Biosocial interactions in modernization

9. Intergenerational variation and eugenism

9. Intergenerational variation and eugenism

9.1. Evolutionary background of intergenerational variation

9.2. Contra-selective effects in modern culture

Intergenerational variation =

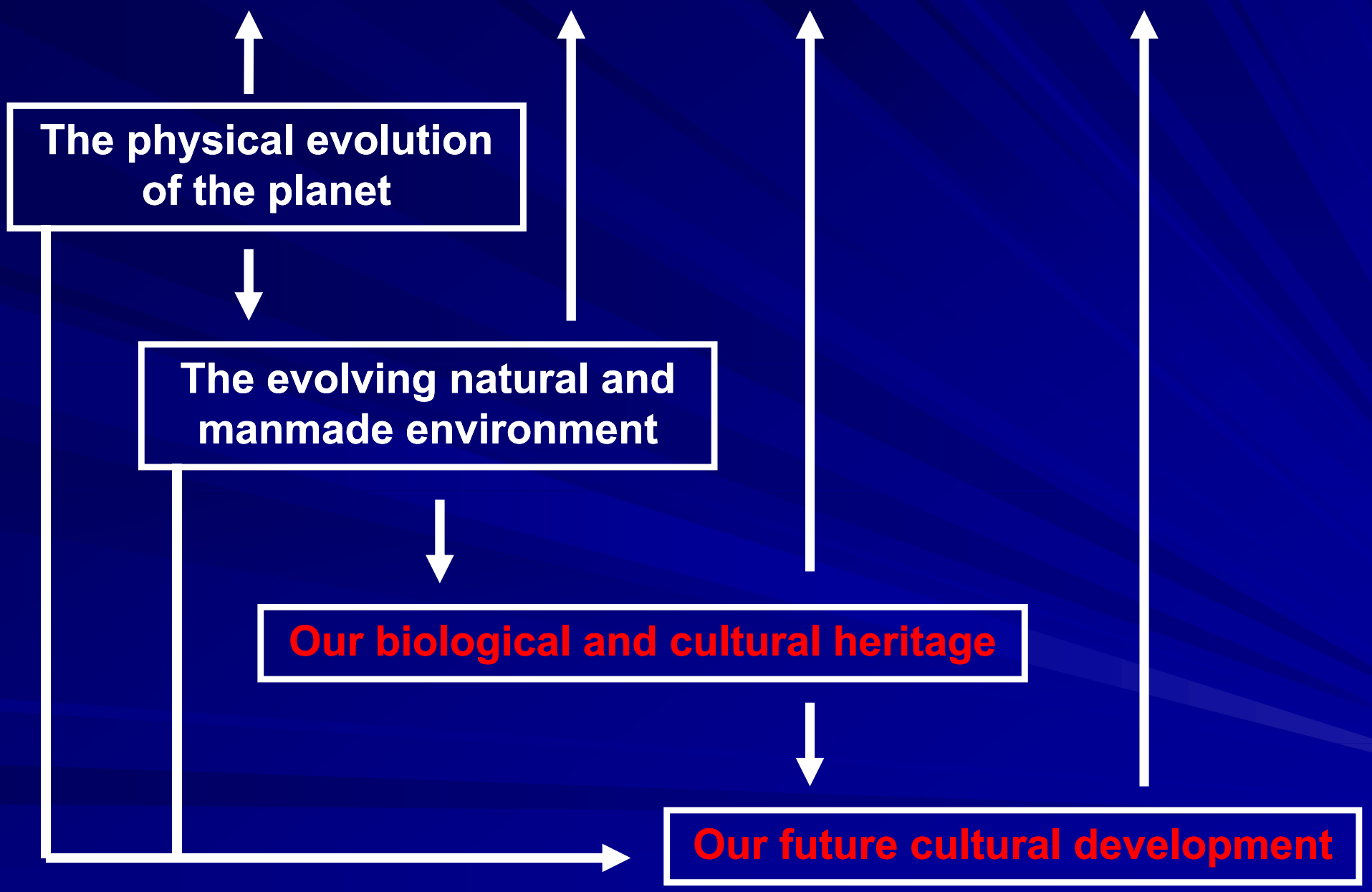
Changes in the genetic composition and genotypic structure

Biological evolution

Changes in the phenotypic expression of individuals and populations

Genes connect the past, the present and the future

The biological future of the human species



Biological and cultural heritage and future perspectives

- Our heritage of the past:
  - Our phyletic state
  - Our cultural inheritance

  ↓

  The effects of the modern demographic transition

- Future:
  - Future biosocial goals
  - Scientific-technological innovations and their applications.

