

The Future as an Academic Discipline

Ciba Foundation Symposium 36 (new series)



1975

Elsevier · Excerpta Medica · North-Holland
Amsterdam · Oxford · New York

**The Future
as an Academic Discipline**

The Ciba Foundation for the promotion of international cooperation in medical and chemical research is a scientific and educational charity established by CIBA Limited – now CIBA-GEIGY Limited – of Basle. The Foundation operates independently in London under English trust law.

Ciba Foundation Symposia are published in collaboration with Elsevier Scientific Publishing Company, Excerpta Medica, North-Holland Publishing Company, in Amsterdam.

The Future as an Academic Discipline

Ciba Foundation Symposium 36 (new series)



1975

Elsevier · Excerpta Medica · North-Holland
Amsterdam · Oxford · New York

© *Copyright 1975 Ciba Foundation*

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system, without permission in writing from the publishers.

ISBN Excerpta Medica 90 219 4040 x
ISBN American Elsevier 0444-15184-2

Published in September 1975 by Elsevier/Excerpta Medica/North-Holland, P.O. Box 211, Amsterdam, and American Elsevier, 53 Vanderbilt Avenue, New York, N.Y. 10017.

Suggested series entry for library catalogues: Ciba Foundation Symposia.

Suggested publisher's entry for library catalogues: Elsevier/Excerpta Medica/North-Holland

Ciba Foundation Symposium 36 (new series)

Printed in The Netherlands by Mouton & Co, The Hague

Contents

- C. H. WADDINGTON Introduction 1
- H. WENTWORTH ELDREDGE The Mark III survey of university-level futures courses 5
Discussion 15
- KARL-ERIK ERIKSSON & ANDERS LUNDBERG A university experiment in Sweden 19
Discussion 29
- ALEXANDER KING The future as a discipline and the future of the disciplines 35
Discussion 47
- F. R. JEVONS A dragon or a pussy cat? Two views of human knowledge 53
Discussion 62
- HAROLD G. SHANE Social decisions prerequisite to educational change 1975–1985 73
Discussion 81
- JOHN M. FRANCIS From academic hothouse to professional dugout: a mean free path 89
Discussion 97
- J. N. BLACK Sclerotic structures and the future of academic organization 107
Discussion 114
- KIMON VALASKAKIS Eclectics: elements of a transdisciplinary methodology for futures studies 121
Discussion 136

YEHEZKEL DROR	Some fundamental philosophical, psychological and intellectual assumptions of futures studies	145
	<i>Discussion</i>	154
JOHN PLATT	Universities as nerve centres of society	167
	<i>Discussion</i>	183
SIR WALTER PERRY	Patterns of education for the future	191
	<i>Discussion</i>	199
	General Discussion	207
C. H. WADDINGTON	Concluding remarks	217
	Biographies of the participants	221
	Index of contributors	225
	Subject index	227

Participants

Symposium on *The Future as an Academic Discipline* held at the Ciba Foundation, London, 6–8 February 1975

C. H. WADDINGTON (*Chairman*) Institute of Animal Genetics, West Mains Road, Edinburgh EH9 3JN

Lord ASHBY Clare College, Cambridge, CB2 1TL

J. N. BLACK Bedford College, Regent's Park, London NW1 4NS

Y. DROR Department of Political Science, Hebrew University of Jerusalem, Israel

H. W. ELDREDGE Department of Sociology, Dartmouth College, Hanover, New Hampshire 03755, USA

J. M. FRANCIS Heriot-Watt University, Research Park, Riccarton, Currie, Edinburgh EH14 4AS

F. R. JEVONS Department of Liberal Studies in Science, The University, Manchester M13 9PL

A. KING The International Federation of Institutes for Advanced Study, 168 rue de Grenelle, 75007 Paris, France

I. F. KLIMES *Futures*, IPC House, 32 High Street, Guildford, Surrey GU1 3EW

K. KUMAR Keynes College, University of Kent at Canterbury, Kent CT2 7NP

A. LUNDBERG Department of Physiology, University of Göteborg, Göteborg, Sweden

F. OLDFIELD School of Independent Studies, University of Lancaster, Fylde College, Bailrigg, Lancaster LA1 4YF

Sir WALTER PERRY The Open University, Walton Hall, Milton Keynes
MK7 6AA

J. R. PLATT Mental Health Research Institute, The University of Michigan,
Ann Arbor, Mich. 48104, USA

Sir HUGH ROBSON Old College, University of Edinburgh, South Bridge,
Edinburgh EH8 9YL

