

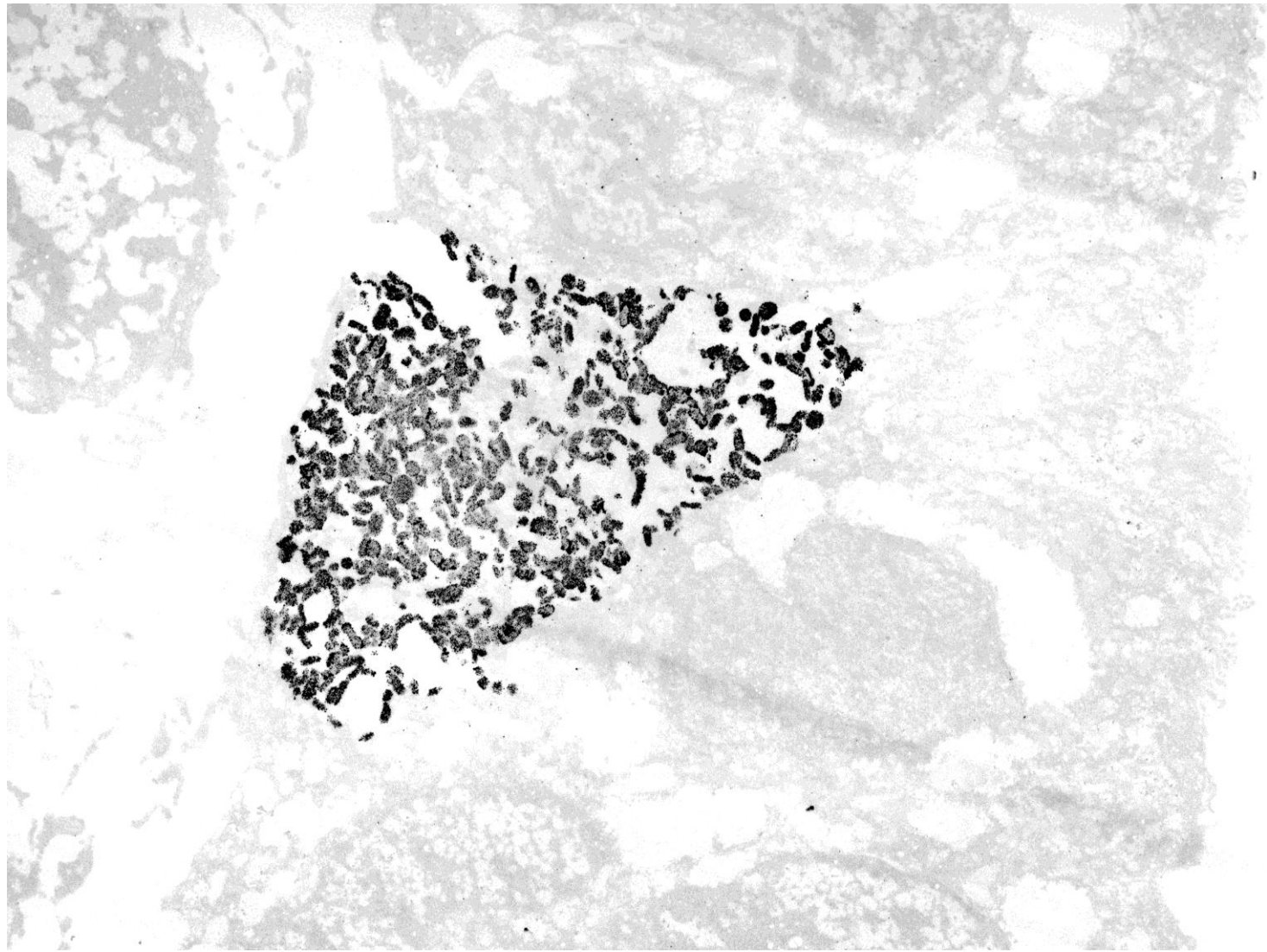
Grimelius argyrophilic reaction at the ultrastructural level in gastrointestinal lesions using formalin-fixed, paraffin-embedded sections

In the pre-immunohistochemical era, silver stains were an important part of the staining arsenal for identifying certain tissue structures and cell types in tissue sections. Grimelius stain can be a broad endocrine cell marker, while Fontana-Masson stain demonstrates the serotonin-containing enterochromaffin cells or melanin-containing cells. Such silver stains are very suitable for electron microscopic demonstration of the reacted silver grains. Even in formalin-fixed, paraffin-embedded sections, the argyrophilic granules are clearly demonstrated at the ultrastructural level. Of note is that Fontana-Masson stain can be applicable to Epon-embedded ultrathin sections.

