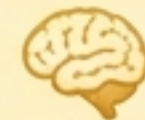
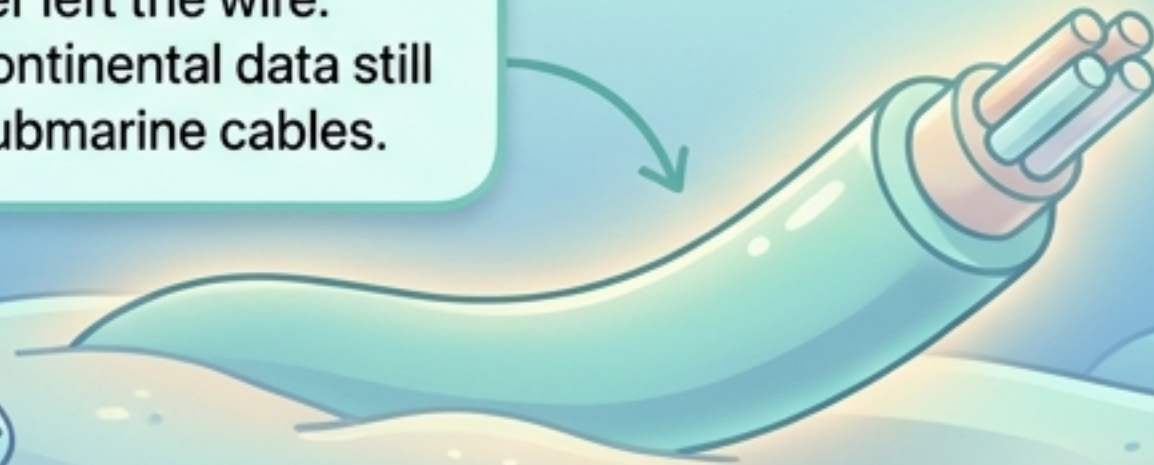


The Wireless Myth & The Wired Backbone

1901: Marconi receives the first transatlantic wireless signal. But wireless only won the edge (Phones, Wi-Fi, Starlink).



The backbone never left the wire. Over 95% of intercontinental data still rides on physical submarine cables.



Why? Capacity. Wireless covers the last hop; **wires** carry the world's volume.

1970: The Glass Revolution

Copper loses signal quickly. Charles Kao theorized glass could carry light, but early optical glass was fifty times too cloudy to work.

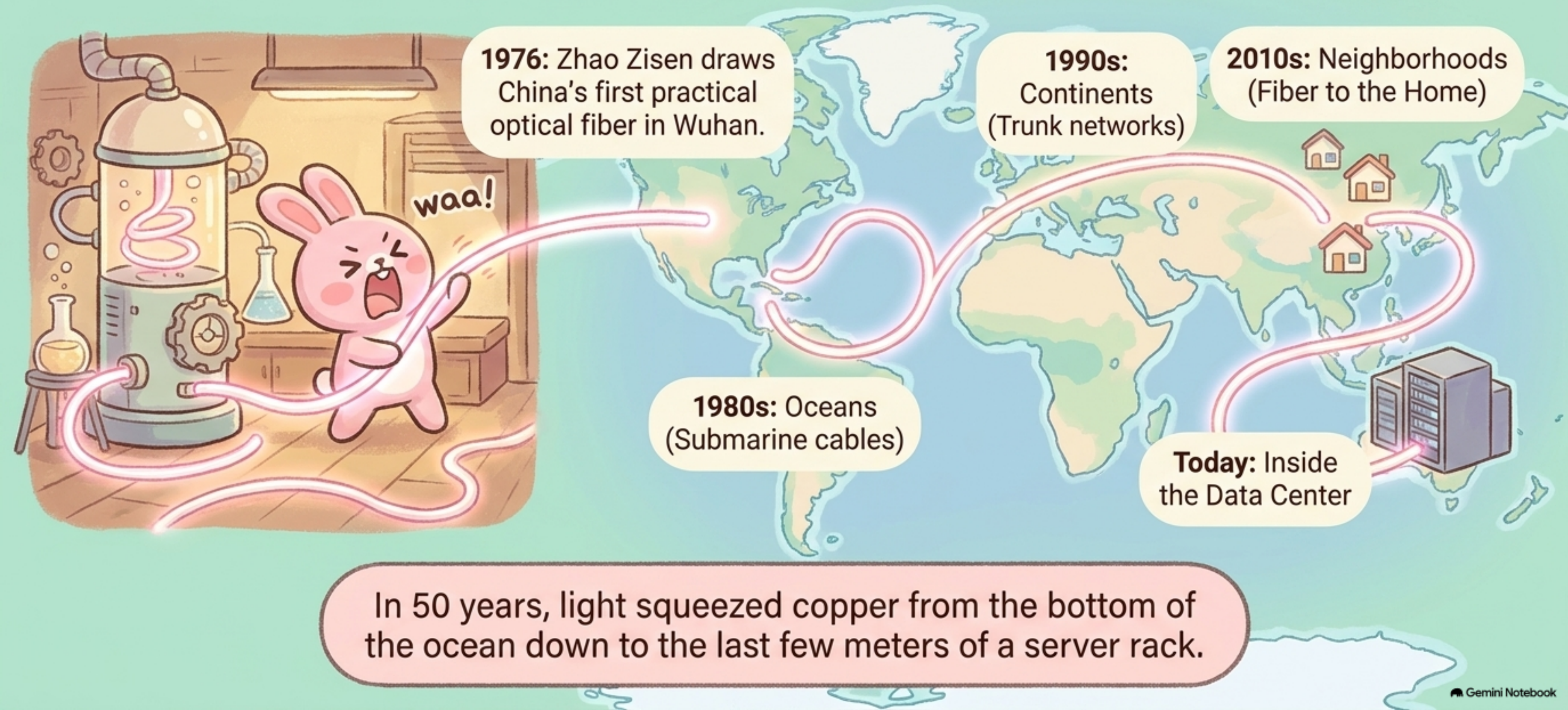
Corning successfully draws titanium-doped silica fiber. The boundary between light and copper permanently shifts.

Attenuation
(Signal Loss)

1000 dB/km
(Science Fiction)

17 dB/km
(Corning Breakthrough!)

Light Advances, Copper Retreats



The Disease of Copper: Attenuation



Copper suffers from skin effect and dielectric loss. The higher the frequency, the faster the signal dies. You must build repeaters every few kilometers to catch and resend the signal. More stations = massive costs and compounding errors.

Light Pays by Port, Copper Pays by Distance



1927 (Radio): 1 transatlantic conversation.
Cost: \$75 for 3 mins (>\$1,000 today).

1956 (Copper TAT-1): 36 Channels.
High cost, repeaters needed constantly.

1988 (Fiber TAT-8): 40,000 Channels.
280 Mbit/s. Unmatched scale.

Physics wrote the outcome. 100km of glass loses 100x less power than just a few centimeters of copper on a modern chip. Distance belongs to light.