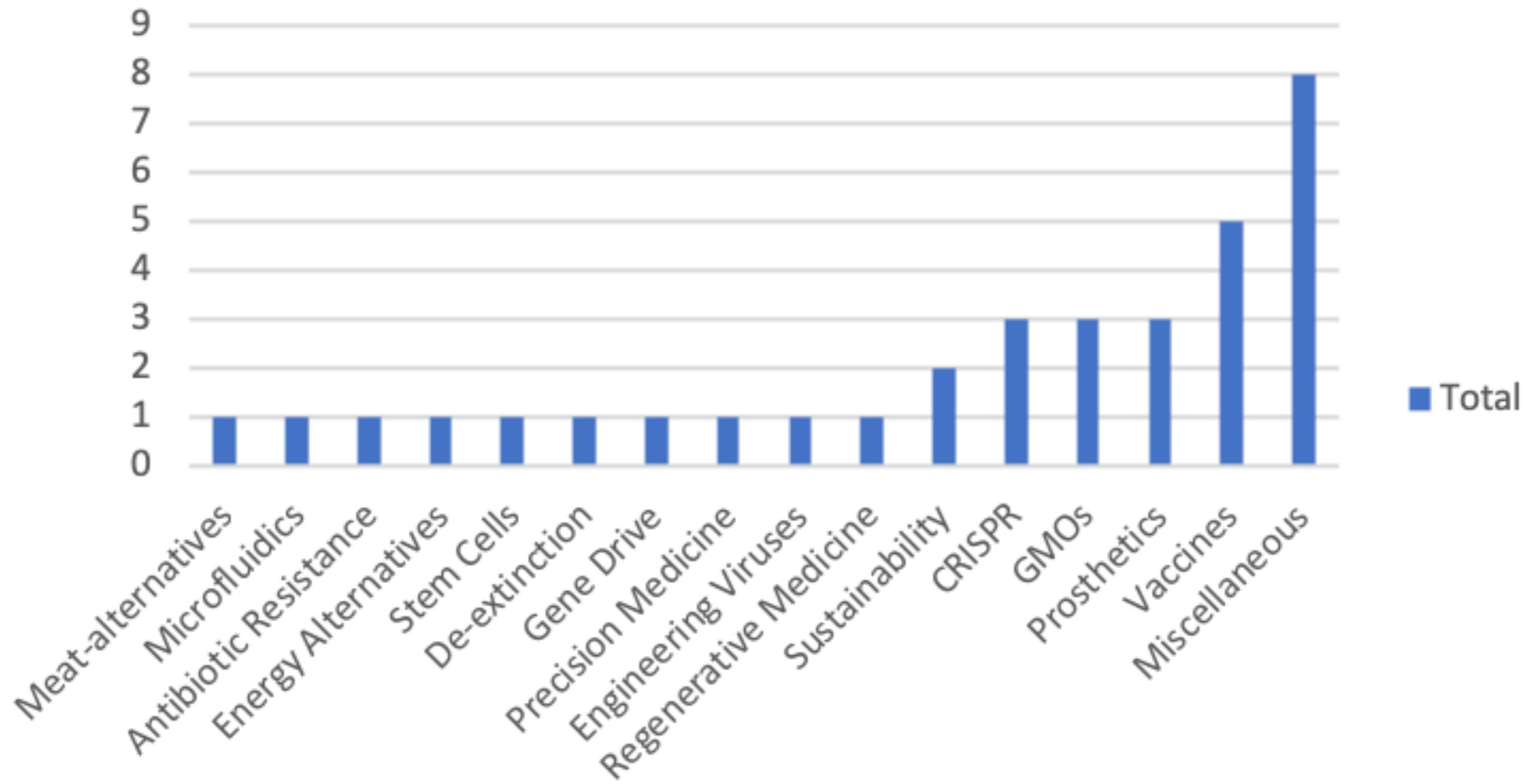