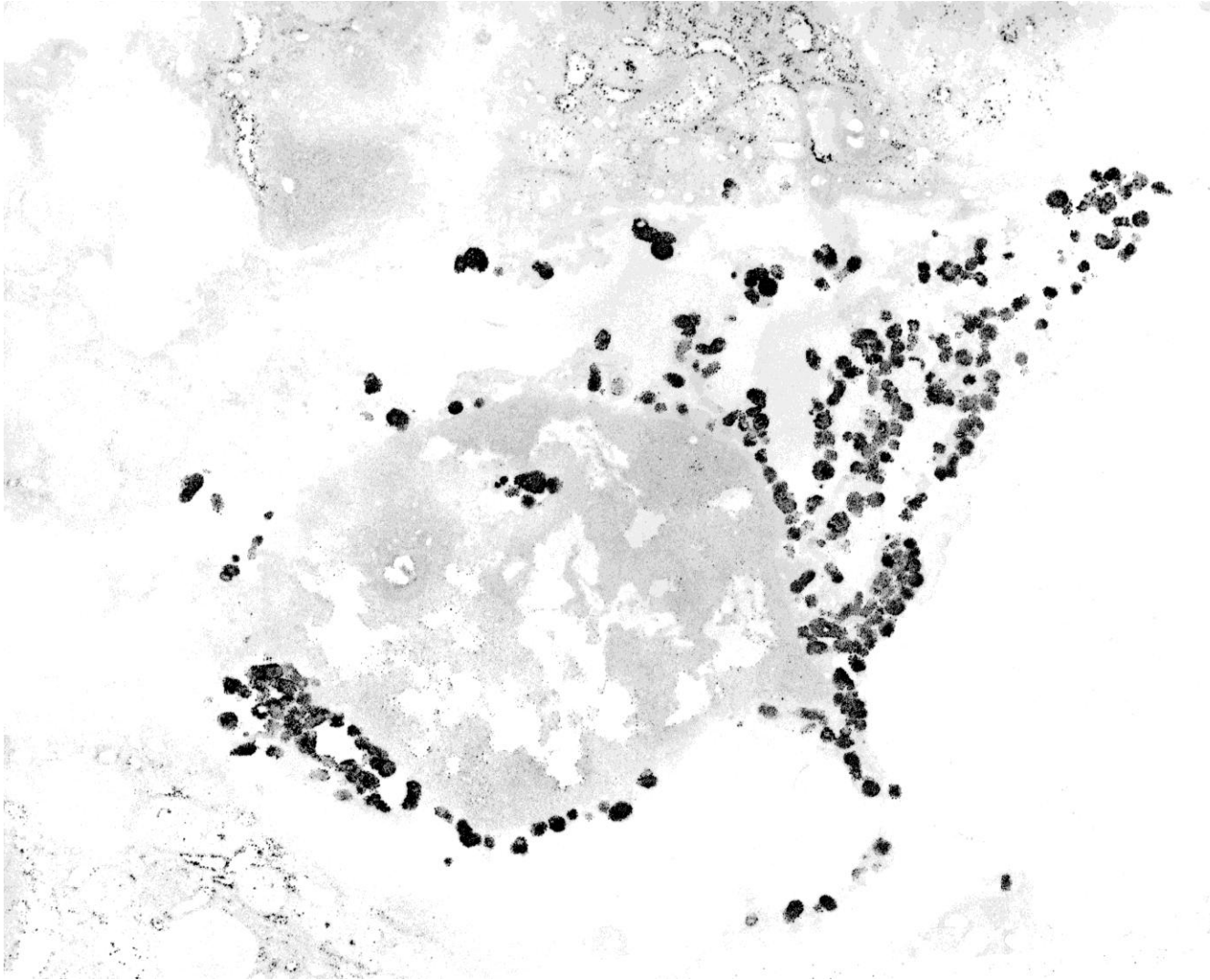
Ref.-1: Grimelius L. Silver stains demonstrating neuroendocrine cells. *Biotech Histochem* 2004; 79(1): 37-44. doi: 10.1080/10520290410001715264

Ref.-2: Carstens PH, Kuhns JG. Ultrastructural confirmation of malignant melanoma. *Ultrastruct Pathol* 1981; 2(2): 147-149. doi: 10.3109/01913128109064243

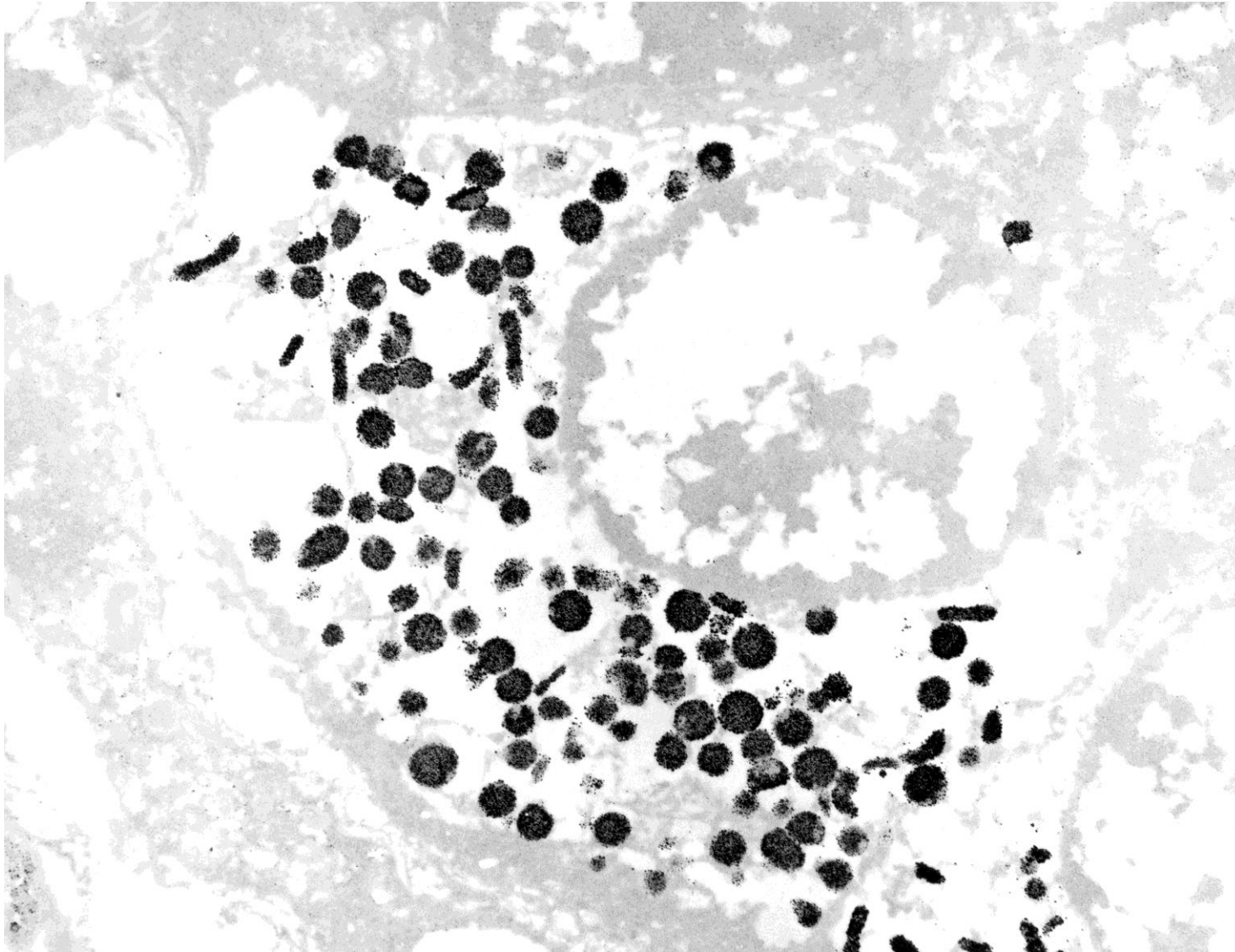
