NOTE ON THE DELHI BOIL.

(FURUNCULUS DELHINUS.)

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THERE being readily accessible more than one good description of the above-named affection, my later observations need but a few introductory remarks.

1. That the "Delhi sore" or "boil" is a peculiar complaint is averred by the common testimony of those who by local experience have become acquainted with its manifestations, and such testimony is, at least, *prima facie* evidence of the reality of this complaint.

2. The main point, therefore, concerns its true nature, and on this question opinions differ. Thus, some medical men, practically conversant with the Delhi boil and its nearer congeners, have supposed that we see here a local complaint, due to infection of some kind from the soil or water-supply; whilst others, not so conversant and being led by general reasoning or analogy, have refused to admit the specific characters of the sore, or at most would refer the complaint to a syphilitic origin; and, finally, an opinion held by both classes of observers is this, namely, that the affection under notice is but a local sign of general deterioration of health. Though I have not

myself visited Delhi, yet I have seen instances of the "boil," and had occasion to peruse its ample though scattered records, besides having studied on the spot two similar cognate affections, and on comparing all these data, I have come to the following conclusion:—That whilst there is here certainly a peculiar skin-complaint, its identity with any form of syphilis cannot be maintained; and, further, the hypothesis of an antecedent cachexia is frequently both needless and insufficient. Hence, there remains to consider the facts pointing to specificity of character, and such are these:—Endemicity and a direct convectability—features in themselves well-nigh decisive, especially when conjoined with the asserted protectiveness of the malady against its own recurrence. Add, too, a certain periodicity of occurrence of outbreak (*e. g.* the month of March, 1876; the autumn is also named); a selection of the most exposed or accessible surfaces of the body (most evident in the better clothed European); a somewhat definite course and duration of the boil; its convectability to a distance; its local characters so marked as to warrant accurate popular diagnosis; and, finally, the comparative harmlessness of the whole thing, with its utter intractability to other than destructive treatment. It is also significant that new-comers or dwellers of not more than a year are often, and all ages and both sexes equally, liable to attack—frequently a whole body of individuals being affected in rapid succession, after the manner of a localised epidemic. I have intimated that bad health is no necessary concomitant of the "boil;" and as indicating a special rather than general influence, would include such negative features as singular exemptions, irregular onset, and variations in degree.

3. In brief, the balance of proof seems clearly in favour of the local origin of the Delhi boil; and as regards its faculty of spreading by contagion, there are so many modifying conditions—both personal and social—that most, if not all, exceptional instances in its dissemination

appear to be applicable upon this datum, at least as readily as upon other and less well-defined hypotheses. As at present informed, then, we should be warranted in maintaining that the early "papule" is due to irritation of some poisonous or parasitic agency, derived from without and settling on the part; that its enlargement into a scaly "nodule" or "boil" is consequent upon a local multiplication of such agent, and, with the "sore" or ulcerated surface which commonly but not invariably follows, would be anticipated from the attendant inflammation and degeneration of tissue. Perhaps, too, an "open" surface is favorable to the extrusion and fructification-products, and the serpiginous character of the ulcer is certainly significant. Discharges—dry or moist—seem to be a means of natural dissemination; auto-inoculation is likely, and a certain degree of systemic infection may follow, whereby arise a multiplication of "boils" and a final protected state of the constitution. There are facts on record intimating that the lymphatic system is sometimes visibly implicated; and, in conclusion, we see here perfectly definite characteristics and many seeming irregularities, to be so readily understood on the view of specificity that it would not be surprising to find direct evidence of foreign and peculiar agency within the structures which are the seat of the boil. What has been observed is the following.

