

SOCIAL MOBILITY THROUGH SCIENCE EDUCATION: THE FATE OF A COHORT OF SCIENCE STUDENTS

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Education has long been considered as a principal instrument of social change. The role of education in social stratification systems was first spelled out by Sorokin (1927). He saw the school to be a major channel of upward mobility and emphasised the extent to which the school served as a mechanism of social testing, selection and distribution of individuals within different social strata, thus determining the properties of different social classes.¹

As Husen (1974) pointed out the hopes for education as a "Great Equaliser" has been high both in capitalist and socialist economies.

Improved education has been conceived to be a spearhead towards the future and to raise the level of employability of the poor and hitherto disadvantaged and thereby enhance their life-chances.²

Tumin and Feldman (1961) considered education as the main dissolver of barriers to social mobility. 'Education opens up the class structure and keeps it fluid, permitting more circulation through class positions than would otherwise be possible'.³ From the point of view of individuals, the great demand for education was triggered as the masses began to perceive education as the catalyst for social mobility, as the means by which they or their children could escape from hard, unremitting toil on the land (Comitas, 1972). Education is regarded as a potent, democratising element, that the more people there are educated, the more people there are who share a common experience (Thompson and Fogel, 1976). Moreover, the egalitarian effect of higher education is supposed to extend to the material well-being of the individuals i.e. to a more equitable redistribution of incomes in the society.

The above view of education as an instrument of social mobility was buttressed by some research evidence. Both Glass (1954) and Praderie (1966) found clear evidence of a meritocratic effect on son's social status in Britain and France. Even though fathers' occupation had also influenced it, so had sons' educational attainment. Blau and Duncan (1967) found meritocratic effect to be much more important than the social heritage effect

1. P. A. Sorokin, *Social mobility*, New York, Harper Bros. 1927.

2. Torsten Husen, *Talent, equality and meritocracy*, The Hague, Nijhoff, 1974, p. 7.

3. Melvin Tumin and Arnold Feldman, *Social class and social change in Puerto Rico*, Princeton, Princeton University Press, 1961, p.7.

in the context of the American population of the early 1960s. Their findings indicated that the meritocratic effect was about 20 times more powerful than the social heritage effect. Perucci (1961) and Perucci and Perucci (1970) concluded that although a person's social worth has affected his success, a person's achievements were more influential than his social origins in attaining success even under the most rigid achievement models of mobility.

Other research, however, showed that although there are individual successes to record in particular cultures and situations, education was not very effective as a means of social restructuring. For example, Anderson (1961), Wisconsin studies,⁴ Carlsson (1969), Solari (1964), Dore (1967), Finlay et al (1968), Hommes and Trivedi (1971), Zschock et al (1974) and Currie (1977) show how both in the developed countries and the developing countries democratisation of access to education (where it was achieved) was no proof at all of greater social mobility or reduction of social inequality.

Nan and Yauger (1975) offer a possible explanation of this situation. They suggest that as development proceeds, an achievement suppression phenomenon occurs. In the least developed areas, because of limited access to education, the direct influence of educational attainment on subsequent occupational status is strong; but as development continues, opportunities for schooling substantially increase while occupational outlets remain very limited. At this intermediate level, the direct influence of educational attainment on status is suppressed by the influence of antecedent social status.

Antecedent social status exerts an influence on occupational status in two ways. Firstly, the educational system itself transmits much of the status origins onto a broader range of schooling outcomes.⁵ As Bourdieu and

4. William H. Sewell and Vimal P. Shah, 'Socio-economic status, intelligence and the attainment of education'. *Sociology of Education*, 40, 1967, pp. 1-23; William H. Sewell and Vimal P. Shah, 'Social class, parental encouragement and educational aspirations'. *American Journal of Sociology*, 73, 1968, pp. 559-571; William H. Sewell, Archibald O. Haller and George W. Ohlendorf, 'The education and the early status attainment process: replication and revision', *American Sociological Review*, 35, December, 1971, pp. 114-127; William H. Sewell, A.O. Haller and A. Portes, 'The educational and early attainment process'. *American Sociological Review*, 34, February, 1969, pp. 82-91; Karl L. Alexander, Bruce K. Eckland and Larry I. Griffin, 'The Wisconsin model of socio-economic achievement: a replication'. *American Journal of Sociology*, 81, September 1975, pp. 324-341.
 5. B. Heys, 'Social selection and stratification in schools'. *American Journal of Sociology* 79, May 1974, pp. 1434-51; Karl L. Alexander and Bruce K. Eckland, 'School experience and status achievement'. In S. E. Dragastin and Glen H. Elder (Eds.) *Adolescence in the life cycles psychological change and social context*, Washington D. C. Hemisphere, 1975, pp. 171-21; J.S. Rosenbaum, 'The stratification of socialisation processes'. *American Sociological Review*, 4 February 1975, pp. 48-54; Karl L. Alexander and Edward L. McDill - Selection and allocation within schools. some causes and consequences of curriculum placement. *American Sociological Review*, 41, December, 1976, pp. 963-8; R. M. Hauser, W. H. Sewell and D., Alwin, *High School effects on achievement in American Society* New York, Academic press, 1976, pp 39-341; Karl L. Alexander, Marthe L. Cook and Edward L. McDill, 'Curriculum tracking and educational stratifications; some further evidence'. *American Sociological Review*, 43, February 1978, pp. 47-66.
- These studies focussing on curriculum differentiation examine how tract membership provides access to various educational resources and promotes or retards achievement.