The time dimension

- Futurologists: period between 5 and 50 years
  - near future (5 years): matter of daily concern
  - > 50 years: ?
- Slaughter (1994): 'The 200-year present'
  - 100 years back
  - 100 years ahead
- **Human sociobiology: evolutionary time scale**
  - Past:
    - 5 million years (hominids)
    - 150,000 – 200,000 years (*Homo sapiens sapiens*)
  - Future:
    - short-term future: < 100 years
    - long-term future: > 100 years

The heritage of the past

- Positive and negative acquisitions of the past!
  - the evolutionary heritage of the human
  - the cultural heritage

  ↓

  - **Current development of modern culture: unsustainable**

- Safe future (= biological and cultural evolution to higher stages of humanization and civilization)
  - Maintenance of bio-diversity and preservation of natural eco-systems;
  - Lasting exploitation of sustainable resources;
  - Thrifty use of unsustainable resources;
  - Stabilization or even decrease of population size at a stationary level;
  - Reduction of overconsumption;
  - Levelling out of international differences in degrees of and opportunities for development.

The biological heritage

- Partially maladapted to modern culture
- Not easy to dispose of in near future!
- Desire to preserve some of our pleasure-giving biological acquisitions, even when maladjusted ?
- Continuously dependent upon biological evolutionary mechanism

  ↳ Emergence in each generation of genetic variants or genotypic combinations which produce phenotypes that cannot survive or are seriously impaired

The cultural heritage

- The existence of various and largely conflicting and competing value and norm systems:
  - Traditional religions
  - Modern human or social oriented ideologies:
    - Atheism
    - Capitalism
    - Ecologism
    - Egalitarianism
    - Fascism/Racism
    - Feminism
    - Humanism
    - Individualism
    - Liberalism
    - Nationalism
    - Socialism (and Communism)
    - Etc.
- The emergence of modern science.

Conflicting and competing value and norm systems

- Two major features:
  - a considerable within- and between-country variation;
  - a gradual, but varying shift from beliefs-based towards knowledge-based value and norm systems.
- Major sociobiological distinctions between beliefs- and knowledge-based value systems:
  - quantitative birth control (contraception, abortion; medically assisted fertility);
  - qualitative birth control (genetic interventionism: eugenics;
  - death control (euthanasia).

Non-interventionism

- Traditional religious groups, e.g.
  - Several christian denominations;
  - Islamic fundamentalists.
- Several secular ideologies, e.g.
  - Individualism: individual rights predominate over societal values
  - Egalitarianism: all individuals are identical, differing only in upbringing;
  - Disability rights advocates: life with disability is worthwhile; all diseases are part of the diversity of the human race

The effects of modern science

- Technological effects:
  - Increase of knowledge, education;
  - Elimination of infectious and contagious diseases, and treatment of other diseases or impairments;
  - Elimination of starvation;
  - Improvement of accommodation;
  - Increase of opportunities for leisure activities;
  - Considerable increase of standard of living in general.

- Ethical effects:
  - Increase of (modern?) ethnical principles such as liberty, justice, equality, solidarity, tolerance;
  - Decrease of superstition as normative drive.

