Science, Technology and Society Week 14

DNA and the Secret of Life, 1850-1950

Lecture

* Covered a lot of ground technically and chronologically

Definitions

* Lots of key technical terms mentioned in lecture
  + Inheritance
    - Resemblance between parents and their offspring, shown through characteristics
  + Preformation
    - the sperm or egg contains a miniature organism, this embryo is a complete tiny version of the original organism itself.
    - Your own character is determined at moment of conception – no more fundamental changes afterwards
    - 17th to 18th century
    - Provided way to have naturalistic account of heredity while still providing a role for God in crafting individuals - human race had been created enclosed within the sperm of Adam or the ovary of Eve
    - All information is present in the egg from the beginning
  + Recapitulation
    - Up to late 19th century – 1868, Ernst Haeckel
    - You go through different stages of evolution and development of organisms
    - Repeating the process of human evolution
    - Kind of pre-determination
    - Idea that embryo is remembering the past history of the human species
  + Pangenesis
    - a theory proposed by Darwin to explain heredity in which all cells in the body produce tiny little ‘gemmules’, which are from the parent cells and they circulate throughout the body to congregate in the gonads
    - essentially a Lamarckian theory of inheritance – characteristics had evolved over a lifetime
    - the whole point of Darwin’s Origin of Species is that it was not Lamarckian so was he Lamarckian?
    - Darwin sees these as two separate things to explain, so he was not inherently anti-Lamarckian
    - Talking about evolution – appealing to different theory
    - Lamarckian theory of inheritance, not a Lamarckian theory of adaptation
  + Mendelian genetics
    - The idea that traits were discrete rather than continuous and he coined the terms dominate and recessive
    - Gets rid of the pangenesis model
    - Could not extract Mendel from what comes later as he was used as a vehicle
    - Looking for observable patterns in inheritance, rather than trying to explain inheritance
  + Classical genetic theory
    - Identify the chromosome
    - Once you know the chromosomes of a person, you know what the person will be like
    - Central dogma of genetics, genetic determinism
    - Traits of the adult organism are totally determined by nature of chromosome in the embryo
  + Watson/ Crick’s discovery
    - Visualisation of the helix structure of DNA
    - DNA was well known when they began research, acid in cell that was the carrier of genetic material
    - Depoliticization of genetics

Are genetics a political philosophy?

* How do we agree with this?
* Funding that led to discoveries came from state
  + Connection to conservative political thought
  + Fascist political thought also played a role – eugenics
* Seeking to uncouple yourself from politics is a political move
* Even without genetics, you can identify people as inferior
* But genetics suggests to some that the disparity between groups are permanent
  + Impossible to change chromosomes
  + Biological reality
* Genetic determinism and particular band of political spectrum
  + One way of thinking about scientific and political ideas together
* Classical genetics – scientific thought responded to the fears of the period
  + More connection to culture, general recognition of pessimist view of progression of man
  + Industrialisation has had a negative effect on human race
  + Human race was going in a negative trend – lower classes reproducing fast, inheritance of bad traits
* Plans for selective breeding – eugenics
  + Fear about the future of the human race
  + Assumes that there is something we can do about the quality of the human race
  + Once chromosomes are fixed, we can change which chromosomes are passed on
* Gives you a tool to manipulate the human race to push it in the direction we prefer
  + Conservative view of humans
* Reformists theory taken up in end of 19th century
  + Human race might improve in face of scientific knowledge
* To sum up: genetic theory didn’t map onto just one political position, but onto several different ones – it was a very versatile theory
* Also, just as much about culture as well as politics
  + Novels, poetry, public discussion
  + Wider culture of dystopian thinking around 1900

Pasteur Institutes give a different view of the science/politics relationship:

- Vaccinations use lots of animals, and sometimes involve vivisection ie live dissection

- What is the politics of these laboratories?

- Complicated situation:

* Version of Indian nationalism to protect cows – but another version of Indian nationalism exists that supports the Pasteur Institutes, a reforming, modernising nationalism
* Note also that, in this case, politics come from a set of material things (ie. animals) not from a theory (classical genetics)