Virtual constructions

The standards of Utopia

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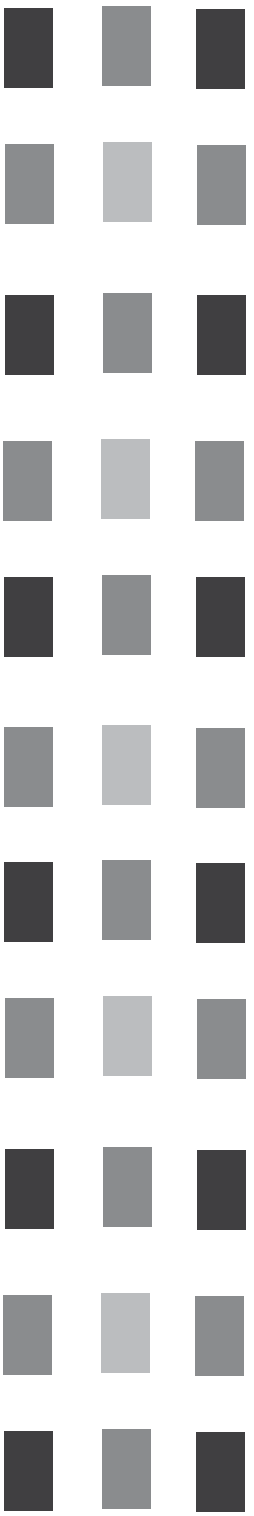


Design is not only a matter of ideas and of the interplay of form and function. It is also a matter of technologies of representation, of specific machines and operations. Nietzsche's fundamental media-theoretical thesis that our writing tools influence our thoughts, is especially pertinent with regard to the represention of space. A good example is the invention of linear perspective in the Italian Renaissance: it established a generalized and reproducible method for the represention of space based on a system of geometrical coordinates. Already here representational operations and digital processes are interlaced.

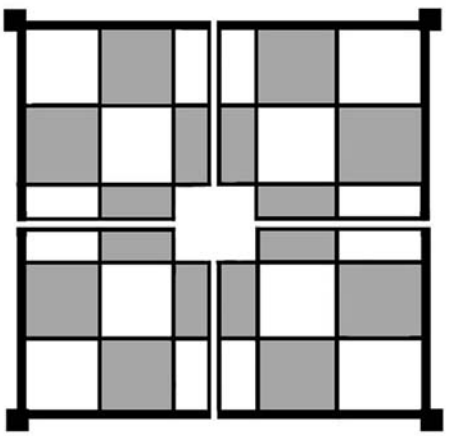
My thesis is that until today the drawing tools of the designer influence his or her design. Ruler and stencil are, like the standardized thickness of lines, not only a testimony to the standardization of architectural representations in general, but also to a pre-formatted language or form. When the computer became a drawing machine, a new generation of picture-production emerged: algorithms both produce and limit the techniques of visualization. With standardized operations it is now possible to produce drawings on the highest level of precision, reproducibility, and calculability. The computer-generated drawing is a composit of standardized commands on the menu-bar. The technical tools bestow credibility on the picture as representations or copies of reality. I want to focus in the following on the status of representation from utopian and ideal city conceptions to virtual communities of computer games.[1]

The Sims is one of the most famous computer games, soon to be online. www.sims-online.com is the new adress of a virtual city where people from all over the world will constitute a global community. In artificial neighborhoods of a manageable city, fictional inhabitants (avatars or *SIMS*) live and work together, engage in relationships, and design their individual environment. What is the attraction of spending hours in front of the monitor setting up virtual networks, populating and furnishing virtual spaces? Is it the seduction to realize the dream of a new and better world in the limitless space of virtuality?

