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Occurrence of Special Cell Groups at Vascular Pole of Glomerulus in Mammalian Kidneys.

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During the past year we have studied the juxtaglomerular corpuscles of Goormaghtigh[1-4] in normal and diseased human kidneys removed surgically and at autopsy. This material amounts at the present time to about 200 unselected cases. While similar structures were noted previously by others in laboratory animals,[5] other mammals[6] and selected human cases,[7, 1] this is the first attempt to demonstrate agglomerations of peculiar cells or cell groups around the afferent arteriole of the glomerulus in routine autopsy and surgical material, stained by special as well as routine methods.

These corpuscles are composed of agglomerations of cells, which are situated chiefly at the vascular pole of the glomerulus between the macula densa[6] of the distal convoluted tubule and the afferent arteriole. A thin layer of these cells may also surround the entire vessel. Occasionally the cells extend along the first part of the arteriole as it enters the glomerular tuft. They usually occur outside the media, surrounding it like a sheath, but they may appear to compose the entire arteriolar wall. We have not observed the corpuscles in kidneys of stillborn infants or children up to 2 years of age. In certain diseased kidneys, as of arteriolar nephrosclerosis, benign or malignant, they may be hypertrophied and thus appear more conspicuous.

The cells which make up the corpuscles can be identified by their morphological characteristics as well as by their staining reactions. They are rather large, polygonal cells with indistinct cell outlines. They are frequently closely packed and delicate argyrophilic fibrils can often be detected between them. Masson's trichrome stain brings out peculiar, fine, fuchsinophilic granules in the cytoplasm, which is

1 Goormaghtigh, N., *Arch. Biol.*, 1932, **43**, 575.
2 Goormaghtigh, N., *J. Physiol.* 1937, **90**, 1263.
3 Goormaghtigh, N., *C. rend. soc. biol.*, 1936, **124**, 293.
4 Goormaghtigh, N., and Handovsky, H., *Arch. Path.*, 1938, **26**, 1144.
5 Ruyter, J. H. C., *Z. f. Zellforschung*, 1925, **2**, 242.
6 Zimmermann, K. W., *Z. f. mikr. anat. Forsch.*, 1933, **32**, 176.
7 Oberling, Ch., *Ctes. rend. hebd. Ac. Sciences, Paris*, 1927, **184**, 1200.

otherwise clear, but vacuolated. The nucleus is large, rounded and vesicular. A clear halo is often seen surrounding it.

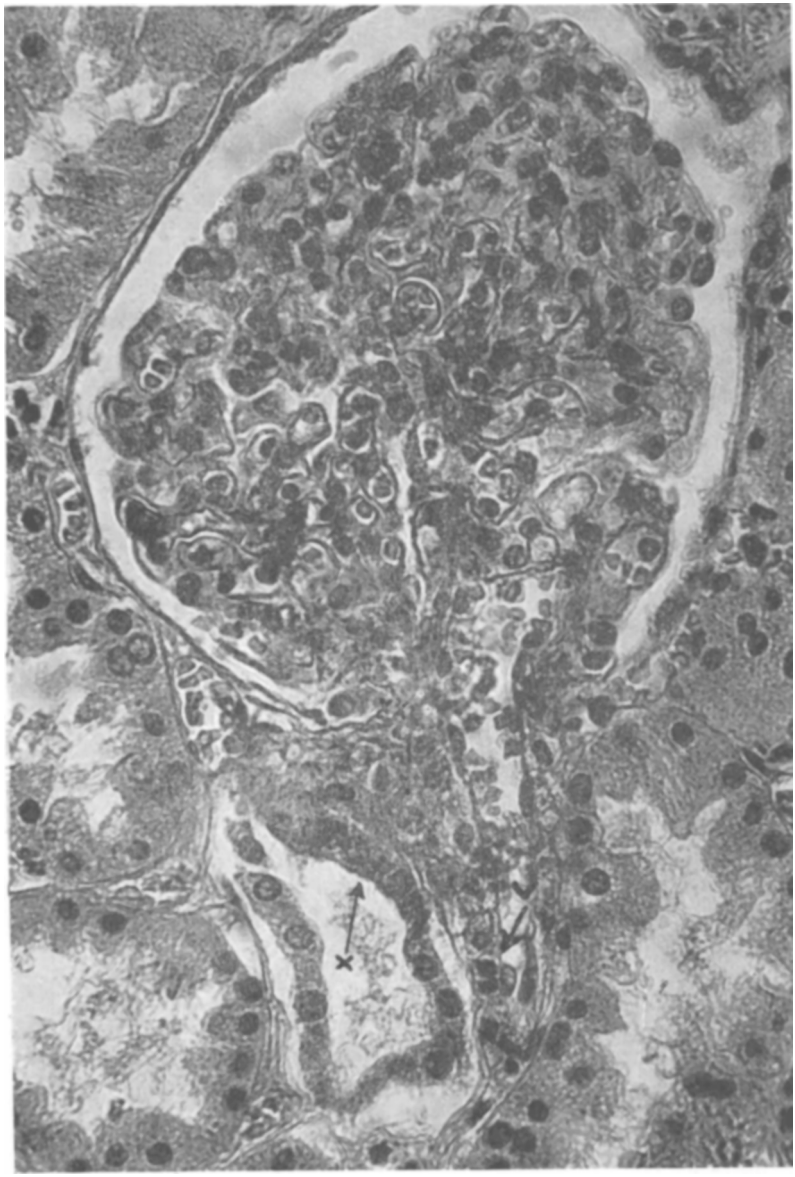

FIG. 1.

