In Case 1, it is not without interest to note the retrogressive changes, especially in view of the statement so often made by writers that the disease shows no tendency to break down. Jackson says, "The course is without tendency to ulceration or softening." Winfield says, "Tumors never suppurate except as a result of improper or meddling treatment." Unna, in his "Histopathology," says, "It is entirely painless and shows absolutely no tendency to spontaneous breaking down." On the other hand, Zeissl³ has reported an instance in which a considerable portion of the nose broke down in an ulcerative process. The long duration of the process of evolution is well illustrated in both cases.

I would not propose changing a clinical name now so well established, despite its inadequacy to describe the whole condition. A name to do this would have to be something like rhino-labio-palato-orbito-pharyngo-laryngo-scleroma, and even then it would not cover every case. It seems, however, to be stretching a point to call the affection rhinoscleroma during the years which may intervene between the time of onset in some mucous membrane, or in the throat and the appearance of clinical signs upon the nose. The term glioscleroma might be more generally appropriate. Kaposi has already used this term, calling the affection granulation sarcoma.

It is probably to be regarded as an infective granuloma of bacillary origin. In the last case Von Frisch's capsule bacillus was found in abundance and cultivated. Its similarity to Friedländer's pneumo-bacillus is striking, as several observers have pointed out. It is from its description, 5 microns long and 2 microns broad, and occurs singly or in groups within cell protoplasm. A Mikulicz cell, which a recent writer, Marschalk, regards as a specific element of connective tissue origin and the result of a special degeneration caused by their presence may contain bacilli in large number.

DISCUSSION.

DR. J. NEVINS HYDE, Chicago—I have seen rhinoscleroma only in Vienna, never in this country.

DR. D. LIEBERTHAL, Chicago—I have seen a case of rhinoscleroma in Chicago and I am keeping track of it. He is not an American, but hails from Moravia, a territory included in the Slav belt, where this disease occurs.

DR. L. E. SCHMIDT, Chicago—The reason we see so little of rhinoscleroma is probably because a large number of the cases go to men who treat diseases of the nose and throat. I know that this is true in Vienna, as I saw many cases in Stoerk's clinic. Furthermore, Kaposi has frequently made the same remark.

DR. C. W. ALLEN, in reply—In answer to the question I would say that I do not remember having seen anything in the literature bearing upon the etiology, but we regard the disease as one caused by a bacillus. There have been some inoculation experiments, usually negative except one where the culture bacillus was inoculated in the eye and a growth occurred which seemed to be of the same general nature and was regarded as a positive finding, but until it is reproduced in the human being I suppose we can not accept it as absolute proof. Being a disease of such long duration it is probably a disease of long incubation and probably it exists as a very slight affection for many years. So we have the same difficulty in tracing the origin as we do in leprosy. We never have had, so far as I know from the literature, any instance of the disease occurring in two members of a family, where it would point to contagion or infection, and there has never been anything pointing to heredity, so far as I know.

3. Wiener Med. Wochenschr., 1880, p. 621.

THE ROLE OF THE MAST-CELLS IN ACUTE AND CHRONIC INFECTIONS.*

HERBERT U. WILLIAMS, M.D.

BUFFALO, N. Y.

In discussing the relation of the mast-cells to infections, it will be proper first to consider what knowledge we have of their composition and their various properties that may have a bearing on this question.

It has been maintained that their granules are composed of mucin, on the ground that the metachromism displayed by these granules with thionin and other dyes is similar to that shown by mucin. This seems to be the principal argument for the theory, although some also state that mast-cells are numerous in mucous membranes during catarrhs and in tumors containing mucin.

In the writer's experience, while the mast-cells may be abundant in inflamed mucous membranes, they are few or wanting in tumors containing mucin and in the umbilical cord. They may be much increased in structures where mucin seems scanty, as in scirrhous carcinoma. However, since chemists state that there are certainly a number of varieties of mucin, the granules of mast-cells could not be expected to conform to the staining reactions of all mucins.

Variations in the number and size of the granules are common. The writer has twice seen relatively enormous granules, once in the wall of the fallopian tube in pyosalpinx, once in hypertrophic rhinitis.

What undoubtedly appear like granules free in the tissues are often observed. They may be only sections of the long and sinuous processes which many of these cells possess.

The matrix around the cells frequently stains in the same manner as the granules, though more faintly. Such pictures are unquestionably sometimes due to the action of reagents; they are of interest as indicating the soluble and diffusible nature of the material composing the granules. Ehrlich and Lazarus¹ cite Unna's descriptions of these stained zones about mast-cells as evidence for the secretory nature of the granules.

Usually it seems to be taken for granted that mast-cells are capable of ameboid movement, but it does not appear that such movement has actually been seen. The highly irregular outlines which they not rarely show, no doubt resemble those of moving amebæ. Their occasional presence between the epithelial cells of the skin, argues for their having ameboid movement. A case of myelogenous leukemia has recently been described, the peritoneal fluid of which was rich in mast-cells, which were supposed to have migrated into it.²

Evidences of phagocytosis are not often found. Unger also ascribed an important function to these cells in transporting droplets of fat in the active mammary gland.³ Concerning their origin and manner of multiplication, little evidence is at hand. Mitoses seem not to have been observed. Bäumer who found mast-cells numerous in the lesions of an artificial urticaria, believed they originated from the connective tissue cells of the adventitia of the vessels. The connective tissue cells, not the mast-cells, showed mitoses. The abundance of mast-cells about the vessels when they are present at all, and their increase in hyperemic conditions, are well known.

