

Education and Irish Society—with special reference to informational needs

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INTRODUCTION

For the first time since the foundation of the State some data on the educational experience of the population were collected at the 1966 Census of Population, taken on the night of 17th April 1966. Information on age at which full-time education has ceased and on type of school or college attended (also on a full-time basis) was collected for all persons 14 years and over. As had been the custom in previous censuses of population, data on the type of education being received were collected also in respect of each person, 14 years and over, attending an educational institution on a full-time basis. Data on educational experience will be collected also at the next census of population due in April 1971, and it is probably reasonable to hope that similar data will be a regular feature of future censuses of population. In this way we have officially taken cognisance of the renewed interest which economists, sociologists, and public policy makers in many countries have had in the concept of "investment in man" since the early fifties. This interest is widely believed to have been evoked by the dramatic recovery which the German economy made after the extreme physical destruction caused by the Second World War. It is widely believed that this recovery was largely due to the high educational level of the people, and in particular to the generally high level of technical education in the country. This feeling was no doubt strengthened by the contrast with the situation which existed in some very rich oil-producing countries, where the low and excessively traditional character of education appeared to be responsible for the waste and stagnation which characterized such countries despite their wealth.

In the event our interest in the matter as far as the Census of Population was concerned was somewhat belated as most countries with adequate statistical services had collected information of this type at the 1960 round of censuses. Results from these enquiries were published in the U.N. Demographic Yearbooks 1963 and 1964 and of course in national publications. Summary data in respect of seventeen such countries were also published in the Annexes and Appendices to Investment in Education, Appendix VIII.E. In fact a number of countries (e.g. United States, Japan) had collected this kind of data at several censuses. However, the publication of the Irish data in Volume VII of the 1966 Census had not so far evoked any considerable degree of comment or analysis.

In part, this may be due to the fact that the information required for a satisfactory analysis of Irish educational problems in relation to various

social and economic issues is still very inadequate. In fact, this paper will to a considerable extent be concerned to discuss the question of providing an adequate information base for this task, rather than attempting any deep analysis of the substantive issues themselves. If some people regret this diversion into what may seem to them a peripheral issue, I can only say that the problem of providing adequate information relevant to the issues involved, is very great and perhaps in some regards quite intractable. In any case, in order to discuss this rather technical problem, it is necessary to set out some of the questions of the relation between Irish society and education as thrown up by the Census and other data, and this is done in the first part of the paper.

PART I — SOME MAJOR ISSUES IN THE RELATION OF EDUCATION TO SOCIETY IN THE IRISH CONTEXT

Demographic issues and participation

In a number of ways the demographic structure in Ireland is untypical of developed Western European and North Atlantic countries. In particular the child dependency ratio is high by comparison with these countries and is rather more like that of more underdeveloped countries where this ratio is typically high. Thus, for example, 31½% of the population of the State in 1966 were in the category 0-14, compared with a figure of 22% for the Federal Republic of Germany and 27% for Greece. 40% of the population of the State were in the category 0-19. However, this of itself would not create a demand for educational resources unless the children and young persons in question are being educated in formal schools. However, in our case participation rates in full-time education in the voluntary ages (i.e. those over 14 and under 6) are high by European standards; are rising rapidly, and are expected to go on rising through the decade. This has resulted in large and rapidly rising numbers in full-time education. On the other hand numbers at work after falling over a long period (during which the fall in the numbers engaged in agriculture was greater than the rise in the numbers engaged in industry and services), have begun to rise, but only rather slowly. Indeed there is no strong reason to suspect that the total of numbers at work will increase very rapidly during the decade, as the expected increases in industry and services will probably continue to be counterbalanced to a considerable extent by the decline in the numbers engaged in agriculture.

This has resulted in the following somewhat startling comparisons; one based on a comparison with some other countries at the mid sixties; the second based on trends over time. A table (table 6) in the OECD publication "Development of Secondary Education" shows the ratio of school enrolments per 100 active population relating to the year 1965. This table indicates "the strain education puts on a country's manpower resources" at least potentially. In this table the ratio for Ireland is 64.6, i.e. in 1965 school enrolments were 670,000 compared with an active population of

1,037,000. This is the *highest* ratio for any country shown in the table which includes all the developed Western European countries as well as the U.S., Canada and Japan. The ratio for the Netherlands which is next highest was 60.4, for the U.S. 60.1, for France 45.8, for Sweden 34.1, and for Canada 39.4. Remembering that this was before the free education scheme, it is likely that the ratio increased more rapidly in the intervening years in Ireland than in the other countries in question. For example, assuming that annual increases in employment during the decade will be of the order of 0.6% which is typical of the trend in recent years, we would have about 1.15 million people at work at the end of the decade. On the other hand, a conservative projection of numbers in full-time education based on the trend in the demand for places would involve the total pupil/student body of 0.86 million persons which would imply a ratio of 75 at the end of the decade compared with 65 for 1965 mentioned above.