Effects of modern culture on intergenerational variation

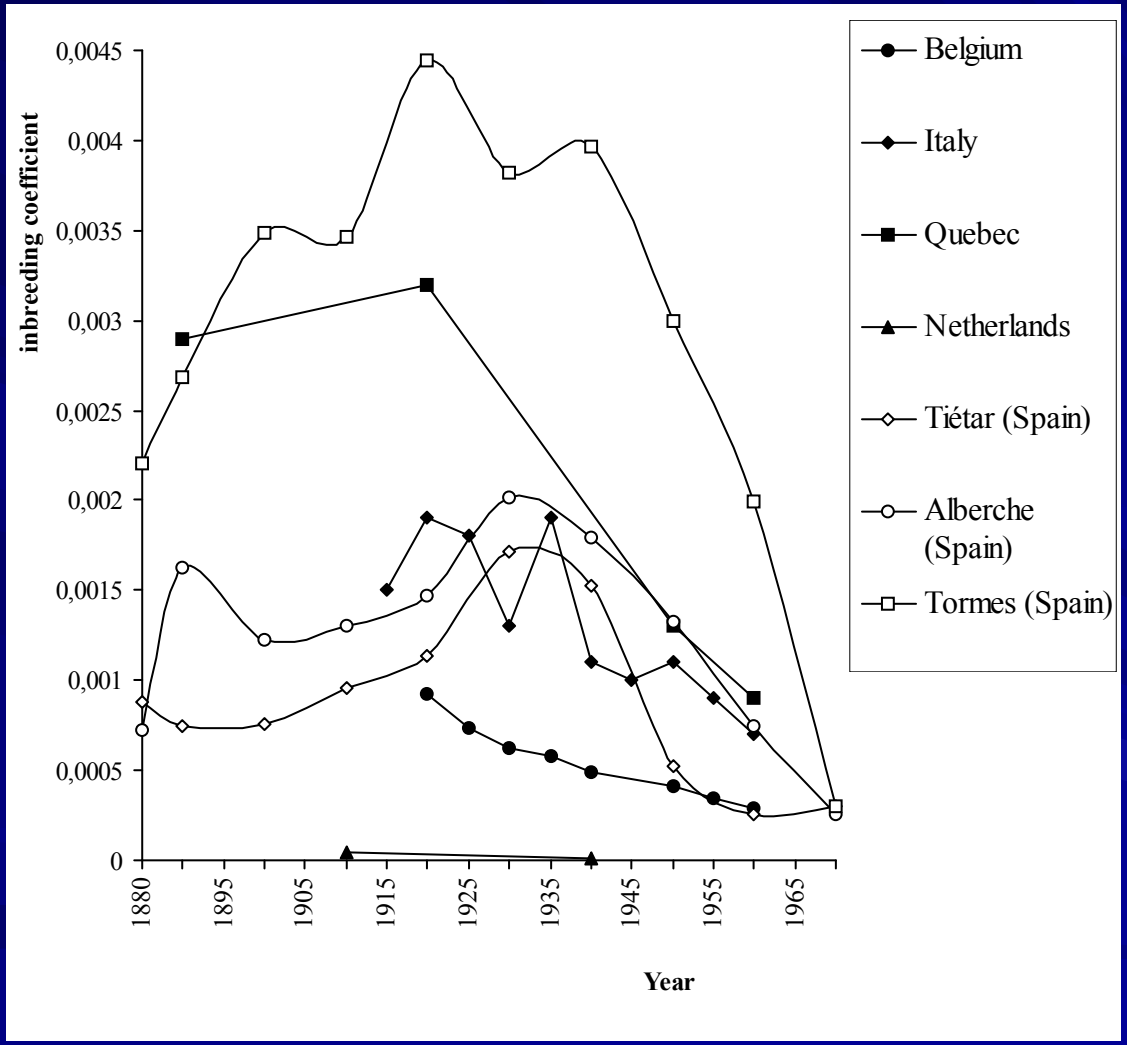
- Phenotypic effects
  - Development of the human-specific potentials
    - ↳ phenotypic adaptability has considerably increased
  - Decrease of social inequalities

- Genetic effects
  - Increased genetic heterogeneity
  - Contraselective effects

Genetic effects of demographic transition

- Mating behaviour
  - ↗ mate circles:
    - ↗ heterogeneity
    - ↘ inbreeding → eugenic effect
  - ↗ assortativie mating: → ↗ homozygosity
  - ↘ selective mating: → ↗ heterogeneity
- Fertility behaviour
  - ↘ parental age (timing): → eugenic effects
  - ↘ number of children (intensity): → miscellaneous
- ↘ Mortality and morbidity : → ↗ heterogeneity
- ↗ Migration: → ↗ heterogeneity

The change of the coefficient of inbreeding (F) in the course of the demographic transition



Contraselective effects of modern culture

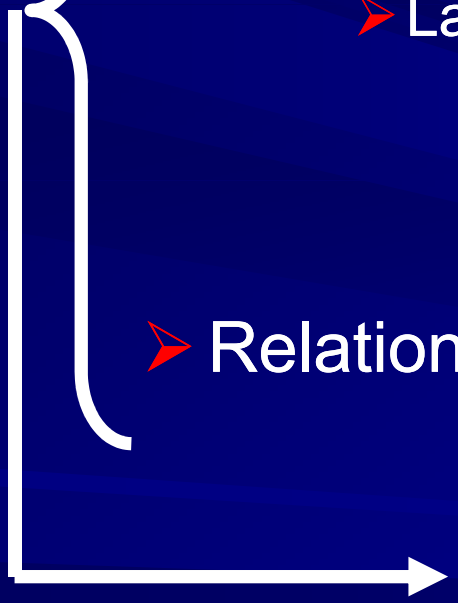
- Replacement therapies
  - selection relaxation
    - ↗ vulnerability
    - dysgenic effects
  - enhanced adaptability
- Differential reproduction

Differential reproduction

- Historical changes in SES-related reproduction
  - Pre-demographic transition: slightly positive
  - Demographic transition:
    - Early 20th century: strongly negative
    - Mid 20th century: differentials levelling down
    - Late 20th century: first signs of slight reversal

Osborn's 'eugenic hypothesis'

