



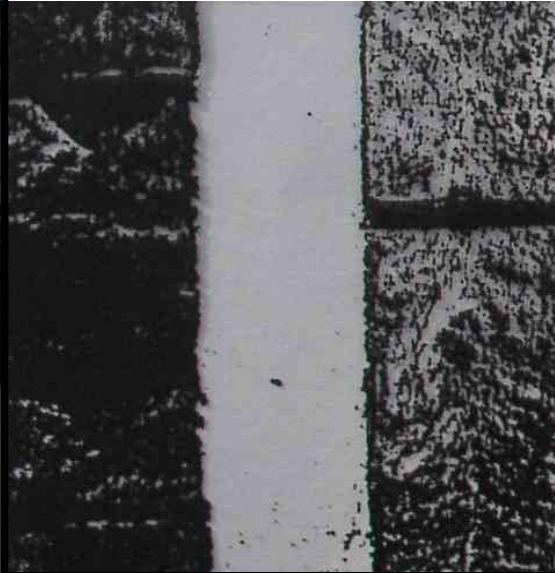
Why humans and their fur parted ways

Wade 2003

Flickr creative commons

← Outdoor weather
Indoor weather →

Heating, cooling and the human body



The changing relation between indoors and out

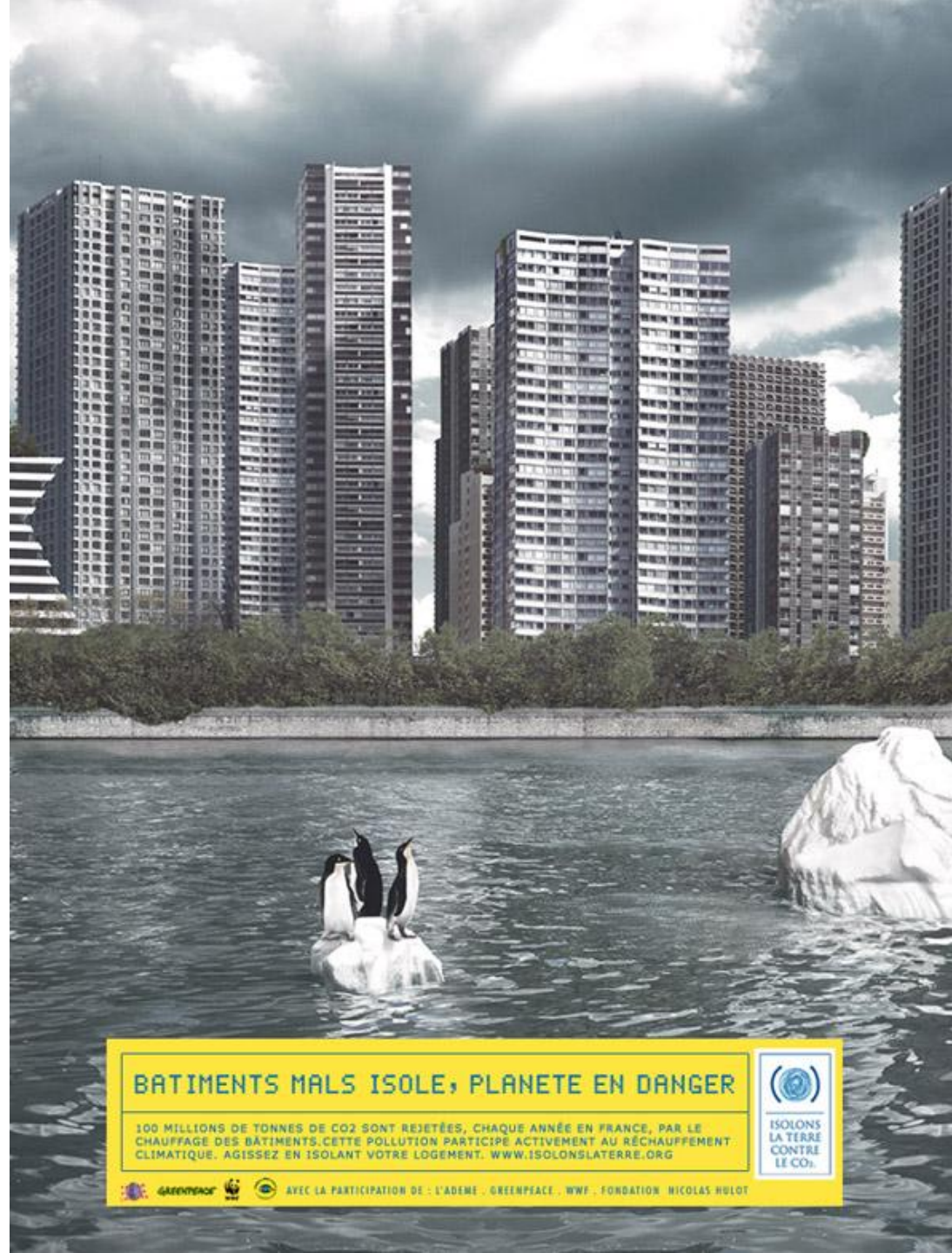
climate change: indoors and out

In Europe primary energy consumption by buildings is around 50% of total energy consumption.

