Human health in the urban environment

Taeke M. de Jong, 2008-01-26, using Jong (2004)[a], Jong (2007)[b] pages 488-490, and Jong (2007)[c].

CONTENTS

---

[a] Jong, T.M. de (2004) *The Ecology of Health in regional perspective.* **In:** *Proceedings of the 2nd WHO International Housing and Health Symposium* (Vilnius, Lithuana) WHO European Centre for Environment and Health (Bonn Office); 528 t/m 539

[b] Jong, T.M. de; Akker, C. van den; Bruin, D de; M.J., Moens.; Steenbergen, C.M.; Toorn, M.W.M. van den [eds.] (2007) *Sun, wind, water, earth, life and living; legends for design.* (Delft) TUD, Faculteit Bouwkunde, Publicatiebureau

[c] Jong, T.M. de (2007) *Spatial human rights.* **In:** Rosemann, Jürgen [ed.] *Permacity* (Delft) Delft University of Technology http://team.bk.tudelft.nl/ > Publications 2007; 53-57 with an extended version Jong, T.M. de (2007) *Density, distribution, competition on space calibrated to spatial rights.* (Zoetermeer) http://team.bk.tudelft.nl/ > Publications 2007

Living in high densities

Being no expert on human health the most extensive overview I know in the joint field of medicine and urbanism is edited by Vogler and Kuhn (1957)[a] ample 50 years ago. They discuss many kinds of 'civilisation damage' in the urban environment from different medical specialist's points of view. I never found a reference into this comprehensive work and I can understand it considering its size and age. So, I recoil from reviewing it as well, the more so while I am not read up on more recent medical literature. Apart from the disadvantages of living in high densities Vogler and Kuhn emphasise, its benefits Jacobs (1961)[b] some years later referred to were partly confirmed in a psychological sense.

Crowding

Freedman (1975)[c]; Freedman (1977)[d] and Baum (1978)[e] discussed research on crowding and behaviour concluding no other impact of increasing density than intensifying existing negative or positive social-psychological processes. However, by human biodiversity or social diversity - stage in the lifecycle, income or life style - some people like to live in high densities, others do not. People with children mostly like low densities of quiet suburbs. So, forced to live in high densities the impact could be primarily negative. However, learning to live in high densities with children might turn out positive by discovering advantages, adapting, compensating shortages and accommodating new functions.

Adaptation and compensation

Adapting to an environment and compensating shortages by new accommodations are essential characteristics of life. Life would never have developed without these capacities. The possibility of adaptation and compensation are often forgotten by researchers only interested in forecasting. 'Arsenic is poisonous', they predict. The prediction is based on 3x standard deviation from the average (99.7% of the cases) and if arsenic poison would be ever a global problem their solution would be removing the cause only. But in Styria (Steiermark) in Austria a village population of so called 'arsenic eaters'[f] probably got used to it. That is the way evolution solved problems by adaptation and compensation increasing diversity, not by global rules reducing diversity. Oxygen was once a global poison, now it is a prerequisite for aerobic life. Adapting, compensating and accommodating are also ways designers study. When low temperature is a problem of living in higher latitudes we compensate (accommodate) by building acclimatised houses. It is unnatural because it disturbs the natural distribution and abundance of homo sapiens. But since we make houses more than 3000 years it appears natural to us. What we call 'natural' apparently is time scale sensitive as well.

Housing

Urbanism has come into being by the hygienistic movement in the 19th century[g], resulting in public health care[h], sewage systems and the housing act of 1901. Housing is still an important factor in human health, part of the 'Duurzaam bouwen' movement not to be elaborated here and the envirionmental policy.

Environment

Environmental policy is mainly occupied by pollution threating human health and biodiversity. The national institute of public health and environment in Bilthoven (RIVM) controlls food, medicines, public health and environment. It houses the governmental planning bureaus for environment and nature (MNP), recently connected with the planning bureau for spatial development (RPB). Its databases in

