

## PRO NATURA INTEGRAL

Editor's note. Under the title of 'Pro Natura Integra', papers on fundamental research in the field of bio-protection will appear. Over-population, under-nutrition and changes in environment have led to ecological disturbances in the balance of Nature which threaten the existence of mankind. Man is faced with uncertainty through the changes in his environment. This most critical crisis can only be over-come by a society which has the will to carry out a biophylaxis which is scientifically founded, ecologico-economically co-ordinated and biopolitically responsible. H. M.

## Will the Exploding Human Population Succeed in Conserving Nature?

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## Why must nature be conserved?

The urgent necessity to conserve nature, the environment of plants, animals and man, is now felt by an increasing number of people<sup>1,2</sup>. The proclamation, by the Council of Europe, of 1970 as the European Conservation Year, is greatly contributing to awakening public interest in conservation problems and to stimulating environmental education<sup>3</sup> on an ecological and interdisciplinary basis.

The papers which will be published under the heading 'Pro Natura Integra'<sup>4</sup> in this Journal are intended to support the action of the Council of Europe. We are greatly indebted to Professor H. MISLIN for consecrating considerable space within *Experientia* to articles relating to our environmental problem; for an ecological and biopolitical approach to nature might now be needed much more urgently than the ones with which many laboratory scientists are familiar.

The battle against a further deterioration of nature will have to be fought on different fronts simultaneously. On one hand, reliable information about pollution and destruction of natural communities or single species will have to be diffused. On the other hand, actions to ensure understanding, conservation and rational management of nature will have to be promoted. First of all, however, it must be realized that the uncontested worldwide necessity of protecting nature against man is the outcome of a *disturbed relationship between the human population and its environment*. This relationship is disturbed on an ecological plane, the demographically exploding human population being on the point of outgrowing the productive,

decomposing and other capacities of the biosphere. It is, however, also disturbed on a more intellectual and cultural level in so far as, owing to urbanization, more and more people are losing contacts with nature and the feeling of depending upon it. This tendency is greatly enhanced by our highly sophisticated education. Is it surprising that under such circumstances the representatives of our insatiable and expanding economy are unable to understand that its plants, wastes and residues are among the principal agents that endanger the basis of their own existence? A thorough analysis of the factors which led and still lead to such deep disturbances between man and nature will thus substantially contribute to its conservation.

In this article an attempt is made to trace back the demographic and economic explosions, and the difficulties in controlling them, to a failure in our traditional educational aims, based on unrealistic concepts of culture and humanism, and of nature as well. But let us first look at the population problem.

## The exploding human population

In the course of this year the human population will exceed the number of 3.6 milliards. Its annual rate of increase is now 1.9%<sup>5</sup>. This means that the world population is growing by 68 million persons per year, by 190,000 persons per day or by 2 persons per second! An annual rate of increase of 1.9% also means that the number of people will have doubled in 37 years.

This increase is certainly the most dramatic one ever experienced by man. No doubt, the human and even pre-human populations probably never ceased to grow<sup>6-8</sup> since tools, fire, and, during the past 10,000 years, agriculture and developing technology brought about ecological conditions under which life expectancy became steadily higher. Figure 1 shows that during more than the first half of our Christian era the world population was still growing slowly. It needed more than 16 centuries to double itself. From that time on, however, the increase became more and more rapid. The second doubling was achieved after 2 centuries, the third after 80 years and, according to the world population prospects of the United Nations<sup>9</sup> the fourth doubling will have taken place after 45 years, that is around the year 1975. For the year 2000, numbers ranging from 5.5 (low estimate) to 7 milliards (high estimate) can be foreseen.

## What caused world population to grow so rapidly?

The density of a population of organisms, harmoniously integrated within the biotic communities of its environment, normally remains constant or fluctuates around a mean value. This is achieved by ecological mechanisms of regulation<sup>10-16</sup>, amongst which a limited supply of food and predation or parasitism play a predominant role. Be-

<sup>1</sup> J. DORST, *Avant que Nature meure* (Delachaux et Niestlé, Neuchâtel 1965).