- Relations between SES and intelligence



Contraselection theory

IQ paradox in modern culture

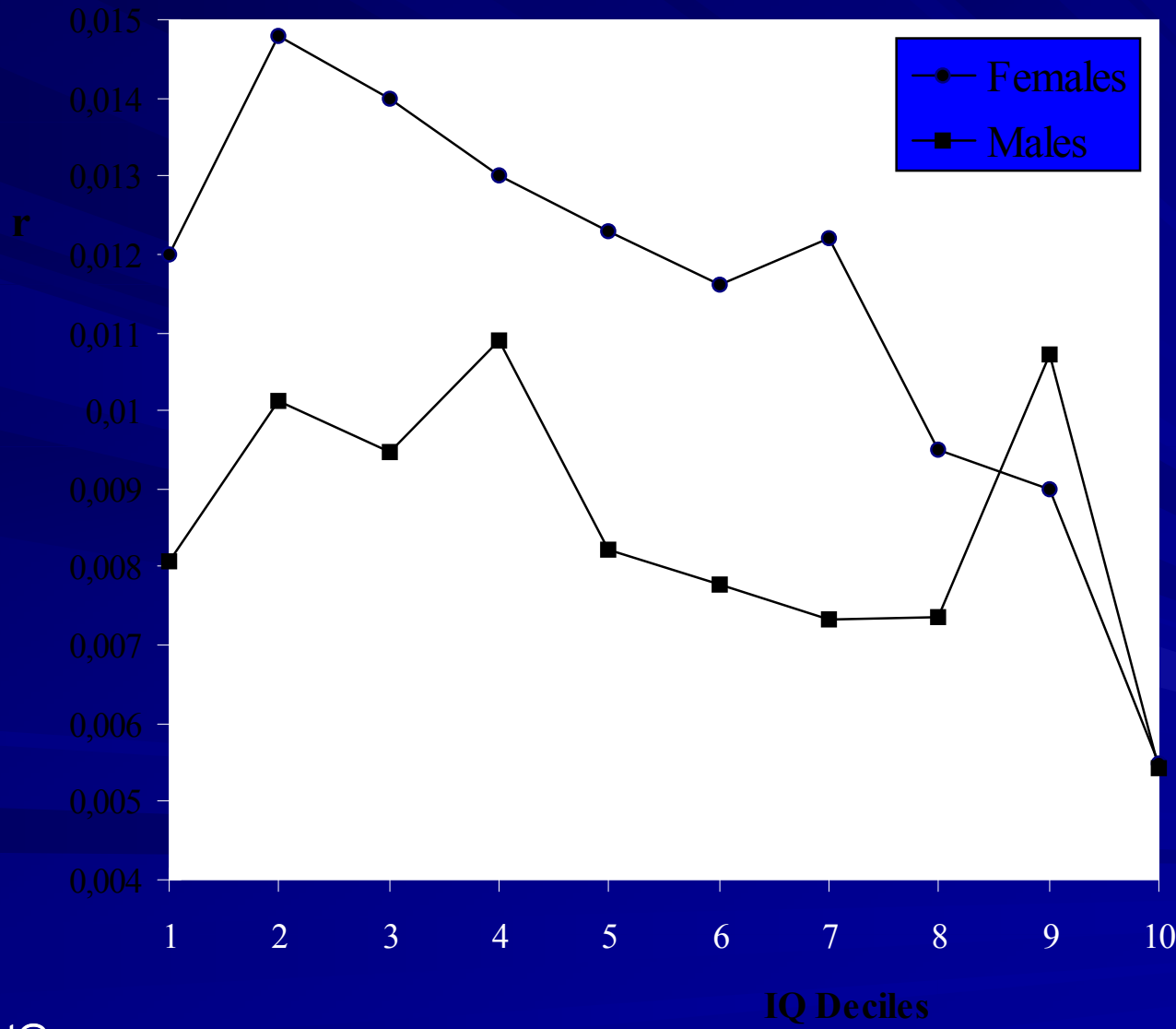
- Differential reproduction → ↘ IQ
- Secular changes → ↗ IQ

