Introduction to computational biology

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Computation has four main uses in biology today

- Data analysis
- Visualization
- Simulation
- Communication

An RNA sequence in 1967

TABLE 5

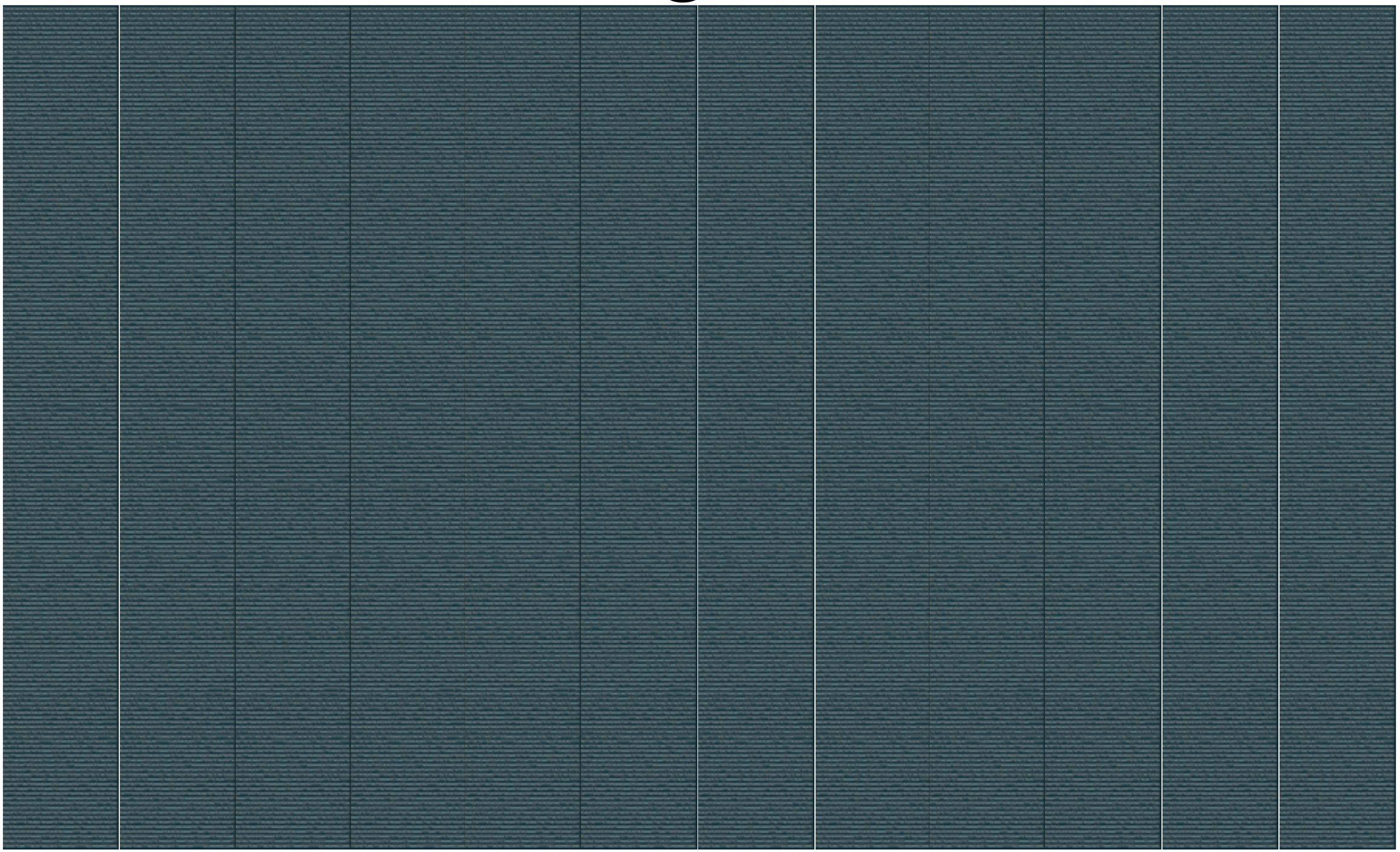
Summary of the evidence for the base sequence of the larger nucleotides from ribonuclease T_1 digests

