

minutes to the University, and at the close of your lecture hour you can go down to the hospital. I think it very likely that we shall adopt the plan of having two or three of the dressers alternately on duty, to assist the house-surgeons in receiving and attending to the accident and surgery cases. In fact we are now in a position to utilise to the utmost the facilities afforded by the proximity of the hospital.

And here it is our duty to refer to the debt of gratitude we owe to Professor Allen Thomson. In the midst of the laborious duties of the most important chair in the medical faculty, he found time to give his unwearied attention to the progress of the noble building in which we are met. The internal arrangements of the new University were in great part suggested by him, and he watched over their execution with the constancy of a clerk of the works. No sooner were these exertions crowned with success than he assumed the duty of superintending the erection of the Western Hospital, and now he has the satisfaction of knowing that it was opened in a state of great efficiency two days ago. It is for us to take advantage of the opportunities thus afforded, and prove our gratitude by making good use of them. We were all grieved when his great exertions in this cause brought on last winter an attack of illness, which for a time prevented him from carrying on his professorial duties; but it is matter of thankfulness that during the recess he completely regained his usual health and vigour. I am sure that it is the earnest wish of his colleagues, and of every student of the University, that he may long continue to fulfil the duties of the chair which he so highly adorns.

In conclusion, I must frankly say that I feel the responsibility of being the first occupant of this chair. Though well accustomed to clinical work, it is a much more important charge to have the students of this great University committed to my care than to be a voluntary teacher as I previously was. The University authorities, by delegating the first duties of this chair to me, have honoured me in a manner that is most gratifying. Be assured that I shall use every endeavour, by the most diligent and unremitting attention to my duties, to render my teaching serviceable to you, and to prove myself not unworthy of the trust reposed in me.

WHAT IS A BACTERIUM?*

By W. A. HOLLIS, M.D.

THIS question is thus answered by Ehrenberg in his great work on Infusoria:† “Animal e familia Vibrioniorum divisione spontanea in catenam filiformem rigidulam abiens.” Dujardin accepted this definition without alteration, although he modified somewhat the other genera of the family. The derivation of the word itself (from *βακτηριον*, a little rod) corresponds well with the characteristic features of the organism above given. For several years the accuracy of Ehrenberg's definition was unquestioned; eventually, however, from the observation of the behaviour of these organisms with certain chemical reagents, and mainly also from the elaborate researches of Professor Cohn regarding their morphology, their animal nature was disputed. It was found that they were unaffected by boiling with potash water, and they were further said to behave somewhat as cellulose does when they were treated with sulphuric acid and iodine, although from their extreme minuteness any changes which take place in their tissue under such conditions are very difficult to observe.

For many years past Professor Cohn, of Breslau, has published in occasional papers the results of his investigations on the subject. He has made one great step in advance of previous observers in ascertaining so much of the history of the bacterium as that it arises from the gelatinous scum seen floating on the top of water containing putrescent organic matter, and this he named “zoogloea.” He then described the *Bacterium termo* in these words:‡

“Cellulæ minimæ bacilliformes, hyalinæ gelatina hyalina in massas mucosas globosas, uvæformes, mox membranaceas consociatæ, dein singulæ elapsæ, per aquam vacillantes”; and he considered them as of decidedly a vegetable nature, and as allied to the Oscillatoriaceæ. In a more recent pamphlet he placed them amongst the family Phycocchromaceæ, in a natural order named Schizosporæ. His last investigations have led him to divide Bacteria into four groups and six genera as follows:—*

- | | |
|----------------------|--|
| I. Sphæro-bacteria. | Genus 1. <i>Micrococcus</i> char. emend. |
| II. Micro-bacteria. | Genus 2. <i>Bacterium</i> char. emend. |
| III. Desmo-bacteria. | Genus 3. <i>Bacillus</i> n. g. |
| | Genus 4. <i>Vibrio</i> char. emend. |
| IV. Spiro-bacteria. | Genus 5. <i>Spirillum</i> , Ehr. |
| | Genus 6. <i>Spirochæta</i> , Ehr. |

Of these genera the bacterium, vibrio, spirillum, and spirochæta were in the original vibrionia family of Ehrenberg.

Cohn considers the ferment of contagion to be due to the presence of a variety of the sphæro-bacteria, the micrococci of Hallier. The whole group he divides into three: the chromogen, zymogen, and pathogen—the micrococci of pigmentation, of ferment, and contagion respectively. These organisms are exceedingly minute, darkish, or coloured granules, so small as to be immeasurable. They frequently present the appearance of beaded chains, or the form of aggregations (colonies). They are motionless, and are occasionally found with the *Bacterium termo* in putrefying organic liquids. Among the pathogen micrococci I may mention the *M. vaccinæ*, observed by Chauveau and Sander-son in the vaccine lymph; the *M. diphthericus*, which is probably the same organism as that described by Professor Eberth, of Zurich, as attacking first the epithelial elements of a part, and subsequently the deeper tissues, and which led him to say “the metastatic pyæmia is for the most part a diphtheria with numerous localisations”;† and, lastly, the *M. septicus*,‡ found, according to Cohn, in the miliary eruption of typhus, pyæmia, and other diseases. The chromogen, or pigmentary micrococci, have occasionally been the means of working miracles. Several instances of bread exuding blood, under supernatural circumstances, are related by Rivolta.§ Ehrenberg found this colour on some bread in the house of a patient who had died of cholera, and he ascertained the pigment to be due to the presence of the *Monas prodigiosa*—small roundish bodies, which Cohn classes with the micrococci.

