A Theory of Confusion, Compression, Communication, Correction, Complexity, Cryptography

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All That Flows

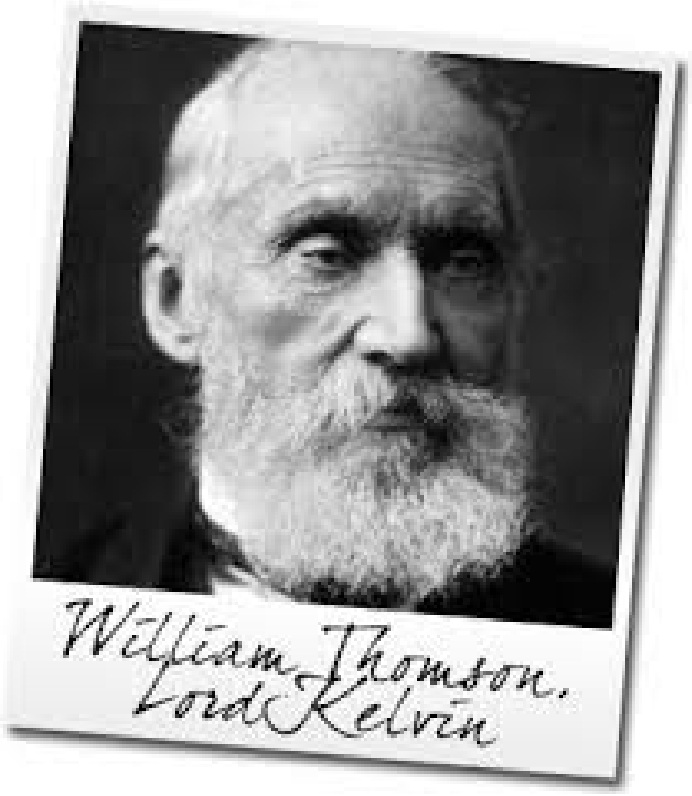
"All that flows is not water" *courtesy: Google Images*

Transmission Source

Is this efficient?

courtesy: Google Images

Measuring Flow



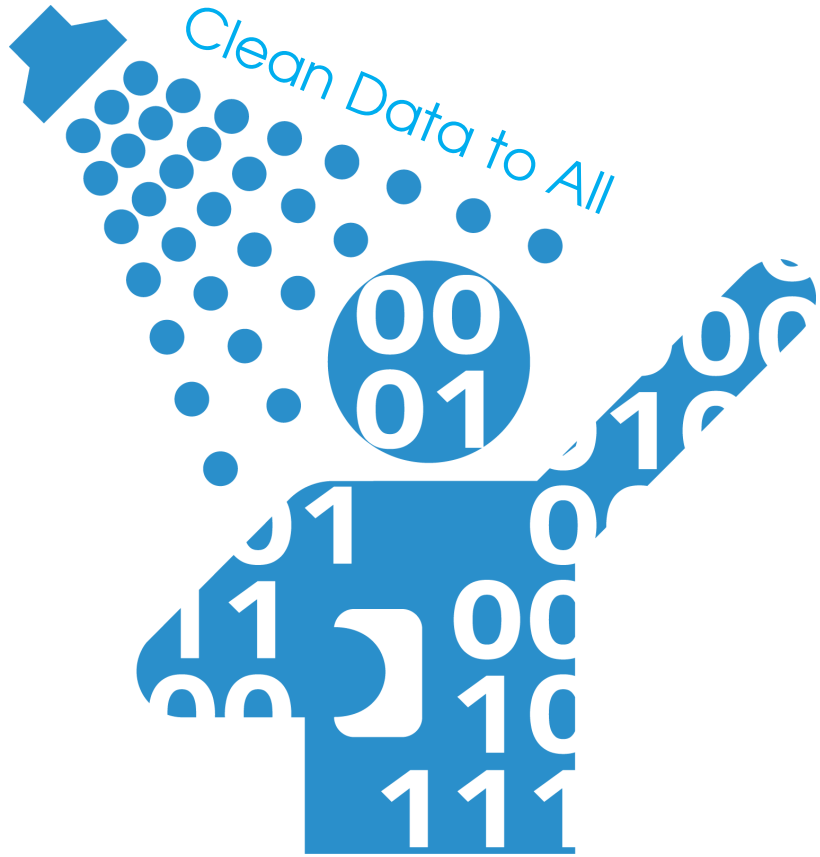
"If you cannot measure it,
you cannot improve it.."

courtesy: Google Images

Transmission Efficiency

"Little bits of water" *courtesy: Google Images*

Transport Problems



courtesy: Google Images

Paper Testament

In the beginning there was, well, sound, say a *cling-clang*, which soon turned into some *dit-dat*s and *di-dah*s.