Spot no. (Plates I & II)	Sequence†
13	A A C U C A G
14	A C C C C A U G
15	Ú C C C A C C U G
16	U C U C C C C A U G
17	C C U U A G

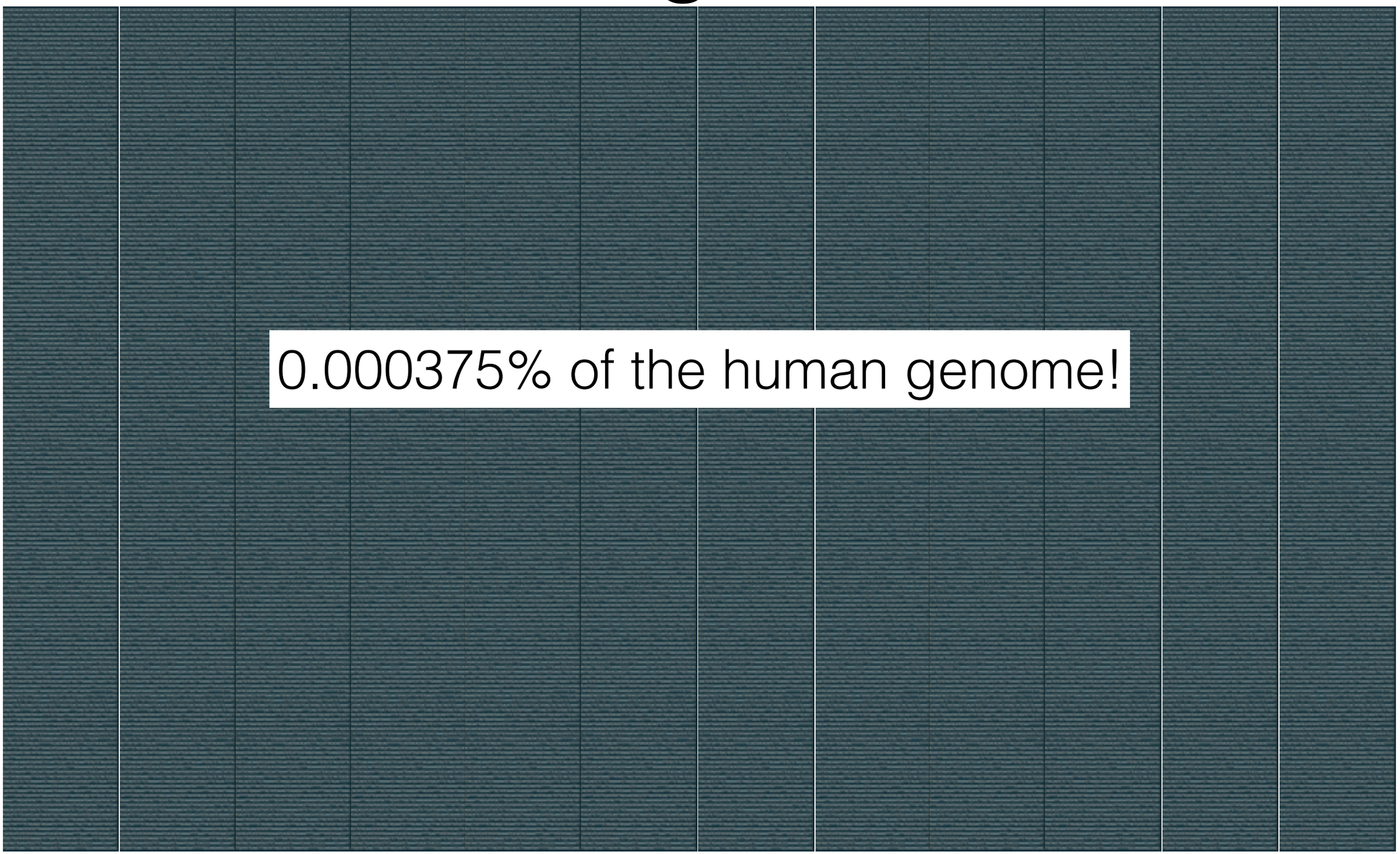
S = S, P = P, Sp = Sp

DNA sequences today are longer