The true bacteria Cohn divides into two species, the *B. termo*, and *B. lineola*. The *B. termo* are small dumbbell-shaped organisms, having a slowly vacillating motion, and about $\frac{1}{1000}$ ” or $\frac{1}{1200}$ ” in length. I have elsewhere given Cohn's description of these micro-bacteria and their zoogloea. They are essentially the ferment of putrefaction, and it is doubtful whether putrefactive changes can take place without them. It is probable that Ehrenberg confounded this bacterium with the *Vibrio lineola* in his plates in the work before noticed. The *B. varicosum* of some writers is possibly this species, although, when fresh names are introduced in classification without sufficient description, some doubt will always be cast upon the accuracy of the investigations.

The *B. lineola* is somewhat larger than the preceding species. It is endowed with stronger and more rapid to-and-fro movements. It is rod-shaped, and is essentially the ferment of sour milk. It is equivalent to the *Vibrio lineola* of Ehrenberg, the *V. tremulans* and *B. triloculare* of the same author, or to the *V. lineola* of Dujardin.

The Desmo-bacteria, or “linked rods,” are distinguished, as their name implies, from the true bacteria by being occasionally united together in chains. They are thus separated: the filament transversely lined—*Bacillus*; the filament cylindrical and curved—*Vibrio*.

The Bacilli Cohn divides into three species:—

The first, the *B. subtilis*, is the *vibrio subtilis* of Ehrenberg. It is a slender supple thread found in stale boiled milk. Its length is about $\frac{1}{1000}$ ”. It moves with a pausing motion, “like a fish forcing its way through reeds.”

The *B. anthracis* of Cohn is the *Bacterium carbuncolare* of some writers. It is described by Rivolta|| (following

* Cohn: Beiträge zur Biologie der Pflanzen. Breslau, 1872.

† Eberth, Zur Kenntniss d. Bacteritischen Mykosen. Leipzig, 1872, p. 15.

‡ The Microsporon septicum of Klebs.

§ Del Parasiti Vegetali. Turin, 1873.

|| Rivolta, op. cit., p. 47.

* Abstract of a paper.

† Die Infusions-thierchen, 1838, p. 77. ‡ Nova Acta, xxiv., p. 123.

Davaine and Delafond) as an immovable, oblong, highly refractive body, found in the blood of animals affected with the disease. Its size (according to Davaine) varies much, from $\frac{1}{1000}$ " to $\frac{1}{200}$ " or even $\frac{1}{2000}$ ". It is unaffected by water, alcohol, ether, acetic, nitric, or phosphoric acid, or soda, potass, or ammonia. Sulphuric acid readily destroys it. It is occasionally found united in chains of two or three links.

Lastly, the *Bacillus ulna* is distinguished from the *B. subtilis* by the greater thickness of its filament and by its rigidity. Its length is about $\frac{1}{250}$ ". Cohn found it in a stale infusion of boiled egg.

The *Vibrios* are distinguished from all the preceding genera by their rotary motion. This motion, which most writers had restricted to the spiro-bacteria, Cohn, I think, rightly applies to the movements of the vibrio. The *V. rugula* is generally seen with one or two slight curves in the form of the signs) or S. A flexible thread, $\frac{1}{2500}$ " to $\frac{1}{1200}$ " long; rotation slower than in the following species. This organism was found in the evacuations of cholera and diarrhoea by Leeuwenhoek, and by Davaine in the pus of balanitis also.* The second species, the *V. serpens*, is distinguished by the greater number and regularity of its curves, by the rigidity of the filament, and its more rapid rotation. The thread is also considerably thinner than the *V. rugula*, and its length is about $\frac{1}{2000}$ ". The motion is serpentine in appearance.

The *Spirilla* (including the *Spirochæta plicatilis*, for I do not think Cohn is justified in separating the two genera) of Dujardin† are distinguished by the greater regularity and closeness of the curves of the spiral, and their uniform corkscrew motion. The distinguishing character of the flexibility or rigidity of the threads in the genera *Spirochæta* and *Spirillum* respectively, insisted upon by Ehrenberg and followed by Cohn, is rightly set aside by Dujardin as superfluous. All the spirilla, of which Cohn gives three species—*S. tenue*, *S. undula*, and *S. volutans*—were found by him in the decomposing tissues of a fresh-water snail. They are distinguished mostly by their size from each other. The *S. volutans* is by far the largest of all the bacteria, if we apply the name to the genus at all. It is thus described by Ehrenberg, "*Filis valde tortuis robustis et elongatis*." Cohn fancies that he has found traces of organisation within it.