---

[a] Vogler, P. and E. Kuhn, Eds. (1957) Medizin und Städtebau. Ein Handbuch fur gesundheitlichen Stadtebau (Munchen, Berlin, Wien) Verlag von Urban & Schwarzenberg.
[b] Jacobs, J. (1961) Death and Life of Great American Cities (New York) Random House.
[c] Freedman, J. L. (1975) Crowding and behavior (San Francisco) W.H.Freeman and Company.
[d] Freedman, J. L. (1977) Psychologie en overbevolking (Utrecht / Antwerpen) Het Spectrum ISBN 90-274-5350-0.
[e] Baum, A. and Y. M. Epstein, Eds. (1978). Human response to Crowding. (Hillsdale, New Jersey) Lawrence Erlbaum Associates, Publishers.
[f] http://adsabs.harvard.edu/abs/1927SciMo..25..246H
http://64.233.183.104/search?q=cache:SrytgsHEWacJ:www.dartmouth.edu/~toxmetal/TXSHas.htm+arsenic+eaters&hl=nl&ct=clnk&cd=1
[g] Cohen, Levi Ali [ed.] (1872) *Handboek der openbare gezondheidsregeling en der geneeskundige politie met het oog op de behoeften en de wetgeving van Nederland* (Groningen) J.B. Wolters
[h] Houwaart (1991) De hygienisten. Artsen, staat & volksgezondheid in Nederland 1840-1890 (Groningen) Historische Uitgeverij Groningen

all these fields are very complete. For an overview of Dutch environmental policy, I refer to Jong(2007)[a].

Regional differences in health

A 2005 survey into medicine use shows that the most well-to-do sandy region 'Gooi' has the lowest use of medicines in The Netherlands (Fig. 1). Insurance companies could decrease their rates for these groups in the same time increasing their wealth (and health). But to which extend Gooi-people owe their health to wealth and life style, to lower housing density, to green area in their direct neighbourhood, dry sandy soil or climate we do not know.

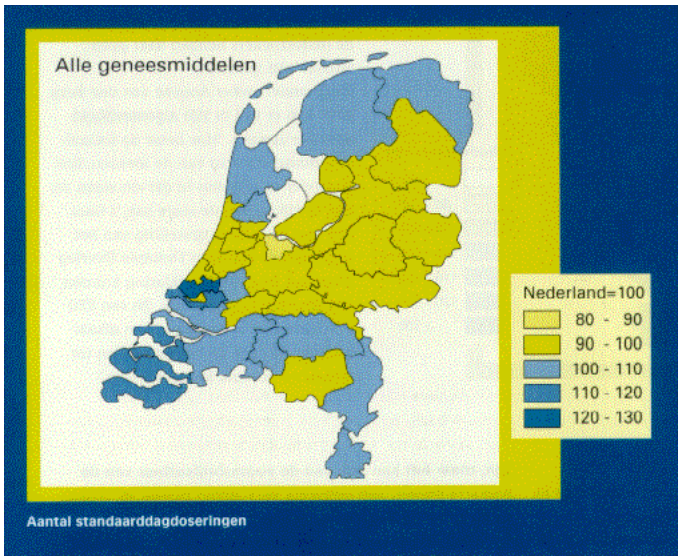

Fig. 1 *Use of medicines*[b]

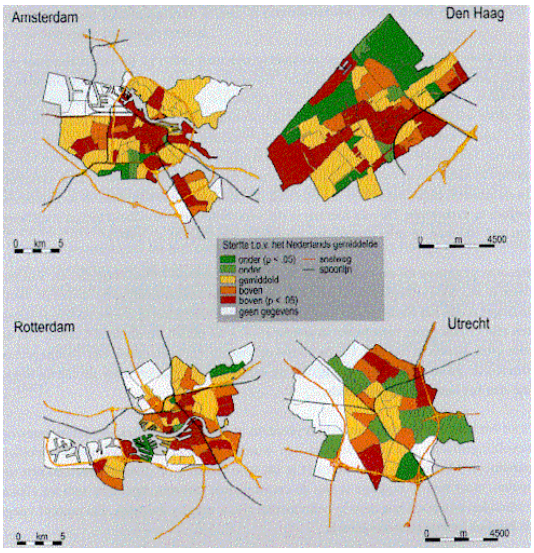

Fig. 2 *Differences in death rates*[c]

Local differences in health

Death rates in the big towns in the nineties were 11% higher than elsewhere in The Netherlands and there are substantial health differences between and within towns (Fig. 2). However, they correlate highly with income differences causing different (un)healthy lifestyles. For example they indicate that in a low-income district the chance to die before the age of 65 is 50% higher than in a high-income district. And rich people move from low-income wet peat and clay districts into high-income sandy districts leaving a less healthy population behind.