H. G. SHANE School of Education, Indiana University, Education Building,
Room 328, Bloomington, Indiana 47401, USA

Sir FREDERICK STEWART Grant Institute of Geology, University of Edinburgh,
West Mains Road, Edinburgh EH9 3JW

R. D. UNDERWOOD School of the Man Made Future, University of Edinburgh,
15 Buccleuch Place, Edinburgh EH8 9LN

K. VALASKAKIS Département des Sciences Economiques, Université de
Montréal, Case postale 6128, Montréal 3, PQ, Canada

M. H. F. WILKINS Department of Biophysics, University of London King's
College, 26-29 Drury Lane, London WC2R 2LS

Sir ERNEST WOODROOFE The Crest, Berry Lane, Worplesdon, Guildford,
Surrey GU3 3QF

J. M. ZIMAN University of Bristol, H. H. Wills Physics Laboratory, Royal
Fort, Tyndall Avenue, Bristol BS8 1TL

Editors: G. E. W. WOLSTENHOLME (*Organizer*) and MAEVE O'CONNOR

Introduction

C. H. WADDINGTON

Institute of Animal Genetics, University of Edinburgh

We are here to discuss whether universities in general and British universities in particular should take account of the problems that mankind is obviously going to face in the next few decades, and, if universities are to do this, how should they do it? It is only because the situation in the next few decades is clearly going to be unlike what it was in our grandfathers' days that I think the question arises so seriously now. We all recognize that we are facing a series of crises which can't be completely separated from one another. Each one of them—atomic warfare or the population problem or the environment problem or the energy problem or what have you—is a considerable threat. The whole set together form what the Club of Rome has called the *problématique*.

How far should universities do anything specifically in connection with this? It seems to me there are two aspects to this. One is the question of incorporating into the universities any of the pure scholarship that is going on in these fields. That is relatively simple for universities to do, even if the scholarship doesn't fall into any previously well-defined disciplines. A great deal of profound thinking of an academic kind is going on in these fields now, at the highest levels of academic scholarship. There is some high-level thinking about the methodology of dealing with complex systems—things like the stability theory, the catastrophe theories of Thom and derivatives of this. Many of these developments can, if you like, be regarded simply as mathematics, but they are a type of mathematics that applies specifically to dealing with complex systems such as confront us historically in the social sphere. They are not only mathematics in the abstract.

There are also scholarly studies on the precise and detailed economic, political and industrial questions. For instance, the economist Jan Tinbergen is working on a project for the Club of Rome which he originally called 'Renewing the world system', and which he has now given the slightly more modest

title 'Reviewing the world system'. In it he is considering how all the economic, industrial and natural resources with which the world is working at present should or could be made to work in a more equitable manner. This is a major work of imaginative scholarship.

Most of these things are at present being done outside the universities and I think universities should make a bigger effort to bring in some of these studies, or at any rate be closely connected with them. They constitute one of the most significant types of academic scholarship in the world today. It is not too difficult for universities to bring them into their existing structure, which is always rather flexible in relation to research and postgraduate aspects. But we need to think seriously about the undergraduate aspect of this problem. Until a short time ago universities were basically there to provide a general education. It is less than a hundred years since a man had to be in Holy Orders before he could be a Fellow at Oxford or Cambridge. And about a hundred years ago the basic purpose of the universities was to produce either clerics or well-educated generalists. The idea that the universities are there to turn out highly-specialized professionals is a recent change in their purpose. I think many university people have found it upsetting. I read the other day that a questionnaire sent to some physicists asked them whether they were high energy particle physicists, and if so were they working on hadrons or kleptons or something else. Not only that, but were they working on positive or negative hadrons? The physicists were not really allowed by this questionnaire to take an interest in anything more than one hypothetical subnuclear particle, and some of them complained about this.

