Some Points in the Pathology of Acne.¹

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The fundamental error in acne is seborrhœa. There is at present a lack of knowledge as to the causation of seborrhœa, but it is known that it is common in adolescence, in disorders of the alimentary tract, and is apparently an inborn peculiarity in some individuals. The symptoms of acne vulgaris are, as we may say, built up on seborrhœa as a basis, and comprise, first, the production of a horny plug in the pilo-sebaceous follicle, the so-called blackhead or comedo; secondly, suppuration around the comedo; and, thirdly, the production of persistent granulomatous nodes, or, in some cases, of cyst-abscesses.

The bacteriology of the condition has been studied for many years by several investigators, and the views held by the various workers are divergent. Unna and Hodara found a small bacillus present, which they did not cultivate, and came to the conclusion that it was the cause of the suppuration. Sabouraud also found the same bacillus and cultivated it, and believed that it was the cause of the seborrhœa and the comedo, but not the cause of the suppuration, which he considered was due to the pyogenic staphylococci. Gilchrist believed that the bacillus was the cause of the symptoms of acne, and named the bacillus the Bacillus acnes. Some years ago I investigated the question and came to the conclusion that the seborrhœa was not bacterial in origin, that the comedo was caused by the small bacillus, which, following Sabouraud, I shall refer to as the microbacillus, and that the suppuration was caused by Staphylococcus pyogenes albus. Recently Fleming worked at the subject and came to the conclusion that the suppuration was in most cases caused by the microbacillus, and urged in proof of his contention its invariable presence in the lesions, its power when rubbed into the arm of producing suppuration in some people, the variable opsonic index in acne patients, and the beneficial effect of inoculation. The appearance of Fleming's work stimulated me to renew my investigations, especially because of the very considerable proportion of acne pustules in which he was unable to demonstrate staphylococci. I therefore examined pus from unopened pustules in my next twenty cases, and in nineteen of these I

¹ Read at the laboratory meeting of the Section at King's College, March 1.
found the cocci in smears, and in the twentieth I was able, by cutting horizontal sections of an acne pustule, to show the cocci in active colony at the periphery of the abscess. My attention was then drawn by Dr. Molesworth, who was working in my clinic, to a paper by Hallé and Civatte in the *Annales de Dermatologie* for 1908. It is worthy of note that this paper was on the bacteriology of the sebaceous glands, and the bacillus described by them and afterwards found to be identical with the microbacillus was found in the little plugs (really minute comedones) of patients who were not suffering from acne. The importance of this paper was the publication of the fact that the microbacillus was an anaerobe, thus obviating all the difficulty previously experienced in getting pure and abundant culture of the organism. I may state that this fact was apparently rediscovered independently in this country last year by Südmersen and Thompson. Dr. Molesworth undertook an investigation of this organism, and my cultural experiments were made subsequently to his. His paper is not yet in print, and it is only by his kindness that I am able to add the cultural details to this paper.

It is well known that vast colonies of this bacillus are found in the mouths of sebaceous glands of patients who are not suffering from obvious acne, but it will be found that in every instance there is present a minute comedo in the mouth of the follicle. The protagonists of the pyogenic effects of the microbacillus meet this objection by saying that the microbacillus is not pyogenic for every individual. It is, however, the fact that in marked acne only a small percentage of the comedones become surrounded by suppuration, while all are stuffed with the bacillus in the most active growth. Therefore the same bacillus must be pyogenic at one point and non-pyogenic at another in the same section not more than a millimetre away. This is to me inconceivable, whereas it is quite simple if the bacillus is considered as the cause of the comedo and the suppuration the result of a secondary infection with another organism. If one examines the bacillus in a smear preparation from a comedo, one finds that it is definitely Gram-positive; whereas if one examines the bacilli found in acne pus, those furthest away from the macerated comedo are found to be much less definitely Gram-positive, and I think it is commonly admitted that with the death of bacilli the quality of staining with Gram becomes progressively lost. That these bacilli are not actually dead is shown by the fact that one can grow them, and that whereas the first generation so grown will be weak Gram-stainers, the second and later generations regain their positive staining with Gram.
As regards the opsonic index, my investigations of a small number of cases gave me rather indefinite results, the lowest being 0.77, the highest 1.03. Dr. Emery carried out a couple of agglutination tests for me, and found that the serum of neither healthy nor acne patients gave any sign of agglutination. This is against Gilchrist's statement that he could identify every acne patient from his serum alone by the agglutination test. Curiously enough, Gilchrist found that the agglutination was more marked in the higher dilutions up to 1 in 100 than in the stronger, a remark to which Dr. Emery drew my attention. Fleming says that his bacillus, if made into a vaccine and injected in larger doses than 10 million, causes marked aggravation of the symptoms. I have given of the microbacillus several doses of 1,000 million, and a great many of doses varying from 250 to 500 million, without any marked aggravation of the symptoms.

I prefer not to say much about the therapeutic effects of this vaccine, though I believe it will prove valuable. I am at present treating a test case under the observation of a dermatological colleague, as I believe we are more likely to get at the truth by having our results controlled by an impartial observer.

Anyone who attempts the cultivation of the organism in 2 per cent. glucose agar under anaerobic conditions will, I think, be convinced of the ease with which the organism can be cultivated, and from the enormous numbers of colonies so obtained will also be convinced that the organism obtained is that which is present in such large numbers in the comedo.

If Fleming's organism is so toxic that 50 million give rise to marked suppuration in an acne patient, I think it cannot be the same organism as Dr. Molesworth's and mine, which gives rise to no special trouble in doses of from 250 to 1,000 millions.