Curare Encyclopedia Article

Curare

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In 1735, the French Academy of Sciences dispatched a scientific expedition to Ecuador to settle a geographic dispute about the curvature of the earth's surface. Heading the expedition was the Frenchman Charles Marie de la Condamine, who spent part of his ten years in South America scientifically exploring the region. Numerous travelers to the New World in the previous two centuries had brought back reports of native poison-tipped arrows that brought swift death by paralysis. Mostly used for hunting animals, these deadly arrows were sometimes used against the European explorers and soldiers. Natives called the poisonous herb *ourari*, which became curare to the Europeans.

La Condamine collected samples of curare and brought them back when he returned to France. (He also sent home samples of a tree sap called *caoutchouc*--rubber.) Experiments soon showed that curare killed animals when injected and acted by paralyzing muscles; victims usually died of suffocation, as the breathing muscles ceased to function. During the nineteenth century, attempts were made to use curare as a muscle relaxant in the treatment of rabies, tetanus, and epilepsy, but these trials were unsuccessful because the curare extracts were variable in quality and potency. In the 1870s, use of curare to keep conscious animals immobile during experimental surgery (breathing was maintained artificially) caused an uproar in Great Britain and led to the passage of anti-vivisection laws.

The first breakthrough leading to successful medical use of curare came in 1935, when Harold King (1932-) isolated the active principle of curare, which he called tubocurarine. A chemically pure alkaloid of curare was introduced in 1942 by Thomas Cullen. That same year, a country doctor and part-time anesthetist, Harold Griffith of Montreal, tested the use of curare in surgery, as a muscle relaxant that permitted lower, safer doses of anesthesia. The properties and hence the effects of curare preparations, however, remained variable and unpredictable. A Swiss-Italian pharmacologist, Daniele Bovet of the Pasteur Institute in Paris, determined to produce a synthetic, uniform curare. He succeeded in 1947 with gallamine, and then went on to synthesize more than 400 compounds that mimicked the effects of curare. One of these, succinylcholine, became a widely used and effective curare substitute, which could be administered in precise dosages with predictable effects. It allows complete muscle relaxation during surgery without deep anesthesia.