Universities are in some danger of finding themselves fossilized into these sorts of divisions. There are a lot of young men who badly need to understand how the world is working and who realize that they don't really do so. So far as they get taught anything about the processes of thinking, they get taught about linear sequences of cause and effect: A causes B, B causes C, C causes D, and so on. It is quite clear that that is not the way the world works now. In the past, when man's industrial resources were such that he could only scratch at the surface of the world, any particular scratch could probably be considered relatively independently of any other, and one could maybe get away with thinking of everything as happening in isolated linear cause-effect sequences. Now that we are dealing with the world in a more profound manner, going much deeper, where everything we do runs into everything else we do, we can't escape from a whole lot of feedback circuits, interactions and non-linear effects. Thinking in terms purely of cause and effect in the old-fashioned way is totally inadequate in our present situation. I think most young people realize this and know that they are not being taught any of the newer ways of dealing

with the problems. The methods don't fit into any standard curriculum. Possibly engineers have to learn a bit on one side, and possibly economists will learn another bit, but nobody in general knows all the different types of thinking of this kind, and most people go through university never having heard of them. I think possibly something should be done about that.

Secondly, in this great complex of problems any single problem is itself complex. We may think that the food problem is easy enough, but nobody actually knows how much of any sort of food we really need, or when food starts doing more harm than it does good, and so on. The population problem also sounds simple until, again, we look into it and find that it is extremely complex, depending on the age structure of a population, how fast it is going to reproduce, the social aims, the rate of material progress that is likely if the size of the family is limited, whether it is economically better to have six sons on the basis that at least one will be left alive when his parents are old and unable to work, and so on. In any one of these problems we find that we are hitting against the fringes of the others. We don't try at present in ordinary universities to give anybody a general overall picture, and it is my belief that we ought to do this.

I have been trying to introduce this type of undergraduate teaching in Edinburgh, on a voluntary basis, for a year, and I hope that we shall soon be able to turn it into one of the options in various courses. I thought that the only way of convincing people that this was an academically respectable course for undergraduates was to write the textbooks and thus explain what I think ought to be in the course. I have written two textbooks for half-year courses. They are at second-year level; that is to say they really are going to skim over everything, with nothing gone into in any depth, but the aim is that if you take the course you can't avoid rubbing your nose in everything: you won't know much about it but at least you'll know it is there. One book is called *Tools of Thought about Complex Systems*. It could also be called 'A Child's Guide to the Fashionable Jargon'. It aims to show what methods people are developing about how to think in more subtle terms than linear sequences of cause and effect. Then I have a more factual book called *The Sources of the Man Made Future*, on the components of the world's *problématique*, under twelve headings. Both books will be published by Cape and Paladin Books in 1975. This is just an approach to what I think is a genuine gap in the education we are at present providing for our young people. I have some experience of the way they react to being offered such a course, and I think they feel they need this. There are very few places they can get it from. It can be, and is, an academic discipline in the sense of being a scholarly pursuit. It can or should be—and is, in a few places—part of the educational opportunities which we offer to students.

Professor Eldredge has for some years been making surveys of what courses are being offered and he should be able to tell us what other countries and universities are doing about the future.

The Mark III survey of university-level futures courses

H. WENTWORTH ELDREDGE

Dartmouth College, Hanover, New Hampshire

Abstract Six years of information-gathering and three reports on some 500 university-level futures courses give rise to the following generalizations. Most academic disciplines and fields are to some degree alerted to the future implications of their research and teaching. The numbers of future-oriented courses in many varying forms have increased; but individuals seem to come and go in the field. There appears to be a somewhat negative intellectual image of futurism and futures studies today; the need to define the field, upgrade methodology and recruit wisely is clear. Societal forecasting (especially values forecasting) based on valid sociocultural change theory is the weakest aspect in the futures complex, along with fumbling attempts at creativity training. 'Futurizing' existing courses appears the most valid operational ploy for introducing future dimensions into university curricula at this point. Technological forecasting joined to technology assessment offers the most promising methodology (excepting perhaps cross-impact matrices), especially if joined to modelling, and it is certainly backed by powerful government and private forces. Informal educational systems may be extremely efficacious in futures studies. The delivery of insights and knowledge (such as it is) about the future in a cybernetic policy-studies fashion is the most pressing next step.

After collecting information (primarily by questionnaire) for six years and writing three critical analytical reports ^{1, 2, 3} on university-level futures courses, with information now in hand on about 500, I venture to say that futures studies, as a quasi-discipline at least, are tolerated on the academic scene. The enormous shock to western society of the 'surprising' energy crisis (although more or less precisely forecast in physical terms for at least a decade), coming after the generally heightened public consciousness on environmental questions, has had its overspill in academia. The rapidity with which the underdeveloped Muslim nations internalized political compact-making and cartel-design (societal technology) of the western type convinced even the most obtuse that the world was on the move at an accelerating pace and that we might be

witnessing one of the major revolutionary breaks in history.