Projection of pupils/students in Education:

I have attempted to make a projection of student numbers and student outflow by broad level of education for the 1970's in respect of full time students. The projection uses the transitions matrix approach. This approach involves a base year enrolment vector (o), a projected arrivals (entrants) vector $E(t)$, a base year set of co-efficients for the initial transition matrix (B) and a matrix of co-efficients showing the annual (linear) change in the base year co-efficients (D). The equation linking enrolments in successive years t and $t + 1$ may be written $S(t+1) = S(t) [B + (t+1)D] + E(t+1)$ where S and E are treated as row vectors for the matrix multiplication and addition.* Without attempting a long justification for the choice of these particular parameters, I suspect that most people familiar with recent developments will regard these as reasonable, if somewhat conservative, as regards expansion. In any case if we provisionally accept this projection as a basis for discussion two things become evident. One, the sharp increase in enrolments in those levels and sectors which have traditionally been the most expensive in terms of cost per student "serviced". Two, the dramatic change that this implies in the distribution by level (and cycle) of the outflow of persons from full-time education. This is still more dramatic if we compare this distribution with that of those who will typically leave active life in Ireland at the beginning of the next decade. In order to put a rough but adequate order of magnitude on these figures I take the average for the cohort who will be 60-69 years of age at the 1981 census to represent the latter (assuming that death or migration will not change the educational distribution of the survivors) and data for outflow from the educational system in 1980/81 to represent the former. This, incidentally, assumes that the distribution of those who enter active life in Ireland

* A copy of the actual co-efficients and the detailed projection was circulated at the meeting as background information.

is identical with that of the outflow from the educational system — clearly not entirely accurate but probably adequate for the purpose in hand. The figures taken in this way are:

	Percentage who had attended		
	Primary	Post-Primary	Third level
Leaving active life in 1980/81	74	21	5
Entering active life in 1980/81	3	76	21

Whatever reservations one has either about the fairly crude numerical assumptions made in deriving those figures, the different statistical bases of the figures, or the quality of the comparative education represented, however inadequately, by them, it is clear that a formidable social phenomena is indicated by these data. Of course these are flow estimates (i.e. those entering/leaving in a particular year) and to that extent highlight the rate of change. It is possible to turn these into stock comparisons between the 1966 and the 1981 situations, from the data and projections available, by making some additional assumptions. I feel, however, in choosing a few summary figures to illustrate this point, that flow figures are more helpful.

The comparatively rapid expansion of the more expensive sectors is obvious from the enrolment projections themselves and still more so if we compare them with the earliest comparable figures available; those for 1963 published in "Investment in Education". The following rough comparisons will give the broad orders of magnitudes involved:

	1963	1970	1981	Ratio 1970/63	Ratio 1981/70
	(thousands)				
First Level	496	520	533	1.05	1.03
Second level—Junior Cycle	96	147	186	1.5	1.3
Second level—Senior Cycle	27	52	90	1.9	1.7
Third level	16	23	54	1.4	2.3

It will be seen that it is the more expensive sectors in which the fastest rate of increase is taking place. This will, of course, place great strain on resources; financial, physical and human.

As regards the likely financial burden it would be highly desirable to be able to estimate the expenditure implied by the projected increase in enrolments with no change in standards of provision at constant prices and to compare this (a) with projected GNP and (b) with projected central and local government revenue. We would then be in a position to judge (i) the probability that finance would be available for an increase in present standards of provision without an increase in the proportion of G.N.P. going for education and (ii) the implications of any "productivity" gains in mitigating the demands that any one component of education is likely to make on the total financial provision.

Unfortunately there are both practical and theoretical difficulties in making these comparisons. On the theoretical side the difficulties revolve around the semantics of the phrase "with no change in standards of provision"; in the case of a service whose output is not subject to market

pricing and is not measured in quantitative terms. One approach which might have the merit of simplicity would be to take past trends in costs, for those broad aggregates of students for which such trends are available, deflate them by one or more agreed indicators and assume a continuation of such deflated trends in unit costs in the future. Apart from the fact that the aggregates in question are so broad that they are very unsatisfactory on that score alone, and the difficulties of choosing meaningful deflators, there is also the point that the trends in question do not represent "constant standards of provision of services". In fact, many changes, some large and some small, have affected them at different points of time in the past. It would be a major and indeed questionable operation to attempt to "correct" for these changes.

Another approach would be to determine in physical terms the baskets of goods and services "consumed" by different aggregates of students, adjust these for projected changes in student numbers, and apply presumed price trends to the components of these baskets, deflating the resultant aggregates by some agreed deflators. Apart from the difficulties of establishing price trends and of assuming their continuance or change, there are great theoretical difficulties in defining the meaning of the term "price", where, as in the case of education, a major component of expenditure is teachers' salaries. In addition, because the educational system is to a considerable degree an aided system rather than an administered system, a great deal of expenditure, apart from salaries, is in the form of grants to institutions. In most of these cases, data are not available on the components of this expenditure. For this reason alone this approach is probably impractical at the present time. Finally, as regards the supply of money for education, no acceptable long term projection of G.N.P. in real terms is currently available either from official, semi-official or other sources. If such were available it would still be necessary to decide whether the trend in the proportion of G.N.P. going to education (which has increased slightly in recent years) would continue, whether it would be halted, or even reversed. However this is not too great a problem as a kind of base line assumption of constancy at present levels would probably be a reasonable starting point.