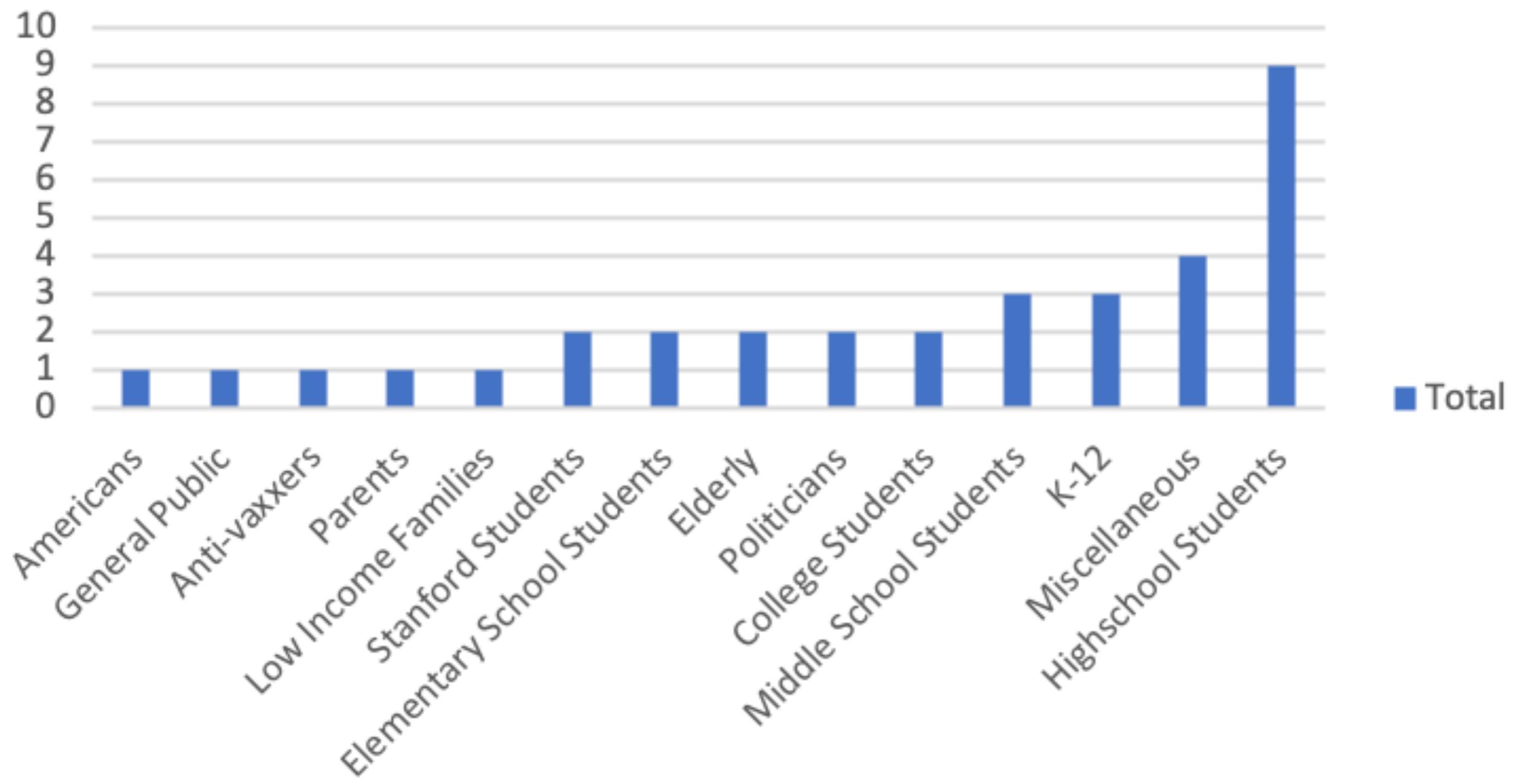


