RESULT AND DISCUSSION
Purpose of the present study is to find out the factors (symptomatic, history and personality) related with prognosis of cases suffering from depressive illness. Altogether sixty such factors (See Table II) in 84 cases have been studied. For each case, Case-record-schedule was filled up and Beck's inventory for measuring depth of depression, Barron's ego-strength scale, Kundu's Neurotic Personality Inventory and Rorschach Test were administered at the beginning of the treatment. Thereafter, standard medicine (See Chapter 3, p. 38) was administered again. Percentage of improvement over six week period was calculated (See Chapter 4, p. 65). To find the relationship of different symptomatic, personal history and personality factors with percentage of improvement, two types of association of factors with percentage of improvement was calculated. The two type of associations are:

1) Calculation of correlation; and

ii) Chi-square test.

In the present work, 60 variables (Table II) were studied in 60 cases (Rest 24 cases were used for validation of the scale developed) to find their association with the percentage of improvement. 11 factors out of 60 have significant association (beyond 0.05% level) with percentage of improvement. The following discussion shows the nature of influence of all 60 factors on the prognosis of the depressive illness.

Table I presents the distribution of age, sex and marital status of the population studied. The age of patients varies from 20 years to 59 years. There are 39 males and 21 females.
Table II indicates that sex has no significant relationship with percentage of improvement ($r_{pbis} = +0.16$ with male). Kiloh et al. (1962), Mendels (1965a), McConaghy et al. (1968) and Kay et al. (1969) also reported that sex was insignificantly related with the improvement in depressives.

From Table II, it is also evident that (within the age range 20-59 years), the higher the age of onset of the present illness, the better the outcome ($r = +0.353$).

Kiloh et al. (1962) reported a correlation of $+0.20$ between patient's age (40 years and above) and percentage of improvement. Mendels (1965a), during a 3-months follow-up, also reported a significant relationship between response to imipramine (i.e. improvement) and patient's age over 50 years. Though the studies are not exactly comparable with the present work, but they all agree that in this age-range higher age of onset is related with good outcome of the disease.

Higher age of 1st onset of illness is also related with the better outcome ($r = +0.32$). The correlation is more or less the same as that with age of onset of the Present illness ($r = +0.35$ Table II).

Married individuals have a better outcome than the singles ($r_{pbis} = +0.21$ Table II), but the association is not statistically significant at 0.05 level. The small association might be due to relationship of age and marital status (Table I). Age at the time of onset of present illness has a correlation of $+0.35$ and individuals of higher age-group are more likely to be married in greater number.
For testing the significance of association of level of education with percentage of improvement, X²-test was used and it was found to be insignificant at 0.05 level. Generally, middle range of education is associated with good prognosis.

Income per capita has no significant relationship with improvement (r = 0.196 Table II).

Duration of illness is insignificantly related to improvement (r = 0.199). The greater the duration of the disease, the better is the improvement.

Presence of history over one year with no symptom-free period indicating poor prognosis (r_pbis = -0.34).

Presence of family history of mental illness was analysed in two ways: 1) Difference in percentage of improvement of individuals having family history of mental illness in first order relatives (parents, siblings and children) and second order relatives (maternal and paternal aunts and uncles, grand-parents etc. related by blood). There is insignificant difference in the percentage of improvement of individuals having history of mental illness in first order relatives and in second order relatives. 2) Type of mental illness in family - Difference in type of mental illness (depression, other than depression, unspecific etc.) in family history was tested by X²-test and it was found to be insignificant. Mendels (1966a) studied it as family history of depression scored as 1 and absence of it as 0 and found an insignificant correlation with percentage of improvement. McConaghy et. al. (1968) reported that history of...
depression in blood relatives has no significant association to
two drugs - amitriptyline and protryptyline; but history of other
psychiatric illness in blood relatives had correlation of -0.59
with protryptyline and -0.59 with response to amitriptyline.

Difference in absence by death of parent at time of inter-
ABSENCE BY DEATH OF
PARENT AT THE TIME
OF INTERVIEW was studied as both parents alive,
both parents dead, only father dead and
only mother dead. Difference in percentage of improvement of these
groups is also statistically insignificant beyond 0.05 level
(Table II).