Almost 50% of this energy is used in the provision of indoor climate control for occupant comfort.

The costs of “comfort”

Fergus Nicol. Editorial /
Energy and Buildings 39
(2007) 737–739



BATIMENTS MAIS ISOLE, PLANETE EN DANGER

100 MILLIONS DE TONNES DE CO₂ SONT REJETÉES, CHAQUE ANNÉE EN FRANCE, PAR LE CHAUFFAGE DES BÂTIMENTS. CETTE POLLUTION PARTICIPE ACTIVEMENT AU RÉCHAUFFEMENT CLIMATIQUE. AGISSEZ EN ISOLANT VOTRE LOGEMENT. WWW.ISOLONSLATERRE.ORG



ISOLONS
LA TERRE
CONTRE
LE CO₂



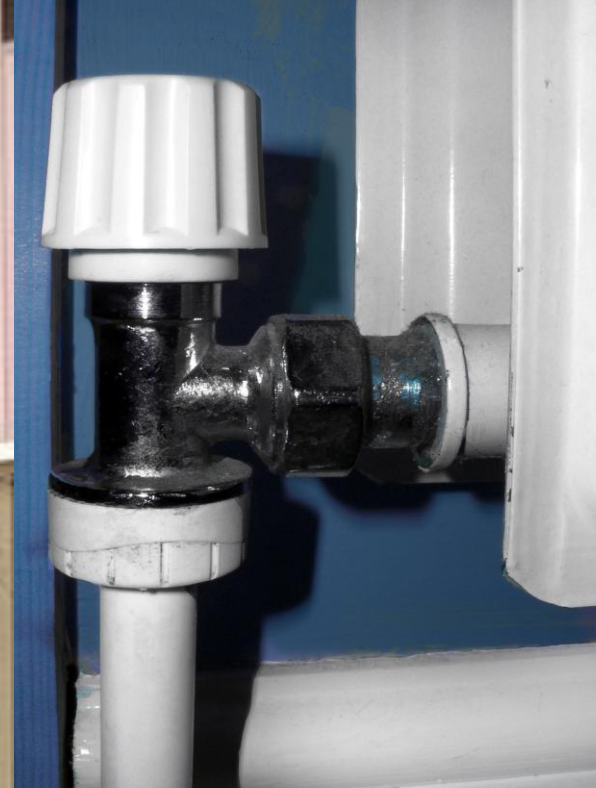
GREENPEACE



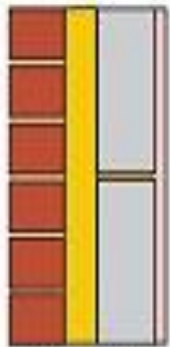
AVEC LA PARTICIPATION DE :



L'ADEME, GREENPEACE, WWF, FONDATION NICOLAS HULOT

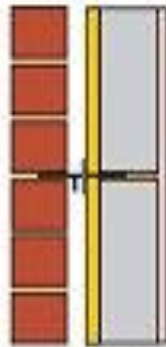


filled cavity



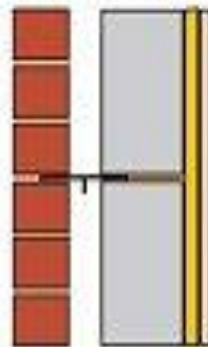
50mm cavity batts
100mm aerated block
13mm lightweight plaster

