CONCLUSIONS

Chapter VIII
The present study has been designed to investigate into the nature and extent of the participation of women in two of the men-dominated professions, viz., science and engineering. One of the assumptions of the present study has been that the social mores, sex-prejudices and stereotypes against the women are very strong, and consequently women have to suffer unequal treatment and discrimination in different spheres of life. The socially and culturally conditioned patterns of behaviour and roles prescribed for women inhibit their full participation in the economic life. The early socialization practices coupled with the perceptions of sex-typed occupations, and the subtle ways of discriminations against women in education and occupation affect the entry, development, and mobility of women in modern professions. The present study endeavours to test these broad assumptions about the women's status in society in general and in modern professions in particular.

In contemporary Indian society, legally all jobs are equally open to both sexes. However, the aggregate data available about the women's participation in modern professions, more particularly, in the science and engineering professions, reveal that the equality of opportunity of the sexes is more a theoretical
proposition than a concrete reality. Therefore, the present study, through an exploration into women's participation in the science and the engineering professions, tries to unravel some of the realities of women's unequal participation in relation to men in these professions.

The study is confined to the scientists and engineers working in the three capital cities of Southern India, namely, Madras, Bangalore and Trivandrum. In all, 280 scientists and engineers have been selected as respondents. Among the scientists, there are 47 women and 41 men, and among the engineers, there are 111 women and 81 men. The actual respondents have been selected following the snow-ball sampling technique. Firstly, the women respondents were contacted and interviewed. Following their suggestions the men working in their organizations on similar job-positions were contacted and included in the study.

The data for the present study have been collected mainly through a questionnaire. Informal talks and observation at the field level have also been used to supplement the data. Secondary data available through published reports and studies are also used.

The analysis of the data and the interpretation made in the preceding chapters lead to the following broad conclusions about the unequal participation and discrimination against
Social Origin of Scientists and Engineers

The data on the socio-economic background of the respondents has been collected with the purpose of understanding the social class characteristics of scientists and engineers on the one hand, and to find out the differences in the socio-economic status of men and women, on the other. Our hypothesis in this connection has been: 'Women scientists and engineers have better socio-economic background than men scientists and engineers'. The evidence adduced in our study confirms this hypothesis.

The analysis of the data on the educational status of the parental family leads us to the following broad conclusions:

(i) Most of the scientists and engineers belong to families with 'average' or 'high' educational level among the parents. It may be said that the choice of the science and engineering subjects is closely related to the educational status of the parents, for it is the parents whose sustained moral and financial support, guidance and encouragement for a long time make it possible for one to step into these professions. (ii) Though both men and women scientists and engineers belong to the educated families, there exist significant differences between these two groups. The women scientists and engineers belong to such families where both the parents are better educated than the parents of the men respondents. It may be that the relative higher academic status of the parental family acts as a major catalyst in the subject-
choice and selection of occupations by the women. Higher the level of education of the parents, greater the chance of women entering into highly prestigious men-dominated professions.

(iii) The educational level of the mothers of women respondents is higher than that of the mothers of the men respondents. It seems that mother's higher educational status has played a considerable influence on the educational career and occupational achievement of the daughters in the next generation.

The parents of the women scientists and engineers are not only better educated, but they also have higher occupational status. Most of the fathers of the women respondents pursue white-collar salaried occupations which carry higher prestige and better income status. As against this, fathers of the men respondents belong to both salaried, and non-salaried occupations, such as agriculture, trade and commerce, etc. As regards the salaried occupations, the men respondents' fathers are in lower ranking jobs as compared to the fathers of the women respondents. In most of the cases, mothers of both men and women respondents are housewives. Among employed mothers, the mothers of women respondents are in better occupational positions as compared to the mothers of the men respondents.

Thus, women scientists and engineers come from better socio-economic background as compared to men scientists and engineers. This finding has certain implications in understanding the emerging status of women in contemporary Indian society. The partici-
pation of women in highly prestigious occupations is very much circumscribed by their class background. Inspite of openness of the educational and occupational structure in modern India, many women are finding it difficult to reach the higher echelons of the occupational hierarchy. Though the educational achievement of women is a significant factor in the achievement of better occupational status, it is not the only factor. This factor operates within the overall socio-cultural matrix. Women, who have better socio-economic background and in whose families the educational roots are deeper, are more likely to go for higher occupational positions. It may be that educationally and economically better status families provide an atmosphere where the women are not only motivated and socialized to undertake future occupational roles, but they also become prepared to take equal place along men in the highly competitive occupational fields.