Passeron (1977) point out the lower a student's social origin, the more his access to higher education has to be paid for by a *restriction in choice* even to the extent of the more or less compulsory *relegation* of the least favoured categories into Arts or Science.⁶ As Young (1971) viewed it knowledge was stratified and this stratification reflected the power structure of the society, in terms of differential access to high status areas of the school curriculum for different groups in the society. Husen and Boalt (1976), Boerner (1977), Kelsall et al (1972), Kelley (1976), Albornoz (1968), Dhar et al (1976) and Rao (1976) draw attention to this relationship between socio-economic background and course selection in their research. Secondly, not only the pre-education step, i.e. the kind and length of schooling but also the post educational step, i.e. the later occupation, is determined by the influence of social class.

It was this growing disillusion regarding the inefficiency of education to bring about the desired outcomes that compelled Bourdieu (1974) to make the following indictment.

It is probably cultural inertia which still makes us see education in terms of the ideology of the school as a liberating force and as a means of increasing social mobility even when the indications tend to be that it is in fact one of the most effective means of perpetuating the existing social patterns as it both provides an apparent justification for social inequalities and recognition to the cultural heritage, i.e. to a social gift treated as natural one.⁷

Education and the Socio-economic Structure of Sri Lanka

The framework of the modern system of education in Sri Lanka was largely developed during the British colonial period from 1802 to 1948. The dual control of schools, an unequal system of schools based on the language used as the medium of instruction and a predominantly academic curriculum all made their impact on Sri Lankan society until well after independence.

Some of the significant steps in educational development were taken in 1945, three years prior to the granting of independence. Education was provided free from kindergarten to the university and the medium of instruction in the primary school was changed to the mother tongue. The number of central schools (*Madhya Maha Vidyalayas*) which were opened to provide an English education at secondary level for the disadvantaged rural child had increased to 54 by 1947. As a result the school-going population increased from 775, 203 in 1942 to 1,025, 836 in 1947. The percentage of the 5-14

6. Pierre Bourdieu and Jean-Claude Passeron, *Reproduction in education, society and culture*, London, Stage Publishers, 1977.

7. Pierre Bourdieu 'The school as a conservative force in scholastic and cultural inequalities'. In John Eggleston (Ed.) *Contemporary research in the sociology of education*, London, Methuen, 1974, p. 32.

age range in schools in 1947 was 57.6⁸ An attempt to rectify the over-emphasis on a literary curriculum to establish a tripartite system of schools as in England, however, failed.

The social, cultural and political forces that gained momentum during the pre-1956 era had their repercussions in the field of education, too. The official Language Act made Sinhala, the language of the majority ethnic group, the official language of the country. This paved way for the change in the medium of instruction at higher levels of education from English to Swabhasha, the local languages. Demand for equality of opportunity by non-Christian religious groups led to the Assisted Schools and Training Colleges Acts, which brought the large majority of the denominational schools under the control of the state.

The cumulative effect of the above measures was an over-whelming quantitative expansion of opportunity at all levels of education. Thus by 1963 the percentage of the 5—14 age group in schools had risen to 75.1 and of the 15—19 age group to 36.1.

This expansion of educational facilities widened the access of the lower socio-economic classes to education considerably. The central schools had effectively carried out their mission of 'bringing secondary education to the very doors of the poor but deserving pupils'. The impact that the change in the medium of instruction had for quantitative expansion of education is illustrated by the claim of the Director of Education in 1958 that the number of pupils in the HSC classes had risen by 70 per cent.

Thus in 1950 Strauss in his study of university students stated that the vast majority of the student population came from families in the upper socio-economic categories, i.e. the professional, managerial and enterpreneurial classes. But Jayasooriya (1965) found that with the expansion of educational opportunities, the social base of those entering higher education had begun to broaden especially after the Swabasha intake of the early sixties. He noted that a large percentage of university students, nearly 2/5 were in receipt of financial assistance compared with 1/2 to 1/3 in the 1950s. Gunawardena (1974) found this trend being strengthened in the following decade and that this percentage had increased up to 43.7 in 1970.