partial fill

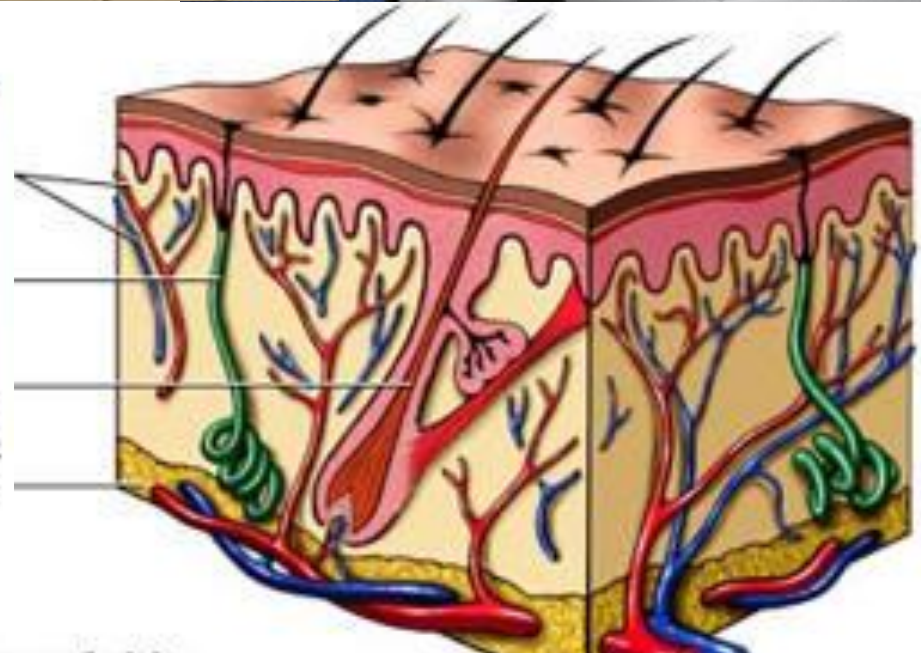


25mm cavity boards
100mm aerated block
13mm lightweight plaster

clear cavity



125mm aerated block
25mm thermal board



How come
22
degrees C?

physical
parameters and
cultural
concerns

sea breeze
or mountain air

what climate
to provide?

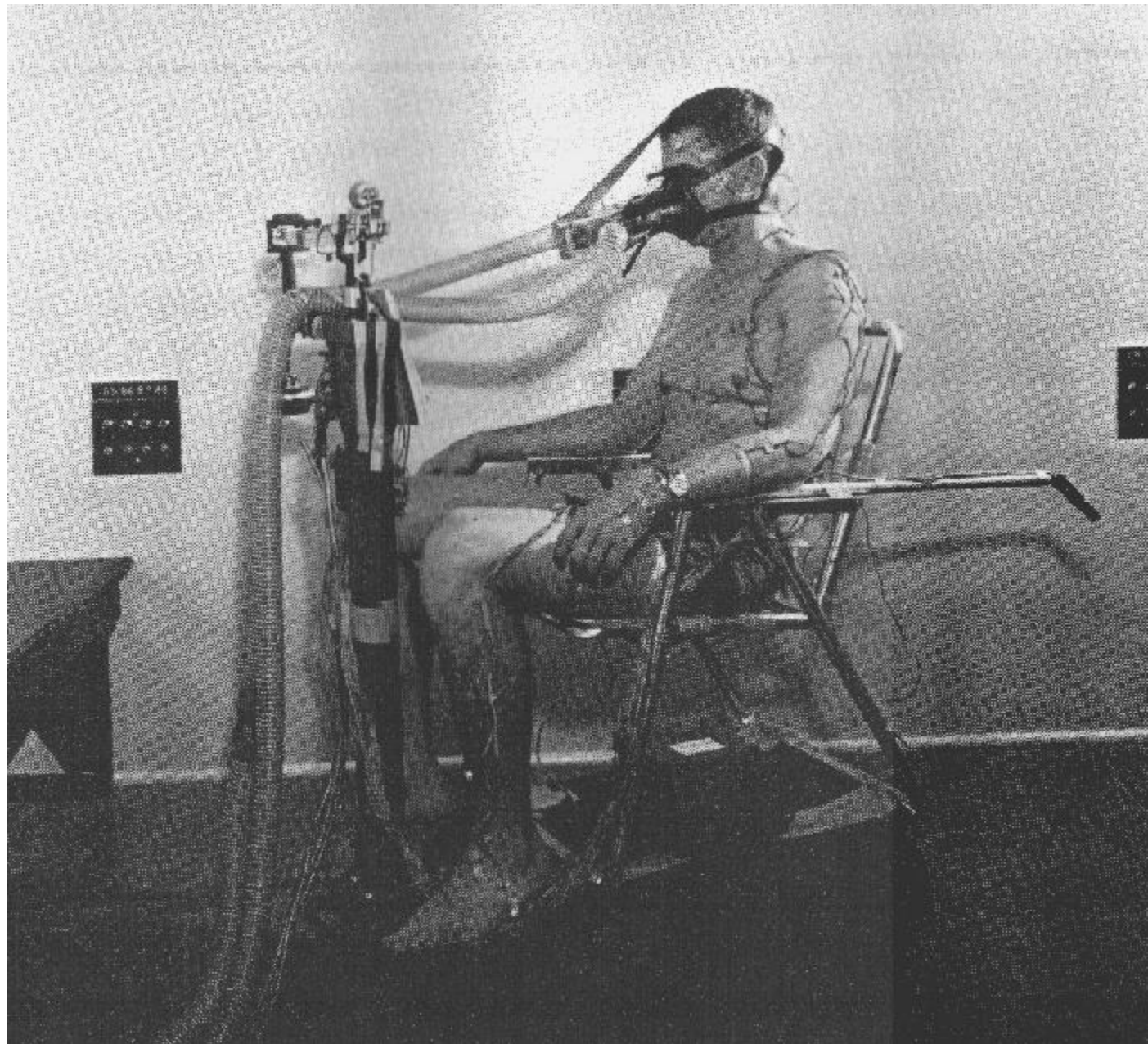
Controlled . . . IN ONE HARNESS . . . THE SIX "CLIMATIC FACTORS" OF TRUE AIR CONDITIONING