} Paradox

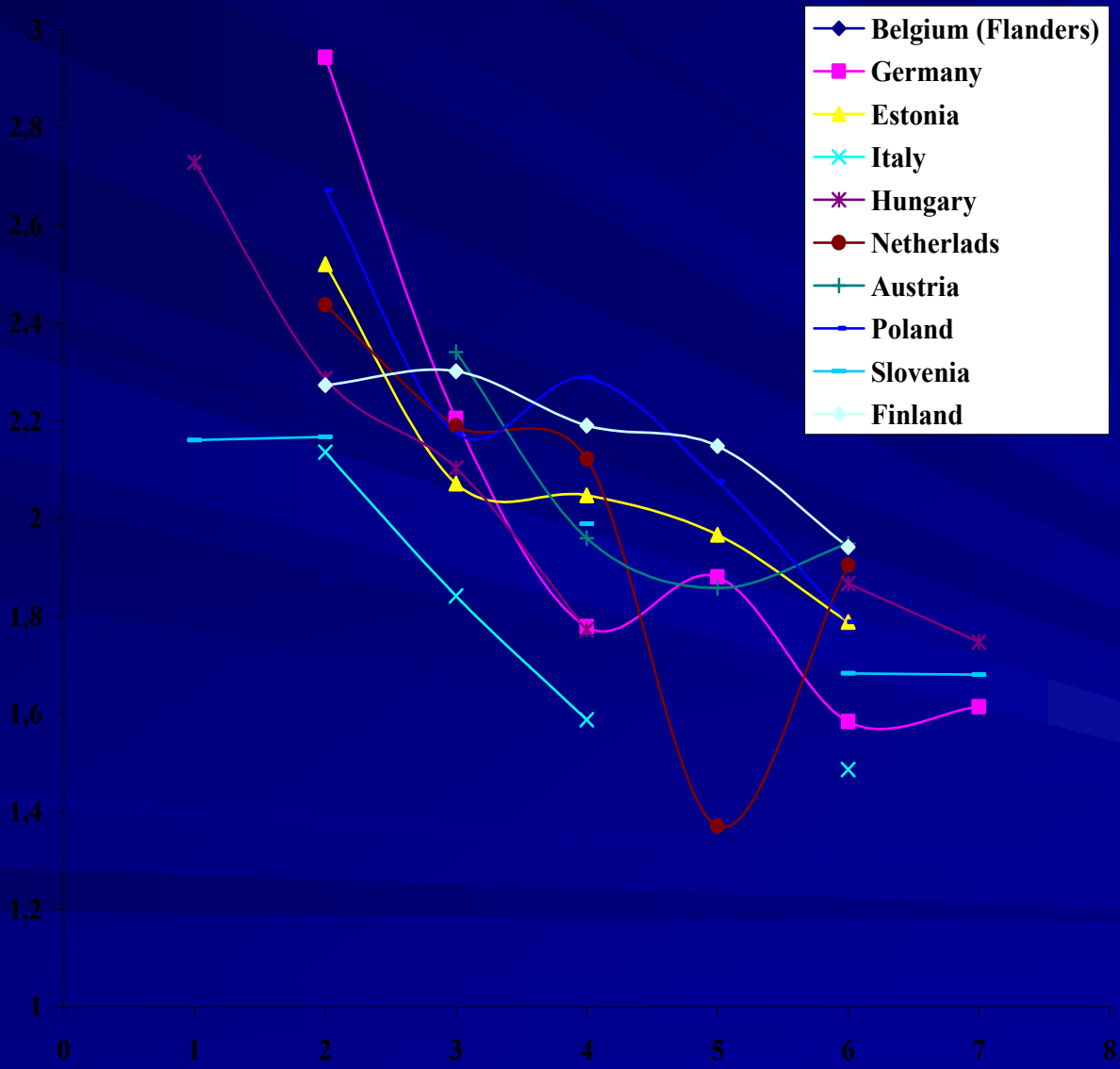
- Explanations for paradox:
  - Reproductive behaviour and SES:
    - Fertility: - correlation
    - Nuptiality: + correlation
    - Generation length: + correlation
    - Mortality: - correlation
  - Secular changes in SES related reproductive behaviour
  - Flynn-Lynn effect: phenotypic improvements may mask genotypic decline

The intrinsic rate of natural increase r by IQ deciles and sex

(Wisconsin Longitudinal Study)



Differential fertility by education of 40 to 65 year old women in selected European countries (PPAS)



Evaluation of contraselection theory

- Current IQ-fertility relation in modern society:
  → slight dysgenic effect;
- Temporary consequence of a major shift in cultural development and its associated demographic regime
- Dysgenic effect might in the near future reverse
  - future progress in genetic knowledge
  - genetic engineering
  - raising expectations about quality of life
  - adapting norms to the newly created genetics and demographics.

CRUCIAL CULTURAL DETERMINANTS FOR THE FUTURE

- **Future scientific and technological developments**
  - **The end of culture?**
  - **The future might be infinitely bright!**

- **Ethical goals for the future**
  - **From quantitative to qualitative birth control**
  - **From phenotypic to genotypic care**

NB. Successes in birth and mortality control

- **sharpened the consciousness that the human is able to control fundamental processes of life**
- **made him more sensitive to biological harm.**

Basic ethical options relevant for the biological future of the human species

- Intervention versus non-intervention
  - principle of the holiness of life
  - principle of the quality of life

- Quality versus quantity
- Equality versus inequality
- Individual versus society
- In-group versus out-group
- Intragenerational versus intergenerational care

Bio-ethical goals

- **Euphenic goals**
  - **optimal phenoptypic expression of the human potentialities**
  - **socially and nationally equitable development of those potentialities**
- **Eugenic goals**