Causes of collective disease

Epidemiological research seldom succeeds in convincingly separating causal physical context factors like the urban environment from other coinciding influences affecting health.
The surveyors did not try to explain either comparing regions of The Netherlands because epidemiological research is one of the most tricky disciplines urging expensive longitudinal research extending decades to be convincing. That is a great pity, because as long as statistical evidence fails an even more tricky branch of statistics wins: risk calculation. Risk calculation seems rational, but often it is also the calculation of fears and myths motivated by little more than sharing them in collective fear.

Contributions by design?

Urban design is not always the most effective solution in environmental problems remaining after the great positive health effect of housing itself. Barton and Tsourou (2000)[d] advise 12 key health objectives for urban planners in the context of WHO healthy city project in which Eindhoven participates: healthy lifestyles, social cohesion, housing quality, access to work, accessibility, local

[a] Jong, T.M. de; Akker, C. van den; Bruin, D de; M.J., Moens.; Steenbergen, C.M.; Toorn, M.W.M. van den [eds.] (2007) *Sun, wind, water, earth, life and living; legends for design.* (Delft) TUD, Faculteit Bouwkunde, Publicatiebureau page 620-654
[b] Batenburg-Eddes, T. v. and A. v. d. Berg-Jeths (2002) Slikken in Nederland (Bilthoven) RIVM rapportnummer 270556005.
[c] Garretsen, H. F. L. and H. Raat (1989) Gezondheid in de vier grote steden ('s-Gravenhage) SDU uitgeverij.
[d] Barton, H. and C. Tsourou (2000) Healthy Urban Planning (London) Spon Press ISBN 0-415-24326-2 hbk; 0-415-24327 pbk.

low-input food production, safety, equity, air quality and aesthetics, water and sanitation quality, quality of land and mineral resources, climate stability. Evaluating their effectiveness again would urge expensive longitudinal research extending decades to be scientifically convincing.
The more we know, the more possible threads we become aware of to be calculated. That raises fear and fear raises stress. Stress is suspect in raising or stimulating diseases like cancer. Fear for cancer is so well-known a medical symptom that it got its own name in medical vocabularies: 'carcinophobia'. Designers in the wake of this uncertainty already try to make solutions for possible problems. That is their task, but they seldom evaluate the effectiveness and possible side-effects of their solutions.

Too many medicines and hygiene

Avoiding any risk physicians prescribe too many medicines, order too many physical examinations increasing the costs of medical care, increasing slowly appearing side effects. Avoiding any risk raises new risks on other levels of scale. Always avoiding to catch a cold may result in high susceptibility for flu any time we leave a building or a car. Our hygiene drove life out and nature in exile. Our biological resistance fades, the number of immunity deficiency diseases increases. We do not get injuries enough to become vaccinated by nature itself. We like dangerous holydays to flee from our unnatural and boring safety, but we do not know real danger anymore and fall ill by foreign food.

Hidden side-effects of medicines

Suppose a new medicine is accepted because it heals a specific disease in 99 from 100 persons, but because everyone reacts different in any of them it causes different kinds of side-effects. Side-effects with enough statistical mass to indicate the new medicine as a cause are described in the instruction leaflet. But what about side-effects not reaching a statistical mass in the diversity of medicated people? The unfortunate client comes back to the doctor with severe symptoms, but the doctor can not conclude the earlier medicine to be the cause and gives another medicine with unpredictable side-effects. And so on. In that case the medical discipline would create its own work. Consulting a doctor would give as much chance to immediate health as to illness later, giving however a little improvement of life expectancy.

Extended life-expectancy by medicine?

McKeown (1976)[a] already doubted the supposed positive impact of medical care on life expectancy but he did not yet take the above argument into account. He argued that the main improvements of life expectancy historically appeared before important medical innovations. So, these improvements could not be explained by medical care. They should be explained by improved hygiene, working and housing conditions and food. His statement has disturbed medical science until now[b].

Exceptional occurrences magnified by publicity

In the same time exceptional occurrences are magnified by television and newspapers. Television and newspapers bomb us by statistical exceptions, distorting our perception of chance and magnifying impact. Risk is popularly defined by chance x impact. The public shame of few physicians involved intimidates the profession as a whole. And we still know little about our body, our own nature yet. Honest physicians remain silent but that is what frightens more. Avoiding any risk physicians prescribe too many medicines, order too many physical examinations increasing the costs of medical care, increasing slowly appearing side effects. There is something wrong in the state of medicine. King Average rules the kingdom of exceptions human species comprises.

