

# Beneden, Edouard Van

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Introductory article

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**The Belgian biologist Edouard Van Beneden (1846–1910) had a successful scientific career. His dissertation demonstrating the omnipresence in the whole animal kingdom, of the egg's unicellular constitution was awarded by the prize of the Royal Academy of Belgium. In 1870, he became professor at the University of Liège and corresponding member of the Royal Academy of Belgium and became chartered member in 1872.**

**Using cytology in embryology and selecting a suitable material to study the fertilisation, he was the first to observe meiosis, described the centrosome and understood the very early polarisation of the egg.**

## His Training and Early Success

On each standing ovation for his scientific achievements, Edouard Van Beneden (1846–1910) paid tribute to his father Pierre-Joseph Van Beneden (1809–1894) whom he acknowledged for his positive influence on his own career. In fact, his father, a Belgian biologist (Prize of the Institute of France 1858), trained him at Louvain. His father's courses gave a large place to embryology highlighting the phyletic links in animal groups. The same approach appears in the early work of the son whose training was expanded by the cytology lessons given by Th. Schwann (1810–1882). He also benefited from practice in the marine biology laboratory founded by his father, in Ostend, as far back as 1843. **See also:** [Egg Activation](#); [History of Cell Biology](#)

These favourable circumstances allowed him to begin a successful career by submitting a dissertation to the Royal Academy of Belgium. He demonstrated in it the omnipresence, in the animal kingdom, of the egg's unicellular constitution; those differences through the groups affecting

only the nutritive annexes or type of development. Prize-winner in 1868, this dissertation increased his awareness of the importance to practice microscopy in biology.

At the same time, he completed his education with a study journey in Germany where he attended the main renowned laboratories.

## His Scientific Career

Back home in 1870, he was entrusted with the teaching of zoology at the University of Liège, where his talented didactics and research team leadership emerged directly. The two basic ideas of his lessons were the transmutation of species and the cell theory. He became, in the same year, corresponding member of the Royal Academy of Belgium before his admission in 1872.

As researcher, he had the presence of mind to use cytology in embryology. This approach combined with the selection of a suitable material to study fertilisation – *Ascaris megalocephala* featuring a small number of chromosomes easily followed through the cell cycle – allowed him a set of observations. In addition to the duplicate nature of the chromosomal material of the fertilised egg, he observed this duality is due to the contribution of the chromosomes of each parent, reduced by half during cell division specific of gamete formation (meiosis). **See also:** [Meiosis](#)

Finally, he realised the universality of the process and observed a reticular structure oriented in relation to the centrosome – organite he described – made the cell contractile. That 1883 dissertation was awarded by the Academy.

Subsequently, his entire work in embryology was dedicated essentially to mammals, having studied development stages in rabbits and bats. His 1888 presentation, at the *Anatomische Gesellschaft* meeting in Wurzburg, describes the egg polarisation and specifies the repartition of the cell territories during its segmentation. **See also:** [Cleavage and Gastrulation in Sea Urchin](#)

Thereafter, he understood that the different sides and the laterality around the symmetry axis of the embryo are established from the egg's first divisions. He never published these results, despite their importance, which were published posthumously, in 1911 and 1916, thanks to A Brachet, one of his students.

Among those multiple awards, the Institute of France awarded him the five-year prize Serres in 1882.

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## Further Reading

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