<sup>2</sup> R. DUBOS; J. DORST; F. F. DARLING and other papers in Unesco Courier, Jan. (1969).

<sup>3</sup> T. PRITCHARD, *Biol. Conservation* 1, 27 (1968).

<sup>4</sup> H. MISLIN, *Experientia* 25, 224 (1969).

<sup>5</sup> UNO, *Demographic Yearbook* 1967 (1968).

<sup>6</sup> E. S. DEEVEY, *Scient. Am.* Sept. 203 (1960).

<sup>7</sup> H. NACHTSHEIM, *Bild der Wissensch.* 4, 26 (1967).

<sup>8</sup> J. M. LUCK, *Science* 126, 903 (1957).

<sup>9</sup> UNO, *Population Studies* No. 41, N.Y. (1966).

<sup>10</sup> E. P. ODUM, *Fundamentals of Ecology* (Saunders Co., Philadelphia/London 1959).

<sup>11</sup> E. J. KORMONDY, *Concepts of Ecology* (Prentice Hall, New Jersey 1969).

<sup>12</sup> A. S. BOUGHEY, *Ecology of Populations* (The Macmillan Co., New York 1968).

<sup>13</sup> V. C. WYNNE-EDWARDS, *Scient. Am.*, Aug. 68 (1964).

<sup>14</sup> L. and M. MILNE, *The Balance of Nature* (A. A. Knopf, New York 1960).

<sup>15</sup> F. SCHWERTFEGGER, *Oecologia* 1, 265 (1968).

<sup>16</sup> P. A. TSCHUMI, *Verh. schweiz. naturf. Ges.* 149 (1970).

havioural, physiological and evolutionary reactions of the population, like for example territorial behaviour, are, however, just as important as the ecosystem-specific factors<sup>13, 16</sup>.

The joint action of all these regulating forces usually results in an almost perfect equilibrium between birth rate and death rate within the population. In the case of local human or animal demes<sup>17</sup>, immigration or emigration may also quite sensibly affect their density and growth rate. The ratio between natality and mortality is, however, the only decisive factor affecting maintenance, increase or decrease of the world population. In order to understand the phenomenon of its accelerated growth, we therefore have to search for factors liable to modify this ratio.

There is general agreement that a decline of the death rate, and not increased fertility, is the origin of our population problem<sup>1, 6, 7, 14, 18</sup>. The acceleration of population growth coincides with the industrial revolution of the 18th and 19th centuries (Figure 1), during and since which time considerable progress was achieved in the domains of food production, hygiene, transport, science, industry and medicine. All these advances contributed to lower the death rate of man, particularly of children, by raising the duration of life.

In the *developed or industrialized countries* of Northern Europe (Figure 2), the decline of the death rate set in towards the end of the 18th century; it is still going on today, as shown by a continued increase of the expectation of life (Table I). During most of the 19th century, the birth rate remained fairly constant. As a result of this, the difference between natality and mortality, the excess of births over deaths or the rate of natural increase, became gradually larger: the population grew more and more rapidly, until, at the end of the 19th century, the birth rate began to drop as well. The excess of births was thus again reduced, and today the rate of natural increase of most technologically developed countries lies below 1% (Table II). What caused this reduction of the birth rate? We know that towards the end of the 19th century methods of birth control were used by an increasing number of couples within most European countries. There are no doubt many reasons that caused people to limit spontaneously the number of their children. Among these reasons we may mention urbanization, a higher level of education, wealth and lower infant mortality. In any case, owing to family planning, the industrialized countries managed eventually to control, at least partly, their demographic explosion.

The situation is very different and most critical in *developing countries*. There, a sharp drop of mortality set in only recently as a result of colonization and above all of the medical and technological help granted to them after the Second World War. Within a few decades, the death rate fell to a level which the developed countries had reached only after 2 centuries of economico-scientific development. Since natality was hardly reduced, the excess of births or the annual rate of natural increase became extremely high and lies now around an average of 3% (Table II). An annual rate of increase of 3% means, however, that the number of people will double in 23 years!