Living with life: living with the risk to die

Avoiding one risk raises new risks on other levels of scale is space or time. Always avoiding to catch a cold may result in high susceptibility for flu any time we leave a building or a car. Our hygiene drove life out and nature in exile. Our biological resistance fades, the number of immunity deficiency diseases increases. We do not get injuries enough to become vaccinated by nature itself. We like dangerous holydays to flee from our unnatural and boring safety, but we do not know real danger anymore and fall ill by foreign food.

Insurance companies sell fear. We pay more for safety than for anything else: insurance, police, army, preventing fire, burglary and catching a cold. We fear we can not pay all and we double our work until

[a] McKeown, Th.F. (1976) *The role of medicine: dream, mirage or nemesis* (London) Nuffield Provincial Hospitals Trust
[b] Mackenbach, J.P. (2004) *Hoe belangrijk zijn innovaties in de gezondheidszorg geweest voor verbeteringen van de volksgezondheid?* **In:** Mackenbach, J.P.; et al. [eds.] *Volksgezondheid gedetermineerd.* (Zutphen) Walburg Pers

we die from the impacts of stress. The life time we spend on worry is lost well-being, lost health and life time. Our fear for exceptional possibilities raises new diseases of the mind and we fear them as well. In reality our life is safer then ever, but we do not dare to live with life: the risk to die. Life became strange to us and death as well, we fear the unfamiliar because it could be unhygienic.

Avoiding risks may be risky

There is something rotten in the state of medicine. King Average rules the kingdom of exceptions human species comprises, but in the same time exceptional occurrences are magnified by television and newspapers. Television and newspapers bomb us by statistical exceptions, distorting our perception of chance and magnifying impact. Risk is popularly defined by chance x impact. The public shame of few physicians involved intimidates the profession as a whole. And we still know little about our body, our own nature yet. Honest physicians remain silent but that is what frightens more.

The unfamiliar diversity of unknown life

In the mean time numerous other organisms are going their own way, not fearing for anything that is not actual and mostly without any apparent fearing at all. They live from very slow to very fast.
I prefer the slow living plants surrounded by their very fast pairing messengers of life-experience, the insects. Plants are the basis of life's pyramid. Added animal life only selects and regulates like man does as well by harvesting, preserving, mowing and gardening. Sometimes we visit them and walk in something totally else we belong to historically but do not have to understand, something we should not try to plan.

A reference environment

For millions of years, human characteristics have been tuned to the natural environment in which people had to survive (adaptation). Therefore, it is useful to acquaint oneself with this 'reference' environment as such, and, now and then, to allow this nature to be the tutor of architectural (and mechanical engineering) forms. Even in the most advanced studies into the development of autonomous robots, the mechanics of insects are attentively observed. Also in the other development that is thought to be important for the future — biotechnology — nature is often 'the tutor of art'.
In the history of human origins (anthropogenesis)[a] , human adaptation and environmental determination have played a major role. Approximately 6 million years ago, due to climatic and environmental changes in Africa, *Homo habilis* exchanged a forest habitat for savanna. Approximately 2 million years ago, *Homo erectus* developed from this animal. In turn, different human-like animals developed from this creature and later became extinct. Fifty thousand years ago only two of these species remained, the Neandertalers and *Homo sapiens sapiens.* The Neandertalers became extinct at this time, leaving *Homo sapiens sapiens* as the sole survivor. For approximately 1 million years, this species' use of tools has served as a criterium to demarcate humanity: the capacity to oversee a series of acts of which only the first (e.g. the making of tools) can be carried out immediately.