Table II indicates that cases with sudden onset have signi-
ONSET OF ILLNESSficantly better outcome than cases with
gradual onset. (r_{pbis} = -0.37 with gradual onset Table II). But
Kiloh et. al. (1962) maintained that good response to imipramine
is likely to occur if the illness comes on insidiously. Patients
having sudden onset tend to do badly. Kiloh et. al. (1962) ex-
plained the association in good outcome and insidious origin as
being due to the fact that insidious onset is a factor of endoge-
nous depression and endogenous depression has good prognosis. It
is, however, an established fact that 'acuter the diseases, better
the outcome'.

Childhood neurotic traits are not related with improvement
(it has negligible positive correlation (r_{pbis} = +0.05) with
CHILDHOOD NEUROTIC TRAITS percentage of improvement Table II).
Mendels (1965a) also indicated that though neurotic traits in
childhood had some association but this association has not reached
statistically significant range at 0.05 level.

Association in sleep disturbances and percentage of improve-
SLEEP DISTURBANCES  ment was tested by $X^2$ - test and it was 
found to be significant at 0.05 level (Table II). Table III giving 
numbers and percentages indicates that the difference is due 
to difference in improvement of individuals having early morning 
waking and no sleep disturbances. Higher percentage of individuals 
having early morning waking lie in "above 50\% - improvement cate-
gory" and higher percentage of individuals having no-disturbance 
lie in "50\% and less improvement category."

Kiloh et. al. (1962) studied it as three factors - presence 
or absence of initial insomnia, presence or absence of early awa-
kening and presence or absence of restless sleep. He found rest-
less sleep had correlation of -0.13 and early morning waking a 
correlation of +0.13 while initial insomnia had still lower cor-
relation with improvement. McConaghy et. al. (1968) reported that 
initial insomnia had a correlation of +0.4 with response to amitriptyline and +0.2 with protriptyline, while restless sleep and 
early morning waking had insignificant association with response 
to both drugs. Mendels (1965) found that type of response had no 
association with sleep-disturbances. Hinton (1963) also reported 
that there was no significant relationship between type of sleep-
disturbances and subsequent improvement with electro-convulsive 
therapy.

Significance of association of past history of mental ill-
PAST HISTORY ness with degree of improvement was tested 
OF MENTAL ILLNESS by $X^2$ - method and it was found to be in-
significant at 0.05 level.

$X^2$ obtained by comparing percentage of improvement of cases 
having depression worse in morning, worse in evening and no change
DIURNAL VARIATION between morning and evening was found to be insignificant at 0.05 level. Mendels (1965) also found no association with response to E.C.T. Hamilton and White (1960) also reported insignificant association.

Course of illness—fluctuating vs. unvarying—also has significant (at 0.05 level) association with percentage of improvement. Mendels (1965) also reported insignificant association between course of illness and good response. There was weak association at one month-follow-up. Hamilton and White (1960); Hobson (1953) found a significant association of course of illness with improvement at one month-follow-up. Mendels (1968) also reported that its association was insignificant at 0.01 level.

The absence of association of type of response with course of illness, Family history of depression and diurnal variation is of considerable importance, because several authors (Carney et al. 1965) have stressed the relationship between these symptoms and endogenous depression and endogenous depression is considered to indicate good prognosis.

Presence of somatic delusions and nihilistic delusions also do not have any statistically significant relationship with percentage of improvement (r pbis = 0.088 for somatic delusions; r pbis = 0.075 for nihilistic delusions). Mendels (1965) reported no association of type of response with presence of delusions.

Paranoid features have insignificant association with percentage of improvement (r pbis = 0.0397). Table II. Mendels (1965) reported that paranoid features had
insignificant association with type of response. McConaghy et. al. (1968) also reported no association between the two.

Presence of depersonalization also does not have any significant relationship with percentage of improvement \( r_{pbis} = 0.002 \) Table II). Mendels (1965) also reported insignificant association between depersonalization and type of response.