The population explosion, released in developing countries by interference from industrial nations, accounts for the relatively high rate of annual increase of the world population, of which the developing countries' share comes up to 70% today<sup>9</sup>. Who knows whether the growth of nations, in which motivation for spontaneous birth control is virtually lacking, can still be brought under control in time<sup>19, 20</sup>?

### *Were the demographic explosion and its repercussions foreseen?*

In spite of the fundamental differences existing between developing and industrial countries, the demographic evolution of both is the outcome of an interaction between civilization and biological phenomena at the population level. Mankind has learned to act arbitrarily upon its own death rate and birth rate and thus to escape from the ecological mechanisms of regulation mentioned above. Moral and other considerations incited us to aim above all at a reduction of mortality, and there were probably few who then foresaw the demographic, ecological, social, economic and political repercussions of the henceforth disturbed equilibrium between birth rate and death rate. The results of this lack of foresight are all too well-known today: In developing countries, economic development and food production can hardly keep in step with population growth<sup>21</sup>, whence hunger and malnutrition<sup>22, 23</sup>, causing widespread apathy, illness<sup>24</sup> and millions of

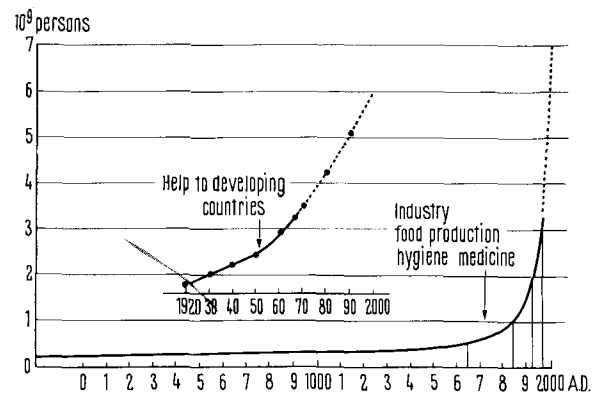


Fig. 1. The increase of the world population during the Christian era. Dotted line at right according to high estimates of the UNO<sup>9</sup>. Centre: more detailed graph for the last 50 years; note accelerated increase since about 1950; dotted line according to medium estimates of the UNO<sup>9</sup>.

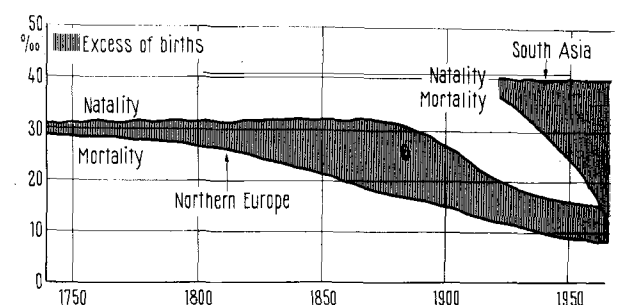


Fig. 2. The demographic evolution of an industrialized region (left) and a developing region (right). Ordinate: birth or death rate (number of events per year and per 1000 persons).

<sup>17</sup> E. MAYR, *Animal Species and Evolution* (Oxford 1963).

<sup>18</sup> UNO, *Population and Food Supply* (1964).

<sup>19</sup> K. DAVIS, *Science* 158, 730 (1967).

<sup>20</sup> B. BERELSON, *Science* 163, 533 (1969).

<sup>21</sup> FAO, *La Situation Mondiale de l'Alimentation et de l'Agriculture* (Rome 1967, 1968, 1969).

<sup>22</sup> FAO, *Third World Food Survey* (Rome 1963).

<sup>23</sup> FAO, *Six Billions to Feed* (Rome 1962).