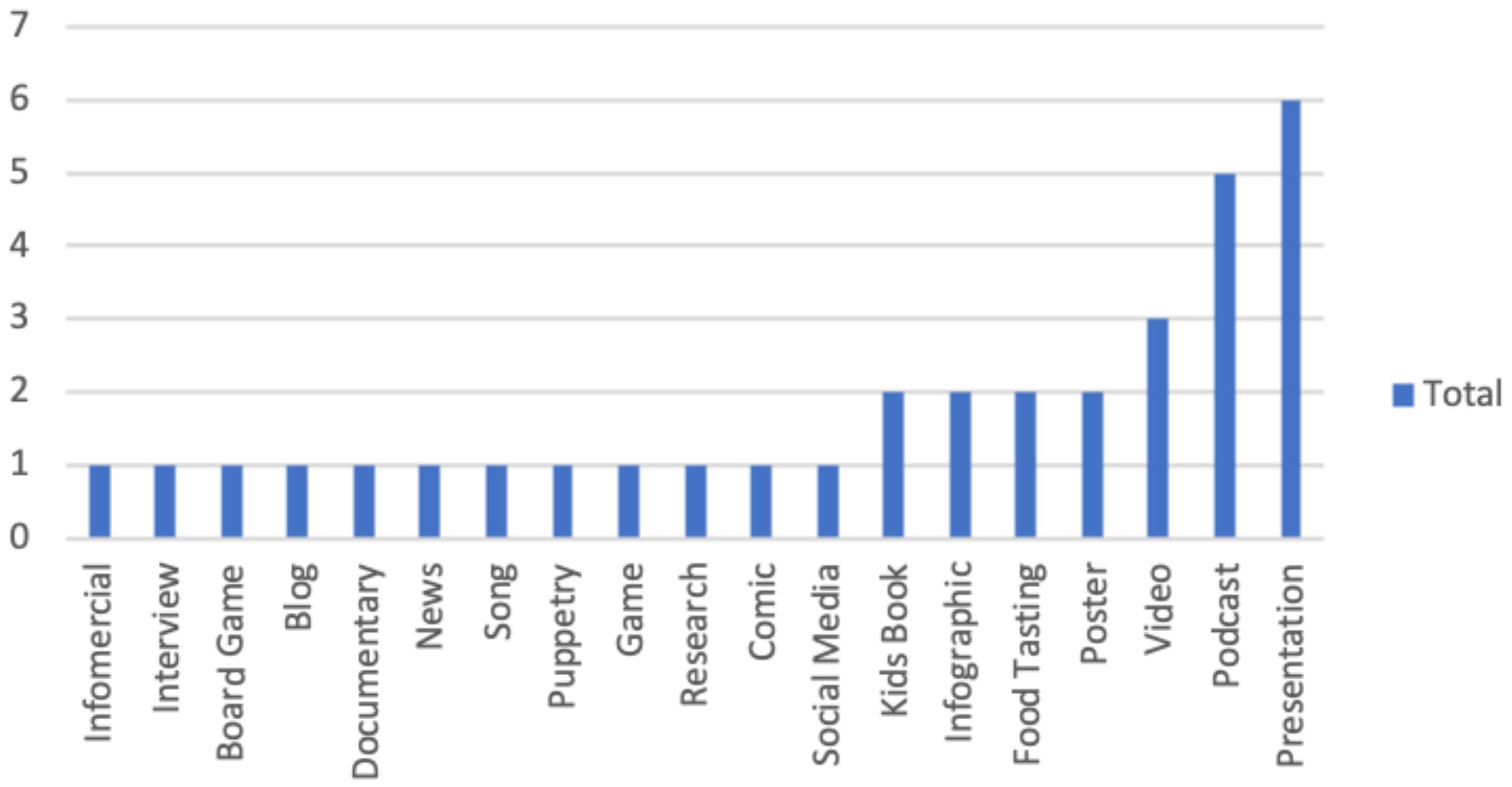
First Choice Topics



First Choice Audiences



First Choice Medium



Order of magnitude problems (Fermi estimates)

- Estimate capacities of what is possible with living matter (during DBT)
- Dimensional analysis in future classes (Physical Biology)
- Great resource: Cell Biology by the Numbers
<http://book.bionumbers.org/>

Monday

BIOE connected to culture/society;

Culture/society not fully configured for BIOE

How to recognize dualistic framings (& their limitations);

