments

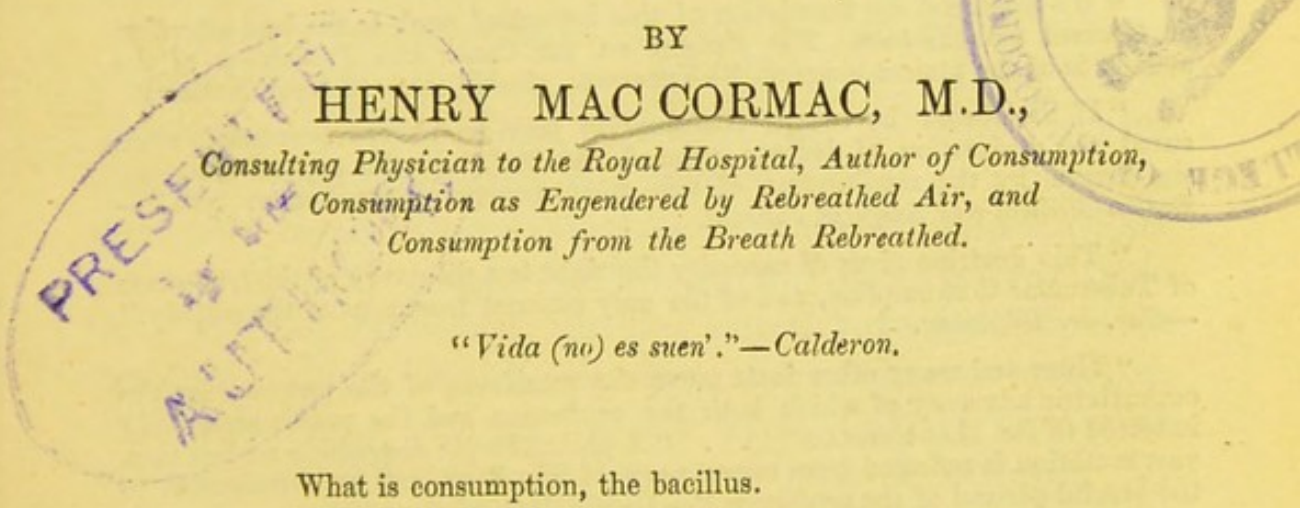
ON

DOCTOR ROBERT KOCHS BACILLI.

BY

HENRY MAC CORMAC, M.D.,

Consulting Physician to the Royal Hospital, Author of Consumption, Consumption as Engendered by Rebreathed Air, and Consumption from the Breath Rebreathed.



"Vida (no) es suen'."—Calderon.

What is consumption, the bacillus.
What is the bacillus, consumption.
But what causes consumption, why the bacillus.
And what causes the bacillus, consumption to be sure.—*q.e.d.*
Chorus of possible supporters of Dr. Koch.

HENRY RENSHAW,
156 STRAND, LONDON.
1882.

"Dr. Mac Cormacs theory has much to sustain it. The practical proofs merit the deepest consideration."—Virchow, *Archiv, xi.*

"This is the very latest English work on the subject, and we hazard little in saying that it is the best. So much medical logic and common sense are rarely met with."—*Reese, American Medical Gazette.*

"We hesitate to accept the Mac Cormac Law in its absolute exclusiveness. But it would be an immense step if his honest, vehement outspeaking could be brought home to every master and mistress in these Islands."—*Medical Times & Gazette.*

"Positive good must arise from the diffusion of his doctrines in every clime, and among all ranks of mankind. The chapter on Prevention is so admirably calculated to do positive good, that we earnestly urge it on the attention of our readers. In fine, the work is most able, exhaustive and convincing."—*Medical Press & Circular.*

"We commend the translation of this important work to the best attention of German practitioners. The chapter on the Cause and Prevention of the malady is of the utmost moment."—Virchow, *Archiv, xv.* (Second Notice.)

