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MICROSCOPIC EXAMINATION

IN DR. BRONSON'S CASE OF

Acne Varioliformis of the Extremities.

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New York.

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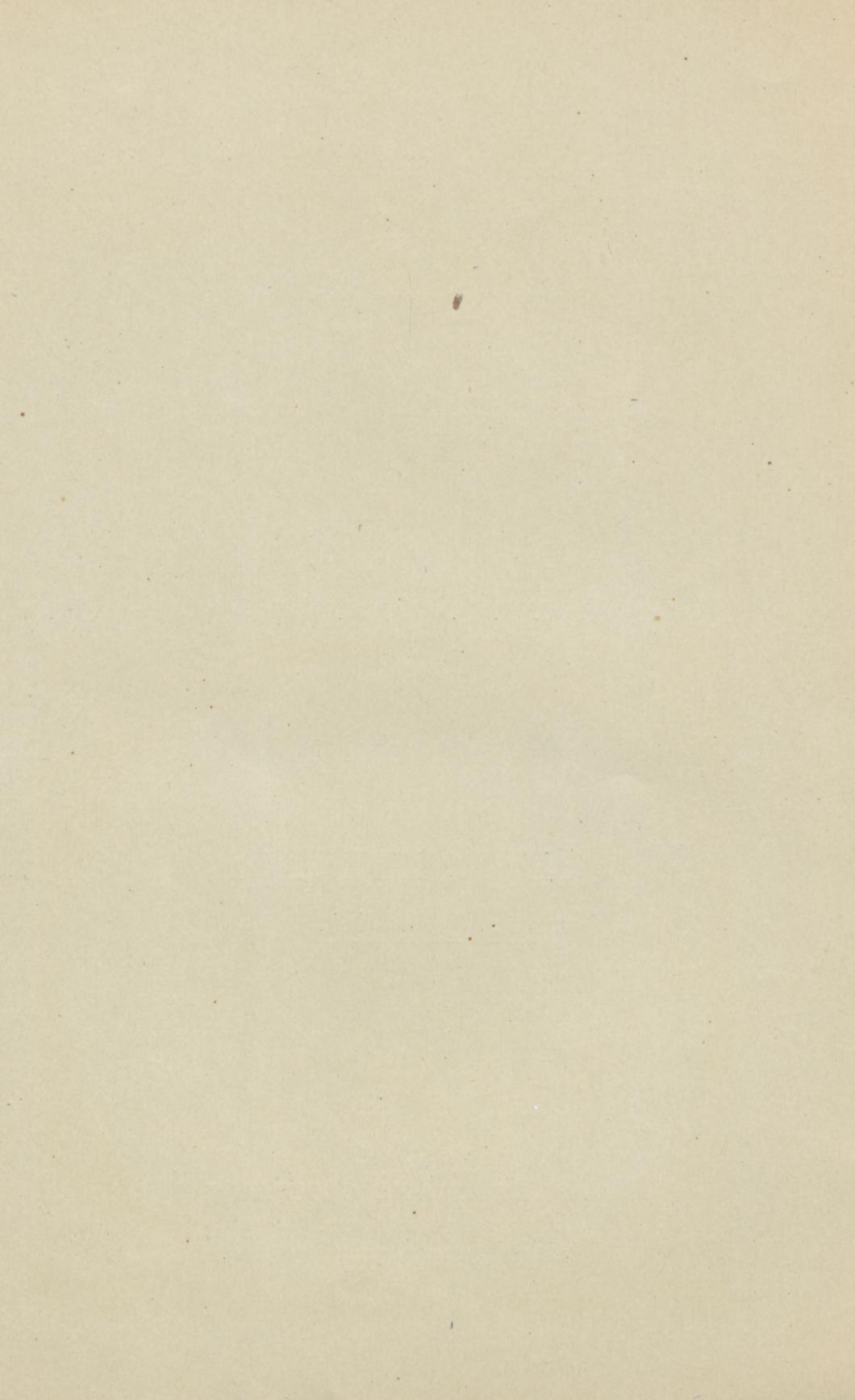


PLATE II.