<sup>24</sup> FAO, *Malnutrition et Maladie* (Genève 1963).

deaths each year, and an increasing lag of the developing countries behind the industrialized ones. This critical situation is still further aggravated by an uneconomic age structure of the population, typical for rapidly growing nations (e.g. India with 41% of children under the age of 15 and 56% of persons aged 15 to 64; Sweden, however, with only 21% of children under the age of 15 and over 66% of persons aged 15 to 64. (See<sup>9,18,25,26</sup>).

In industrial countries, where an economic explosion is now superseding a slowing down demographic one, pollution of air, water, soil and foodstuffs<sup>1,2,4,8,27-29</sup>, noise, murderous traffic and other consequences of overcrowding or over-industrialization have become a permanent menace to our health and life. The progressive destruction of the few remaining natural ecosystems – ponds, marshes, forests, etc. – for winning agricultural land or building sites lead to a disappearance of the habitats of numerous plants and animals and of grounds badly needed by ourselves for recreation, education and research.

There is no doubt that all these calamities were not foreseen when man began to manipulate the growth rate of his population and his environment. More alarming, however, is the fact that the measures taken to fight against them suffer from a similar lack of circumspection as the interventions which caused them: For instance, many still claim that the world population problem can be solved by intensifying food production<sup>30,31</sup>; world population could then happily keep growing up to 50 milliards or more<sup>32,33</sup>. As if a minimum number of food calories were the only requirements of man! Are the possibility to dispose of our wastes, the availability of clean water and air, a homely environment with enough living space and quiet and natural recreation grounds, some silence, at least at night, not just as necessary and therefore as limiting as food supply?

Why is the full complexity of the problem, and in particular its biological aspects, so rarely taken into account; why does nature, in spite of all the efforts made to conserve it, yet recede more and more? Why should it be so difficult to understand that the fight against hunger, pollution, destruction of nature, etc., will be hopeless unless the underlying demographic disorder and economic explosion are dealt with simultaneously? For no population and no economic system can grow indefinitely within a limited space and on limited resources.

In a society of economic producers and consumers, everybody strives for economic expansion. A steady growth of the world population is no doubt a very welcome promoter of it. Who knows to what extent considerations of this kind contribute to the general indifference towards nature and to the reluctance with which governments and other bodies of industrial countries meet the claim for more freedom in family planning. That moral principles and taboos also play a decisive role needs no further mention here.

Economic interests and taboos, however, do not account entirely for this hopeless situation. An *alarming lack of information and understanding about the many-sidedness of our population and environmental crisis* bears the heaviest responsibility for our entangled and severely prejudiced position. This means that *our traditional education has lamentably failed!* It has failed in so far as biology is concerned, since this subject has long been unable to teach us to what extent human life depends upon ecological realities within our population and our environment. It has also failed in a more general way, since those who are really familiar with the most important political, economic, social and other cultural aspects of our time, without ignoring their biological implications, seem to be very scarce. How can we expect people to

solve problems when they neither know nor understand the premises?

Let us now turn to a critical examination of biology teaching first, and of our general educational aims next. A thorough reform on both levels might be the most urgently needed contribution to the conservation of mankind and nature.

Table I. The expectation of life at birth in some European countries

		1901-10	1931-40	1951-55	1961-65
Denmark	♂	52.9	62	69.75	70.3
	♀	56.2	63.8	72.60	74.1
France	♂	~48	~56	~65	~67
	♀	~52	~61	~71	~75
Germany	♂	44.82	~59	~65	~67
	♀	48.33	~62	~69	~73
Sweden	♂	54.53	63.76	70.49	71.60
	♀	56.98	66.13	73.43	75.70
Switzerland	♂	49.25	~60.70	~66.5	~69
	♀	52.15	~64.6	~71	~74.5
U.K.	♂	48.53	~59	~67	~68
	♀	53.38	~63	~72	~74

Note continued increase during 20th century. Based on data from<sup>5</sup>.  
♂ = male; ♀ = female.

