SOME AETIOLOGICAL FACTORS IN DEPRESSIVE ILLNESS

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It is in vain to speak of cures, or think of remedies, until such time as we have considered of the causes.

Galen (c. 130 - 200).

FOREWORD

The main purpose of this study is to determine whether individuals with depressive illness have suffered from parental loss during childhood to a greater extent than normal individuals.

An important part of the investigation is the demonstration that medical and surgical out-patients attending a general hospital are suitable to act as a control series for comparison with the depressive patients. Since the method of study involves interviewing a considerable number of depressive and control individuals, the opportunity has been taken to enquire into a number of other factors, mainly of a socio-demographic nature, which are said to be of importance in the causation of depressive illness.

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INTRODUCTION

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Psychiatric literature contains numerous references to the important role played by the parents, especially mother, in the normal emotional and intellectual development of the individual and many authors testify to the profound effects on the young of disruption of the relationship with the parent. Particularly in psychoanalytic writings, stress is laid on the child's need for a continuing relationship with the mother-figure during the formative years and distortion or interruption of the mother-child relationship is regarded as a factor of great importance in the genesis of mental disorder. Animal experiments in which the young are reared in isolation appear to provide striking confirmation of this viewpoint. Such animals fail to thrive, not only emotionally and intellectually, but also physically, since they do not gain weight at a normal rate and are unduly prone to intercurrent disease.

Actual loss of the parent during childhood has been held to be of particular moment in the subsequent development of various psychiatric conditions; for example, personality disorder, psychoneurosis, schizophrenia and depression. If such a diverse range of pathology can result from one particular disturbance then it would seem that the disturbance must be a fairly non-specific one. This being so, it could be argued that it is scarcely worth studying since an outstanding need in psychiatry is the identification of specific precipitating factors. However, it must be pointed out that much of the work on parental deprivation can be severely criticized on methodological grounds: authors frequently fail to define their terms, the number of subjects studied is often

very small and the views expressed in conclusion are mostly impressionistic. Although the published results often appear striking, lack of a suitable control series, or indeed of any standard of comparison, renders the work of little value in many cases.

There is fairly good evidence for a significant relationship between parental deprivation and the subsequent development of a personality disorder, but the alleged relationship between parental deprivation and other psychiatric illnesses has not been convincingly demonstrated. In particular, this aspect of depressive illness is poorly documented and since the connection between deprivation, mourning and depression is discussed at length in the literature, it seems an important aspect to consider. This project is designed to ascertain whether a group of patients suffering from depressive illness has in fact suffered parental loss in childhood more often than individuals in a control group.

If individuals suffering from a mental illness such as depression can be shown to have an excess of parental loss, it is tempting thereafter to apply post hoc reasoning and to assert that the loss of the parent is a cause of the illness. Such an assumption is frequently made but is not necessarily justifiable. It could equally well be argued that if depressive patients show an excess of parental deprivation it is because the parents of depressives are somehow unusually prone to die while their children are still immature. Following this line of reasoning, it is suggested that the parents of depressives are older than average when the depressives are born and the project undertakes to investigate this.

The term, 'Parental Deprivation', does not represent a single entity

Deprivation may occur in various ways: by death, desertion, absence due to work or war-service and so on. The deprivation may be primarily physical or emotional. It would seem reasonable to suppose that the death of a parent would be of profounder significance than loss of a parent for a reason other than death and it is conventionally accepted that loss of the mother during childhood is of considerably greater importance than loss of the father. Furthermore, it could be held that a deeply disturbed relationship between the child and the parent, not necessarily involving separation, might predispose the child to subsequent depressive illness. Information has been gathered to examine these hypothetical situations.

It has been suggested that the patient's ordinal position in the sibship of his family of upbringing may influence his predisposition to depression and also that the larger the sibship the more apt is he to develop depression since he is less likely to be able to form a deep and stable relationship with his parents and sibs in the period of childhood. Data on these points have been obtained. Enquiry has been made into the civil state and fertility of the depressive patients as compared with the controls since previous references to these factors give contradictory results.

Both depressives and controls have been questioned about the presence of a family history of mental disorder with the intention of confirming previous studies which show an excess frequency of mental illness in the families of manic-depressive patients. As well as this, it was considered that patients suffering from severe depressive illness might show a higher

prevalence of psychiatric disorder in their families as compared with the families of patients with less severe depression. If this were so, it would suggest that depression 'breeds true' in its degree of severity, since the relatives of severely depressed individuals who themselves develop depression are more likely to be recognized as ill if their attacks of depression are severe.

A thorough examination of the literature on depressive illness has produced few satisfactory answers to the various hypotheses mentioned in these preceding paragraphs. This project attempts to examine these hypotheses as impartially as possible, using simple but objective techniques. Patients admitted to psychiatric hospital suffering from a primary depressive illness have been interviewed and their answers to a number of standardized questions recorded. Identical interviews have been conducted with a similar number of non-depressed individuals in order to obtain a standard of comparison. Epidemiological method is used, not to assess the incidence or prevalence of depressive illness in the community, but in this instance to assess the prevalence, and thus indirectly the importance, of certain factors said to be involved in the aetiology of depression. It must again be stressed that, although such a technique may show a significant relationship between an illness and any number of factors, it cannot demonstrate cause and effect.

In summary, this project is designed to examine the following hypotheses:-

1. Parental deprivation, by death or by other cause, predisposes towards depressive illness.

2. The age of the parents is of significance in the aetiology of depressive illness in that the older the parent at the time of the individual's birth, the more likely is that individual to develop depressive illness.

3. Loss of a parent in childhood by death is more likely to cause a tendency to depressive illness than loss of a parent by a cause other than death.

4. Loss of mother during childhood is more important in predisposing to depressive illness than loss of father.

5. A disturbed parent-child relationship in early life is important in producing a tendency to depressive illness.

6. Persons suffering from depressive illness belong to a larger-than-average sibship in their family of upbringing.

7. The ordinal position of the depressive individual in his sibship is of importance in the aetiology of his depressive illness.

8. Depressive patients tend to remain unmarried more than do normal individuals and the fertility of married depressives differs from that of married non-depressives.

9. Depressive patients more often present with a positive family history of severe mental illness than do normal individuals.

10. Individuals with severe depression more often have a positive family history of severe mental illness than do individuals with less-severe depression.

REVIEW AND DISCUSSION OF THE RELEVANT LITERATURE

REVIEW AND DISCUSSION OF THE RELEVANT LITERATURE

This review and discussion of the literature on depressive illness makes no attempt to cover the whole field of depression but concentrates instead on these aspects of the subject which are of relevance to the present study. The review falls into five main sections in the first of which depression is defined for the purpose of this study and a brief outline of the phenomenology of the conditions is given.

In the second section, difficulties which arise in the diagnosis of depressive illness are discussed and methods of minimising such difficulties when they occur in the course of an investigation are suggested. Also in this section, problems of classification and nomenclature are dealt with.

The third section reviews the literature on demographic and genetic factors in depression, while the fourthconsiders the available evidence on parental deprivation and its relation to mental illness, especially depression. In both these sections stress is necessarily laid on the inconclusiveness of the findings at the present time. As will be shown, poor experimental technique is frequently a basic cause of this lack of reliable data.

The review and discussion of the literature ends with a brief appraisal of the application of epidemiology to psychiatric research.

PHENOMENOLOGY OF DEPRESSIVE ILLNESS

Depressive illness, for the purpose of this study, is defined as a primary disturbance of affect in the direction of sadness. This definition is adapted from that of Meyer-Gross et al (1960).

Recognition of a typical case of depressive illness is not usually difficult and most authorities agree on the cardinal features of the condition. The essential element is the presence of pathological sadness although in some cases this feature is so altered or overlaid as to make its recognition difficult. Other symptoms which may be present in varying degree are guilt feelings, insomnia, retardation, apathy and somatic complaints: in more severe cases, suicidal tendencies and delusions may occur. At times, agitation and anxiety are prominent and may even be the presenting symptoms. Foulds (1960) has criticized the traditional use of delayed insomnia and diurnal variation of symptoms as criteria in the diagnosis of depression and he finds that these symptoms are related to advancing age rather than to the illness itself.

Depression belongs to the group of affective illnesses and an outstanding characteristic of these disorders is their tendency to run a periodic course. However, by no means all the patients who develop affective illness suffer from a recurrence and Stenstedt (1952) reports that 53% of his manic-depressive subjects have had only one attack in their lives. As a rule there is complete recovery from the individual attack with no impairment of mental function. Alternation of depression and mania may occur, or recurrence of depression or mania alone, but manic episodes are much rarer than attacks of depression and among

Stenstedt's (1952) subjects the first illness was depressive in 83% of cases. Affective illness is commoner in women than in men, according to hospital admission statistics (Roth, 1959) and results obtained from a community survey, (Stenstedt, 1952). Roth (1959) states that the highest frequency of first admissions to hospital for depression is in late middle age but its first onset in the individual may occur from adolescence onward.

DIAGNOSIS AND CLASSIFICATION OF DEPRESSIVE ILLNESS

If the existence of a nosological entity known as depressive illness is accepted, the above statements are fairly unexceptionable and widely agreed upon, but many practical difficulties may arise in the diagnosis of the individual case of depression. This study is concerned to examine the primary depressive syndrome and not the depressive symptom which may occur as a secondary feature in any psychiatric condition. An attempt has been made to gather a group of cases corresponding as closely as possible to the classical descriptions of depressive illness to ensure that the findings of the study will not be contaminated by extraneous psychopathology. The difficulties which stand in the way of accurate diagnosis are considered in some detail in the following paragraphs to demonstrate that, not only must these difficulties be recognised, but also precautions must be taken to overcome them.

The diagnosis of depression is essentially a clinical one which rests on the empirical recognition of depressed affect. Unfortunately, there has been no very striking advance in diagnostic technique since Mapother and Lewis's (1937) statement that, 'Analysis feature by feature is less informative than a single glance'. There is no physical or psychological test

which can provide unequivocal proof of the presence of affective disorder and ultimately the diagnosis is made on the basis of clinical examination. Nowadays, rating scales of signs and symptoms are popular in the study of depression because they allow the investigator to quantify his clinical impressions to some extent but rating scales can only be applied once the initial diagnosis has been made. (Knowles, 1963: Hamilton, 1960). The accuracy of diagnosis may be increased if the patient is examined by more than one psychiatrist and the results of examination combined. This multiple-examination procedure is considered valuable even where the comparative objectivity of a rating-scale is employed, (Hamilton, 1960).