Ref.-3: Tsutsumi Y. Electron microscopic study using formalin-fixed, paraffin-embedded material, with special reference to observation of microbial organisms and endocrine granules. *Acta Histochem Cytochem* 2018; 51(2): 63-71. doi: 10.1267/ahc.18012



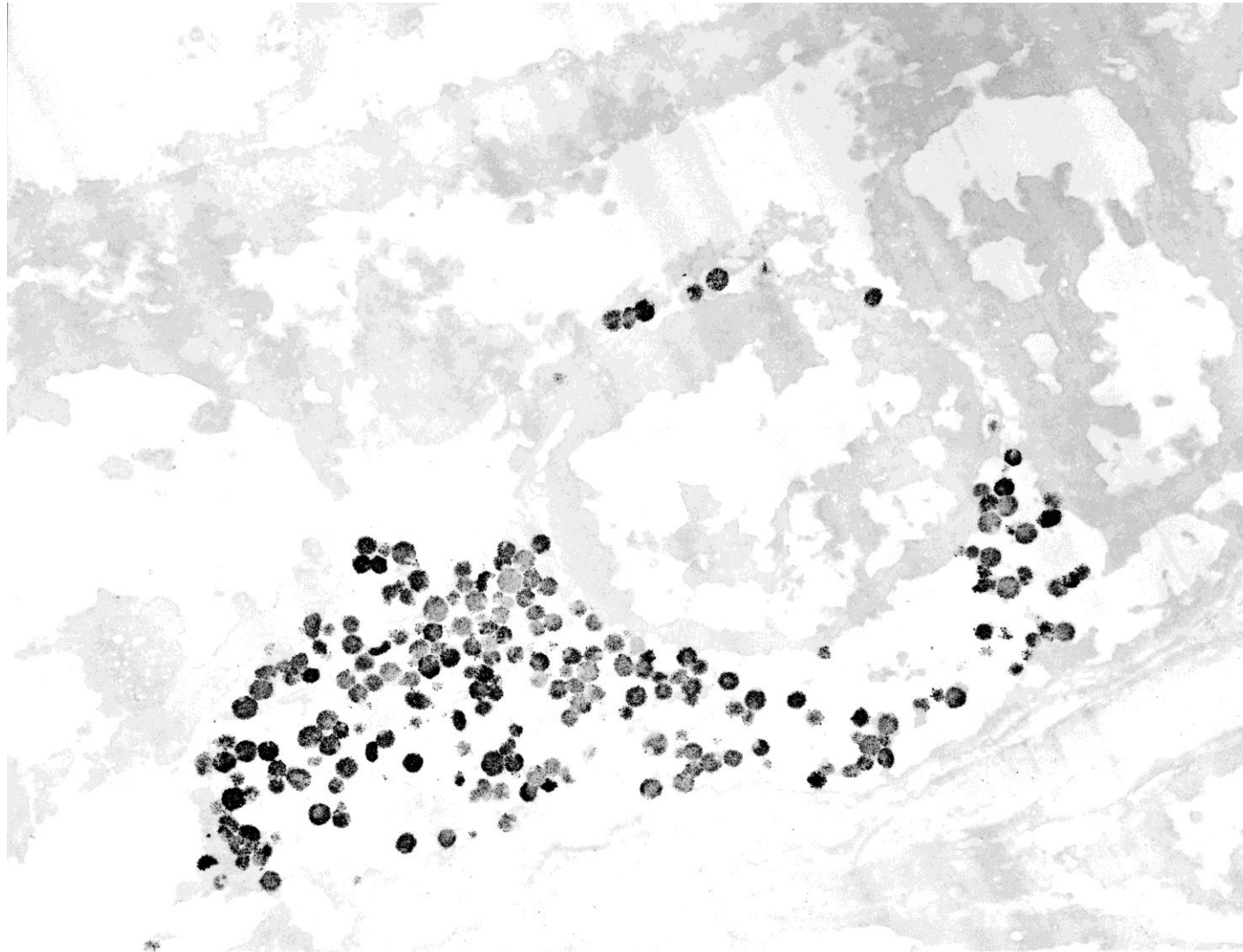
Ultrastructural Grimelius' argyrophilic reaction in the fetal intestine at the 12th gestational week. Argyrophilic neuroendocrine granules are clustered in the cytoplasm. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-1