Concerning their occurrence in normal and pathologic

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tissues,⁵ so much has been written that it will be necessary to adhere closely to the subject of their behavior in the infections. However, their wide distribution among animals and at all periods of life must be noted, as indicating that they have important functions in the normal organism. It is remarkable that they are numerous in the tissues of the rat and rare in those of the nearly related rabbit and guinea-pig. Coen found that they quickly appeared in the skin of the rabbit or guinea-pig in which they do not usually occur, after irritation with iodine.⁶

Mast-cells are uncommon in pus and in muco-purulent discharges. Although it does not appear that any special search has been made for them in acute infectious diseases, the histologies of the infections have been so carefully worked out that they could certainly not have been overlooked. Upon reading recent studies of acute infections of all sorts, one finds that while mast-cells are frequently present in and around the lesions, they have not been seen in such numbers or so arranged that any specific relation has been ascribed to them; as, for example exists for eosinophiles in acute trichinosis. The writer's experience would lead him to adopt a similar view. An exception to this opinion is found in an article on the changes in the tissues produced by experimental bubonic plague, where mast-cells were found in the diseased lymph-nodes in such numbers as to lead the author⁷ to believe they perform an important rôle in plague.

In chronic infectious diseases, especially tuberculosis, mast-cells are usually present in the zone of reactive inflammation about the lesions, where they may be numerous. The lesions themselves do not contain them in large numbers, if at all. There is nothing to show that the infectious element causes this increase. The writer has more often found mast-cells very numerous in such material as scrapings from chronic endometritis, uterine myoma, or carcinoma of the breast or lip, than in the vicinity of tubercles or gummata. It should be noted that in myelogenic leukemia the blood contains an increased number of mast-cells, if leukemia be regarded as an infectious disease. Turk has claimed that the parasites described by Löwit⁸ for leukemia are mast-cell granules.

In general it may be said that where mast-cells become increased, plasma-cells are likely to be present and in much larger numbers than the mast-cells. This parallelism is not close, however. The writer's impression is that plasma-cells appear to be more definitely connected with infectious processes than mast-cells. The formation of tumor-like masses, often seen with plasma-cells, has been described for mast-cells only in urticaria pigmentosa.⁹ The writer has recently had an opportunity to secure a striking confirmation of Unna's observation in a case of urticaria pigmentosa.

It appears from the preceding that evidence is at present lacking to prove that mast-cells have any special relation to infections in general or to any particular infection. But it must be said that the subject has not yet received the study that it deserves. The facility with which these cells may be demonstrated, the large size of their granules, and the exhibition of characteristic reactions by the granules make them a promising field for research.

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SOME INVESTIGATIONS UPON
ANTIVENENE.*

JOSEPH MCFARLAND, M.D.

PHILADELPHIA.

The investigations of the last decade upon immunity to the infectious diseases have led to the discovery of many important and interesting facts. Among the most instructive of these we may mention the successful immunization of animals to serpent's venom achieved by Wolfenden, Phisalix and Bertrand, and Calmette, and the discovery in the blood of the immunized animals of a specific protective substance, first demonstrated by Phisalix and Bertrand, and elaborately studied by Calmette and Fraser.

THE METHOD OF IMMUNIZATION

adopted by Calmette consisted in the administration to horses of progressively increasing doses of cobra venom, slightly modified by heat, until the animals attained a high degree of immunity and antivenene appeared in large quantity in the blood.

COMPOSITION OF VENOM.

It has been well known for many years that the venom of serpents is not a simple poison, but one composed of several distinct poisonous proteids of different physiologic action. In their great monograph upon the subject, Mitchell and Reichert concluded that every venom contained two important poisonous proteids, one of which they regarded as a peptone, the other as a globulin. The former was a nervous poison, whose chief physiologic action was upon the center of respiration, upon which it acted so destructively that nearly all cases of venom intoxication die from more or less rapid failure of the respiration. The globulin they found to be an irritating substance with a marked local action upon the tissues, which it devitalized and disorganized, causing extensive extravasations of blood, necrotic and gangrenous changes, and leading to death from the local injury done. Wolfenden agreed with Mitchell and Reichert except that he regarded their peptone as an albumose, and since the time of these investigations it has been generally accepted that the activity of venoms depends upon the presence of these two bodies, and that the difference in the symptomatology of snake bite depends upon the different proportions in which these active principles are present in the venoms. Thus, the venom of the cobra—*Naja tripudians*—contains much of the nervous poison, and but little of the irritative poison, hence cobra bites are apt to cause comparatively little local damage, though they may prove fatal. On the other hand, the venom of the rattlesnake contains relatively less of the nervous poison, and a large quantity of the irritative poison, so that the bite of this snake is apt to be followed by extensive local damage, though usually not fatal.

Calmette found that when venoms were heated to 70-85° C., the irritative poison was precipitated, the nervous poison almost unchanged. The heated poison could be introduced into animals without pain, and

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