MINNEAPOLIS HONEYWELL CONTROLLERS VALVES, RELAYS, THERMOSTATS AND OTHER UNITS PROVIDE FOR SIMULTANEOUS CONTROL



Defining
comfort





Professor Fanger in his "Doctor-dress" at a reception at DTU, June 14, 2001

Standardising comfort, sweat and smell: the clo and the olf

The standard amount of insulation required to keep a resting person warm in a windless room at 70 °F (21.1°C) is equal to one **Clo**.

Units were chosen so that 1 clo would be roughly the insulating value afforded by a man's underwear and a lightweight suit, or "a heavy top coat alone."

The **Olf** is a unit used to measure the scent emission of people and objects.

One olf is defined as the scent emission of an "average person", a sitting adult that takes an average of 0.7 baths per day and whose skin has a total area of 1.8 square metres; the scent emission of an object or person is measured by trained personnel comparing it to normed scents.

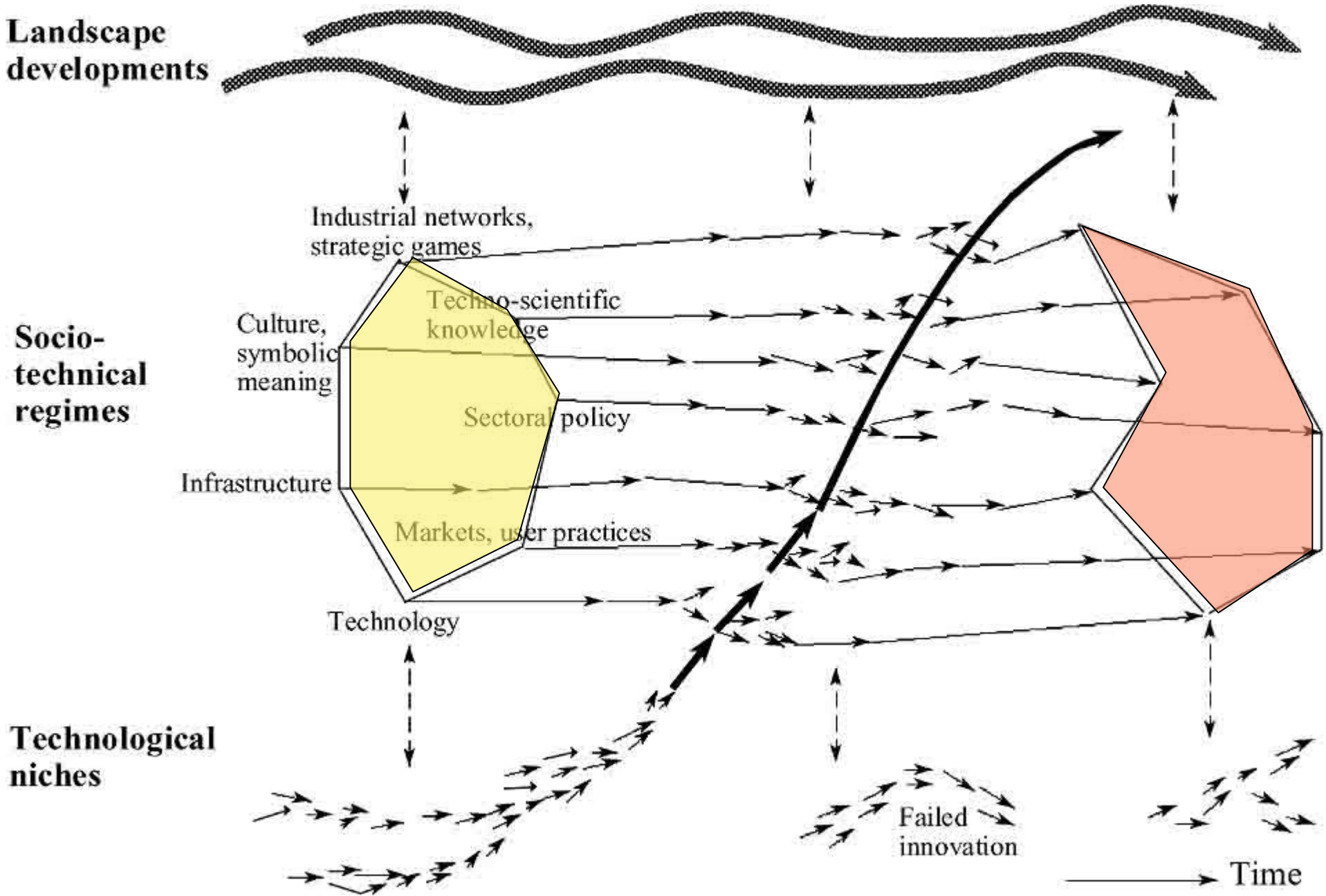
Standardising science also matters for ventilation rates and energy consumption.