I have above given a short *résumé* of the labours of the most trustworthy naturalists upon the morphology of bacteria. I shall now only add a few remarks upon the limitations we should place on the term.

In the first place, then, it seems right to consider bacteria as strictly forming part of the vegetable kingdom, and this, as I have before remarked, is the opinion of all the most trustworthy authorities of France, Germany, and Italy. I should have included our own country in this geographical list had I not lately been somewhat startled to find a learned professor in a recent lecture at the Royal Institution‡ reported to have represented bacteria to be "*animalcules*." Secondly, I think the name bacteria ought to be restricted to those minute rod-like hyaline bodies, the *B. termo* and *B. lineola* of Cohn. They have a more or less rapid to-and-fro motion. The so-called "*locomotive bacteria*" of some physiologists are probably in many instances specimens of the larger *V. rugula*. Rivolta considers that the true bacteria have no proper locomotive powers, only the vacillatory movements common to all small particles of matter suspended in liquids. Thirdly, we must, I think, always associate the presence of the true bacteria (especially the *B. termo*) with putrefactive or analogous changes in organic liquids.

At some future period I hope to give a short account of the etiology of these organisms, and the part they play in the causation of disease.

* Davaine, *Entozoaires*, 1860, p. 5. † Infusoirs, p. 209.

‡ See report in *Illustrated London News*, Feb. 14th, 1874, p. 162.

ON A HITHERTO UNDESCRIBED FORM OF SKIN DISEASE.

By H. S. PURDON, M.D., L.R.C.P.,

PHYSICIAN TO THE BELFAST GENERAL HOSPITAL AND TO THE HOSPITAL FOR DISEASES OF THE SKIN.

I HAVE had, during the last nine years, frequent opportunities of seeing patients at the Belfast Hospital for Skin Diseases who suffered under a peculiar and yet trivial affection of the skin, usually confined to the upper extremities. I briefly noticed this disease in the *Medical Mirror*, August, 1867, when giving the statistics, &c., regarding the patients attending the Skin Hospital. Since then I have had more opportunities of observing the eruption, and now beg to offer one or two remarks thereon.

This affection of the skin is peculiar, and is only met with in those workers who are employed in the "spinning room" of our flax-spinning mills. Those attacked are usually young girls called "doffers," whose occupation is principally to "doff" or remove the bobbins from the machines, and to clean and oil the same. The following case is an example of the disease.

Arabella C—, aged fourteen, a "doffer," was admitted at the Skin Hospital December, 1873. She has an extensive eruption on both forearms and arms. The skin of the affected parts is dry, harsh, and covered with a papulo-pustular eruption. The forearms exhibit, scattered over them, innumerable little black specks, showing the orifices of gland-ducts obstructed by sebum, which gets the black spot from dust adhering thereto. In some places the eruption (before the stage of maturity is reached) has a "shotty" feel, somewhat similar to what is felt in small-pox. The skin generally over the patient's body is of a yellowish colour and anæmic appearance. She was ordered to wash the affected parts with soft soap, to use the dilute citrine ointment, and to take a tonic aperient mixture.

As already remarked, the eruption is confined chiefly, if not always, to the forearms and arms of the young girls called "doffers," who are employed in the spinning room, the temperature of which is high. These girls are lightly clad, even in winter, "perspire at every pore," and after a time their skin becomes of a dirty yellowish hue. The constant sweating makes the orifices of the sudoriparous and sebaceous gland-ducts more open and visible; and then the oil (which is train or sperm oil) with which the machinery is oiled saturates their arms and hands, and clogs and obstructs the orifices of these gland-ducts. The retained secretion, acting as an irritant, gives rise to inflammation, causing in the first instance a papular eruption, which, however, soon becomes pustular at the summit, with a black spot in the centre; these elevations, however, rarely burst or scab. The disease seems to me to be a combination of lichen and acne, if I may so express myself. The papules in the first instance are produced by an inflammation of the follicles due to retained secretion acting as a foreign body and giving rise to irritation accompanied by prolific cell-growth. I have never met with an eruption similar in appearance, &c., in any of the towns where I studied dermatology, and it seems to be peculiar to the class of people I have mentioned, Belfast being the great centre of flax-spinning.

I wrote to some of my professional brethren who attend the dispensaries in Belfast and the immediate neighbourhood of flax-spinning mills, and who have thus good opportunities of observing this complaint, asking them to give me any information they could regarding it. Dr. Newett, medical officer of the Ligoneil Dispensary, says: "I repeatedly see the cases of lichen-like eruption, chiefly on the arms (if not altogether so), to which you refer." Dr. Spedding, one of the medical officers of the Belfast Dispensary, writes: "I have often observed the eruption you speak of. During the small-pox epidemic it often confused me, when there were symptoms of pyrexia present. It always remains papular, is frequently, in the young, upon the face as well as the arms, and might be mistaken for acne. I have observed that it is only those employed in the hot rooms who have it. In fact, from its presence I can always diagnose the patient to be a 'spinner.' I have never tried any treatment for it, believing such to be useless while they are

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