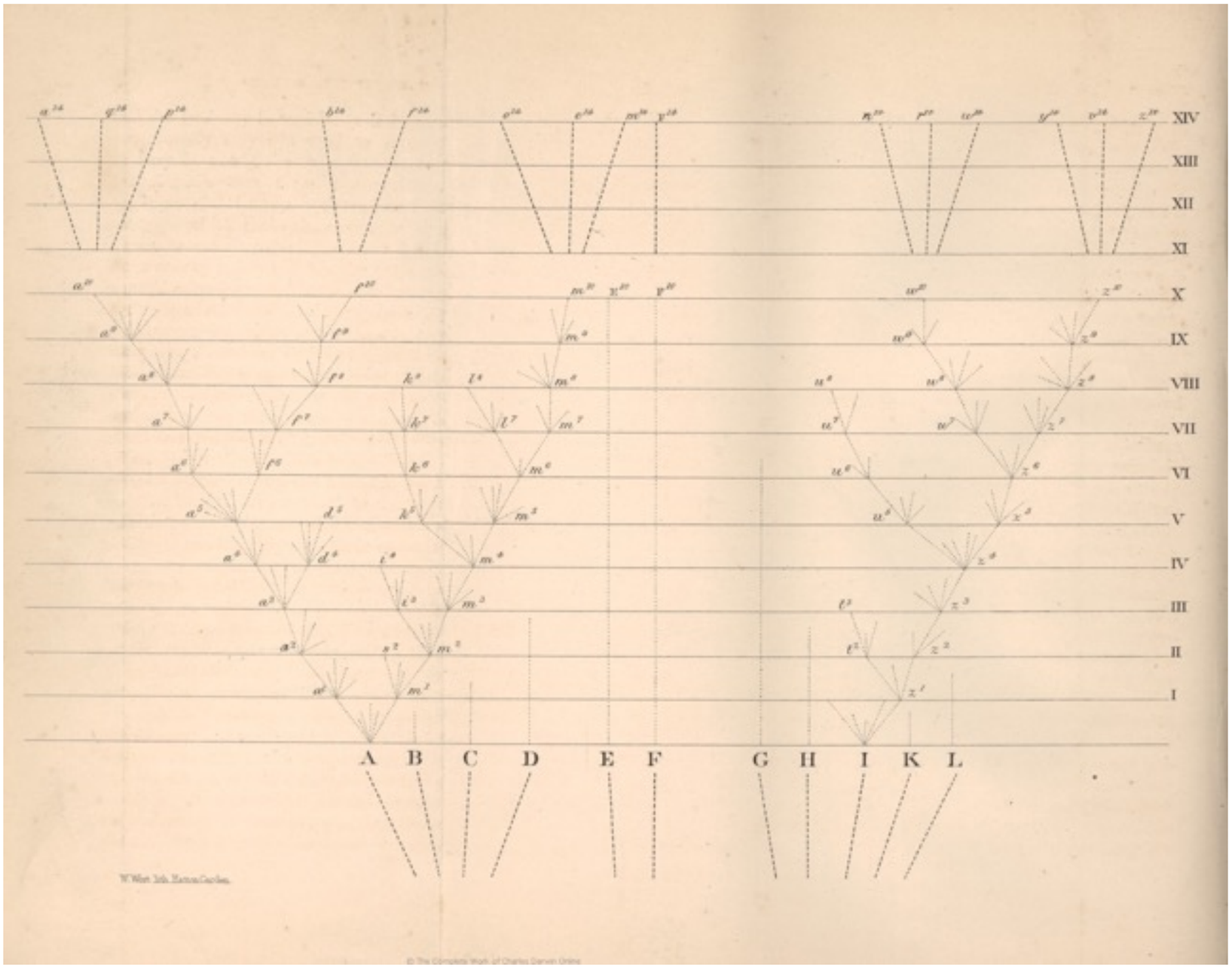
DNA sequences today are **much** longer



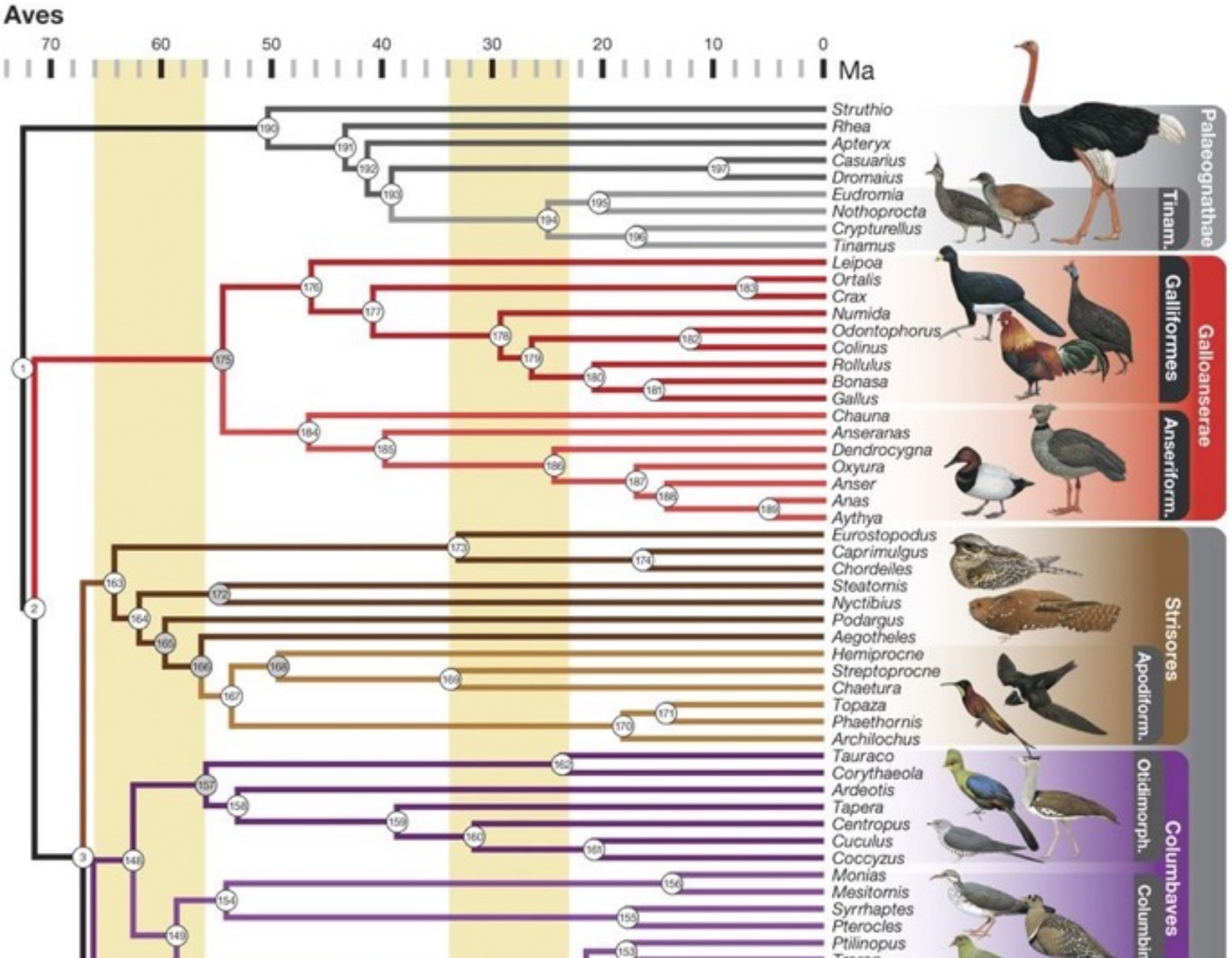