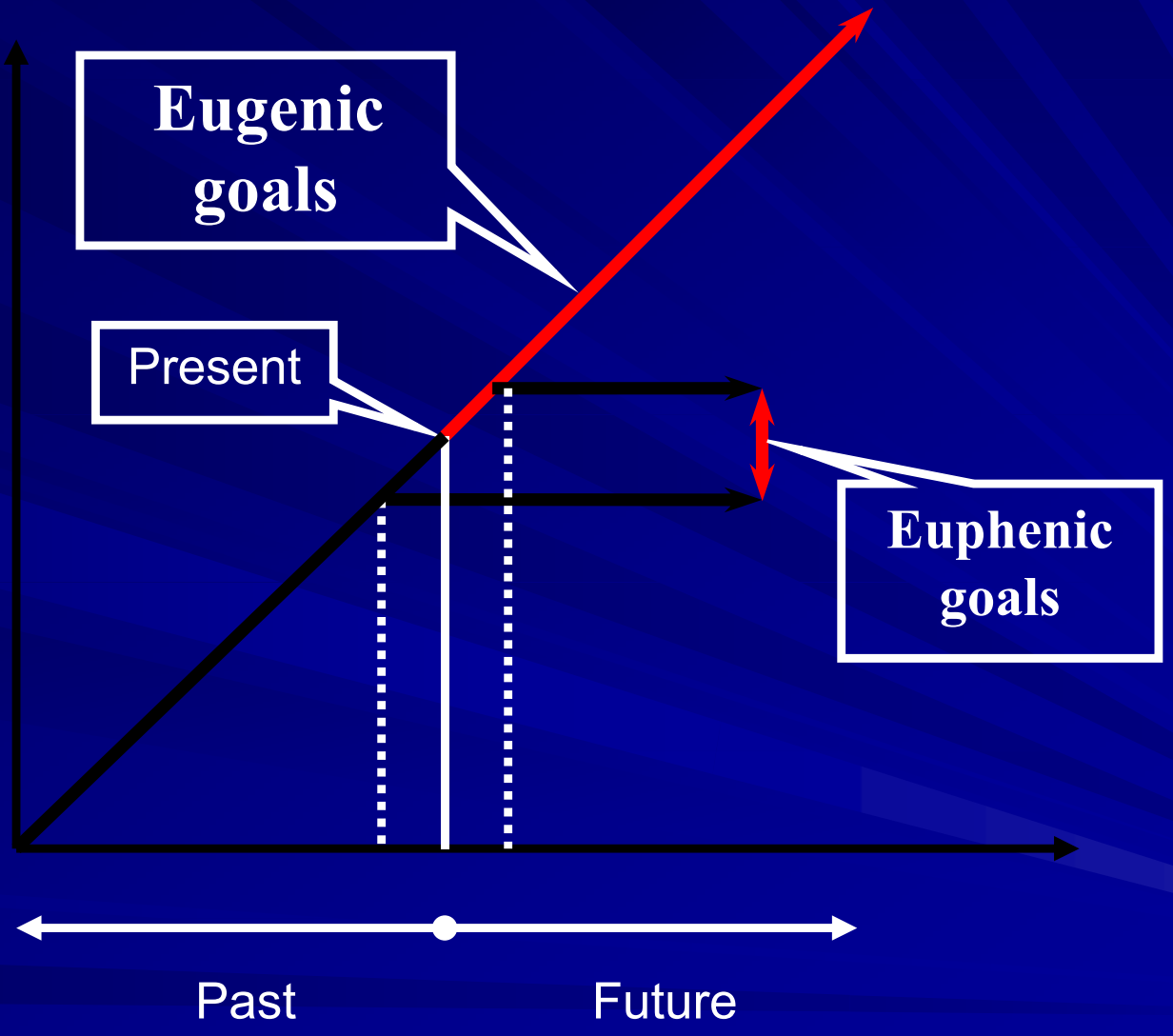
  Francis Galton (1883; 1905) :

  "Eugenics is the science which deals with all the influences that improve and develop the inborn qualities of a race to the utmost advantage."

Eugenic goals

- Human inborn qualities?
  - cognitive abilities
  - mental and physical health
  - sociability
  - maintenance of genetic variability
- Human specific genetic potentialities:
  - Develop genetic potentialities
  - Improve genetic potentialities?

Euphenic and eugenic goals for future ontogenetic and phylogenetic development



The ultimate aim of eugenics: the furthering of the hominization process?

- Overhage (1977):“Die biologische Zukunft der Menschheit”
  - “*Die ‘ferne’ Zukunft der Menschen bleibt der wissenschaftlichen Ergründung verschlossen. Sie kann kein Ziel der Eugenik sein*.”
- Muller (1960): “Guidance of human evolution”
- World Transhumanist Association:
  - ‘posthuman’ stage
  - higher than current intellectual heights, resistance to disease, increased longevity, unlimited youth and vigor, increased capacity for pleasure, love, artistic appreciation, and serenity, experience of novel states of consciousness,

Carrying forward the hominization process

- In general
  - cognitive abilities (including biological instruments of communication);
  - emotional personality characteristics which facilitate sociability and altruism;
  - physical vigour, health and longevity
  - maintenance of genetic variability

- Muller's (1960) specifications:
  - In the domain of mental powers:
    - more profound analytic abilities
    - multi-dimensional thinking
    - more creative imagination
    - development of new mental faculties such as telepathy;
  - In the domain of emotional personality, decrease:
    - quick anger, blinding fear, strong jealousy, self-deceiving egotism;
    - susceptibility to group experiences and indoctrination;
    - predispositions to combativeness, xenophobia and related impulses;
  - in the physical realm:
    - reduction of need for sleep
    - better control of induction of sedation and stimulation
    - increased physical tolerance and aptitudes in general.