However, whatever the theoretical or practical difficulties of making these projections, it is evident that the projected expansion in enrolments will place great strain on finances likely to be available. In addition to demands for funds to expand the present system there are and will continue to be demands for improvements on present standards of provision in all sectors. Most of these demands appear desirable in themselves, but it seems likely that many of them will be difficult to achieve unless their cost can be met to some extent by "productivity" gains. The concept of productivity in the sphere of education is both complex and highly controversial, so I will not attempt to introduce what could only be a superficial analysis at this time. Nevertheless it will continue to be a focus of interest for educational debate during the decade.

Equality of Opportunity:

In the last few years some significant steps in the direction of equality of opportunity (however defined) have clearly been taken, and it may seem either irrelevant or utopian to discuss the implications of further steps in this direction in the light of the projected expansion of the system, and of the financial burden that this expansion together with the demands for higher standards will throw on available resources. Nevertheless it seemed inappropriate not to give some attention to the question and to the need for further information in this area for three reasons. First, it is the general experience of Western European countries, as reported on specifically at a recent major O.E.C.D. review "Conference on Policies for Educational Growth", that the dramatic expansions of enrolments in all such countries have had only a very limited effect on relative participation by the different socio-economic groups in the post-compulsory sectors. Thus if we define equality of opportunity in terms of the proportion of the various socio-economic groups reaching degree or degree-equivalent standard, it is clear that the problem is more intractable than has been previously envisaged. In addition it has now become evident that the system works in most countries in such a manner that more public money is spent on the education of persons who start life in reasonably favourable situations than on those who start life in very unfavourable circumstances. Thus even the much lower objective of equality of expenditure per student is not likely to be achieved in most European countries in the foreseeable future. Secondly, data that are just now becoming available on the situation subsequent on recent advances in this area, indicate that when the general run of society moves ahead in response to better opportunities the failure of those who are not able to benefit from these opportunities becomes more evident and also of more concern. For example, data just recently available have shown that the percentage of those leaving primary schools who do not go on to post-primary schools has declined significantly. However, when we look more closely at the data, we find that while there are no terminal leavers from over half the primary schools, there are also some schools where more than three-quarters of leavers are terminal leavers. In some cases all leavers are terminal leavers. Most of those schools are in the inner areas of the cities and very large towns, indicating that the problems of such areas in other countries are not unknown to us. Finally the Census results themselves, taken in conjunction with the projection of future enrolments, highlight the issue of differences in opportunity between the generations as well as between socio-economic and geographical groups. It seems to me that a greater subjective awareness of this situation, arising both from experiences in the home and in the work situation, will develop in large groups of the population, and will lead to a sizeable demand for "second chance" education. For all these reasons I believe that more information on the extent of the movement towards (or away from) equality of opportunity will continue to be necessary in future, even if no further steps in this direction could be envisaged in the short term.

Economic Aspects of Educational Developments:

It is clear that in this country as in most other Western countries the main determinant of educational expansion is the demand for places. Nevertheless it is still relevant to ask how the supply of educated persons generated by this process will match the demand for educated persons implied by a particular rate and pattern of economic growth; whether the information we have, or are likely to acquire, enables us to say anything useful about this comparison; and what if anything it is possible for the central or local authorities to do about the matter, if a significant disparity seems to be likely.

It is well known that there have been two approaches to these questions; the manpower approach and the rate of return approach. The arguments between the proponents of these approaches have been fairly completely expressed in an extensive literature and it seems to me that a kind of plateau has been reached with both sides resting prior to an attempt to reach some synthesis which will have some practical significance. It is clear that at the level of verbal formulae some kind of agreed criticism of these approaches has been reached, but these formulae have neither influenced the operational procedures of either approach very deeply in any study I have seen nor has a combined approach, which is likely to have any operational significance, been developed. The only work of which I am aware which is attempting to develop such a synthesis is that being done at the Department of Applied Economics, at the University of Cambridge, but as this has not yet been published, we can merely await the event with interest.

A good general survey of the position has recently been published by the OECD "Occupational and Educational Structures of the Labour Force and Levels of Economic Development".

I have little to add to the general discussion but there are a few things which I think are worth saying. I am not hopeful that the calculation of the social rates of return to various levels and kinds of education will in its present form be very helpful to us as a guide to policy. However, I believe that it would be worth calculating the private rate of return to various kinds of education above the junior post-primary level. These rates would indicate whether the demand for places which we experience, is compatible with economic criteria or whether it is dominated by traditional choices or personal preferences. If we find the former to be the case, then there will be little point in public exhortations to young persons to change from the more traditional choices to the newer kinds of education, unless some public policies to change the relative rates of return were considered feasible. If the latter is the case there would then be a case for increased information relating to the economic value of new skills and corresponding exhortations. It is worthy of note that P. J. Foster in a well known article on the situation in Ghana in "Education and Economic Development" edited by Anderson and Bowman, took the view that in that country the preference for traditional educational channels was explicable in terms of economic rationality. This issue is

particularly acute in relation to the category of technicians. Shortages of technicians may be a consequence of a number of factors; shortage of capacity for the education of technicians; shortage of applicants for available places; emigration of trained technicians in search of better returns or wider experience, or the use of technical qualifications in jobs other than those for which the education in question was intended. To the extent to which the first cause is eliminated by the provision of better facilities as has in fact been achieved to a large extent with the opening of the Regional Technical Colleges, the other issues come to the fore. It seems to me highly desirable to have data on the comparative private rates of return (a) to technicians, (b) to persons of comparable general education and (c) to professionals. Only then can we evaluate the extent to which traditional preferences are dominating economic considerations in the choice of educational sectors.