Human abilities to challenge by design

The origins of the human race, preceding *Homo habilis*, has produced a large number of ergonomically interesting 'aboreal pre-adaptations' (adaptations to the former forest environment), such as the ability to grasp with the hands, stereoscopic vision, upright posture, the production of a limited number of offspring at each pregnancy, a lengthy up-bringing of the offspring, etc. The tropical rain forest is then by no means as frightening as is it is made out to be. It is a fantastic experience to cut a path for oneself through this twilit environment: it feels as though one is returning home after 6 million years. All the senses are stimulated in a changing, yet balanced, way. One can seldom see further than 100 metres ahead and is constantly obliged to focus the eyes on objects both nearby and further away. Moreover, it is an environment similar to a Gothic cathedral: full of vertical light-seeking pilasters, in which, occasionally, the sun festively forces its way to the bottom. This demands continuous attentiveness, but, on the other hand, the senses seldom become overloaded.
In this century, we are witnessing the clearance of the last primitive forest peoples and their culture and habitat. Nevertheless, a cultural-ecological study of these communities that are so closely linked with our reference environment could be of importance for future urban design.

---

[a] The views on anthropogenesis are changing. This view is an older one derived from Harrison, G. A., J. S. Weiner, et al. (1964) *Human Biology* (Oxford) The Clarendon Press in Dutch translation: Harrison, G. A., J. S. Weiner, et al. (1970) *Biologie van de mens* (Utrecht/Antwerpen) Het Spectrum N.V. More recent insights are summarised in: Diamond, Jared (1997) *Guns, Germs, and steel, The Fates of Human Societies* (New York/London) W.W.Norton & Company, translated in Dutch as Diamond, Jared (2000) *Zwaarden, paarden en ziektekiemen; Waarom Europeanen en Aziaten de wereld domineren* (Utrecht) Het Spectrum B.V. This book is an excellent introduction into historical human ecology.

The transition from forest dwelling to life on the flat savanna lands must have made the eyes lazy, but the hands and the head more diligent. It is particularly these border environments where people seek cover and where they build their own protective shelters.

Urban living

The biggest mass migration ever was the movement from the country-side to the towns that resulted from the Industrial Revolution. The spatial and social consequences of that process are summarised under the term 'urbanisation'. A progressive division between production, exchange and consumption (working, transport, living and recreation) has taken place, both in space and time, so that monofunctional spaces and *interfunctional activities* (activities that are only useful within a series of activities) have come into existence. This division of functions does not only take place between households, but also on the level of the individual households themselves. For everyone, there is a separate time for living, working and enjoying recreation. The household is losing its traditional functions such as providing training, religion, assurance and by that size and coherence.
How people spend their time gives a good indication of their daily lives and their use of space. Less and less time is needed to sustain life. Apes and people who currently live at subsistence level, and many households in the past, need(ed) to spend 40% of their time on that. Nowadays, by dividing tasks, we only spend approximately 8% of our time earning our daily bread, if one includes children, pensioners and others exempt from paid employment.

Civilisation damage

The fact, that communities whose main activities are unrelated to the environment to which they have become attuned in the course of their history, can lead to long-term, unbalanced, over- (or under) stress in the organism. Insufficient adaptation to this stress causes lop-sized development. For example, one can wonder why hardly anyone has perfect teeth or cannot see clearly, without artificial aids, by his fiftieth birthday.

Living in closer proximity to others increases the risks of spreading infectious deseases, anonimity, loss of social control and new forms of criminality, even though according to Freedman (1975)[a] the psychic effects appear not to be too adverse. A new biological tendency has come into existence that causes isolation, strongly polarising life into public and private spaces as Bahrdt (1957)[b] already described. Accommodating to abnormal climates also sets physical demands on this isolation. The resulting 'inner environments' not only become a new habitat for humans, but also for birds, rats, mice, fleas, mites, fungi, bacteria, pets and house plants (Reumer, 2000)[c]. Asthma, as the third largest cause of death after cancer, heart and vascular disease, is a problem mainly in temperate climates.

Sensoric and motoric deprivation

In addition to physical illnesses, there are also psychiatric disorders that can be linked with the new living environment, such as more frequent instances of schizophrenia in inner cities, although the cause can also be said to lie in the attraction of inner city areas for sufferers of schizophrenia[d].
Although many tests have been carried out on sensoric deprivation[e] (the lack of sensory stimuli)[f], one should perhaps talk instead of 'motoric deprivation'in the modern urban environment, in other words, the lack of accompanying motoric sensations from the muscles, and, more generally, the awareness of one's own body and thereby of non-fictitious 'reality'.

