We believe that electricity exists, because the electric company keeps sending us bills for it, but we cannot figure out how it travels inside wires.

Dave Barry

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SES 194

Energy in Everyday Life

Electricity I

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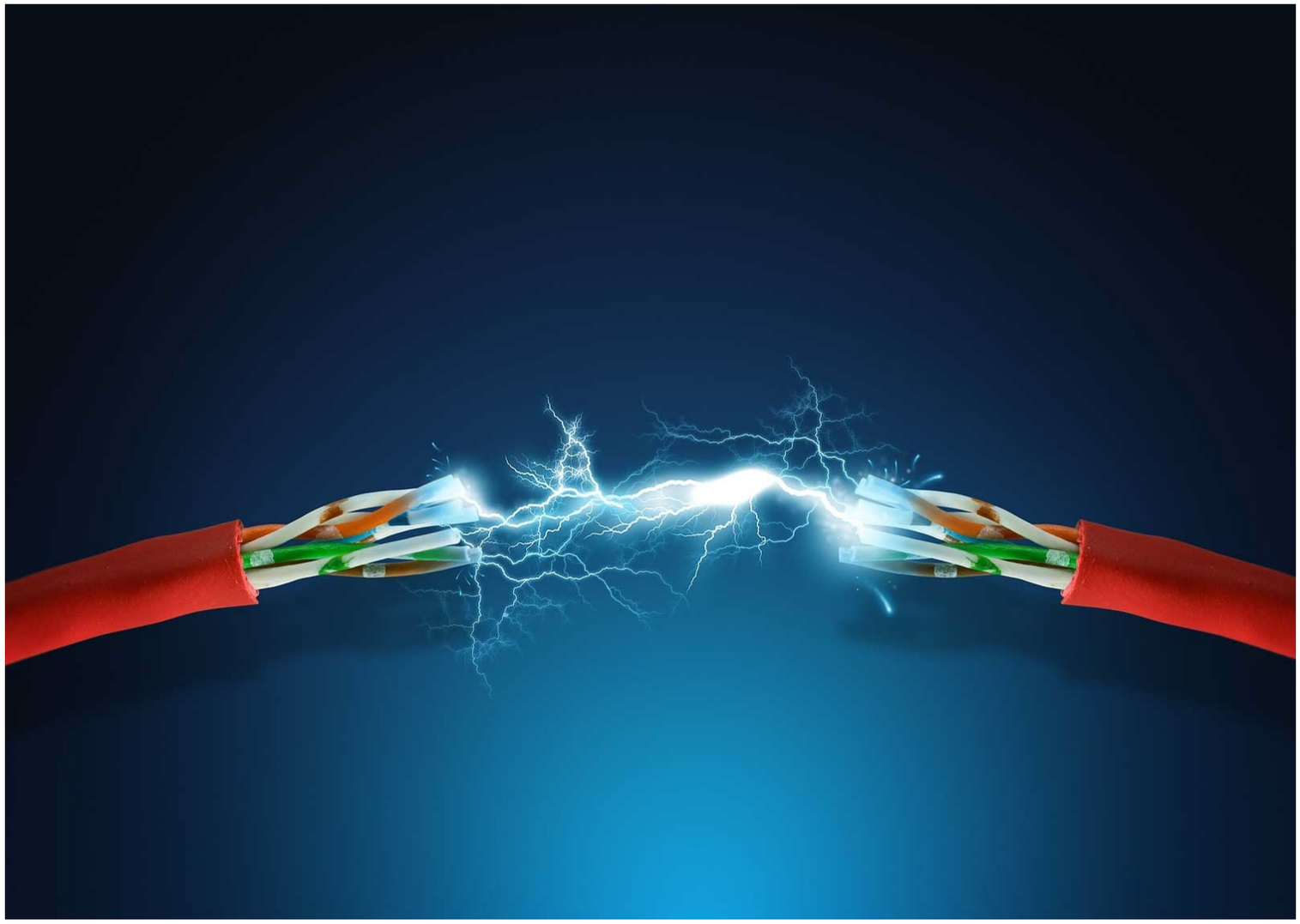
For many applications, electric energy is the preferred "high quality" energy, easily made to do work of many kinds.

Room temperature thermal energy is a "low quality" fuel. It may be used to heat a room, but it is challenging to use it to raise a weight or listen to recorded music.

Electricity’s main advantages are its cleanliness at the point of use, convenience, safety, and ease of controls.