Seeking to navigate or transcend dualistic framings

Today

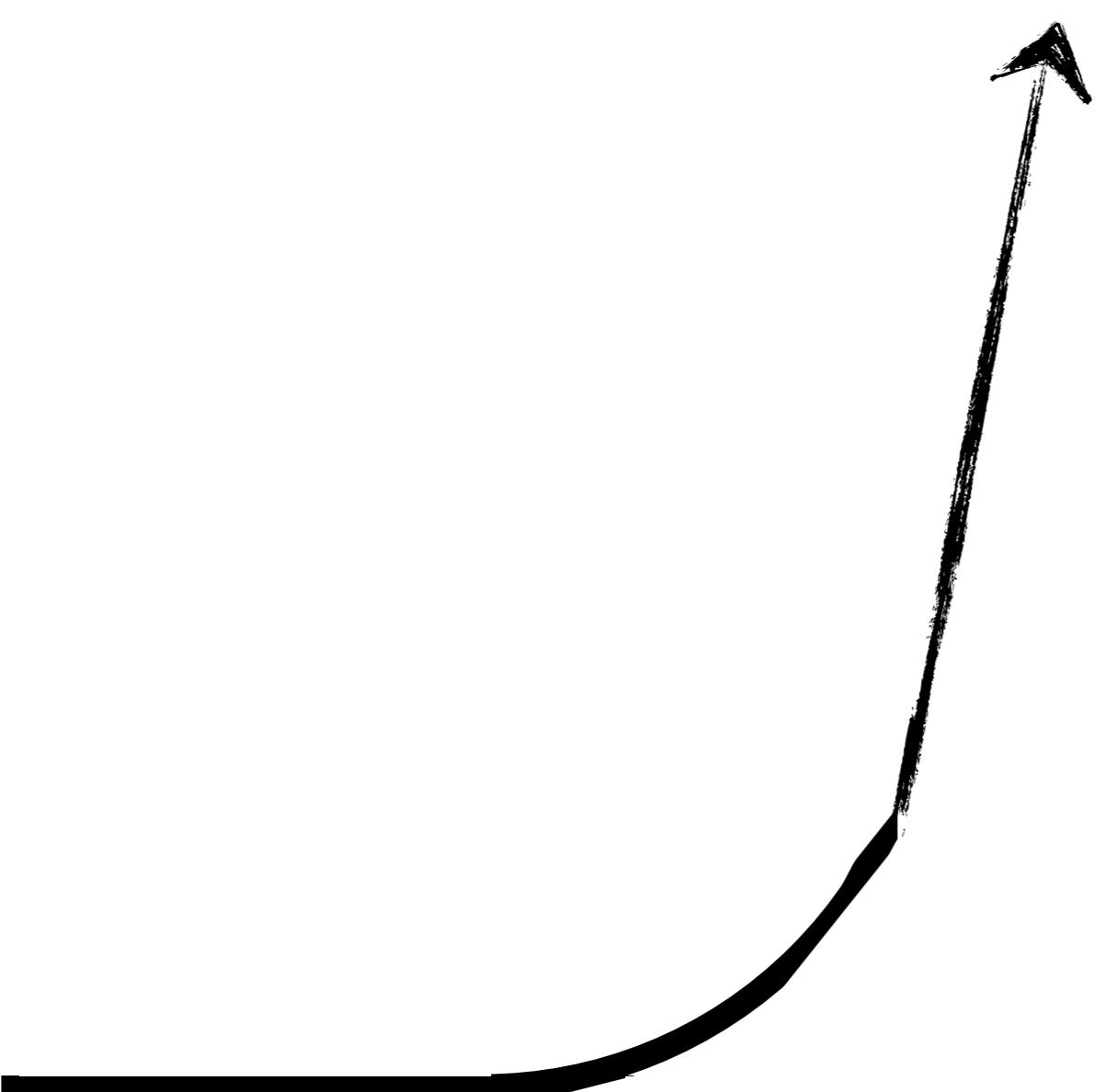
BIOE operates within intrinsic cultural narratives

Citizenship must be renewed (or at least updated, in part)

Recognizing and redirecting narrative context

Recognizing and reframing proxy battles

Considering what is required to be a citizen



Equity? Meaning? Citizenship?

