

COMMENCEMENT ADDRESS, UNIVERSITY OF MICHIGAN. 5 May 1975
By Sir Kingsley Dunham

Mr Chancellor, Ladies and Gentlemen,

"This Grace is Granted" used to be the phrase with which the Chancellor of my own university conferred degrees and I am greatly honoured to receive this ~~morning~~ ^{afternoon} a degree, by grace of the University of Michigan, in company with ^{4 other} distinguished leaders in American life and with the candidates who I see before me, all of whom have earned their qualification in a more usual fashion.

Forty years ago I was a post-doctoral fellow at a well-known university in New England, waiting for the examiners to declare the result of my candidature for a PhD at home in old England, at that time 6 day's journey away across the stormy Atlantic. The answer came in a cable from my father with only 4 words in it: "This Grace is Granted" - he had been present at the Congregation at which it was conferred on me in absentia; the cable brought us closely together, for it was a great day for us both. I am very happy this afternoon to see so many mothers, fathers, wives, husbands and sweethearts here to share in the fulfilment of the hopes of this year's graduates. I congratulate you all on your success as well as on the pleasure I am sure it has given your friends and relations.

The 6 day's travel which once separated New England from old England is now little more than 6 hours and if supersonic flight becomes acceptable, it will be less than half of this. One very evident sign of the effective contraction of the human environment is the ease with which people can move about and can communicate with one another. Where once the problems of one's environment (though they were not called that!) were confined to a family circle, their scope has extended through the tribe, the city, the national state, until now we are approaching a condition where the scale is global and all humanity must be conceived as being involved. As Foreign Secretary of the 300-year old Royal Society for the Improvement of Natural Knowledge, I have to try to take a global view, and it is in this wide context that I invite you to think about the role of the university in relation to the environment of man.

In his brilliant 1972 Darwin lecture* the Oxford biologist J W S Pringle has maintained that the normal working of natural selection, by which Homo sapiens, like all other creatures evolved, has largely been nullified in the case of man, thanks to advances in medicine, agriculture and other technologies. His survival now depends on cultural selection, which Pringle regards as an analogous process, but one which needs an anxiety state to drive it along. Thus, after the agricultural revolution of Neolithic times, fear of famine produced beliefs which we may regard as superstitious, but which acted as a spur to tribal organisation and efficiency. In the earliest days of the Christian era, the widespread belief that the end of the world was approaching can be held to have been one of the factors promoting the phenomenally rapid spread of Christianity through the Middle East and the Roman Empire. However much one may deplore the so-called religious wars and the intolerances of reformation and counter-reformation, one cannot deny the dynamic importance of the Jud&o-Christian ethic in promoting the western culture to which we belong. If, today, there are many who find it impossible to accept the danger of hell fire or any other supernatural sanction for ethics - and this is perhaps more apparent on my side of the Atlantic than yours - the virtues of charity (in the Pauline sense), of compassion, of justice and of honesty are still highly regarded and eagerly sought. In the past 20 years we have experienced two global fears; the first, of nuclear and thermonuclear weapons by which mankind could totally destroy itself, and the second, the deterioration of the environment, producing the same result but more slowly and painfully. Of the first, it need only be said that fear has indeed forced action by which greatly improved international relations have come about, with sincere desire on all sides to use these dangerous devices exclusively for peaceful purposes. Here we must hope that nothing is allowed to disturb the balance achieved.

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JUDAEO

Of the environment 5 aspects demand brief notice: population, non-renewable resources, renewable resources, pollution, human ecology. The triumph of technology

*A Vision of Man. Jour. Inst. Biol. (in press) 1973

to which I have already referred has made possible an exponential rise in human world population, so that 1.5 billion in 1940 became 3 billion in 1970, and it is expected (using the United Nations median estimate) to become 6 billion by the end of the millenium. . . Most if not all the 132 nations of the world wish to follow the western lead and become industrialised. Consumption curves for the fossil fuels, metals and other useful products of the earth's crust therefore follow the shape of the population curve but the increase of rate is greater. These resources are non-renewable and finite. Renewable resources from agriculture and fisheries are equally already under pressure. Pollution of air and water with the effluents of civilisation offers serious dangers, which have already received a great deal of publicity.

Systems analysis now makes it possible to undertake an approximate integration of the variables involved, using appropriate feedbacks, aimed at producing a model, however crude, of human ecology. The remarkable studies of the Club de Rome and the MIT group with which the names of Forrester and Matthews are particularly associated have yielded dynamic models which are disquieting in the extreme in that they indicate that unless we somehow find means of curbing population growth, and of limiting economic growth, famine and/or pollution could lead to mass death within a few decades. Although the accuracy of the input can be criticised, the implications certainly cannot be neglected. This study already had international collaborators. It has been followed by the setting up of the ~~First~~ International Institute for Applied Systems Analysis, the first enterprise in which East and West equally collaborate. The major partners are the Academies of Science of the Soviet Union and the National Academy of the United States; with the learned academies of Austria, Bulgaria, Canada, Czechoslovakia, France, the Democratic Republic of Germany, the Federal Republic of Germany, Italy, Japan, Poland and the Royal Society for the United Kingdom.

The world-wide emergency was recognised still more clearly by the holding of the United Nations Conference on the Human Environment at Stockholm last year, and here

the People's Republic of China (one-fifth of the world) was represented. Under the motto: "Only One Earth", the conference received statements from governments on a very wide variety of topics, including pollution, climate, natural disasters, genetic resources, land and water management, aquatic resources, energy, wild life, human settlements, population; it also considered information referral systems, integrated planning, international economic relations, conservation and education. Of course the cranks, the queer societies, the people we recognise as the environmental lobby were at Stockholm in force, but the conference proper was conducted by hard-headed government negotiators. It emerged with a Declaration on the Human Environment from which I select only one phrase to quote

"The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the peoples of the whole world and the duty of all governments."

It is no purpose of mine to join the prophets of doom today, though from my own special knowledge of non-renewable resources I could produce a fairly alarming case. I am sure that however much economists may advise that growth must go on the environmental problem is being taken seriously by governments. Their action is linked by existing agencies such as FAO, WHO, WMO, IOC, UNESCO and will be coordinated in the new UN Environmental organisation. But these cannot be effective without the understanding and support of the citizen; though what I do want to do is to appeal, through your great university, for greater university interest and participation. You, ladies and gentlemen, include not only the biologists, chemists, earth scientists, physicists and mathematicians who can produce accurately assessed input; but among you there are sociologists, psychologists, medicals into whose comprehension comes the human dimension of the problem; and unless I am mistaken there are lawyers and future law givers, future legislators of this state, future US congressmen and senators. I do not think any of you can fail to be involved; nor can the writers, the linguists and the poets among you.

From those of you now leaving the university to take your places in the world, I invite your informed interest in this problem. From the university itself, I ask that consideration should be given not merely to the provision of courses for environmental scientists and technologists (which no doubt you already have) but also to the provision of general overights, perhaps through open lectures or seminars, of the problem in its socio-economic as well as its scientific aspect. Let me add in conclusion one further remark. I do not think that the solution of the human problem is to be found in devising more, and more elaborate technology, though doubtless some first-rate technological developments (such as the controlled thermonuclear energy) are desirable or necessary. But ultimately it looks as though the problem is basically a moral one. To an increasing extent we seem likely to be called on to limit personal desires for the general good. In the capitalist West we stand accused of working a system the basis of which is personal greed. Yet in times of military emergency we have accepted great personal limitations. Are the sanctions imposed by humanity in trouble with its global environment sufficient to make the moral issue compelling? That, to me, is the fundamental question.