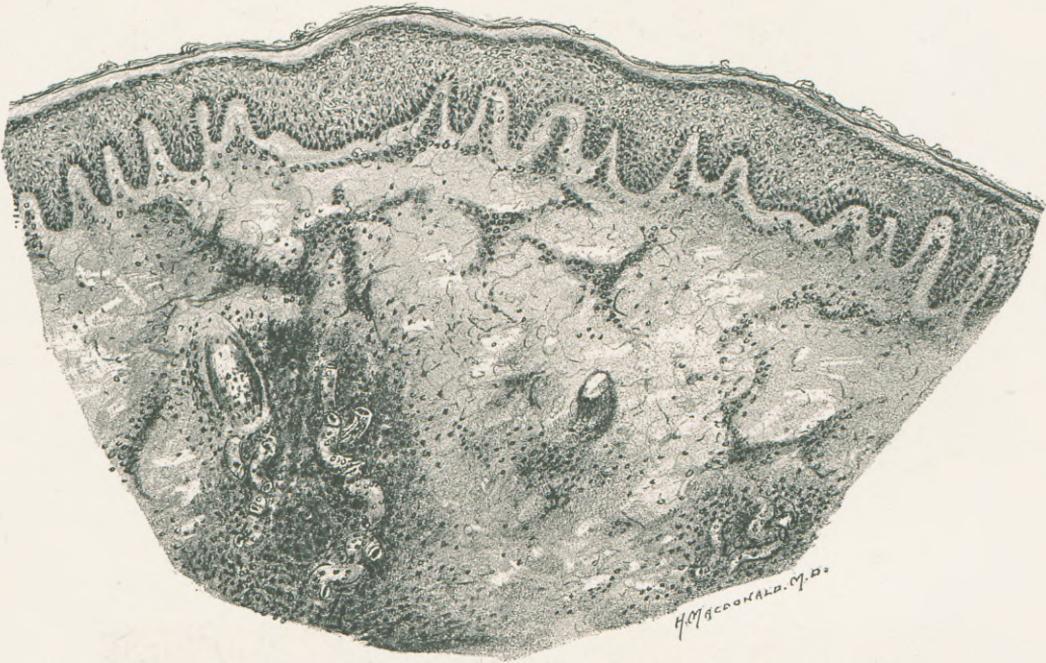


FIG. 1.—A BEGINNING PAPULE IN ACNE VARIOLIFORMIS SHOWING THE SMALL-CELL INFILTRATION ABOUT THE SWEAT GLANDS.



FIG. 2.—A PAPULE IN ACNE VARIOLIFORMIS AT AN ADVANCED STAGE, SHOWING THE CELL INFILTRATION AT THE SIDE OF THE HAIR FOLLICLE, AND THE BREAKING DOWN OF THE EPIDERMIS AT *a*.



FIG. 3.—A PAPULE IN ACNE VARIOLIFORMIS AFTER THE FORMATION OF THE CENTRAL NECROTIC MASS *a*. THE SITUATION OF A SMALL ABSCESS CAVITY IS SHOWN AT *b*.



FIG. 4.—PHOTO-MICROGRAPH SHOWING A BEGINNING PAPULE IN ACNE VARIOLIFORMIS.

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THE microscopic examination in the foregoing case of acne varioliformis of the extremities was made from three papules removed by the cutaneous punch from the dorsum of the hand and from the posterior aspect of the forearm. The papules when freshly excised were from four to five millimetres in diameter, and included the entire thickness of the skin with a portion of the subcutaneous tissue. To determine, if possible, the anatomical structure of the derma from which the papules originated, one of them was removed in an early stage of development while situated deeply below the surface, and felt as a firm subcutaneous papule, probably a millimetre in diameter. The epidermis over this papule was unaffected and not appreciably elevated, but the deposit could be readily seen and felt.

A second papule was excised while in a more advanced stage of development, being larger and of a darker hue; the epidermis over it had undergone some change and appeared slightly elevated.

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A third papule was removed at a stage corresponding to the complete evolution of the pathological process, its central necrotic mass having almost completely separated itself from the subjacent tissue, while surrounding it a marked inflammatory zone was present.

In the process of excision a small abscess at the side of the slough was evacuated, the situation of which is shown in the drawing (Fig. 3). Sections from this papule included the central necrotic mass as well as the surrounding zone of inflammation. The excised papules were hardened in alcohol, imbedded in celloidin, cut with a Thoma microtome, stained in a variety of ways, and mounted in balsam. The most satisfactory results were obtained from hæmatoxylin alone, and a double stain of hæmatoxylin and eosin, or picrocarmine.

Examination of a Subcutaneous Papule in an Early Stage of Development.—Sections from this papule examined under a low power show few changes in the epidermis. The horny layer is everywhere of pretty uniform thickness and firmly adherent. The stratum granulosum is well defined, and contains from four to five layers of cells rich in keratohyalin. The rete Malpighii is unchanged. The blood-vessels of the papillary and sub-papillary regions are dilated and surrounded in places by small round-cell infiltration, but there is no tendency in these regions to the formation of nodules as seen in the deeper portions of the cutis.

In a number of the sections longitudinal views of sweat-ducts were encountered, surrounded, with their accompanying blood-vessels, by small exudation cells.