John Maynard Keynes,
***Economic Possibilities for our
Grandchildren***
(1930)*

I

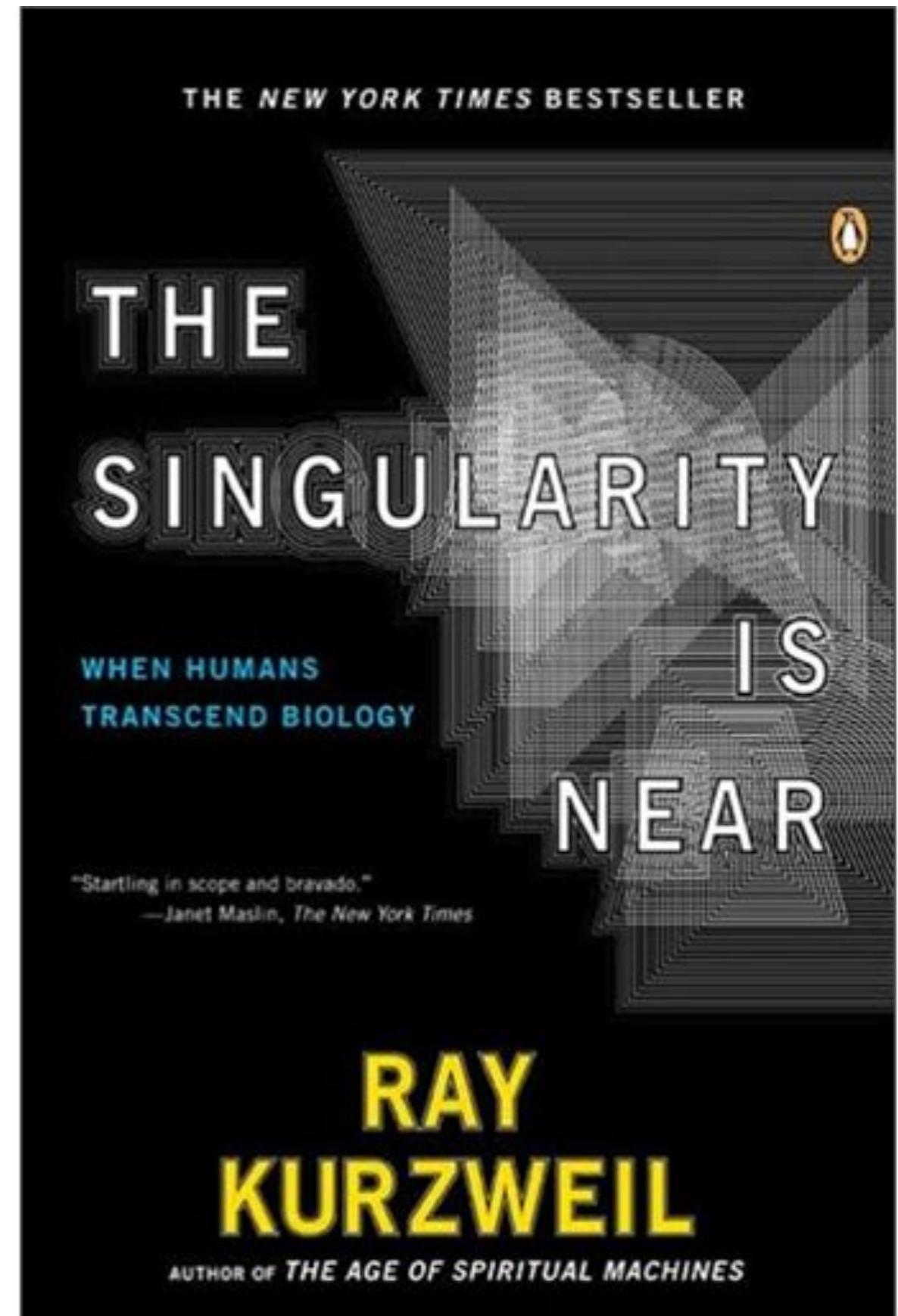
We are suffering just now from a bad attack of economic pessimism. It is common to hear people say that the epoch of enormous economic progress which characterised the nineteenth century is over; that the rapid improvement in the standard of life is now going to slow down --at any rate in Great Britain; that a decline in prosperity is more likely than an improvement in the decade which lies ahead of us.

I believe that this is a wildly mistaken interpretation of what is happening to us. We are suffering, not from the rheumatics of old age, but from the growing-pains of over-rapid changes, from the painfulness of readjustment between one economic period and another. The increase of technical efficiency has been taking place faster than we can deal with the problem of labour absorption; the improvement in the standard of life has been a little too quick; the banking and monetary system of the world has been preventing the rate of interest from falling as fast as equilibrium requires. And even so, the waste and confusion which ensue relate to not more than $7\frac{1}{2}$ per cent of the national income; we are muddling away one and sixpence in the £, and have only 18s. 6d., when we might, if we were more sensible, have £1 ; yet, nevertheless, the 18s. 6d. mounts up to as much as the £1 would have been five or six years ago. We forget that in 1929 the physical output of the industry of Great Britain was greater than ever before, and that the net surplus of our foreign balance available for new foreign investment, after paying for all our imports, was greater last year than that of any other country, being indeed 50 per cent greater than the corresponding surplus of the United States. Or again-if it is to be a matter of comparisons-suppose that we were to reduce our wages by a half, repudiate four fifths of the national debt, and hoard our surplus wealth in barren gold instead of lending it at 6 per cent or more, we should resemble the now much-envied France. But would it be an improvement?

Increasing compute
Increasing DNA read
Increasing DNA write



Equity?
Meaning?
Citizenship?



What are the strengths of the
“exponential” narrative?

What are its costs or byproducts?

What are our options?

