

BIOLOGY AND ANTHROPOLOGY : BEFORE AND AFTER BOLOGNA

CHARLES SUSANNE
Vrije Universiteit Brussell

ABSTRACT

The XXIst century can be considered as the century of the genetics. As anthropologists, we have to choice the divulgation of genetical studies to contribute to the development of new points of view, more humanistic, in the interpretation of the differences existing between populations. The genetics can, indeed, change the concept we have from ourselves and from the others as well as the relationship between human groups. The history of humanity is a history of discriminations and of conflicts caused by false ideas on «differences» considered as “inborn” and “superior”.

Who can better than anthropologists explain the huge human polymorphism? The genetic «ideology» based on the «human genome» denies this variability and discriminates whom is deviating from the desirable «model». The human genome is an abstraction: a representative genome for all humans does not exist.

The Human Genome Project can be an excellent anthropological tool if we keep attentive to ethical principles as fundamental as democracy and public management of better conditions of life.

Keywords: human genome, racism, anthropology, polymorphism,
genetic ideology.

RESUMEN

El siglo XXI puede ser considerado como el siglo de la genética. Como antropólogos tenemos que contribuir a la divulgación de estudios sobre genética para favorecer el desarrollo de nuevos puntos de vista, más humanísticos, sobre la interpretación de las diferencias que existen entre poblaciones. Sin embargo, la genética puede cambiar el concepto que tenemos de nosotros mismos y de los otros así como de las relaciones entre grupos humanos. La historia de la humanidad

es una historia de discriminaciones y conflictos motivados por falsas ideas sobre las «diferencias» consideradas como «de nacimiento» y «superiores.»

¿Y quién mejor que los antropólogos pueden explicar el enorme polimorfismo humano? La «ideología» genética basada en el «genoma humano» niega esta variabilidad y discrimina a aquellos que se desvían del «modelo» considerado por algunos como el más deseable. El genoma humano es una abstracción: no existe un genoma representativo de todos los humanos.

El Proyecto Genoma Humano puede ser una excelente herramienta antropológica si nos mantenemos fieles a principios éticos tan fundamentales como la democracia y la gestión pública de mejores condiciones de vida.

Palabras clave: genoma humano, racismo, antropología, polimorfismo, ideología genética.

BIOLOGY AT EUROPEAN UNION UNIVERSITIES

As a result of the Maastricht treaty the European Union has become responsible for educational programmes at least in terms of collaboration between the Member States (126 in education, 127 in vocational training, 130 in research). Socrates in responding to the evolution in European Union responsibilities, is attempting to consider the past experiences of the Erasmus programme, it is not neglecting the previous individual ICPs but is now centralising much more of the efforts at university level.

Biology became transversal. Indeed, there is a increasingly international concern about global changes, degradation of natural resources, reduction of bio-diversity, pollution of air and water, long-term disposal of hazardous wastes, diminution of ozone layer,... Science knowledge is intimately related to the local and/or global solutions to a healthier environment.

Other transnational issues are linked to biology: health (cancers, cardiovascular diseases, AIDS,...), malnutrition and hunger, population growth, biotechnology, genic therapy,...

In the biological sciences, universities need to adapt if they want to maintain their traditional vocations in the 21st century and their relevance to society. The knowledge and know-how of universities will be essential in the many societal challenges we have to face.

- Teaching should not only be a source of information but an opportunity to coach students in the process of learning by themselves.

- New concepts must be incorporated into the biology curriculum although biological studies imply we keep a broad scientific base.
- New discoveries imply a tendency for polarisation between molecular biology, the ecological sciences and organism biology although a biologist has to understand the whole of biology to master his research.
- The increase of specialisation is so great that no single university is today able to cover the whole range of biology, this implies collaboration and networking is now a necessity (and will become ever more so).

Other challenges are of an industrial, ethical, educational and even political origin:

- Industrial, because more and more biologists are attracted by biotechnological concepts and their business consequences,
- Ethical, because biologists are implicated in bioethical discussions and have to explain the limits and/or the dangers of some techniques,
- Political, because the general public is increasingly aware of the biosphere's deterioration and the potentially catastrophic effects of different pollutants causing acid rain, a thinning of the ozone layer and global warming,... Biologists have the responsibility to motivate and formulate long-term politics.
- Educational, because to develop a basic understanding of the philosophy of bioethics, the new biotechnological developments or current ecological problems, then a biological culture must be developed in the general public.