Depression may present in many ways. Apart from variation in severity and chronicity, the appearance of a case may differ greatly according to the stage in its natural history at which the illness is observed. In some instances the appearances are more suggestive of psychoneurosis or a psychosis other than depression. At times the diagnosis of depression is only confirmed by a natural history typical of affective disorder, by the presence of a family history of affective disorder, or by an appropriate response to antidepressant treatment. On the other hand, an apparently unmistakeable depression may prove in the course of time to be a totally different condition and in this context, Ødegård (1961) notes that of 263 patients diagnosed as suffering from affective psychosis, 54 were found at follow-up to be schizophrenic. Similarly, Clark and Mallet (1963) describe a follow-up study of 82 patients diagnosed as depressive at the time of discharge from hospital: 20% of these patients required re-admission

within three years of discharge and a third of these readmissions had to be re-diagnosed as schizophrenic. It seems likely that any study on depression must inevitably contain a small proportion of other illnesses masquerading as affective disorder unless prolonged contact with the patient can be maintained to ensure near-complete accuracy in diagnosis. In the short-term study, only rigid exclusion of doubtful cases can minimise the difficulty although this in itself is open to the criticism that it may cause undue bias in the selection of patients.

The depressive patient may make no complaint of a psychological nature and his presenting symptoms may be purely physical. This is especially true of the more severe type of depressive illness (Jones and Hall, 1963). Brown (1936) has made the suggestion that physical complaints may have a basis in the lax musculature, low blood-pressure, constipation and insomnia typical of the severe depressive. Bradley (1963) notes two types of localized pain associated with depression: chronic pain followed by depression and pain which appears simultaneously with depression. Antidepressant treatment dispels the depression but not the pain in the first group, while in the second group both pain and depression disappear with treatment. The pain in the latter group may be regarded as an 'affective equivalent' and at times it may completely obscure the depressive aspect of the illness. da Fonseca (1963) notes that affective equivalents have the same tendency to periodic recurrence as depression and often may occur as a familial phenomenon. It is of course necessary to perform a physical examination in every case of depression to assess the relative importance of physical and psychological symptoms: in a study such as

the present one it is especially important to exclude depression which is purely reactive to physical ill-being and conversely to include those cases in which physical symptoms are unquestionably an expression of the depressive illness. From this point of view it is an advantage to study cases of depression admitted to hospital since each patient has had a thorough examination at the time of admission.

Many studies of psychiatric illness are carried out in hospital and this is not wholly advantageous. It has to be recognized that patients admitted to hospital with depression are a highly-selected group. The less severe forms of depression may go unrecognized or even uncomplained-of and if they are recognized they may well be treated by the general practitioner or the outpatient psychiatrist. Nowadays, admission to hospital because of depression often occurs only when the patient has failed to respond to outpatient treatment. It is probably justifiable to assume that hospitalized depressives represent the most severe end of the depression-spectrum but there does not appear to be any study which confirms this impression. Stengel (1960) has pointed out that investigations on depression carried out in the psychiatric hospital may produce quite different results from those performed in the out-patient clinic or private consulting-room, mainly because the patient-populations seen in these different surroundings are themselves so different. It is therefore necessary to be explicit about the source of patients under investigation and care must be taken not to generalize rashly from data obtained in rather specialized circumstances.

There is still much controversy over the desirability of attempting to distinguish between endogenous and neurotic types of depression. Some

investigators, for example Lewis (1934), Curran (1937), Curran and Mallinson (1941) and Garmany (1958), find no evidence to justify such a distinction but recently the opposite view has been taken by Astrup (1959), Foulds (1960) and Kiloh and Garside (1963). In practice it does seem convenient to accept some form of subdivision, even if it simply implies a difference in degree of severity rather than any connotation of aetiology. The distinction between endogenous and reactive depression, that is, depression which arises spontaneously and that which apparently develops as a reaction to some harmful stimulus, has lost favour recently. It can be shown that many so-called endogenous depressive illnesses appear to have clearly-defined precipitating factors and a study which demonstrates this is that of Morozova and Shumskii (1963). These workers report that 36.9% of the depressive phases in patients with recurrent endogenous depressive illness are related to an extrinsic provoking factor, although the frequency of the association diminishes from first to subsequent phases, a finding which the authors explain by postulating an endogenous predisposition which develops with age and advance of the illness. The concept of reactive depression does not seem, in the light of these findings, to be of any classificatory value.

A number of authors, including Roth (1959), state that in neurotic depression the premorbid personality is often unstable and the response to electroconvulsive therapy is poor, with a high relapse rate. This is not a description of a primary depressive illness but most probably that of a depression secondary to psychoneurosis or personality disorder, and the prognosis, by and large, is that of the underlying condition. A

semantic misapprehension has crept in here. The term 'Neurotic Depression' should imply a depressive illness of neurotic intensity or quality and not one arising from a psychoneurosis. In this study neurotic depression is regarded as a primary condition similar to, but less severe than, endogenous depression.

Following present-day custom (Stengel,1960) the cases of severe primary depression in this study are included in the manic-depressive category (301.1 in the International Classification of Diseases) and those few cases of depression with a history of manic episodes (301.0) are regarded as falling into the same diagnostic group. Primary neurotic depression corresponds to category 314 of the International Classification but again it is stressed that the distinction between it and the endogenous form seems largely an artificial one.

The concept of involutional depression no longer finds favour and there seems no call for its continuing use. Until quite recently it was regarded by many as a diagnostic entity (Titley, 1936: Malzberg, 1948: Dewsbery, 1954) and Kallmann (1953, 1959) put forward evidence for a specific hereditary pattern and pre-psychotic personality-type. Recent work by Slater (1953), Tait et al.(1957) and Stenstedt (1959) provides convincing proof that the condition is endogenous depression of late onset and these workers cannot confirm Kallmann's finding of a genetic relationship with schizophrenia. Stenstedt, for example, finds that 10% of his patients have a parent with endogenous affective illness.

Depression in the elderly is a different matter. This is now recognized to be relatively common (Roth, 1955: Kay, 1959: Roth and Kay,1962)

and also to be to some extent aetiologically distinct from depression occuring in earlier life. (Roth and Kay, 1956). There is less genetic predisposition in depression of old age and immediate precipitating factors are of relatively greater importance: particularly factors like physical illness, acute physical stress and sensory deprivation. Depression in the elderly is a subject which requires quite separate study and in this project patients over the age of sixty are excluded.

Finally, mention must be made of puerperal depression. Psychotic illness is rare in the gestational period but there seems little doubt that a significant excess of psychosis, especially manic-depressive, occurs in the puerperium. (Pugh et al., 1963). However, it is not known whether puerperal depression is qualitatively different from depression occurring at other times. Nemphill (1952) states that puerperal depression responds poorly to treatment, whereas Meyer-Gross et al. (1960) regard the response to electroconvulsive therapy as good in many cases. A small number of cases of puerperal depression is included in this study: they have been classified as endogenous depression as they are clinically indistinguishable from that condition.

DEMOGRAPHIC AND GENETIC FACTORS IN DEPRESSIVE ILLNESS

Prevalence and Incidence of Depressive Illness

The number of published studies on the epidemiology of depression is small and the lack of uniformity in methods of study makes comparison difficult. Until quite recently, estimates of prevalence and incidence were usually based on hospital admission statistics with their many

attendant fallacies (Lin and Standley,1962). Ødegård (1961) provides figures based on such data but he expresses confidence that these are a fair reflection of the community situation in Norway. He states that the life-time risk of developing affective psychosis in Norway is about 1.2% for men and 1.6% for women. Sørensen and Strömgren (1961) report that, on the Danish island of Samsø at a given date, 3.9% of the population over 20 years of age suffer from a depressive illness, but 77% of the cases are regarded as neurotic. (A prevalence rate for psychotic depression of approximately 0.9% of the population over 20 years of age). Stenstedt (1952) estimates that the prevalence of manic-depressive psychosis in Sweden is about 1%, a figure he notes as comparable with that found for Denmark. Juel-Nielsen et al.(1961) calculate an incidence rate for depressive states in the County of Aarhus, Denmark, of 0.2 to 0.5% per annum, with a high female preponderance, but only about a quarter of these come to psychiatric attention. The Taiwan (Formosa) study of Lin (1953) provides the much lower prevalence figure of 0.7 per 1,000 for cases of depression.

It may be said that, despite the figures quoted above, the true incidence, prevalence and lifetime morbidity-risk figures for depressive illness are not known, partly because of inability to agree on what constitutes a case of depressive illness and partly because of overwhelming difficulties in comprehensive case-finding.

Social Class Factors in Depressive Illness

There is fairly widespread agreement that schizophrenia tends to be commoner at the lower end of the socio-economic scale but the findings

on depression are somewhat contradictory. Faris and Dunham (1960) report no evidence of a differential distribution of manic-depressive psychoses in the City of Chicago in contrast to schizophrenia which is found much more frequently in areas of marked social disorganization. Clark (1949) and Hare (1955) find that the social class distribution for depressives is similar to that for the general population but Malzberg (1956 a & b) notes a higher prevalence of manic-depressive psychosis in the upper social classes while Tietze et al. (1941) and the Report of the Registrar General (1953, 1955) agree on a slight increase of manic-depressive illness towards the lower end of the social scale. These anomalies can probably be explained by social class bias in the types of population studied, and most authors seem agreed that if the social class distribution differs from that of the general population, the divergence is not a large one.

Cultural Factors Influencing the Prevalence of Depressive Illness

There are many allusions to allegedly wide variations in the prevalence of depression in different cultures and these are used to support arguments for the environmental aetiology of depression. Few of them stand up to scrutiny, but two which seem more than usually authoritative are the works of Eaton and Weil (1955) and Böök (1953). The first is a study of mental illness in the Hutterite communities of the American prairies and the authors report a high prevalence of manic-depressive psychosis with a low prevalence of schizophrenia. They attribute this finding to the Hutterite way of life which is characterised by living in small and extremely cohesive groups in a state of religious communism and where aggression must be turned inward rather than be outwardly expressed.

Böök's study of an isolated North Swedish community produces quite different results. This investigator finds an excess of schizophrenia among the mentally ill and very little manic-depressive disease and he postulates that many generations of isolated existence have selectively favoured the survival and procreation of the schizoid personality.

The findings of these two studies are still regarded as controversial and are against the trend of present-day thought. It is possible that differences in the methods of case-identification may have influenced the results. It is also possible that a genetic factor is at work here, since the Hutterites for example are descended from a very small group of families and in-breeding is common. (Lin and Standley, 1962).

Most present-day workers stress that the prevalence of depressive illness, so far as it can be determined, seems remarkably constant in different populations and cultures. Ødegård (1961) finds little difference in the prevalence of depression in different parts of Norway and Helgason (1961) reports that there is no marked variance between the morbid risk and lifetime prevalence of depression in Denmark and Iceland. Leighton et al (1963) stress that depression, which previous workers had regarded as rare in the African negro, is not only common among the Yoruba of Nigeria but is possibly slightly commoner than in Stirling County, Canada. These authors make the important point that, although cultural differences do not appear to affect the basic prevalence rate of depression, they may alter some of the presenting features of the illness and this may be one reason for some of the divergent results obtained in intercultural studies.

