Hilaire, Comte de Chardonnet Biography

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Biography

Chardonnet's career in science began with engineering studies at the École Polytechnique; he also assisted Louis Pasteur (1822-1845) in his efforts to save the French silk industry from a devastating silkworm epidemic. Realizing there was a market for an artificial silk, Chardonnet built upon the work of the Swiss chemist George Audemars and Sir Joseph Swan of England to develop cellulose-based fibers. Audemars had received a patent in 1855 for the manufacture of synthetic fibers; by 1880 Swan had developed threads from nitrocellulose.

Chardonnet first treated cotton with nitric and sulfuric acids and then dissolved the mixture in alcohol and ether. He then passed the solution through glass tubes, forming fibers, and allowed them to dry. These fibers, called rayon (the term used in referring to any fiber developed from cellulose) were highly flammable until they were denitrated. Reportedly, some garments made of early rayon burst into flames when lit cigarettes were nearby, Unfortunately the techniques that existed at that time to denitrate the material weakened it and made it unsuitable for the textile industry. Chardonnet used ammonium sulfide to denitrate these fibers thus reducing the flammability and retaining fiber strength comparable to that of silk. He received the first patent for his work in 1884 and began manufacturing rayon in 1891. The material was displayed at the 1891 Paris Exposition where it won the grand prize. He was also awarded the Perkin medal in 1914 for his development of rayon.

After his work with fibers, Chardonnet went on to study a number of other subjects including ultraviolet light, telephony, and the movements of birds' eyes. He died in 1924 in Paris, France.