Table II. Demographic data from 8 industrial (above) and 8 developing countries (below)

	Population in millions (1967)	Birth rate	Death rate	Annual rate of increase (%)	Doubling after years
Belgium	9.6	15.2	12.2	0.3	233
Denmark	4.8	18.4	10.3	0.81	86
France	49.9	16.8	10.8	0.67	104
Italy	52.3	18.1	9.7	0.84	83
Switzerland	6	17.7	9	0.87	80
United Kingdom	55	17.5	11.2	0.63	110
USA	199.1	17.9	9.4	0.85	82
USSR	236	17.4	7.6	0.98	71
Congo	16.3	43	20	2.3	30
Kenya	9.9	50	20	3	23
Sudan	14.3	51.7	18.5	3.3	22
Brazil	85.6	41-43	10-12	3.1	23
Venezuela	9.3	46-48	9-10	3.7	20
India	511.7	38.4	12.9	2.5	27
Iran	26.3	48	24	2.4	29
Pakistan	107.3	49	18	3.1	22

Birth and death rates: number of events per 1000 persons and per year. Based on data from<sup>5</sup>.

<sup>25</sup> UNO, Demographic Yearbook 1966 (1967).

<sup>26</sup> P. A. TSCHUMI, *Reformatio* 11/12, 657 (1968).

<sup>27</sup> K. MELLANBY, *Pesticides and Pollution* (Collins, London 1967).

<sup>28</sup> J. P. RIBAUD, *Schweiz. Naturschutz* 25, 73 (1969).

<sup>29</sup> J. ROBINSON, *Nature* 214, 1307 (1967).

<sup>30</sup> H. MOHLER, *Ist die Welthungersnot unvermeidlich?* (Haupt, Bern 1967).

<sup>31</sup> H. D. CREMER, *Naturwiss. Rundschau* 22, 283 (1969).

<sup>32</sup> C. CLARK, in *Man and his Future* (Churchill, London 1963).

<sup>33</sup> R. CALDER, *Ceres* 7, 2, 58 (1968).

### *Biology and human affairs*

The time is not long ago when the principle aims of biological research and the main subjects of the teaching in biology were systematics, anatomy and physiology of single organisms. Accordingly, human biology was then dealing essentially with the structure and the functioning of the human body.

Though very rewarding for biologists and medical students, this kind of approach, producing names of plants and of animals and diagrams of organs and of organ systems, could not be very appealing to all those who were primarily interested in social, economic, technical, cultural and other human affairs. All these people soon became convinced that natural history was a subject far remote from the concerns of civilized people and that the biological traits were by no means the most important ones of mankind. The educational value of biology was therefore thought to be rather limited, and the space and means attributed to it within the school programmes of numerous countries, including Switzerland and Germany, became very restricted.

Today, this unfortunate situation, resulting from the failure of biology to recognize in good time its own educational function, seriously interferes with the contribution which this subject would at last be able and ought to make to the education of modern man.

At present, we know from ecology<sup>10,11,12,14,34,35</sup> that life, including ours, has yet other aspects than the anatomical and physiological ones. Every organism, from bacteria to man, is part of a population, a group of potentially interbreeding individuals who all share in a common gene-pool<sup>17</sup>. Each population, in turn, is integrated within a biological entity of still higher degree, the ecosystem, the community of all vegetal, animal and human (if present) populations of a given region plus the abiotic components and factors of their habitat. Populations and ecosystems are ruled by laws of their own and their life depends, in particular, upon complicated interactions and delicate equilibria between all members of the community.

The integrity of the ecosystem and the maintenance of the balance within it and between its populations are essential for the welfare of individuals. This is also true for ourselves. Sound knowledge about the elements of ecology is therefore a prerequisite for the understanding and management of nature and human life.

One of the most particular aspects of human life is the cultural one. Culture or civilization is the outcome of a long biological evolution of our animal ancestors and of vivid interactions between biological and cultural evolution along the hominid line<sup>36</sup>.

Today, owing to our sophisticated education, we unfortunately tend to disregard our natural origins and to forget how much our civilized existence, our behaviour, our mental faculties, etc., still depend on biological phenomena within and around us. We usually also ignore that culture has become a very powerful biological agent: Our education, social structures, sciences and medicine, agriculture, technology, economy, etc., are interfering increasingly and sometimes dangerously with their natural basis, that is with heredity, health and life expectancy of individuals; with the growth rate, age structure, gene-pool and evolution of populations; with the composition of and the equilibria within ecosystems and the biosphere.