Presence of suicidal ideas also has only insignificant association with percentage of improvement \( r_{pbis} = 0.071 \) Table II). Klloh et. al. (1962) reported that attempted suicide had an association of -0.17 with type of response. Individuals having history of attempted suicide were however excluded from the group studied here as E.C.T. was administered to them. Mendels (1965a) studied it as suicidal attempt and suicidal threat and found insignificant association with percentage of recovery.

Tendency to blame others also is not significantly related with type of response \( r_{pbis} = -0.12 \) Table II).

Irritability has point biserial correlation of -0.142 with percentage of improvement. Klloh et. al. (1962) found it to be a significant factor correlated with poor prognosis \( r_{pbis} = -0.30 \). In the present study, the direction of association is same but degree is less.

Anxiety has insignificant association with percentage of improvement \( r_{pbis} = -0.007 \) Table II). McConaghy et. al. (1968) also reported insignificant association between anxiety and type of response. Fay et. al. (1969) reported a cor-
Relation of +0.02 between anxiety and poor immediate outcome (their study also include long-term follow-up of 5 years).

Presence of hypochondriasis indicates a good prognosis

HYPOCHONDRIASIS ($r_{pbis} = +0.213$ Table II); but it is statistically insignificant at 0.05 level. In Kiloh et al.'s study (1962), however, there was a correlation of -0.15 between hypochondriasis and type of response. Mendels (1965a) found no association in hypochondriasis and type of response; while Kay et al. (1969b) reported that somatic complaints had correlation of +0.26 with poor immediate outcome. Here also somatic complaints indicated poor outcome. But in the present study, the result found is just the reverse.

Obsession has no association with type of response ($r_{pbis} = -0.082$ Table II). In Mendel's (1965a) study, it has insignificant association with type of response at one month interval, but at three month interval presence of obsession indicated more favourable outcome with E.C.T. McConaghy et al. (1968) reported no association between presence of obsession and type of response.

Presence of hysterical traits indicates poor response

HYSTERICAL TRAITS ($r_{pbis} = -0.121$). In Kiloh et al. (1962)'s study, hysterical features had a correlation of -0.32 with type of response. But Mendels (1965a) reported no association between type of response and premorbid hysterical personality. McConaghy et al. (1968) also reported no association between the two. Kay et al. (1969b) reported a correlation of +0.14 with poor immediate outcome. So association of hysterical traits with the type of response is negative, their presence indicates poor prognosis.
Usually, in the studies (Kay et al. 1969b), the degree of association has been found to be low (-0.12, -0.16 etc.). Only in the Kiloh et al. (1962)'s study, it has reached statistically significant range (correlation = -0.32).

Presence of retardation indicates good response ($r_{bias} = RETARDATION \times 0.207$ Table II) but, it is not statistically significant at 0.05 level. In Kiloh et al. (1962)'s study, subjective retardation had a correlation of -0.15 with the improvement. In Mendel's (1968) study, psychomotor retardation was found to be associated with favourable response to E.C.T. Kay et al. (1969b) reported a correlation of -0.33 between retardation and poor immediate outcome. So, on the basis of available studies, we can say that presence of retardation, particularly psychomotor retardation, is an indicator of good response (Mendels 1968, Kay 1968); but in the present study, it is not statistically significant at 0.05 level (for which the correlation needed is 0.26 and the observed correlation is $+0.21$). Only exception is Kiloh (1962)'s study (correlation = -0.15); but he studied retardation as subjective retardation and not as psychomotor retardation.

Presence of agitation indicates poor prognosis ($r_{bias} = AGITATION \times 0.262$ Table II) and it is significant at 0.05 level. McConaghy (1968) reported that, only in case of amitriptyline, there was correlation of -0.40 with type of response.

Self-reproach has insignificant association ($r_{bias} = SELF-REPROACH \times 0.081$ Table II) with percentage of improvement. Mendels (1965a) found no association between self-reproach and type of response. McConaghy (1968) studied self-reproach and
guilt feeling together and reported insignificant association with type of response to the medicines studied. In the present study, however, guilt feeling was studied separately and it has an insignificant association with improvement. ($r_{pbs} = +0.08$ Table II).