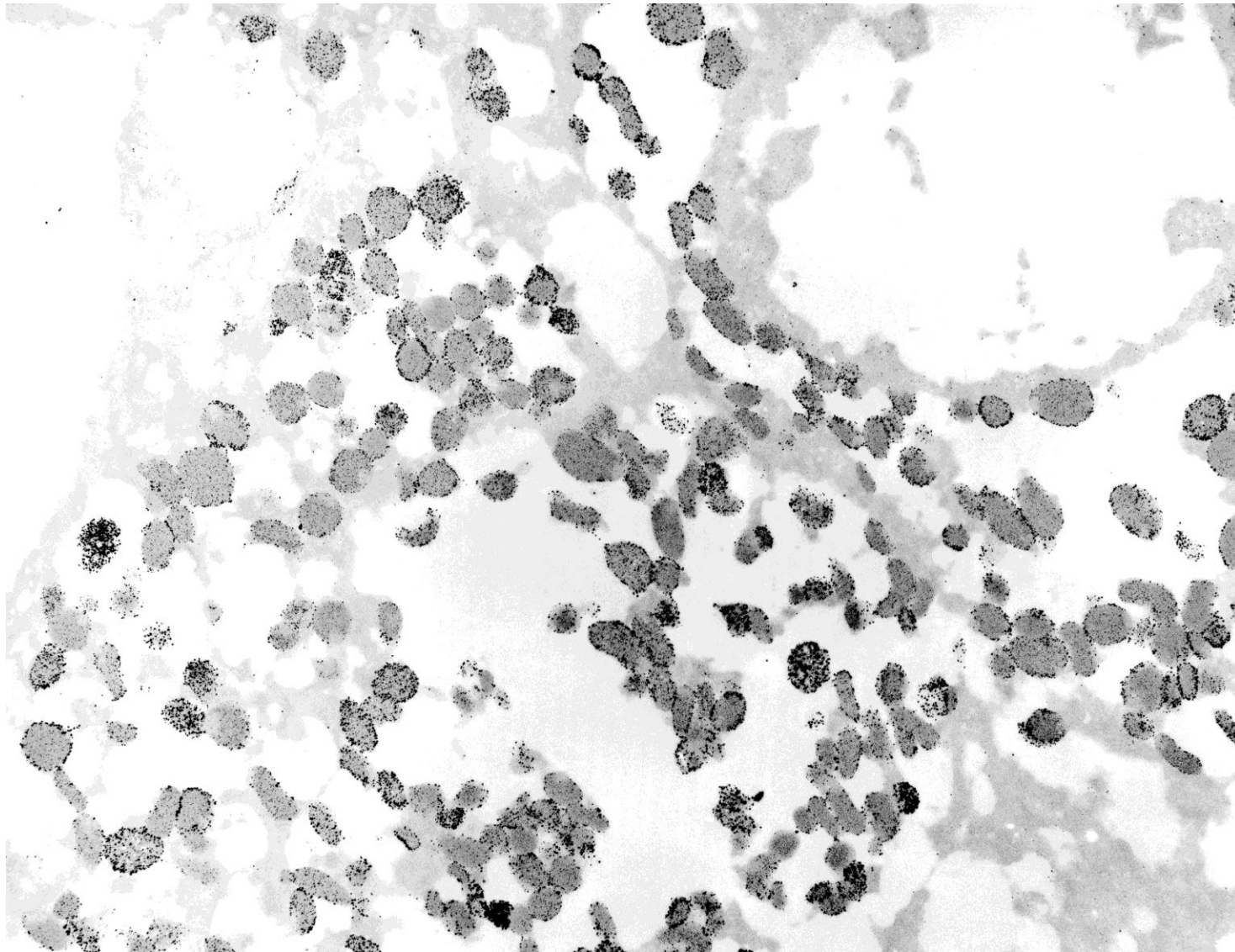
Ultrastructural Grimelius' argyrophilic reaction in the normal pyloric gland. Argyrophilic neuroendocrine granules are clustered in the cytoplasm. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-2



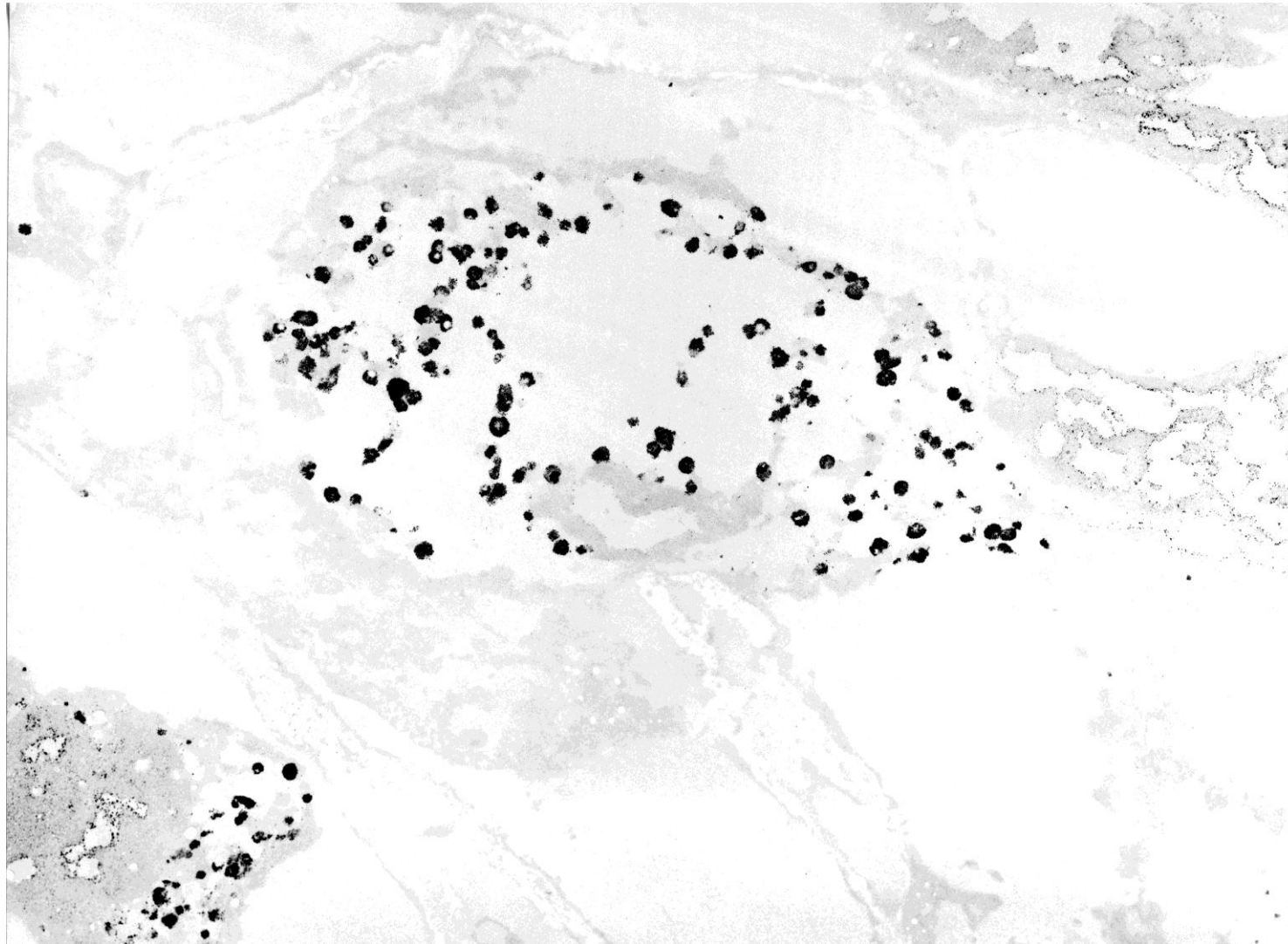
Ultrastructural Grimelius' argyrophilic reaction in the intestinal metaplasia of the stomach. Argyrophilic