

## Cartography: Making Sense of Our Worlds

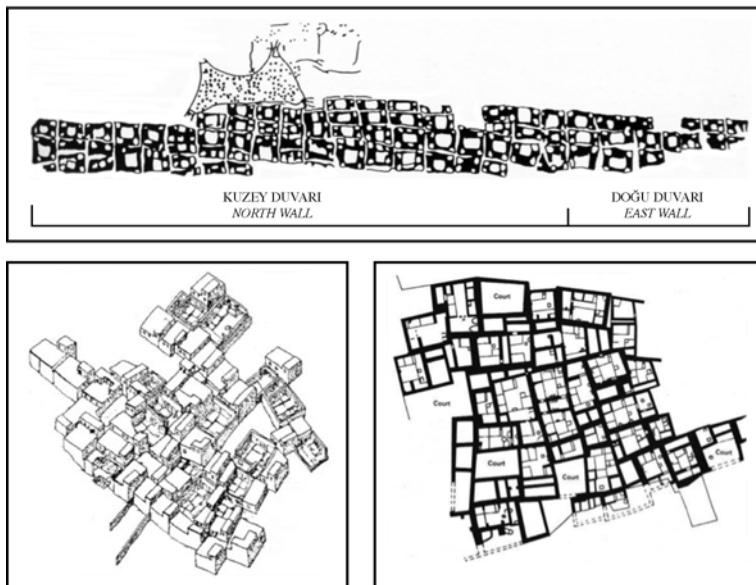
Danny Dorling

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To me cartography is the means by which we make sense of our worlds. Almost all of the earliest cartographic images are not simply way-finding maps, but contain messages of how human society is ordered and what the threats and opportunities to that society might be, as well as providing messages for how much better things could be.

One the of the earliest maps of a city, Çatalhöyük, depicts houses built cheek by jowl, with no streets or even alleyways between them and with a threatening Volcano looming over this earliest of human concentrations. Recently archaeologists have suggested that what we see today as a volcano may, in fact, have been a rather lurid leopard skin dress, drawn above the city for some other reason. We may never know if that dot-filled-form is dress or volcano, but we know that this map – revealed on a 9000 year old plaster wall – served a purpose greater than simply being a remarkably accurate depiction of the buildings around it, for many thousands of years having been buried and ruined.

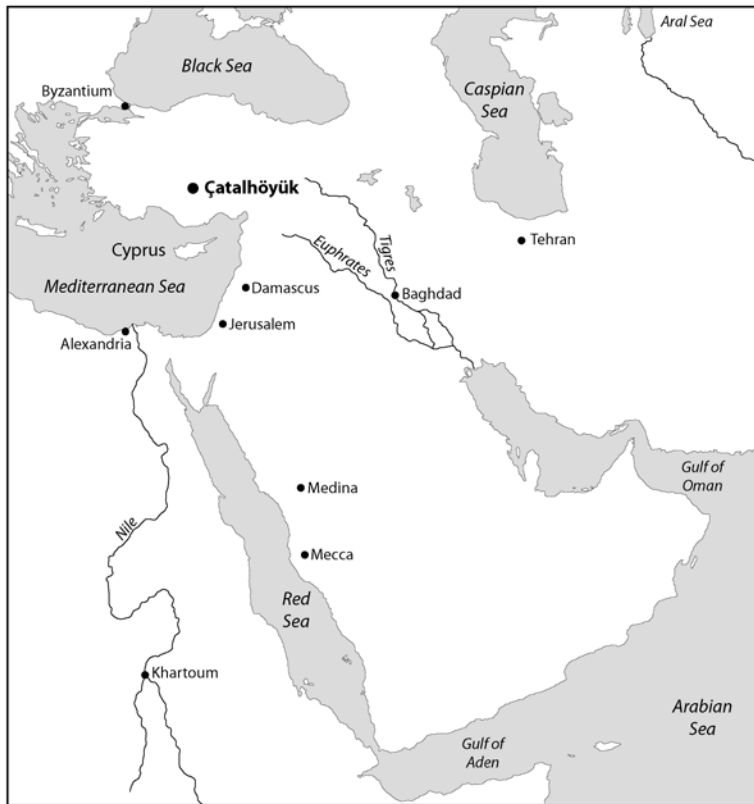
Çatalhöyük, the world's first city (without streets)



Source: Redrawn from many reconstructed images that now appear on the web.

