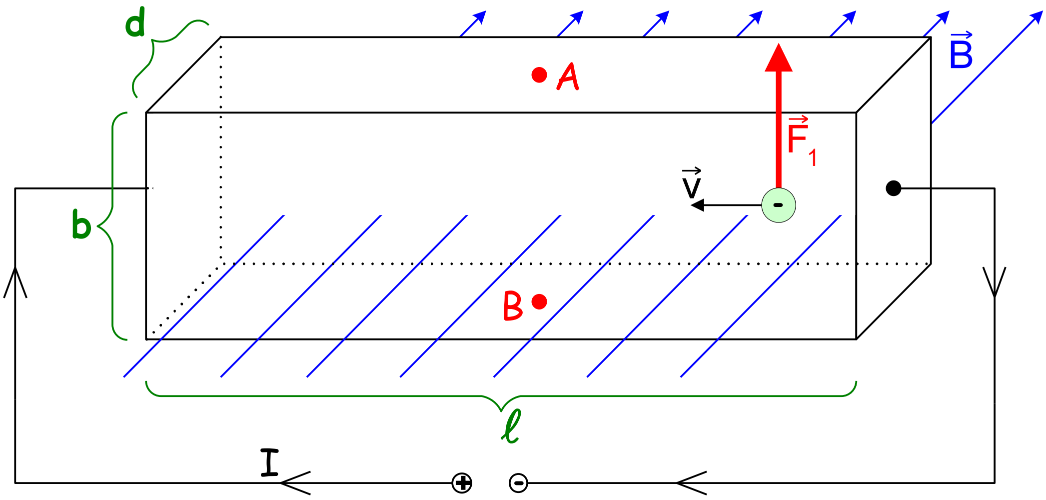
Ein rechteckiger Metallstreifen (Länge l, Breite b, Dicke d) befindet sich in einem homogenen Magnetfeld, das den Streifen senkrecht durchsetzt.

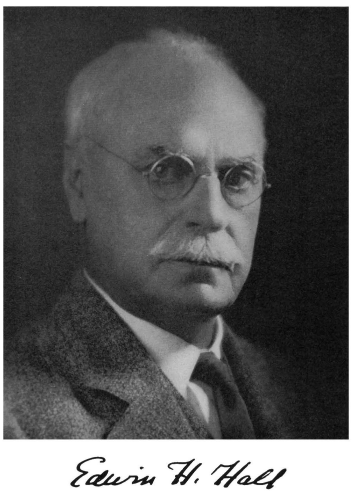


Auf jedes Elektron, das sich mit der Geschwindigkeit v durch den Metallstreifen bewegt, wirkt aufgrund des Magnetfeldes die Lorentzkraft F_1 senkrecht nach oben.

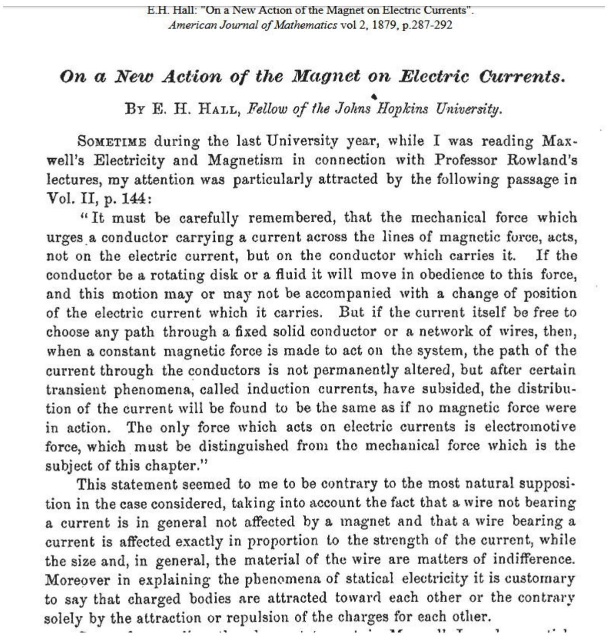
⇒ Jedes Elektron wird auf seinem Weg durch den Streifen nach oben abgelenkt.

⇒ An der Oberseite des Metallstreifens entsteht ein Elektronenüberschuss, an der Unterseite ein Elektronenmangel.

⇒ Zwischen den Punkten A und B an der Ober- bzw. Unterseite des Metallstreifens entsteht eine Spannung U_H, die sog. Hallspannung.



Dieser Effekt wurde von **Edwin Herbert Hall**[1] (1855-1938) im Rahmen seiner Doktorarbeit entdeckt und 1879 unter dem Titel *On a New Action of the Magnet on Electric Currents* veröffentlicht.[2]



E.H. Hall: "On a New Action of the Magnet on Electric Currents".
American Journal of Mathematics vol 2, 1879, p.287-292

On a New Action of the Magnet on Electric Currents.

By E. H. Hall, *Fellow of the Johns Hopkins University.*

Sometime during the last University year, while I was reading Maxwell's Electricity and Magnetism in connection with Professor Rowland's lectures, my attention was particularly attracted by the following passage in Vol. II, p. 144:

"It must be carefully remembered, that the mechanical force which urges a conductor carrying a current across the lines of magnetic force, acts, not on the electric current, but on the conductor which carries it. If the conductor be a rotating disk or a fluid it will move in obedience to this force, and this motion may or may not be accompanied with a change of position of the electric current which it carries. But if the current itself be free to choose any path through a fixed solid conductor or a network of wires, then, when a constant magnetic force is made to act on the system, the path of the current through the conductors is not permanently altered, but after certain transient phenomena, called induction currents, have subsided, the distribution of the current will be found to be the same as if no magnetic force were in action. The only force which acts on electric currents is electromotive force, which must be distinguished from the mechanical force which is the subject of this chapter."

This statement seemed to me to be contrary to the most natural supposition in the case considered, taking into account the fact that a wire not bearing a current is in general not affected by a magnet and that a wire bearing a current is affected exactly in proportion to the strength of the current, while the size and, in general, the material of the wire are matters of indifference. Moreover in explaining the phenomena of statical electricity it is customary to say that charged bodies are attracted toward each other or the contrary solely by the attraction or repulsion of the charges for each other.

1 Bild aus P. W. Bridgman (1939), Biographical Memoir of Edwin Herbert Hall, National Academy of Sciences; http://www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/hall-edwin.pdf aufgerufen am 18.12.2017, 20:19

2 aus der Originalveröffentlichung von E. H. Hall, *American Journal of Mathematics* vol 2, 1879, p.287-292; zitiert in https://web.archive.org/web/20070208040346/http://www.stenomuseet.dk/skoletj/elmag/kilde9.html; aufgerufen am 18.12.2017, 20:25