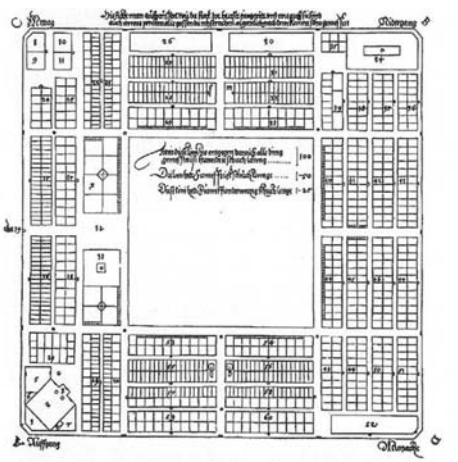
The entertainment value of these premises seems to be historically proven. Already Thomas Morus advertized his novel of 1516 describing the discovery of the island Utopia as edifying entertainment. Popular interest in his spatial and political Utopia was especially nourished by recent advances in colonialisation, which made it possible to discover, or better yet, to install an ideal state. The essential tools for colonisation existed since antiquity. Hippodomas of Milet used the grid to base the Greek colonies on a gridded ground plan of clear spatial orientation and good ventilation. The grid also assured easy control and fast mobilization for the military camps of the Roman Empire.

On Morus` island Utopia, the capital city "Amaurotum" is built on an orthogonal matrix that could easily be multiplied 54 times (as the novel suggests), or even endlessly (fig. 1). The houses of Utopia, clustered in rectangular building sites like objects in the grid, are temporary dwellings for changing users: every ten years a housing lottery takes place and forces the inhabitants to move. The dwelling in Utopia becomes a transitory space in no-where. Morus´ Utopia is an efficient model of a modular and serial city.

In this grid of eternal return citizens, soldiers, and goods become addressable even in the no-where. The address precedes presence: intersections and quadrants can be determined numerically, local information can be transmitted and administered. The grid as utopian pattern of unconditional rationality, perfect bureaucracy, total knowledge, and clear spatial order guarantees uniformity in difference, and repetition in variation. It becomes the foundational model of numerous utopian cities: the gridded plan can also be found in Albrecht Dürers´ design of the ideal city from 1527 (fig. 2), in the realized masterplan of Freudenstadt (plan by Heinrich Schickhard



1 | *Scheme of Morus' city "Amaurotum", 1996*

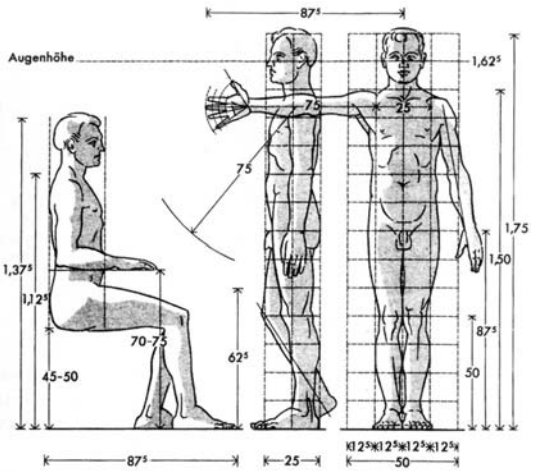


2 | *Albrecht Dürer, Idealstadt, 1527*

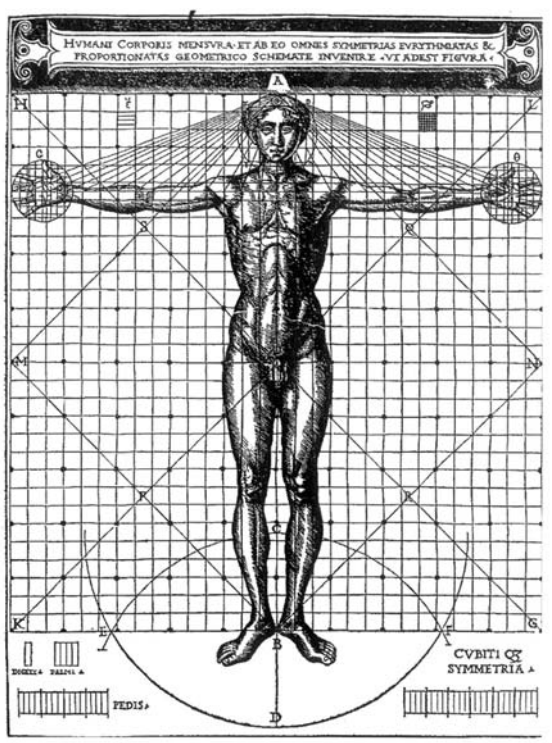
1599) and in the utopian novel "Christianopolis" of the theologian Johan Valentien Andrae 1619. Four years earlier Vincenzo Scamozzi had developed an urban design based on his "idea of an universal architecture". By means of geometrical analysis he inscribed the building grid of his ideal city "Palmanova" into the circular fortification surrounding it.