Yet this broadening did not ensure that all recipients of a higher education were reaping the socio-economic rewards expected from education. In the early stages of educational expansion education proved to be potent in opening up avenues of upward social mobility and as a dissolver of barriers of social origin. Lop-sided expansion of Arts education soon tended to alter

8. *Report of the special committee on the education*, Govt. of Ceylon (Sri Lanka), SP XXIV of 1943, Colombo, Govt Press, 1943, p. 11.

its efficacy. Thus Gunawardena (1980) found that although a considerable amount of social mobility appeared to have resulted due to the receipt of a higher education by the Arts graduates in her sample, that their socio-economic status (present) was directly related to their fathers' socio-economic background. The fact that the percentage of students following Science courses at all levels is low,⁹ on the other hand, proved effective in safeguarding the economic and the social returns that accrued to the recipients of a Science education. This perception of Science education led to the privileged strata in society in focusing their attention on the Science-oriented fields of study which held out the greatest rewards (employment, prestige and income).

Research exploring the relationship between social origins and the choice of courses by students in Sri Lanka are almost non-existent. A few studies, however, have touched upon the relationship between these two variables in the case of Sri Lankan university students. Thus Jayasooriya (1963), inquiring into University Students' attitudes found a large concentration of Arts students, well over 2/3 from a markedly rural and working class background. The upper and middle classes were poorly represented in the Arts sample, but were more evident in the samples drawn from the Peradeniya University's Medical and Science Faculties. Interestingly, however, the lower middle class seemed to be fairly well represented in both these faculties.

Uswatte-aratchchi (1974) found that the students gaining entry to Faculties other than the Humanities and Social Sciences Faculties had fathers in higher paid and more prestigious occupations. The concentration was heaviest among the students admitted to the Faculty of Medicine where 65 per cent of students had fathers in the prestigious occupations. The corresponding percentages were 48 per cent in Science, 47 in Engineering, 45 in Agriculture and Veterinary science and only 07 in the Faculties of Humanities and Social Sciences.

Gunawardena's (1974) study showed that the increase of student drawing financial assistance was a preponderant feature of the Arts Faculties more than of Medical or Engineering Faculties. It was found that while 72.4 per cent and 63.9 per cent of Arts students at Vidyalkara and Peradeniya Universities were receiving financial assistance, in Colombo, the percentages were respectively 3.2 for Medicine and 8.9 for Natural Science; The percentages for Agriculture and Veterinary Science was 12.6, and for Engineering 1.1. In 1976, 42.4 per cent men and 34.9 per cent women in Arts-based Faculties were from rural homes and only 11.2 per cent men and 17.1 per cent women were from professional families. In contrast 52.9 per cent of the men students and 65.5 per cent of the women students admitted to Science-based courses

9. In 1971 at Grades XI and XII only 92, 151 students were enrolled in Science as against 224, 236 in Arts and 39, 441 in Commerce. By 1981 this disparity had reduced with 113, 21 students enrolled in Arts and Commerce and 74, 749 in Science

were from professional families and only 10.2 men and 5.8 per cent women were from an agrarian background (Jayaweera, 1979). A similar study on a cohort of Arts graduates (Gunawardena, 1980) revealed that the overwhelming majority of the Arts graduates tended to come from a lower socio-economic background, and that the type of education they received was closely linked with their socio-economic background.

The Significance of the Present Study and its Methodology

In view of the foregoing evidence, we felt it would be a productive endeavour to explore to what extent the general belief that Science education is effective in providing social mobility for its recipients is valid in Sri Lanka. As no such study has been undertaken even on the role of education as an agent of social mobility in this country we felt this to be a fruitful area of research which could be extended later.

The present study would examine

- (a) the extent to which lower socio-economic groups in Sri Lanka have access to Science education at secondary level ;
- (b) the relationship, between the variable of academic achievement and the secondary school attended on the one hand, and socio-economic background on the other ; and
- (c) the relationship between present socio-economic status and antecedent socio-economic background, and thereby the extent of social mobility that has taken place.

The sample for the survey consists of a group of students who had sat for the G.C.E. (O.L.) Examination in 1968. It was felt that at least ten years after secondary schooling (the survey was carried out in 1978) was a sufficient period of time for these individuals to have stabilised their occupational careerer. Although initially the plan was to survey 200 students from four selected schools, visits to these schools revealed that some of these schools had very few students offering Science for the G.C.E.(O.L.) Examination and therefore the sample of schools was expanded upto eight. These were two singlesexed, urban prestigious schools - Visakha Vidyalaya, Colombo and Royal College, Colombo ; two suburban schools primarily catering to the middle class, Ananda Sastralaya, Kotte and Samudra Devi Balika Vidyalaya, Nugegoda; two *Madhya Maha Vidyalayas*, Dehiwala and Veyangoda; and two deprived schools, one urban- St. Matthew's College, Dematagoda, an one rural, Pasyala Maha Vidyalaya, Pasyala.

The instrument used for data collection was a mail questionnaire. The questionnaire with an enclosed stamped envelope was mailed to 400 individuals who had studied at the above-mentioned schools and had sat for the G.C.E.