The di-dahs started assuming shapes, like transcripts, musical notes, and artforms which captured imaginations of generations.

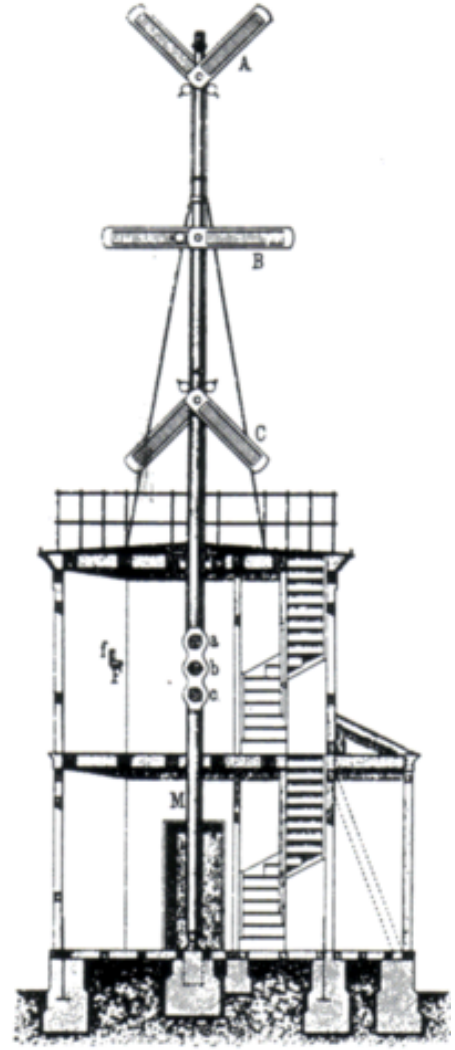
Just as wheels shouldered the civilization, thin paper tapes wound to their cogs profoundly altered humanities' mind boggling quest to the unimaginable, perhaps, even beyond.

So much to speak that the virtual has become the new reality.