Triage—whom do you allow to die by starvation? ^{4,5}—and ‘the lifeboat theory’—whom do you throw overboard to save the others?⁶—are the questions that now face the affluent societies, and especially the United States. Has our vaunted humanitarianism merely been the result of a once teeming plenty or are we Americans as ‘selfish’ as Europe and Asia—not to mention the developing areas and the communist bloc—have of necessity always been?⁷ Trapped by the Marshall Plan and our own ‘bleeding hearts’ are we doomed to feed the foolish globe to its own Malthusian destruction? It would seem that all systems may be ‘no go’.^{8,9} In fact Frank Davidson of early Chunnel fame gives a course on ‘failure’ with the System Dynamics Group at MIT’s Alfred P. Sloan School of Management. All this has now been sharply punctuated by India’s detonation of a ‘peaceful’ nuclear device as well as Israel’s frank admission of military nuclear capability. In the late 1960s, the youth revolt and ethnic unrest dramatized the smouldering discontent of large segments of the populations of western civilization with the lack of human depth in our life patterns. This upheaval certainly forced the young clients of North American universities to wonder about what their future had in store for them. Could they anticipate long and drab lives or fiery extinction? And, on a more optimistic level, could they have some say in creating possible alternative futures of quality? In view of all this turmoil it is hardly surprising that an increasing number of university researchers/teachers have attempted to forecast the future for their students in university-level courses.

This attack on the future has come from a number of directions and is of varying quality. *Demography*, long interested in extrapolation (initially egged on by profit-minded insurance companies), continues to plod ever more wisely into the future. *Utopianists* (literary or design-oriented) reach back through a long tradition linked to the legends of primitive man and spin possible futures which criticize the present or prefigure a better world. This latter group are joined by the *science fiction* enthusiasts who seem to feel that all global ills can be solved by a ‘technological fix’, although increasingly they prefigure far-out psychological and behavioural technologies. Big business and big government, immensely serious, have inspired assiduous *technological forecasting* in the business administration schools; and latterly, brought up short by shifting social values (for example, environmental concern led to the cut-off in the supersonic transport programme and the near-stoppage of nuclear power plant construction in the United States), business and government have become increasingly involved with *technology assessment*—still in its infancy. *Educationalists*, who fancy that they hold the future in trust through their manipulations of the young, show spots of inventive futures techniques in

education (as do others), in addition to ‘futurizing’ their course contents. *Sociologists* are among the strongest supporters of futures studies, at least among the younger social change/operational types intrigued or horrified by the *Brave New World* cleverly glimpsed by Huxley.¹⁰ *Political scientists* are getting into the act increasingly and if all the members of the future-oriented Policy Studies Organization (80 programmes are run by members) were added to the political scientists offering futures courses, they would possibly be by far the most numerous social science group. I do not pretend that Table 1 which lists by discipline those giving futures courses who reported to the Mark III Survey, is a valid sampling of discipline/field interest—here are recorded merely those course-givers who fell into my net—but it may be instructive as to interest.

The techniques for learning/teaching futures studies rest quite obviously on what exists to learn/teach. It would appear that there is little that is excitingly fresh to be discovered (a) in reliable knowledge in the futures field, except in technological forecasting/technology assessment, systems dynamics and the policy sciences, (b) in new teaching techniques, or (c) in people-oriented experiential learning (except Syncon, a highly complex form of group dynamics). It should be noted that technological forecasting/technology assessment, systems

TABLE 1
Future course-givers, by discipline, reporting to the Mark III Survey

	1973–1974 Reports	Cumulative 1969–1974
Anthropology	4	9
Business administration	32	57
Computer science (modelling, etc.)	24	27
Demography	2	2
Economics	7	10
Education	28	40
English	5	10
Engineering	17	26
Geography	7	10
History	5	8
Humanities (overlap with English)	16	19
Law	3	4
Natural sciences	13	25
Political science	19	33
Psychology	3	3
Sociology	50	77
Theology	5	10
Urbanists (including architecture)	15	28
Miscellaneous	58	78
	<hr/> 313	<hr/> 476

Note: Science fiction, policy studies, peace studies are not included in these totals.

dynamics, and policy studies in general tend to eschew the label of 'futurism'. The standard methodological ploys that I explored in my 1970 and 1973 surveys are still with us, adding little to the twelve that Daniel Bell staked out a decade ago.¹¹ These standard methods may be conveniently grouped under five headings:

- Type A: Intuitive methods ('genius forecasting') and codified intuition or Delphi; now enriched by cross-impact matrices;
- Type B: Trend extrapolation;
- Type C: Ideal state and/or alternative possible futures and scenarios;
- Type D: Dynamic models;
- Type E: Social (societal) indicators and Quality of Life (QOL) indices, which constitute an adjunct methodology crucial to the delivery of futures research.