Scamozzis project recalls another type of ideal constructions based on the grid: the construction of the ideal human body. In the renaissance, the human body as a modularized ideal for the symmetrical proportions in architectural harmony came into the focus of artists and architects. Leonardo da Vinci bestowed on Vitruvius´ proof of the compatibility of geometrical symmetry and proportion with the human body an enduring elegance: through perfect idealization the human body can be inscribed equally into circle and square[2] (fig. 3). Like a piece of land, the human body could be divided and measured to fit the square grid and thus to serve as scaleable template for the proportioning of groundplans and facades in the design of buildings. As a gridded model, the human body is transfered through the scaling operation of the divider (Filarete), or by the exact projection of the drawing – machine (Dürer). The ideal of an "individual" man in the renaissance becomes the ideal of a measured and "standardized" man.

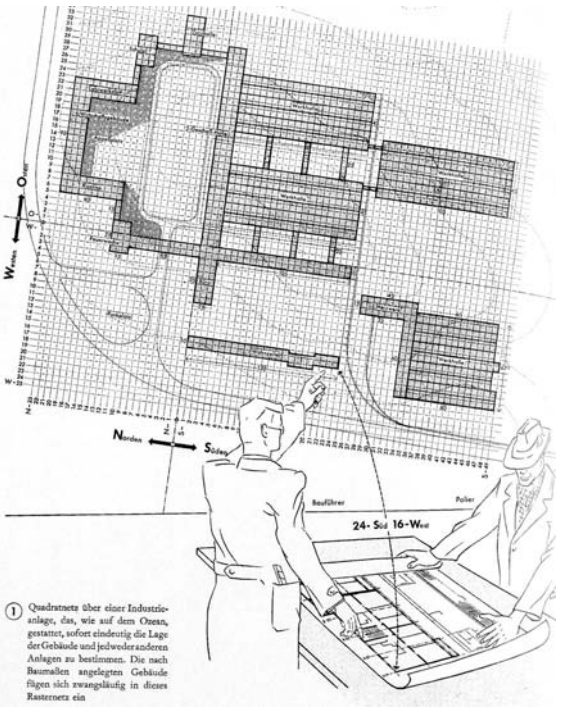
With his gridded man, Vitruvius searched for an ideal measure for proportions in architectural design and used the male foot as modular unit. In the 20th Century the architect Ernst Neufert brought Vitruvius' search to its rightful culmination by positing the foot as the standard measure for the industrial brick size. In reference to Vitruv and anthropometrics Neufert developed a system of building measurements (Baumaß-System), which combine decimal and duodecimal system and uses a basic measuring unit of 1,25 meter. With this so called "Oktametersystem" (fig. 4) Neufert was able to relate architectural measures such as room heights and brick sizes (25 cm x 12,5 cm) with the average man (175 cm) in an efficient system of convertibility. In 1942, this "Baumaß-System" was



4 | *Ernst Neufert, The propotions of man in the "Oktametermaß", 1943*



3 | *Homo ad quadratum in geometrical fragmentation, 1521*



5 | *Ernst Neufert, groundplan of an industrial komplex based on the measured grid of 2 IBA, 1936*