(O.L.) Examination in 1968. Of these 94 were returned; one was reported to be out of the island, one indicated reluctance to participate in the survey, and the other was reported dead. Eighty-one had responded sending completed questionnaires. As a reminder postcards were sent to the remaining 225 addresses. This time another 45 responded and 13 postcards were returned. Again, as a second reminder, a questionnaire enclosing a stamped, addressed envelope was sent to the remaining 167 individuals; as a result 41 more questionnaires were returned completed, raising the number of respondents to 167. This represented a response rate of 41.8 per cent which though by no means high is considered as adequate due to the fact that the respondents had been contacted by means of a mail questionnaire and that too, ten years after they had left the institution from which their addresses had been obtained.

The questionnaire attempted to gather information relating to the socio-economic background of the respondents, their home environment as it was related to their academic work, their educational career including academic achievement at the G.C.E. (O.L.) Examination and further examinations, their occupational status and related factors such as the period of unemployment, salary from occupation, its prestige and consequently their socio-economic status.

The data gathered by the questionnaires were analysed by means of elementary statistical procedures such as frequency distributions and cross-tabulations. The relationship between a few major variables like the respondent's present socio-economic status, his educational achievement and father's socio-economic status were examined by means of Pearson's Correlation Coefficients.

There are a few limitations of the methodology employed here.

- (1) The schools which served as the base for the selection of the respondents were all from the Colombo District. The fact that Colombo District is the most populous, urbanised and developed district in respect of educational facilities does not allow for any generalisations to be made on the conclusions derived from this research. As far as the selection of individual schools are concerned also this limitation applies, especially because the rural schools are under-represented. Both these limitations stemmed primarily from financial constraints.
- (2) The data gathered on the basis of a mail questionnaire poses the basic question of non-respondents - who are they? what are their characteristics? Why did they not respond? In accordance with the general belief that the literate and in this particular study, those who were successful in achieving a good education and of securing a good job were more likely to respond, this sample can be regarded as a biased sample.

- (3) The questionnaire is pointed out as the ideal instrument for gathering data at a nominal expense both in money and effort terms. It also lends better to statistical analyses. Yet it ignores in-depth information which could have been culled from interviews and observations. As Denzin (1978) pointed out,

If each method leads to different features of empirical reality, then no single method can ever capture all the relevant features of that reality. Consequently, sociologists must learn to employ multiple methods in analysis of the same empirical events.¹⁰

Our finances, however, unfortunately did not warrant the use of multiple methods and we had to be content with the use of the questionnaire alone.

Analysis of data

One-hundred and sixty seven individuals had responded out of a total of 400 to whom the questionnaire had been sent. By sex they were more or less equally divided, 50.9 per cent being male and 49.1 per cent being female. According to their home residence, only 39.5 per cent were rural residents, more than 3/5 being urban residents. The categorisation was done on the basis of the type of the local government council administering the area, with the village council area being considered as rural and the others administered by municipal, urban and town councils as urban. The large majority of the respondents were between 22 and 28 years of age; while 46.5 per cent were aged between 22 to 25, another 44.3 per cent were aged between 26 to 28.

In classifying the respondents according to socio-economic background, the scale used by Gunawardena (1980) which incorporated the three variables of the respondent's father's level of education, total monthly income and the prestige ranking of the father's occupation,¹¹ was utilised. Table 1.1 shows the distribution of the respondents according to the educational level of their fathers.

The second component of the socio-economic status is the occupational prestige of the fathers. Its distribution is set out in Table 1.2. It is note worthy that while only 37.2 per cent of the fathers fall into the two upper groups on the level of education, when classified according to the occupational prestige, the percentage in the two higher groups has risen to 47.9 per cent.

10. Norman K. Denzin, *The Research Act*, New York, McGraw-Hill 1978, p. 15.

11. F. Sushila Niles, *School achievement in Sri Lanka : Home School and Attitudinal influences*, Unpublished Ph. D. Thesis, 1979, La Trobe University, Melbourne.

Classification according to fathers' total monthly income (Table 1.3) is more akin to that according to educational level. Thus 39.0 per cent of the fathers fall into the two higher income groups.

The above three variables of father's education, his occupational prestige and total monthly income were combined to compute a composite socio-economic index. The resulting groups were recoded to form four broad groups. Group I representing the upper group; Group II, the upper middle group; Group III, the lower middle group, and Group IV the lower group. Table 2.1 shows the classification of the respondents according to their fathers' socio-economic status. The inter-relationship between these three components and their correlation with the composite socio-economic index are set out in Table 2.2. Table 2.2 shows that all three indicators are about equally correlated with the composite index. This reflects the uniform tendency for values on all three indicators to have a limited distribution.

The intercorrelations between the components of the socio-economic indicator are lower but are considerable averaging above 0.6 for the whole sample. All the inter-correlations are positive, showing the tendency for occupational and educational status to be related to income.