The total evidence in hand indicates that in late 1974 all the standard futures research and teaching methodologies (conventional wisdom?) were still in use, with little firm evidence at hand to verify the reliability or heuristic value of any! The *validity gap* faces all futures study, it would seem. In five general directions, however, there appears to be some purposeful activity in the development of research/teaching methodology, at least in these significant areas: (a) technological forecasting/technological assessment; (b) general systems theory and systems analysis/dynamics, (c) Delphi/cross-impact analysis, (d) creativity and experiential learning, (e) policy studies. I shall examine the first four of these in turn.

(a) *Technological forecasting (TF) and technology assessment (TA)*

Long firmly based in advanced military hardware planning, TF is making increasing inroads into both governmental and corporate planning. No nation wants to be caught short by an enemy's gadget or by resource depletion (or resource cornering), although almost everyone seems to be caught sooner or later. No private corporation wishes to be lapped by a competitor's *nouvelle vague* product or crushed by a value shift (as supersonic transport was). The penalties for sleeping at the switch are national extinction and corporate bankruptcy. Inadequacies are painfully evident and painfully penalized. Thus the unemotional vigorous schools of business administration with their generally highly motivated students appear to be testing both the concrete and the general outlines of the future. A leading sage of technological forecasting berates all sociologists (through me) unceasingly and probably quite correctly: 'The important point to convey to the sociologists is that we are receiving continual

pressure from industrialists to get them some help on predicting the interaction of social change with technological change. In other words, give them some insight on social forecasting' (private communication).

The brilliant paper by Richard L. Henshel and Leslie W. Kennedy¹² has shown that as our skills increase in these directions so will the complications resulting from self-defeating or self-fulfilling prophecies.

The rapid recent growth of interest in TA all over the globe and in trans-economic social (or societal) indicators, with sensitive Quality of Life indices being developed in Japan, Germany, England, and the USA, to cite but a few involved nations, bodes well for an eventual humanistic weighing of TF on a professionalized scale. The key node of this activity is the International Society for Technological Assessment in Washington, D.C.

There is in this whole TF/TA complex the seed of excellent futures research. With TF stemming from the graduate schools of business administration (originally from Harvard), it is hardly surprising that, in addition to some precise theorizing, the store of *case studies* of both TF and TA in operation is increasing. The finest way to test a method is to examine the results of using it in real-world situations (often neglected by social scientists, who serve usually as mere analysts, *not* operational planners). Actually TF/TA in my estimation will fall far short in practical results unless they are married to systems analysis/systems dynamics and general systems theory.

(b) General systems theory and systems analysis/systems dynamics/modelling, etc.

While not necessarily so, basic systems analysis tends to be increasingly mathematical. Systems dynamics is clearly dependent on computer storage and manipulation. These rigorous, highly intellectual technologies seem to be at the very roots of the alternative futures game, and they seem of considerable interest to America's mathematical youth. Are we spawning an intellectual technocratic elite as guardians of esoteric processes? In any case, the game must be played; all teacher/scholars are increasingly involved with the computer—like it or not. The variables are too complex for anyone to test out mentally unaided by the planning–forcing techniques of systems analysis—generally computer based—and the game is too changeable in process for us not to include a continuing cybernetic feedback on the values, resources and organizational structure, in an endless chain reaction. Even *intuitive futurists* use mental models. Whether the sophisticated mathematical crutches already available will ever cope adequately with the infinite complexity of future reality is doubtful, but they are already better than the sages' guess-estimates. It is more than likely

that all futurists will need to master this difficult bundle of technologies if they wish to produce more than 'hot air'. From the University of Pennsylvania's Wharton School of Business Administration came this nugget: 'I teach a seminar on forecasting methods. It's called "Long-Range Forecasting: From Crystal Ball to Computer".'