neuroendocrine granules with varied sizes and figures are clustered in the cytoplasm. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-3



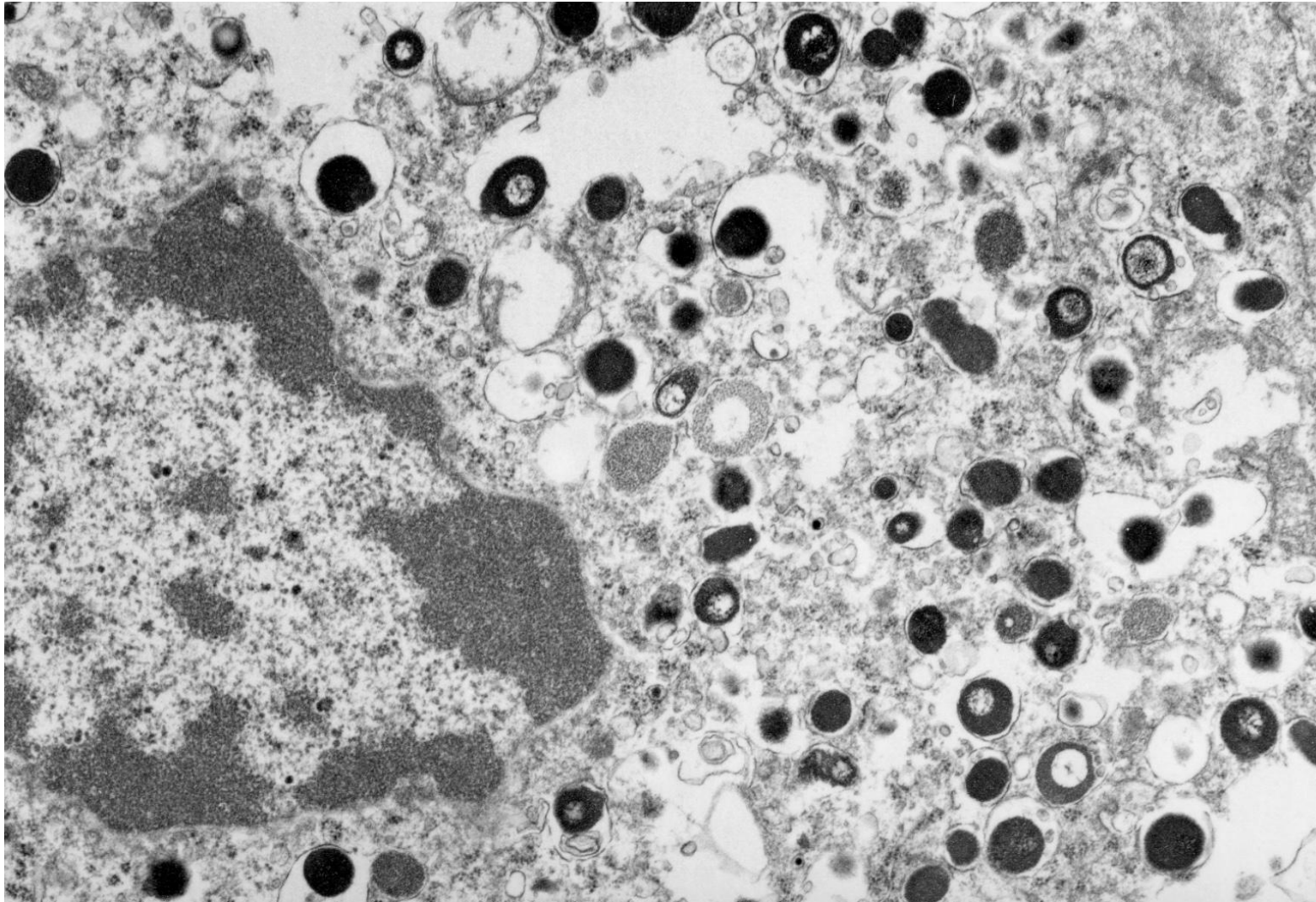
Ultrastructural Grimelius' argyrophilic reaction in a neuroendocrine cell in well-differentiated adenocarcinoma of the stomach. Argyrophilic neuroendocrine granules are clustered in the cytoplasm. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-4



