

Do you know what happened on
September 2 1850 ?

Stay tuned because I will tell you



THEME of this CONFERENCE



RENATURALIZATION OF CITIES AND THE CHALLENGES FOR REDUCING INEQUALITIES

The event is aimed to discuss public **policies**
to face **social inequalities**
and
environmental injustice

in the face of **climate change**

?

? How can you Do This ?
Where can you start

?

Remember our THEME ?

RENATURALIZATION OF CITIES

Lets start with “City/Community”
What are the main ingredients of a city ?

- Buildings
- People who live in them and together
- Infrastructure
- Energy and power to run the city
- Communication
- Building materials
- Building methods (policies, laws and building codes)

On September 2, 1850, Dr Hermann Otto Blumenau, founded the city of Blumenau

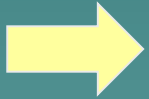
A German Pharmacist faced social inequalities, detrimental public policies and environmental injustice in his home country which just started the process of industrialization and pollution

He headed to Brazil with a vision – a goal – and with highly motivated people to begin a better life and live in a better community/city

This conference also has a vision – a goal – and you - highly motivated professionals who want to use a different approach

He and a handful of likeminded people left Germany and faced tremendous hardships to create a better live and a better city

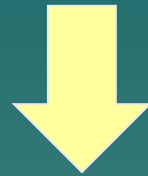
If you want to bake a cake or create a dish you never cooked or baked before – you need the right ingredients and a recipe



All you have to do now is get the ingredients and follow the recipe

Here is the recipe for healthy and sustainable buildings and therefore the beginning of a healthy city

Blumenau and for that matter every other city started with **one** building



- Healthy Buildings
- Healthy Cities
- Healthy and Happy People

Something went **Wrong** !

This is where Building Biology comes into the picture
A healthy and sustainable city starts with **ONE** building

Introduction

to the subject of
Building Biology
and
Building Ecology

What is Building-Biology?

- ◆ The study of the impact of the built environment on human health and the application of this knowledge to the construction or modification of homes and workplaces
- ◆ The holistic interaction between human life and other life forms with the environment
- ◆ **BUILDING**
(house, habitation..)
- **BIO= LIFE**
(mode of life, living...)
- **LOGY**
(order, harmony, culture, reason.....)

**THE STUDY OF THE INTERRELATIONSHIP OF LIFE
BUILDINGS and COMUNITIES**

What is Building Ecology?

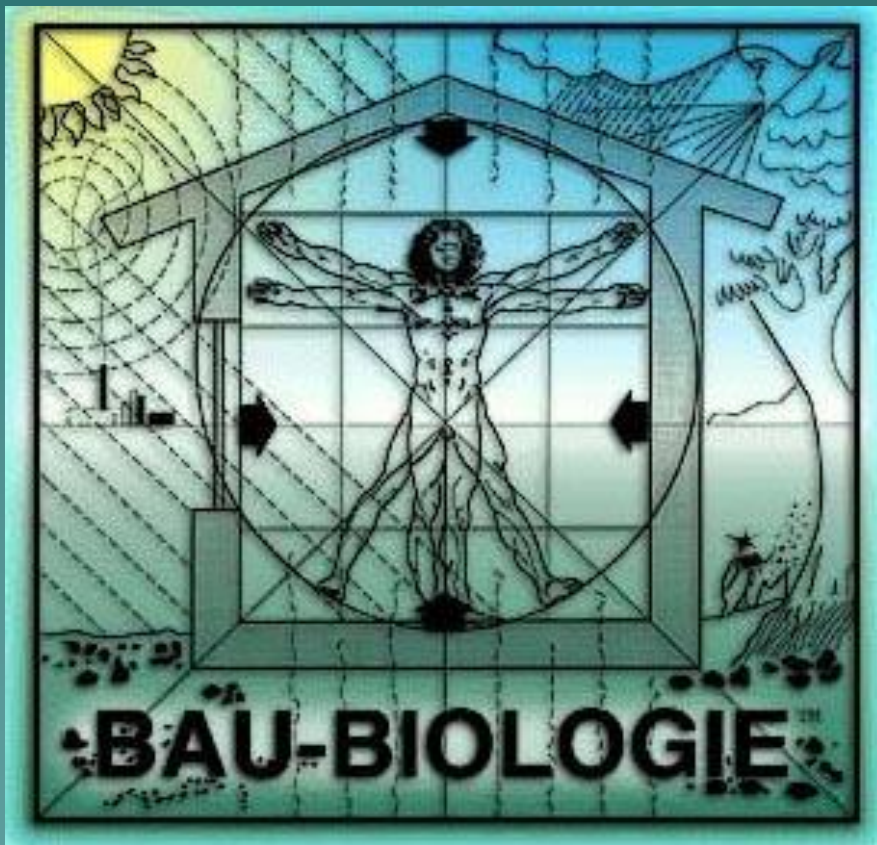
- ◆ **Ecology is defined as:**
 - ◆ The study of the relationships among living things and their environments
- ◆ **Environment is defined as:**
 - ◆ The sum of physical, chemical, and biological factors that surround living things

Thus in our specific case it is

**THE STUDY OF THE INTERRELATIONSHIP
BETWEEN BUILDINGS AND THE ENVIRONMENT**

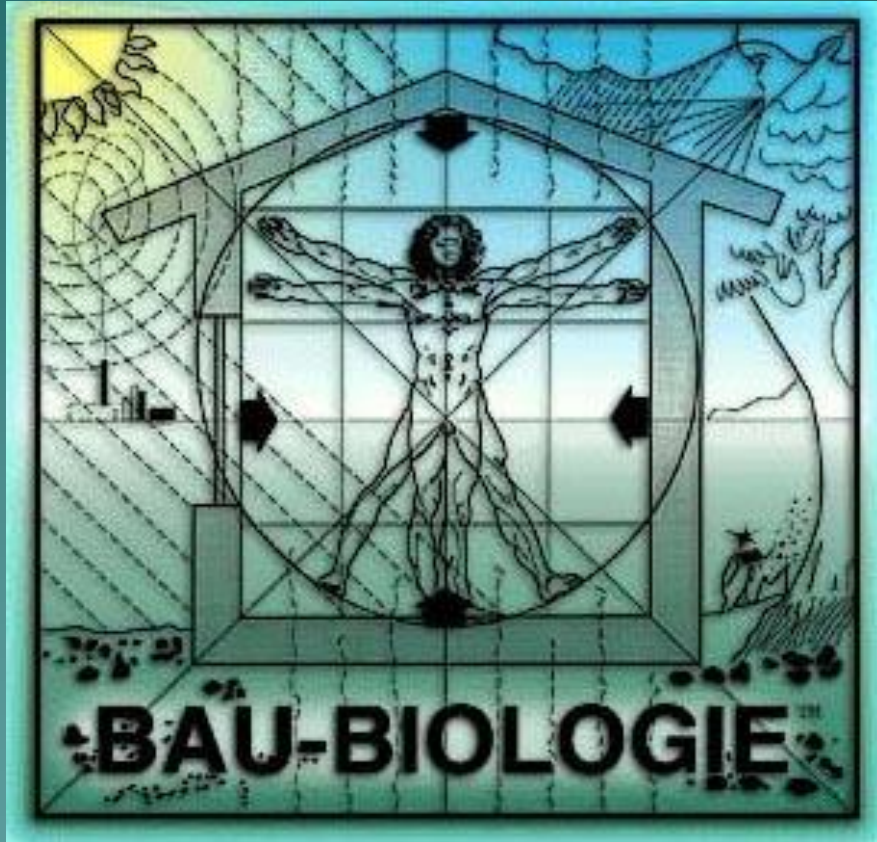
DISCUSSION & VISION

Building-Biology and Ecology



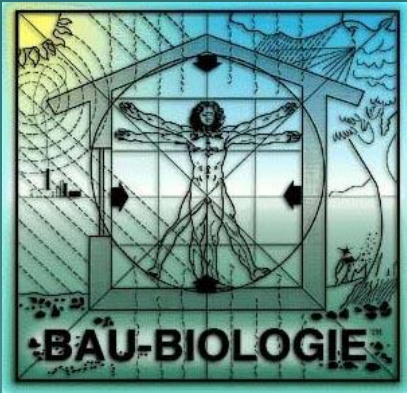
A world in which people understand the vital and complex relationship between the natural and built environments and are empowered to bring these two into greater harmony.