Tendency to withdraw socially has insignificant association with the type of response ($r_{pbs} = +0.089$ Table II).

Presence of indecision indicates poor improvement ($r_{pbs} = -0.162$) but, the association has not reached statistically significant range.

Sense of failure also has insignificant association with degree of improvement ($r_{pbs} = +0.068$ Table II).

Presence of pessimism also has no significant association with improvement ($r_{pbs} = -0.015$ Table II).

Loss of appetite has insignificant association with degree of improvement ($r_{pbs} = +0.039$ Table II). Mendels (1965) also reported no association between loss of appetite and type of outcome.

Constipation has only insignificant association with degree of improvement ($r_{pbs} = -0.021$ Table II).

Feeling of lack of energy also has insignificant association with improvement ($r_{pbs} = +0.061$ Table II).

So, presence of social withdrawal, indecision, sense of failure, pessimism, loss of appetite, constipation and lack of energy are not significantly related with the degree of improve-
Self-pity has insignificant association with percentage of \( r_{pbi} = 0.085 \) Table II). In Kiloh (1962)'s study, it had a correlation of -0.25 and McConaghy (1968) reported that there was correlation of +0.46 with response to amitriptyline and -0.04 to protriptyline. Cause of this difference in results is not very evident, particularly when Kiloh (1962)'s study uses the same medicine. So, this factor need a further study for establishment of its relation to the type of response.

Presence of feeling of hopelessness indicates good response \( r_{pbi} = 0.119 \) Table II) but it has not reached statistically significant range.

Reactivity of depression is associated with poor prognosis \( r_{pbi} = -0.159 \) Table II) but the association of depression is not statistically significant. McConaghy (1968) reported that it has a correlation of -0.43 with response to amitriptyline and -0.05 with response to protriptyline.

Adequate premorbid personality indicates good response \( r_{pbi} = 0.260 \) Table II) and the association is statistically significant. In Kendels (1965) study, this factor was significant at 0.05 level. Similar results have been reported by Hobson (1953). Kendels (1968) study also indicated that inadequate personality was associated with poor response.

Presence of precipitating factors have an insignificant association with the type of response \( r_{pbi} = 0.104 \) Table II). In Kiloh (1962)'s study, it
had a correlation of -0.14. In Mendels (1965a) study, there was a significant association between presence of precipitating factors and poor response to E.C.T. Hobson (1953), Hamilton and White (1960) and Ottoson (1962), however, found it to be a positive indicator. The difference in the results of the studies may be due to:

1) Difference in use of the term precipitating factors.
2) Difference in patient population.

Precipitating factor is the traumatic event associated with the onset of the illness. These events associated with onset of illness may be of three types:

1) Co- incidental events arising from the upsets, disappointments and frustrations of life. In this case, they are the temporal coincidence and are not related causatively with onset of the illness.
2) Problems and difficulties may occur as consequence of depression. These should be differentiated cautiously from the real precipitating factors.
3) There are some co- incidental events that are related causatively with the onset of the illness or may precipitate an underlying state.

Mendels (1965a) defined it in the sense mentioned at 3) above, while Hobson (1953) defined precipitating factors as incidents associated with onset of illness. In the present study, precipitating factors are defined as co-incidents which seem to be related with onset of illness.

Presence of adequate psychogenesis indicates poor prognosis

\[ r_{pbi} = -0.313 \] (Table II)
al. (1969) reported, that it had a correlation of +0.15 with poor immediate outcome. Although direction of association is same, their correlation is much smaller than that found in the present study.

Prognosis of more severely depressed patients is poor. First day score on Beck's inventory for measuring depression DEPTH OF DEPRESSION has \( r = -0.38 \) (Table II) with percentage improvement. Kiloh (1962) found a correlation of -0.13 with intensity of depression. Hamilton and White (1960) in assessing the outcome of depressive states treated with E.C.T. noted the same phenomenon that prognosis of the more severely depressed patients is likely to be worse.