The Family Environment in the Childhood of the Depressive Patient

While Norton (1952) reports that individuals with psychoneurosis or personality disorder have a tendency to appear in the higher birth ranks and Goodman (1957) finds that schizophrenics tend to be the youngest in the family, Malzberg (1938) can discern no significant relationship between birth-order and manic-depressive illness. Fromm-Reichmann (1949), whose impressions do not appear to be supported by statistics, states that manic-depressives often come from large sibships or otherwise large families in which several father-figures share responsibility. In her opinion, such a situation prevents the child from relating meaningfully to a specific father-figure and this may predispose him to depression in later life. Munroe (1959), paraphrasing Adler, states that the youngest child is typically spoiled by everyone, but he is also the weakest of the family and he is in a position of general competition. Although no specific tendency to psychiatric illness is hypothesized here, the implication is that the youngest child has more difficulty than the rest in attaining psychological maturity.

Enquiry has failed to reveal any reference dealing with the age of the parents at the time of the depressive individual's birth, although Norton has noted that the proportion of patients with psychoneurosis or personality disorder born to mothers at higher maternal ages is greater than in a group of controls and Goodman (1957) similarly notes that in schizophrenia there is a slightly raised maternal age with a deficit of mothers under 25 and an excess aged 35 years or more at the time of the patient's birth.

Barry and Barry (1961) make the interesting but unexplained observation, which is based on figures obtained from very large numbers of patients, that the births of individuals who subsequently develop manic-depressive illness or schizophrenia tend to occur to significant excess in the first three months of the year.

Marriage and Fertility in Depressive Illness

There is disagreement about both these factors. Ødegård (1946, 1953) finds that the marriage rate in depressives is similar to that in normals but Stenstedt (1952), Kraines (1957) and Kallmann (1953) all report a lower marriage-rate in manic-depressive psychosis. Essen-Möller (1935) finds that the marriage-rate is about normal until the time of the first onset of depression and thereafter it falls to approximately half the original level. The group of patients with involutional depression described by Stenstedt (1959) shows a high rate of both celibacy and divorce but Ødegård (1946) notes no increase of affective illness among the divorced.

As regards the fertility of depressives, Ødegård (1961 ~~no date~~) states that manic-depressives are only slightly sub-fertile till the time of their first admission to hospital with the illness whereas Kallmann (1953) finds that their fertility is significantly reduced. Stenstedt (1952) and Essen-Möller (1935) both report normal fertility in their married depressive subjects and Lewis (1958) remarks that manic-depressives are normally fertile. Hopkinson (1963a) finds that fertility is significantly higher in those women whose illness begins after the age of 50, as compared with women who develop depression prior to that age. The age of onset of the illness does not seem to be of importance in the fertility of male

depressives.

The Genetics of Depressive Illness

It is fairly generally accepted that a strong heredo-familial tendency to manic-depressive illness exists, but the exact nature of this tendency is not clear. Rüdin (1930) reports that one-third of the children of a manic-depressive parent themselves develop the illness and the rate increases to 62.5% where both parents are manic-depressive. On the other hand, three-quarters of his manic-depressive subjects are born of apparently normal parents and there is no excess of parental consanguinity in his series. Slater (1936) postulates a dominant inheritance of the condition but suggests that inhibition of manifestation can occur. Stenstedt (1952) agrees with this view and adds that manifestation appears to occur more readily in the female than in the male. Hopkinson (1964) notes a lower frequency of genetic loading in depressive illness whose onset occurs after the age of 50 years, as compared with depression of earlier onset. Roth and Kay (1956) similarly find that in patients who develop depressive illness for the first time over the age of 60 years, physical illness and sensory deprivation are more important precipitating causes than an hereditary predisposition.

The closer the degree of consanguinity to a depressive patient, the greater appears to be the risk of being affected by the illness. (Rüdin, 1930: Slater, 1936). Twin studies appear to show the overwhelming importance of hereditary factors in manic-depressive illness (Kallmann, 1959), but recently there has been growing criticism of twin studies. Jackson (1960) points out that not only are twins in any case a highly-selected group, but there is frequently doubt in the diagnosis of zygosity

and preferential reporting of concordant identical twins. The genetic evidence supplied by twin studies must therefore be accepted with some caution.

Slater (1936) finds no relationship between manic-depressive illness and mental deficiency but he reports an excess of schizophrenics occurring in the families of his depressive subjects. Other investigators (Hansen, 1938: Stenstedt, 1952: Hopkinson, 1964) have failed to confirm any genetic affinity between depression and schizophrenia and Kallmann's (1959) finding of an excess of schizophrenics among the relatives of individuals with involutional depression has been discounted by Stenstedt (1959).

It therefore seems likely that there is a specific hereditary element in manic-depressive illness but it is not possible to define it accurately at present. It is probable that expression can be evoked or inhibited by certain factors and that the earlier the onset of the illness, the stronger is the genetic influence. Stenstedt (1952) points out that an outstanding difficulty in the way of obtaining an accurate estimate of hereditary factors is the ease with which many mild cases of manic-depressive illness may be overlooked.

PARENTAL DEPRIVATION AND MENTAL ILLNESS

Since in most cultures it is normal practice for children to be reared by their parents there is a general consensus of opinion that it is undesirable to be deprived of one's parents in childhood. This can scarcely be disputed but to assert, as many authorities do, that a variety of severe psychological abnormalities may arise in the child as a result

of such deprivation is to make an assumption of some magnitude. It requires an even larger assumption to postulate a causal connection between some long-past occurrence such as childhood bereavement and a psychiatric illness which develops in adult life. It will be contended here that, save in a small number of instances, the evidence for such a connection is meagre.

Goldfarb (1955) suggests that the family of upbringing performs five main functions for the young child and these are:-

1) it provides parents who bestow emotional warmth and love on the child andwho minister to its needs:

2) it provides for continuous contact, especially between the child and the mother-figure:

3) the mother is a source of safety and gratification and a means of reducing tension and discomfort by feeding, cleaning, fondling and so on:

4) the parents provide constant stimulation which is necessary for normal intellectual and emotional development:

5) the relationship with the parents allows the child to reciprocate and by a process of reality-testing to master its environment.

This list, which is by no means exhaustive, demonstrates some of the complexity of the mother-child relationship and it would not be surprising to learn that its severance while the child is still immature and very dependent could cause serious effects, both immediate and distant. But does it invariably, or even frequently, do so? Bowlby (1962), whose name keeps recurring in this field of study, describes the short-term effects on the young child of admission to a residential nursery or hospital. He defines three distinct stages in the child's reaction to the loss of its

mother: the stage of Protest, then after a variable time that of Despair and finally, after a very variable period, the stage of Detachment when he appears to forget his mother. The last stage becomes permanent if separation is prolonged enough. This course of events is probably a protective mechanism; in the first place to draw attention to neglect and later to allow the child to form a relationship with a substitute mother-figure. Bowlby regards the process as a form of mourning for the lost love-object and this may partly be true. However, as will subsequently be discussed, the situation is a far more complex one than he makes out.

In his early papers on the subject of parental deprivation, Bowlby (1940, 1944) reports the finding of severe intellectual and emotional disturbances in deprived, institutionalized children and he claims (1944) that these children are predisposed to severe psychiatric disorder in adult life, especially psychopathic and affectionless personality disorders. These claims are supported by a number of roughly contemporaneous studies, for example those of Ribble (1943) and Spitz (1945), but disagreement with such findings is growing stronger. Bender (1945) agrees that institutionally-reared children are psychologically disturbed but she finds no evidence of the concomitant physical ill-being that the earlier workers frequently note. Rheingold (1956) and Rheingold and Bayley (1959) are unable to confirm the presence even of psychological disturbance. Bowlby (1962), although he has not changed his theoretical standpoint on the effects of childhood bereavement, now says that it is probably only a small proportion of deprived children who go on to develop personality disorder. Some authorities, for example Lin and Standley (1962), would

insist that there is little evidence even for such a qualified statement.

The effects of institutionalization are complex, but the earlier workers chose mother-child separation as the cardinal feature because it fitted well with current psychiatric theory. Although the descriptions give hints of other influences these are usually not pursued because mourning for mother is the main preoccupation. For example, when Spitz (1945) describes children being reared in conditions of 'impeccable hygiene with precautions against contagion', he actually implies that these children spend their early months in an environment of almost complete isolation, visited by members of staff as infrequently as possible and handled briefly only when being fed or changed.

Experiments in which animals are raised in isolation are often quoted in support of theories of maternal deprivation. These animals show impaired physical and mental development but there is good evidence, for example that contained in the work of McClelland (1956) and Levine (1958), that it is not maternal deprivation but sensory deprivation that is the important factor here. These and other investigators have demonstrated that animals reared apart from their mothers but frequently handled and petted in early life show more liveliness and curiosity, grow more rapidly and to a greater size, and are more resistant to disease and stress than animals deprived of such stimulation. Similar conclusions have been reached by workers studying the human infant. Montagu (1953) and Fischer (1958) believe that sufficient tactile stimulation of the very young infant is more important for its normal development than the presence of a specific mother-figure. Some confirmation of this is lent by the work of Rabin (1957) who finds that Kibbutz-reared

children in Israel are no less emotionally stable and mature than children raised in private homes..

Casler (1961) who is a severe critic of the traditional views on maternal deprivation does not believe that the infant is capable of distinguishing a specific mother-figure before the age of six months and he claims that, provided the child is well-cared for and adequately stimulated before that age, it will develop normally even in institutional surroundings. Maternal deprivation after this age may be perceived by the child but provided an adequate mother-substitute (or substitutes) is available, the great majority of children will only be transiently affected by their bereavement. Casler holds that the original observations made by Bowlby and others stem largely from bad institutional conditions and not from the effects of maternal deprivation per se. He also points out that institutionalized children are a highly selected group: it is possible that a considerable proportion have been admitted to institutions for reasons which imply an adverse heredity or home-environment which may have affected them even before admission.

The literature on parental deprivation contains a great deal of impressionistic material and there is often great unwillingness to define terms. For example, it is often assumed that parental deprivation is synonymous with maternal deprivation and loss of father is rarely taken into account, although Batchelor and Napier (1953) suggest that it may be a factor of importance in attempted suicide. As can be seen, views on parental deprivation have been coloured by the work done on institutionalized children but parental deprivation must occur frequently in children

who never leave their own homes. Indeed, the question arises; what is parental deprivation? When the phrase comes to be examined, it is realised that it covers a whole constellation of factors.

Parental deprivation is often used to denote loss of the parent by death, but may also include physical absence of the parent due to other causes. It sometimes implies irrevocable loss but may be used to cover all types of parent-loss, permanent or temporary. At times it is even used to describe the emotional deprivation which occurs in a disturbed parent-child relationship with or without actual physical separation. Since many workers do not disclose what meaning they attach to the term 'parental deprivation' comparison between their results is unrewarding. The complications do not end there, because the age of the child when deprivation occurs and the duration of the deprivation-experience if it is temporary must be taken into account. Then again, it is customary to assume that parental deprivation is a serious occurrence but this is not necessarily so. The child whose father dies a hero's death or the child deserted by a brutal parent may not take a tragic view of the circumstance. The adequacy of the parent-substitute in continuing the rearing of the child may well be of paramount importance for the child's future mental well-being, but this figure is frequently ignored. Any study which professes accuracy on the subject of parental deprivation must state its position on all these variables.