Rationale for the preservation and the advancement of human-specific characteristics

- Preservation of the present human-specific characteristics
  - Prevent deleterious mutations
  - Prevent cultural production of unfavourable mutations
  - Prevent contraselective effects of modern culture
- Advancement of human specific potentialities:
  - Bajema (1971): modern culture requires high intelligence and creativity;
  - Elgin (1993):"*Awakening Earth: Exploring the Evolution of Human Culture and Consciousness"*
    - (1) the hunting-gathering era;
    - (2) the agrarian era;
    - (3) the scientific-industrial era;
    - (4) the '*communications and reconciliation'* era;
    - (5) the '*bonding and building'* era;
    - (6) the '*surpassing'* era;
    - (7) the '*initial maturity as planetary civilization' era.*

General societal conditions for implementing a eugenic programme

- Negative conditions:
  - laissez-faire economics;
  - authoritarian regimes.
- Positive conditions:
  - democracy;
  - personal freedom;
  - humane individual development;
  - female emancipation;
  - generalised birth control.

Scientific and social dimensions of eugenics
(Bajema, 1976)

- As scientific discipline (in fact a subdiscipline of human genetics):
  - eugenics “encompasses those scientific studies that are concerned with ascertaining the genetic consequences of implementing or continuing any kind of social program.”
- As social movement:
  - eugenics “encompasses all efforts whose goal is the modification of natural selection to bring about change in a particular direction within human populations or the human species as a whole.”

Broad and narrow eugenics

- Eugenics in a broad way (Galton, 1883, 1905):
  - improve the inborn qualities of the human species
  - develop them to the utmost advantage.
- Eugenics in a narrow sense:
  - improvement of the human gene pool

Eugenic target levels

- Individual eugenics (the individual level):
  - current-day genetic counselling as it is since many decades developed at university medical-genetic departments in many countries;
  - Its aim is either to provide individuals or families who are at high genetic risk, with genetic information and/or medical assistance in order to prevent the transmission of a genetic disease or impairment to following generations.
- Social eugenics (the population level):
  - improve the genetic composition of the population's gene pool;
  - changing the distribution of 'normal' characteristics – e.g. intelligence, sociability, physical health in general – in the direction of the higher values of the variation.

Eugenic benefits

- Genetically determined diseases or impairments may be avoided, mental or physical health may be improved, specific human features such as intelligence and sociability may be furthered.
- Natural selection may be replaced with scientific selection, thus changing the current laissez faire posture in natural selection into a guided selection
- Enhance individual well-being and family happiness and welfare.
- Favourable social effects:
  - In the field of education: avoid unqualified people to shoulder the responsibilities of parenthood;
  - In the field of economics: reduce the high financial costs of treating, maintaining and caring of genetically heavily impaired persons.

Eugenic costs

- Limiting individual 'freedom' in the domain of reproduction;
- Unexpected social effects of germ-line therapy, e.g.:
  - enhanced memory capacity: might make life more difficult as unpleasant past events might continue to preoccupy one's mind;
  - genetic engineered children might fall short of the parents' expectations and consequently psychologically burden the life of both parents and offspring.
- Measures aimed at improving polygenetic features undoubtedly will have statistical positive effects at the population level, but not necessarily for each individual or couple.
- Arrival of groups of individuals with superior capabilities in particular areas – intelligence, physical performance, artistic creativity – might disrupt social cohesion by increasing inter-group competition, jealousy on the one side and contempt on the other.

Major stages in the eugenics movement

- the 'Mainline Eugenic Movement' from the end of the 19th century up to 1930s:
  - 'Mendelian' oriented, hereditarily prejudiced, class and race biased, politically conservative, antifeminist, strongly against birth control (contraception and abortion), and in favour of compulsory eugenic measures;
  - late offshoot in Germany: Nazi 'eugenics'.
- the 'Reform Eugenics from the 1930s:
  - reacted against the unscientific and authoritarian approach of the Mainline Eugenics and its class and race prejudices.
- the 'New Eugenics' from the mid 1960s:
  - arose on the basis of the dramatic development of the biochemistry of heredity and in particular of molecular genetics and of micromanipulator medicine in general, resulting in totally new fields such as germinal gene therapy and medically assisted reproduction.