Outdoors






**Indoors: where people
spend their time**



Geels 2002.

Different refrigerated regimes

A photograph of a multi-story building facade covered in numerous air conditioning units of various brands and models, illustrating different refrigerated regimes. The units are densely packed and vary in size and design, with some mounted on brackets and others directly on the wall. The building has blue window frames and a white facade. The image is overlaid with a semi-transparent grey box containing text.

USA: post war house building, 1950s onwards

Japan: symbol of westernisation, 1980s

Australia: retrofitting existing stock, 2000

Diversity between and within countries

LP5
HIGHLY
FLAMMABLE
NO SMOKING
NO NAKED LIGHTS

2WE

Landscape developments

Air conditioning as normal

Socio-technical regimes

Industrial networks, strategic games
Techno-scientific knowledge
Culture, symbolic meaning
Sectoral policy
Infrastructure
Markets, user practices
Technology

Technological niches

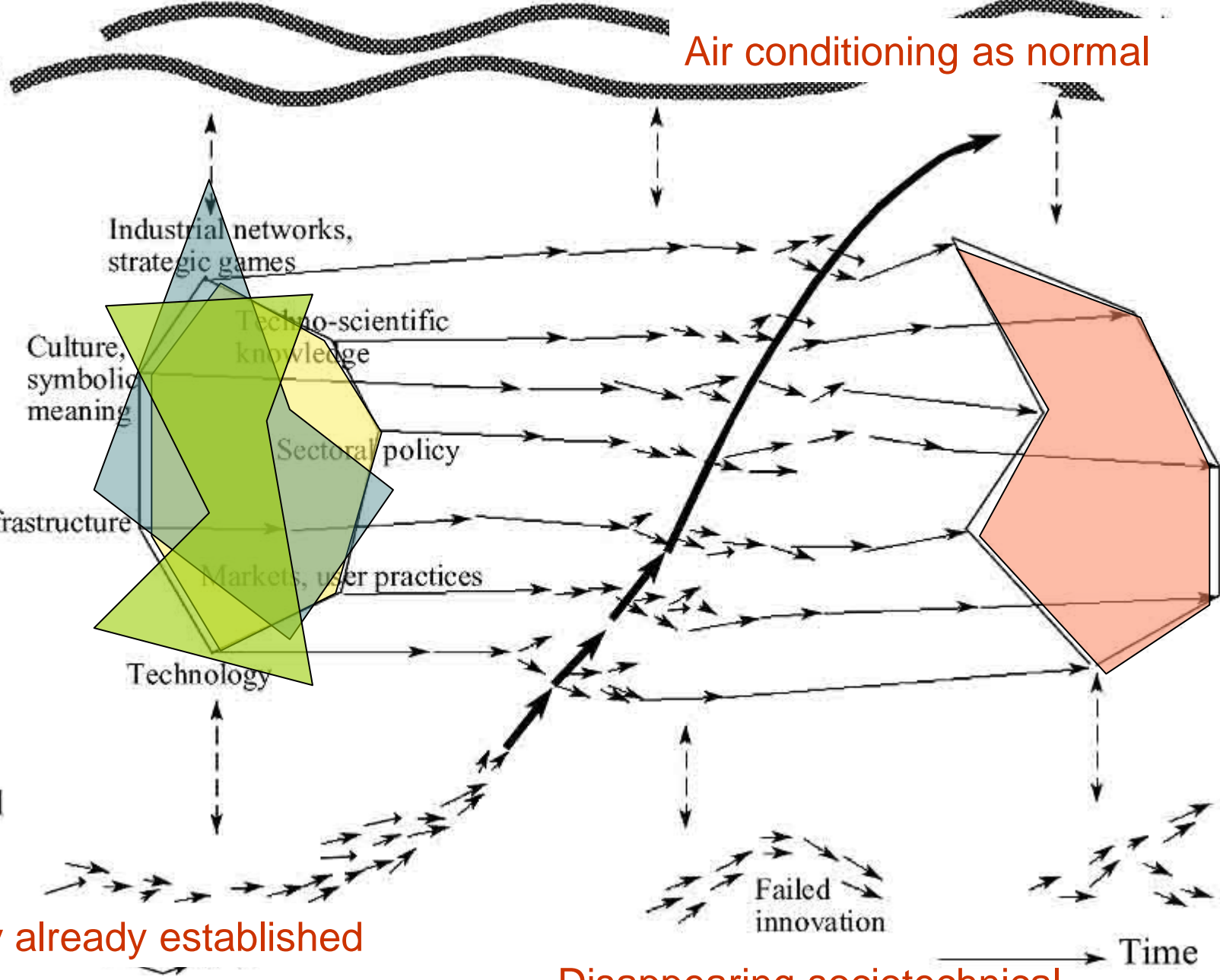
Technology already established

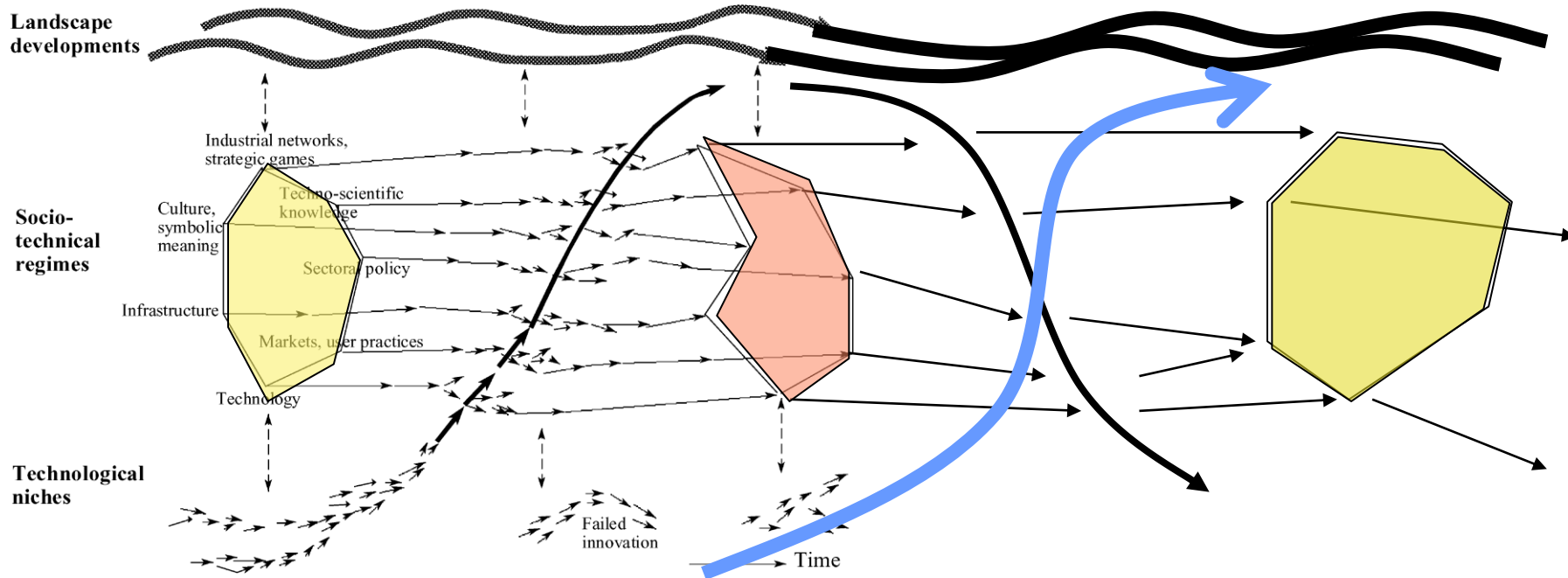
Disappearing sociotechnical systems: vernacular cooling

Failed innovation

Time

Geels 2002.





Mechanical cooling

Changing ideas and conventions of comfort: space, body, building?



6 to 30 degrees C; 20 to 28 degrees C; 22 degrees C.

スーツ

COOLBIZ



28℃

私たちはチーム・マイナス6%の一員として
地球温暖化防止を推進するため、
冷房時の室温を28℃にしています。
5月では、28℃で快適に仕事をするため
スーツからCool Bizへ衣替えしています。



株式会社セイコーインスツル
011-277-3822

セイコーインスツル グループ





Climate Control Clothing by Snowgum

FREE

**FREE
DVD**

With Purchase*

*Buy any Family Pack!
While stock lasts, get a Family Pack
DVD.