4. By the kindness of Dr. Fairweather, civil surgeon at Delhi, I procured last spring several specimens of this local affection, which were taken from the living subject or excised shortly after death, being then preserved in diluted alcohol and solution of potassic bichromate. On arrival in Bombay, the parts were hardened in strong spirit, converted into thin sections, and submitted to microscopic examination with the aid of simple reagents, as glycerine, acetic acid, and solution of potass. Different stages of the sore were represented, but not all specimens were suited for minute scrutiny, owing to variations in the strength of the preservative media. Amongst those

in better condition there was one, measuring an inch across, of oval form, and moderate duration, representing the stage just prior to ulceration, which Dr. Fairweather described as "a beautiful specimen cut out entire, along with a margin of sound skin, from the cheek of a lad who was killed by lightning, and whose body was sent for medico-legal examination." My chief results were obtained from this characteristic sample, but the other specimens, stated to be also typical, furnished useful material; and I may briefly sum up the observations made as follows:—In the early stage of the boil there is some overgrowth of the epidermis and a defined cellular infiltration of the derma, encroaching also upon the subjacent connective tissue; afterwards the cuticle becomes not only thickened, but subject to irregular development. I noticed in it a group of large ($\frac{1}{1000}$ inch), dark ovoid cells filled with bright granules, which, however striking, might have been only sebaceous products, and there were seen collections of clear reniform bodies, possibly accidental; more noticeable, however, were the numerous globular masses of laminated epithelium, sometimes large enough to be visible to the unaided eye, generally of opaque-white hue, and situated both superficially and deep; a few darker "globes" were found to contain coiled-up hairs. I note that the hair-follicles were widened, varicose, plugged with opaque matter, and accompanied by the spherical masses just named; the hair-shafts are broken, clubbed, swollen, or shrunk, and of granular aspect; the sebaceous glands distended or withered, sometimes expanded into cysts, and their contents variously altered. The sweat-glands and ducts did not claim especial attention; no strictly abnormal elements were observed in these epidermal structures. The papillæ of the cutis were, prior to obliteration, greatly enlarged, often dipping far down and sometimes branched at their free ends; they and the rest of the true skin were the seat of a dense cellular infiltration, whose characters did not seem peculiar; it was the same kind of

granulation-tissue which I had found in the "bouton de Crete" and the "bouton de Biskra;" and I may add that the epidermal formations are mainly identical in "Caneotica" and the "Delhi boil." Blood-vessels were plentiful, and at first nothing more unusual was noted, but guided by previous experience the search was continued, and then I detected in the particular specimen already adverted to, the appearances which are depicted in the drawings. Of these, figs. 1, 2, 3, and 4, Pl. XIV, indicate the presence in dilated canals (probably lymphatic vessels) of a mycelium-like growth, which if not common had yet a characteristic aspect; it was not affected by the commoner reagents, is extremely minute, and of far too regular a form to be due to accident; certainly it came not from outside, but had arisen *in situ*. Figs 5 and 6 show an even more striking stage of the growth, and after due consideration I am disposed to rely upon the validity of these observations, as demonstrating the existence of a true parasitic plant-like structure within the substance of the Delhi boil. The aspect, position, relations, and disposition, and the uniform character of the filamentous mass last described cannot, in my opinion, be relegated to known structures, and to conceive of their artificial production seems impossible. Here but little granular matter was intermixed with the growth; elsewhere such was more common, and it is within the bounds of supposition that it may be of micrococcus nature. I have no desire to speculate upon the connection of these foreign materials with the essential cause of the Delhi boil, having no other data to offer, yet one may imagine that such connection exists, if it be not a vital one; and my observations seem to afford a definite basis for the view, otherwise supported, that the troublesome skin-affection under notice is really of parasitic origin, *i. e.* of specific character. They confirm, for me, the opinion that such an affection exists as was lately termed *mycosis cutis chronica* (*vide* the last volume of the 'Transactions' of this Society).

In conclusion, it is legitimate to add that light is hereby afforded in practical dealing with these peculiar endemic skin complaints; and future observers will now have a definiteness of aim, which may be useful for their guidance.

DESCRIPTION OF PLATE XIV.

(Delhi Boil, Dr. H. V. Carter.)