Another implication of our data relates to the men-women status differences and discrimination against women. The contemporary Indian situations is that the women, inspite of their better educational attainment and relatively good family background, do not hold the same socio-economic status, professional recognition, job-placement, and work-allotment as that enjoyed by men in the similar job-positions. Our data have indicated that men, even with lesser educational attainment and relatively inferior socio-economic background, are placed at
better occupational positions compared to that of women. This may be construed as a process of subtle discrimination.

Our exploration into the social origin of women scientists and engineers is not confined only to the educational and occupational status of the parental family, but extends to the status of the spouses as well. The traditional Indian social structure transfixes the status of husband and his family to the wife. This has been another indicator of women's subservient position in our society, where the individual achievement of women has been underplayed. Even when a woman, because of her education and independent occupational status, occupies a position of eminence, autonomy, and power, she remains subservient to the male authority within her family. We also wished to see if there was status congruence. Or had any incongruity resulted due to the professional status of our women respondents?

We found that the status of the spouses of women scientists and engineers in terms of education, occupation, and income is better than that of their own. Thus, status equality in matrimonial alliances is yet not a practice commonly in vogue. Rather, superior status of men is considered to be a primary requirement in the settlement of most of the marriages. The analysis of data pertaining to the educational and occupational status of the men respondents makes this point quite clear. We have found that most of the men respondents have wives who are not engaged in any gainful employment. Even where the wives
are gainfully employed, their income status is much lower than that of their husbands. In our sample, the mean monthly income of the spouses of the women respondents has been found to be ₹1773/- as against ₹1057/- of the spouses of the men respondents. It seems that the traditional socio-cultural practices are still very dominant, and most married working women do not have equal professional status to that of their husbands.

Not only the professional and income status of the women scientists and engineers have been found, in most of the cases, lower than their husbands but the study also reveals that these women, even though occupy independent economic status, are not treated equally within their families. The dominance of male authority has been found quite apparent in all major decisions regarding control over income, expenditure, family property, etc.

**Academic Profile of the Scientists and the Engineers**

Access to science and engineering professions requires a long period of education and training. Better educational achievements may lead to better placement and career development. If women with equal or better academic qualifications have lower job-positions, or are stagnating for a long time on a particular job-position, then it may be construed as a form of latent discriminations, and as an indication of unequal participation by women in the occupational structure. Such discrimination may not originate from the organizational sources only,
it may also emanate from the sex-based socio-cultural patterns which are still dominant in our society. Therefore, we have posited a hypothesis: 'The subject-choice and selection of job-position in science and engineering professions by women are rooted more in traditional sex-typed images of subjects and job-positions than in equal competition between men and women'. Our exploration confirms this hypothesis.

The first part of the hypothesis relating to the subject-choice may be examined in the light of the evidence adduced in the present study. In our sample, though there is not much variation in the subject-choice of men and women in the field of science, it varies strongly on sex line in engineering. Men in relatively higher proportion have offered civil engineering (27.05 percent), electrical engineering (15.57 percent) and mechanical engineering (14.75 percent). On the contrary, the major concentration of women has been found in electronic engineering (25.31 percent). Thus, even when women enter into the engineering profession, they opt for such areas which are considered easy and more suitable to them. The sex-based differences in the subject-choice is further reinforced when we examine the data on the reasons for selecting science and engineering subjects. Most of the women (61.70 percent) have offered science subjects because of their deep interest in it. Of those who have offered science because it provided better occupational career, their proportion is high among men (39.20
percent) than among women (10.63 percent). This variation also exists in the case of engineering subjects. A much higher proportion of men (43.20 percent) have offered engineering subjects for better occupational prospects as against 27.92 percent women accounting for this reason. Thus, while men have clear career-objectives in pursuing academic courses, women give less emphasis on future occupational goals in selecting a particular academic course.