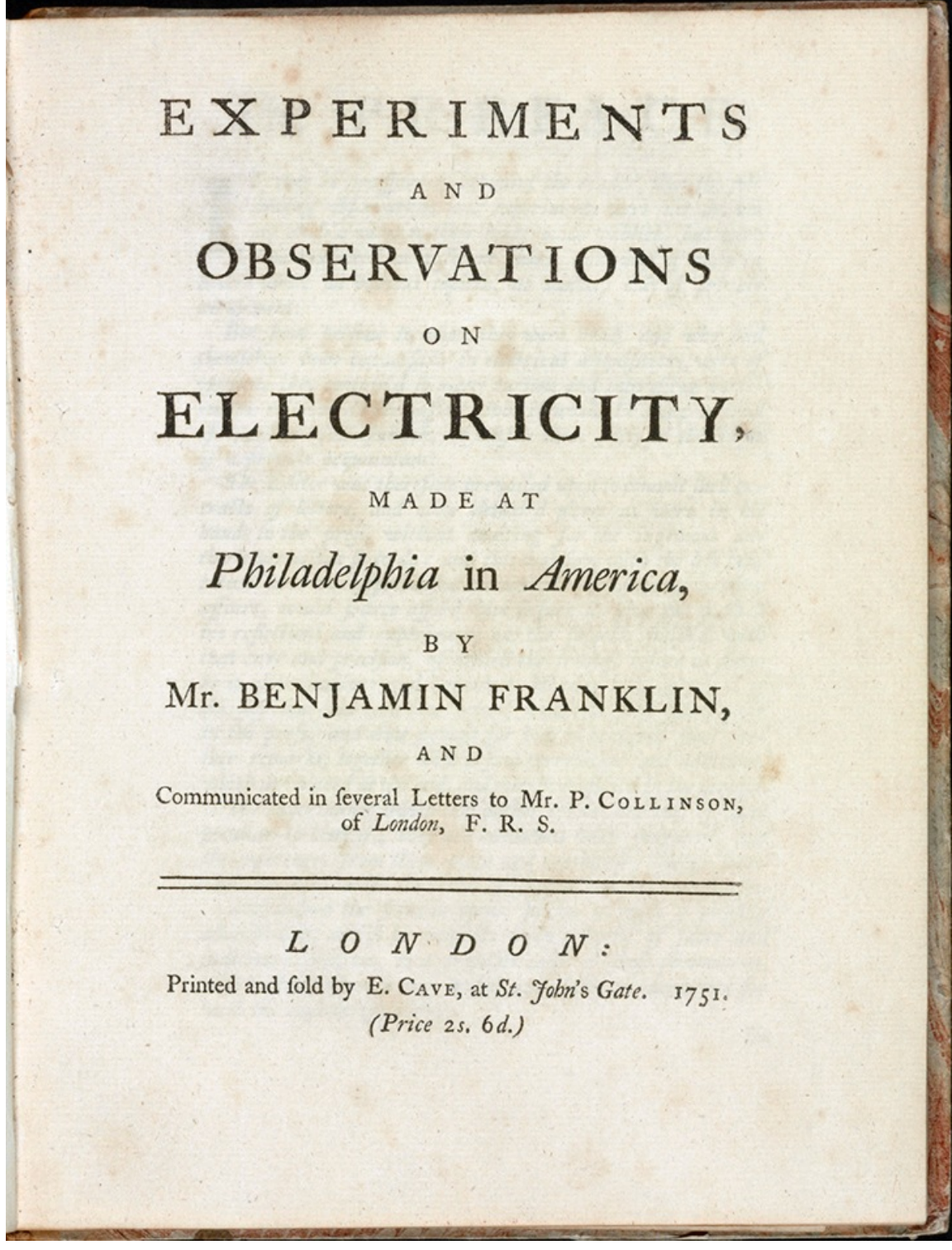


Electricity’s main disadvantage is its greater cost in comparison to direct usage of fossil or nuclear fuels

The electric outlet and electric batteries in various forms dominate our experience with electrical energy nowadays.

But we have coexisted with electricity and electric energy from when early humans first used lightning kindled wood to keep watch fires and campfires burning.

Benjamin Franklin, who sold many of his possessions to fund his experiments on electricity, suggested there was some electrical "fluid" that could be separated and distinguished from, some other electrical "fluid".



EXPERIMENTS

AND

OBSERVATIONS

ON

ELECTRICITY,

MADE AT

Philadelphia in *America*,

BY

Mr. BENJAMIN FRANKLIN,

AND

Communicated in feveral Letters to Mr. P. COLLINSON,
of *London*, F. R. S.