As far as the manpower forecasting approach is concerned, any remarks I make in relation to the situation in this country will be more than usually tentative as no official manpower forecast has so far been issued. However it is an aspect of all such forecasts intended to influence educational planning that one or two operations is required. In the Tinbergen approach, one moves directly from a forecast of output by industry or sector to a forecast of the educational stock required to produce that output, via a matrix relating output to educational inputs to the process. In the other approach, one moves from a forecast of the numbers required in each occupation to a forecast of the educational stock required, via a matrix relating occupation and education. There are two serious difficulties here. One is the well-known difficulty in reconciling the classification of persons by industry derived from the Census of Population with that derived from the Census of Production and other establishment-based enquiries. As our economic forecasts are based on the establishment concept, the normal difficulties of transition to educational classifications are accentuated by this incompatibility. My feeling is that the Tinbergen method is more affected by this problem than the approach via occupational description. The second difficulty, or rather danger, which applies particularly to the approach via occupational classifications is that we may be tempted to use the matrix linking occupational descriptions to educational headings, which can be extracted from the published volume of the Census, dealing with Education, directly, as it is, and apply it to a vector of required occupations. This would be a disastrous mistake in my opinion in that it would assume that the increase in output in any given industry between let us say two Census years, was adequately accounted for (as far as manpower was concerned), by the change in the occupational composition of the work force engaged in that industry between the two periods in question, ignoring the likelihood that the upward educational shift which almost certainly took place in educational levels within occupational descriptions, was a contributory factor in the increase in production and sales. To attempt to evaluate the extent of this, it seems to be essential to have

at least two data points; so that the relevance of the changes in the coefficients of the matrix relating education and occupation can be evaluated as well as the changes in occupational composition within industries. Happily we will not have too long to wait before a second set of data is likely to be available. With reasonable luck and perhaps some gentle arm-twisting one might hope that a comparable matrix from the 1971 Census of Population might be available by the end of 1973. In the meantime, if it were possible to make available a table relating age, occupation and education it might be possible, without too many questionable assumptions, to make a reasonable projection of the coefficients of the 1971 matrix. In fact, there is some evidence in the published table relating occupation and education that within many occupations, age and education may be (inversely) related. For example, in many of the skilled occupations there is a bimodal distribution as regards age at which full-time education terminated. These distributions characteristically peak at 14 and 16 years of age, suggesting to me, at least, that those who left at 16 may be younger persons who took the group certificate prior to an apprenticeship, while those who left at 14 may be older people, who entered the trade before it was necessary to have the group certificate as a condition of entry. It would clearly be totally wrong to assume that the present (1966) values of this row of the matrix would be appropriate to new entrants to these skilled occupations. This is simply one example of the danger of using the 1966 matrix as it stands, in changing a demand expressed in occupational terms into one expressed in educational terms and hence relevant to educational planning. This leads to the more general point, almost totally ignored in the manpower planning literature, whether the transformation from an occupational to an educational classification should preferably be done on stocks or on flows.

I am very conscious of the difficulties as regards data, which this suggestion (i.e. that the occupation-education transformation should be applied to flows rather than stocks), implies, both as regards past data and in terms of assumptions, which would have to be made to convert a projected stock change to a flow projection. Nevertheless I believe it would be worth attempting to do this at least as an exercise, because it would enable us to take various institutional and attitudinal constraints into account — thereby being more realistic. It is a fact that initial appointments or promotions (i.e. the events that mark a shift from one state to another and which get neglected in the comparison of successive censuses) go through institutional bottlenecks and are affected by attitudes on the part of employers/personnel managers. It is reasonable to assume that such attitudes change only slowly and are ascertainable. By taking them into account we move further away from the normative attitude usually adopted in the manpower approach, but in my opinion, closer to reality. However, as the data problem is so formidable I would not wish to press the suggestion too hard.

One fact which must be a background to all our thinking in this area

is that Ireland and Irish people are part of a wider labour market, for many purposes a world-wide labour market. This has many implications, not the least of which is that, if the financial rewards for any given occupation are markedly and relatively greater abroad than they are in Ireland, the provision of additional capacity for training persons for that occupation will not prevent a shortage of manpower in that occupation.

These then are some of the main issues as I see them and lends me to a brief discussion of the possibilities and priorities of collecting additional data and of using it to integrate the data we already have at our disposal.

PART II — DATA POSSIBILITIES

Possible approaches to further data collection and analysis

As I see it there are three main approaches. These are complementary rather than competitive from a conceptual standpoint, though they will be competitive in terms of the resources required to implement them.