(c) Delphi techniques/cross-impact analysis

Based on lumps of 'genius forecasting', Delphi projection techniques in mini or maxi form edge into a great majority of courses in all fields. A clear externality of the use of students as 'experts' in Delphi operations is experiential learning through participation. But Delphi is more than that and the time is now ripe to evaluate its successes and failures after more than a decade of use in increasingly varied fields. The handy time span of a decade is available for testing the validity of its projections and reshaping the format of use so that it can do better in precise prognostication. The development of cross-impact analysis, into which leading Delphi practitioners have moved, indicates a formal awareness that 'everything is related to everything else'. One is reminded of the Kahn/Wiener fifteen-fold interlocking trends from the 1960s and of total environmental planning/holistic planning on the urban/regional/national scene, now almost two decades old. Obviously straight-line and complex extrapolation curves do fit into this cross-impact method. Since both Delphi and cross-impact analysis have clear (formal organizational, too) relations with TF/TA and with general systems theory, systems analysis, and systems dynamics, this complex of research thinking is forming a veritable powerhouse of methodology. The Rand Graduate Institute (RGI) had in 1973-1974 some twenty persons in a doctoral programme—each working in an area tied to a real-world current or past Rand project in policy studies—clearly a new departure in sophisticated extra-university future-oriented education. All futurists should learn to manage mathematical modelling with their left hand as they cleave ahead (hopefully) with their right guided by 'creative intellect' under a holistic systems theory. Clearly there is also a useful and fascinating teaching device in this bundle of skills.

(d) Experiential learning/creativity/scenarios

These enormously varied and vital activities, both in research and in teaching, can hardly be classed as 'hard' technology. But who can gainsay the basic importance of fresh creative insights—'more of the same' promises little. It would appear that a most unusual collection of tricks is available (essential?)

for the well-equipped futurist teacher. Mod and trendy instructors do not 'tell' students anything but serve hopefully as exciting resources, even models, for the neophyte to use in expanding up to his presumably ample God-given potential. Assuredly the educational structure is in ferment, as should be amply evident to readers of the ubiquitous newspaper (not averse in capitalist countries to inflating and to exploiting the spectacular over the drab norm), and quite unlike the pattern in 'socialist' lands where teaching is a solemn authoritative business. 'Doing something sticks in the consciousness better than reading about it' goes the new wisdom. Just how do you 'live' in the 5th century B.C. of Athens or 2000 A.D.? A mock-up could be fashioned, of course, and museums of the future growing in both Denmark and Minnesota are early attempts in the direction of 'living in the future'.

In a rough way, there appear to be two innovative poles of activity in futures studies, one at the hard or 'right' pole: TF/TA, policy sciences, corporate cramming courses of a high excellence and precision in non-standard time formats. In the middle, there are free educational structures marrying futures orientation with 'futurist' educational restructuring and open course management. At the 'left' or soft pole are the intentional communities and the full gamut of often curious experiential learning experiences, as well as attempts at fostering intellectual creativity.

There is a hodge-podge of new directions in this last rubric, many left of centre, difficult to conceptualize in any adequate fashion. Futurist teachers tend to be innovative and iconoclastic, interdisciplinary, and by definition probes of the unknown—not always in any way that could be called planned by any stretch of the imagination. Consciously or unconsciously they do covertly or overtly push for systems breaks. The gamut of educational 'gimmicks' used to stir up client students, presumably to foster creativity as well as culture/future shock, seems endless: simulations; telephone interviews; movies; TV scripts; participatory planning; poetry readings; formation of a collective; expressive dancing; technological cum group-think jamborees such as Syncon and the World Game; a voodoo experience; scenario building/intentional communes for future living; 'happenings'; confrontation/encounter sessions; role-playing; modelling; brain-storming; free-form courses; nature worship; a futures fair; a personal life history projection; visits to 'futuristic' locations such as California; videotapes; survival training and solos; individual obituaries. In my ongoing survey I shall continue to record, often with amazement, the things people do in attempting to make other people think! If such an assault did not unsettle the recipient, it would be surprising, but what does this *ersatz* and slanted experience actually add up to? Obviously all courses do not employ all techniques. But is 'creativity' also a product of such bustle? Do

glorious and valuable thoughts emerge—thoughts which are so much needed before rigorous testing and experimentation if viable alternative human futures are to be created for man? In my surveys, no answer has as yet been revealed. In short, there is little or no evidence of any sophisticated controlled development of creativity—a serious gap. An interesting people-involving Open University (England) course, ‘Art and Environment’, planned to start in 1976, exemplifies neatly the neo-populist faith in the untapped abilities of the common man and exemplifies also certain participatory futures-teaching techniques as well as content.