A European topical network in biology will have different responsibilities (Susanne, 1995):

- to propose a place for transversal meeting within one discipline, and favouring meetings above and/or between the topical subdisciplines
- to harmonise qualifications throughout Europe
- to propose curriculum development, especially Master Sc. and Ph.D.
- to regulate a European Ph.D.
- to promote common graduate and postgraduate courses
- to help develop a European Credit Transfer System in biology
- to develop exchanges of students and staff
- to contribute to public education and continuing education
- to contribute to the creation of materials for distance teaching

- to promote biological knowledge for the advancement of human welfare
- to promote geo-political 'cohesion'
- to favour the circulation of scientists and professors.

In the joint declaration of the European Ministers of Education convened in Bologna in June 1999, affirming a support to the universities' central role in developing European cultural dimensions and to citizen's mobility and employability, the following objectives were considered: adoption of a system of easily readable and comparable degrees based on two main cycles, undergraduate lasting a minimum of three years, graduate leading to the Master and/or Doctorate degree.

Basic training at least for the first years of biology is rather similar. However basic training remains highly variable in terms of the weight given to different methodologies of teaching: lectures, seminars, collective work, interactive work groups, project work, laboratory exercises, field courses, computer work, thesis work.

BASIC TRAINING BEFORE SPECIALISATION.

Biological studies imply an adequate background in different sciences, such as:

- mathematics (including statistics)
 - computer sciences (for analysis and modelling)
 - physics (including biophysics)
 - chemistry (especially organic chemistry)
 - biochemistry
 - geology (including palaeontology)
 - ethics and/or philosophy of sciences (awareness of the responsibilities of biologists in the field of research in (bio)technology, and of bioethics)
- In biological sciences, a basic knowledge of different life levels is expected
- biomolecules
 - cells
 - organisms
 - populations
 - bio-systems.

This means, for instance, it should include:

- cell biology (ultra-structure of cells and of organelles, cell division, prokaryotes and eukaryotes,...)
- biology of organisms (histology, embryology, growth and development, general and comparative physiology,....)
- systematics (taxonomy and taxonomic principles, phylogeny, analysis of flora and fauna,...)
- genetics (genetic material, genetic code, protein synthesis, gene action, mutagenesis, patterns of inheritance,...)
- population genetics (evolution, selection, migration, genetic drift, mutation, speciation,...)
- ecology (biosphere, ecosystems, population growth,...)
- evolutionary biology and anthropology

This basic training should not neglect bridges between different disciplines and should also focus on a range of techniques and skills. We can consider this core-programme as present in all universities although some variability in depth can be present due to institutional specialisms.

The teaching should include not only lectures but also laboratory exercises, seminars, projects, field studies, and technical training. The periods of practical work have to be long enough, as this part of teaching is indispensable for biological studies of quality (Susanne, 1995).

The whole basic training of the B.Sc. should take three years and would have already some professional goals.

Master Sciences

The rapid increase of biological knowledge implies that differentiation of programmes should be possible, it is indeed impossible to cover the whole of biology at a specialised level, a choice has to be made. This phase should take two years and should be characterised by orientations to a professional and/or research specialisation.

This phase of teaching in E.U. universities will be very diverse as a result not only of each institution's pedagogical decisions but also, let us confess, as a result of human factors related to the presence of a limited number of professors and consequently of a limited number of specialisms.

Differences between E.U. universities will lead to a great deal of variety in curricula, with many possibilities in terms of:

- topic specialisations
- preparation for a wide range of professions

- preparation for careers not needing a Ph.D.
- preparation for research careers and a Ph.D.

This situation has many advantages in terms of internationalisation and complementation of curricula.

Where will be anthropology in this teaching system? It is still a matter of discussion, a reason more to be attentive to the new evolutions indeed, in the new regulations our nations are developing.