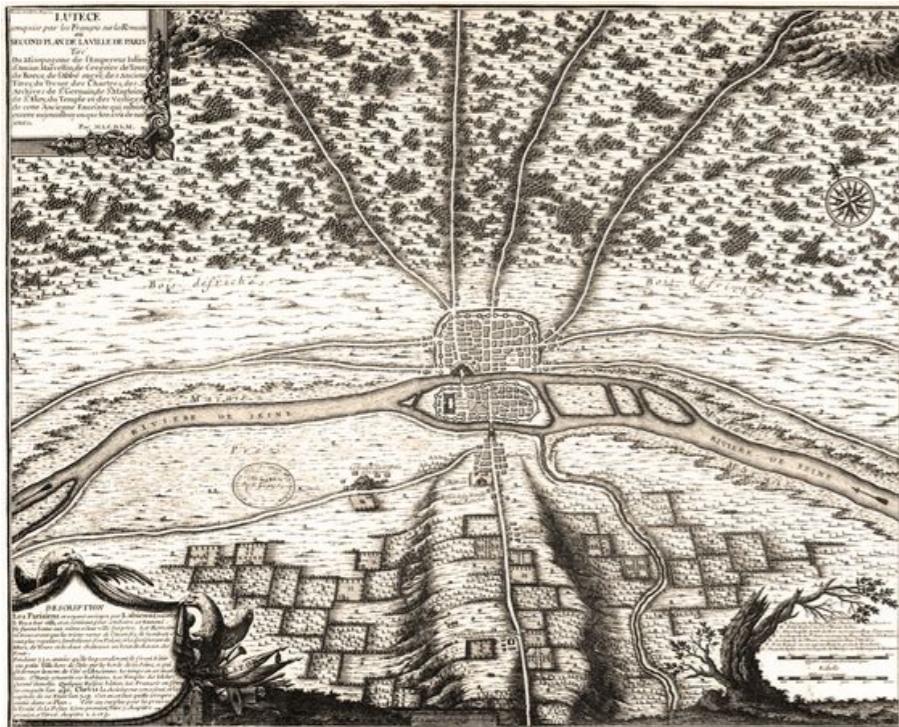
>1% global literacy rate & empowerment for three essential tech. families

On-demand distributed construction of lineage-agnostic organisms
(i.e., nature-compatible matter compilers)

ROE >1 for affordable & sustainable energy

Energy,
Information,
& Matter mostly local
& all limiting...

Energy,
Information,
& Matter all networked
& none limiting...



Paris ~500AD



Paris ~2025AD

red rhapsody®
fruit smoothie blend



odwalla®

smoothie

15.2 FL OZ (450 mL)

200
CALORIES
PER BOTTLE

what's inside?



juice of 2 apples



8 strawberries



1/3 banana



juice of 2/3 beet



A 100% DV vitamin A



E 100% DV vitamin E



C 35% DV vitamin C

vegan

IMPORTANT: MUST BE KEPT REFRIGERATED
EXTREMELY PERISHABLE

100% JUICE/PURÉE BLEND

Nutrition Facts

Serving Size 1 Bottle

Amount Per Serving

Calories 200

% Daily Value*

Total Fat 0g 0%

Sodium 25mg 1%

Potassium 700mg 20%

Total Carbohydrate 48g 16%

Dietary Fiber 2g 8%

Sugars 39g

Protein 2g Not a significant source of protein

Vitamin A 100% (100% as Beta Carotene)

Vitamin C 35% • Calcium 2%

Iron 8% • Vitamin E 100%

Not a significant source of calories from fat,
saturated fat, trans fat and cholesterol.

*Percent Daily Values are based on a 2,000 calorie diet.

INGREDIENTS: APPLE JUICE, STRAWBERRY PURÉE,
BANANA PURÉE, BEET JUICE FROM CONCENTRATE,
PLUM PURÉE, TOMATO PURÉE, POMEGRANATE JUICE
FROM CONCENTRATE, RASPBERRY PURÉE,
POTASSIUM PHOSPHATE, VITAMIN C (ASCORBIC
ACID), VITAMIN E (D-ALPHA TOCOPHEROL ACETATE),
ROOIBOS RED TEA POWDER AND BETA CAROTENE.

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Why does this label exist?

Should bioengineers care?

If we should care then what do we do?

What capacities should be available to all citizens?