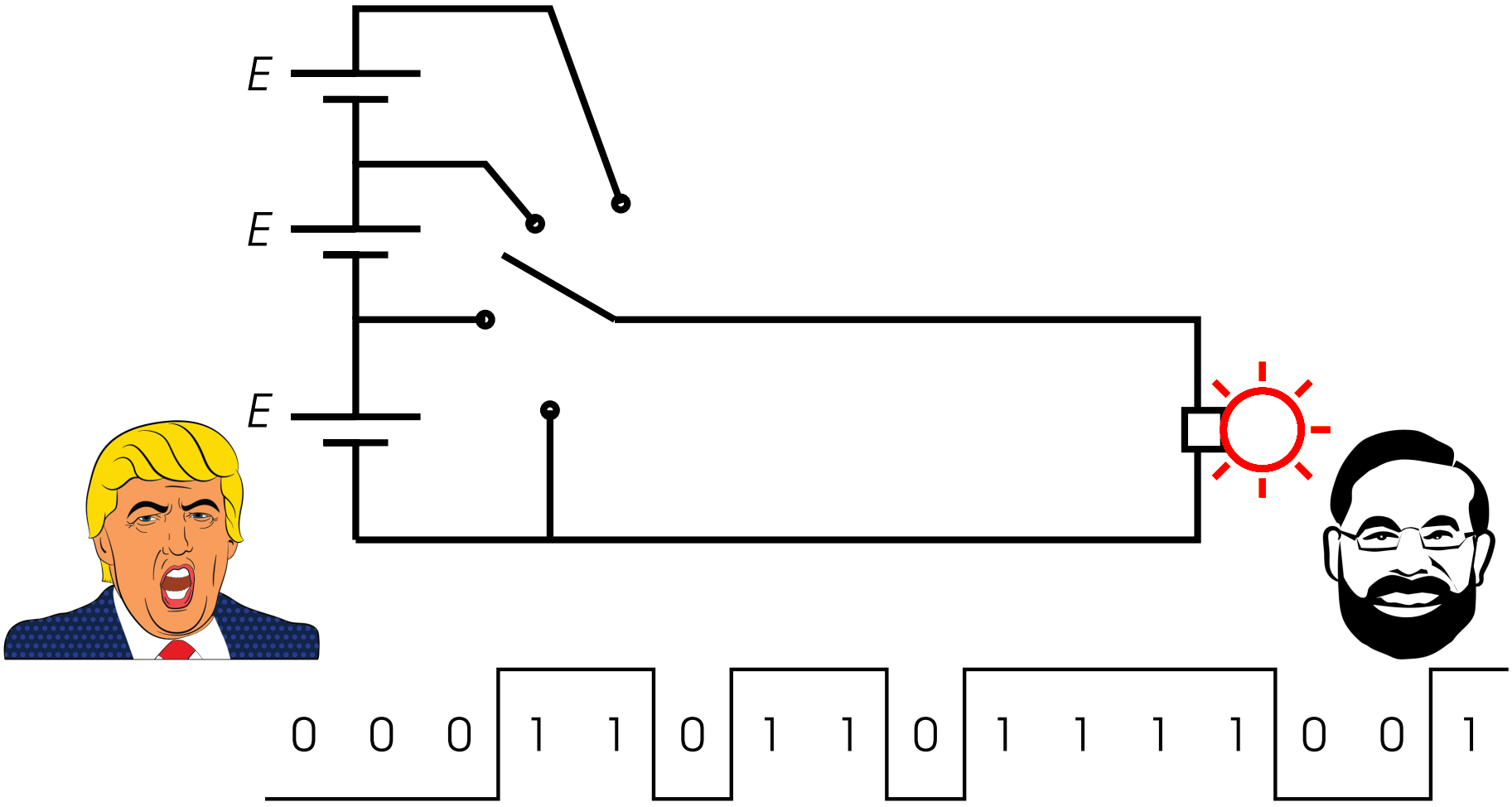
Historical Perspective 1840

City	Days
New York	12
Alexandria	13
Constantinople	19
Bombay	33
Calcutta	44
Singapore	45
Shanghai	57
Sydney	73

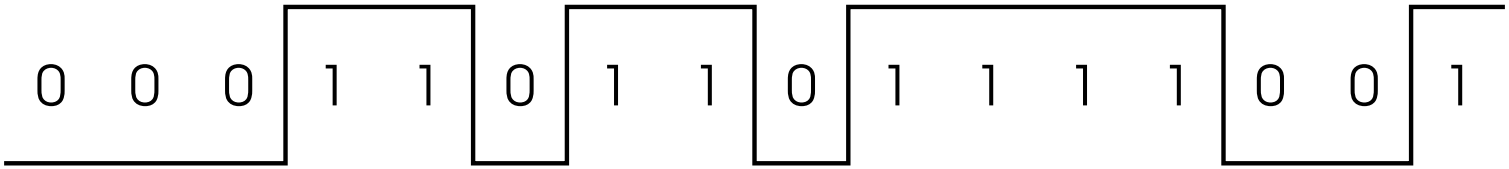
Table: Postal Delay from London



A Simple Circuit



Data Rates



Data-rate for a *speed* of β switchings per second:

- Using one battery

  $$\textit{Data Rate} = \beta \text{ bits per sec .}$$

- Using three batteries

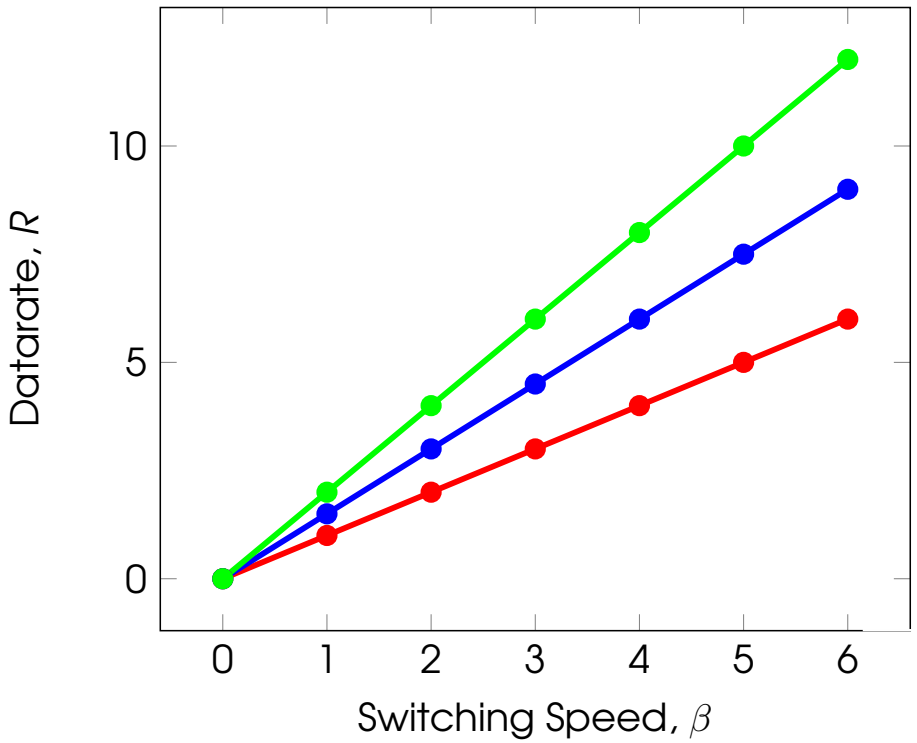
  $$\textit{Data Rate} = \_\_\_ \times \beta \text{ bits per sec .}$$