A great difficulty in the assessment of the effects of childhood bereavement arises from our ignorance of what constitutes a normal level of parental deprivation in the general population. Few studies are extant which give information on this, but those which do, offer surprisingly high results. The Statistical Bulletin of the Metropolitan Life Insurance

Company (1944) states that 16.7% of the population of the United States have lost one or both parents before the age of 18 years. Norton (1952) calculates that 14.2% of a group of non-psychiatric hospital in-patients have lost one or both parents before the age of 16 years. Hilgard, Newman and Fisk (1960) report that in a general population census of individuals aged 19 to 49 years, 21% are found to have lost one or both parents before the age of 19 years. Stein and Sklaroff (1957), studying an apparently stable population in an Edinburgh suburb, make the surprising discovery that families with schoolchildren have an over-all rate of 16% broken homes.

Gregory (1958) has pointed out that rates of parental deprivation may vary considerably in time and place whereas there is no very convincing evidence that rates for mental disorders fluctuate in sympathy, even allowing for a prolonged time-gap. He remarks that parental deprivation rates are closely related to prevailing rates of mortality, separation and divorce. Almost invariably, children lose their fathers more often than their mothers because men are usually older than their wives, males have a higher death-rate than females of the same age and it is father rather than mother who disappears in circumstances such as war or divorce. Factors such as these may introduce considerable bias into a study if they are not allowed for.

Methods of Studying the Effects of Parental Deprivation

Potentially the most valuable method of studying parental deprivation is a prospective one in which a cohort of individuals deprived of parents in childhood is observed and any characteristic psychological reaction occurring thereafter is noted. Ideally, such a study should continue for

the entire life-time of the subjects but of course this method is enormously laborious and expensive and it is rarely used. In the field of social psychology, the outstanding example of the cohort study is the Terman Gifted Group Study which began in 1921 and is still continuing. In the field of parental deprivation, Bowlby is engaged on a lifelong project using the cohort method but unfortunately his description (1962) of experimental methods suggests that the design of the project leaves something to be desired.

Valuable clues about the importance of parental deprivation may be obtained in retrospective studies. These may concentrate on the frequency of mental illness occurring in individuals who have lost parents in childhood or may enquire into the frequency of childhood parent-loss in the mentally ill. The latter is the more popular method since it is easier to gather a group of individuals suffering from mental illness than one of individuals who have suffered parental loss. Examples of both methods are mentioned in the ensuing paragraphs.

Parental Deprivation and its Relation to Psychiatric Syndromes

It has been suggested at various times that parental deprivation is a causal, or at least a concomitant, factor in the aetiology of a number of psychiatric conditions. It is difficult to accept its specificity as a predisposing element when it is apparently found to excess in a number of disparate illnesses and it is therefore important to justify parental deprivation as a worthwhile area of investigation. To do this it is necessary to discuss the literature on parental deprivation as it pertains to various psychiatric disorders in order to demonstrate how flimsy is the evidence linking it to at least some of these disorders. In this way it

may be possible to show that it is rather less non-specific in its effects than at present seems likely. The occurrence of psychiatric disorder in the parentally deprived is considered first and then a number of psychiatric conditions are examined in turn for evidence of an excess of parental deprivation.

A. Psychiatric Disorder following Parental Deprivation

Studies which begin with the gathering of a group of parentally deprived individuals are sparse because of the difficulties of identifying such a group. Earle and Earle (1961) report on 100 adults in whom separation from the mother had occurred for a period of longer than six months in the first six years of life. The subjects are compared with controls matched for age and sex. It is found that early maternal deprivation is significantly related to the diagnosis of sociopathic personality and perhaps dissociative hysteria, to broken marriage, poor work-record and having been in prison or reformatory, but not to any other psychiatric diagnosis. Imboden et al. (1963) have studied the effects of childhood separation experiences in ostensibly healthy adults. Some 25% of their 500 subjects admit to separation as defined in the study and these individuals show a significantly higher score in the Cornell Medical Index and Morale-Loss Scale than do the non-separation individuals. However, the two groups show no difference in frequency of visiting a dispensary with symptomatic complaints and this leads the authors to suggest that the separation experience influences their reporting characteristics (as measured by the Cornell Medical Index) rather than predisposing them to illness.

B. The Frequency of Parental Deprivation in Psychiatric Conditions

1) Psychiatric Illness

In this category is discussed the small number of studies in which the authors give no details of diagnosis except that the patients are psychiatrically ill. Oswald (1958) reports that in young Serviceman presenting for medical examination the frequency of parental deprivation is significantly higher in psychiatric as opposed to neurological cases. Hilgard et al. (1960), in an examination of 3,579 patients in a state mental hospital, find that 27% of the patients had lost a parent before the age of 19 years, as compared with 21% of a group of normal controls: unfortunately they do not disclose if this difference is a significant one. Pollock (1962) gives details of parental deprivation in a group of patients seen by him in private practice, using the 1959 Statistical Abstract of the U.S. for comparison. The patients are admitted to be predominantly from the higher socio-economic strata. He finds that an excess of his female subjects have lost father in childhood as compared with the males, but a slight excess of males have lost mother. In the females, the highest incidence of parental death occurs in adolescence but in the males the peak is in the first two years of life.

As can be seen, the results in this type of study can only be vague at best. For all one knows, one particular psychiatric condition may be contaminating the results for all the others. The need for investigations involving much narrower categories of illness is obvious.

2) Psychotic Illness

Barry (1939) finds that maternal deaths occur three times more

commonly in the childhood of psychotic patients as compared with normal controls whereas paternal deaths show no such excess.

3) Psychoneurotic Illness

Stengel (1943) reports that all but two of eleven cases of psychogenic fugue have a history of gross disturbance of home life as a child. A positive correlation is found by Madow and Hardy (1947) between war neurosis and broken home while in a comparison of a group of psychoneurotic students with a matched group of non-neurotic students Ingham (1949) notes a relationship between psychoneurosis and intrafamily conflict. Other important concomitents he finds are mental illness in the parents and parental separation.

These studies emphasize the role of the disturbed home rather than of actual parental loss in the aetiology of psychoneurosis and this may be an important point. However, an excess of childhood bereavement in neurotics is stressed by Barry and Lindemann (1960). These investigators claim that their results show a significant relationship between psychoneurosis and death of the mother before the subjects fifth birthday, especially for females. Unhappily they base their results on a group of 947 patients with 'psychoneurosis or psychosomatic disorder' and do not differentiate between these categories.

The work on psychosis and neurosis as exemplified by the above studies again stresses the need for greater specificity in diagnosis and the rashness of clairing results which the study is incapable of providing.

4) Suicide and Attempted Suicide

It is customary to discuss these two topics together although it is probable that those who commit suicide and those who attempt it are two fairly distinct populations. From the available evidence it seems likely that they have at least one common link: both groups suffer to an excessive degree from the effects of parental deprivation and broken home. Two studies which suggest that parental loss is an important factor in the background of consummated suicide are those of Palmer (1941) and Reitman (1942). Although neither uses a control series, the findings certainly indicate an excess of deprivation. In Palmer's study, 11 out of 25 suicides had lost a parent before the age of 14 years and Reitman reports that 15 of his 25 subjects had lost a parent by death, desertion or other cause by the age of 15 years.

Similar findings are reported for attempted suicide. Simon (1950) notes that 29 out of 50 ex-servicemen hospitalized because of suicidal attempts have a broken-home background and Batchelor and Napier (1953) find that 116 of the 200 attempted suicides in their series come from broken homes while all of their teenage subjects are products of such a background. Harrington and Cross (1959) state that 22 out of 102 attempted suicides admitted to a general hospital have had an emotionally disturbed childhood: 11 of the 102 were separated from one or both parents by the age of 14 years. (The findings in this last study do not suggest any marked excess of deprivation but no controls are provided for direct comparison). Robins et al. (1957) arrange their attempted suicides into categories according to diagnosis and they note a differential frequency of broken-home background in the various psychiatric disorders: lowest

in depressives (47%) and highest in sociopaths (86%).

Suicide and attempted suicide can be associated with virtually any form of psychiatric illness and in Western societies at least, the majority of suicidal attempts are probably made in the presence of some form of psychological disturbance even if the disturbance is a very transient one. Since this association with psychiatric illness exists, it would be interesting to know if the degree of parental deprivation increases in suicidal as compared with non-suicidal individuals suffering from an otherwise similar psychiatric disorder. An investigation on these lines has been carried out by Walton (1958) who compares non-suicidal depressive patients with depressive patients who had threatened or attempted suicide and he demonstrates a significant excess of childhood bereavement in the suicidal group. Bruhn (1962) similarly finds an excess of broken-home background in psychiatric patients who have attempted suicide as compared with matched psychiatric patients who have not made such an attempt.

This finding of an excess of parental deprivation in the suicidal as compared with the non-suicidal patient is of practical importance. It is more than likely that a number of studies on parental deprivation have contained a proportion of patients who have attempted suicide. Their presence will almost certainly inflate the prevalence-figure for childhood bereavement and the credit for this may well go to the particular illness being studied rather than to the suicide-factor.

5) Schizophrenia

Wahl (1956) uses highly subjective criteria in reporting that 50.3% of 568 male schizophrenics come from homes where there is severe rejection and/or overprotection by one or both parents, but he also finds that 41% of the patients have lost a parent by death, divorce or separation before the age of 15 years, as compared with 11.4% of controls. Lidz and Lidz (1949) note a similar degree of parental loss in a group of 50 schizophrenics whose illness began before their 21st birthday. 20 of these subjects lost a parent by death or separation before the 19th birthday, about half of the parents being lost on account of serious emotional illness. Oltman et al.(1951) remark on a tendency to increased parental deprivation in schizophrenics whose illness begins before the age of 20 years but not in those with a later onset. Hilgard and Newman (1963) report a significant excess of maternal, but not paternal, deprivation in childhood in a group of schizophrenics aged 20 to 30 years at the time of admission to hospital.

An impression which is gained from these authors' findings is that the family background of many schizophrenics is disorganized to an abnormal degree and that parental deprivation may often be a result of this. In addition, such deprivation may influence the severity of the illness, causing a tendency to earlier onset.

6) Depressive Illness

Oltman and McGarry (1951) find little difference in the degree of parental deprivation in individuals with manic-depressive psychosis and in normals but Stenstedt (1952) states that dissolution of the home

before the age of 15 years or serious parental conflict may increase the risk that sibs of manic-depressive patients will themselves develop the illness. In his study of involutional depression Stenstedt (1959) further finds that 33% of his depressive subjects come from an unfavourable childhood environment.

Brown (1961) has conducted a study of 216 outpatients suffering fromdepression who are compared with controls attending local general practitioners. He also uses the 1921 Census results for comparison purposes, this particular census being employed on the grounds that it gives some indication of the amount of childhood parental loss among individuals who are now approximately of the same age-group as his depressive subjects. The findings include a significantly higher loss of parents in childhood among the depressives and especially loss of father, except for the period 0 to 4 years when father loss is no greater than that of the control group. The author reports that 12% of the depressive patients do not know if one or other parent is dead, which he regards as a possible reflection of family disruption in depression but which may equally raise doubts as to his diagnostic methods since the literature generally emphasizes the tendency to family cohesiveness of depressives. It is not made clear exactly what type of depressions the author is studying and out-patient depressives often include a large admixture of depressions secondary to other conditions. Finally, the proportion of those with suicidal tendencies is not mentioned.

