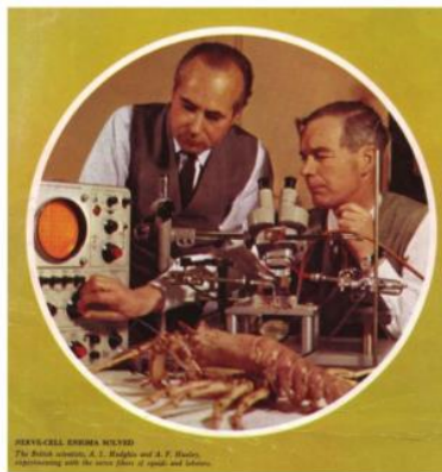


1963 Nobel prize in Physiology and Medicine



Cover of the 1963 Nobel Prize Programme: Huxley, left, looks on as Hodgkin adjusts a brand-new Tektronix 502A oscilloscope.

First years

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- The idea was an immediate success and provided the first recording of an intra -cellular action potential.
- But, only a few weeks after their first measurements, Hitler invaded Poland and the subsequent declaration of war meant that further research stopped.

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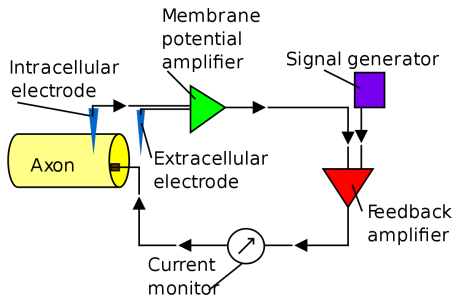
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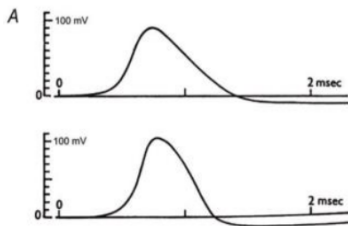
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- Both benefited greatly from experiences beyond their academic specialties, in particular Hodgkins involvement with **feedback control systems** and Huxleys manipulation of **mathematical equations**.

Voltage-Clamp



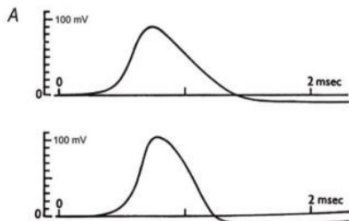
It is the method used to measure the ion currents through the membranes of neurons **while holding the membrane voltage at a set level**. (Wikipedia)

Numerical integration



Calculated (upper) and measured (lower)
action potentials in squid giant axons

Numerical integration

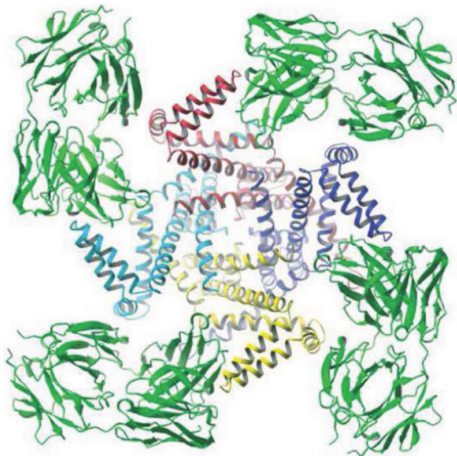


Calculated (upper) and measured (lower) action potentials in squid giant axons



Brunsviga 20 mechanical calculator. The numerical integration of the solution of the differential equations took a few weeks and many thousands of rotations of the mechanical calculator crank. For each small step in time, new values of n , m , and h had to be calculated.

Ion channels and neuroscience



The modern history of ion channels began in 1952 when Hodgkin and Huxley published their seminal papers on the theory of the action potential in the squid giant axon ...

Roderick MacKinnon Nobel Prize Lecture, 2003.