

Earth Acne

The proliferation of built structures (A working paper)

Jonathan Drane

Faculty of the Built Environment
UNSW, Sydney Australia
October 2010

Contact: jon@jondrane.net, www.jondrane.net /research

Keywords: *Proliferation of cities, ranking of cities, mega-cities, growth modeling, urban morphology*

Abstract: Seen from a satellite, as the dawn light from the sun cuts the earth's sphere and crawls across the planet, every working day it brings the population to life, and then almost robotically they move across its surface to their second home for the day. This phenomena happens usually all at relatively the same time. When the sun goes down they all take the same strange pilgrimage in reverse. What has happened to our people, what is happening to our planet?

Copyright ©2007 Jonathan Drane. All rights reserved.

First published by Greenshoot Investments Pty Ltd in 2007 on www.jondrane.net

No part of this paper may be used or reproduced in any manner without the written permission of the writer except in the case of brief quotations embodied in critical articles and reviews.

Introduction

There was a time on planet earth when no cities existed- when the earth's face was un-blemished by man-made structure or remnant. In the era since however, the face of the earth has been marked by the advent of human made structures and other remnants. The most prevalent physical remnant measured by visual impact has been the built form, the continuing spread of the building remnants of human existence that accommodate human activity and organization.

Presenting in forms such as dwellings, monuments, temples, towers, bridges and roadways they have been spread across the planet for millennia. Despite the aesthetic merit of many, from the planet's point of view they can be seen as a blemish, which until invaded by them, offered the rich provinces of natural habitat such as plains, grasslands, deltas, mountains and rivers.

The built form has, fueled by human vitality and activity, in effect, crawled its way slowly through the millennia, extended its reach to vastly different domains of our earth, and across the face of the planet; settling in river deltas, embedding in the mouth of rivers, jumping across canyons, rising in the mountains and sprouting in amongst the desert sands.

This human activity is what could be termed 'Earth Acne'.

Over the millennia the acne has proliferated at different rates, depending upon the nature of the civilization. Sometimes prolific, sometimes stagnant, it seemed to grow and depend on the vitality of the civilization which was its host.

Historically the acne has been constituted of dense materials extracted and derived from the earth itself- of stone and metal and wood. This in turn left a common signature which was manifested in low level structures held down by the weight of these source materials.

Mostly low in level therefore, it would be occasionally interrupted by the advent of taller structures that paid homage to the gods or kings of the era. These however gained their height through a mixture of ancient engineering, stone, wood and pulleys.

Due to the density of the materials and in the case of stone, the longevity of the remnants was assured, leaving many future archaeologists and tourist to marvel at the structures of a different time.

Due to the nature of the usage and function of the built form, the remnant structure would hold a pattern born of its original blueprint, defined partly by the building technology of the time. The original community that occupied the remnant would in effect leave through these patterns, the clue to the way they lived in that time.

Seen from the air, the acne would form distinct patterns that signaled the existence of the different uses by the occupants. The original uses would be embedded in these structures leaving future civilizations to adapt or adjust the structures.

Created by hands with the aid of wheels, pulleys and fulcrums, the built form rose above the landscape and formed structures that would cast shadows across the landscape. They were however rarely very high as a result of the limitations of these methods.

The rate of proliferation of these built forms was always weighed down by the limitations of gravity, simple engineering and manpower.

And so based on these properties the built form was spawned at a certain rate which was determined by the vitality of the civilization and the available building techniques. It spread at this rate for the past five thousand years which marks the start of human cities.

A New Strain

In the past one hundred years, a new strain of the acne arose and presented in the form of tall buildings, which were facilitated by the advent of modern structural engineering techniques. The buildings were built of steel and concrete, and rose in height to 100 levels and more, literally in the space of a few decades.

The term cityscape is used in a similar meaning as a landscape. Until the advent of tall office buildings, the landscape of the city could be likened to a savanna of sorts with low lying grasses, scrubs and the occasional tree. With the advent of tall office buildings however a new and prolific species was sown that resembled the spread of tall bamboo across the savanna.

In the history and timeline of cities the arrival of the new species has been sudden, recent and prolific.