Beck et al. (1963) report on a carefully-performed study which unfortunately has no normal comparison-group. These investigators have

classified 297 depressive subjects, by means of a depression inventory and by clinical evaluation, into a 'high-depressed' group and a 'low-depressed' group. The high-depressed group (the most severely ill) shows a significantly higher prevalence (27%) of orphanhood before the age of 16 years than does the low-depressed group (12%). There is no obvious relationship between the age of the parents, the occurrence of orphanhood and the onset of depression and it is concluded that death of a parent in childhood may be a factor influencing chiefly the degree of severity of a depressive illness.

This last point seems an important one. It is conceivable that loss of a parent in early life is one of the factors which geneticists postulate on theoretical grounds to explain the variable expression of the hereditary tendency to depression.

Parental Deprivation: Its Significance to Mental Illness

From this survey of the literature it can be asserted that there is no convincing proof of a causal relationship between parental deprivation and mental illness. Loss of the parent in childhood may have effects on the developing personality but it is likely that these effects become noticeable only where deprivation occurs in an already-vulnerable personality or where the child is not protected from the consequences of losing the parent.

It is possible that parental deprivation may be an important modifying influence in the natural history of several psychiatric conditions but not perhaps in the rather indiscriminate fashion that a first glance at the evidence would suggest. For example, it may on the one hand

accentuate the severity of a depressive illness but on the other hand, accelerate the onset of schizophrenia. In psychoneurosis, parental disharmony rather than actual parental loss may be of importance but in suicide and attempted suicide, both parental disharmony and parental deprivation appear to be prominent factors.

If, as is suggested, parental deprivation does have such comparatively specific effects it is certainly a subject worth further examination, particularly if it can provide help in delineating populations at risk of psychiatric illness. In the belief that this is so, the present study has been carried out.

THE USE OF EPIDEMIOLOGICAL METHODS IN THE STUDY OF PSYCHIATRIC ILLNESS

Lilienfeld (1957) defines epidemiology as the study of the distribution of a disease in space and time within a population, and of the factors that influence this distribution.

Originally applied to the study of communicable disease, the value of epidemiology in studying non-communicable, including psychiatric, illness is now widely accepted. (Reid, 1960). Unfortunately, its contribution to accuracy and impartiality in psychiatric research is still severely hampered by such limiting factors as vagueness of diagnostic criteria, controversy over nomenclature and lack of objective standards of severity of an illness. Even with the application of epidemiological and statistical techniques the results of closely similar studies on psychiatric disorders may not be comparable because of the inability of the investigators to agree on basic theoretical premises. It is a paradox that, in the study of psychiatric research-literature, it is often easier to understand the description of experimental method than it is to understand the

psychiatric content. It is obvious that the use of factual methods in psychiatric research must be extended: if it is possible to agree on techniques it may eventually be possible to agree on principles.

The use of epidemiology in psychiatry is increasing, largely because it offers one method of avoiding the somewhat anecdotal approach which is still very prevalent in research into mental illness. However, its suitability as a research tool is not universal and the four main uses to which epidemiology can be put in psychiatric research are enumerated by Lin and Standley (1962):

1) to assess the prevalence of different types of mental ill-health in a population as a basis for the prevention, treatment and control of these diseases;

2) to uncover associations between population characteristics and disease that may clarify the origins of mental disorder;

3) to test aetiological hypotheses originating from laboratory or clinical studies;

4) to assess rates of spontaneous recovery to evaluate the effectiveness of preventive and therapeutic measures.

The use of epidemiological technique in this study does not imply that an attempt is being made to estimate, for example, the prevalence of depressive illness in the population at large. The study begins with a selected group of depressive patients and methods 2) and 3) (above) are employed to investigate a possible relationship between depressive illness and certain factors in the lives of the individuals concerned. Should these methods reveal any significant relationships it must be

stressed that it is not justifiable thereupon to assume that the factors have caused the illness: it can only be stated that they are somehow related to it. This is no disadvantage, since the demonstration by objective means that such relationships exist allows future research to be carried out to define their nature more exactly.

GENERAL METHOD

GENERAL METHOD

This study consisted of an investigation into a number of aetiological factors in depressive illness and in order to enhance its validity, considerable care was taken with its planning. At each stage of the planning, the design was discussed and criticised at meetings with colleagues expert in psychiatric research. Difficulties or oversights which occurred were thus dealt with in the preparatory period and no modification of method was found necessary when the study itself began.

It was decided to investigate patients admitted to psychiatric hospitals in the Edinburgh area on account of depression and a maximum of two years of full-time research was allotted to the study. A retrospective method of investigation was chosen as being most economic of time and it was arranged that the investigator would obtain data on a total of approximately 150 depressive patients. A questionnaire was devised which enabled the investigator to obtain all the relevant information at a single interview with each patient and without recourse to any outside source of information.

When the form of the study had been finalised, a pilot study was carried out. Ten depressive in-patients were interviewed and a questionnaire was completed in each case. No unforeseen difficulties arose: the interviews were uneventful, the patients co-operative and the data apparently satisfactory. So smoothly did the pilot study run that these patients were able to be included in the definitive series.

It was obvious that the results of an investigation of this type

could be shown to be significant only if they could be compared with some normal standard. The need for a satisfactory control series was self-evident and it was necessary to be sure at an early stage that a source of control-material was at hand. It was suggested that out-patients attending medical and surgical clinics in a general hospital were likely to be fairly representative of the general public. With the co-operation of the physicians of the Western General Hospital, Edinburgh, the investigator interviewed a total of 210 medical and surgical out-patients, completing for each one a questionnaire schedule identical to that used for the depressive patients. The results of this investigation suggested that medical and surgical out-patients as a group were not unrepresentetive of the population as a whole. By the completion of a questionnaire in each case, all the data required for comparison with a group of depressives was available and so these patients were used as the control series.

At this point the method of investigation was demonstrably satisfactory and a suitable control series had been obtained. It was now possible to proceed with the collection of data from depressive patients. The investigator arranged to visit each psychiatric hospital in the Edinburgh area at a particular time each week and at each visit patients admitted with depressive illness since the previous week were referred for interview. The diagnosis of depression was checked by means of a clinical interview with the patient and then a questionnaire was completed for each case. A total of 183 depressive patients was interviewed but it was decided that 30 of these were suffering from depression secondary ...

to another psychiatric condition and they were excluded from the final series.

During the course of the study, information from each depressive patient and each control individual was transferred from the questionnaire schedules to punch-cards. As a result, analysis of the data could be started as soon as the collection of information was complete.

As may be seen from this outline description of the research, the study proceeded in a series of stages and in the following section these stages will be described in detail.

THE INVESTIGATION

THE INVESTIGATION

Object To examine a number of hypotheses on aetiological factors in depressive illness with especial regard to those which seek to demonstrate a causal relationship between certain occurrences in childhood and the subsequent development of depressive illness.

Aim To study a group of patients suffering from depressive illness and to compare them with a matched group of non-depressive individuals in order to test the following hypotheses:

1) Parental deprivation, by death or by other cause, predisposes towards depressive illness.

2) The age of the parents is of significance in the aetiology of depressive illness in that the older the parent at the time of the individuals birth, the more likely is that individual to develop depressive illness.

3) Loss of a parent in childhood by death is more likely to cause a tendency to depressive illness than loss of a parent by a cause other than death.

4) Loss of mother during childhood is more important in predisposing to depressive illness than loss of father.

5) A disturbed parent-child relationship in early life is important in producing a tendency to depressive illness.

6) Persons suffering from depressive illness belong to a larger-than-average sibship in their family of upbringing.

7) The ordinal position of the depressive indivual in his sibship is of importance in the aetiology of depressive illness.

8) Depressive patients tend to remain unmarried more than do normal individuals and the fertility of married depressives differs from that of married non-depressives.

9) Depressive patients more often present a positive family history of severe mental illness than do normal individuals.

10) Individuals with severe depression more often have a positive family history of severe mental illness than do individuals with less-severe depression.

Definitions

1) Depressive illness is defined as a primary disturbance of affect in the direction of sadness.

2) A case of depressive illness: a patient will be acceptable for inclusion in the study if he has been diagnosed by a psychiatrist as suffering from depressive illness (as defined above) and the investigator making an independent examination, agrees with this diagnosis.

3) A case of suicidal depression: a case of depressive illness where the patient, as part of this or a previous illness, has deliberately tried to harm himself. A patient with thoughts of suicide who has never attempted to harm himself will not be regarded as a case of suicidal depression.

4) Childhood is taken arbitarily to mean the time from birth till the 16th birthday.

5) Parental deprivation refers to the complete absence of a parent for any reason during a continuous period of three months or more in the patient's childhood.

Auspices of the Study

This study was carried out during the investigator's tenure of the

post of clinical member of the scientific staff of the Medical Research Council Unit for Research on the Epidemiology of Psychiatric Illness, Edinburgh. Permission to undertake the study was granted by the Honorary Director of the Unit, Professor G. M. Carstairs.

Time Schedule of the Study

February - March 1963	:	Preliminary formulation of hypotheses and study-method.
March 1963	:	Approval of the project.
April - July 1963	:	Review of the literature and design of the project.
September 1963	:	Pilot study.
October 1963 - January 1964	:	Obtaining the control series.
January - July 1964	:	Data-collection on depressive patients.
August - October 1964	:	Processing of data.

Preliminary Formulation of Hypotheses

In an investigation of this type it is essential to know at the outset exactly what information is being sought and how it is to be obtained. If the results of the research are to be acceptable it must be shown that the experimental method was held constant throughout the process of data-collection, so the necessity for careful planning and prior elimination of inconsistencies is vital.

This study began as a surmise arising from an hypothesis, the hypothesis being that individuals suffering from depressive illness tended to be deprived of their parents during childhood to a significantly

greater degree than non-depressives. As has been demonstrated in the preceding review of the literature there is some evidence to support this contention but the evidence is equivocal and there is certainly no proof for the frequent assumption that the parental deprivation is a cause of the depression. If depressives are excessively prone to childhood parent-loss, other explanations than cause-and-effect are possible: at this point the surmise arose. It seemed not unreasonable to suggest that depressives lost their parents in childhood to excess because they had been born of older-than-average parents who would, in the natural course of events, tend to die at an earlier stage in the lives of their children.

A close examination of the literature revealed a small number of references to parental age in mental illnesses other than depression (see page) but none to this aspect of depressive illness. On consideration, it seemed a worthwhile (deprivation) avenue of enquiry, firstly because the findings which suggested that parental deprivation occurred to excess in the childhood of depressives were not overtly convincing and would need to be confirmed or refuted as a preliminary to research into parental age: and secondly, if it could be shown that depressives had a tendency to be born of older parents, interesting aetiological possibilities might arise. As is well-known, a high proportion of infants suffering from Mongolism are born of older mothers and a genetic basis has now been established in this condition. If a similar situation were found to obtain in depressive illness it would suggest a possible new line of enquiry into the aetiology of affective disorder.