- Using two batteries

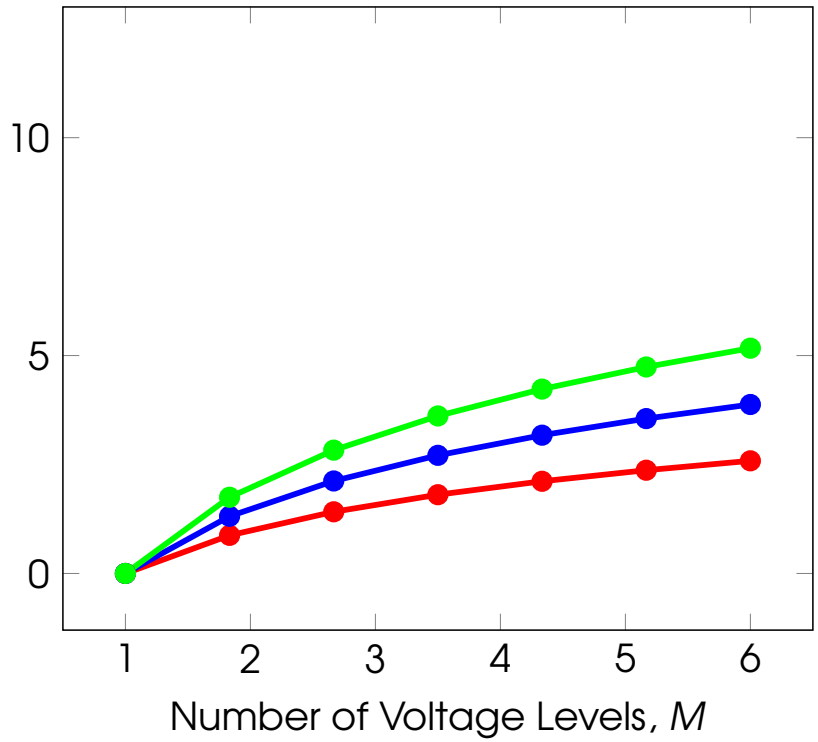
  $$\textit{Data Rate} = \_\_\_ \times \beta \text{ bits per sec .}$$

- Challenge: Maximum data-rate using two batteries and β?

Bandwidth Vs Power



'Linear' in bandwidth β.



Logarithmic in # levels.

A – 000000

B – 000001

C – 000010

D – 000011

.

.