An infamous 'eugenic' fallacy of the past: NAZI dysgenics

- NAZI laws:
  - ("*Gesetz zur Verhütung erbkranken Nachwuchses vom 14. Juli 1933*").
  - ("*Gesetz zum Schutze des Deutschen Blutes und der Deutschen Ehre, 1935*"
  - (*"Gesetz über die Sterbehilfe bei unheilbar Kranken, 1939"*)
  - Holocaust on Jews, political and ethical opponents and other undesirable population categories (1941-1945)
- Evaluation:
  - So-called NAZI eugenics = dysgenics!
    - indiscriminate sterilisation of people with a genetic impairment in Nazi Germany was scientifically unfounded
    - euthanasia of handicapped people had no eugenic repercussions
    - promotion of the so-called Aryan race was cheap swindle;
    - The Shoah was a final solution in the competition with a socially successful population group who, moreover, was traditionally in Christian Europe a welcome scapegoat in times of crisis

Eugenics: a dirty word?

- Nazism compromised the eugenics movement
  - American Eugenics Society → Society for the Study of Social Biology (1972), its journal 'Eugenics Review' → 'Social Biology' (1969);
  - The 'British Eugenics Society' →'Galton Institute' (1989), its journal 'Eugenics Quarterly' → 'Journal of Biosocial Science'.
- Strategy of opponents of eugenics to abuse the Nazi fallacy to reject eugenics as such, - a vicious *ad hominem* tactic of putting the opponent in an unfavourable daylight by associating them to a criminal ideology;
- Increasing precedence accorded to individual rights over social rights;
- Shift from biological to cultural determinants in the explanation and policy action in social matters.

FUTURE POLICIES/ACTIONS/METHODS

- Euphenic engineering
  - Pharmacology
  - Surgery
  - Somatic gene-therapy
    - Gene activation therapy
    - Gene replacement therapy
- Eugenic engineering
  - Biotechnology
    - Medically assisted fertility
    - Germinal gene therapy
  - Genetically differential demographic behaviour
    - Individual/family oriented eugenics
    - Population oriented eugenics

Medically assisted fertility

- **Artificial donor-insemination** (AID)
- **Ovum donation**
- ***In vitro* fertilisation**
- **Embryo selection**
- **Parthenogenese**
- **Cloning**
- **Sex selection**

Genetically differential demographic behaviour

- Values and norms
- Education and information
- Universal availability and accessibility of birth control practices
- Availability and accessibility of genetic counselling services
- Detection of relatively highly prevalent genetic deleterious genes at the population level by a general screening (Teitelbaum, 1972)
- Encourage people of low intelligence or with a high risk of transmitting deleterious genes through a system of financial incentives (Boulding, 1964)
- Preventing the transmission of deleterious genes can be done by exerting 'soft coercion' (Bajema, 1971)
- 'Mutual coercion' (Hardin, 1968)

Ethics of eugenic interventions

- Ethical concerns about eugenics in general
  - Intrinsic objections to eugenics, e.g.
    - nature knows best (= naturalistic fallacy!)
    - nature is conceived as the work and will of God (= don't play God, leave well alone)
    - social eugenics = bad eugenics
    - 'designer babies', 'home-made eugenics'
  - Extrinsic objections to eugenics
    - Eugenic practices are too risky or even catastrophic for the biological future
    - Reduction of the genetic variability in the population
    - Sexual abuse (men → women; women → men)
    - Social inequalities in the application possibilities
- Ethical issues in eugenic practice (next slide)

Ethical issues in eugenic practice

- Compulsory versus free choice application of eugenic measures
  - Individuals receive non-directive genetic counselling and make autonomously informed decisions about their future reproductive behaviour.
  - Compulsory eugenics – individuals (having a genetic risk) are obliged to genetic counselling or screening and are, in case of a diagnosed individual or family risk, obliged to follow the legal provisions
  - Variety of intermediate positions (e.g. soft coercion; interference of counsellors),
- Specific problems:
  - Mentally or socially unable patients to decide 'freely and responsibly' about having children in case of high genetic risks.
  - Sex selection
  - Right to genetic privacy
    - Informing relatives?
    - informing third parties (employers, health insurance companies)?
  - Demographic instruments of selection (e.g. selective abortion)

Attitudes and behaviour towards eugenics

- NB. Caution about attitudinal investigations!
  (e.g. Experience with birth control practices)
- Average human thinks and acts strongly in eugenic terms
  - Eugenic attitudes are largely spread among western populations and their medical professionals;
  - Partner choice (cf. 'good genes' theory)
  - Reproductive behaviour of married and unmarried couples who are faced with a hereditary genetic risk

The long-term genetic future

- Evolutionary extinction
- Evolutionary regression, e.g.
  - atrophied lower limbs,
  - non-lactating mammary glands,
  - weakened auditory and visual powers,
  - further reduced and degenerated set of teeth,
  - increase in all possible other physical and mental disorders for which replacement therapies are developed or selection relaxation is made possible
- Evolutionary stabilization
- Evolutionary progression
  - Improvement of physical health and performances
  - Increase of neurological capacity:
    - increased cognitive performances,
    - more refined emotional life and stronger sociability.
  - Furthering of other desired human characteristics (e.g. beauty, sexual arousal and orgasm, euphoria, longevity.

The long-term genetic future