The original image is augmented above by two modern day plans drawn directly below it. These show how the city without streets might have looked had anyone then been able to fly and how it was laid out in plan form. We presume that people got to their homes by walking over the roofs of others' property. Also almost certainly property will have had a different meaning then. There were no countries, as we know them now, and the idea of given generic names to masses of water, the entire lengths of river networks, and maybe of towns and cities will have all been inventions of thought that have come long since Çatalhöyük was first built, along with both the idea of streets and, in some cases a very long time later: sewers.

Where three continents join



Note: Selected cities that were founded and seas and rivers that were named after Çatalhöyük in lighter type

Source: Re-drawn from author's map.

The modern day map that privileges coastlines as being so important, that puts north uppermost and that leaves so much of its space blank, is useful for seeing how the bottleneck between three great continental land masses could have been the place where human innovation flourished, as interaction maximised, but it might also mislead greatly.

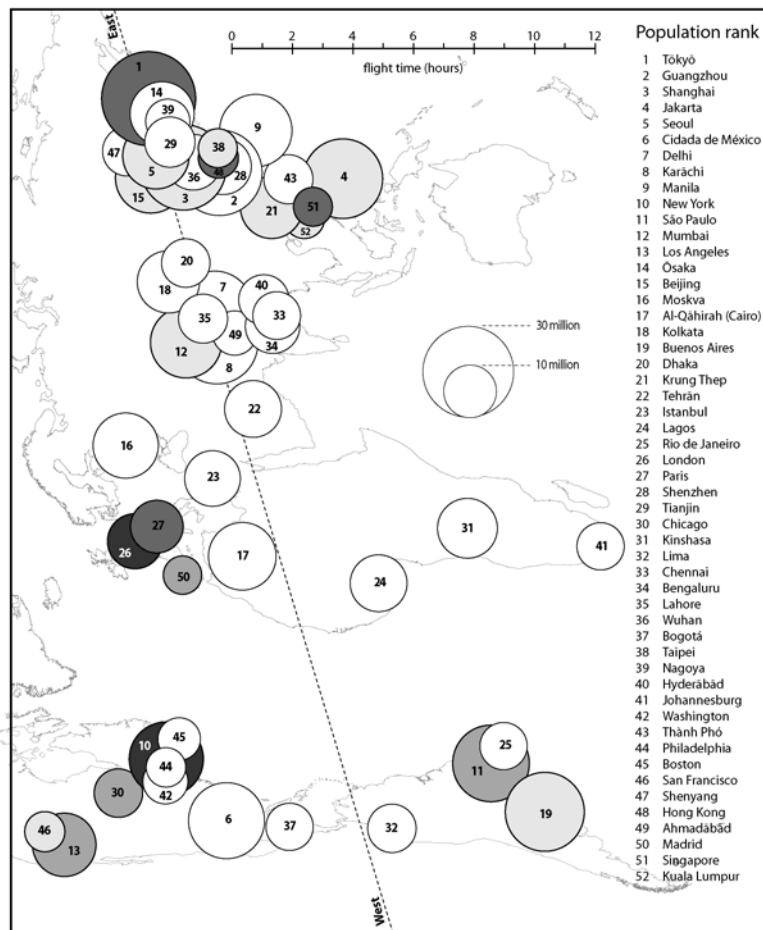
If, in the past, people found moving long distances over water far easier than over land then we would need to turn the map above inside out in some way to see the topography and topology that actually lead to Çatalhöyük being, for a time, near the centre of things.

Cartography can obscure as much as it reveals. Use a modern day map to look at the past, or even look at the present without getting the metric right, and you might not see things as clearly as you could.