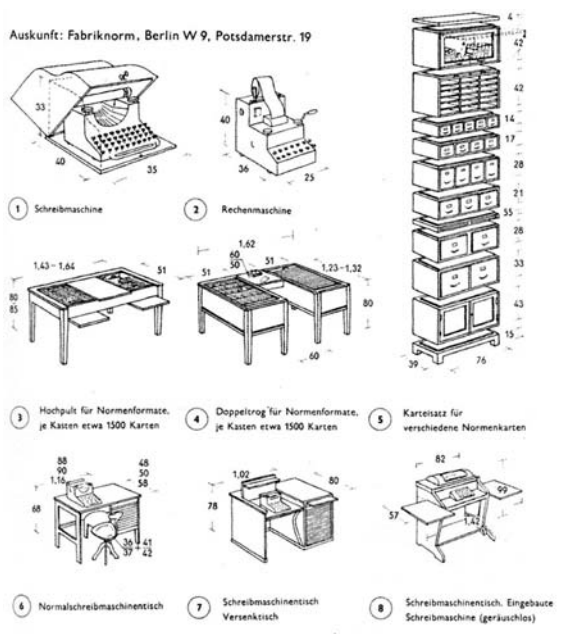
standardized 1942 as as a universal industrial norm, the "Industriebaumaß" (IBA) and was fixed as DIN 4171 (fig. 5). Its resulting basic grid of 2,50 m is the basis for planning and constructing industrial buildings until today. Neufert's *Bauentwurfslehre* prescribed measure with which exponents of modernism sought to, master space: "… das Maß wird Herr, das Chaos gezwungen, Form zu werden: logisch, unzweideutig, Mathematik, Gesetz."[3] wrote Ludwig Hilbersheimer in his *Großstadtarchitektur* of 1927 and found confirmation in Neufert's project and in the establishment of the DIN-standards only few years later.[4]

Since Neuferts *Bauentwurfslehre*, published in 1936, architectural design starts with the "schematic drawing of rooms as simple rectangles with the required surface area on a uniform scale ..."[5] With the efficient gridding of the ground plan not only measured space and building elements but every object in space could be standardized and arithmetized in a combinatory system of identical units: everything located in the built environment, from brick to the human body, from the cradle to the airport – whether standing, going, rolling or flying – every object could be measured and put into a unified spatial grid, into an orthogonal scheme that allows proportions to be visualized (fig. 6).

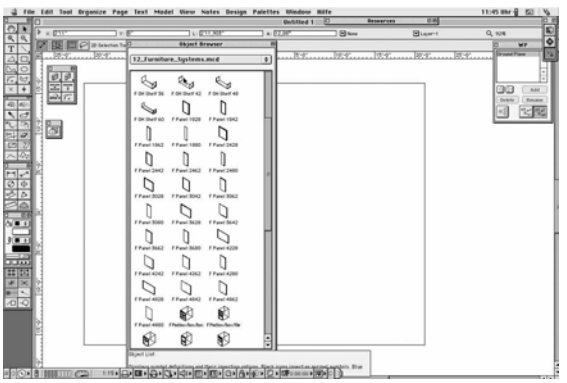
Walter Gropius played quite an important role in the career of Ernst Neufert: he was his teacher at the Bauhaus in Weimar and later his employer. And he supported together with the German "Normungsausschuss" the publication of Neufert's *Bauentwurfslehre*. Already in 1910 Gropius wrote about the design of "industrial mass-production": "Of objects there exists a choice of designs in different execution and pricing level, but in identical size. All parts fit without exception since they have been produced according to one and the same normed size, and thus can be exchanged at will. The builder now can compose a house after his own personal taste drom this wealth of material and diverse forms."[6] With his "Program for the foundation of a universal building company on an artistic uniform basis"[7] – Gropius developed a concept, that allowed for the substitution of the architect by a program. The presupposition of this program was,however, that the best proportions for all building elements was ascertained and established, which then could figure as "standard sizes" for temporary and future designs.

Neufert estabished the measured grid as the computing basis for the most efficient proportions through which henceforth architecture-ideal, universal, and utopian could be made real local, and particular through the axial measures of built realities. Neufert visualized this program with a library of spaces and spatial objects, which contains our whole living world. The objects of this library had to be put into and snapped to the grid. Remarkably, this can be done by architects, as well as by building owners, players and computers. Space-units, building-elements, furniture, even the human body become in modernity and in the object-libraries of Ernst Neufert, objects of CAD-software and strategy-games for the representation of "optimal size proportions" resp. of "standard sizes" (fig. 7).