ARCHITECTURAL VISION



Join technical expertise, architectural design, building methods, building materials, biological understanding and ecological sensitivity to promote healthy homes, workplaces and communities/cities

OBJECTIVE.....



is to educate - specifically, to help people and professionals realize that homes, workplaces and subsequently entire communities and cities can be created to bring the benefits of both health and aesthetics into their living environments.

Bringing awareness to the health hazards that may exist in our living spaces not only improves health and provides a sense of well being, it also has an impact on the health of this planet.



**“ We do not inherit the earth from our ancestors
we borrow it from our children”**

The Columns of Building Biology



The 25 Principles of Building Biology



Guidelines and standards

Fields - Waves – Radiation – EMF

Toxic substances and room climate

Fungi – allergens – particles - dust

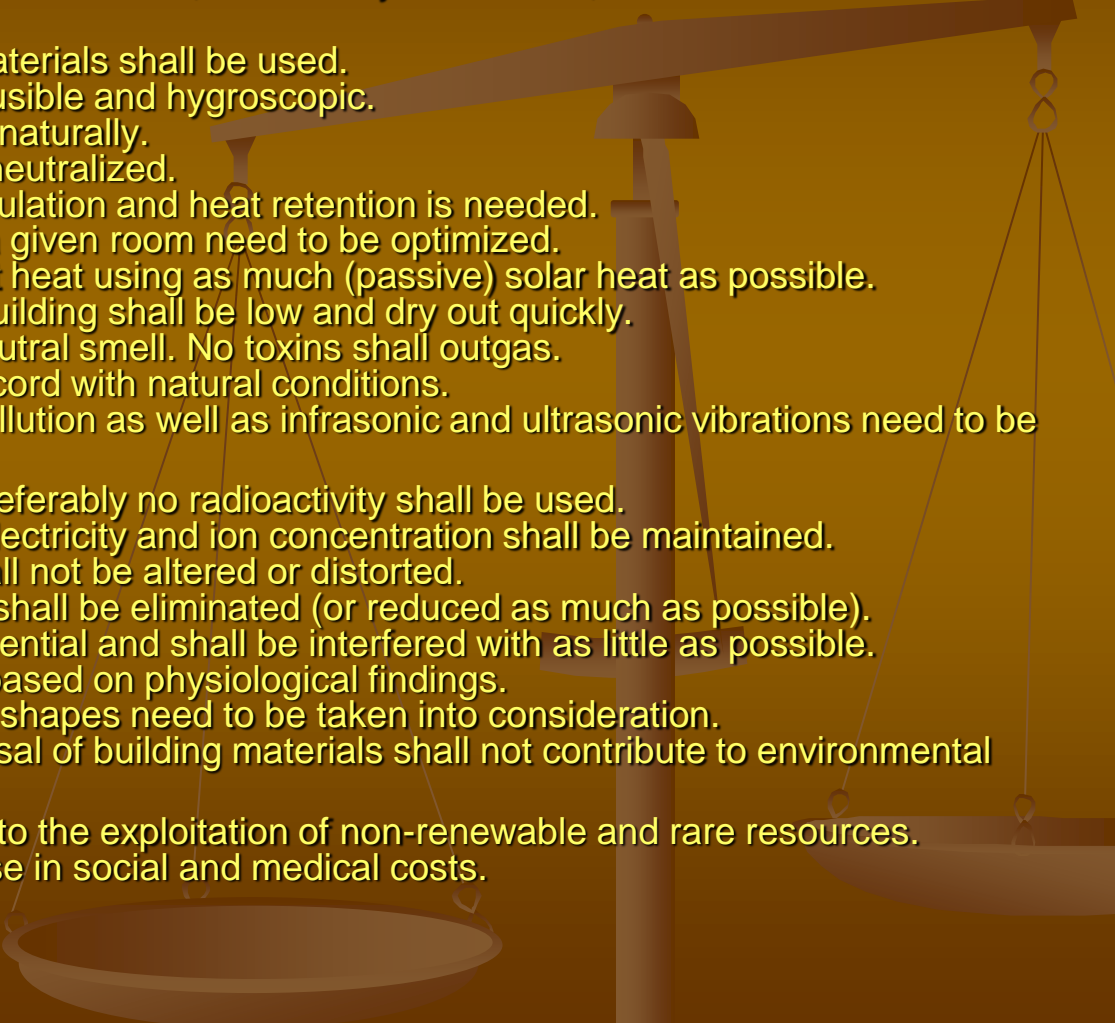


New building construction – third skin



Sick building syndrome

The 25 Principles of Building Biology

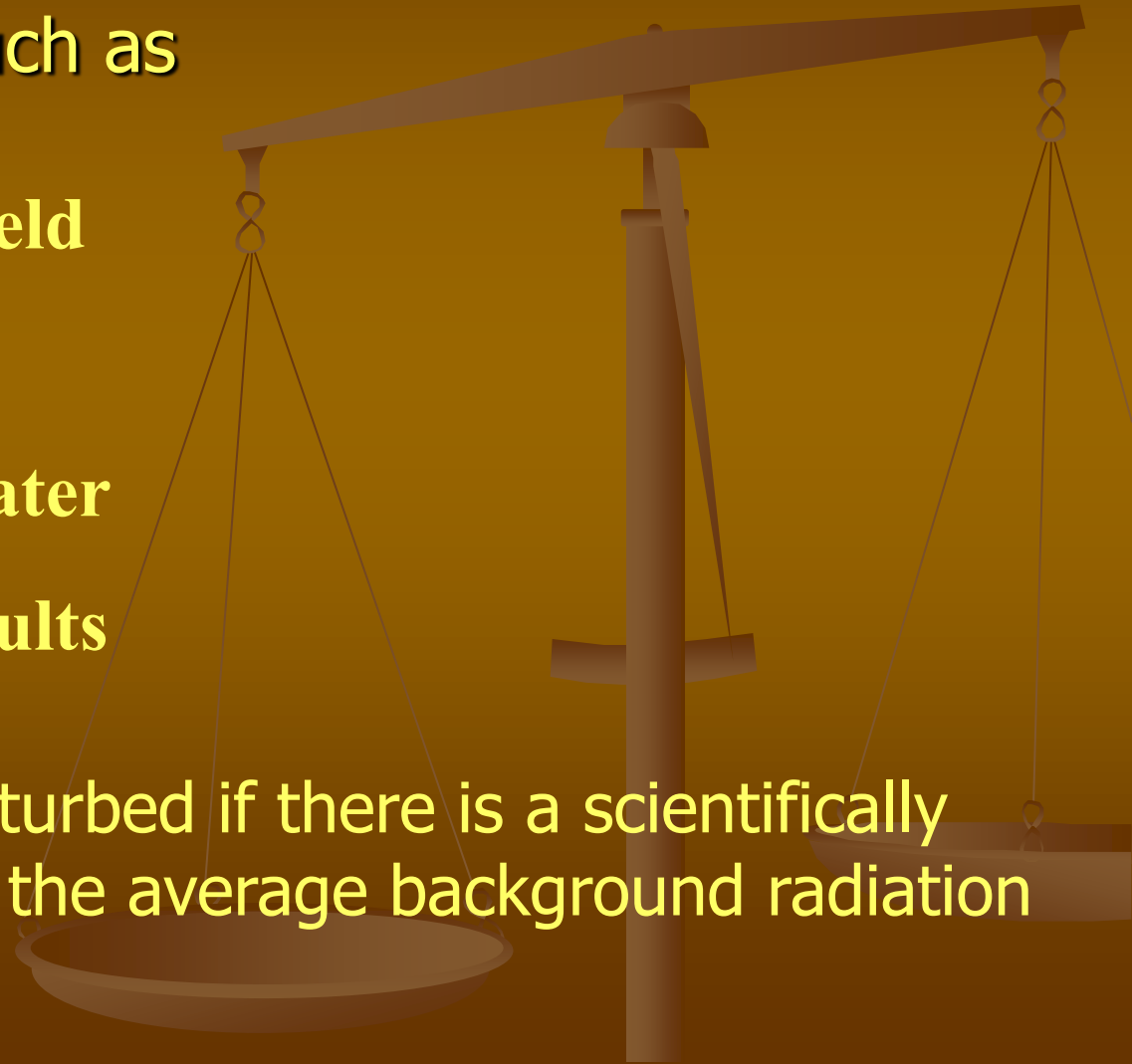
1. A building site shall be geologically undisturbed.
 2. Residential homes are best located away from industrial centers and main traffic routes.
 3. Housing shall be developed in a decentralized and loose manner interlaced with sufficient green space.
 4. Housing and developments shall be personalized, in harmony with nature, fit for human habitation and family oriented.
 5. Natural and unadulterated building materials shall be used.
 6. Walls, floors and ceilings shall be diffusible and hygroscopic.
 7. Indoor air humidity shall be regulated naturally.
 8. Air pollutants need to be filtered and neutralized.
 9. An appropriate balance of thermal insulation and heat retention is needed.
 10. The air and surface temperatures of a given room need to be optimized.
 11. A heating system shall feature radiant heat using as much (passive) solar heat as possible.
 12. The total moisture content of a new building shall be low and dry out quickly.
 13. A building shall have a pleasant or neutral smell. No toxins shall outgas.
 14. Light, lighting and color shall be in accord with natural conditions.
 15. Protective measures against noise pollution as well as infrasonic and ultrasonic vibrations need to be human oriented.
 16. Only building materials with little or preferably no radioactivity shall be used.
 17. The natural balance of atmospheric electricity and ion concentration shall be maintained.
 18. The Earth's natural magnetic field shall not be altered or distorted.
 19. Man-made electromagnetic radiation shall be eliminated (or reduced as much as possible).
 20. Cosmic and terrestrial radiation is essential and shall be interfered with as little as possible.
 21. Interior and furniture design shall be based on physiological findings.
 22. Harmonic measures, proportions and shapes need to be taken into consideration.
 23. The production, installation and disposal of building materials shall not contribute to environmental pollution and high energy costs.
 24. Building activities shall not contribute to the exploitation of non-renewable and rare resources.
 25. Building activities shall not cause a rise in social and medical costs.
- 