It is significant that the above tables show a concentration of our respondents in the lower middle and the lower groups, with the lower group possessing the highest percentage. This finding runs counter to the general belief that access to science education in Sri Lanka is still restricted to the privileged socio-economic groups. Our sample indicates, on the other hand, that all socio-economic groups are equally well-represented in the field of Science education. Here, however, we need to draw attention to the fact that was pointed out earlier by us—that our sample was drawn more from the urban and suburban schools than from the rural schools. Even Veyangoda *Madhya Maha Vidyalaya*, which though located in the heart of a rural environment, yet is in a locality which exemplifies a considerable amount of urbanisation. This fact coupled with the greater distribution of educational facilities in the Colombo District does not allow us to generalise this finding for the whole country.

G.C.E.(O.L.) Examination represents the first hurdle that a secondary school student aspiring for a higher education comes across. As such it is pertinent here to inquire to what extent the individuals who gain access to Science education had been successful at this initial examination and the extent of the relationship, if any, between their G.C.E. (O.L.) results and their antecedent socio-economic background (Table 3).

Table 3 reveals that the majority had qualified to proceed to the G.C.E. (O.L.) class. Yet when analysed according to socio-economic background,

the percentage in this group (those qualifying for the (A.L.) from the two lower socio-economic groups) is much less than from the two upper socio-economic groups.

It was necessary therefore, to inquire into what had caused this disparity. We decided to probe into several aspects of the home environment which are normally considered to have an effect on academic achievement. They are family size, the purchase of newspapers, number of books in the home, the availability of a separate place for studies, and the engagement in domestic chores while a student. Receipt of tuition, though a factor outside the home, is directly related to the financial ability of the parents.

Family size can be an important variable in the presence or absence of a favourable environment for studies, because the facilities for learning for each member of the family differ corresponding to the number of members. Our respondents mostly came from families which had between three to five children (52.4 per cent). Families with two or one children were mainly from the upper socio-economic group (55.6 per cent) this percentage declined to 18.5 in the lower group. No other significant variations appeared between these two groups.

A separate place for studies, the purchase of newspapers, the number of books in the home and the claims made by domestic chores on the respondent's time while they were students appeared to be directly related to their father's socio-economic status.

Considered cumulatively, the data presented a picture of home environments which were academically stimulating for respondents from the upper socio-economic groups unlike for their counterparts from the lower end of the scale. Yet the current propensity (which existed even ten years ago) of attending tuition classes, especially for Science subjects, could either aggravate or ameliorate these differences in the home environment. A child from a lower socio-economic background attending a tuition class might as a result of this extra coaching compensate for his disadvantaged home background. Another child, who as a result of deprived economic conditions, does not attend such classes would not have any such support coming to him.

Our study revealed that contrary to general belief higher percentages from lower socio-economic groups had attended tuition classes. This percentage varied from 22.2 per cent in the upper group to 76.6 in the lower middle group and 92.1 in the lower group. Nor was there a correlation between the receipt of tuition and G.C.E.(O.L.) results. Thus while 84.4 per cent of the respondents who had passed in less than 5 subjects at the G.C.E. (O.L.) Examination had received tuition the percentage which had become eligible to proceed to the A.L. class and which had also received tuition was much less,

only 59.6 per cent. These data indicated a situation where receipt of tuition is neither dependent on socio-economic background nor results in better preparation for the examination. One cannot ignore though that the concept of tuition itself and the quality of teaching in a tuition class may vary from place to place.

The home environment thus appears to be related to the examination performance of our group of respondents even though we cannot infer its direct impact. But not so the factor of tuition. This brings us to the next important variable in our survey, the school factor.

We categorised the secondary schools in our sample into three groups. (1) Group I—the prestigious schools, (2) the *Madhya Maha Vidyalayas* and the former Assisted schools, which can be expected to have a moderate level of facilities and (3) Group III—the deprived schools. Twenty-two per cent of our respondents had come from Group I schools, 51.5 per cent from Group II schools and the rest, 25.7 per cent from deprived schools.

To what extent did the secondary school attended by a person affect his or her academic achievement? A cross-tabulation of the type of secondary school attended by the respondents by their G.C.E. (O.L.) results showed a strong correlation between these two variables (Table 5). Here we see that the percentage qualifying for Advanced Level is 83.8 in prestigious schools and that this had fallen to 34.9 in the case of the deprived schools. If so one may argue that the examination results of a person reflect not only the influence of his socio-economic background but also his schooling.

A close relationship appeared to exist between the father's socio-economic status and the secondary school attended by the respondents. It is noteworthy that 100 per cent of the respondents from the upper socio-economic group had attended prestigious schools. *Madhya Maha Vidyalayas* and the assisted schools, on the other hand, appear to act as a bulwark against rigid class bias, drawing as they do large numbers of respondents from both the middle group and the lower group. It is the presence of these schools, thus, that has mainly contributed to the democratisation of science education at secondary level.