Higher ego strength indicates better prognosis. Score on EGO STRENGTH Barron's ego strength scale have \( r = +0.24 \) with percentage of improvement, \( (r = 0.25 \text{ is significant at 0.05 level}) \), but it has not reached the statistically significant range.

Higher level of neuroticism is associated with poor prognosis. Level of neuroticism as measured by score on KNPI has a NEUROTICISM negative correlation \( (r = -0.27 \text{ Table II}) \) with percentage of improvement. Usually, studies of prognosis study the presence of neurotic trait in adulthood and find out its association with the improvement. These neurotic traits of adulthood are included in the measure of neuroticism. Really, KNPI purposes to measure the present level of neurotic element in one's personality. In Mendels (1965a) study, the presence of neurotic trait in adulthood was associated with poor prognosis. Hobson's (1953) study had a similar finding. It is found that even level of neuroticism has a negative association with percent-
In case of Rorschach, altogether thirteen scoring categories were studied in relation to percentage of improvement. These thirteen categories are:

- Content (Human)
- Content (Animal)
- Number of responses
- Percentage of whole (W) responses
- Percentage of big detail (D) responses
- Percentage of small detail (d) responses
- Percentage of space (S) responses
- Percentage of form (F*) responses
- Presence of (F") responses
- Presence of shading responses (cF)
- Presence of colour responses (CF)
- Presence of human movement (H) responses
- Percentage of animal movement (FN) responses

For percentage of improvement, individuals were divided into two groups, viz., those having percentage decrease in score of depth of depression above the median and those having below the median.

The $X^2$-test was used to test significance of association of those two groups of patients and categories according to each of the traits mentioned above. The $X^2$-value was significant at 0.05 level only in case of percentage of whole responses. Table IV giving percentage indicates that presence of whole responses is related with better response.

Twelve factors from personal and family history and symptoms of depression and all thirteen measurable items of Rorschach were taken for calculation of multiple regression. These twelve factors are:

1. Type of onset
2. Duration
3. Age at time of present onset
4. Age at time of first onset
5. History over one year with no symptom-free period

Out of these, except for Duration, Hypochondriasis, Ego-strength, all others have statistically significant association with the prognosis. Sleep disturbances which also have statistically significant association have not been included for regression analysis for, this is the item where data cannot be converted to 0, 1, 2, 3 form which is required for analysis by a computer. Duration with $r = -0.199$, Hypochondriasis with $r = -0.21$, Ego-strength with $r = -0.24$ are included in the analysis because their association is high (though not statistically significant, $r = 0.25$ is statistically significant here) and other studies also have found them to be of value in predicting response.

The multiple regression of 25 factors was determined by method of least squares using a Computer (IBM 1130). Regression co-efficients for different factors taken as independent explaining variables are presented in Table V. The usual $t$-test for significance of partial regression co-efficient was carried out. It was found that of the 25 factors involved, significant dependencies came out on the following characteristics:

Age at the time of present onset, Adequate personality, 1st day score on Beck's inventory, Age at the time of first onset, History over one year with no symptom free period, Agitation, Adequate psychogenesis, Number of
responses on Rorschach, whole responses, small details, space responses, Content (Human), Form (F + ), Shading (cf).

To check the ability of this multiple linear regression to explain differences in responsiveness, predicted values were obtained for 24 cases, whose age, sex and marital status are presented in Table VI.

Table VII indicates that, in most of the cases, there was considerable difference in observed and predicted values.

To test the agreement between observed and predicted values, a two-way table classifying the cases as having values above and below median for observed and expected values was prepared (Table VIIIa). This table shows insignificant association between observed and predicted values. Table VIIb, showing the number of individuals having difference in observed and predicted value being "more than 10" or "less than 10", indicates that, in 31.67% of cases, difference in observed and predicted percentage of improvement is "more than 10".