We found significant differences in the academic achievement of men and women pursuing science and engineering professions. At the graduate level, the mean percentage of marks secured by men is 61.69 percent while it is 62.69 percent for women. This difference becomes sharper at post-graduate level where the average marks secured by men respondents are 63.60 percent as against 65.09 percent secured by women respondents. This suggests that though, both men and women are entering into the science and engineering professions with good academic background, it is better in the case of women. This further implies that the entry of women into the male-dominated professions have been facilitated by their better academic performance. Taking into consideration that most of the women in our sample are at the lower echelons of the job-hierarchy, it may be inferred that women may not have received as fair treatment in the professions as they deserved because of their better achievement.
The occupational profile of the scientists and engineers reveals significant sex-based variations and confirms the hypothesis that; 'the selection of job-position in science and engineering professions by women is rooted more in traditional sex-typed images of jobs within these professions than in equal competition between men and women'. In our sample, barring a few women who were at very top positions, a majority of them are at the lower ebbs of the professional hierarchy. There are 83.54 percent women as against 64.47 percent men who are assistant engineers/scientific officers/lecturers. Keeping in view that the women respondents have better educational career than the men respondents, their placement at the lower cadres signifies their inferior and unequal status in the job-hierarchy. On the other hand, men with equal or lower educational qualifications have achieved higher positions in the job-hierarchy.

The inferior status of women in these professions is further substantiated by a comparative evaluation of their income and length of service vis-a-vis men. There is considerable variation in the income of men and women respondents. The mean monthly income of men respondents is Rs.1702.77 and for women it is Rs.1519.75. The lower income of women and their lower position in the occupational hierarchy becomes much more glaring when we take into account the fact that women have better academic career than men. The information about the length of service
of the respondents reveals that the men have spent a longer time in their jobs than the women. The average length of service of women respondents is 11.26 years as compared to 15.50 years of men. Thus, the shorter length of women's stay in the profession may be construed as disadvantageous and contributes to their inferior status and lower income.

We have also noted sex-based variations in the principal job-activities of the respondents. More men are engaged in supervision, planning, consultancy, and production. On the other hand, more women are engaged in designing, laboratory-work, research, sales and marketing.

The inter-occupational mobility differs along sex. More men than women have changed occupations preceding the present job. The men respondents have spent between two to four years in the previous jobs. The reasons for leaving the previous jobs have been stated as the temporary nature of the job and low salary. On the other hand, many women have left the previous jobs because workplace was far away from their home, or their husbands were transferred, or they had the maternity problems, or the atmosphere for women workers in the work-organization was not congenial. In the case of men, the monetary considerations forced them to opt for better, secured, and highly paid jobs while the women had to leave their previous jobs because of the
marital and familial obligations. The inter-occupational mobility among women is less, as the number of occupational shifts preceding the present job has been found limited among them.

The reasons for the selection of job-positions also differ between men and women. Whereas a large number of men have entered into science and engineering professions to earn their livelihood, a large number of women have entered into the job market in order to supplement the income of their families. Several women have stated such non-economic factors as the thirst for knowledge, or interest in science/engineering subjects as more important factors for job-selection. It may be said that this is so because many women accept the role of men as the primary bread earners for the family, and perceive themselves as the secondary earners.

Analysing the data about the motivating agents for job-selection, we have found that both men and women, in most of the cases, have exercised individual judgement while choosing the present job. However, the exercise of such individual initiative is more pronounced in the case of men. It seems that women are still influenced by their family and kinship ties. They mention that they were influenced by their fathers, mothers, spouses, relatives, friends and acquaintances at the time of making decisions about the job. It seems that the disadvantage of being a woman in our society has not lessened much and the
women have to take decisions within the broader societal framework.

**Job-satisfaction and Career-commitment**

The job-satisfaction and career-commitment are major dimensions in the study of any profession. The job-satisfaction as well as career-commitment are anchored in subjective as well as objective conditions. The psychological dispositions of the incumbents on the one hand, and the objective conditions of work-situation on the other, may bring variations in the job-satisfaction and career-commitment. Men-women difference is also one of the major factors which may result into differential levels of satisfaction from the job, and commitment to career. In this regard, we have put forward the hypothesis: 'The job-satisfaction and the level of career-commitment are higher among men than among women'. The present study confirms this hypothesis.

The data reveal significant sex-based variations in the level of job-satisfaction. It has been found that more men than women are fully satisfied with their working hours. Women's dissatisfaction arise from overstay in the office which hamper their activities at home, and also due to inconvenience in transportation between office and home. The dissatisfaction among women with the placement in jobs have been found quite pronounced. They have indicated that their men colleagues get
favoured job-positions in their work-organizations. They also feel that women are deprived of the job-positions where the chances of promotion, scope for exercising power and influence, opportunity to show excellence and increase productivity are greater. The women respondents are less satisfied with facilities available at work-place. The toilet facilities and seating arrangement in their work-place are unsatisfactory in the opinion of a fairly good proportion of women respondents.