The time spent in the car, in front of a television screen, at a sports competition arouses all sorts of sensoric emotions which have no logical motoric counterpart causing obesity. Stresses cannot be

---

[a] Freedman, Jonathan L. (1975) *Crowding and behavior* (San Francisco) W.H.Freeman and Company
[b] Bahrdt, Hans Paul (1957) *Die Moderne Gross-Stadt.* (Tübingen)
Bahrdt, H.P. (1957) *Wie natürlich ist der Mensch? / Organische Städtebaukunst* Die Moderne Gross-Stadt. (Tübingen): 110, 111
[c] Reumer, J.W.F. (2000) *Stadsecologie; de stedelijke omgeving als ecosysteem* (Rotterdam) Natuurmuseum; Stadsecologische reeks
[d] The occurrence of special diseases like schizophrenia in special parts of the city is registered in the years '70 by the GGD of Rotterdam. A two-sided causality appeared. The environment not only caused disease, but selected the immigration of problem cases on other characteristics like income.
[e] Bowlby, John; Ainsworth, Mary D. Salter; World Health Organization. (1966) *Maternal care and mental health* (New York,) Schocken Books
Vernon, J.A. (1963) Inside the black room, studies of sensory deprivation (London) Penguin
[f] Sensory deprivation, the reaction on lack of stimuli is often experimentally examined. See for a short review of the research until 1978: Jong, T. M. d. (1978) Milieudifferentiatie; Een Fundamenteel Onderzoek Faculty of Architecture (Delft) Delft University of Technology or Jong, T. M. d. (1988) Milieudifferentiatie (Delft) DUT Faculteit Bouwkunde.

resolved motorically by delay of physical exertion. This is one of the causes of obesity, heart and vascular disease. Where people live in close proximity to each other and where internal spaces are fragile, the 'motoric sequel' becomes systematically suppressed, from childhood onwards. This could provide an explanation for the popularity of sport and violence. Specialisation and the division of tasks splinter the unity of life, not only spatially (this happens here, and that there), but also in time (first this, and then that). The number of interfunctional activities is growing and is laying a heavy claim on tolerance to frustration, both for individuals and groups of people.

Moreover, close proximity[a] cause natural territorial conflicts.

Costs of care

A secret medical survey I heard of by a medical student in the seventies revealed that half of our diseases at that time were iatrogeneous (caused by physicians). I do not know whether that was true or not and what the present state of medicine is in this respect. That is why I fear the worst case. Insurance companies sell fear. We pay more for safety than for anything else: insurance, police, army, preventing fire, burglary and catching a cold. We fear we can not pay all and we double our work until we die from the impacts of stress. The life time we spend on worry is lost well-being, lost health and life time. Our fear for exceptional possibilities raises new diseases of the mind and we fear them as well. In reality our life is safer than ever, but we do not dare to live with life: the risk to die. Life became strange to us and death as well, we fear the unfamiliar because it could be unhygienic.

Stress

Stress is a natural response to danger. It temporary stops body functions to reach an optimal performance for fight or flight. The digestive, neural and auto-immune systems halt and some people even hold their breath. The working conditions are an important source of stress. However just there flight and fight are legally forbidden. So stress conditions may last eight working hours or more per day. That is a unnaturally long period for stress. It demands extreme release, explaining the popularity of sports and criminality after working hours. Ecologically they are the same: flight or fight.

Stress may be an important cause of diseases like heart-attack, eczema and cancer. It also offers many starting points for design to be elaborated.

Carefree nature

In the mean time numerous other organisms are going their own way, not fearing for anything that is not actual and mostly without any apparent fearing at all. They live from very slow to very fast.
I prefer the slow living plants surrounded by their very fast pairing messengers of life-experience, the insects. Plants are the basis of life's pyramid. Added animal life only selects and regulates like man does as well by harvesting, preserving, mowing and gardening. Sometimes we visit them and walk in something totally else we belong to historically but do not have to understand, something we should not try to plan.

Releasing care

I think it stimulates human health when we bring life close to everybody's home and living, but nobody knows, it is a hypothesis. Berg, Berg et al. (2001)[b] give an overview in their essay about the relation between nature and health concerning history, possible impacts on stress, fear, physical resistance and personal growth, updated in Berg (2007)[c]. Nature puts the stressing concept of our own importance into a relative perspective of one species between 1 700 000 ones or more. They differ more from us than any people we tend to reject in social conflict. Nature tempers forced choice as architecture should do as well according to Eyck, Parin et al. (1968)[d].