After it had been agreed that the relationship between depressive illness, parental deprivation and parental age should be studied, another

thorough examination of the literature on depression and parental deprivation was undertaken. As a result of this, certain other aspects of the aetiology of depression were noted which could profitably be examined and which could readily be included in the projected investigation. Ultimately, the ten hypotheses listed above were constructed and it was possible to proceed to the design of the experiment.

The Geographical Area in which the Study took place

The study was conducted in a number of hospitals in the Edinburgh area. Edinburgh, with a population according to the 1961 Census of 468,361, is the Capital of Scotland and the County town of the County of Midlothian. It is largely a commercial and residential city but it possesses a growing number of industrial concerns and Leith, the port of Edinburgh, is an active centre of trade, especially with the Continent. The city's hinterland is largely given over to farming but there are a number of coal-mining areas and several small towns associated with light industries. Thus, the city of Edinburgh tends to be residential and substantially middle-class but in the area as a whole a wide distribution of occupations and social classes obtains.

Hospitals in the Edinburgh Area

Edinburgh is renowned for its University and Medical School. Closely associated with the latter is the Royal Infirmary which, with 1,123 beds, is the largest of the city's general hospitals. There are a number of specialized hospitals in the city and also several district hospitals, the largest of which is the Western General Hospital with 510 beds. The

majority of this hospital's beds are given over to the major specialities and there are active out-patient clinics to which come patients from a wide range of socio-economic levels.

Neither the Royal Infirmary nor the Western General Hospital has in-patient psychiatric beds although the former has a Professorial Department of Psychological Medicine and both have psychiatric out-patient clinics. The main psychiatric in-patient centre is the Royal Edinburgh Hospital which has 1,141 beds. This is really a complex of hospitals all administered by a single board of management and its constituent elements are: Jordanburn Hospital, which is the Professorial in-patient unit, West House Hospital, Craig House Hospital and associated nursing homes. Two other hospitals, Bangour in West Lothian (1,080 beds) and Rosslynlee in Midlothian (402 beds) lie outwith the city boundaries and serve their respective counties but also admit patients from Edinburgh. West House, Bangour and Rosslynlee act as district psychiatric hospitals for particular sectors of the city.

On the whole, patients tend to be admitted to the hospital which is responsible for their home area but this system is by no means rigid and, for example, it is usually considered more advisable to re-admit a patient to the hospital where he was previously treated than to admit him to another hospital because he has moved house to another part of the city. Admission to Jordanburn is more selective because of its teaching and research functions while admission to Craig House and the nursing homes is usually on a paying basis. Each hospital has its own out-patient clinics, usually held in the districts which it supervises.

The psychiatric facilities available to Edinburgh citizens are fairly comprehensive and it is probable that the majority of individuals from the city and its surrounding districts who require in-patient psychiatric treatment receive it at one of the hospitals described above. From the point of view of the present research-project the area was compact enough to enable an investigator to screen all the psychiatric hospitals for cases of depressive illness and thus to obtain a group of patients representing all strata of society.

The Type of Study

The study was planned to be carried out in its entirety in the relatively limited maximum time of two years. In an illness such as depression whose natural history may span the greater part of a lifetime, an ongoing study of such short duration would be of small value. It was therefore decided that the study should be an anamnestic one in which a group of depressive subjects would be questioned to obtain the desired information. Since this information was for the most part of an objective nature it seemed reasonable to set about obtaining it in this way.

Before the study began no reliable estimate was available of the number of patients with primary depressive illness who would be likely to require admission to Edinburgh psychiatric hospitals in a given period. It was agreed that a series of some 150 depressive subjects would provide sufficient material for statistical analysis. Since most estimates concurred that the admission rate for female depressives was approximately twice that for male depressives it was arranged that the series would be complete when 50 male subjects had been interviewed. The decision to

interview patients in all the psychiatric hospitals in the Edinburgh area was made partly to facilitate the speed of gathering cases but mainly to ensure that there would be adequate representation of both sexes, all age-groups (within the defined limits) and all socio-economic levels among the subjects. It should be stressed however that no attempt was made to estimate prevalence or incidence rates for depressive illness, this being no part of the study, and despite the use of epidemiological methods, the research was not in any way a community survey.

The design of the study was made as simple and straightforward as possible and in the interests of scientific communication terms were defined closely and criteria were rendered as objective as could be. This conceivably sacrificed a number of subtle nuances but this loss was compensated by the opportunity to obtain some firm data in an area of psychiatric theory notably lacking in the commodity. It was not found possible to set up an experimental design which closely followed previous work because previous work was usually so loosely constructed. It was hoped that the present study, by virtue of its simplicity of design, would be capable of being reproduced with little difficulty.

The study contains a control series which can be criticized on the grounds that it does not necessarily represent the general population, but an attempt has been made to demonstrate that it is not markedly unrepresentative and this does not seem to have been done in previous investigations in this field. In addition, the information about both depressives and controls was obtained by a single investigator who carried out personal interviews on all the patients using a standard interview-technique based

on a questionnaire. The standard of the information obtained should therefore be consistent throughout the depressive and the control series.

Only in-patients were included in the depressive series so as to obtain as little diagnostic variation as possible, and since the patients were drawn from several different hospitals it was hoped that no consistent diagnostic bias would be present. Any patient whose diagnosis did not meet the criteria of the study was rejected by the investigator with the result that all the patients in the final series were regarded as undoubtedly depressed in the opinions of two psychiatrists.

The use of a retrospective method of collecting information is a possible source of criticism since retrospective enquiry may produce unreliable data. The human memory is notoriously fallible and it is desirable to have some independent means of checking the material obtained by this method. Unfortunately, most of the information obtained in this study was not readily confirmable but the consistency of the results suggests that it was not unduly inaccurate. Although it was feared that the reporting characteristics of depressive individuals might be affected by the illness and that they might be more likely to repress psychological material relating to their early lives, this did not appear to happen.

Despite the precautions taken to ensure diagnostic accuracy, the diagnosis of depressive illness was a clinical one because no more reliable method was available. Although not part of the original design of the study, in a proportion of the depressive patients the investigator completed a symptom-sign inventory (see Appendix 6) in an attempt to differentiate objectively between endogenous and neurotic depression, but this

failed because virtually all the patients were receiving antidepressant treatment by the time they came to inter-view and this invalidated the test. This difficulty in diagnostic precision is unfortunately inherent in most psychiatric studies and must inevitably reduce the confidence with which results can be accepted. Then again, as pointed out in the review of the literature (page), in a short-term study it is likely that a number of cases are actually other conditions in masquerade. Only the rigorous exclusion of doubtful cases, as was carried out in this research, can reduce this possibility to a minimum.

It is not suggested that this study is free of errors but it is possible that it has been carried out at least as accurately as any research which is reported in the literature on parental deprivation.

Selection of Patients for the Study

The aim of the study has been to examine certain concomitants of depressive illness and in order to avoid confusion by extraneous psychopathology it was essential to obtain a group of patients who, so far as could be determined, had no history of psychiatric disorder other than affective illness. For this reason, any patient who, in addition to his depressive illness, showed one or more of the following characteristics was excluded from the study:

1) a psychiatric condition other than affective illness;
2) thought disorder, thought-blocking, thought-interference, thought-incongruity;
3) emotional incongruity;
4) passivity feelings;

5) clouding of consciousness and disorientation;

6) a history of convulsions;

7) a history of severe head-injury;

8) evidence of neurological abnormalities.

It was pointed out in the review of the literature (page 16) that depression in the elderly appeared to differ in several important respects from depression of earlier onset and that it required separate consideration. Consequently, no patient who had celebrated his 61st birthday was admitted to the depressive series. The lower age limit was set at the 16th birthday since this, by definition, marked the end of childhood.

To increase diagnostic accuracy it was decided to study only in-patient depressives although these admittedly form a highly-selected group and many of the reasons for selection are only imperfectly known. A sizeable number are admitted to hospital because antidepressant treatment at home has not improved them: others are admitted because of the severity of the illness or the danger of suicide. It is probable that depressive in-patients represent the more severe end of the depressive spectrum but at present this is assumption. However, in this study it was more important to obtain subjects undoubtedly suffering from depressive illness than to obtain a 'representative' sample of depressives and it was simpler to attain this end under in-patient conditions. In addition, the in-patient situation was more conducive to the conducting of a formal interview than the conditions in a busy out-patient clinic and in-patients were more readily available for re-interview if, on occasion, all the information was not gathered at the first session.

Permission was obtained from the medical superintendents or senior consultants of the psychiatric hospitals in the Edinburgh area (Jordanburn, West House, Craig House, Bangour and Rosslynlee) to visit each hospital once a week and on each occasion to interview those patients admitted since the previous visit because of depressive illness. In this way, it was possible to see virtually all the in-patient cases of depressive illness from Edinburgh and the surrounding districts admitted during the period of the study.

To minimize the possibility of personal bias in diagnostic procedure it was arranged that at each visit the investigator would be given a list of patients between the ages of 16 and 60 admitted in the preceding week whom the medical staff had diagnosed as suffering from depressive illness. Each of these patients was then interviewed and clinically assessed by the investigator and a questionnaire schedule was completed in every case. In all, 183 patients were referred in this way and all were undoubtedly depressed. However, 30 were found to be suffering from a depression secondary to a psychoneurosis or a personality disorder and, although details were recorded in these cases exactly as in the others, they were excluded from the final series, leaving a total of 153 primary depressions.

At the end of every visit to a hospital, a check was made with the member of the secretarial staff dealing with admission formalities to ensure that no case of depression had been overlooked. If any appeared to have been so, a member of the medical staff was informed and if he agreed that the case met the criteria for the study, the patient was interviewed.

It was found to be more satisfactory if the investigator called at the hospital in person each week rather than telephoning to enquire if suitable cases were available since his regular appearance prompted the medical staff to prepare lists of patients beforehand and there was less likelihood of patients being overlooked.

The system worked admirably. The minimum of work was required of hospital staff and this ensured their goodwill in the research. If it was ever inconvenient from the hospital's point of view for the investigator to call at a particular time a different time was mutually arranged and if, for any reason, the investigator was unable to visit at his expected time, the hospital was informed. These and similar courtesies enhanced the willingness of medical, nursing and secretarial staff to co-operate and no instance of obstructiveness was encountered in the course of the study.

The Interview

Insofar as it was possible the interview followed a set pattern, this being made comparatively easy by the fact that a single individual was conducting all the interviews. The investigator opened the interview by introducing himself by name and by explaining that he was a doctor on the staff of Edinburgh University. (The use of the name of the University was justifiable because the investigator was an honorary lecturer: it was considered that mention of the University would mean more to a patient than reference to the Medical Research Council about which many people know little). The patient was then told that he was being seen from a research point of view and not as part of his personal treatment regime

and he was asked if he agreed to be interviewed. Only three depressive patients refused permission on the first occasion of asking, probably because of agitation associated with the depression, but in each case full co-operation was obtained at the next visit.