1.A building site shall be geologically undisturbed

Geological disturbances are alterations of the earth's natural radiation such as

- **DC Magnetic Field**
- **Radioactivity**
- **Underground water**
- **Underground faults**

A site is geologically disturbed if there is a scientifically measurable anomaly of the average background radiation



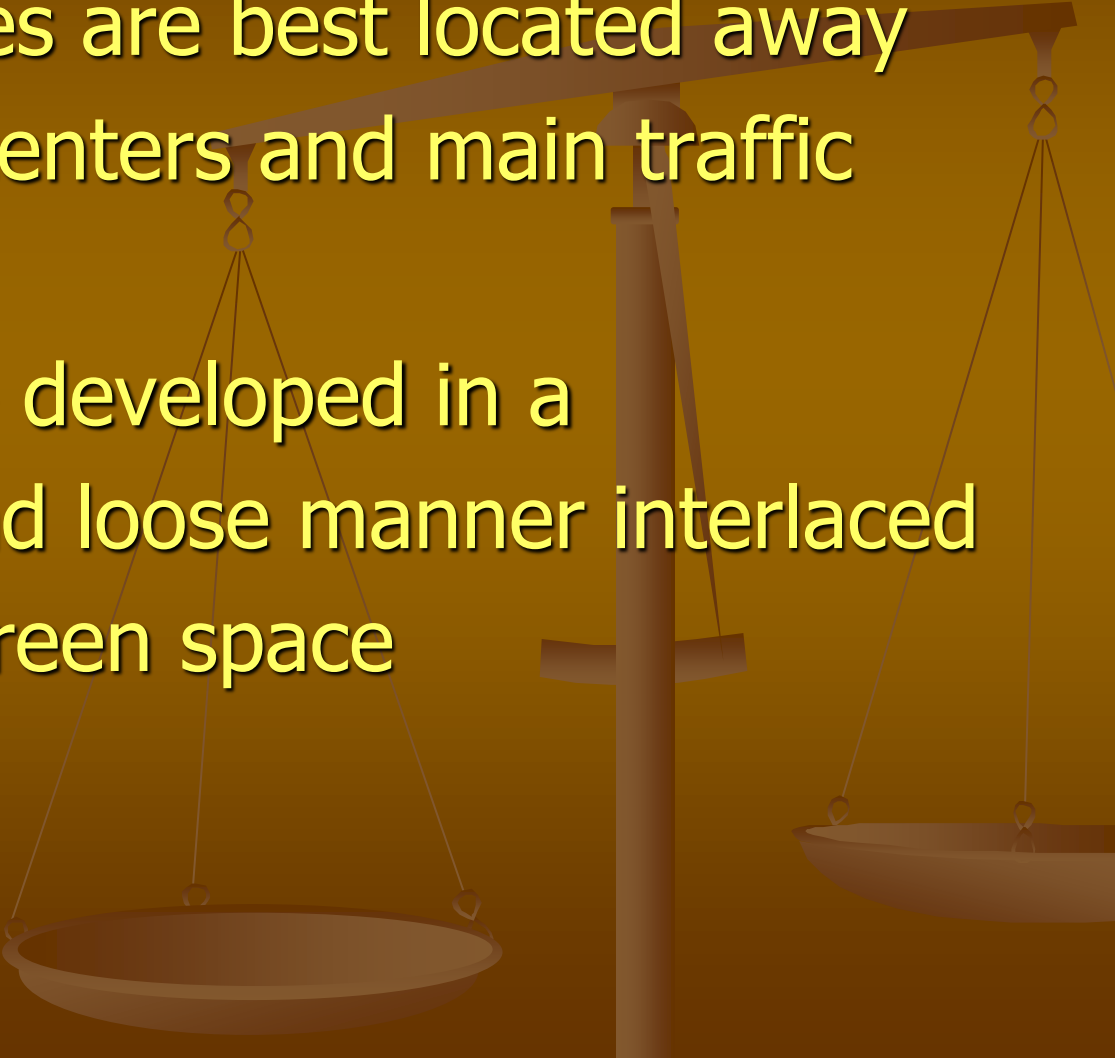


Under natural conditions the compass points to the north

Instruments : Precision compass for sleeping areas

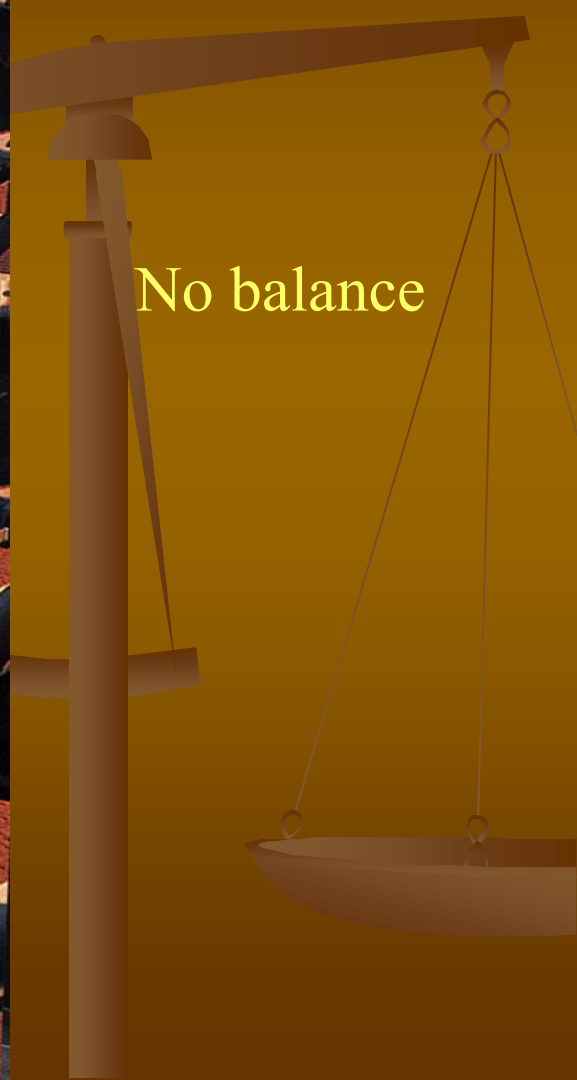
Geo magnetometer for building sites

Geiger counter and scintillation counter

- 
2. Residential homes are best located away from industrial centers and main traffic routes.
 3. Housing shall be developed in a decentralized and loose manner interlaced with sufficient green space