Photomicrograph showing a glomerulus of a human kidney with afferent arteriole, juxtaglomerular corpuscle (xx) and adjacent macula densa of the distal convoluted tubule (x). Enlargement 360 ×.

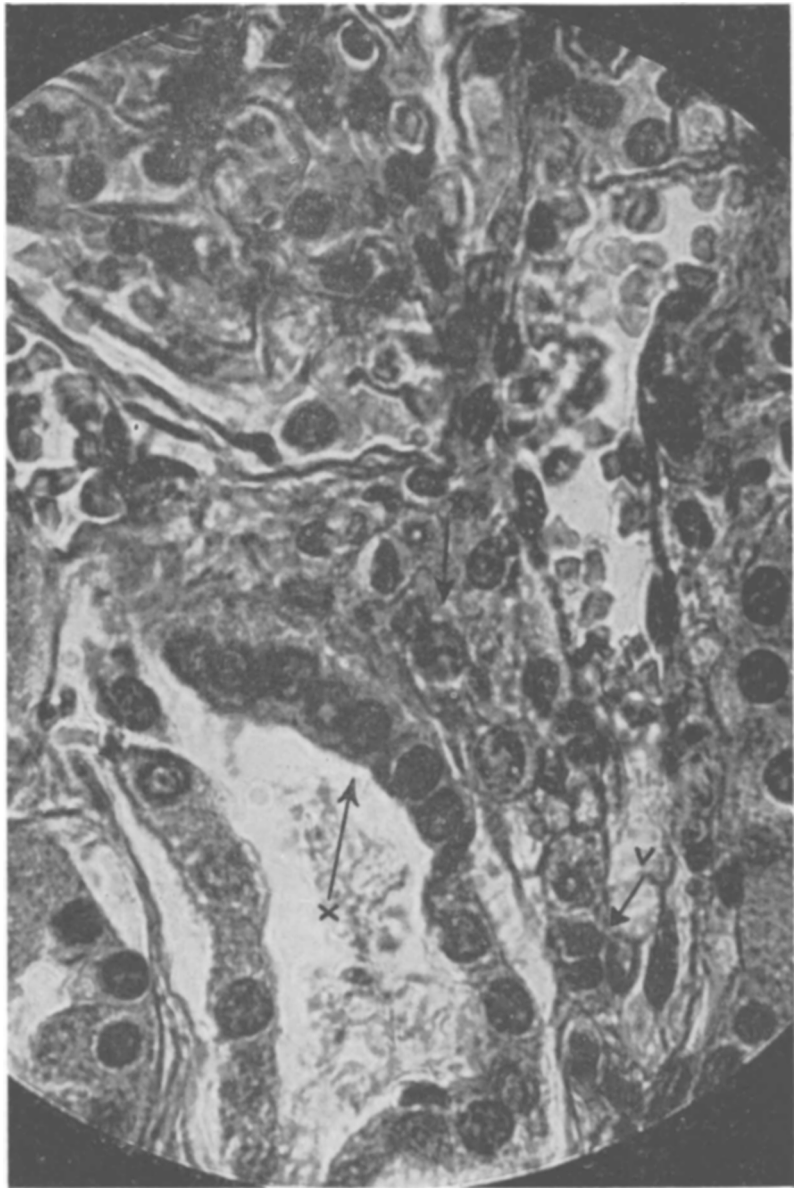

FIG. 2.

Photomicrograph of macula densa (x) and juxtaglomerular corpuscle (xx) in a human kidney. Note the halo around some of the nuclei in the corpuscle and the vacuolization of the cytoplasm. Several intercellular fibrils are also visible. (v) indicates smooth muscle cells of the arteriolar media. Enlargement 600 ×.

Tangential sections of mouse, rat, rabbit and cat kidneys, starting from the cortical surface and proceeding toward the medulla show that the juxtaglomerular corpuscles are absent in the superficial layers of the cortex corticis, but increase markedly toward the middle part of the cortex and decrease again toward the corticomedullary junction. They seem to be intrinsic characteristic structures of the normal, functioning mammalian kidney. The distribution of the macula densa in the kidney parallels that of the juxtaglomerular corpuscles.

It is important that the tissues be fixed while very fresh, preferably in Bouin's or Zenker's solution. They may be embedded in paraffin in the usual way and sectioned serially, if possible at 4 to 6 microns. Preparations stained with hematoxylin-eosin show the structures clearly, but do not give adequate cytologic details. Masson's trichrome stain is more satisfactory and Mallory's phosphotungstic acid-hematoxylin reveals good nuclear detail. Cytoplasmic vacuolization is clearly visible with this stain and with Mallory's anilin blue connective tissue stain. Intercellular fibrils are well brought out with Masson's stain or better with silver stains.

No definite suggestion as to the nature, the biological or physiological function of these cells can yet be given. Their intimate relationship with the macula densa is noteworthy and may suggest a physio-biologic interrelation between these two structures.

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Influence of Neoprontosil on Migration of Blood Leucocytes in Tissue Cultures.*

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Sulfanilamide and Neoprontosil have been reported to stimulate phagocytosis of bacteria by leucocytes *in vitro*. Finkelstein and Birkeland[1] found that in the presence of sulfanilamide and Prontosil (Neoprontosil?) the number of guinea pig leucocytes taking up bacteria and the number of bacteria engulfed per leucocyte was markedly increased. Fresh plasma or serum appeared to be neces-

* The Neoprontosil was furnished by the Department of Medical Research, Winthrop Chemical Co., Inc.

1 Finkelstein, R., and Birkeland, J. Y., *Science*, 1938, **87**, 441.