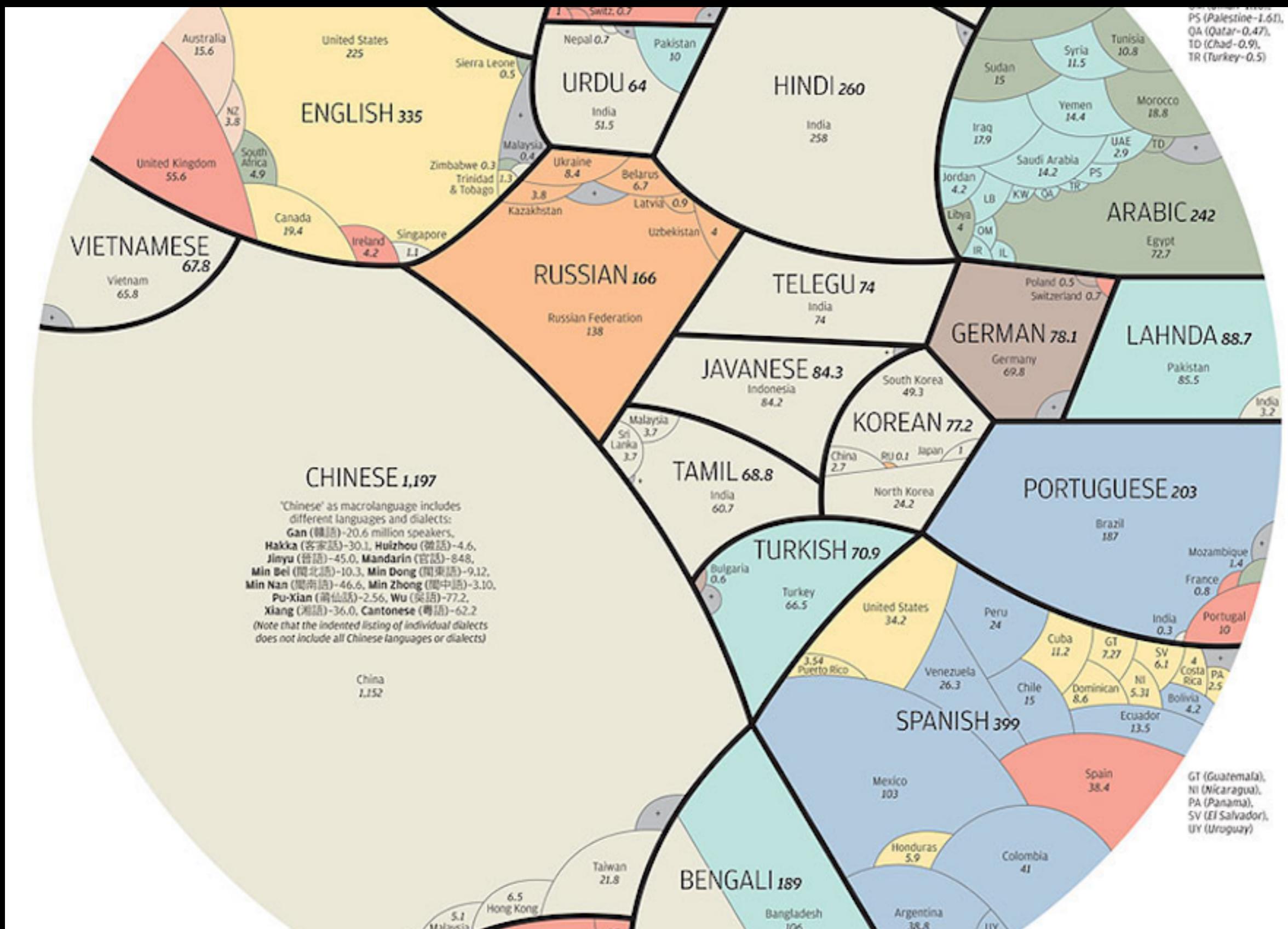
Jefferson to
Adams re:
“natural
aristocracy”
October 1813

With respect to Aristocracy, we should further consider that, before the establishment of the American states, nothing was known to History but the Man of the old world, crowded within limits either small or overcharged, and steeped in the vices which that situation generates. A government adapted to such men would be one thing; but a very different one that for the Man of these states. Here every one may have land to labor for himself if he chuses; or, preferring the exercise of any other industry, may exact for it such compensation as not only to afford a comfortable subsistence, but wherewith to provide for a cessation from labor in old age. Every one, by his property, or by his satisfactory situation, is interested in the support of law and order. And such men may safely and advantageously reserve to themselves a wholesome controul over their public affairs, and a degree of freedom, which in the hands of the Canaille of the cities of Europe, would be instantly perverted to the demolition and destruction of every thing public and private. The history of the last 25. years of France, and of the last 40. years in America, nay of it's last 200. years, proves the truth of both parts of this observation.