No balance





4. Housing and developments shall be personalized, in harmony with nature, fit for human habitation and family oriented.



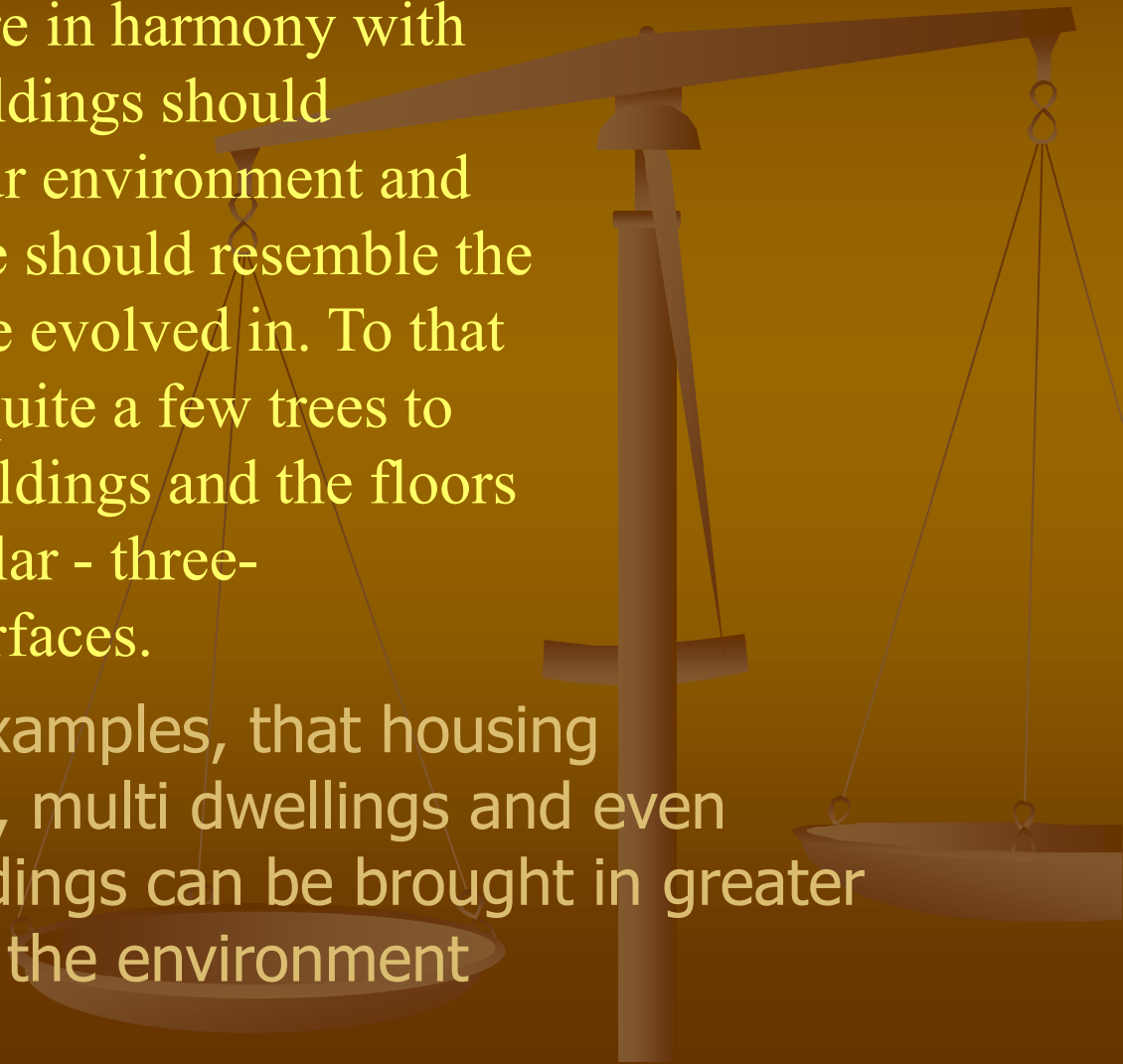
The Hundertwasser house in Vienna



Friedensreich Hundertwasser – Austrian artist and designer

Hundertwasser believes that man should live more in harmony with nature. Our buildings should contribute to our environment and our living space should resemble the environment we evolved in. To that end, he plants quite a few trees to grow out of buildings and the floors are quite irregular - three-dimensional surfaces.

Some other examples, that housing developments, multi dwellings and even industrial buildings can be brought in greater harmony with the environment



Hundertwasser house Vienna



reiner Ziegelbau (38 cm dicke Hohlziegel Wienerberger Porotherm). Lediglich die auskragenden Teile und Decken sind aus Stahlbeton. Somit SENKRECHT durchschnitten, triffst Du auf Stahlbeton. Durchgefärbter Verputz. Bauzeit von 1983 bis 1985.