"If his theory be sound, consumption may be always prevented, often cured, the decimation of infants reduced one-half, and the general mortality one-fourth by the annihilation of this great scourge of the human race."—*Boston Medical and Surgical Journal.*

"This doctrine gives of necessity the right to a discovery of the true cause of Tubercular Consumption, and of the only rational treatment of the malady."—*Gaz. des Hôpitaux.*

"These and many other facts prove the soundness of the practice for the enthusiastic advocacy of which both the profession and the public are greatly indebted to Dr. Mac Cormac." . . "A philanthropic disposition no less than vast erudition is reflected from every page of his Book, and we commend it to the careful perusal of the profession."—*Dublin Medical Quarterly.*

"Tubercle, Dr. Mac Cormac explains, consists of non-oxidised carbonaceous matters as owing to the respiration of a corrupt atmosphere. Perfect ventilation he esteems the surest prophylactic. This view is sustained by statistical evidence and the history of cases. The work abounds with numerous citations and evinces deep research. We commend it to the attention of practitioners."—*Zeitschrift für Praktische Heilkunde*, 1866, *iii. Heft.*

"The Authors strenuous conviction that Consumption and Scrofula are occasioned by the respiration of foul air and averted by the respiration of pure air, has induced me to make Dr. Mac Cormacs work known not only to the medical but the general public of our Fatherland."—Preface to Hoffmanns German Translation. Erlangen.

"Dr. Mac Cormac sustains a theory which physiology and micro-chemical research, we trust shall speedily establish throughout Holland."—Preface to Praegers Dutch Translation. S'Gravenhage.

Dedication,

TO

DOCTOR WILSON FOX.

You will, I dare say, dear Doctor Fox, recollect our converse on the etiology of tubercle one afternoon last summer beneath your hospitable roof. Many seem now to have arrived at the conclusion that Dr. Robert Kochs bacillus is a sort of battering ram in regard of the production of phthisis. Dr. Koch, *Berliner Wochenschrift*, April 10, would place the infection of consumption before that of plague, cholera, diseases most communicable. Were this indeed so, no one should escape phthisis, no one recover from it. Bacilli, however, do not constitute the effective agency which Dr. Koch and some others imagine. Consumption, human beings regarded, is not communicated by inoculation, nor yet, I submit, by infection. Dr. Kochs bacilli do not occasion phthisis, it is phthisis which occasions them. To suppose that they are dynamic factors in the production of consumption is clearly a case of ὑστερον προτερον, cart before horse conclusion, disproved by statistics, observation, and, in short, the natural history of the disease. Laying inoculation aside, to suppose that bacilli induce tubercle, is to turn attention from the real factor, to wit, rebreathed air, to whose sole agency the frightful prevalence of phthisis is, in fact, owing. Put away rebreathed air, and you put away *pari passu* tuberculosis, with all the evils which it engenders. Assuming that all Dr. Kochs statements are strictly verifiable, then his bacilli would be simply an epiphenomenon, and, ordinary conditions of con-

sumption regarded, the result not the cause of the disease.* Farther research will, I trust, lead you and the profession at large to the adoption of this view. It will be a glad day for the world when it proves so. Wishing you every good fortune, and this above all the rest, I am, dear Doctor Fox, your sincere wellwisher and friend,

HENRY MAC CORMAC.

BELFAST, 20*th July*, 1882.

* The following, in respect of the inoculation of rabbits with saliva, appears in the *British Medical*, 9th April, 1881, p. 571. On making further inquiries, I received from M. Vulpian the communication here appended. I cannot reconcile the discrepancy of statement, but possibly M. Vulpian does not mean to advert to any except recent experiments :—

INOCULATION OF SALIVA.