DNA sequences today are **much** longer



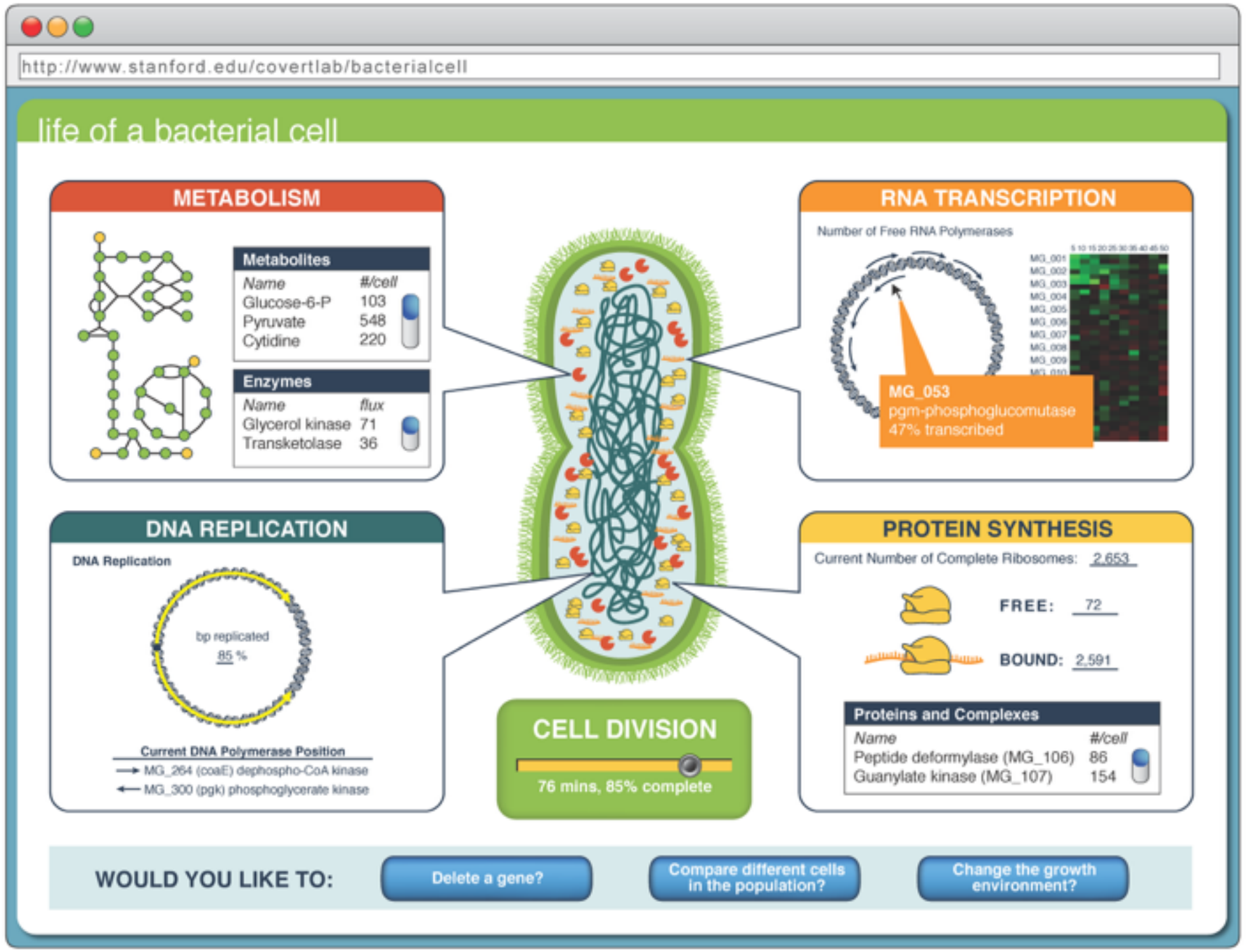
Without computers, figures were … rudimentary