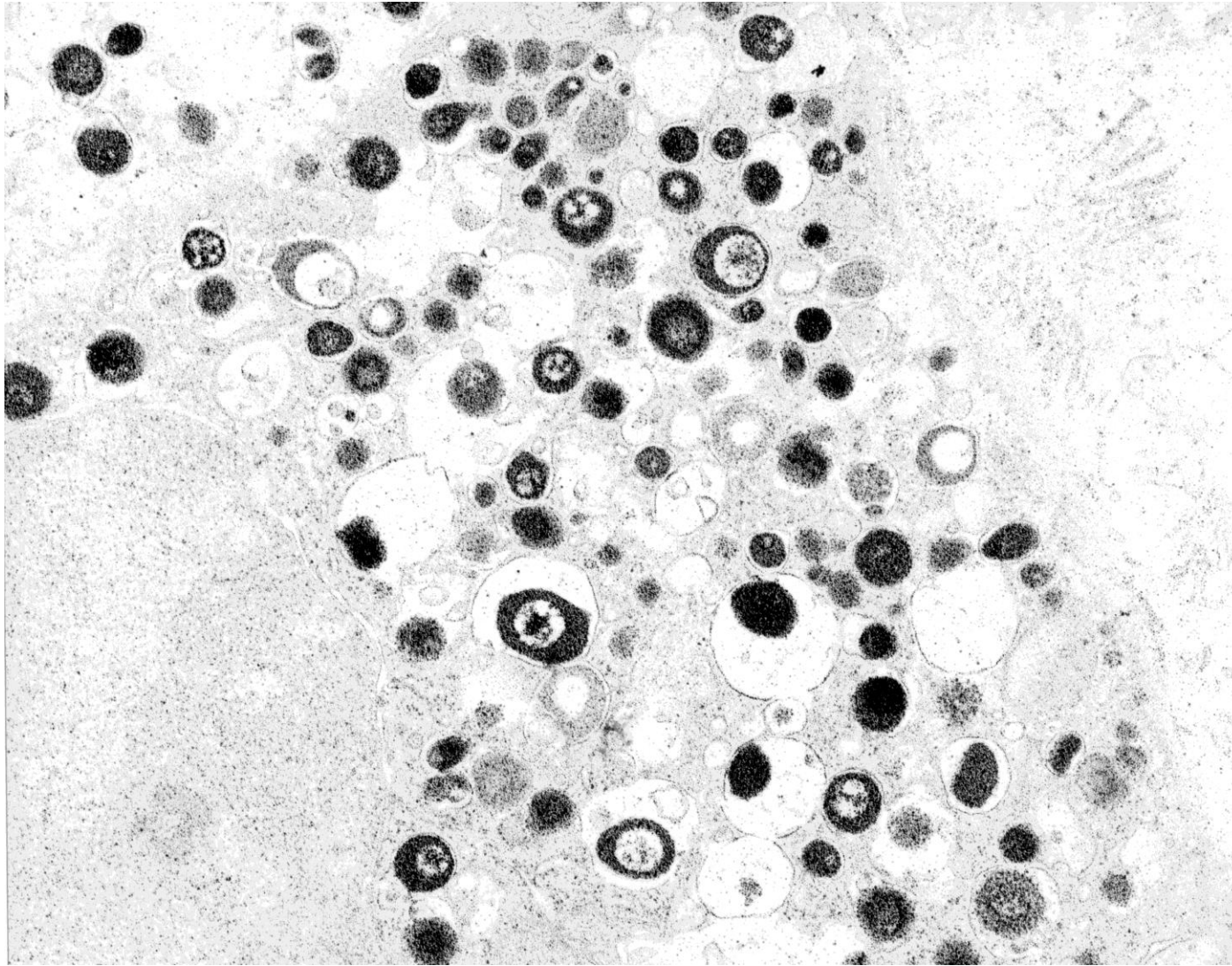
Ultrastructural Grimelius' argyrophilic reaction in the enterochromaffin cells in well-differentiated adenocarcinoma of the stomach. Argyrophilia is mainly seen at the periphery of the neuroendocrine. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-5



Ultrastructural Grimelius' argyrophilic reaction in scirrhus/signet ring cell carcinoma of the stomach. Argyrophilic neuroendocrine granules are clustered in the cytoplasm. Grimelius stain at the EM level using a formalin-fixed paraffin-embedded section-6



Ultrastructural Fontana-Masson's argentaffin reaction in argentaffin (serotonin-positive) gallbladder carcinoid tumor. Argentaffin neuroendocrine granules can be demonstrated on the ultrathin sections after glutaraldehyde fixation and Epon-embedding. Argentaffinity is demonstrated on the ultrathin sections. Fontana-Masson stain at the EM level using an ultrathin section-1



Ultrastructural Fontana-Masson's argentaffin reaction in argentaffin (serotonin-positive) gallbladder carcinoid tumor. Argentaffin neuroendocrine granules can be demonstrated on the ultrathin sections after glutaraldehyde fixation and Epon-embedding. Argentaffinity is demonstrated on the ultrathin sections. Fontana-Masson stain at the EM level using an ultrathin section-2