"On the occasion of the reading of the letter of M. Pasteur by M. Parrot to the meeting of the Académie de Médecine, relating to experiments by inoculating rabbits with the saliva of children who had died of ordinary diseases, M. Vulpian presented to the Academy a note, in which he communicated the results of analogous experiments performed by him in his Laboratory at the Faculty of Medicine. M. Vulpian injected under the skin of rabbits saliva collected at the very moment of the experiment from perfectly healthy individuals; and this injection killed the rabbits so inoculated in forty-eight hours. The blood of these rabbits was found filled with microscopic organisms; among which was found a special organism, discovered by M. Pasteur in the course of his experiments with inoculation of the saliva of a child who had died of rabies. One drop of this blood, diluted in ten grammes of distilled water, and injected under the skin of other rabbits, also brought on the death of these animals: the blood of which was similarly filled with microscopic organisms. These singular results, of which the interpretation is by no means easy, present also the no less singular peculiarity of not being stable. Rabbits placed in identical conditions, and inoculated with the same saliva, experienced no ill effects from their inoculation, and continued in excellent health. It would, therefore, appear that experimental microbiology is not yet on the way to become either an easy or clear science, notwithstanding M. Pasteurs *fiat lux*."

Writing from London, a medical friend observes, "Several experimenters have failed to develop Kochs bacilli by the staining method which he describes. They cannot be seen under ordinary circumstances."

PARIS, 16*th June*, 1882.

MONSIEUR ET TRÈS HONORÉ CONFRÈRE,

Je n'ai fait aucune communication soit à l'Académie de Médecine, soit à l'Académie des Sciences, sur l'injection des matierès diverses sous la peau des animaux. Je ne crois même pas qu'une communication ait été faite par un autre investigateur, à l'une ou à l'autre de ces Académies, dans ces derniers mois.

Veuillez agréer, jè vous prie, l'expression de ma considération la plus distinguée.

A. VULPIAN.

ETIOLOGY OF TUBERCLE.

Dr. Kochs views have met with very general attention, *Berliner Klinische Wochenschrift*, No. 15, 10 April, 1882. Tuberculosis, we are now told, is a parasitic disease, and the parasite a pod-shaped bacillus about as long as a blood corpuscle, *Medical Times and Gazette*, 22 April, 1882. Inoculated animals become infected with tubercle in which are found cells infested with bacilli. As bearing on the etiology, it is important, Dr. Klein remarks, that the same results may be achieved by inoculating rabbits and guinea-pigs with other matters. Sanderson and Simon employed mechanical irritation, as the seton. Frankel and Cohnheim resorted to vermilion, blotting-paper, and gutta-percha, *Practitioner*, August, 1881.

Dr. Koch is very explicit. If the number of victims, he observes, which a malady calls for can be considered a criterion, *massstab*, then must infections the most terrible rank far below tuberculosis, which cuts off a seventh, and, if we include adults only, a full third of the human race. Dr. Koch colours his bacilli blue, thus and otherwise isolating them from other microcosms which remain brown, *braune farbe*. Bacilli cultivated, as he terms it, in the blood serum of sheep or oxen sterilised by heat, appear to the naked eye, by the tenth day, in the form of small points and dry-looking scales, *trocken aussehende schüppchen*. When these are inoculated in

the belly, the adjoining inguinal, and perhaps axillary glands of the animals operated upon, swell within a fortnight to about the size of lentils, followed by emaciation and death in from four to six weeks, the spleen, liver, and other organs displaying the usual characteristic tubercular alterations. In some cases inoculation with matters taken from scrofulous glands, a diseased joint, or the lung tubercle of an ape, led to no results; whereas, inoculation with what Koch calls *tuberkelbacillenhaltigen massen*, uniformly induced tuberculisation within four weeks. The question now was, would these tubercles induce other tubercles? To determine this, four out of six guinea-pigs, bought at the same time, were inoculated in the belly with what Dr. Koch terms *bacillen-cultur*, otherwise miliary tubercles taken from human lungs, and subjected during 54 days to five successive cultures. The inoculated points became sore. After 32 days one pig died and the rest were killed, the animals inoculated displaying *hochgradig-tuberculös* in liver, spleen, and lungs, while those not inoculated evinced no trace of tubercle whatever, *keine spur*.