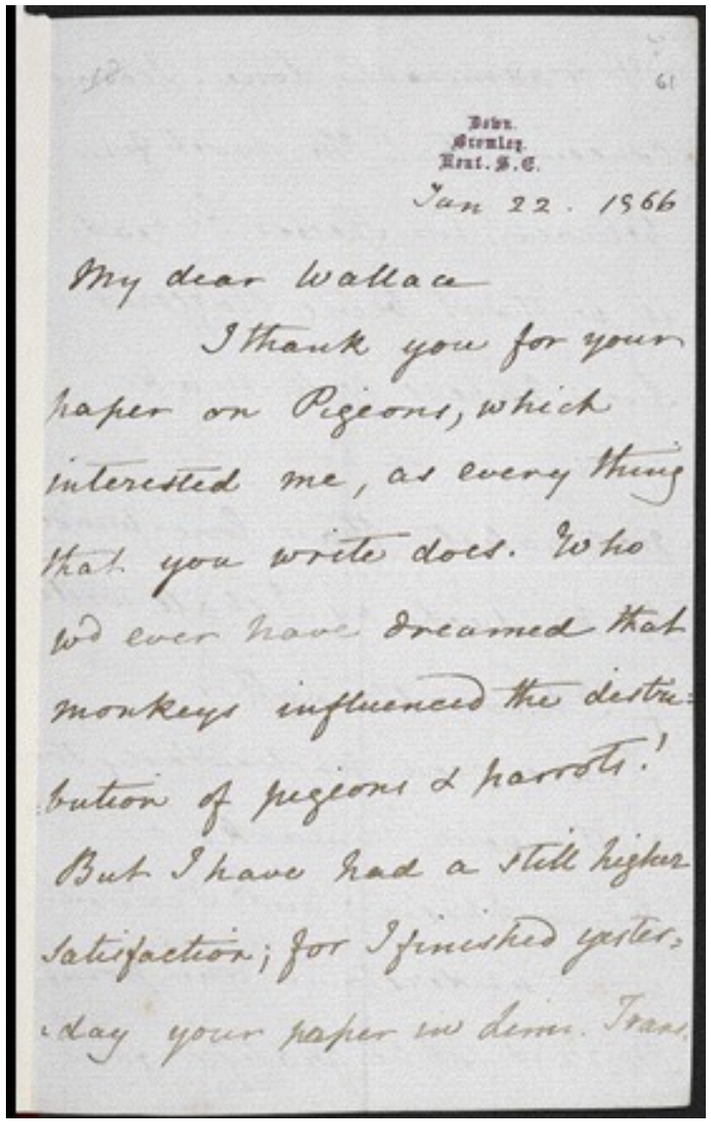
With computers, we can make sophisticated graphics



With computers, we can simulate complex processes



Scientific communication used to be difficult



Down.
Bromley.
Kent. S.E.