The ability for these buildings to hold large amounts of floor space unseen previously in such a concentrated form, allowed for the ease of accommodation of larger relative numbers of occupants within the cities that they arose in.

Previous constraints on office space within the cityscape were now virtually only limited by the availability of sites to build such tall buildings upon, as well as the prevailing appetite for them. A new community of buildings developed out of this strain and clustered in business districts of their own.

Every day at the same time, the workforce that occupied these buildings would move to and from the city, creating the increased necessity for improved transport corridors and systems, which in turn contributed to more built form on the planet.

The physical footprint of these buildings provided physical efficiencies compared to the earlier buildings, which would be spread out over large areas of the cityscape. The taller buildings however brought more people to the city than previously, bringing impact to their environmental footprint.

Implications.

The existence and proliferation of these tall office buildings in the cityscape goes virtually unchallenged by the broader population of the city and possibly un-noticed by many also. Perceived perhaps as a necessity of the modern era, the centralization and accommodation of commercial

organizations into city environments is justified by factors as diverse as operational efficiency, ease of communication, transport efficiencies and commercial 'status'.

Critical enquiry of this phenomena is centred around efficiency and utility with those who would seek improvement of these buildings in terms of building construction, architectural integrity and green building conformity amongst others. This line of enquiry however also assumes that tall office buildings are a necessity and not worthy of re-consideration as a form of commercial accommodation in the first place.

A tall office building can hold a small 'city of occupants', draws on considerable amounts of energy in their creation, holds embodied energy within their finished structures and facades, and can run 24/7 with continuous energy demands. A typical tall office building in effect can hold the ecological footprint of a small country township.

The act of pulling people out of their homes each workday morning and into these structures, (and then discharging them at the end of the work day at the same time) creates enormous impacts on transport infrastructures as well as environmental loads.

A tall office building is recognized as one that 'towers' over the general landscape of other buildings. Historically, buildings that have accommodated commercial activity have conformed to the lower levels of other buildings simply because the technology that supported 'office tower' construction had not been invented.

The first renowned tall office building was the Empire State Building with a lightweight composite steel and concrete construction previously unseen:

*The **Empire State Building** is a 102-story landmark [Art Deco skyscraper](#) in [New York City](#) at the intersection of [Fifth Avenue](#) and [West 34th Street](#). It is 381 meters (1,250 ft) tall. It stood as the [world's tallest building](#) for more than 40 years, from its completion in 1931 until construction of the [World Trade Center's North Tower](#) was completed in 1972. Following the [terrorist bombing and destruction of the World Trade Center](#) in 2001, the Empire State Building again became the tallest building in New York City.. (Wikipedia 2010)*

Until the Empire State Building was constructed, the community of office buildings was restricted by masonry and stone construction which due to its great weight limited the height of office buildings and all buildings for that matter.

The world's tallest structure is the 828 m (2,717 ft) tall [Burj Khalifa](#) in [Dubai, United Arab Emirates](#). The building gained the official title of "Tallest Building in the World" at its opening on 4 January 2010. It is taller than any other man-made structure ever built. (Wikipedia 2010)

This is an extreme example, but a tall office building can hold the population of what some might know as a country town, on a site which would be normally allocated to the local post office. It is one thing to be able to build tall buildings due to technology. It is another thing altogether to enact the creation of such buildings justified by commercial expedience.

In cities like Dubai which holds a deep history also, this phenomena has literally sprung from the desert sands in a matter of a decade or so.

The study (Ranking of Dynamic Cities- Jonathan Drane www.jondrane.net /research) of which this article/working paper is part, will view all ‘species’ of built form and focus on ‘the tall office building’ and its proliferation rate historically across cityscapes..

Since the population of ‘cityscapes’ is large around the world, and the dynamics of proliferation are under study, a select number of emerging cities will be studied.

Cities will be chosen that have both a rich history to allow for comparison of historical proliferation, as well as current proliferation, and also be informed by a mix of districts within the cityscape including residential, financial, retail and business districts.

The cities will be chosen based on a set of criteria aligned with the above factors.

This is a working paper which forms a part of a larger study by the author on the Ranking of Dynamic Cities. Please see www.jondrane.net / research for updates.