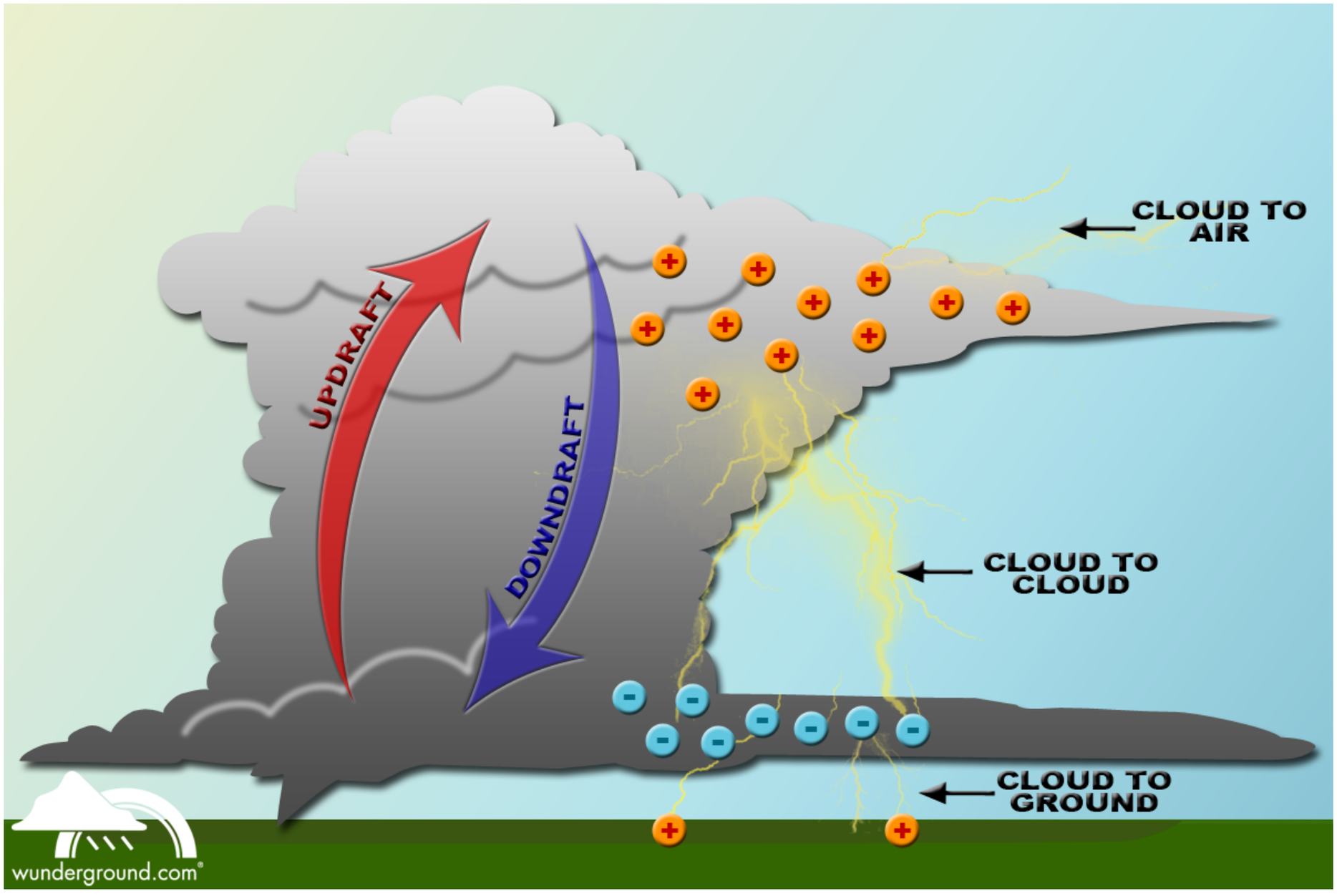
L O N D O N:

Printed and fold by E. CAVE, at *St. John's Gate.* 1751.

(Price 2s. 6d.)

Today we call that fluid "electric charge" and follow Franklin's suggestion of positive and negative electric charges.

When two units of equal but opposite charge combine, they form electrically neutral material.



When the charge is separated - accumulating in clouds for example - it can build up until there is a breakdown as the charge buildup seeks to neutralize itself.

Franklin, in his famous kite experiment, was able to drain some of the cloud charges into a Leyden jar to show that it was the same as the “static charge” produced by rubbing fur on rubber, silk on glass, or … shoes on carpet.