The first two or three minutes of the interview were given over to this introduction and to informal conversation to put the patient at ease. Thereafter, the conversation was led, without apparent break, into an enquiry about the patient's current illness, its symptoms, severity and duration. The patient was asked about a history of previous psychiatric illness and what form it assumed; about a family history of affective disorder; about possible precipitating causes of the present illness; and about the treatment which he was receiving for the current illness. The cardinal feature sought for in the course of this examination was the presence of depressive affect. In some cases this was already responding to treatment and more reliance had to be put on history than on clinical appearances.

Hamilton and White (1959) list a series of signs and symptoms which they regard as typical of depressive illness and this symptom inventory was used as a guide for questioning the patient about his illness. At first it was intended to complete an inventory-schedule for each patient but this was found to be impracticable. However, the list of signs and symptoms provided a convenient and standard method of checking the patient's complaints. The list was as follows:

1) Depressed mood.

2) Guilt

3) Suicide

4) Insomnia (initial)

5) Insomnia (middle)

6) Insomnia (delayed)

7) Work and Interests

8) Retardation

9) Agitation

10) Anxiety (psychic)

11) Anxiety (somatic)

12) Gastro-intestinal symptoms

13) General somatic symptoms

14) Genital symptoms (loss of libido)

15) Hypochondriasis

16) Loss of insight

17) Loss of weight

Because of the careful prior selection of cases it was rarely difficult to be sure of the diagnosis of depression but it was frequently difficult to differentiate into endogenous and neurotic types. In 60 of the 163 depressive patients in the study, a symptom-sign inventory, adapted from that of Foulds (1962), was completed in an attempt to objectify the differentiation (for details see Appendix 6) but this gave no help, largely because the clinical picture had usually been altered by the effects of treatment by the time the inventory was applied to the patient. Despite this difficulty, each case was clinically assessed as either an endogenous or a neurotic type of depression. In the opinion of the investigator this was mainly a division into severe and less-severe forms.

Endogenous depression was diagnosed in the presence of one or more of the following circumstances:

1) if the depression of mood was severe;

2) if delusions, somatic delusions or severe guilt feelings were present;

3) if the depression was disproportionately severe in relation to the nature of the precipitating factors if these were present, or if it persisted unduly when they were removed. (Otherwise the presence or absence of precipitating factors was not considered as a means of differentiation);

4) if the depression was recurrent in the absence of adequate provoking factors or if there was a previous history of manic illness.

The degree of agitation or anxiety was not regarded as per se an indication of the degree of depression and an attempt to commit suicide was not regarded as a criterion of severity of the illness unless the circumstances of the attempt were obviously psychotic.

The clinical assessment of the patient's condition lasted approximately fifteen minutes and when it was complete the investigator decided whether the patient was indeed suffering from a primary depressive illness and whether this was endogenous or neurotic in its degree of severity. Once these decisions were made they were irrevocable so that they could not be affected by subsequently-obtained information about factors whose association with the illness was under investigation.

The next stage of the interview was the completion of the questionnaire which was carried out in all cases, even if the patient had been diagnosed

as suffering from a secondary type of depression. The questionnaire was completed by the investigator who recorded the answers on the schedule. While an attempt was made to complete it systematically, it was found that information was often obtained without asking and as much as possible the patient was allowed to express himself freely. In this way it was ensured that the investigator's personality intruded itself as little as possible. Garrulous patients at times had to be brought back to the point, but in the great majority of cases it was not difficult to acquire the data by careful listening and the interjection of simple, non-committal questions as required by the questionnaire. Great care was taken that the questions asked by the investigator should remain unvaried in essence throughout the study, even though there was a frequent temptation tc attempt to amplify certain points as the research progressed.

Completing the questionnaire lasted 10 to 15 minutes in most cases and it was necessary in only a small number of cases for the investigator to have to arrange a second interview to finish the schedule. A patient's inability to provide all the information required of him at a single session was almost invariably due to his having had electro-convulsive therapy earlier in the day. The following interview was then arranged so as not to fall on a treatment day.

The questionnaire items will now be considered in detail.

The Questionnaire

The Questionnaire The questionnaire schedule is reproduced in this thesis (Appendix 4). In practice it consisted of a sheet of foolscap paper printed

on both sides but for convenience it is shown here on quarto-size paper. Answers to questions were written in the spaces provided or, in some cases alternative answers were provided and the correct choice had to be marked by an encircling line.

The questionnaire was designed to be suitable for application both to depressive patients and to non-depressive control patients. It contained eight sections, each dealing with a particular aspect of the case, and these were as follows:

1) Routine Information: for reference purposes, the date of interview, the name of the hospital and the date of the patient's admission to it, and the name of the psychiatrist who referred the patient for interview were noted.

2) Personal Data: the patient's name and address and the name and address of his general practitioner were recorded. These details were of no significance to the present study but provided a means of tracing patients should there be a desire to follow-up the group of depressives at a later date.

The sex, date of birth, age and civil state of the patient were all recorded as being pertinent to the investigation. Religious persuasion was enquired after because it was likely to be an important variable in any study concerned with family size. The patient's occupation (or husband's occupation in the case of a female) was noted in order to assess his socio-economic position as defined by the Registrar General's Classification of Occupations (1960).

3) Previous History of Psychiatric Illness: since a depressive

illness is frequently only one episode in the natural history of an affective disorder, it was thought necessary to record the details of the first and any intervening episodes. Where there was a positive history of psychiatric illness, the approximate date of the episode, the form it took, its duration and its treatment were noted. The name of the hospital where treatment had been carried out was obtained lest in some future study more precise details of the past history would be required. Taking this fairly comprehensive past history was found to be of great assistance in confirming the current diagnosis.

4) The Current Psychiatric Illness: this by definition was always depressive illness but the term on the schedule was a general one so that it could apply to any current psychiatric condition presenting in a control-patient. In the depressive patients it was noted whether the illness was endogenous or neurotic and how long the present attack had lasted. In order to decide whether the depression was primary or secondary the presence of the following entities was sought for:

1. Personality disorder
2. Psychosis other than depression
3. Psychoneurosis
4. Alcoholism
5. Mental defect
6. Epilepsy
7. Any other psychiatric illness

Evidence of a cyclothymic personality was not regarded as inconsistent with the diagnosis of primary depression and below-average intelligence of

itself did not exclude a patient from the series, but the presence of one or more of the other conditions mentioned above led to his being rejected. If there was doubt whether the patient was truly a chronic alcoholic or merely over-indulgent in alcohol he was not accepted for the series.

Although the presence of demonstrable precipitating factors was not regarded as of great diagnostic significance, the schedule allowed for them to be recorded if they occurred.

5) Family History: in this section the first purpose was to obtain details of parental age at the time of the patient's birth and of the patient's age at the time of his parents' deaths. The patient was asked if the parent was alive and if so, what age the parent was. Subtraction of the patient's age from the parent's age gave the age of the parent at the time of the patient's birth without having to enquire specifically for it. If the parent was dead, the same result was obtained by finding the age of the patient at the time of the parent's death and by subtracting the result from the age of the parent at the time of death. In this way, all the information was obtained by asking the patient only for easily-remembered events, dates and ages.

Where the parent was dead, details of his name, birthplace, last address and the place where death occurred were noted so that they could be used to obtain more precise information from Register House, Edinburgh, if this were necessary to a future study.

A family history of mental illness was then enquired for and a note was made of its presence or absence, who was affected and the form the

illness took, if this was known.

Next, as an integral part of the investigation into sibship size in the family of upbringing, the number of sibs of the patient was recorded, their sex, the order in which they came and the patient's ordinal position in the family. Note was also taken of parental re-marriage, the presence of step-sibs, the death of sibs during the patient's childhood and whether the patient was an adopted child. To investigate the fertility of depressive patients, the age, sex and number of his own children were noted and he was asked if he had lost any children by death.

6) Personal History: here the patient was asked if he had been a twin at birth and then information was sought about separation from parents during the period of childhood. If separation had occurred the reasons for it, the nature of the separation and the period in childhood in which it had taken place were gone into. If the separation was temporary its duration was obtained and details of the parental surrogate were enquired for.

7) Factors Causing Disturbance in Family Relationships: it seemed important here that the investigator should not attempt to suggest any factors to the patient but should instead allow him to express his own opinion about disturbed relationships in his home of upbringing. The questions asked on the topic were made as neutral as possible, the patient first being asked, "Was there anything in your childhood home which you now regard as having been particularly unhappy or upsetting?" If the answer was in the affirmative, his complaint was recorded and he was asked, "Was there anything else which was unpleasant at home when you were young?"

Any further complaint was recorded.

If the answer to the first question was negative, the second question was altered slightly to, "Was there anything at all which was unpleasant at home when you were young?" Otherwise , no further pressure was put on the patient to recall unhappy childhood events and if the response remained negative this was noted.

8) Physical Illness, Present and Past: the main purpose of this section was to provide a means of recording the presenting physical complaint and the previous history of physical illness of the control patients, but the same details were collected from the depressive patients to ensure uniformity of data.

The questionnaire schedule did not contain any section dealing with attempted suicide but from the beginning of the study details of this if it had occurred were noted at the top of the front page of the schedule.

On completion of the questionnaire the formal interview was at an end. Many patients wished to talk a little more and it was now possible to be perfectly informal, but care was taken not to express any opinion on their condition or on the treatment being received lest the hospital staff be antagonized by apparent interference.

The entire interview took on average approximately half-an-hour.

Personnel and Equipment Used in the Study

The study was carried out almost entirely by the investigator with of course the readily accessible advice of Medical Research Council colleagues and the assistance of these psychiatrists who prepared lists of patients to

be interviewed at each visit to hospital. Access to secretarial assistance was available when required but virtually all that was required of the secretary was to prepare stencils and to print batches of questionnaire schedules and symptom-sign inventories as required.

The investigator completed each schedule during the interview with the patient and as soon as possible thereafter he transferred the information to punch-cards.

The equipment used in the study was of the simplest nature:

1) Approximately 400 sheets of foolscap plain paper for questionnaire schedules.

2) Approximately 100 sheets of quarto plain paper for symptom-sign inventories.

3) Approximately 400 Copeland-Chatterson punch-cards for recording data.

4) Approximately 150 plain cards for recording article-references.

5) A notebook into which was entered the name and place and date of interview of each patient. This was carried by the investigator and was a useful form of reference when visiting a hospital as to which patients had already been seen.

Since visiting each psychiatric hospital in the area once a week involved some 72 miles of travel, the use of a motor-car was of considerable assistance.

THE PILOT STUDY

THE PILOT STUDY

By the beginning of September, 1963, the project's design had reached a stage where it required practical application to test its efficacy. All foreseeable theoretical difficulties had been dealt with, the questionnaire appeared adequate to obtain the required information and, as described previously, the type of patient to be studied had been closely defined.