One approach is that best set out perhaps by R. Stone,* which he refers to as a set of socio-demographic accounts which can be integrated with the set of national accounts. The socio-demographic component of the system provides in principle, a means of integrating information on human stocks with those on flows. This stress on integrating (a) data on stocks and flows and (b) data on human beings derived from various sources, is the keynote of the approach. It may be thought of as a generalization of the manpower approach, but at least initially places more stress on developing an accounting framework for statistics of the present system than with the development of forecasting models.

This approach assumes that the population can usefully be classified into four main groups: those engaged in learning activities (in formal institutions); those engaged in earning activities; those engaged in other activities (e.g. non-gainfully occupied, retired, very young children who have not yet gone to school) and the rest of the world. (In fact there are two concepts of the "home" population — the domestic concept based on residence and the national concept based on citizenship, either of which may be chosen — if statistics are available — for particular purposes). Each of these groups can and usually will be sub-classified into many further states. In addition each person is regarded as classified by his/her individual year of age. At any given point in time each person

* "Demographic Accounting and Model Building", R. Stone, Paris (1971), OECD. See also "A model of the educational system", *Minerva*, Vol. 3 (1965), No. 2, and "Input-output and demographic accounting", *Minerva*, Vol. 4 (1966), No. 4.

is in one or other of the major states (and sub-states). One year later everybody will have moved to another state. For convenience of terminology we treat those who remain in the same state as having moved from that state to itself — in any case they will all have got one year older. (There are special problems with those who are at the same time both learners and earners. However the effect is simply to make the classification system more complicated). From the combined set of data a matrix of transition co-efficients can be derived which simply states the proportion of those who are in a given state in the initial and in "another" state the following year when they are one year older. If we made the unrealistic assumption that this matrix of co-efficients was constant and if we could predict the vector of arrivals to the system (i.e. births and immigrants) it is possible to predict the state of the system at any future point in time. In practice, of course, this matrix will not have fixed co-efficients. However, if we had observations of further pairs of years we could get some idea of how these various co-efficients were changing. It might then be possible to formulate some plausible hypotheses which could be used to predict the future values of the co-efficient matrix. Given any such forecasts, the future states of the system can be determined in the same way as if the matrix were constant. Given that data were available it would be possible to let this system interact with other characteristics of human beings; in particular with immutable characteristics such as sex, or social condition at birth (e.g. socio-economic status of family, size of family, geographic or ethnic origin). However, apart from data problems there are problems of the sheer magnitude of the set of matrices one gets by letting all these factors interact. Nevertheless, there is no doubt that the values of the co-efficients in part of the transition matrices are very sensitive to these structural factors.

In addition to the effect of structural factors, it will be appreciated that any of the co-efficients are the outcome (as in the case of the economic input-output co-efficients) of changing supply and demand influences, and both of these can in turn be heavily influenced by administrative decisions. For example, the supply side may be considerably influenced by centrally determined capacity restrictions, while demand may be influenced by such items as the level of and conditions for student aid. This creates problems in the interpretation of the effect of previous changes in administrative decisions. It also creates problems both in forecasting such decisions in the future and in forecasting the responsiveness of the system to what may be discontinuous breaks in the conditions under which it operates.

Despite all of these problems and accepting that flow statistics and the matrices derived from them relate to what we call the kinematics rather than the dynamics of the system, I am convinced that this approach represents an essential stage in the development of our thinking about this problem.

The second approach is the development of the kinds of statistics which would make the calculation of rates of returns, both private and

social, feasible.¹ I wish to make three points however. One, a good deal more than is commonly allowed for may be required both in terms of data and analysis. In my view an attempt should be made to separate out the returns of a particular type of education as such, from the returns to items, closely correlated with various kinds of education, such as social background or income of parent, or innate intelligence. This postulates a great deal of data, involving a survey of individuals and considerable analysis.

I cannot claim to be fully aware of all the recent literature on this topic, but as far as I know very few studies make a serious attempt to disentangle the effect of these various factors. For this reason a higher rate of return may be attributed to particular forms of education (i.e. those forms which in any particular situation attract persons from the most advantaged groups) than would be warranted if the other elements were factored out in some way.

Secondly, I have only very rarely seen a systematic attempt to apply sensitivity analysis in rate of return studies. This seems to me particularly important in these studies because in the way these studies are set up one form of education gets the highest benefit/cost ratio and each form of education can be ranked in decreasing order of "desirableness" from there down. It seems to me highly desirable to have a procedure which sets out the sensitivity of such rankings to the complex of assumptions made in deriving them.

Finally, on the cost side it would seem to me desirable to distinguish the situation where the cost figures used are based on a full use of the educational capacity available from the situation where the unit cost per graduate is "inflated" because historically less than "full" use was made of capacity. Decisions based on such figures could be seriously misleading if a higher use of capacity for the facilities in question could be envisaged in future periods.

The third approach is to forego the attempt to develop an integrated model of the socio-economic system and concentrate on developing such indicators as may be useful from time to time to indicate pressure points. It would focus on occupations which had achieved rapid increases in salaries and wages and on the initial employment experiences of graduates of expensive institutions. It would normally be very difficult to distinguish when using this approach, between a backlog which was being worked off and one which was constant or increasing, and hence it would have an inbuilt tendency to over-compensation.