The impact of futures studies on two important professional graduate fields in the United States can be seen in two courses. The first example is the attempt, at Syracuse University’s respected Maxwell Graduate School of Citizenship and Public Affairs in 1973–1974, to link administrative techniques with insight into the future in a course on ‘Post-industrial administration and social change’; the second is a similar venture made in a seminar on ‘Planning for alternative possible urban futures’ offered at Harvard’s Graduate School of Design, Department of City and Regional Planning, in the autumn of 1974. Both courses seem to indicate that, although a reasonable *tour d’horizon* can be made in which futures studies are related to existing professional training, little more than that can be expected within the short span of a few months. It proved heartening in the Harvard case to have pre-professionals—with so much operant knowledge to digest in so short a time—still eager for mind-stretching in a futures direction. The urbanists have finally come to future life, heralded by William Ewald’s massive editorial job^{13,14,15} for the American Institute of Planners—an organization curiously long dormant in the face of the rather obvious fact that at least the physical works of urban planners live long into the future (see the Roman colosseum). BART, San Francisco’s Bay Area Rapid Transport System, will undoubtedly be around in 2075, barring a MIRV barrage. Portions of London’s Underground were laid out for steam trains in the 1840s! *The California Plan Tomorrow: The Future is Now*¹⁶ offers a California One scenario in which the quality of life becomes seriously impaired before 2000, and a California Two ‘which makes possible person fulfillment within an amenable environment’—one hopes! *Hawaii 2000*¹⁷ chronicles the wide participatory planning ‘five-ring,’ multi-media drive of that state towards human futures, backed heavily by the State Government and the State University, offering at least six ‘alternative Hawaiis’. *Inventing the Future Memphis*, a lively effort by Southwestern University’s Center for Alternative Futures in that city, has struggled ahead and is now getting ever-better results in public education and realization. Joining *Tomorrow’s London* are *Washington 2000*, *Seattle 2000*, and *Atlanta 2000*; the latter city, largely influenced by the

private sector, is rapidly building a spectacular and commercially outstanding central city. Is the Quality of Life (QOL) quotient quite so highly served as the profit motive in this spectacular central business district with 'futuristic' glassed construction of high rise and high-cost commercial and transient hotel recreational facilities?

A significant development is the application of Forrester's urban dynamics to the real city of Lowell, Massachusetts, a decaying manufacturing city from the early nineteenth century, buffeted by technology shifts and the movement of the textile industry first to the South and latterly out of the United States.¹⁸ A team from the MIT System Dynamics Center for the past three years has worked closely with the city officialdom and people and, using a computerized mathematical dynamics model as a heuristic device, has upgraded community decision-making in four key directions: (a) values for the future city, (b) final land use (c) property tax and (d) housing policy.

What are the results of this third iteration of my survey of futures courses? Specifically, analysis of the 300 courses collected by the standard questionnaire in 1973–1974 revealed, among other things, these five salient conclusions:

(1) Futures studies *per se* have grown steadily but not spectacularly as university-level courses both at the undergraduate and graduate levels. Other fields, not labelled 'futurism', but with a clear future-orientation (such as: environment/ecology; TF/TA; long-range planning; policy sciences; peace studies; general systems theory; systems analysis and dynamics; even science fiction; black studies and women's studies) appear to have increased more rapidly than futures studies in North America.

(2) The population of course-givers in 'pure' futures studies seems to fall into a sieve from which some old hands drop out each year, to be replenished by a fresh stream of generally young recruits. This suggests the somewhat negative present intellectual image of futurism (an identity crisis?)—an image perhaps derived from its 'pop' manifestations or from disillusionment with its success at reliable forecasting and immediate delivery. It also indicates clearly the necessity of defining the futures field, of upgrading training in the relatively slight corpus of reliable knowledge (including embryonic theory) of futures study, and of stepping up the enlistment and development of fresh young minds *already grounded solidly in some recognized discipline or field*. European universities appear, from inadequate evidence at hand and with the possible exception of technological forecasting and general systems analysis/mathematical modelling, to have approached futures studies much more gingerly.