---

[a] Proshansky, Harold M.; Ittelson, Wiliam H.; Rivlin, Leanne G. [eds.] (1970) *Environmental Psychology. Man and his Physical Setting* (New York) Holt, Rinehart and Winston, summarised on proximity items in Jong, Taeke M. de (1975) Ruimtelijke aspecten van de psychiatrie, een inventaris. (Rotterdam) referaat and Jong, Taeke M. de (1978) Autoriteit en territorium De As, anarcho-socialisties tijdschrift, zesde jaargang, nummer 31, both to be found in http://team.bk.tudelft.nl/ > Publications 1970-1979

[b] Berg, A. E. v. d., M. M. H. E. v. d. Berg, et al. (2001) Van buiten wordt je beter. Een essay over de relatie tussen natuur en gezondheid (Wageningen) Alterra, bijlage bij het jaarboek 2001.

[c] Berg, A. van den (2007) *Public Health* **In:** Jong, T.M. de; Dekker, J.N.M.; Posthoorn, R. [eds.] *Landscape ecology in the Dutch context: nature, town and infrastructure* (Zeist) KNNV-uitgeverij

[d] Eyck, A. E. v., P. Parin, et al. (1968) Ecology in Design / Kaleidoscope of the mind / Miracle of Moderation / Image of Ourselves (Philadelphia) Graduate School of fine arts, University of Pensylvania.

The challenge of diversity

The intellectual challenge of this century is to handle diversity instead of generalising it by statistical reduction[a]. Blinded by immediate measurable positive effects we do not have scientific instruments to count individual side-effects without statistical mass. *Generalising* research has diminishing returns for context sensitive problems. On the other hand context sensitive design is promising, *generating* study. Designers are not engaged for the average, but for context sensitive exceptions. Biological evolution and ecological succession is its model. Evolution after all makes use of exceptions surviving in a changing context. You can not understand the process of evolution by stressing the average. It stimulates an active form of modesty.

The more we know about nature the more we appear to know not, and the more we want to know, to see, to experience. In any town of The Netherlands specialised study groups of nature associations contribute to atlases of birds, butterflies, bats, amphibians, reptiles, mammals, fishes, plants and mushrooms multiplying our shrinking world of holiday destinations by growing local universes we tended to overlook. In any town nature writes a history of war and peace far more thrilling than television and newspapers could do.
Nature looks for its journalists because it only exists by the grace of those seeing it.

Some starting points for design and study

Most health aspects can not be influenced by architecture or urban design. However, the all embracing phenomenon of *stress* could be influenced by design. Besides the thrilling experiences many designers strive for, there should be places of rest and beauty as a balance between recognition and surprise not surpassing the boundaries of boredom and chaos.
A first concern could be the dispersion of green areas in the urban surface. A starting point is given in Jong (2007)[b] and its accompanying computer programme. The same publication gives attention to child perception[c] and composition analysis[d].
A second concern should be the appropriate implementation of traffing in the urban tissue.
The heritage of Boudewyn Bach summarised in his last work[e] should not be lost[f].

---

[a] Jong, T.M. de (2007) Connecting is easy, separating is difficult **In:** Jong, T.M. de; Dekker, J.N.M.; Posthoorn, R. [eds.] Landscape ecology in the Dutch context: nature, town and infrastructure (Zeist) KNNV-uitgeverij

[b] Jong, T.M. de; Akker, C. van den; Bruin, D de; M.J., Moens.; Steenbergen, C.M.; Toorn, M.W.M. van den [eds.] (2007) *Sun, wind, water, earth, life and living; legends for design.* (Delft) TUD, Faculteit Bouwkunde, Publicatiebureau pages 478 – 486.