Reverting to the finite difference input-output approach, the main question, it seems to me, is not the desirability of such an integrated set of accounts, but rather the feasibility of this approach in an Irish context

1. There is probably no need to describe this procedure in detail as it is now rather standardized. See for example M. Blaug "Approaches to Educational Planning" *Economic Journal*, Vol. 77 (1967), No. 306.

and the practical implications that this would have for us.

Apart from some of the basic demographic flows and some other special cases, there is great difficulty in getting any flow information. This is of course particularly true as regards migration, especially emigration and immigration, and also as regards occupational change. It is clear for reasons well known that no significant information as regards the composition of migration can be got as it occurs. Hence, it seems to me that it can be got, if at all, only by deduction; from the analysis of Census results or of special enquiries taken in association with the Census. Some analysis of the aggregates concerning vintages using the results of successive Censuses has already been published, providing estimates of the age-sex composition of (net) migrants between successive Censuses. This procedure of analysing aggregates from successive Censuses can be taken somewhat further, but it has very obvious limitations. It is really useful only in analysing changes in the case of states which are either exclusively sinks or exclusively sources. If a state has both outflows and inflows as most states have, further useful information cannot be obtained by this method.

One method which it has never been feasible to attempt in the past for practical processing reasons, is that of using the detailed information contained in successive censuses as a means of matching individuals in both censuses; analysing what changes had occurred to them in the intercensal period and in addition analysing (a) those who had come in to the population, and (b) those who had left the population between the periods. If this method turned out to be practicable it would constitute a powerful tool for the analysis of intercensal flows. This would certainly be a major research project and would have to be supported accordingly. In addition the difficulties might be found to be too great to give useful results. Nevertheless I am convinced the experiment is worth trying. There is also the possibility of post-censal sample surveys based on the Census. There is some experience with these in other countries particularly the Federal Republic of Germany. Hence a more accurate estimate of the potential of such surveys is possible in this case.

Another major issue on the path to an integrated set of socio-demographic accounts is the joint utilization of data collected on an individual (or individual family) basis with other data on individuals collected on an institutional basis. I have one practical suggestion to make with regard to this. The data collected at the 1966 Census and to be collected at the 1971 Census can be processed in such a way that a variable "number of years left the full-time educational system" can be derived and used as a major basis of classification. This could be compared with estimates, which it is possible but difficult to develop, of the members who leave the full-time education system each year. While I would not wish to underestimate the statistical problems likely to be involved it is possible that this would give us some idea of how people who had left the system for a given number of years, at a given age (and possibly with given educational experience) had distributed themselves over

various choices. If successful this method would also give some time trends.

There is another point to which I would like to draw attention. It is now very well known that socio-economic category is highly significant as an indication of educational potential. However it is frequently difficult to collect information on this category on an institutional basis and also very difficult to make this data compatible with that from the Census. For this reason I would like to see the Census data stretched as far as they would go, both in the analysis of individual situations and in the analysis of family developments. One difficulty here is that the family socio-economic background is lost in the case of young persons (particularly those 15 – 19) who have left home and are employed away from home at the Census date. I believe it is possible by paying special attention to this category in the Census and by making some fairly reasonable assumptions to make some reasonable aggregative estimates of the background of such persons. By vintage analysis, it might then be possible to get some picture of emigration by socio-economic group and possibly geographic area, as well as getting some idea of the transformation between one socio-economic category and another and the relation of this to educational experience. In general I would like to see socio-economic category more widely used as a basis of analysis.

Finally, I would like to suggest that our knowledge of the effects of providing a given level of education to a certain proportion of people could be considerably enriched if surveys of various kinds covering areas outside of economic activity, used the Census of Population classifications of educational level. I have in mind surveys of such things as overt behaviour (e.g. political and community participation) or attitudes (e.g. to innovation in social issues) and aspirations for self and family. It is a well accepted cliché that education is a system with multiple objectives and many honourable persons go to great lengths to warn us that it has other than economic aspects. One can agree wholeheartedly with this admonition, and at the same time feel it necessary to point out that very little effort has been put into finding out what difference, if any, any given level and type of education makes to other aspects of life.

DISCUSSION

Prof. P. Lynch: It is my pleasant duty to propose a vote of thanks to Mr. Hyland for a most important contribution to educational research. In this field Mr. Hyland has done pioneering work. As he said some data on the educational experience of the population appeared in Volume VII of the 1966 Census and, unfortunately, not very much commentary or analysis has so far been published on that valuable material. Mr. Hyland modestly avoids referring to his own original work in assembling the statistical material which was published in the annexes and appendices to "Investment in Education" in 1965.

Mr. Hyland need not have been in any way apologetic in largely

confining himself to the question of providing adequate information rather than discoursing on existing information. The provision of adequate information is, in no sense, a peripheral issue. A great deal of so-called social research in Ireland and elsewhere is defective and, perhaps, valueless precisely because the data upon which it is based is inadequate and incomplete. How right Professor Kaldor was when he referred to the residual factor in economic growth as really 'a co-efficient of ignorance'. Mr. Hyland refers to himself as a conservative statistician. One may have doubts about the virtues of conservatism in general, but I cannot think of a better adjective to apply to a statistician.