Taking three rabbits, pure blood serum was injected into the posterior eye-chamber of one, while into the eyes of the other two was introduced blood serum, in which were rubbed up a few particles, *einige bröckchen*, of tuberculous matter 91 days under culture, taken from cattle. After the lapse of 28 days, the first rabbit was found quite sound, while the lungs of the other two rabbits proved full of incipient tubercles, *tuberkel-knötchen*. Bacilli masses 142 days under culture were now injected into the

peritoneal cavity of ten rabbits. After death, the peritoneal coat, when placed under the microscope, could be seen full of bacilli-laden spores, while two rabbits not operated upon remained exempt. Rats, rabbits, cats, and dogs were next dealt with similarly, and with similar results. The foregoing facts, Dr. Koch considers, justify the pretention, *ausspruch*, that bacilli are not only the attendants, but the actual virus of tubercle. As to whence bacilli come, and how they gain access to the living organism, he thinks they derive from dried up phthisical sputa which adhere to dust, *staubpartikelchen*, and as thus are respired. In fact guinea-pigs inoculated in the cellular tissue with phthisical sputa two, and even eight weeks dried, became tuberculous just as if recent tubercular matters had been resorted to.

Dr. Koch does not meet the question as to how man and brute incur bacilli in the first instance. His ingenious supposition that the disease is conveyed by dust, is purely hypothetical. Before there can be tubercular bacilli, the man or brute, it is obvious, must be tuberculous. How, then, do man and brute become so primarily. If indeed tubercle were communicable like plague or cholera, and other dreaded infections, *gefürchtetsten infectionskrankheiten, pest, cholera* u. s. w., as Dr. Koch seems to contend, how could any one, physician, nurse, or other attendant, escape? In two families, recently under my observation, in each of which there was a victim to phthisis, eight women in all were for months in closest contact with the sufferers, yet they now enjoy perfect health. There was an officer

whose wife laboured under phthisis. The poor woman could not bear him out of her sight. In effect, he nursed her night and day, and each morning, for he lay down beside her, his linen was drenched with colliquative sweat. The wife died, but the husband remained well. I could give many, indeed very many, similar instances. Modern pathology, Dr. Klein avers, favours the assumption that tuberculosis is a specific infection, but the evidence, he adds, is not so complete as to place it on a level with other specific diseases already ascertained.

We do not find that tubercle-stricken people perish so surely as did Dr. Kochs rabbits and guinea-pigs. In point of fact, they recover sometimes, and would, doubtless, do so oftener were they only placed under favourable conditions. D. H. was one of a family of sisters. They all slept in small, ill-ventilated chambers, and in closely-curtained beds. One of these sisters died of ordinary tubercular consumption, one of consumption plus tubercular laryngitis, and one of consumption and cancer of the mamma. At last D. H. herself contracted phthisis. There was every stethoscopic sign, with profuse sputa, night sweats, extreme emaciation, loss of the hair, and colliquative diarrhea. After all, she regained perfect health which she enjoyed for years after. My only treatment consisted in unlimited fresh air, unstinted fresh milk, new-laid eggs, and diluted whiskey, which last seemed to have no more effect on her than so much water. After her recovery, I may observe, she never touched it, otherwise, she had everything she fancied.

Isdel was a lad of some thirteen or fourteen

summers. He was utterly reduced by night sweats, colliquative diarrhea, cough, and profuse sputa. The air of the room in which he lay one could cut, so to speak, with a knife. His parents hung a blind over the window when I had it opened. I took the window out, however, and made his father carry the boy, well wrapped up in blanketing, daily out of doors, just like a babe in arms. He was well supplied with every kind of nourishment, among which, fresh eggs, new milk, and dilute whiskey were not forgotten. Isdel made a capital recovery, and when I last saw him, some years after, was in the enjoyment of perfect health.