Longitudinal and oblique sections of hair-follicles, with their inclosed hairs, were also seen unchanged and not the seat of a perifollicular exudation. In a few sections the hair-follicle, with its sebaceous gland, could be traced throughout its entire length quite unaffected. In the deeper layers of the derma oblique sections of the hair-follicles were often seen surrounded by small exudation cells. The perifolliculitis in these cases appeared to be secondary, however, as it occurred generally at the periphery of a deep-seated nodule where the inflammatory action was intense, seemingly involving all the tissues of the cutis alike at this place.

The most striking features of the section under a low power were the presence of deep-seated, irregularly-rounded foci of inflammation at the situation of the coil glands, and encompassing these glands in a dense mass of small round-cell infiltration (see Fig. 1, and Fig. 4). Two of these small nodules were especially well marked in the lowermost portion of the section, lying to the right and left of the median line, while between them was a poorly-defined mass of small cells, which were not readily colored with hæmatoxylin. Scattered among the cells of

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this central mass, granular matter and disintegrating cells could be made out. It was difficult to determine whether the apparently separate foci of inflammation had occurred at the same time, forming a single nodule the centre of which was undergoing retrogressive changes or whether they originated independently.

I am inclined to the latter view, as portions of unaffected cutis were visible between the nodules. The most intense inflammatory action was certainly present about the coil glands, as revealed by the greatest number of small round cells at these situations. A direct relationship between these glands and their surrounding inflammation could not, however, be made out, as they were apparently unaltered in their histological structure. Their lumen was unchanged and the nuclei of their lining cells were readily stained with hæmatoxylin and borax-carmin.

A sweat-duct could frequently be traced from one of the deep-seated nodules to the epidermis, surrounded by small round cells.

In over fifty sections examined from this papule the hair-follicles were found unaffected in their superior portions. A perifolliculitis was only present, as before stated, in connection with the deep-seated inflammation. The sebaceous glands were found in every instance to be quite normal.

Examination of a Papule at a More Advanced Stage of Development.—

In sections from this papule the cutis, instead of presenting sharply-defined groups of small round cells, shows a more general cellular infiltration, particularly in the papillary and sub-papillary portions of the derma. Numerous capillaries were found filled with blood-corpuscles and surrounded by dense masses of small cells, some of which presented elongated forms, as if in process of conversion into connective tissue.

Transverse sections of some of the smaller vessels showed their walls to be thickened by a homogeneous mass, in which here and there a few nuclei and some granular matter were seen.

A longitudinal section of a hair-follicle, with its inclosed hair, was encountered near the centre of the section, the bulb of which was encompassed by a dense cellular mass (Fig. 2). The follicle was unchanged except at a point directly above the bulb, where the epithelial cells of both the outer and inner root-sheaths were separated, disintegrated in places and infiltrated by small round cells. Extending from this place to the outlet of the hair through the epidermis the outline of the follicle is well preserved, though surrounded by the general infiltration throughout the derma. Situated to the right of the follicle (Fig. 2) the cellular infiltration is denser and the vascular changes the most pronounced.

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Many disintegrated cells and much granular matter were found scattered throughout the section in this locality.

The papillæ are here crowded with small cells which have penetrated between the intercellular spaces of the rete, obliterating the boundary line between it and the cutis.

The lowermost rete cells have lost their normal contour and appear ragged and granular, while almost midway in the epidermis a separation of the superficial and deep cells has taken place, causing the elevation and change in the epidermis noted before its excision.

The space between these separated strata is occupied with granular matter and cell detritus. Above, the cells have more or less lost their stratified character; they appear granular, their outlines are indistinct, and as a rule their nuclei can no longer be distinguished.

With hæmatoxylin the affected portion of the epidermis stains a much lighter hue than the adjacent healthy part, though little difference in this respect was noted with borax-carminé. Many of the rete cells at the periphery of the detached portion show a brightly-stained nucleus centrally or peripherally situated, while the cell protoplasm is unstained.

The dermal and epidermal changes here described correspond to the situation of the papule in the excised piece of skin, and seem to show beyond all doubt that the essential histological changes in *acne varioliformis* take place outside of the hair-follicle, contrary to the view which has heretofore been generally maintained.

Examination of a Papule after the Formation of the Central Necrotic Mass.—The situation, shape, and relation of this broken-down tissue to its surroundings are well shown in the drawing (Fig. 3). In the section the central slough extended deeper into the cutis, and the papule was not so elevated above the *niveau*.

Examined under a low power the mass appears finely granular, its central part staining a lighter color and appearing more homogeneous than the periphery.

With a higher power the granular matter is found to consist of cell detritus, small round cells undergoing fatty degeneration, with the remains of the reticular structure of the cutis and of the epidermis.