[c] pages 676-682

[d] pages 683-686

[e] Bach, Boudewyn; Jong, T.M. de; Jong, M.I. de; Hal, E. van (2006) *Urban design and traffic / Stedenbouw en verkeer* (Ede) CROW

[f] Bach, B.; Boer, M. de; Hart, M 't (1984) *Stedelijke routevorming. Routevorming voor voetgangers en fietsers binnen stadsdelen, wijken en verblijfsgebieden.* (Delft) TH-Delft, Afdeling der Bouwkunde, Vakgroep Planologie en Stedebouwkunde

Bach, B. (1985) *Betaalbare verkeersveiligheid in woonwijken. Evaluatie prijsvraag woonwens-verkeerswens '85* (Ede) CROW, KIVI

Bach, B. (1985) *Concept 1995. Stars of stripes. Naslagwerk Verkeers- en vervoerskunde* (Delft) Technische Universiteit Delft, Faculteit Bouwkunde

Bach, B.; Hakkesteegt, P.; Radema, B.P. (1986) *Verkeerskunde. Ten behoeve van de (stede)bouwkundige planvorming (BK 104)* (Delft) TU-Delft, Fac. BK., Vakgroep Ontwerpen van Stedelijke Gebieden en Woningbouw, Werkverband Stad en Verkeer

Hakkesteegt, P.; Radema, B.P.; Bach, B. (1988) *Vervoers- & Verkeersplanologie. College Bk 105 1988-1989.* (Delft) TU-Delft, Afdeling der Bouwkunde, Werkverband Stedebouw & Verkeer

Bach, B.; Hakkesteegt, P. (1990) *Verkeerskunde & Infrastructuur voor (stede)bouwkundige* (Delft) TU-Delft, Faculteit der Bouwkunde, vakgroep

Bach, Boudewijn; Pressman, Norman (1992) *Climate-sensitive Urban Space. Concepts and Tools to Humanize Cities.* (Delft) Publicatiebureau Bouwkunde

Hoeven, Frank van der; Bach, Boudewijn (1993) *Stedebouwkundig Ontwerpen en Mobiliteit. Ontwerpaspecten, Verkeer, Vervoer en Infrastructuur* (Delft) TU-Delft Faculteit Bouwkunde

Bach, B.; Hoeven, F. van der (1994) *Stedebouwkundig ontwerpen en mobiliteit. Deel I: Wisselwerking bij stedebouwkundig ontwerpen tussen Urbanisatiepatroon en Vervoer, Verkeer en Infrastructuur.* (Delft) TU-Delft, Faculteit der Bouwkunde; art. nr. 734

Hoeven, F.D. van der; Westrik, J.A.; Bach, B. (1996) *Oostlijn. Verdichtingspotenties metrostationsgebieden Amsterdam.* (Delft) TU-Delft, Faculteit der Bouwkunde, Vakgroep Stedebouwkunde

Bach, Boudewijn; Calabrese, Luisa Maria (1999) *Bewoners verkeren in & rond De 'Zuidas'* (Amsterdam) Bewonersplatform Zuidas

Westrik, John; Hoeven, Frank van der; Rozemaijer, Sandra; Heusden, Thijs van; Bach, Boudewijn (1999) *Stedelijke dichtheden.* (Delft) TU-Delft, Faculteit Bouwkunde, Werkverband Stedebouwkundig Ontwerpen

Bach, B.; Hoeven, F. van der (2000) *Stedebouwkundig ontwerpen en mobiliteit* (Delft); art. nr. 921

Bach, B. [ed.] (2000, 1990) *Naslagwerk Verkeer en Vervoer* (Delft) Publicatiebureau Bouwkunde; Lexicon

Bach, Boudewyn; Hotze, George; Hoeven, Frank van der (2002) *Concept 2002. Duurzaam Verkeer, Mobiliteit & Stedenbouwkundig Ontwerpen. Leerstof toegespritst op de BSc & MSc.* (Delft) University of Technology Delft; The Netherlands

Hotze, George; Rooij, Remon; Bach, Boudewijn (2003) *Structuurschetsen, Planning & Ontwerp. De 'ins' en 'outs' van het maken van een structuurschets. (Concept)* (Delft) Afdeling Urbanism, Faculteit Bouwkunde , TU Delft

Palmboom, F.; Tjallingii, S.; Bach, Boudewyn; e.a. (2005) *Landscape Analysis, Water Systems and Mobility.* (Delft) TU-Delft, faculteit Bouwkunde
Tjallingii, Sybrand; Bach, Boudewijn (2003) *Water and Traffic Networks. Carrying structures urban development. Background texts to the MSc1 course Water and Traffic Networks (BkM1UO5)* (Delft) TU-Delft, Department of Urbanism
Bach, Boudewijn B.; Hoeven, Frank van der (?) *Cycle Town Houten (NL)* (Delft) Produced by Diepens and Okkema Traffic Consultans and TU-Delft