Mrs. Cs two sisters died in quick succession of phthisis. The second sister I saw towards the close of her illness, and was able to abate the consuming hectic from which she suffered by somewhat copious doses of quinine. Presently, Mrs. C., along with her sisters daughter, began to spit blood. There were also other ominous signs. They lived in great opulence, renewed air excepted, in which there was no opulence. I had the window removed and the sleeping room door, I think, taken off its hinges. Now, they slept virtually in the open air, a thing which neither Mrs. C. nor any of her relatives, among whom phthisis had been disastrously frequent, ever did before. The day they spent on horse-back either at home or along the seashore. After a time the hemoptysis entirely disappeared, nor was Mrs. C. or her niece ever after troubled by phthisis or any of its saddening accessories.

To a lady prostrated utterly by a huge scrofulous

ulcer, with profuse purulent discharge, extending almost round the neck, I gave quinine and iron, with succulent nourishment, and, better still, made her ride all day long, and sleep quite as if in the open air. The ulcers healed perfectly, and there is not, I suppose, in all London, where she now resides, a more flourishing or vigorous woman.

I could cite very many instances of the removal of scrofula in some of its evilest forms, by procedures in all respects similar. We have only become recently aware of the procedures of Doctors Dubove and Dujardin Beaumetz, which consist in feeding far-gone phthisical subjects with milk, eggs, raw meat reduced to an impalpable powder, and thrown into the stomach by means of the esophagean tube. It does not seem to induce vomiting. To one patient there was administered, with, it is said, striking benefit, 600 grammes crushed raw meat, twelve raw eggs, and some powdered lentils, to another, three litres new milk and twenty-one eggs, for sixteen days, daily.

Baudelocque, Fourcault, Lombard, Pettenkofer, and others, have shown to demonstration that fouled air is productive of phthisis and scrofula, to which I have added, as I believe, the coping-stone, that phthisis is indeed owing to the respiration of fouled air, but air fouled by prior respiration. It is this protracted respiration of air thus befouled, and not bacilli-laden dust, as Koch ingeniously imagines, that induces consumption in sailors who repose in hammocks slung within 18 inches of the ceiling in the swarming between decks of ships of war, the frightful bunks of merchant ships, in

soldiers in crowded barrack rooms, the poor children in the Dublin House of Industry, the shepherds of France, who go to rest in shut-up vans, the work people of Lisle in their horrid homes, the New-zealanders in sham houses, without access during sleep to the outer air, and in the natives of Labrador, when they come to occupy wretched dens on the St. Lawrence. In fine, it is the respiration of prebreathed air that renders scrofula and consumption the scourge of the habitable world. Dr. Koch has no suggestion to offer for the prevention of tuberculosis. Whereas, I assert that with the habitual respiration of air not befouled by the products of prior respiration, consumption and scrofula are, under ordinary conditions, impossible. There is no phthisis among the Bedouins of the desert or the Indians of the prairie, nor is there any, as Dr. Morgan and others have shown, in the dwellers of the moist and misty Hebrides, where the inhabitants live in houses of one room, with a central fire and hole in the roof, thus insuring a constant upward current and pure atmosphere day and night, and always. Why should the men, women, and children of the Hebrides escape but for the pure air which they respire, when the rest of Scotland is infested to such an extent that Dr. Mac Intosh, who was an Edinburgh lecturer, and wrote a big book on the practice of physic, declares that a Scottish family does not exist quite exempt from some form of phthisis or scrofula. If the people only breathed air uncontaminated, as is the air breathed in the Hebrides, consumption and scrofula would cease to occupy their midst. This, and this

only, is the practical bearing of the case. The bacilli it is clear do not agree with renewed air. Dr. Kochs discovery, if strictly verified, is a pathological curiosity, interesting, nay, important as we please, but, so far without any practical bearing, the prevention of phthisis regarded, whatever.