His paper raises fundamental issues for public policy. His discussion on child dependency ratios in Ireland in contrast with the experience of other countries raises striking educational and social problems. His assumptions about the slow growth in the total number of people at work over the next decade may be disheartening to those who had greater expectations when the NIEC produced their report on Full Employment, but I fully accept Mr. Hyland's realism. The conclusion from this part of his paper is the need for improving the quality of the education we provide.

His projection of enrolments showing the greatest expansion in the expensive sectors of education underline the need for improving the efficiency of the educational system and increasing its productivity: otherwise, the strain on the finances of the community would be very severe. Here, however, I would attempt to strike a slightly optimistic note. If, by the end of 1971, this country could return to economic sanity, reduce its annual rate of inflation and set a course towards achieving and maintaining an annual growth rate of 4% we might once again be on our way towards full employment and by the end of the century would have doubled our GNP in real terms. There would be obvious limitations to expenditure on consumption goods and services even in an affluent society from which it follows that more resources would be available for education.

What Mr. Hyland has to say about equality of opportunity and the lack of socio-economic participation in education is timely and raises other very important policy issues, including the method of financing post-primary and higher education. I agree with what he had to say about the limited use of social rates of return in connection with education expenditure.

In conclusion I hope that Mr. Hyland's paper will be the first instalment of a prolonged discussion of a most important subject.

Mrs. M. Nevin (Communicated after meeting): I wish to join in the thanks to Mr. Hyland for a magnificent paper. He has shown great insight into the problems of educational research.

Mr. Hyland has drawn attention to the high drop-out rate of children attending primary schools in the inner areas of our cities. It would seem that city schools are being left increasingly with children from poor.

culturally-deprived homes. Undoubtedly the physical environment in which these children live has much to do with early leaving. Poor housing and absence of recreational facilities have a depressing effect on school attainment and lack of school progress is bound to make the child dispirited, ready to drop out at the earliest possible moment. Increased expenditure on housing and recreational facilities could in the long run pay dividends in the educational field. This is not to say that no improvement can be expected until the housing situation has been remedied. Children whose home environment lacks comfort and stimulation have great need for efficient and dedicated teaching and it is encouraging to learn from a survey carried out in Washington D.C. how much dedicated teaching can contribute to redressing the disadvantages of a poor background. The survey found that several of the Washington public schools, serving some of the most deprived neighbourhoods on the entire east coast of the United States, succeeded in raising the class performance of their pupils to national levels.

Even when the transition between primary and post-primary school has been made another hurdle, the restless period of adolescence, has to be crossed. Many boys and girls find schoolwork hard, even unpleasant, and when they come to the difficult years of adolescence they become restless and are eager to leave school and get a job. In their own words "anything is better than staying at school". They fail to see the relevance of the school curriculum to their plans. If they belong to one of the lower social groups they are less likely to be subjected to determined adult pressures to stay on at school than are boys from upper social groups. While most parents, irrespective of social group, agree on the value of education, middle-class parents are more determined to see that their children complete post-primary education. Failure to do so probably would mean downward mobility, at least in the case of boys. Furthermore, middle-class parents can arrange to have special tuition given, when necessary, to raise the school performance of their children and so guarantee success in Leaving Certificate and possible entrance to university. Incidentally, the situation whereby honours in Leaving Certificate may be accumulated by sitting the examination more than once favours the boy or girl whose parents can afford an extra year or two at school.

I agree with Mr. Hyland that the demand for "second chance" education is likely to rise. The provision of second chance education is a national problem and should be tackled as such. Ideally, there should be as many ways as possible for young people who left formal education at an early age to return to their studies again and make up the losses of earlier years. The simple expansion of existing institutions will not solve the problem.

Dr. Geary (Communicated after meeting): As to specific points in the paper, the surprising fact that Ireland has so high a percentage (64.6) of school enrolments in relation to active population is an aspect of our

fantastically high dependency ratio, almost our gravest social problem. These ratios are high because the denominator, the active population, is so low, in turn due to emigration.

Presumably the tables which were circulated giving forecasts for 1969/70 to 1978/79 were calculated using the matrix formula, via the input-output type of matrix also circulated. But these must have embodied assumptions about the extension of post-primary education. What were these? A statistician must aver that he would have preferred a paper on the statistics rather than the paper he heard redolent, as it was, with speculations about the future of education in Ireland.

I surmise that Mr. Hyland conceives his task to be to make forecasts of the output or stock levels of all kinds of education. Such figures are urgently required for teacher training, expenditure on school buildings, equipment etc., for such preparation must precede the advent of pupils.

I am sceptical about the possibility of linking education courses to job requirements ten or twenty years hence. In its haphazard way, with no planning at all, this equation worked out fairly well in the past. One difficulty is emigration, as the lecturer recognises. In future "the Irish habit of going away" (a quotation from the 9th century manuscript) is likely to spread, the flow being both ways in every country.