Nature and culture meet and interact with each other on all biological levels, from the molecular upwards to that of populations and ecosystems. Unfortunately, neither biology nor the so-called human or moral sciences

have until now investigated the nature and the consequences of this interaction: biologists because they were engaged in laboratory work on single organisms, and the humanists because nature, as it was taught to them, was far too remote from what they were interested in.

Thus, for generations, man was left alone with quite inadequate knowledge and understanding about the main biological traits of himself and nature around him and about the interactions between nature and culture. Yet, this did not keep him from tinkering about inconsiderately with the most delicate and important equilibria within his own population and his environment. Today, as things go wrong with these disregarded aspects of our life, now that our population is exploding and that our environment is already badly deteriorated and polluted, we at last begin to discover what biology should have dealt with long ago.

Biology should have taught us, and will in future have to teach us, to what extent human life is, on one hand, biologically and, on the other, culturally determined; it will have to remind all of us how much our population is, despite and also because of our civilization, dependent upon the natural resources of our own and of the biosphere, and it will have to make us acquainted with these resources and their ecological implications. Above all, biology must make us aware of the powerful and unwholesome impact of our socio-economic activities upon ourselves, our environment and the resources of nature, and it will have to teach us how to conserve these resources.

The task of modern biology is, in other words, to awaken a more realistic attitude towards nature than the still widely spread one resulting from an obsolete humanism and economic engagement on one hand and from a one-sided biology on the other. This new attitude, however, will only come from an approach to nature which will include the ecological, social and cultural aspects of our life.

Owing to international seminars organized by the OECD<sup>37,38</sup> and the Council of Europe (1968), and thanks to the activity and the pioneer publications of the Belgian ecologist P. DUVIGNEAUD<sup>35</sup> and the American BSCS-writers<sup>39</sup>, ecology is now finding its way into the biology teaching of our European secondary schools<sup>40,41</sup>. Let us hope that our universities will not delay too long a reform of their own teaching programmes.

### *General education crushed under the load of the past*

If biology is now on the way to acquiring a realistic and badly needed educational value, many other subjects taught in our European schools are still far from this goal. They rather contribute to deepening the gap between civilized man and nature, between 20th-century people

<sup>34</sup> Ecology is the body of knowledge about, and the investigation of, the relations between organisms and their living and non-living environment. It deals with the structure of populations, communities and ecosystems, with metabolic and structural changes taking place within them and with the mechanisms which either cause these changes or confer stability on the whole system.

<sup>35</sup> P. DUVIGNEAUD, Documentation No. 23, Ministère de l'Éducation Nationale et de la Culture (Bruxelles 1967).

<sup>36</sup> TH. DOBZHANSKY, *Mankind Evolving* (Yale 1962).

<sup>37</sup> OECD, *New Thinking in School Biology* (Paris 1963).

<sup>38</sup> OECD, *Biologie Moderne* (Paris 1966).

<sup>39</sup> BSCS, *Green Version* (Rand McNally and Co., 1963).

<sup>40</sup> CAMPAN and PANIEL, *Biologie Géologie* (Hachette, Paris 1967).

<sup>41</sup> P. A. TSCHUMI, *Allgemeine Biologie* (Sabe, Aarau 1970).

and 20th-century problems by overemphasizing the importance of past events, of old languages and of outdated knowledge and thinking. What is the sense of orientating our youth obstinately towards a remote past when it is too obvious that as citizens they will be unable to cope with the difficulties of today and tomorrow. Dominant features of our present time are economic, technological and scientific supremacy, political and social instability, strong demographic pressure and a deeply disturbed relation between civilization and man's environment. Is the main function of education not precisely to prepare our children, by teaching appropriate subjects, to understand and to be competent to deal with the problems they will meet as adults<sup>42</sup>?