Hundertwasser house
Frankfurt, Germany



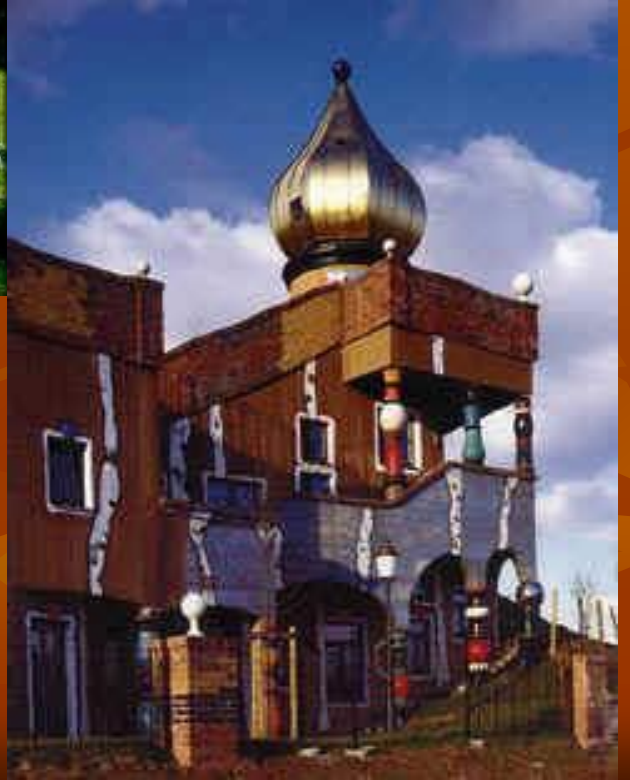


Multi dwelling housing can be pleasant

Hundertwasser house Frankfurt Germany

Power Plant in Vienna





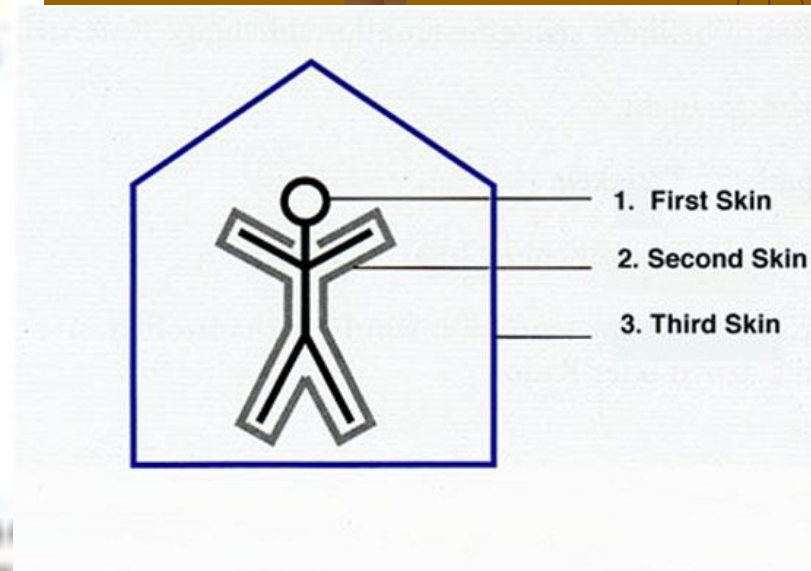
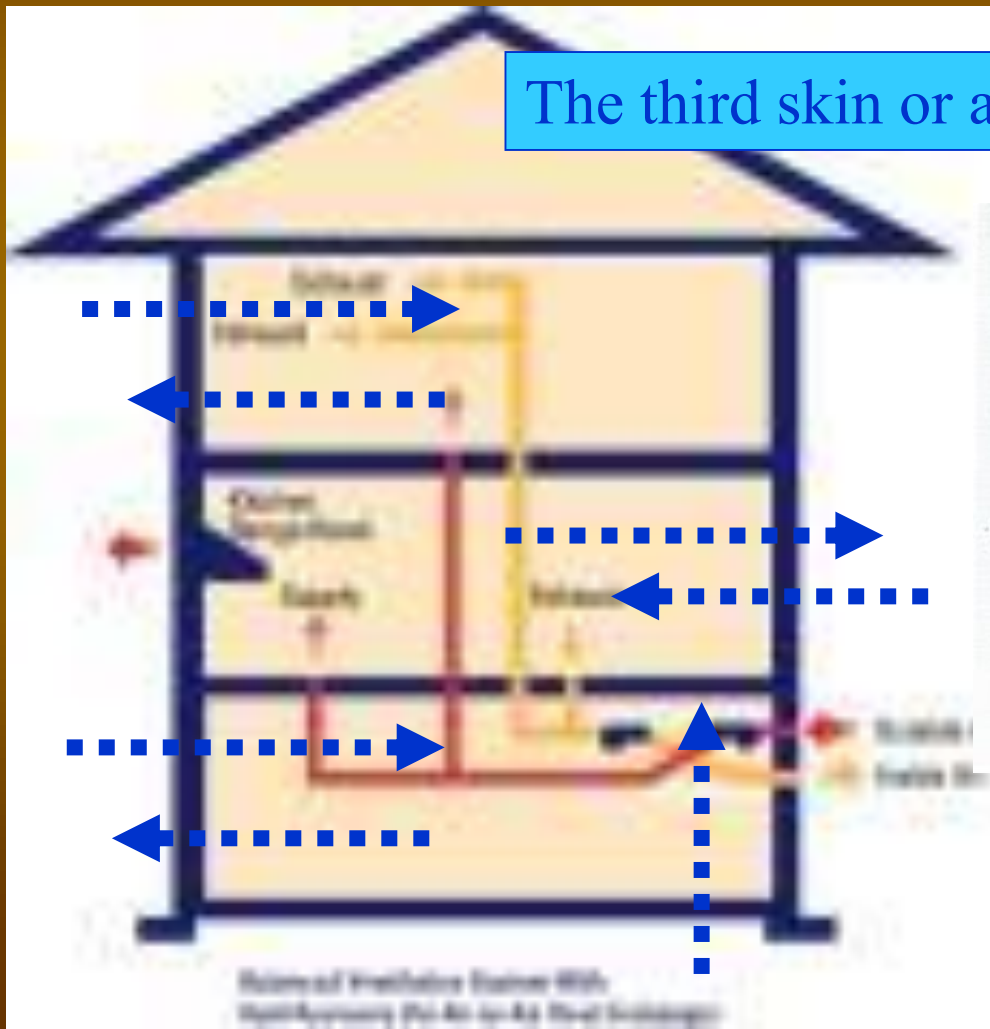
5. Natural and unadulterated building materials shall be used.