Cartography changes as our conception of how we are all connected to each other changes. We can easily think that how we draw maps today is how they should always have been drawn, if only people in the past had benefited from what we now know, but that is easy to disprove as both fanciful and narrow minded. In many ways the modern mechanisation of mapping making has held innovation back because computer software mimics what cartographers of a few decades ago saw as good cartography.

Should you be a teacher here is an exercise you can set your students. Ask them to draw a new map of the world. They need to take a list of the world's largest modern cities. Many such lists exist; all are to a degree arbitrary. Begin with the largest city, in the case of the list I use, Tokyo, and calculate how long it takes to fly from there to the second largest city in the world. My list suggested that in 2012 this was Guangzhou

The top 52 world cities by population  
(Shading is rank in world city hierarchy)



Source: Re-drawn from the author's rough drafts.

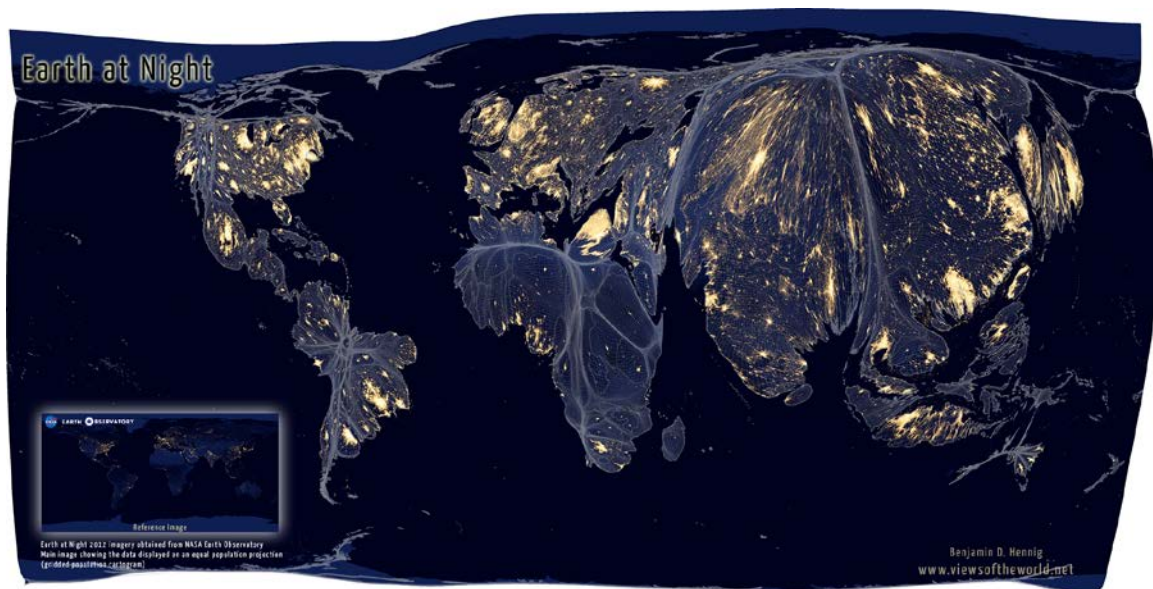
There are many calculators on the web that will give you the shortest travel times between two cities. Use one of these to next draw each city as a circle with area in proportion to its population and the distance between each pair of city centres made proportional to that quickest possible travel time between their most central airports. A third and fourth city can be added by taking a pair of compasses and drawing circles from each existing city centre the correct distances away. Where those compass lines intersect is where the next city down in the hierarchy should be placed. Keep adding cities until it becomes too hard to work out the appropriate location of the next by hand.

The map above is one attempt to create a new world map of the major cities by population where fastest travel time is the geometry, not distance. What is most remarkable about this map is that the world is flat when it comes to its most populous cities, although it wraps round from top to bottom (if East is put uppermost again).