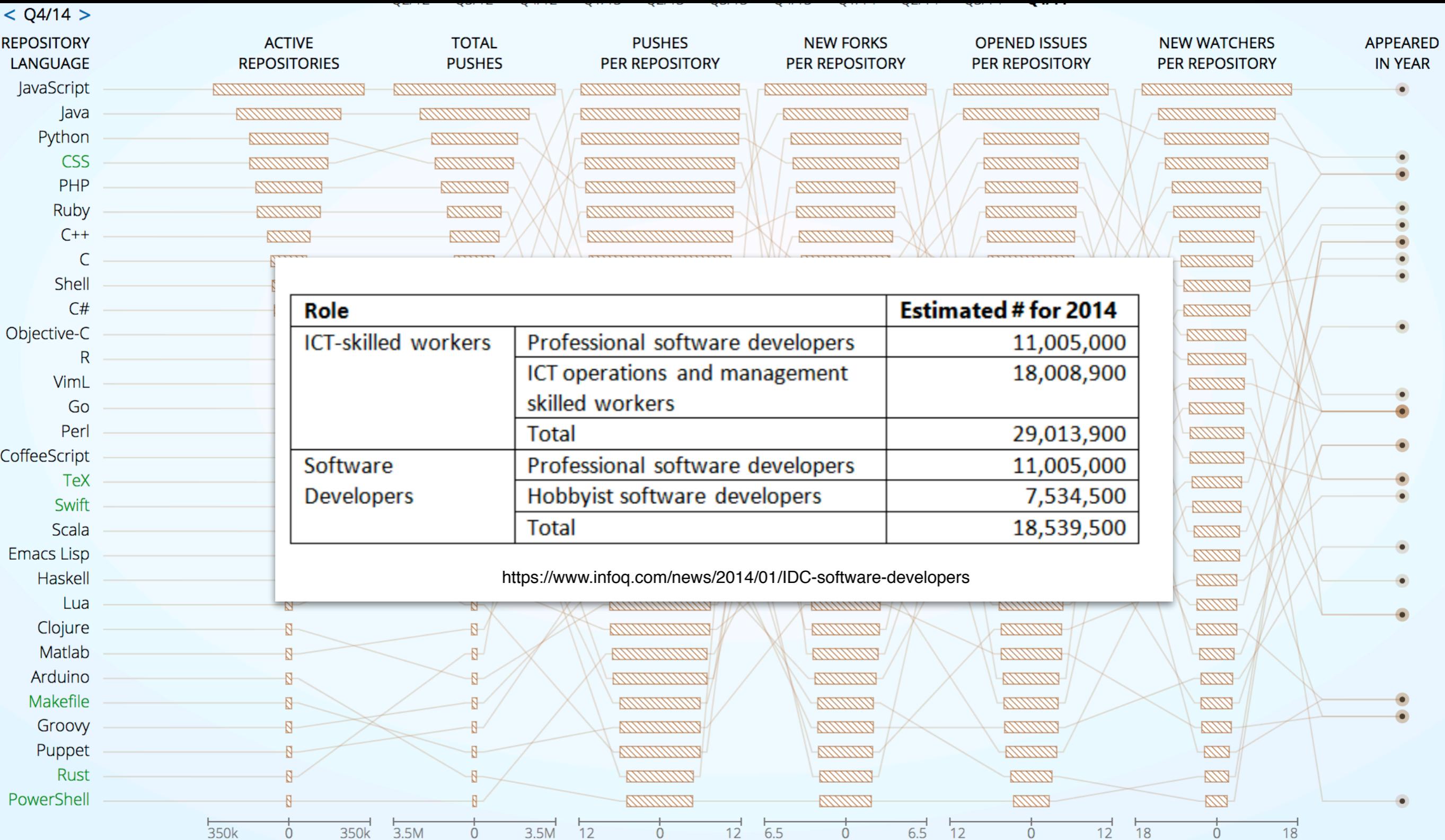
change has sensibly taken place in the

Progress
and
Economic
new
Benevolent
Period

How many people should have the option of learning to read and write?



How many people should have the option of learning to read and write computer programs?



How many people should have the option of learning to read and write DNA?



What is the equivalent of Jefferson's
1813 land for the 21st century?

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