1936, when the *Bauentwurfslehre* was published, Konrad Zuse constructed in Berlin the first computer, and Alan Turing developed the mathematical model of a universal and discret machine; both contributed to the computability of the life-world. Turing's machine could solve every decidable problem in finite time (and without human help) with a certain number of elements and a certain number of clearly defined rules for the combination of those elements. One could say that the elements and rules gain with Ernst Neufert defini-



6 | *Ernst Neufert, office buildings and tools, 1936*



7 | *Office furniture system in the object library of the CAD software "Vector Works", 2002*

tion sharpness, and that Konrad Zuse's concrete (and not only mathematical) machine could compute with those elements every solvable architectural problem in finite time. With the development of the computer as a universal medium, the graphic interface becomes a bridge (already visible in Neufert's project) between abstract numbers (coordinates and measures) and spatial-pictorial description. The visualization of numeric data generates for Neufert, and still in today's specific software, the objects that constitute idealized, standarized and virtual worlds.

Konrad Zuse, the ingenious engineer, created with the computer that vehicle that allowes since the beginning of utopian fiction the entrance to the idealized and virtual worlds: in the literature of the 16th century this was simply a ship, at the beginning of science fiction in the 19th century it was e.g. a time-machine or another highly developed technical instrument, that mostly ingenious engineers knew how to construct. Since the ninties of the 20th century, the computer allows us entrance to the promised worlds, to the ideal cities and global villages: "We look forward to starting this journey with you. Welcome!" Luc Barthelet (Senior VP, Maxis) invites us confidential to the promising sphere of action of *The Sims*: "... The Sims Online is an online world where the Sims are real. You get to be yourself or whoever you want to be. In this world you have your own piece of land to do with as you please. So, you can create a house ... .or whatever else you can imagine ... . The Sims Online is a massive online world that you can access at any time. ... Everything that you buy, build or create will be there when you return." The city of "Sims-online" is, similar to the houses of utopia, a transitional place with temporary inhabitants who do not change house every ten years but change daily their presence in the virtual community (leave daily or maybe forever).[8] Will Wright "the creator of SimCity™ and The Sims™" developed with this software the generator of a virtual world that in its constructive protocols has conspicuous similarities with the first concepts of utopian, ideal and modern cities. "Sims-Lane" emerges as utopian and virtual city-model from the orthogonal matrix in no-where, where Morus, Andrae, Dürer, etc. founded their ideal states and urban concepts (fig. 8).

The Sims is based, like most strategy games and CAD-software, on object – libraries that offer the material to settle down and furnish new homes in a cosy manner (fig. 9). The promise "to build your dream house" or "whatever you can imagine" suggests the possibility of free decision, which in reality is circumscribed by the limits of the object library and the fixed constructive grid. What does it therefore mean: "to be yourself or whoever you want to be"? What is the basis of this promising

8 | *menu-bar in the game "The Sims" with tools for construction*

9 | *The city site "Sims Lane" at the beginning of the game "The Sims"*

10 | *visualized grid with vitual housing model*

11 | *The interior of a given housing model*

new identity, of the architectural design of our dream house or the personal construction of our avatar named SIM?

Grid and standard (norm) provide the basis on which every player may construct his or her identity out of a range of prefabricated elements (fig. 10). Not only does the limited assortment of objects produce formal borders-the programming of the game imposes strict rules. Just to give you an example: after I finished furnishing my new virtual home by using the Bauhaus-furniture on offer, I, as design-oriented player, found myself confronted with the sudden deep depressions of my SIMS – I had to realize that one could stop those depressions only by taking the modern furniture away and replace it with flowered and ornamented items. Obviously, the psychology inherent in the program favors kitschy puppet-architecture. The individual design of the virtual home in the brave new Sims community becomes the kitsch – dictate of a programmer, who direct the design of the life-world as rigorously as Walt Disney inc. regulates the color of the curtains in their gated communities (fig. 11).

Idealized space and idealized body are since antiquity rationally dissected and then reconstructed as calculable medium. Anthropometrics reduces space and body to a common denominator: Through idealization and (beginning with the 19th century) standardization modularization of cities and bodies becomes constructive. Body, space, city, and gridded plan form a computable structure in which every element is calculable, adressable and, consequently, exchangeable.