Mr. Hyland, as a statistician-forecaster wants to know what is likely to happen administratively and otherwise (including changes in the public attitude towards education) during the coming years and I am sure that his deep philosophizing is based on this consideration. He aspires to make what Ragnar Frisch termed "onlooker forecasts" as distinct from planning forecasts. I think the latter are much more practical for the middle-term, say up to 15 years ahead. These are theoretical exercises, depending on one's assumptions. In relation to costs, future GNP, priorities, these exercises will help the people to make up its collective mind as to what it wants. At present there is no philosophy of education in Ireland, despite the vast welter of discussion. For that matter, we have no idea of what kind of citizens we want to produce, except a vague idea that they should be materially richer in the mass than they are despite the fact of spreading skepticism about the truth of the equation $\text{wealth} = \text{happiness}$. It is possibly true enough as relating to the very poor, yet while aggregate wealth is increasing the gap is widening between rich and poor.

Mr. Hyland's paper is strongly oriented towards utility. (As he read, I found myself wondering what John Henry Newman would have thought of it). In it, there is no mention at all of our cultural needs. Yet culture is the end-product of the civilised life, work a means to that end. We will be much nearer to the ideal of equality of opportunity when education pays proper attention to our cultural needs which are certain to increase with increasing leisure. Culture can bring the labourer and the university professor closer in status as civilised beings.

But as to equality of opportunity in the narrow sense, one recalls Monica Nevin's finding that 2 per cent. of the children of the artisan classes reached the university compared with something like 20 per cent. (as I recall it) for the white collar class. And I recall my (and J. G. Hughes') finding that every year something like 2,000 boys start work as labourers, few to leave these occupations except when they are too old and tired to do manual work. Each year there are geniuses amongst these 2,000—if they only had a chance to show it. I am firmly convinced that there can be no pretention to equality of opportunity in the formal sense until poor students are paid a weekly wage, though I don't know how this is to be done on our present level of GNP, taxation and, again, our dependency ratio.

Much of the discussion about education turns on the future demand for certain skills. What about the demand for the unskilled who may perhaps be broadly equated to the uneducated. There has been much talk of automation, yet recent censuses in Ireland show but a small decline in the numbers in the great army of unskilled. This situation seems likely to continue. If education spreads, where are we to produce enough manual labourers? Shall we all have to do our stint as labourers for a month each year; it might be good for us — as keeping us in touch with reality? Or is the market mechanism to ordain that wages of labourers, with scarcity, will rise to the point of attracting the required numbers, making no education an asset, so that university professors and higher civil servants *must* do their labouring stint to make a living? Must educators, to protect the educated class, ensure that there is a large fall-out from the primary level? Yes, indeed, we want a philosophy of education at the terrestrial level.

In these comments I may seem to have wandered far from any statistical base. But so, commendably, has Mr. Hyland. He will agree with me that it is part of the discipline of figuring that we must know what we are talking about.

I am afraid I must discourage the lecturer in his idea that useful statistical material can be derived by linking individuals at successive censuses. In the past I have tried it on a number of occasions, at the family level, which should be easier than at the individual level, but found identification almost impossible. During the past few years I have been toying with the following idea and I would like to know what Mr. Hyland thinks of it. Select two samples (as random as possible) of, say, 2,000 each, of Irish born persons aged 40 at present (i) living in Ireland (ii) living outside Ireland and ascertain every single detail about their careers from age 6. I have not worked out how the data would be dealt with statistically but I am convinced that we would learn a great deal, guide us as to future policy. As regards education, we would find out the return on capital expenditure on education (and practically all expenditure on education has this character), and much more besides.

I had hoped that Mr. Hyland would have a "go" on my paper on education statistics in Vol. 1, No. 1, of the *Economic and Social Review*.

This was an elaborate attempt to use single equation regression analysis to establish relations between educational and other entities, using existing annual educational statistics during the post-war period. Truth to say, it was not very successful as an educational document; I would very much like such an expert in these statistics as the lecturer to tell me where I went astray. I would not have published at all if the exercise did not result in some useful results, but pertaining to regression, not education. We must try to use this existing, and very good, corpus of statistics to the full for analysis. To describe them as "by-products of administration" is not to decry them as statistics. Quite the contrary, in fact, because they are presumably used for administration and, as a general principle, it is good that figures should be used (a term which includes its negative, misused).

Mr. Hyland (in a written reply) stated in answer to Dr. Geary's query on the assumptions made with regard to the extension of post-primary education that the broad policy assumption was that places would be made available as required by the demand for places at current levels of support and that money would be available to finance the current and capital expenditure involved.

He adhered to his opinion that no systematic survey of the possibilities of linking data at successive censuses of the type he had in mind had been done and felt it would be worth doing. He felt that this investigation, if successful, would provide information complementary to the survey Dr. Geary had in mind which was a special application of vintage analysis in depth.

As regards Dr. Geary's paper in Vol. 1, No. 1, of *Economic and Social Reviews* he felt that one could question the procedure used in going straight from births to enrolments without going through the intermediate stage of formalizing the stock figures for numbers of young persons by age in the population. Data on teachers could not be expected to be too closely related to data on pupils because of the policy decisions which could affect the relationship both in the short and long terms.