Boeck examined the necrotic portion of the skin in his case of *acne frontalis s. necrotica*, and found it possible to demonstrate the elastic tissue of the skin quite unchanged by the pathological process. I was unable to do this by the staining method used by him, Ziehl's solution of fuchsin followed by a watery solution of picric acid. The fuchsin solution stained the mass a deep uniform red, while the portion corresponding to the stratum corneum was colored yellow. With borax-methylin-blue solution the nuclei of a few of the remaining rete cells were colored, together with a number of the small cells.

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The concentric ringed structure of necrotic mass which Boeck speaks of as present in the case examined by him was not noted, perhaps because the degenerative changes were too far advanced in the case under consideration. The necrotic mass was rendered exceedingly brittle by the reagents used, so that it was difficult to preserve the sections of it complete. The derma beneath and on either side was infiltrated with small round cells, especially about the vessels, while at the line of demarcation a considerable amount of granular detritus and a number of red blood-corpuscles were present.

The stratum corneum above on either side was thickened and separated, and the stratum granulosum absent. A few minute cysts, caused by the breaking down of rete cells, were seen, and a number of these cells were undergoing vacuolation. The epidermis further removed from the conical mass was unchanged.

A large number of sections from each of the papules excised were stained for micro-organisms by Gram's method, Kühne's method, and by Ziehl's solution of fuchsin, without result except in the papule last described. In this a few long slender bacilli stained a deep blue were seen in the tissue of the derma adjacent to the separating mass. In the granular débris surrounding the abscess cavity small cocci in groups were discovered, but nothing which give any clue to the nature of the disease.

Especial attention was directed to the subcutaneous nodules in the first specimen described, but no organisms of any kind could be found in them.

Résumé.—The result of the microscopic examination in this case of acne varioliformis would seem to show that the lesion begins as a deep-seated small cell infiltration about the coil glands, which are situated beneath the hair-follicles. In the beginning several independent foci of inflammation are present, which subsequently coalesce, producing a generalized infiltration of the derma with a tendency to central degeneration. As the infiltration approaches the surface it penetrates and disintegrates the overlying epidermis, separating it from the adjacent tissue.

The central dry necrotic mass which represents the final stage in the evolution of the pathological process is made up of the epidermis with the underlying tissues of the derma, which have undergone a peculiar degeneration and have become separated from the adjoining tissue by a sharp line of demarcation. The examination, unfortunately, gives little insight into the nature or cause of this singular affection, nor reveals why the affected tissues should be thrown off *en masse* rather than undergo a liquefactive degeneration.

One would be led to suppose, however, that some agent, bacterial

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or chemical, had played an active part in the inflammation, causing a reaction on the part of the tissue and an endeavor to throw off the offending cause and its results. The formation of pus, which is not a constant feature of the papules, was doubtless due to a secondary infection by pus cocci.

Pathological Literature.—As far as I have been able to ascertain, the foregoing examination is the only one that has been made of a beginning papule in this affection.

Dr. Grunewald (*Monatsheft für prak. Dermatologie*, Band IV., No. 3, 1885) reports a case of universal acne varioliformis, terminating in death, in which a microscopic examination was made of a number of the excised lesions. The histological changes in this case are, however, so entirely different from those in Dr. Bronson's case that they must be looked upon as distinct affections.

In Dr. Grunewald's case they were confined almost exclusively to the epidermis and the papillæ, the floor of the cicatrix being formed of one or two of the lowermost layers of réte cells.

Boeck, in his case of acne frontalis s. necrotica already referred to (*Archiv für Dermatologie und Syphilis*, Heft 1, 1889), examined only the separated necrotic tissue.

Of this he gives a minute and careful description, and concludes that the inflammation begins in and about the hair-follicle, rapidly extending, however, to the surrounding tissues and involving them in the destructive process. He mentions finding masses of small streptococci deep in the hair-follicle, and also small round fungus spores of double contours, which could not be stained, but were rendered more distinct by means of caustic potash.

Pick, under the title acne frontalis seu varioliformis (Hebra), acne frontalis necrotica (Boeck) (*Archiv f. Dermatologie und Syphilis*, p. 551, 1889), briefly narrates the result of the microscopic examination of the first-mentioned disease, which he regards as a distinct affection from the latter. His examination of the final stage of the process failed to reveal a connection between it and the hair-follicle or sebaceous gland.

Leloir and Vidal (*Traité descriptif des Maladies de la Peau, Symptomatologie et anatomie pathologique*, p. 23) examined two advanced papules from the forehead from a case of acne varioliformis. They found the remains of the orifice of a hair-follicle in the degenerated tissue, and in the derma a small-cell infiltration which had preserved in part the outline of the degenerated follicle. They conclude that the affection is a perifolliculitis, terminating in destruction of the hair-follicle and its sebaceous gland.