These 25 factors have been found to be of not much value in explaining prognosis. Factors from Rorschach (with exception of one—W%) are related insignificantly with prognosis and these have usually not been included in the development of weightage scales for predicting response to type of treatment (Kiloh 1962, Mendels 1965b and 1968, Corney 1965). As a check against the argument that failure of the scale developed in the present study might perhaps be due to presence of these 13 Rorschach factors in the multiple regression analysis, it was decided to take into account only rest of the 12 factors (other than the 13 Rorschach factors included in the first multiple regression). Regression co-efficients of these 12 factors taken as independent explaining variables are presented in Table IX.

Using the regression equation so developed, predicted values for percentage of improvement were obtained for the same 24 cases (Table X). To test the agreement between observed and predicted values, a two-way table classifying the cases as having value "above the median" and "below the median" for observed and predict-
ed values was prepared. This table, however, also shows (Table XIA) insignificant association between observed and predicted values.

Table XIB showing number of individuals having difference in observed and predicted values being "more than 10" and "less than 10" indicates that, still, in 70.83% of cases difference in observed and predicted percentage of improvement is "more than 10". It can thus be seen that, even here, results point to a high percentage of cases with significant difference between observed and predicted values (Table X, XIA and XIB).

Since these 12 factors were also found to be of not much value in explaining prognosis and since the validity of including categorical data in a multiple linear regression is not beyond doubt, it was further decided to take into account only five measurable characteristics significantly correlated with percentage of improvement. Regression Co-efficient for these five factors taken as independent explaining variable are presented in Table XII.

Using this equation, predicted values for percentage of improvement were obtained for the same 24 cases (Table XIII). To test the agreement between observed and predicted value, a two-way table classifying the cases as having values above and below median for observed and predicted values was prepared. This table shows (Table XIVA) insignificant association between observed and predicted values.

Table XIVB showing, the number of individuals having difference in observed and predicted values being "more than 10" or "less than 10", indicates, that in 83.33% of cases, differences in observed and predicted percentage of improvement is more than 10.

Many other authors (Kiloh 1962, Mendels 1965b, and 1968, Carney 1965) have developed a weightage scale for predicting response to the type of treatment (Imipramine in Kiloh et. al.'s case, E.C.T. in Mendel's and Carney's study). For the scale of Kiloh et. al. and Mendels, ability of the scale on new cases (Not included in the group whereupon the weightage are based) has not
been tested. No such study testing validity of the scales has been reported. Carney (1972) has reported a study indicating the positive validity of their scale.

The present investigation is aimed at developing a weightage scale and finding out its validity. While testing the validity of the scales, it was found that the scales so developed were unable to predict the prognosis of new cases. On the basis of the present study, we can only say that linear regression is unable to explain the differences in prognosis of a population very similar to one on which it was developed. Though there are many factors related with prognosis (like age of onset, Neuroticism, type of onset etc.), it is very difficult to assign them proper weights.

This is due to various reasons. There are too many variations in responsiveness which require an extremely large number of cases to be studied.

The scale so developed failed to predict the prognosis of the new cases because perhaps there are many other variables (other than the variables studied which are already 60 in number) from social life of an individual which interact to alter the type of response of the patient to the same drug. These variables are not the subject matter of the study, excepting as included in Adequate Psychogenesis.

In this connection, it is noteworthy that factors found to be related with prognosis (with the exception of sleep-disturbances, agitation and depth of depression) are not symptoms of depressive illness; rather, these are history factors (like age of onset-present and first, history over one year with no symptom-free period, sudden onset of illness, adequate premorbid
personality, adequate psychogenesis) and personality factors (like neuroticism, ego-strength, W$).

Any work in the field of prognosis is usually carried on mainly with symptom factors. This work has taken into account these and, in addition, some personality factors as well. Results suggest that inclusion of more history and social interaction factors might lead to more fruitful results or a better scale of prognosis. Either this is true, or, one has to admit that the development of such a scale is really a very difficult (if not impossible) task. Accordingly, while using such scales (developed by other authors), one must be aware of the limitations of the scales so developed which are rarely validated properly. In the present study, attempts to validate the scales so developed even on a population very similar to the one on which they were developed have failed to do so.