After the initial certification at the secondary level, only a minority proceeded to undertake further education; 63.5 per cent of the total sample had either stopped after obtaining or due to failure to obtain the G.C.E.(O.L.) certificate. The minority which proceeded further, had obtained degrees in Medicine, Engineering, Science or Arts, or had qualified in technical, accountancy or teacher training; 4.8 per cent had obtained non-graduate diplomas (Table 6).

Table 6 shows the classification of the post-secondary qualifications of the respondents by fathers' socio-economic status. The disparities most striking here are in those who had not proceeded beyond secondary education. Thus while only 11.1 per cent of the upper group respondents fell into this category, the percentage increased inversely from 4.9 in the upper middle group and 71.4 in the lower middle group to 80.0 in the lower group. The percentages going in for Medicine and Engineering from the two lower socio-economic groups were also much lower than the corresponding percentages from the two upper groups, i.e. 2.0 per cent (lower middle) and 1.5 per cent (lower) respectively.

Having completed their education at various levels, the respondents in our sample were employed in various jobs. The highest proportion though fell into the unemployed category. Fifty-three respondents or 31.7 per cent of the total sample were still unemployed ten years after they had sat for the G.C.E. (O.L.) Examination. The others were engaged in diverse jobs ranging from security officers, fitters, uncertificated teachers, tourist drivers, artists, cultivation officers, bus conductors, businessmen, waiters, policemen, to doctor, engineers, advocates and lecturers (see Table 7 for the frequency distributions of respondents by occupation).

The above range of occupations reveals the different levels which our respondents, who had all ventured on a Science education, had attained. When classified according to Niles' occupational prestige scale, the percentages in the four groups were 5.4, 43.1, 13.8 and 37.7 respectively. Compared with the prestige of their fathers' occupations, these percentages showed a decline in the three upper groups. According to the same prestige scale, the percentages for the fathers' occupations were 7, 2, 40.7, 26.3 and 25.7 respectively. It was true that our respondents were only at the commencement of their careers and that no account had been taken of the age gap between the two generations.

The socio-economic status of the respondents was also computed in the same manner as was done for their fathers, incorporating their educational level, level of occupational prestige and income. A cross-tabulation of their present socio-economic status with fathers' socio-economic status served as a rough estimate of the extent of social mobility they had achieved (Table 8).

Table 8 reveals that the 1.8 per cent of the respondents who had attained to Group I in socio-economic status had come solely from the upper-middle group. Considering the age gap between the two generations and the number of years before our respondents to improve in their occupations and consequently their socio-economic status, the 11.4 per cent in Group II can also be considered as prospective respondents who are likely to rise up to Group I in the near future. It is significant that this percentage has declined steadily with the respondents' fathers' socio-economic status, i.e. 88.9, 13.6, 6.1 and

3.1 respectively. Similarly, the downward social mobility that is apparent also increases as one goes down the socio-economic scale. Thus 11.1 per cent of the respondents who have fathers in socio-economic group I are at present in socio-economic group III. Eighteen per cent of those whose fathers belong to upper-middle group are now in Group IV, while the corresponding percentages for those with fathers in lower-middle group and lower group are much higher, 46.9 and 64.6.

What are the percentages that have achieved social mobility? They represent small minorities in each socio-economic group. Thus 6.8 per cent from the upper-middle group have risen up to Group I, 6.1 per cent in lower-middle group to Group II, 3.1 per cent in lower group to Group II and another 32.2 per cent in the same group to Group III. On the whole, the extent of social mobility achieved by our respondents is very low, only 16.2 per cent of the whole sample having achieved some amount of mobility. The percentage which had experienced downward mobility in spite of their science education, on the other hand, was greater, 40.1.

Conclusions

Our study revealed that within the restrictions placed by our limited sample of district, as well as schools, that a considerable amount of access to science education appears to exist for students from all socio-economic groups. Yet this access is not sufficient to warrant the completion of academic examinations for the majority of the respondents from the lower socio-economic groups.

This situation, can be the outcome of varying factors. Our data revealed that the students from the lower socio-economic groups in general, had been exposed to less stimulating home environments than those from upper socio-economic groups. These socio-economic disparities appeared to be accentuated to a certain extent by the type of secondary school attended by these respondents. Although the schools in the second category, *Madhya Maha Vidyalayas*, and the Assisted schools, seem to have exercised an ameliorating influence by catering to large proportions of respondents from all socio-economic groups (excluding the upper group) the disadvantaged lower group yet had 40 per cent of its respondents attending deprived schools. Consequently, the cumulative result of both home and school factors was that at the initial examination they faced, their performance varied according to their socio-economic background.

