

A molecular biologist takes a trip inside the human body under the headline:

Sex & the City... I mean: Cell & the City

People are often surprised by my dual interest in both molecular biology and political economy. The connection is not obvious. However, when you consider that my greatest interest is in eradicating extreme suffering, it starts to make more sense. I believe that science can, if humanity decides to utilize it altruistically, eventually eradicate the biological substrates of extreme suffering.

That being said, it's going to be a long haul, and that's where political economy comes in, the bottom-line, money and resources. The question is how to structure our system in such a way so as to fund this type of progress.

I often find myself thinking about how biological organization from the level of individual cells, tissues, organs, and organisms distribute resources, and how the physical allocation of these resources makes all the difference in the evolutionary success of the subject.

The cellular milieu is a sea of wonder. If you were able to sit inside a nano-sized submarine with enzymatic reactions sparking all around you, you might get the feeling of disorder and chaos. However, the cell is anything but disorganized. Membranes compartmentalize a wide range of pHs critical to the structure and function of enzymes and other molecules.

The distribution of these compartments is a critical component of the cell, allowing for an unfathomable number of perfectly orchestrated events that rarely skip a beat. Cellular superhighways in the form of cytoplasmic scaffolding help traffic these molecules between compartments, optimized, among other ways, in terms of their distance from each other. For instance, DNA's trusty messenger RNA travels from the nucleus to the rough endoplasmic reticulum where it is translated into protein, the substance that actually makes a person's skin dark or eyes blue. The trafficking of RNA is essential to the basic functioning of the cell and often needs to occur so rapidly that the membrane of the rough

endoplasmic reticulum is continuous with the outer layer of the nuclear envelope. In other words, they're right next to each other. Other compartments need to be kept away from each other. There are concentration gradients, and other means of partitioning, but that's the point, the cell optimizes its use of space both internally and externally. If it doesn't, it either dies or over proliferates, often resulting in cancer.

Similarly, if cities and their citizenry are to thrive, they must optimize their use of space, i.e. land. In a city, taxes are one of the primary drivers of land use. Taxes on land values allocate space more efficiently by spurring idle landlords into either using their land for productive purposes or selling it to others who will. This means, selling off vacant lots, renovating vacant floors, and constructing taller buildings in areas where there is demand for them. However, when there is a lack of pressure on individual landlords to economize on their use of surface area i.e. land, and a strong incentive to speculate on rising land values, more land will be held out of use. The cumulative effect on the city is that there is less room for everyone else, increasing the cost of land (rent, mortgage rates, purchasing prices).

Taxing labor, exchange, and buildings is detrimental to economic activity. The result is less exchange, and less building space. A lower supply of building space hurts laborers because of the higher rents and mortgage costs caused by the resultant artificial scarcity in land. Also, when less space can be utilized for business, there is less business and less demand for labor. This stifles wages. Furthermore, cities are hurt by these taxes due to the obvious fact that there is less of a financial reward for production after taxes are paid. Thus, it is necessary, in the interest of promoting the economic health of the city, to shift taxes off of the productive activities mentioned and onto land values.

Speculating on land does not actually produce wealth. In fact, it physically impedes it by withholding land required

for productive activity out of use. Taxing land values actually creates incentives for production unlike other taxes. This runs counter to how most people commonly think about taxes. It is an issue of what economists call elasticity. If potato chips are taxed, less potato chips will be sold. Tax cars and there will be less cars. If land values are taxed though, there is still just as much as there was before. The real difference is that there is less of an incentive to waste space in areas where the demand for land is high. If a cell is to survive, it must use its space efficiently, and so must a city.

However, this isn't to say that cities should be heavily zoned or planned top down. Some planning is obviously necessary, but just as there is no central conductor of the cell, so too can cities with the proper incentive to use space efficiently grow stably and organically.

When you consider the very common practice of cross collateralizing mortgage loans, it's easy to infer the impetus on the part of both the individual landlord and banks, buying low and selling high, the promise of a free ride. However that free ride, its cumulative effects, have very serious consequences.

Cells, like cities, must maintain boundaries if they are to symbiotically thrive within the larger macrobiot. Indeed like cancer, the sprawl that is created in cities by high taxes on production and low taxes on land values disaggregates the efficiency of the division of labor, killing cities with high rents, poverty, and criminality.

Fortunately for humans, we are endowed with something greater than the sum of our molecular parts, more effective than the tumor suppressor p53. We don't have to submit our cities to the painful selection process that preened our cells. We can make a conscious decision to change the way our cities are structured and alleviate a great deal of suffering in the process.