Dr. Blake, of California, assures me, that he treats and cures his phthisical cases by sending them to New Mexico, and making them sleep under a tree. This is the open air treatment, the only treatment, indeed, that can prevent or cure consumption. Settlers in Canada and the States often pass the winter in open sheds, enjoying perfect health. Once they begin to occupy ceiled rooms, however, their troubles begin. I never saw a case of phthisis or scrofula which I could not refer to prebreathed air. Consumption, in truth, is notoriously coincident with a stooping posture, insufficing respiratory effort, and a stagnant unrenewed atmosphere. Kochs bacilli do not engender consumption, it is the consumption which we daily witness, which engenders them. And what causes consumption, not bacilli surely, but prebreathed air, air clogged and fouled with the products of prior respiration. From this conclusion there is really no escape. Disease must be coincident with its cause, and the cause, in truth the only cause, of consumption and scrofula is the prior breath. In Russia, windows are double, felt or voilok closes every interstice. The late Czarevitch died of this regimen. It is only wonderful that Russians do not all die of it. And yet it would be so easy to connect a chamber, heated by the pech or stove, which should furnish

a warm, pure atmosphere in supplies, practically unlimited, from without.

The Murray sisters slept each in a chamber, so to speak, hermetically sealed. Windows were carefully pasted over, and bed-curtains pinned to at night. The older sister died first. Her lungs, on post mortem examination, were crammed with tubercles, large and small, in every stage of growth and decay. The younger sister, who had not only to struggle with tubercular but also cancerous degeneration, survived somewhat longer.

The four daughters of a country physician slept, each in a separately curtained bed, in one close room. All four died of phthisis. The fifth sister, who occupied a chamber by herself, as also a brother, seldom indoors, escaped.

Mrs. F. died after twelve months suffering, attended day and night by her two daughters. After the interment, I said, in so many words, to these young persons, you will die, as your mother and brother died, of consumption, if only you live as they lived, shut up. We shall do whatever you direct us to do, they replied. In effect, they went out daily, slept with both door and window wide open, and, winter and summer, took a cold shower-bath every morn. Years have since lapsed. One sister I saw last summer nigh London, the happy mother of a healthy family, the other, a picture of health, pursues art at home beside her aged father.

I knew, from infancy, and from time to time attended J. B. Her mother, and father a physician, died, both of them, of phthisis. I spoke to J. B. much as

I did to the two sisters, and a finer example of flourishing early womanhood than she was, when I saw her afterwards, as she stood one summer eve, with bared head and scarlet cloak at a concert-room door, it would be difficult to meet. In a few years she married, but such were the prepossessions of her new relatives, who took no counsel from me, that neither she nor her baby was suffered to venture out of doors. To be brief, she contracted phthisis and perished.

One day two young people, husband and wife, both far gone in consumption, called on me for advice. Soon after, the young man came alone. Doctor, he said, when I awoke this morn, my wife lay dead beside me. I sent him to Natal, where a kind and generous man, besides other attentions, gave him a horse to ride, but it was too late, he returned no more.

In this country, cows are kept in houses one side, or rather end, of which is quite open. Such cows, unlike those in London and especially Paris, never become tuberculous. One day, in the course of conversation, a farmer in the country told me he had lost a cow. Such a one, he said, he had never had, never saw. And I cannot think why, he continued, I was so good to her. Show me, I said, where you put the animal. He led me to a chamber, boarded on every side. The ceiling one could place ones hand upon. In short, when the door was closed, the place was a shut sac. It was easy to perceive why the poor cow perished, and why the farmers other cows, housed in the usual fashion, maintained good health.

I have no wish or desire except the furtherance of

truth and the interests of my fellows, and therefore am bound to affirm and declare that man and brute, the common course of things regarded, contract consumption and scrofula, not through infection, inoculation, or the inhalation of Dr. Kochs bacilli, but by reason of the inhalation of prebreathed air, and that neither malady has any other source or origin whatever. There is no other way either of avoiding these fell diseases except by avoiding rebreathed air, and this is perfectly effective.

I shall now close with the very words of which Dr. Koch himself makes use at the end of his truly able, yet withal, in certain essentials, inconclusive if elaborate essay : "*Meine untersuchungen habe ich im interesse der gesundheitspflege vorgenommen, und dieser wird auch, wie ich hoffe, der grösste nutzen daraus erwachsen.*"