Y – 011000

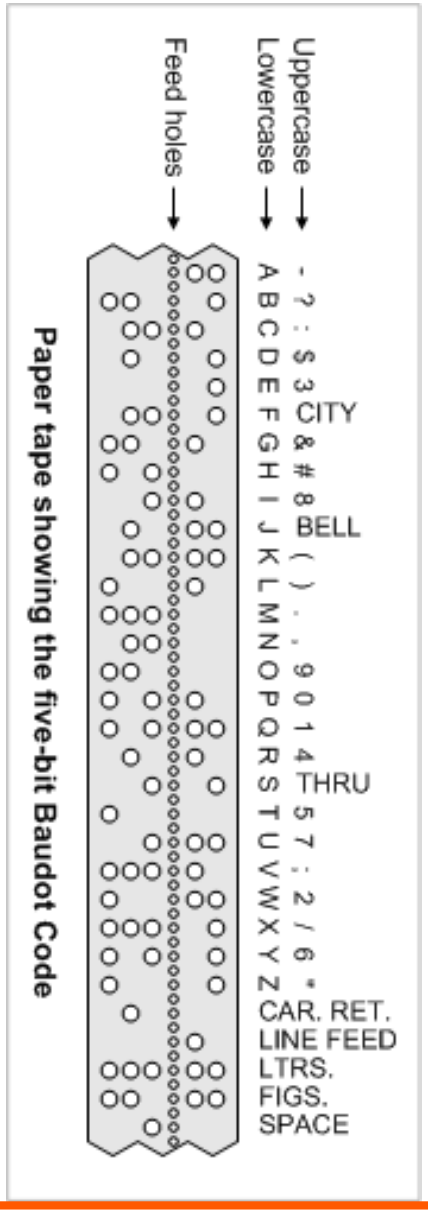
Z – 011001

0 – 011010

1 – 011011

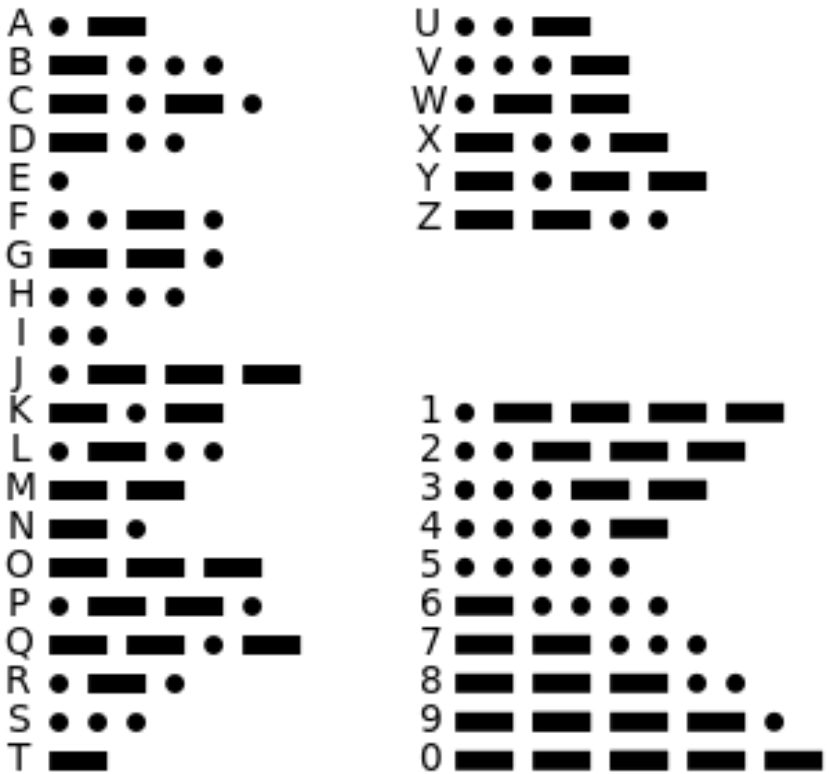
.

9 – 100110

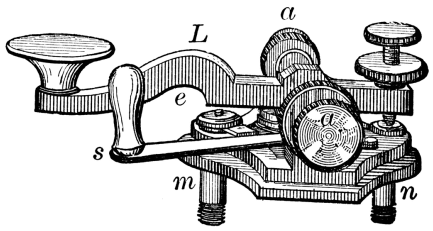


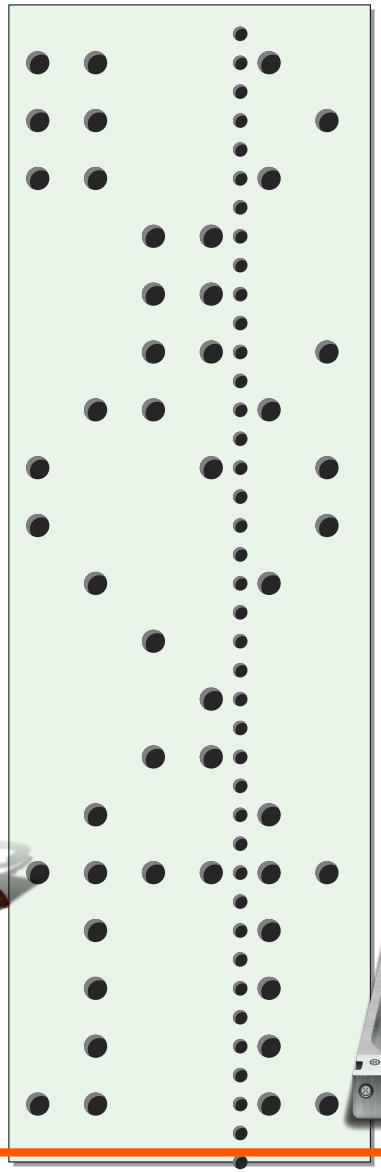
International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.



Digital Storage





Courtesy: clipart-library.com