There´s one matrix on which colonies, utopian and ideal cities, and virtual communities easily settle: the grid. It is not only the spatial foundation for the no-where (ou-topos) or the good-place (eu-topos) of Utopia, but at the same time the structure or routine for idealization, measurement, fragmentation, modularisation, standardization, repetition and, last but not least, the routine for the interface of the drawing machines of the 15th century as well as of computer software today. Copy and paste are the operations that allow the creation of virtual places no matter where and no matter for whom. This abstract method has to proceed from more or less neutral objects and elements, which share modularized standards and are flexible to combine.

The combination of grid an object library in architetrural planning originates in Neufert's *Bauentwurfslehre* and becomes the program that Walter Gropius had propagated: with a unequivocally defined finite number of elements a machine can combine these elements with finite possibilities. This combination, which represents today in the planning software (and the game of *the SIMS* e.g.) the "handiwork" of artists, architects, building owners and is strictly speaking an achievement of computing that groups measured objects in measured spaces in optimized distances. This way of spatial planning became possible with the grid, with the standardization and with Ernst Neufert.

With the breakthrough of object-oriented software, which unburdens players as well as architects from the labor of programming, a tool is given that forces the user to operate in specific modi and seduces him or her to minimize – for simplicity's sake – the own formal vocabulary in respect to the menu-bar. Form and content are no longer spontaneous artistic expressions in virtual space, but depend on technical knowledge, that gives access to artistic liberty in the first place. Discourses about architectural design and individuality are consequently based on media-technical conditions. The possibilities and prohibitions of discourse have to be discussed on two levels, the aesthetic and the technical. If not, precision, calculability, order and reproducibility may generate a "plan as dictator" as Le Corbusier in his *plan voisin* once euphorically proclaimed.

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Notes:

1 See also: Annett Zinsmeister (ed.): *Constructing Utopian – Konstruktionen künstlerischer Welten*, Berlin 2004.

2 Fragmentation of man (as measure of all things) in anthropometrical modules (later: Francesco die Giorgio Martini, Dürer) Frings, Marcus: *Mensch und Maß. Antropomorphe Elemente in der Architekturtheorie des Quattrocento*, Weimar, 1998; Naredi-Rainer, Paul von: *Architektur und Harmonie*, Köln, 1982.

3 "The measure becomes the master, the chaos is forced to become form; logically, definitem mathematics, law." Ludwig Hilberseimer: *Großstadtarchitektur*, Stuttgart, 1927, p. 103.

4 Fortunately Neufert's attempt failed to include an obligatory measure through with the edition of the *Bauordnungslehre* 1942. Anyhow: from the beginning of the economization of planning it is obvious that an universal measure of uniformity deals with the absolute reduction of possibilities.

5 Neufert, Ernst: *Bauentwurfslehre* in: Prigge, Walter: *Ernst Neufert. Normierte Baukultur*, Frankfurt/Main, 1999, p. 10.

6 Gropius, Walter: *Programm zur Gründung einer allgemeinen Hausbaugesellschaft auf künstlerisch einheitlicher Grundlage m.b.H.*, 1910 in: Probst, Schädlich (Hg): *Walter Gropius*, Bd. 3, Berlin, 1987.

7 "Programm zur Gründung einer allgemeinen Hausbaugesellschaft auf künstlerisch einheitlicher Grundlage m.b.H."

8 The behaviour of the future in habitants of the SIM online community couldn#t be evaluated statistically yet, consequently it is still an interesting question, what will happen with abandoned virtual houses of players who will stop the game, because they are just bored ... .For sure the programmers did not calculated the "value of ruins" of these virtual buildings.

Credits:

1 Refering to Gerd de Bruyn: *Die Diktatur der Philanthropen*, 1996.

2 Albrecht Dürer in: *Etliche Underricht zu Befestigung der Stett, Schloss und Flecken*, Nürnberg 1527. Bibliotheque Nationale de France, Réserve des imprimés Paris.

3 Vitruv edition,1521.

4 Ernst Neufert: *Bauordnungslehre,* 1943.

5, 6 Ernst Neufert: *Bauentwurfslehre,* 1936.

7 Annett Zinsmeister, Screenshot of CAD-Software Vector Works, 2002.

8–11 Annett Zinsmeister, Screenshot of the computer game "The Sims", 2002.