Highlights



Ok in Japan, not OK in the USA

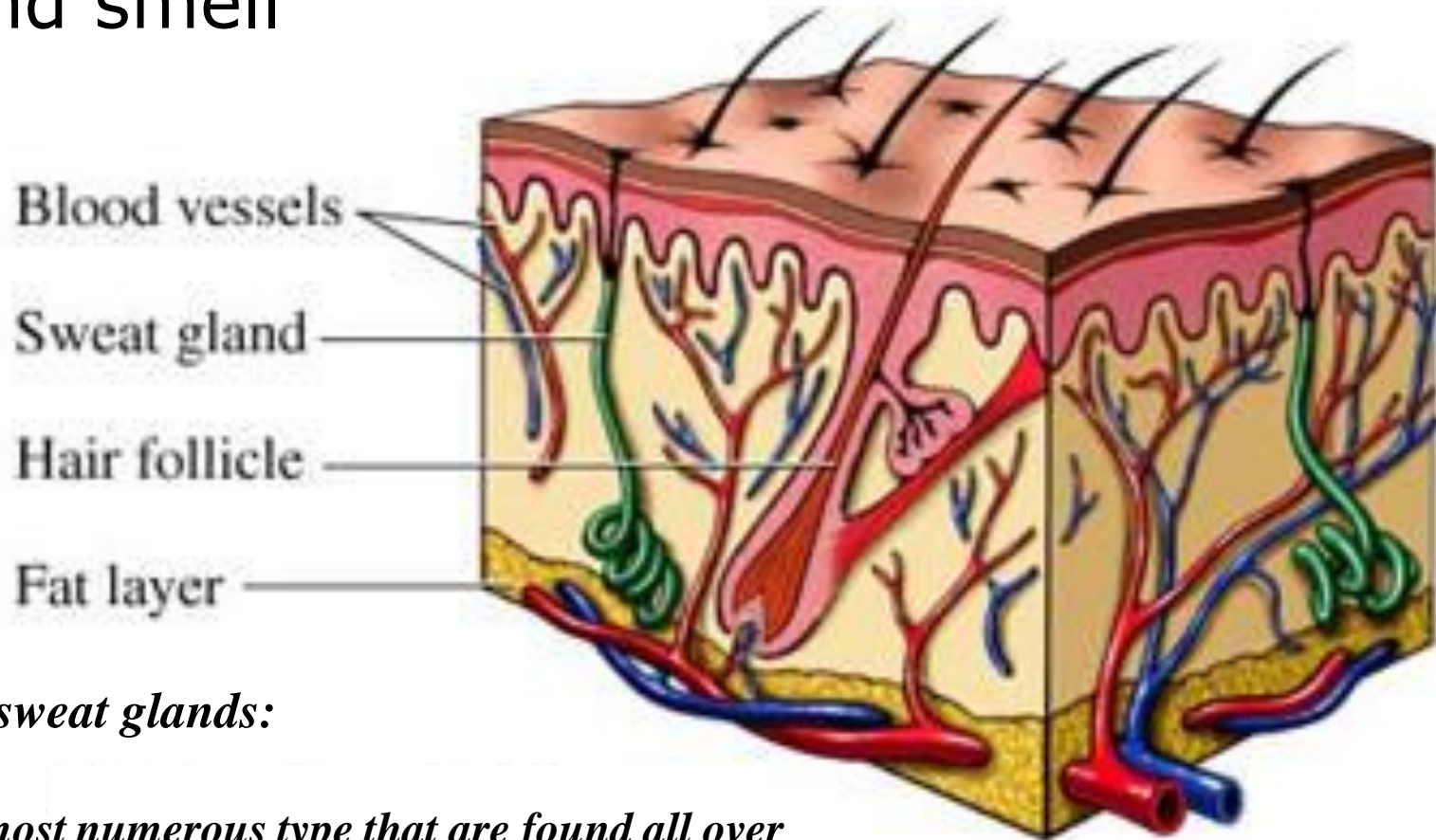
Japan Sweats It Out As It Wages War On Air Conditioning Salarymen Shed Their Ties And Endure the Shame On Steamy Summer Days, Sebastian Moffett

The Wall Street Journal, **September 11, 2007; Page A1**

TOKYO -- Late last month, the presidents of Japan's three biggest banks gathered to make an important announcement: They were abandoning formal attire for the rest of the summer -- and insisting that their 1,630 branches nationwide keep office temperatures at a steamy 82 degrees Fahrenheit in order to conserve energy

Satoshi Iue, Sanyo Electric chairman and CEO, poses during a 'Cool Biz' fashion show.