Many aeroplanes may fly over the artic to connect some of the richest cities in the world but, if you were thinking of designing a London underground style cartogram of the globe, where each station is a mega-city, you might do well to start with the above image and then try to work out how to separate out the cities at the top of the world; those which now cluster so closely.

The map above is just a rough sketch, in effect drawn by hand. It will contain errors, Tehran is oddly placed, partly due to it being a little harder to fly there, partly due to the author being lazy towards the end of finishing off this map.

As more and more towns and cities are added to a map where distance is made proportional to travel-time, the surface of the map has to become undulated. Hard-to-reach towns need to be drawn on mountain tops, these are of mountains that are only there in our minds and in the time it takes us to travel between places. All this is a new cartography still waiting to be discovered.



To me cartography is about making sense of the world. It can be conducted without images, or simply by painting pictures using words or sounds, but it is so much easier to describe how you believe different elements to be connected when you can use an image. Any description of the map below, in words, can never substitute for the actual map.

The map above is drawn by Benjamin Hennig. It shows the traditional image of the earth at night, although it uses the latest, December 2012, release of satellite data. It is a map of humanity and who is both best connected and most wasteful. The image is drawn on an equal area population cartogram, where every very small grid square has its area enlarged or decreased so as to be shown in almost exact proportion to the number of people living in that area. The projection is made using a technique that ensures that all lines of latitude and longitude still meet at 90 degrees, the map is conformal. It approximates the best unique solution. Cartography should be about innovation and this is one of the most innovative maps to have been created in recent years (Hennig 2013).

On a normal map of the world the “earth at night” image appears to show where people are and where there are no people, or people with little light. On the equal population cartogram of the world there are people everywhere, in exactly equal density. Where there is light is most often where light is being most wasted, shone up to the sky rather than down to the book.

Slight changes to cartography can promote great changes to how we conceive of our society or societies, whether we begin to see ourselves as one mass of seven or eight billion people, or whether we draw ourselves as supposedly more separated than that.

Cartography is about choices. There is no single right way to depict the world that we are a part of. How we choose to depict it will alter how we see it and treat others, the land, energy, air travel, see the seas of the Mediterranean, the lands of the middle east, whether we see a places as being in the middle, or as being east of somewhere we consider now more central, and whether we worry more about volcanoes or the excesses of leopard print clothing, let alone what happens when you first built a city with no streets.

Cartography is both art and science, but also a part of the humanities and of popular culture, of new technology and of ancient history. ‘Making maps or charts’ is as old as we are and changes as fast as we change. More new maps and charts will have been made in our lifetimes than over the course of the lives of every human who has ever lived. With new technology it may also be possible for our children to be able to say the same thing again, and consign us to part of that strange and obscure history, no longer being at the forefront that we write so much about.

Always, what matters most is whether the sense that is being made of the world does itself make sense. If it does not then we need new maps, more maps, and better maps.

**Reference:**

Hennig, D. B. (2013), Rediscovering the world: map transformations of human and physical space, Heidelberg: Springer. See also this posting made on 5 March 2012: 'Mapping the Anthropocene on the 500th birthday of the cartographer Gerardus Mercator': <http://www.viewsoftheworld.net/?tag=anthropocene>.

**Short biography**

Danny Dorling has been a Professor of Human Geography at the University of Sheffield since 2003. He will take up the Halford Mackinder Professorship in Geography at the University of Oxford in autumn 2013.

He went to various schools in Oxford and to University in Newcastle upon Tyne. He has worked in Newcastle, Bristol, Leeds and New Zealand. With a group of colleagues he helped create the website [www.worldmapper.org](http://www.worldmapper.org) which shows who has most and least in the world.

He has published with others more than 25 books on issues related to social inequalities and several hundred journal papers. His cartographic work includes, three co-authored texts: "Identity in Britain: A cradle-to-grave atlas", "The Atlas of the Real World: Mapping the way we live" and "Bankrupt Britain: an atlas of social change". His most recent book is "Population 10 Billion", from where all the images used here are taken apart from the final image.

He is currently President of the Society of Cartographers.