Thus, it is clear that dissatisfaction with job-situation is more pronounced among the women respondents than among the men respondents. This dissatisfaction relates to two aspects of the work-situation. Firstly, some of the women are dissatisfied because equal treatment vis-a-vis men is not given to them in their work-organizations. Secondly, there is dissatisfaction among women because certain facilities which are especially required for women are not provided to them, such as proper seating arrangement, separate toilet facility, etc. As most of the work-organizations in science and engineering are geared to men, special facilities for women in the work-organizations have not been provided, or if provided, then those are not sufficient.

Our exploration into the career-commitment of the scientists and engineers vary on the basis of their sex status. The high career-commitment has been found more pronounced among the men than among the women. The relatively low-commitment of
women in the job may be due to their dissatisfaction with the job-situation, discriminatory work-allotment, placement, transfer, promotion, etc. It may also be due to familial and marital obligations of the women which might detract them from full-involvement in the occupational-career.

**Discrimination/Unequal Treatment to Women**

Direct measurement of discrimination to women in professions is a difficult task. Moreover, overt discrimination is not always apparent. Most of the cases of discrimination against women are subtle and latent in form. Therefore, only an inferential analysis of the phenomenon could be made. In this connection, we have framed the hypothesis: 'The discrimination against women in science and engineering professions with regard to access and treatment on job is latent rather than manifest'. This has been amply proved by our investigation.

Enquiring into the fairness of selection process we have found that though a good number of women respondents feel that their selection to the profession, as compared to men scientists and engineers, have been fair, yet a substantial proportion of them feel that in comparison to men, they do not receive equal and fair treatment in the selection process. They further feel that the men, even though possessing relatively lower qualifications, receive favoured treatment in this regard.
We have also found that there exists differential treatment to the women in matters of allocation of work/responsibility in their work-organizations. Though, majority of the women respondents feel that, as compared to men on the similar positions, they have been allotted similar work/responsibility in their work-organizations, yet there are a fairly good number of women who have complained that they have been allotted inferior work/responsibility in comparison to their men colleagues. These women feel that their work-organizations are more favourably inclined towards men than women.

The differential treatment of men and women have also been measured in terms of the difference in their salary. The study has revealed that in the cadres of assistant engineer/scientific officer/lecturer, the mean monthly income of the men is Rs.1527.85 and that of women Rs.1386.36. In the cadre of engineer/senior scientific officer/reader the mean monthly income of men is Rs.1866.67 and that of women Rs.1712.50. In these two occupational categories, where most of the respondents of the present study are located, the women have lower income status than the men. We have found that either the women have shorter length of service, or they are stagnating at one job-position. This has also resulted in relatively low salary status to them.

Promotion denial is one of the major complaints of the women. In the study, a good proportion of women have complained
that they have been unfairly denied the promotion which was due to them. These women feel that less competent men with relatively poor career profiles have been given more favoured treatment and the women have been left to stagnate in their earlier job-positions. Some of the women have also complained that the prestigious and influential job-positions in their work-organizations are not given to them. Sex-prejudice, favouritism/nepotism, internal political bickering, red-tapism, unfavourable rules for promotion have been reported as other important reasons for promotion denial by women respondents.

Extending the area of enquiry, from the personal experiences of discrimination to a larger area concerning the work-organization as a whole, the study has revealed some very significant facts. As many as 22.78 percent women respondents have stated that in their work-organizations well-qualified women scientists and engineers have been assigned inferior job-positions. Similarly, 17.09 percent women feel that in their work-organisations deliberate promotion has been given to the less-qualified men scientists and engineers.

A fairly good number of women respondents have reported cases where instructions issued by women officers are not taken seriously, or ignored because they emanate from women. It seems that women superordinates ordinarily do not enjoy as much power, respect, and superiority as their men counterparts enjoy.
Analysing the collegial relationship we have found that though most of the respondents described their relationship with men as well as with women colleagues as congenial, there are some who find it rather strained and hostile. The strained and hostile relationship have been felt by 17.08 per cent women respondents against men, and 10.65 per cent men respondents against women. However, considerably strained and hostile relationship have been reported within the same sex — 27.04 per cent men have experienced hostile relationship with men colleagues and 28.48 per cent women respondents felt hostile relationship with women colleagues.