I think as anthropologists we have to try to:

- be present at B. Sc. Level eventually not with a teaching of anthropology as such but of human biology inside other teachings such as evolution, genetics, ...
- to develop at M. SC. level a specialisation. We will be probably unable to develop a M.Sc. in anthropology as such because the EU rules are speaking of a specialised staff in number of 30 for the development of a master. We will have each time to compose some possible collaborations in a Master with a broader title.
- To develop doctoral schools but again (and even more than for M.Sc level) we will have to join our forces. In doctoral schools about 80 staff have to be foreseen.

This is the reason why at EU level we have foreseen European structures able to help you at your local level

- European Master in anthropology
- European PH D in biology (seeannex 1)

Help yourself ! I mean with this that you can through these European structures show to your authorities that if you have indeed some local staff to develop a specialisation, but that you are moreover looking for European synergies and that moreover invited staff from abroad can help but also that students can planify their thesis in other European laboratories, you will be in a better situation than alone.

	BE	DE	SP	FR	UK	CZ	HU	Bologna
	2	2	2	BE U6 Lic. 2	3	3	3	3
B.Sc	2	3	3	Mait. 1	B.Sc 1	B.Sc 2	2	2
	1 or 2	Dipl.	Lic.	DE A 1	3	Mag.		
M.S c		PhD	4/5	3/4	PhD		3	3
	mi. n			PhD				
PhD	3	PhD				8		
						PhD		

TEACHING OF BIOLOGY

Beginning of the 1980s, industrials, OECD, IMF (International Monetary Fund), World Bank and EU «discover» new financial resources, the resources of public services, health, social security, pensions, teaching, that can be taken over by the private sector. Public teaching would have to be replaced by a private teaching that can be sold. Indeed private industries are looking to the enormous budget of the public teaching budget. In France, for instance, it represents 1/3 of the total external commerce. At the OECD level, the annual budget of education means \$1.200 billions and 5 to 8% of the GIP, it occupies 10 million teachers. In the same countries, the automobile sectors employs 5 millions workers for almost the same annual budget.

The ERT (European Round Table of Industrials) considers education as vital strategic investments, the private sector would have to influence the teaching programmes. Students become clients and courses products. Even the EU says «The realisation of these objectives means educational structures conceived in function of the needs of the clients ... resulting in an amelioration of the quality of the products» (CE, 1991). And of course, the G7, «the education must be considered as a service to give to the economical world» (ERT,1995). «The presence of industrials in the administration council would have to be explored». And of course, «students have to pay for a large part of their education» (OECD, 1996).

Bologna is probably also a result of this way of thinking because Bologna means a decrease of the average length of studies to allow students to obtain after a short cycle a «directly professional valuable» diploma (N.Hirtt, 2001). For many students, the first cycle will be the only cycle. (p. 110)

Following the White Paper of the European Commission, one has to encourage shorter studies more practically oriented, with enough adaptability (CE, 1993).

Our university teaching is pushed to follow a new educational system:

- with stronger links with the industrial world,
- with a larger selection of students, centres of «excellence» can only survive with less students,
- with more autonomy and larger dimensions (including high schools) but with more financial austerity.

We are far from the concept of «equal chances for everyone» and of «democratisation» of universities from the year 1955-1975 where industries were looking for a larger and more qualified source of personnel.

From the 1990s on, austerity is the only leitmotiv, following the way of thinking of the ERT (European Round Table of Industrials) «In supporting the teaching system, we are losing the finances we need to support our economy». What the industry asks is not more a «democrat» teaching, it is a limited number of highly specialised personnel, with high mobility and flexibility and a large number of low qualified people. We are confronted to a bipolarisation of our teaching system (N. Hirtt, 1996).

Most of our governments, the EU and the OECD follow these tendencies and answer to these ERT wishes. It means:

1) Austerity means also decreasing the number of personnel as about 80% of the teaching budget is linked to personnel, and to increase the ratio number of students/professors.

2) Flexibility means answering to the only wishes of the industry. «Europe authorises and even encourages universities to continue «interesting» studies, without relationship with the job-market, and with no hope to practical applications». «Il y a des gens que l'on forme pour des diplômes qui ne servent à rien !» (ERT, 1995).

3) Selection means hierarchisation: the leitmotiv at university level is «less and better», the ERT pushes to numerus clausus, wants less «intellectuals», it is a stop to the democratisation of studies, to a learning process based on autonomous and critical thinking.