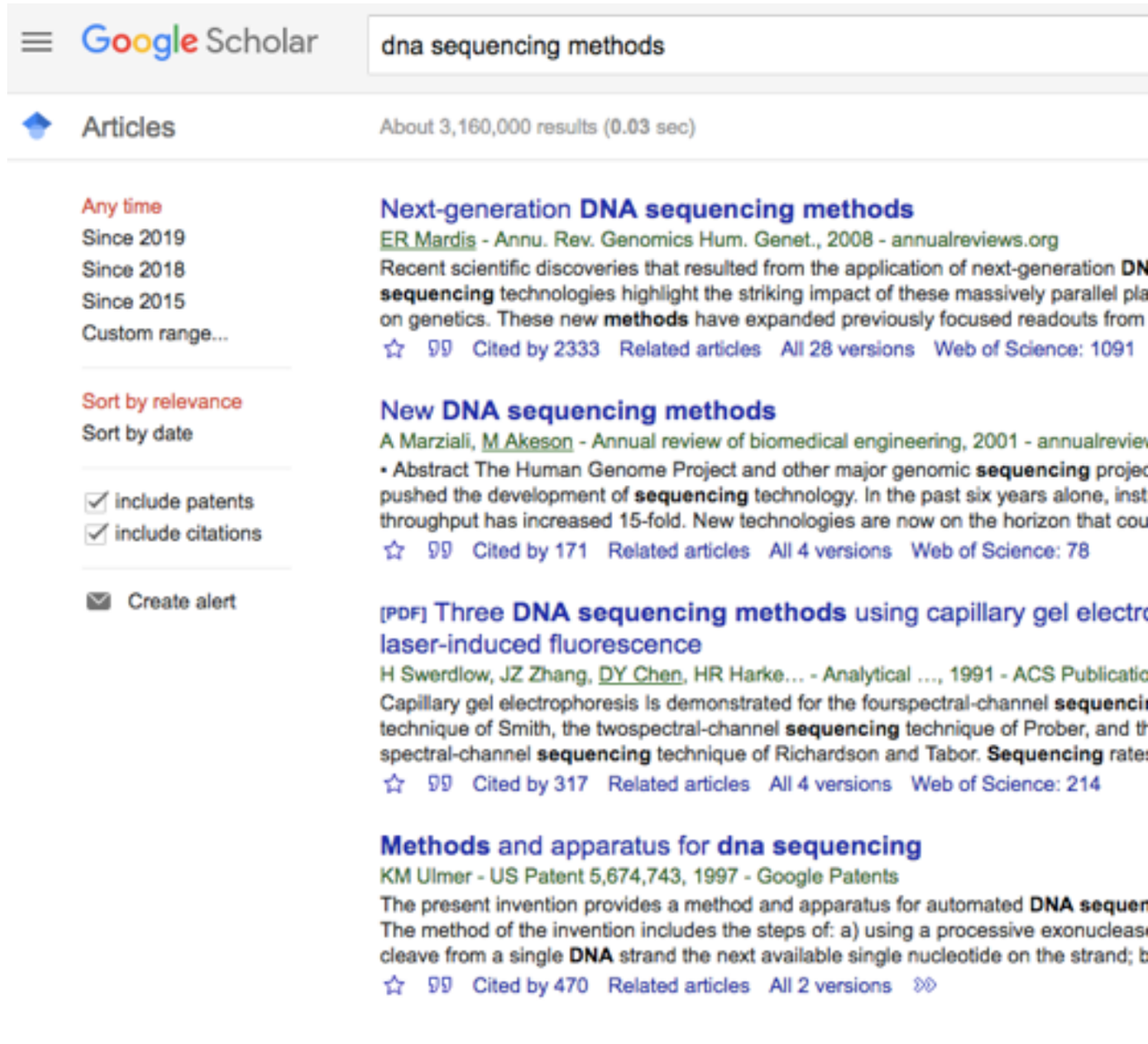
Jan 22. 1866

My dear Wallace

I thank you for your paper on Pigeons, which interested me, as every thing that you write does. Who wd ever have dreamed that monkeys influenced the distribution of pigeons & parrots!

But I have had a still higher satisfaction; for I finished yesterday your paper in Linn. Trans.

Scientific communication is much easier now



Our goals for this workshop:

1. **Identify** uses of computers in biology

2. **Write** and **execute** basic `python` code.

3. **Apply** these programming skills to: data analysis and simulations

Now, Chris is going to get us started with python