Sweat and smell



Two types of sweat glands:

Eccrine - the most numerous type that are found all over the body, particularly on the palms of the hands, soles of the feet and forehead – basically water+salt

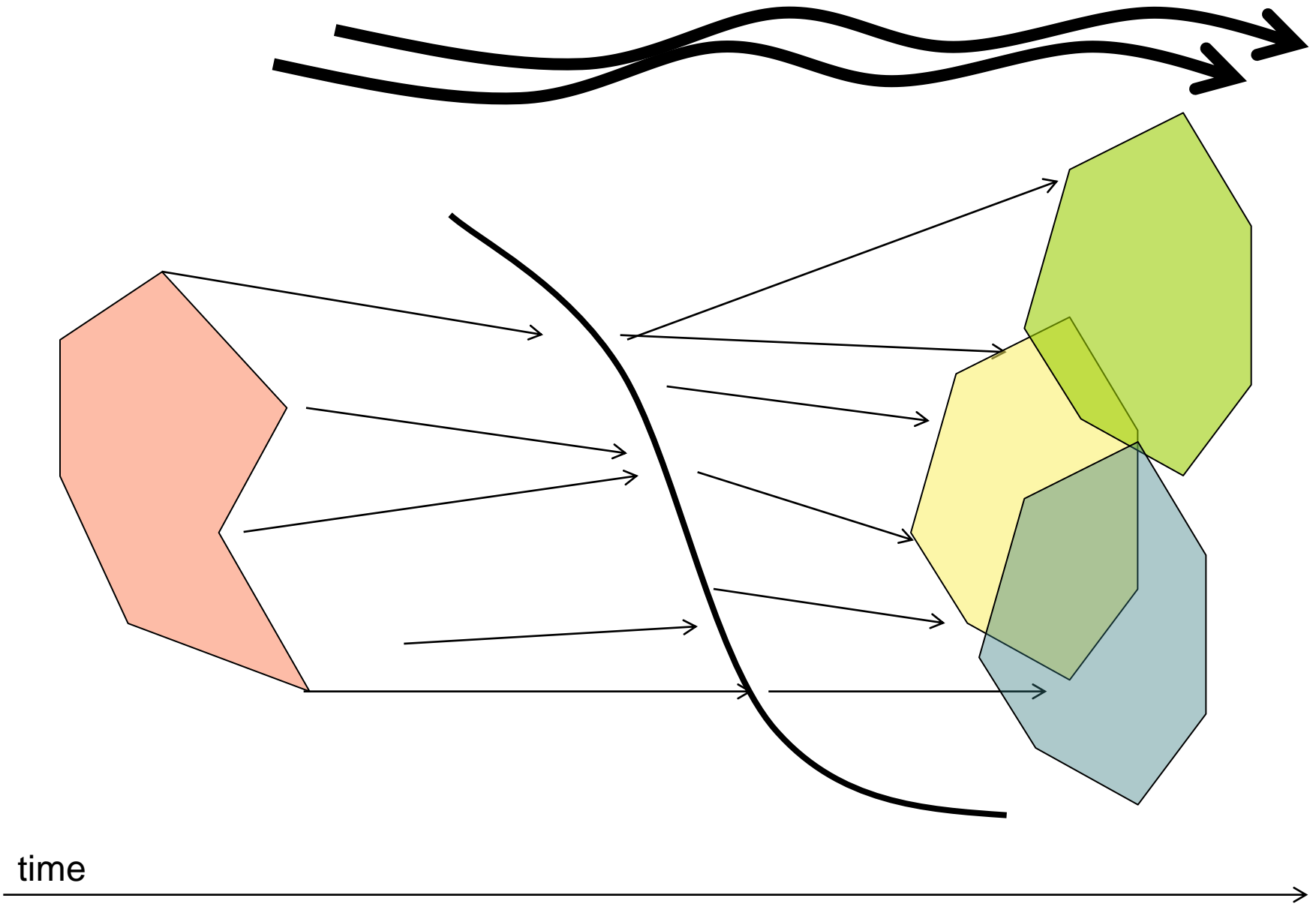
Apocrine - mostly confined to the armpits (axilla) and the anal-genital area. They typically end in hair follicles rather than pores. – include fatty acids and protein



Cool United Nations

Cool is becoming the new buzzword in global efforts to reduce our carbon footprints and tackle climate change.

Changing conventions; modifying technologies; re-defining the role of the building itself.



The air conditioned man:
The great economical
idea of the age. The
ventilating costume, cool
in summer, warm in
winter. 1877.

BE041647| RM| © Bettmann/CORBIS