4) Autonomy of universities is an important step to privatisation. The OECD (Organisation of Economical and Commercial Development) is cynically clear at this level: «If one diminishes the budget, you have to avoid a decrease in quantity of the services, even if the quality decreases ... the families will not react to this decrease of quality and autonomy means universities will decrease by their own and individually some activities» (C.Morrisson, 1996). The decrease of budget implies universities need sponsorship and co-operation with industries. Autonomy inevitably increases concurrence between universities and leads to privatisation (the example of the USA is clear at this level) and merchandising (USA: registration fee at university goes from \$4.000 to \$200.000 and increases more rapidly than the inflation rate). Moreover, the risk is that the council of universities would be controlled by political groups or even extreme groups (such as right fundamentalists religions of the USA) who will impose their points of view on the programme.

Autonomy has many objectives:

(1) reducing the budget and giving the control of the austerity to the institutions;

(2) diminishing the resistance of the teaching personnel;

(3) coming to a differentiated development of the institutions;

(4) allowing a more rapid adaptation to industries.

(5) Privatisation, accelerated by the use of technologies of information and communication is a large market indeed (with large congresses World Education Market).

«Efficiency and quality of teaching would undoubtedly be favoured if the institutions would not have a character of public administration but would be considered and managed as enterprises.» (Kredietbank, 1994). «This sector resists to technology, costs increase and there is not enough competition... For all these reasons, entrepreneurs consider teaching as a large market to conquest.» (CE, 1995a).

Is e-learning more efficient? Is it facilitating access to information? The internet gives to the student many documents, but of very heterogeneous quality, where it is almost impossible, without a good basic knowledge of the topic, to make the difference between facts and opinions, analysis and judgements, scientific rigour and prejudices, vulgarisation and developments at university level. We have no knowledge and no evaluation of the advantages of these technologies (OECD, 1998). By which kind of miracle should the student unable to use a simple and inert book become an expert in using a rapid, dense and continuously changing information. Is it to put multimedia in service of the modernisation of pedagogy? Or to put modernisation of pedagogy in service of the industry of the multimedia?

6) Employability is opposed to the concept of qualification (whole of knowledge and competence, recognised, certified, with social guarantees). Employability is essentially a flexible catalogue of competencies («savoir-faire») and of attitudes («savoir être») where knowledge is considered as secondary. The EU would like to propose a skill's card, accumulating electronically competencies.

«This present White Paper suggest... to recognise the partial competencies through a system of accreditation...outside of the institutions delivering diplomas. ...We suggest an agency of non governmental external evaluation ...contributing to the transparency of the markets regulation.» The skill accreditation card will work for and be controlled by the market (CE, 1995b).

Universities must give priority to their presence in the market» (Graham Hills, *The University of the Future*, ed. M. Thorne, 1999) where teaching and fundamental research is neglecting all topics not resulting rapidly in profitable applications. And indeed, many (UK) universities, even if the personnel remains largely paid by the States, are more and more engaged in a competition of commercial style, trying to find sources of complementary finances. The law is to produce more, with less personnel, and to produce only what can be sold. (J. Wolfensohn, 1999) It means to open the door to «offers of more innovating education» (OECD, 1998; EU,...) and to deregulate the teaching of the public system. The motor of these politics is, of course, the decrease of the grants for universities pushing the institutions to look for «so interesting» commercial offers». The World Bank (1995) is clear: «we will give priority to states disposed to adopt a legislative framework for universities... where the private sector would intervene more». Also the WTO (World Trade Organisation, 1998) works to promote a privatisation and a market of education, and a system of certification of competencies more flexible than the classical university diplomas.

Let us be critical as universities have to be by definition!

«I do not wish an intellectual education. Science would corrupt my youth.» (A. Hitler)

Employability means some teaching is becoming superficial: sciences (biology, anthropology, geography), history, philosophy, literature. We must continue to struggle for a good level of teaching for everybody, a teaching to understand the world and the society, perhaps to transform it? Irrealistic? Provocative?

Learning to learn! What a seducing idea, is it not? In fact, an universal pedagogical idea! The problem is that the industry wishes to develop it only around skills, it is not about «futile» studies, knowledge for an intellectual or cultural personal enrichment, knowledge to better understand the world and the society (N. Hirtt, 2002).

