Parametric Urbanism:

THAMES GATEWAY – Urban Laboratory

1.Thesis:

Parametric Urbanism takes the tools of parametric design into the domain of large scale urbanism. Parametric versioning is exploited to create urban fields with an unprecedented level of intricacy.

2.Topic:

Thames Gateway as Urban Laboratory

London's architectural and urban sensibility has to wake up to the fact that London is one of the growth poles in an accelerating world-wide dynamic. We are exploring how to approach such super-large developments with an architect's sensibility, deploying form- and space-making strategies rather than mere planning tools. The ability to handle large territories architecturally turns on a series of new and powerful digital design techniques. The application of the thus re-tooled architectural sensibility to the design of large scale urban fields results in what we call ***Parametric Urbanism.***

The Thames Gateway is hailed as Europe's largest urban regeneration project. For us it suggests the potential to become the most potent laboratory of contemporary forms of urbanism.

We are starting by the reconstruction the fundamental typological catalog of architecture and urbanism in terms of field conditions: point-fields of villas, line-fields of towers, plane-fields of slabs and volume fields of urban blocks. With respect to theses 4 basic types of urban fields we go through a series of parametric variations and differentiations before we enter a matrix game of recombination and interpenetration, leading to mutations of both fields and components. Through this process we are building up a repertoire of sufficient richness and complexity to approach the territory with multiple interlacing strategies.

3.Techniques:

Constrained Proliferation: The building as Generative Component

Bentley's "GenerativeComponents" (GC) is a parametric**-**associative design system. Components might be constructed from multiple elements constrained/cohered by associative relations so that the overall component might sensibly adapt to various local conditions. As they populate a differentiated surface their adaptation should ***accentuate and amplify*** this differentiation. (This technique can also be replicated in Maya (Mel-script).)

This relationship between the GenerativeComponent and its various instantiations at different points of insertion in the "environment" might be conceptualized in analogy to the way a single geno-type might produce a differentiated population of phenol-types in response to different environmental conditions that impact the ontogeny of the respective individual organism.

4. Method;

Architectural tectonics produces urban field effects and vice versa

Initially the component might be a simple (not too simple) building mass that populates a topographically or otherwise articulated mesh (parcel array). The resultant differentiation of building shapes translates the lawful differentiation of the topography as well as other environmental factors. This already produces significant global urban effects.

However, the crux of how we would like to use GC (or its Maya equivalent) is the ambition to bring the architectural subsystems and the attendant tectonic articulation of the buildings under the spell of the global urban differentiation in a single computational set up. This in turn means that the local architectural features work towards the amplification for the urban vectors and thus facilitate orientation via an unprecedented level of overall associative integration. The key subsystems that are to be integrated within the urban stage of the Generative Component are:

1. System of internal subdivision, i.e. sub-volumes, floors, walls
2. Structural system, i.e. primary skeleton
3. Navigation System, i.e. void with primary circulation/orientation
4. Envelope, i.e. opaque vs transparent, layered with bri-soleil, balconies etc.

The attempt should be made to develop a geno-type that defines and integrates all these systems across the whole range of phenol-typical variation. This task should be solved by means of a single complex parametric model that adapts to the differentiated site-conditions.

End.