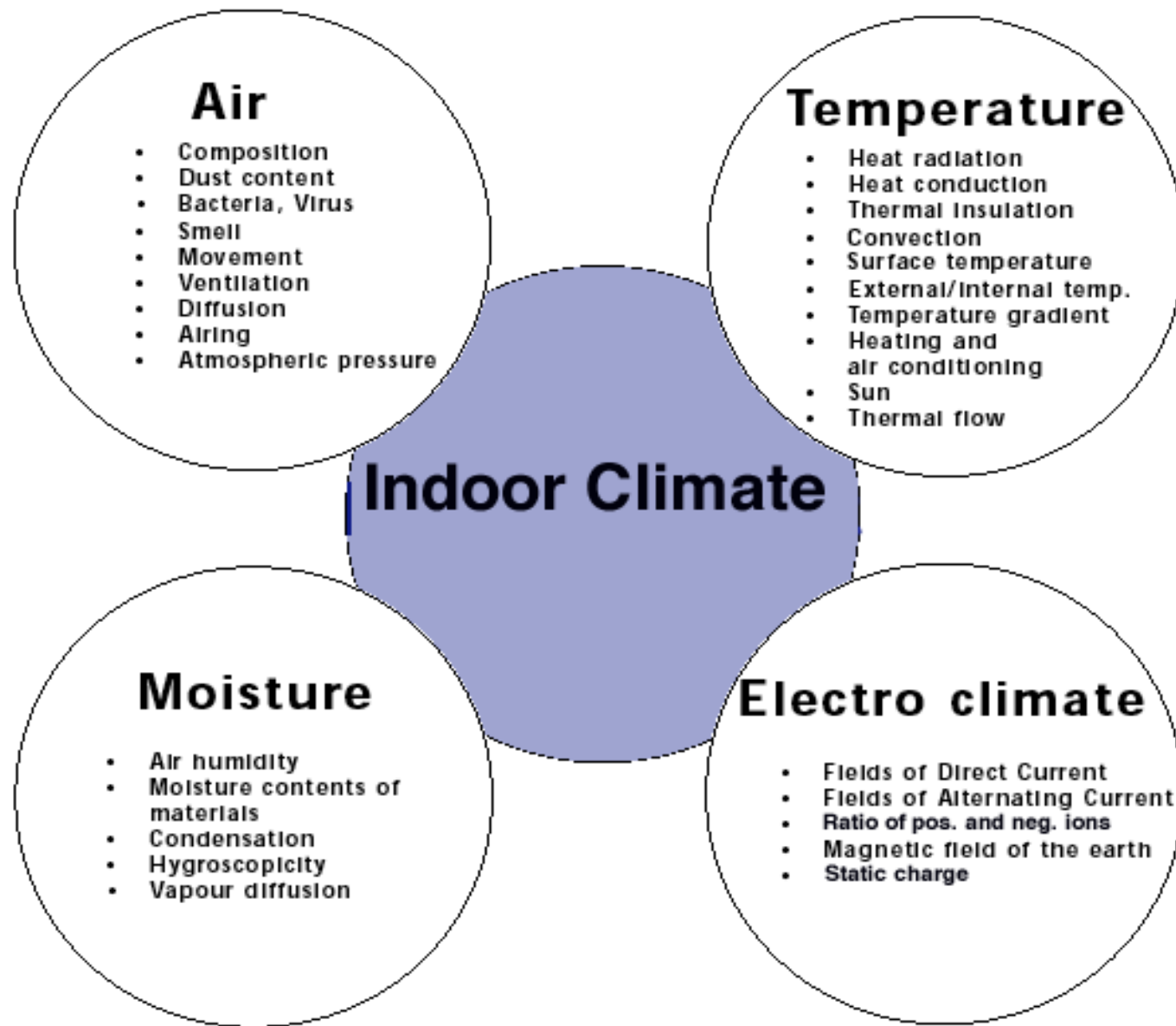


6. Walls, floors and ceilings shall be diffusible and hygroscopic

7. Indoor air humidity shall be regulated naturally

The third skin or a breathing house



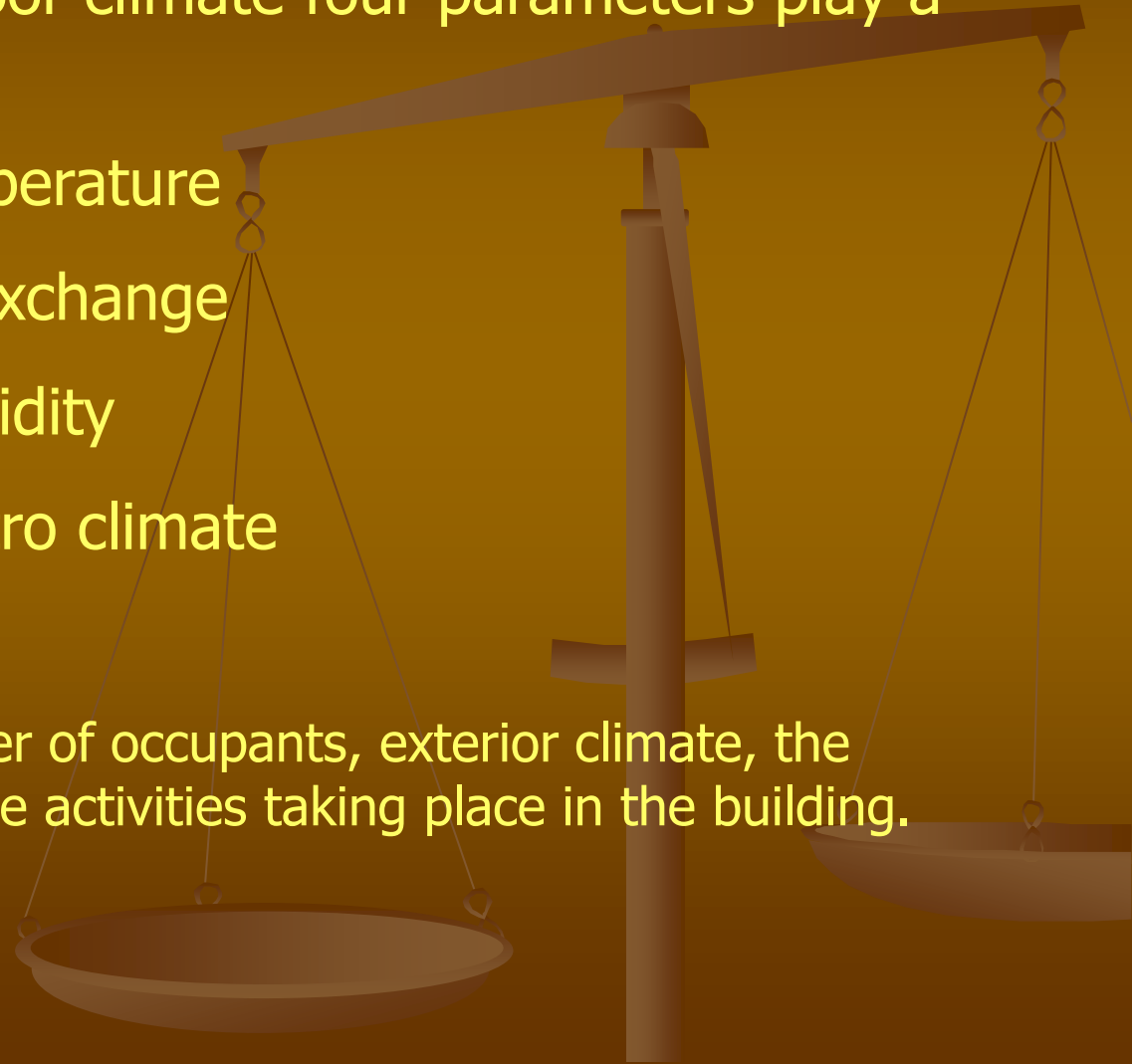


Breathing walls and a healthy indoor living climate

To achieve a healthy indoor climate four parameters play a role

- => Temperature
- => Air exchange
- => Humidity
- => Electro climate

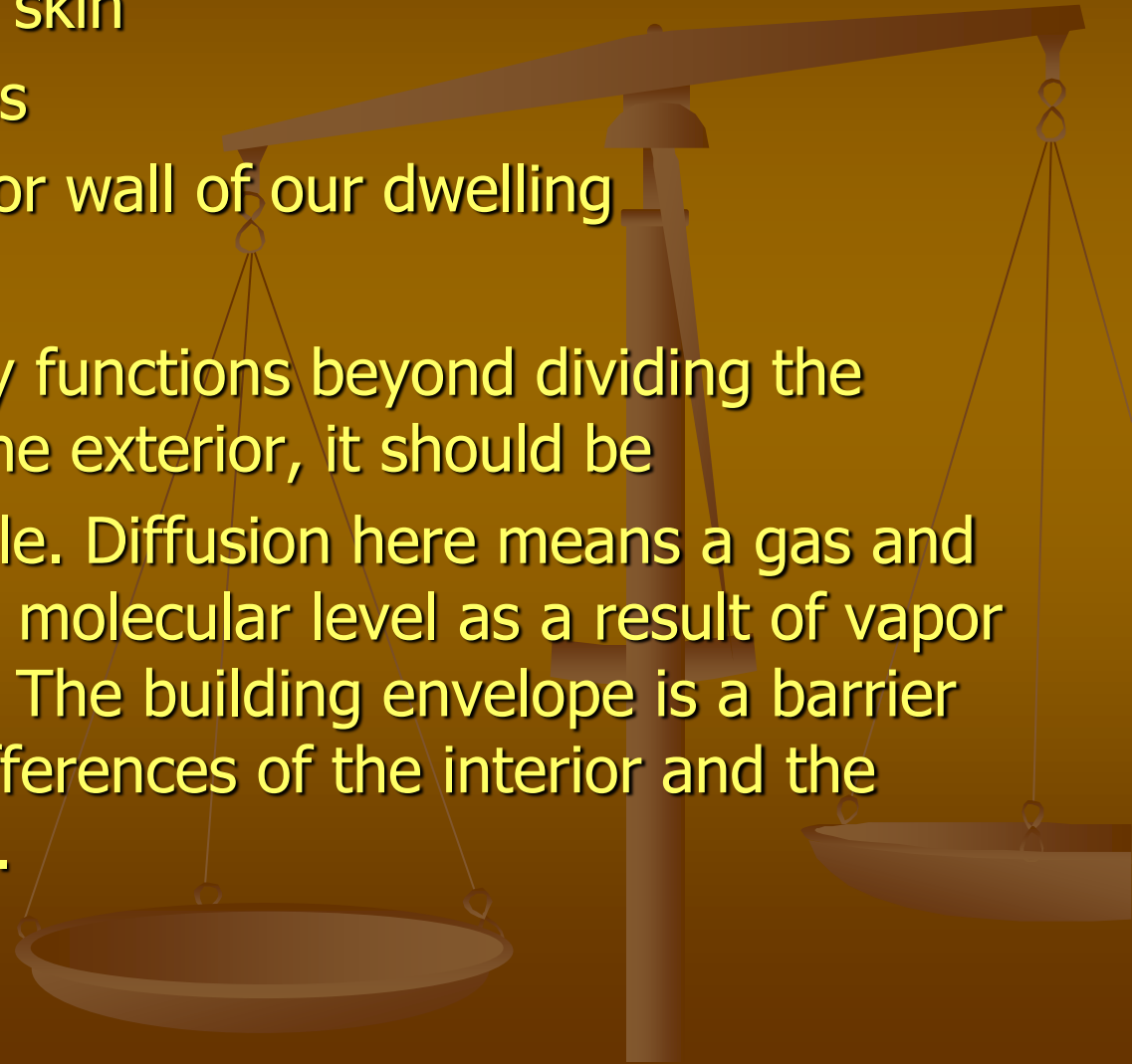
Additional factors are – number of occupants, exterior climate, the building materials used and the activities taking place in the building.