(3) Societal forecasting, and especially values forecasting based on valid sociocultural change theory, is the weakest aspect of the entire futures com-

plex. It is to be hoped that experienced anthropological and sociological researchers will contribute here eventually.

(4) Futurizing the content and point of view of existing solid courses in recognized fields and disciplines seems the most valid operational strategy for extending futures studies for the moment. Many physical scientists burned by the now revealed diseconomies of atomic skills do this. Increasingly alert researchers/teachers in varied fields glance 'over their shoulder at the on-rushing future', as do many of their rather pessimistic young clients. This is especially true for those dealing with new medical technologies.

(5) In my personal estimation, technological forecasting for big business and big government is the most highly motivated and successful research-oriented complex on the American and Canadian scene—and has the best methodologists apart from the modellers and the users of cross-impact matrices. Brought up short by value shifts, the TF fraternity is flailing about (with some new environmentalist recruits) in technology assessment. Many of these people tend to see 'technology' much too narrowly, failing to grasp that there are also (feeble, admittedly) societal and behavioural technologies based on the social and behavioural sciences. And that all basic science and the resultant technologies subsist on a burgeoning intellectual technology resting heavily on the 'gadget' assistance of the computer.

Finally, are there further tentative insights that can be drawn from my six years of research in futures' teaching? Here are three:

(1) The folders on 500 course-givers, filling six file drawers, are now too numerous to be handled adequately by a one-person 'team'; a much more rigorous delving is needed into the realities of what actually goes on, rather than what respondents state happens. Questionnaires have clear limitations; follow-up is most necessary. The coverage of the non-North American experience is much too feeble. Data storage and retrieval is inadequate and the detailed interrelationships and interconnections must be subjected to a much more rigorous analysis than one individual's resources in time, energy and expertise permit. Futurism and futurists do seem stuck on a developmental plateau. To these ends a search has been instituted for a powerful research group, public or private, profit or non-profit, who could build on my shoulders.

(2) The future, hanging ominously or looming in an excitingly challenging fashion ahead, is too crucial to be left to amateurs, part-time 'genius forecasters', woolly-headed visionaries (however well meaning), and publicity seekers. The uses made of futures studies by the national governments of France,¹⁹ Sweden²⁰ and the Netherlands,²¹ and the location of these futures bureaus (at least as early warning systems or look-out stations) close to central decision-making, are facts emphasizing that alternative national futures can

possibly be removed from control by the 'hand of God' or conversely from control by capitalism's beloved invisible hand.

(3) Futures studies must link up as a subset with convoluted policy studies or advanced delivery systems²² if human civilization is to survive or possibly even continue to flourish. If there is to be a systems break in the next decades, no doubt futures studies could serve as a helpful bridge over that chasm. The universities and other types of less traditional learning/teaching centres (with or without walls) have a central role in training societies and their leaders for these alternative *futuribles* (possible futures). It is unimportant whether future-oriented learning is entitled 'futures studies' or not, so long as a man-centred, holistic, operational, long-range, flexible planning effort is forwarded.

Discussion

Waddington: One of the great questions facing us at this meeting is whether we should be teaching about the future as a whole, with everything brought into it, or whether specialists should give specialist courses that look a bit into the future of a particular specialty. For instance, until two years ago the energy experts in the United States were forecasting that the US would consume four times the current amount of petroleum by the year 2000. That doesn't look very convincing if we take into account considerations other than those concerned only with the use of energy. In the whole subject of looking into the future within a specialty, how far can we get without bumping into the future in other specialties? Can we find a way of looking at the futures of all of them together?

Platt: The question is illustrated by the fact that until a year or so ago, demographers and United Nations forecasters repeatedly based their forecasts for world population on expected numbers of children, or on expected dates for the 'demographic transition' to fewer births, totally ignoring factors such as food and resources. But it is only when food and resources are put into the equations formally, or into the thinking, that we begin to see certain limits which have no historical precedents. Instead of forecasts of 7000 million or 12 000 million people after the year 2000, we then suddenly come up with numbers like 5000 or 5500 million people by the turn of the century, with perhaps 1000 million people dying of starvation between now and then. The *Limits to Growth* forecast by Meadows and others in 1972 showed, I think for the first time, that the population would necessarily be a substantially lower number; and this was because they took into account the interaction of these other factors.²³