Why not consecrate part of all the time spent on learning Latin and Greek to the study of another modern foreign language and perhaps even to more of natural sciences, amongst which biology would now be able to contribute very valuably to a genuine humanistic education? Why not, instead of starting the teaching of history with ancient Egypt or Greece, begin with present times and take from the past what is strictly necessary for understanding our own political and economic structures? Would it not be preferable, instead of reading and learning in chronological order a long list of literary and philosophical authors from the Renaissance onwards, to study among the modern writers those dealing competently with the main problems of today, even if their education were not strictly literary? Moreover, instead of sticking to on outdated number and hierarchy of subjects, should we not have the courage to fix new centres of gravity and even to replace old and obsolete subjects by new ones, such as economics, sociology, etc.? Above all, however, should we not seek to realize much more interdisciplinary work, since our existence is not a mosaic of single topics but rather the result of complex interactions between the numerous aspects of our life? But this would mean bridging gaps between single subjects and above all between the literary and scientific 'cultures', the last gap being one of the main obstacles to a fully comprehensive education.

It is true that, if we were following these suggestions, we would then educate people who would not be cultivated in a traditional sense, who would for instance not know

what 'in medias res' or 'ipso facto' meant, who would ignore who murdered Julius Caesar, who were the genitors of Hercules and who wrote the story of Gargantua. But these people might instead be able to exchange information and ideas with a wider circle of foreign persons than most of our youngsters with a leaving certificate can, to understand more than the average citizen of today about politics and economy, to contribute more efficiently than most learned persons of these days to the solution of demographic and environmental problems and, as journalists, to diffuse more realistic information about these problems, and with another emphasis, than is done currently. Such people and their education might eventually lay the foundations for a new and more realistic notion of culture and humanism.

Our hitherto existing educational structures and methods rest upon, and always lead again to, sophisticated and unrealistic concepts of culture and humanism, in which many outdated and unimportant features of our history and intellectual life are overemphasized, whilst scientific, technological and socio-economic knowledge and work are despised. That such concepts are a weak, misleading and dangerous basis for an up-to-date education should need no further comment.

And still, hard fighting, if not worldwide catastrophes, will be required until the educational reforms, about which so much is said and written today, will yield more than mere reshuffling of existing programmes. The space attributed in Western Germany to the teaching of the natural sciences and the new Swiss 'Maturitäts-Anerkennungsverordnung' (1968) prove how far our competent authorities still are from a comprehensive view of human life. Such a view is, however, a prerequisite for ending a sterile competition between literary and scientific humanisms and for finding the solution of, amongst others, our demographic and environmental problems, on which all the aspects of our life, from ecological to moral, converge. If we lose this educational battle, then the chances for winning the environmental one will remain very small indeed.

<sup>42</sup> P. A. TSCHUMI, *Gymnasium Helveticum* 23, 373 (1968/69).

## CORRIGENDUM

P. A. FINOT, R. VIANI, J. BRICOUT and J. MAURON:

*Detection and Identification of Pyridosine, a Second Lysine Derivative Obtained Upon Acid Hydrolysis of Heated Milk*, *Experientia* 25, p. 134 (1969). The correct name of com-

pound V should be L-2-amino-6-[3-hydroxy-4-oxo-6-methyl-1-pyridinyl]-hexanoic acid or  $\epsilon$ -[3-hydroxy-4-oxo-6-methyl-1-pyridinyl]-L-norleucine instead of  $\epsilon$ -[1,4-dihydro-6-methyl-3-hydroxy-4-oxo-1-pyridyl]-L-lysine. Pyridosine is to be maintained as trivial name.

## CONGRESSUS

### Romania Regional Congress of Physiological Sciences

in Braşov 10-16 August 1970

This congress will be organized under the sponsorship of the International Union of Physiological Sciences

(IUPS). Information concerning participation may be obtained from: Romanian National Organizing Committee, Institute of Physiology, Boulevard 1 Mai No. 11, Bucuresti 8 (Romania).