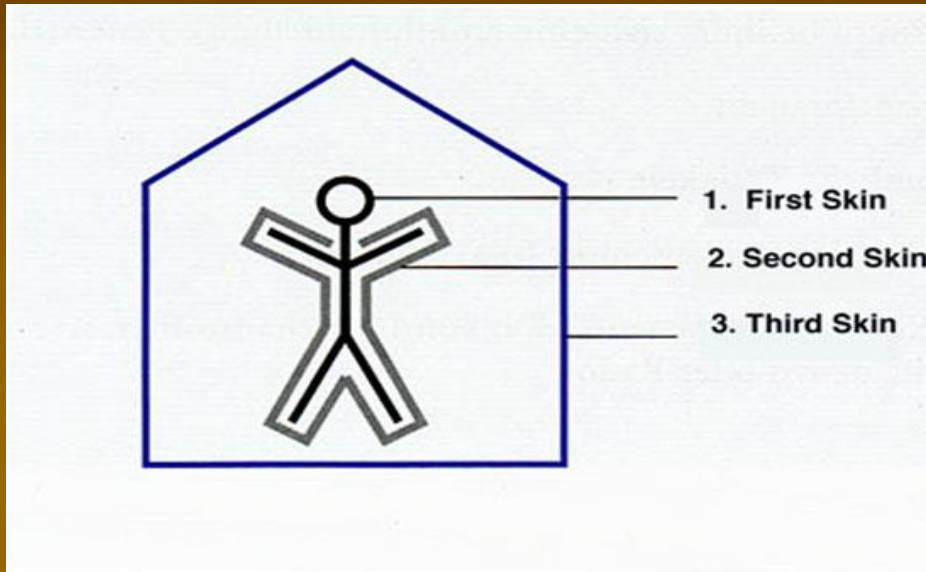
A breathing wall – the third skin approach

- First skin = actual skin
- Second skin = clothes
- Third skin = exterior wall of our dwelling

The third skin has many functions beyond dividing the interior space from the exterior, it should be breathable or diffusible. Diffusion here means a gas and vapor exchange on a molecular level as a result of vapor pressure differences. The building envelope is a barrier between pressure differences of the interior and the exterior of a building.



The building envelope - a third skin approach



First skin = actual skin

Second skin = clothes

Third skin = exterior walls of our dwelling

- The building envelope as a third skin has many functions beyond dividing the interior space from the exterior, it should be breathable or diffusible.
- Diffusion here means a gas and vapor exchange on a molecular level as a result of vapor pressure differences – a healthy house

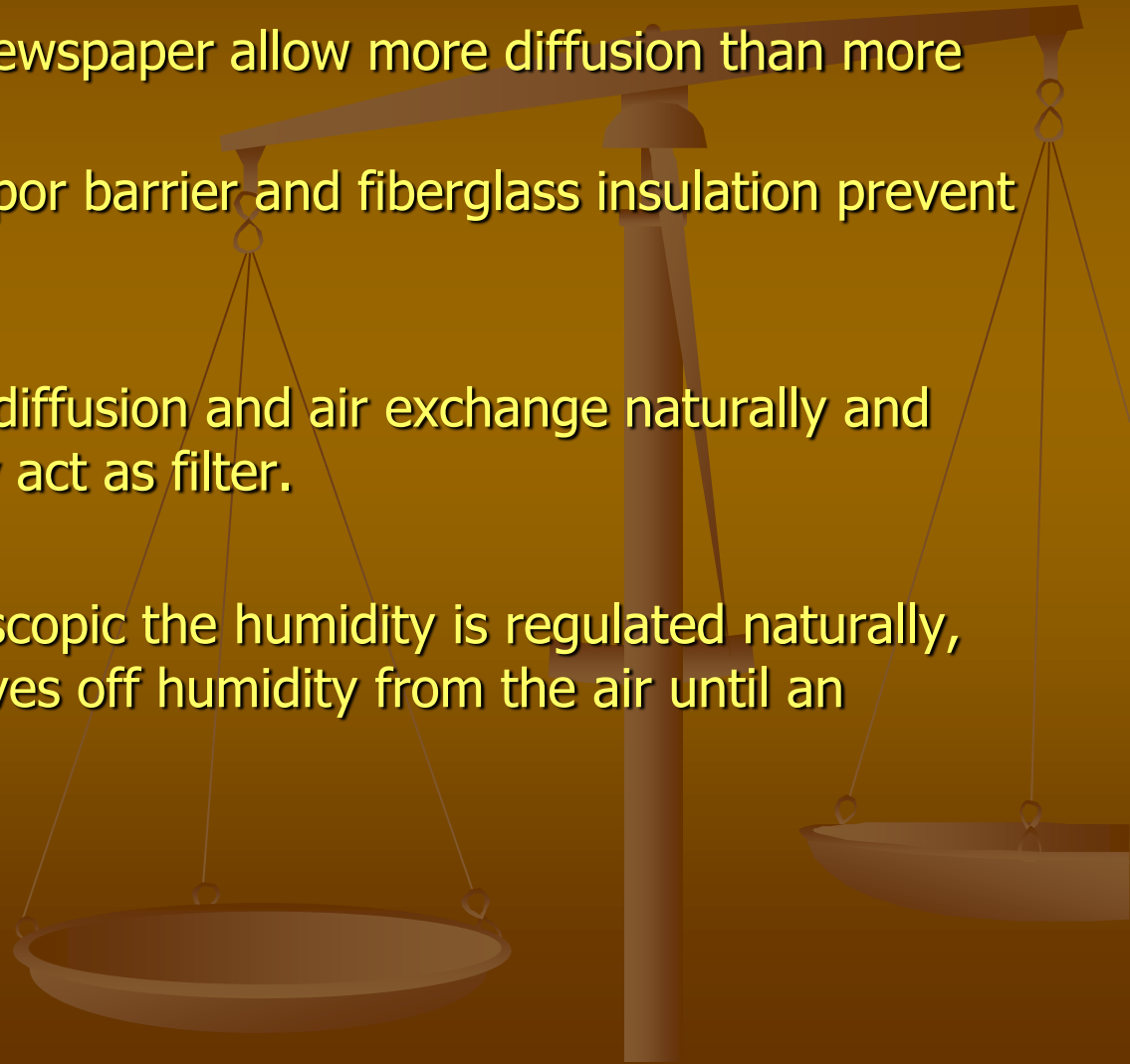
The type of material in the barrier determines how quickly if at all, this diffusion occurs.

Natural and airy materials such as cellulose based ones like straw, wood, recycled newspaper allow more diffusion than more dense materials.