Thus, not only organizational discrimination against women scientists and engineers have been observed but there also exist unequal treatment and subtle discrimination in the behavioural and interpersonal relationship with the colleagues. However, discrimination and unequal treatment have been found mostly in latent and covert forms.

**Sex-Based Prejudices and Stereotypes**

One of the major obstacles in the upward mobility of women is the socially structured and culturally sanctioned sex-based prejudices and stereotypes. The sex-typed images of men and women are different and are, in most of the cases, antagonistic to the women. On account of these prejudices and stereotypes they are not treated fairly in different walks of life including
the economic life. These prejudices and stereotypes are very deep rooted and spread across different segments of the society. The scientists and engineers are a class of people who by their training and by their work-roles are supposed to imbibe scientific rationality, objectivity and pragmatism. The persistence of sex-based prejudices and stereotypes among the members of the scientific community may be construed as a negation of scientific temper for which these professions stand for. In this connection, our hypothesis is: 'The persistence of sex-based prejudices and stereotypes are to be found more among men than among women members of the scientific community'.

Our investigation suggests that there has been considerable erosion of sex-based prejudices and stereotypes among the members of the scientific community, yet these have not vanished altogether. And whatever remainants are found, is more pronounced among men than among women members of the scientific community.

To measure the sex-based prejudices and stereotypes, we have used two different inventories. The first deals with the measurement of prejudices and stereotypes regarding women's participation in modern professions, and the second measures the prejudices and stereotypes relating to women's biological characteristics and their socio-economic status. As regards the first, we have found that a greater proportion of men (45.90 per cent) than women (20.80 per cent) possess high level
of prejudices and stereotypes in relation to women's participation in modern professions. More men than women have agreed that between career and family women give top priority to their family, that women are satisfied with routine types of jobs, that women cannot be efficient scientists and engineers, and that women cannot be successful bosses over men, etc.

The prejudices and stereotypes in relation to women's biological characteristics and their socio-economic status have been found among a few respondents. Only 14.75 per cent men and 5.06 per cent women respondents possess high level of such prejudices and stereotypes. Some of these men feel that there are inherent differences between men and women that limit the capacity of women to perform effectively on the job, or women are not the main breadwinners in their families, etc.

Thus, our hypothesis is partially true. The sex-based prejudices and stereotypes are largely decreasing both among the men and women members of the scientific community. However, a few men still cling to these sex-based prejudices and stereotypes.

Authority Structure and Decision-Making Process in the Family

Nowhere the men-women difference in the status and the role has been so much sharp as in the sphere of family life. Traditionally, the structure of the Indian joint family has been that of male superiority and subordination of women. The patriarchal family has institutionalized the subjugation of women
through clearly defined and rigidly prescribed value-system and behaviour pattern. It is assumed that modern urban family, more particularly the families of the members of scientific community, are more egalitarian. In such families women with higher education and better occupational status are supposed to enjoy an equal status to that of men in all the major decision-making processes in the family and control over family assets. In this connection, we have formulated a hypothesis: 'In family authority structure, decision-making process and control over family property, the traditional masculine-feminine dichotomy still persists'.

Our investigation has revealed that the traditional patriarchal structure of the family with the dominance of male members still persists in vital areas of the family life. Crucial decisions are taken by male members, mostly alone. Women are associated in the decision-making process only in minor and less important areas. We have found that in the most crucial area of professional career a majority of the men respondents take independent decisions. On the contrary, most of the women take decisions jointly with their husbands. In matters relating to family budget joint decisions by men and women is the most common feature. Yet, there are some men who do not associate their wives in this matter. In relatively minor areas of the schooling of the children, and decision about the educational career of the children, women are generally consulted by their husbands.
As regards the control over spending of salary, a higher proportion of men than women have full control over it. A substantial proportion of women have to account for their expenditure to their spouses or parents. The relatively low position of women is again visible in the legal entitlement of the property. The property is mostly in the names of husbands, parents, or jointly owned by the family. Women's independent ownership of the property has been reported only in a few cases. We have also found that there are cases where property acquired through women's caring is owned by their husbands.

Thus, we may say that the women have not achieved equal status to that of men in all spheres of the family life. In some areas, they have started taking up joint decisions with their husbands. But in crucial matters regarding decisions about the professional career, family budget, accountability for the expenses incurred, the men have more say than women. Thus, it confirms our hypothesis that the traditional masculine-feminine dichotomy still persists. Taking into consideration that the women in this study have higher educational and independent occupational status, their subservience to traditional male authority make it much more glaring.