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S. G. Chassovnikov

1871—1920

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The Russian histologist S. G. Chassovnikov deserves notice as an early student of the islets of Langerhans. He was born in Saratov, a town on the Volga River, on Sept. 23, 1871. After preparatory school he attended the University of Moscow as a medical student and was graduated with honors and a master's degree in medicine in 1895. In 1896, Chassovnikov moved to Warsaw, where he became an assistant to Professor Vollosov at that city's Histological Institute.

He remained in Warsaw until 1912 and during that time revealed his interest in the pancreas. A preliminary report of his research on the excretory parenchyma and islands of Langerhans appeared in *Travaux de la Société des Naturalistes de Varsovie* in 1898. The research was described in detail in his thesis, which was written in Russian and published in Warsaw in 1900. Its title was "Concerning the Morphology and the Functional Changes of the Cells of the Pancreas."

Chassovnikov observed the fine granules in the islet cells. He also noticed the transitional forms between parenchymal cells and islet cells and considered the pos-

sibility that the islands were composed of exhausted glandular cells. Work published by Schulze in 1900 and Sobolev in 1900 and 1902 stimulated him to further research. They had noticed that, though the excretory parenchyma was destroyed after ligation of the excretory duct of the pancreas, the islands remained. When diabetes did not follow, they attributed this to the presence of the islands.

Chassovnikov ligated the duct of *Wirsung* in fourteen rabbits, and observed glucosuria in none of them. He also examined the pancreas at intervals ranging from two to seventy-five days after the ligation. He could find no clear distinction between the islands and the excretory parenchyma in formalin-fixed tissue, and he turned to Hermann's fluid as fixative and stained paraffin sections with safranin and methylene blue. In 1898 he had observed that island cell granules exhibited a differing affinity for these dyes. In most cells the granules absorbed methylene blue; in others, especially at the periphery of the island cells, they absorbed safranin. Chassovnikov also observed red granular cells

among the parenchymal cells. In his published research he illustrated these experiments with his own beautiful color drawings. Today we call the red-colored cells, alpha cells and the green, beta cells.

In 1906 Chassovnikov described two cell types in the islands of the rabbit which he could stain differentially in a single section. A year later Lane, unaware of Chassovnikov's publication, described both cell types in the guinea pig at Bensley's laboratory. Lane used various fixatives, stained with neutral gentian violet, and therefore did not observe the two cell types in a single section. He talked of A and B cells and suspected that they would excrete a different matter. In 1911, Bensley improved Lane's method, wrote of A and B cells and succeeded in staining both differentially in one section.

Chassovnikov frequently observed proliferation of the connective tissue through the islands the third week after ligating the duct. In this way the islands were divided into small groups, each always containing both cell types. The cells did not show any sign of degeneration, thus disproving the hypothesis that island cells were actually exhausted glandular cells. Because the islands persisted and diabetes did not appear after ligation, Chassovnikov, together with Schulze and Sobolev, concluded that the islands were organs of internal secretion which regulate carbohydrate metabolism. Chassovnikov came to this conclusion and surmised that there was a missing link in the pattern of experimental diabetes, i.e., that diabetes would appear after extirpation of the islands persisting in the atrophic pancreas. However, he was unable to prove this final point, as no more research could be conducted at Russian universities. He also had to give up his intention to do histological research on the island cells after intravenous administration of glucose. He was convinced that this was the only way to examine the function of the islands more closely, because the pancreas of people who died of diabetes was unusable as a result of post-mortem changes. Furthermore, he considered it possible that the liver as well as the islands played a role in diabetes.

In 1911 Chassovnikov entered in competition for a professorship at Tomsk. He was elected, but the Ministry refused his nomination on grounds that he lacked pedagogical experience. Nevertheless, in 1912 he was appointed Extraordinary Professor in Histology and Embryology at Tomsk and this was changed four years later into a regular professorship. In October of 1913 he was elected Secretary of the medical faculty, from which position he had to resign three years later because of tuberculosis. Chassovnikov then applied for

a professorship in southern Russia, hoping that the change in climate would cure him. In 1917 he was chosen Professor in Histology and Embryology at Kiev, but the civil war made the move impossible. On Sept. 26, 1926, Chassovnikov died of tuberculosis at the age of almost forty-nine.

Chassovnikov had great scientific gifts and enormous energy. He wrote and spoke fluent English, French and German. While still a student, he translated a German textbook into Russian. He was an excellent lecturer and though an uncommunicative person with a morose manner, he was very well liked by students for his simplicity and strong sense of justice. His primary interest was cytophysiology, and the endocrine glands especially fascinated him. He believed that a perfect histological technic was fundamental for scientific research and therefore made all preparations himself. In this respect he demanded very high standards of himself and his students. In the Histological Laboratory at Tomsk a great collection of preparations made by Chassovnikov can be found. They are striking for the aesthetic care with which they were prepared. He wrote approximately twenty articles, of which some were published for government records a year after his death. A son of the prematurely stricken scientist followed in his father's footsteps and also became professor of histology in Russia.

ACKNOWLEDGMENT

Because the archives of the Warsaw University were removed to Rostov in 1915 and destroyed in the Second World War, the author was unable to acquaint herself with Chassovnikov's publication of 1898.

The author extends her thanks to the directors of the Histological Laboratory of the University in Tomsk, the University Library in Warsaw and the Institute of Medical History in Moscow for their cooperation in obtaining a portrait of Chassovnikov, a microfilm of his thesis and biographical data.

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EDITOR'S NOTE: Illness has prevented Dr. van Beek from completing or proofreading the English translation of her biographical sketch of this little known student of the pancreas and the islets of Langerhans. The Editors are certain that all readers will be grateful to Dr. van Beek for her effort in drawing attention to the historically important contribution of Chassovnikov.