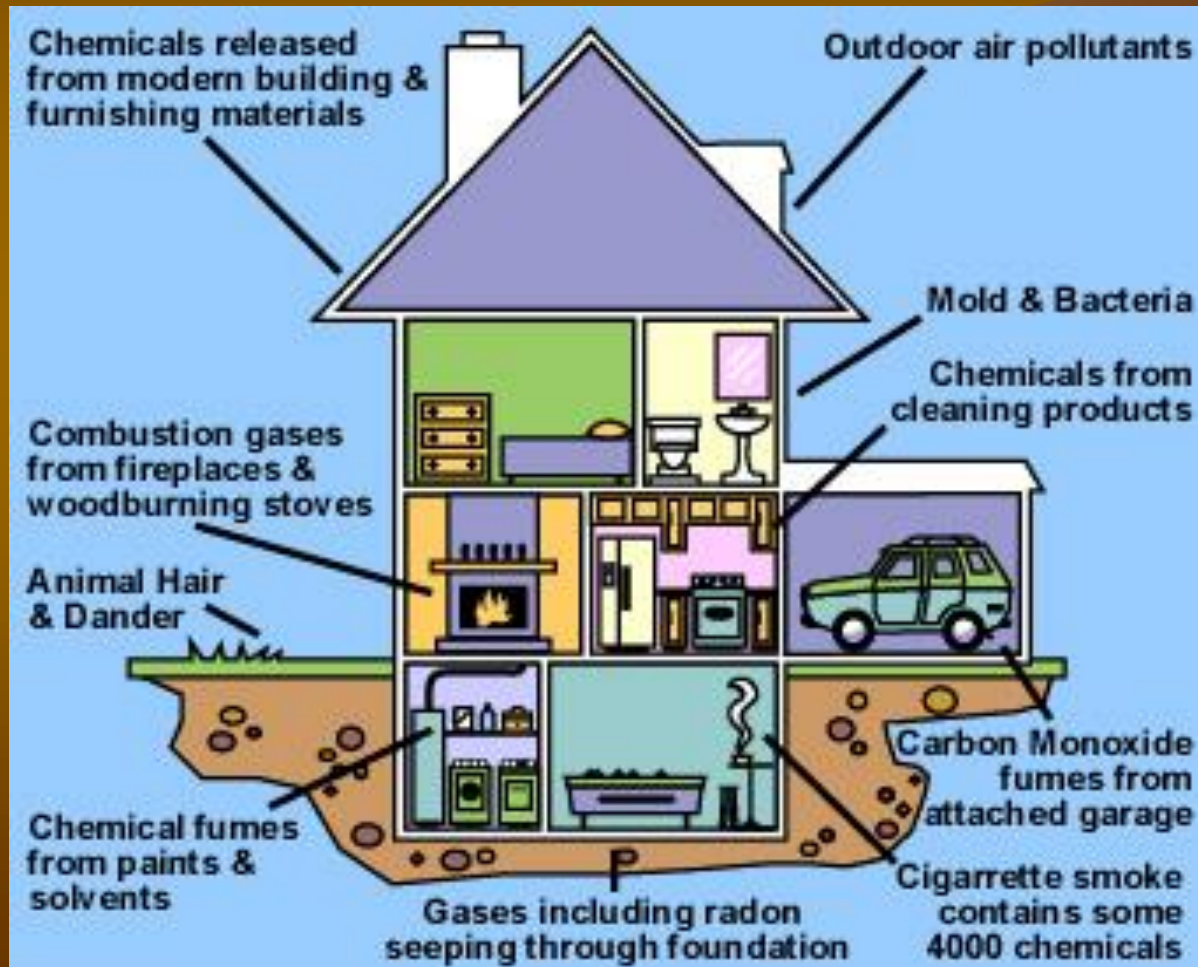
Airtight walls with plastic vapor barrier and fiberglass insulation prevent diffusion.

A breathable wall regulates diffusion and air exchange naturally and certain materials like clay act as filter.

If the material is also hygroscopic the humidity is regulated naturally, because it takes on or gives off humidity from the air until an equilibrium is reached.



8. Air pollutants need to be filtered and neutralized



Some of the highest offenders are:

Printers & fax machines

Smoking

Exterminators

Lack of Fresh Air

Sealed windows

Carcinogenic cleaning products

Copy machines

Mold

The stack effect

Renovations

DO YOU WORK IN A TOXIN FACTORY?

The modern office is home to as many as 350 different volatile organic chemicals released by building materials, furnishings, and office equipment. That's not to mention the molds and bad indoor air that often flourish in these sealed-up environments. Some of the biggest offenders:

Printers and fax machines

They all ooze ozone. Scientists have yet to figure out definitively what happens when that ozone mixes with the workplace's other volatile organic chemicals.

Smoking

When people in your office sneak a smoke—even if it's behind closed doors—the second-hand stuff funnels through the ventilation system to the rest of the office.

Exterminators

It doesn't help that exterminators spray pesticides that may contain carcinogens over your workspace.

What fresh air?

Believe it or not, many fresh air vents are located over loading docks and parking garages, sucking in carbon monoxide and other contaminants.

Hidden Dangers: A Glossary

HVACs Heating, ventilation, and air-conditioning systems. Often they circulate contaminated air.

VOCs Volatile organic chemicals. They're emitted by furnishings, cleaning products, and equipment.

MCS Multiple chemical sensitivity. Sufferers are hypersensitive to chemicals.

CCP Carbonless copy paper. Found in credit-card and bank receipts. It contains known and probable carcinogens.

Sealed windows

Most people now work in enclosed offices. Not being able to crack open a window means that you're relying on building managers to pump through enough fresh air—something they don't always do.

Carcinogenic cleaning products

There are 70,000 chemical cleaning products on the market, many of which are used to clean up your office. Some of these products may contain carcinogens.

Copy machines

They also emit ozone. What's worse, they are not always next to vents, so their emissions stay trapped in the office air.

The office bathroom—the modern mold machine

Who hasn't seen a clogged toilet? Flooded bathrooms can create molds.

The stack effect

Co-workers who smoke may think they are doing you a favor by taking it outside. But experts say this can be even worse. When you open the revolving door, the building sucks in the second-hand smoke like a chimney.

Renovations

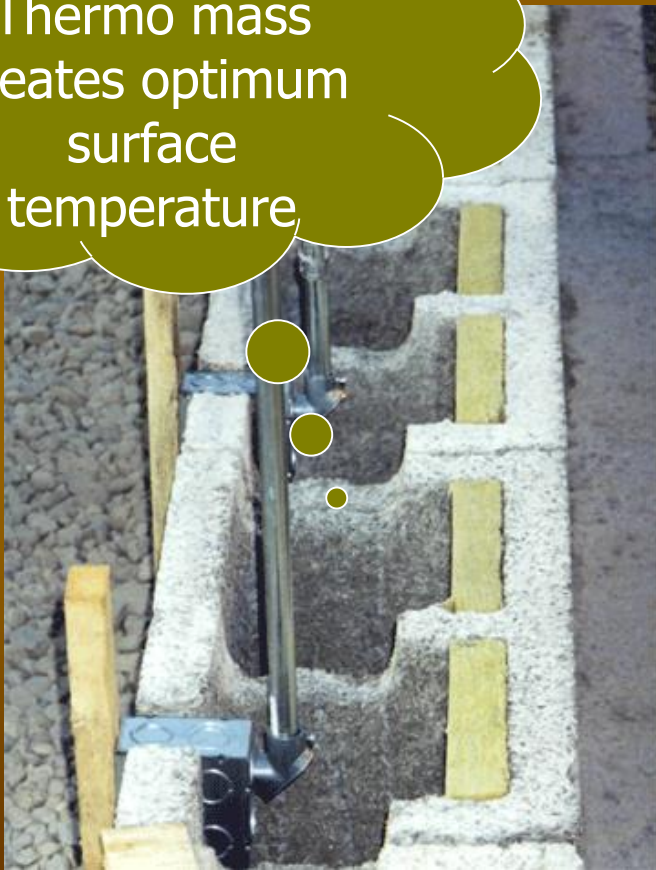
Working in a building—especially those with sealed windows—can cause workers to inhale paint fumes, construction dust, and odors from new furnishings that can irritate skin, eyes, and airways.



ILLUSTRATION BY ROGER KENNY & ROB DOTY/ENR

9. An appropriate balance of thermal insulation and heat retention is needed

Thermo mass creates optimum surface temperature



“outsulation” for optimum heat retention