The influence of antecedent socio-economic status did not cease at the secondary school certificate level. For the respondents from lower socio-economic groups, their antecedent socio-economic background seemed to have followed them through their courses of post-secondary education (or

their lack of them), to their employment and present socio-economic status. Pearson correlation coefficients were obtained to explore the relationship among some of the more important variables (Table 9).

Table 9 also brings out in summary form the above data. Respondents' socio-economic status is positively and highly correlated with his occupational prestige. From among the three variables of fathers' socio-economic status, highest educational qualification, and the secondary school attended, the most highly correlated with the respondents' socio-economic status is his highest educational qualification. This speaks eloquently for the existence of a meritocratic society, where those qualified attain the highest positions. Yet what is also significant is that just as highest educational qualification, the secondary school attended and fathers' socio-economic status are also correlated positively with the respondents' socio-economic status, especially the latter factor. Even more noteworthy is the moderately high positive correlation between the highest educational qualifications and fathers' socio-economic status. Thus even though the ultimate socio-economic status of a respondent is mostly dependent on his highest educational qualifications, the latter itself is influenced (if not determined) by his antecedent socio-economic status.

It is significant that the percentage which had experienced downward mobility is greater than that experiencing upward mobility. It is true that the majority 63.5 per cent of the sample had not proceeded beyond G.C.E. (O.L.). Yet 54.2 per cent had qualified to proceed to the G.C.E. (A.L.) and another 1.8 per cent had passed the G.C.E. (O.L.).

We mentioned the limitations that are inherent in our study: the bias in the sample and drawbacks in the methodology employed. These restrict the generalizability of our findings. Yet to us this study is useful in revealing that in present day Sri Lanka, not even Science education is potent in generating social mobility to its recipients. Science education is not the marketable product that it was a decade or so ago; the demand for science is much less in our stagnant economy than is generally believed to be. The prestigious position that Science still occupies in the school curriculum is more due to the fact that places in Science education are still less than in other areas, even if it is no longer a scarce commodity. What most concerns us, however, is the persisting influence that socio-economic background appears to exercise on the recipients of science education—that access merely does not amount to an equalisation of opportunities in actual terms.

The limitations of our own research indicate to us the directions for further research in this area. Only nation-wide surveys or failing that, wide representative stratified sampling can improve the generalizability of the conclusions derived from this type of research. Such surveys could also explore the

extent to which ethnicity, e.g. the relatively low level of education among the Muslims, or regional characteristics, e.g. expansion of science education in Jaffna, influence the benefits gained from this type of education. We are also firmly convinced that no amount of wide coverage for questionnaire surveys can make up for a lack of in-depth information which can be obtained solely through interviews and observation. It is the interview which will elaborate on individual differences - how and why one individual falters at a lower level while another triumphantly climbs up the social ladder.

TABLE 1.1

Distribution of respondents' fathers according to level of education

<i>Group</i>	<i>Number</i>	<i>Percentage</i>
University Education ..	22	13.2
O.L. or higher ..	40	24.0
Grade 6—10 ..	71	42.5
Below ..	34	20.4
Total ..	167	100.0

TABLE 1.2

Distribution of respondents' fathers according to occupational prestige

<i>Group</i>	<i>Number</i>	<i>Percentage</i>
Group I ..	12	7.2
Group II ..	68	40.7
Group III ..	44	26.8
Group IV ..	43	25.7
Total ..	167	100.0

TABLE 1.3

Distribution of respondents' fathers according to total monthly income

<i>Category</i>	<i>Number</i>	<i>Percentage</i>
Over Rs. 1,000 ..	38	22.8
Rs. 600—Rs. 999 ..	27	16.2
Rs. 300—Rs. 599 ..	54	32.3
Less than Rs. 299 ..	48	28.7
Total ..	167	100.0

TABLE 2.1

Distribution of respondents according to fathers' socio-economic status

Group	Number	Percentage
Upper	09	5.4
Upper-Middle	44	26.3
Lower-Middle	49	29.3
Lower	65	38.9
Total	167	100.0

TABLE 2.2

Inter-correlations between fathers' education, occupation and income and the composite indicator of socio-economic status (Pearson Products-Moment Correlations)*

	Socio-economic Status	Occupation	Total Income
Fathers' Occupation.	.. 0.814 (167)	..	
Fathers' Total Income	.. 0.874 (167)	.. 0.626 (167)	..
Fathers' Education	.. 0.808 (167)	.. 0.606 (167)	.. 0.659 (167)

*All correlations are significant at the .001 level

TABLE 3

Cross tabulation of respondents' G.C.E. (O.L.) Examination results by respondents' fathers' socio-economic status

G.C.E. (O.L.) Results	Upper	Upper-Middle	Lower-Middle	Lower	Total
Passed less than 5 ..	00.0	06.8	26.5	27.7	20.4
Passed 5 ..	22.2	09.1	22.2	33.8	23.4
Passed O.L. ..	00.0	00.0	02.0	03.1	01.8
Eligible for A.L. ..	77.8	84.1	49.0	35.4	54.5
	100.0	100.0	100.0	100.0	100.0
	(9)	(44)	(49)	(65)	(167)