Deregulation of the universities (and schools) is the EU's wish («... the time of education out of schools is coming...»). It means : autonomy of universities, paying system of studies, presence of industry in the university councils (CE, 1996).

Strange autonomy! A «liberalisation» from «bureaucracy» to be submitted to a stronger authority, industry and financial market.

Strange contradiction ! «Cognitive society» and «long life learning» but more and more voices to ask shorter studies with less study topics.

ANNEX 1

CREATION OF AN EUROPEAN PHD IN BIOLOGY

This proposal has been elaborated inside the ICP Biology B-1004.

PRINCIPLE

The diversity of fields covered by the advanced Biology is presently so large that no university is anymore able to cover all them. Such situation brings more and more students to realise a more or less important part of their PhD investigations abroad.

Many students have seen for the first time the possibility of experiencing an academic life abroad under the ERASMUS Programme. It has been recognised that such an experience promotes the development of an 'open

mind' and constitutes a threshold in the student process becoming fully responsible.

Obviously, the creation of an European PhD e.g. in Biology performed in the principles of mutual trust and confidence between each institution involved would strengthen the promotion of an European dimension to the studies and would develop the European spirit.

To grant the 'European Doctorate' label to young holders of a PhD who have demonstrate their potentials would certainly encourage the mobility of young researchers. It would also promote the quality assessment of the Ph.D. studies in Europe.

However, it is important to stress that the independence and the responsibility of each university for its own system of education should be respected. Consequently the title of European PhD conferred to young scientists meeting certain criteria would give extra recognition, a kind of bonus.

The title of European PhD must attest the fact that the candidate demonstrates undeniable scientific qualities,

- has proven his/her ability to adapt to a new scientific environment,
- displays interest in and curiosity about European culture and has command of a second European language.

The following items propose attribution criteria and assessment procedures.

ATTRIBUTION CRITERIA

1. To postulate the title of European PhD, the candidates must meet the following prerequisites:

- They must hold a PhD in biological science, from their home University,
- The PhD jury and/or advising committee must include at least one member from another European state.

2. Moreover:

- The candidate must have published at least one article in a refereed journal.

- The candidate should provide proof of a stay in an European laboratory of an another country for at least 6 months during the PhD time
- Students already possessing a PhD, can qualify for an European PhD by further study of at least 12 months in another European laboratory.

The European PhD cannot be awarded later than 5 years after the award of the home PhD.

- The candidate must provide the board awarding the European doctorate with an exhaustive summary of his/her doctoral thesis (10 pages excluding figures or bibliographical references) in two official European languages.

IMPLEMENTATION OF THE PROCEDURE

The ICP and JEP co-ordinators of all Universities concerned are bound to inform students registered for a PhD of the existence of the European PhD.

Candidates for the title must subsequently express their wish to obtain it by filling in the appropriate form available exclusively from the general co-ordinator of the ICP or the JEP as soon as possible.

For each recipient, the general co-ordinator or his/her representative must receive a file containing:

- the authorisation from the University to register for the European PhD
- the application for the European doctorate
- a certificate from the *alma mater*, proving that the candidate holds a PhD
- a certificate attesting the time spent working abroad
- the two summaries of the thesis
- a copy of all his/her publications.

SUPERVISING COMMITTEE

The permanent board will be composed of five members chosen from the co-ordinators of the ICP or JEP. It will be chaired by the general co-ordinator of his/her representative, and includes experts chosen from a European panel.

Each participating University can nominate up to 10 academic members to this European panel.

The board will be confirmed and renewed at each meeting of the co-ordinators, i.e. twice yearly. Membership rotates, with members serving for no longer than three years.

The board will evaluate the records during the co-ordinators meeting, i.e. twice yearly.

DELIBERATION

If the board agrees to award the degree, it will immediately communicate its opinion to the assembly of co-ordinators. Thereafter, each co-ordinator has three months to express any opposition to the board's proposal.

After this period:

- If the proposal to grant the European PhD has not been opposed, the candidate will be informed by the general co-ordinator that he or she *met* all the requirements and is now entitled to the European PhD
- If the proposal meets with criticism, the procedure will be repeated from the start at the next assembly of co-ordinators.