Fig. 1. In a section from outer part of sore: + K-O + glycerine: $\times$ 500 diameters. Not far from the free surface, and near the edge, and surrounded by a dense infiltration of granular cells, is a pear-shaped cavity, containing a number of exceedingly minute and clear fibres, which have the aspect of branching filaments; they probably extend throughout this space. are mostly straight, colourless, and united at sharp angles. Transverse diameter of cavity, about $\frac{1}{800}$ in.; of filaments, probably less than $\frac{1}{8000}$ in. Another empty space is seen below and to the left; towards the right hand is part of a sebaceous gland. The cavity has defined and somewhat thickened walls, and intermingled with the filaments is a certain amount of fine granular matter. Nothing like *conidia* are seen, or free cells or nuclei. The dark tint below is probably due to red blood-material.

Fig. 2. Section from near middle of sore, at a spot not far from free surface: + acetic acid and glycerine: $\times$ about 500 diameters. The open space displays a closer network of delicate, straight, and branching, bright fibres; refracting granules are intermingled, and, above, a clouded mass of granular cells, in which some of the fibres are implanted. Towards the narrower lumen an endothelial lining is observable. At *a* are fibres, seen with a power of 700 diameters, which appear as if tubular, and occasionally jointed or beaded. At *b* are two cells from the interior of the cavity, within which were noticed one or two bright short rods, resembling Bacillar bodies, such as I have observed in other places, *e.g.* in perfectly fresh (living) cells and juice from a leprous nodule, to which no reagent was added. My notes add that the above fibres are not due to interspaces of endothelium, not branches of adenoid cells, not yellow elastic fibres, and cannot be nerve-tubules. The structure is a real one.

Fig. 3. A fragment from the edge of another section: + acetic acid + glycerine: $\times 500$. Here is a small obliquely divided canal, which, besides a granule-cell or two and a small group of red granules, contains a similar network of fine fibres. These were seen also before the addition of the diluted acetic acid.

Fig. 4. From a section of the sore to which K-O and glycerine were added. It is an oblique vertical section, and the spot shown is not far from the surface, towards one end: $\times 700$. An elongated channel appears, which is formed by the bifurcation of a canal coming up from below. Both canal and branches are filled with a fine branching growth, having delicate filaments of bright aspect, which assume the characters of mycelium. A few bright granules are mingled, and the mass, in different foci, presents the appearance of a densely felted collection. The prolonged action of K-O renders the filaments less visible.

Fig. 5. From a section to which glycerine alone is added. At a thin edge is noticed the long vessel here depicted, which, in its sinuous course, rather abruptly expands into an elongated cavity, where is seen a mycelioid growth. This growth is very luxuriant, presents an angular aspect where most compressed, (P) in the narrower lumen, and more open or wavy meshes in the dilated portion; its mode of branching is clearly shown, and all is sufficiently defined. Nothing of the like aspect is visible outside. The unaltered vessel (P lymphatic) is just equal to the diameter of the granular cells it serves to convey, or $\frac{1}{3} \cdot \frac{1}{4000}$ in. The dilated cavity measures $\frac{1}{500}$. The filaments are probably not more than $\frac{1}{20000}$ in., and they do not vary much in diameter, being remarkably uniform, and, to all appearance, *sui generis*.

Fig. 6. A part of the above, opposite the mark *; $\times \frac{1}{24}$ immersion, and about $\frac{1}{1800}$ diameters. On each side the walls of the canal are seen in varying focus. The interior is occupied by the new growth alone, whose filaments seem neither jointed nor beaded, are close set, and arranged as shown, it being impossible to depict their ramifications compatibly with clearness. Towards the wider end (above) the filaments are less densely aggregated, whilst in the direction of the narrow portion (below) they are more closely arranged and more parallel; here some granular matter exists which contains round, ovoid, and beaded, refractile bodies.

Sections from the scar of a Delhi boil all showed orange or red tinted particles, not unlike those found in the scar of the Bouton de Biskra, as well as remains of cell-infiltration. The above-described filamentous substance was not seen, nor, I may add, will it be easily detected in most sections of whatever age or stage of the 'boil.' In

the drawings the filaments are rendered by dark lines ; they have, in nature, however, a bright centre, due to refraction, which I am unable to represent.

Date of the above observations, June and July, 1876.