TABLE 4

Cross-tabulation of the school attended by G.C.E. (O.L.) Examination results of the respondents

Results	Prestigious	MMV or Assisted	Deprived	Total
Less than 5	5.4	19.8	34.9	20.5
Passed 5	10.8	25.6	30.2	23.5
Passed O.L.	0.0	03.5	0.0	01.8
Qualified A.L.	83.8	51.2	34.9	54.2
	100.0	100.0	100.0	100.0
	(32)	(86)	(43)	(166)

TABLE 5

Cross tabulations of secondary school attended by fathers' socio-economic status of the respondents

School	Upper	Upper-Middle	Lower-Middle	Lower	Total
Prestigious	100.0	45.5	14.3	1.5	22.3
MMV or Assisted	0.0	45.5	57.1	58.5	52.2
Deprived	0.0	6.8	28.6	40.0	25.6
	100.0	100.0	100.0	100.0	100.0
	(9)	(43)	(49)	(65)	(161)

TABLE 6

Crosstabulation of post-secondary education by fathers' socio-economic status of respondents

Post-secondary Education	Upper	Upper-Middle	Lower-Middle	Lower	Total
Medicine & Engineering	22.2	11.4	02.0	01.5	05.4
Science Degree	22.2	13.6	06.1	01.5	07.2
Non-graduate Diploma	11.1	18.2	08.2	09.2	11.4
Other Technical	0.0	0.0	06.1	03.1	03.0
Non-Science Degree	2.22	04.8	02.0	04.6	04.8
Accountancy	0.0	11.4	02.0	00.0	03.6
Teacher Training	11.1	0.0	02.0	00.0	01.2
Not Applicable	11.1	40.9	71.4	80.0	63.5
	100.0	100.0	100.0	100.0	100.0
	(9)	(44)	(49)	(65)	(167)

TABLE 7

Frequency distribution of respondents by occupation

Category	Number	Percentage
Unemployed	53	31.7
Security officer	01	0.6
Cost clerk	04	2.4
Fitter	02	1.2
Clerk	08	4.8
Engineer	01	0.6
Technician	18	10.8
Uncertified Teacher	01	0.6
DASC Physician	01	0.6
Doctor	05	3.0
Cashier	04	2.4
Postal Clerical Assistant	01	0.6
Tourist Driver	01	0.6
Trader	01	0.6
Accounts Clerk	01	0.6
Airman	05	3.0
Cultivation Officer	03	1.8
Typist	01	0.6
Artist	02	1.2
Salesperson	03	1.8
Laboratory Assistant	02	1.2
Bus Conductor	01	0.6
Businessman	02	1.2
Mechanic	04	2.4
Labourer	01	0.6
Electrician	04	2.4
Overseer	01	0.6
Booking Clerk	01	0.6
Watcher	01	0.6
Telecommunication Inspector	01	0.6
Waiter	01	0.6
Statistical Officer	05	3.0
Graduate Teacher	01	0.6
Foreman	01	0.6
Middle Management Executive	01	0.6
Price Control Inspector	01	0.6
Market Trader	01	0.6
Wharf Clerk	01	0.6
Translator	01	0.6
Trained Teacher	01	0.6
University Lecturer	01	0.6

Category	Number	Percentage
Public Health Nurse ..	01	0.6
Operator ..	01	0.6
Policeman ..	03	1.8
Supervisor ..	01	0.6
Sales Representative ..	01	0.6
Instructor ..	02	1.2
Advocate ..	01	0.6
Missing ..	08	4.8
	167	100.0

TABLE 8

Classification of respondents' present socio-economic status by their fathers' socio-economic status

Present status	Upper	Upper-Middle	Lower-Middle	Lower	Total
Group I ..	0.0	6.8	0.0	0.0	1.8
Group II ..	88.9	13.6	06.1	3.1	11.4
Group III ..	11.1	61.4	46.9	32.3	43.1
Group IV ..	0.0	18.2	46.9	64.6	43.7
	100.0	100.0	100.0	100.0	100.0
	(9)	(44)	(49)	(65)	(167)

TABLE 9

Inter-correlations between fathers' socio-economic status, highest educational qualifications, secondary schools attended and graduates' occupations (Pearson Product Moment Correlation Coefficient)*

	FSEL	HIEDQUAL	SECSCH	NROC
RSES ..	0.517	0.739	0.388	0.855
HIEDQUAL ..	0.451	—	0.412	0.519
SECSCH ..	0.526	0.412	—	—
NROC ..	0.479	0.519	0.29	—

*All correlations are significant at .001 level.

FSEL — Father's socio-economic status

RSES — Respondent's socio-economic status

HIEDQUAL — Highest educational qualifications

SECSCH — Secondary school

NROC — Respondent's occupational prestige (Niles' scale)

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