It was decided that 10 depressive patients should be interviewed to test the research method. Permission was obtained from Professor G. M. Carstairs to interview in-patients in Jordanburn Hospital, the Professorial in-patient unit where there was a high admission-rate and thus a good chance of finding depressive patients with relative ease. The investigator therefore conferred with the psychiatrist in Jordanburn who dealt with the admission of cases, explaining to him the purpose of the investigation and he agreed to refer those cases which appeared to him to agree with the criteria of the study.

Following this, the investigator visited the hospital on three occasions at weekly intervals and 10 depressive patients (5 male, 5 female) were referred for interview. No difficulty was encountered: the patients were co-operative, even enthusiastic, and gave no indication of resentment at being included in a research-project. The interviews followed a smooth course and the required information was obtained without difficulty.

As a result, it was practicable to proceed with the study without changing the experimental method in any way. Of the 10 patients seen,

it was possible to include 8 in the definitive series of depressive patients. The remaining 2 (1 male, 1 female) were regarded by the investigator as suffering from depression secondary to another condition and they were relegated to a separate 'Reject' category. As the investigation proceeded, similar cases of secondary depression were included in this category.

No further details of the pilot-study patients are given here since they are most appropriately discussed in the context of the entire series.

THE CONTROL SERIES

THE CONTROL SERIES

It would be of great assistance in any epidemiological study of psychiatric illness to have a ready supply of control individuals but this is difficult to ensure. In planning this study it was realised at an early stage that suitable controls were necessary to render the results meaningful and in considering available sources, the possibility of using general hospital out-patients was entertained. This had something to commend it since it seemed likely that individuals who were themselves in a hospital setting would be more willing to co-operate in a medical research project. As well as this, out-patients are usually available in large numbers: for example, in a typical week the Royal Infirmary of Edinburgh deals with well over a thousand surgical out-patients and in a typical month with some six hundred medical out-patients. Therefore, in any month, the Infirmary's medical and surgical clinics alone will see approximately five thousand out-patients, about half of whom attend by appointment.

From these figures it can be seen that, during a comparatively brief period of time, the Royal Infirmary of Edinburgh will pass through its out-patient clinics a sizeable proportion of the population of the area it serves, and this is true of any active general hospital. Where such large numbers of people are involved it seems possible that a random sample of medical and surgical out-patients would not differ greatly from the population at large, apart from the illness which caused attendance at the hospital.

Fortunately, for the purposes of this study it was not necessary for the controls to be absolutely typical of the general public. The main character-

istic required of them was that they should have no history of depressive illness. However, it was certainly desirable to show that a control group was not unduly biased in any direction. A comparatively straightforward method of demonstrating this in the present instance was to choose a number of socio-demographic factors and to compare the medical and surgical out-patients according to these factors. If it could be shown (as in the event it was) that the two groups of patients closely resembled each other, it would encourage the belief that, taken together, medical and surgical out-patients did not differ too markedly from the general population and that they were suitable to act as controls in this study.

As well as this, it seemed logical to use hospital patients as controls for depressive in-patients. Referral to hospital is the result of a complicated process of selection and it seemed possible that some of the variables involved might be eliminated in this way. It was therefore decided to investigate the suitability of general hospital out-patients as controls by interviewing them in the same way as was used for the depressive patients in the study. Out-patients were chosen rather than in-patients because it is simpler in practice to obtain a comparatively unselected group of out-patients. It seemed wiser to study only out-patients attending by appointment since it would be unfair to subject emergency cases to an apparently irrelevant interview. Patients under the age of 16 years were not interviewed as they were still in the period of childhood defined in the study, but there was no upper age limit.

Aim To study a group of medical and surgical out-patients to ascertain

if they are suitable to act as a control series in the present study.

Method of Investigation

Method of Investigation

At first it was intended to carry out this part of the study in the Royal Infirmary of Edinburgh but this proved impossible because of the pressure on the out-patient facilities there, a situation which will continue till new premises are available. Permission was therefore obtained to attend the out-patient department at the Western General Hospital, Edinburgh, which is about half the size of the Royal Infirmary. In this department it was easier to conduct an enquiry without taking up much-needed accomodation or interrupting the routine of the clinic.

The investigator arranged to attend six clinics, each held once a week. Three of the clinics were medical, dealing mainly with general cases although one had a slight bias to endocrinology and another a slight bias to rheumatic heart disease. Of the other three clinics, two dealt with general surgical cases and the third was orthopaedic. The consultants in charge agreed that, once they had completed their examination, the patient could be seen by the investigator. As it was not possible to interview every patient attending a busy session a working arrangement was devised with the co-operation of the nursing staff. As the first patient left the consulting-room he was taken to another room to be interviewed. When this was completed and the patient had left the room, the next patient to leave the consulting-room was brought along, and so on till the end of the clinic. Any patient whose examination ended while

an interview was in progress was allowed to leave. In this way, it was ensured that no patients were kept waiting, the rhythm of the clinic was not disturbed and if anything, the randomness of the patient sample was enhanced.

The purpose of the investigation was explained to every patient at the outset of an interview and each was asked if he agreed to take part. Only one patient, a female attending the orthopaedic clinic, refused to take part and she had to be excluded from the series. Otherwise there was complete co-operation from all patients.

The first task in the interview was to enquire whether the patient had a history of affective illness and to note whether he appeared to be suffering from depression at the time of examination. When either of these circumstances occurred, the interview was brought to an end and no details about the patient were recorded, so that the series would be as free as possible of depressive individuals. Of 222 out-patients, 12 were excluded in this way as the accompanying table shows.

Patients excluded from the series because of affective disorder

	No. of cases
Patients depressed at interview	2
Almost-certain history of affective disorder	3
Doubtful history of affective disorder	5
History of depression following drug-treatment	2
Total	12

In the remaining 210 patients, who constitute the final sample

the interview was carried through to completion. A questionnaire was completed in each case, using exactly the same technique of obtaining information as was used for the depressive patients in the pilot study. The entire session lasted about 15 minutes and no difficulty was experienced in obtaining the necessary information.

It had been decided that approximately 200 patients would form the series, so data-collection ceased after the last clinic of the week in which the 200th patient was seen. As information was gathered it was transferred from questionnaire to punch-cards. Thereafter, 14 items from the information obtained by the questionnaire were selected and a statistical comparison by the chi-square method was carried out to see whether medical and surgical out-patients differed significantly in respect of any of these items. Next, the entire sample was divided according to sex and the same comparison was made between male and female patients.

The items chosen for comparison were:

1) The age-distribution of the patients.
2) Civil state.
3) Social class distribution.
4) Religious persuasion.
5) Size of the sibship in the patient's family of upbringing.
6) Number of children in the patient's own family.
7) Loss of a parent by death before the patient's 16th birthday.
8) Loss of a parent for any reason, for at least three months, before the patient's 16th birthday.
9) Complaint by the patient of a disturbed relationship with a

parent during childhood.

10) Family history of mental disorder.

11) Age of mother at the time of the patient's birth.

12) Age of father at the time of the patient's birth.

13) Age of the patient at the time of mother's death.

14) Age of the patient at the time of father's death.

The results of the comparisons will now be discussed in detail.

The Outpatient Material

(All tables and figures referred to in this section are contained in Appendix I pp. 157 to 177).

The material consists of 210 out-patients of the Western General hospital, Edinburgh, the majority of whom live in Edinburgh, Midlothian or West Lothian, with only a small proportion dwelling outwith these areas (Table 1). Their ages range from 16 to 79 years with a mean age for the entire group of 49.34 years. (Tables 2a & b). There is a preponderance of middle-aged individuals in the sample and this can best be seen in Figure 1 where the age-distribution of the male and female patients is shown in comparison with the age-distribution (according to the 1961 Census) of the male and female inhabitants of Edinburgh. As will be seen later, this excess of the middle-aged is of positive advantage to the study since depressive illness shows a similar tendency to occur especially in the middle years of life.

Table 3 compares the pattern of celibacy, marriage and separation in the out--patients with that prevailing among the population of Edinburgh (as measured by the 1961 Census). Again, a considerable discrepancy occurs, there being an apparent excess of married individuals in the out-patient group. This is easily explained and is due mainly to the small number of out-patients between the ages of 16 and 30 years. Although the celibacy rate falls steadily during the course of this period, the 16-30 age-group provides the highest proportion of unmarried individuals in the adult population.

Of the 210 out-patients, 117 were attending a medical clinic and

93 a surgical clinic at the time of interview. Females outnumber the males in both the medical and the surgical categories, particularly in the former, and this can be seen in Table 4 where the patients are shown distributed according to sex and clinic status. The mean age of the surgical patients is found to be somewhat higher than that of the medical patients (Table 2a) and the males are on average rather older than the females. (Table 2b).

The out-patient-data will now be examined in detail. The whole group will first be divided according to clinic-status and the medical patients will be compared with the surgical patients to see whether they differ significantly in any of the 14 socio-demographic characteristics already enumerated. Thereafter, the group will be divided according to the sex of the patients and the comparison will be repeated, this time between males and females. The chi-square method is used for the calculations.

Results

Age Distribution (Table 5a & b). As has already been mentioned, the surgical patients are on average a somewhat older group than the medical patients and the males are rather older than the females. The differences in mean age between the groups is not large but it would not be surprising to find that the distribution of the patients' ages varied markedly since, for example, it is quite possible that medical and surgical conditions attack different age-groups. However, it is found that the difference which is present is not a significant one, either between the medical and surgical patients ($p > .30$) or between the males and females. ($p > .10$)

The next three items to be considered are civil state, social class and religious persuasion. These are fairly basic demographic factors and any striking difference which might occur within any subgroup of the sample in relation to them would certainly give rise to the suspicion that the entire group of out-patients was an atypical section of the general population.

Civil State (Table 6a & b). Patients were recorded as being unmarried, married, widowed or divorced. (The last category included all individuals permanently separated from the spouse, even if not by legal arrangement). The number of divorced persons is so small (2 out of 210) that for purposes of calculation, divorcees are included with the widowed. There is no significant difference between medical and surgical patients ($p > .10$) or between males and females ($p > .20$) as to the civil state pattern.

Social Class (Table 7a & b). The five-class system according to occupation (General Register Office, 1960) is used but since the number of individuals involved is rather small, the figures for classes 1 and 2 are combined as are the figures for classes 4 and 5. No recent figures for the social class distribution of the population of Edinburgh are available but among the out-patients there is a considerable predominance of social class 3 which probably reflects the middle-class nature of the area. When the medical and surgical patients are compared, there is no significant difference in social class distribution ($p > .50$) and the same is true of the males and females ($p > .80$).

Religious Persuasion (Table 8a & b). Patients were asked to state their religious persuasion or the religion prevailing in the childhood home if they themselves professed none. The particular religious affiliation was noted in each case but since only one patient was Jewish and all the rest declared either Protestantism or Roman Catholicism, for the purposes of calculation the patients were denoted either Protestant or non-Protestant. There is no significant difference in the proportion of medical or surgical patients professing these religions ($p > .05$) and this holds true for the males and females. ($p > .20$).

Lack of any significant difference occurring until now is gratifying, particularly when fairly small numbers are involved, and it suggests that, in a broad way, the group of out-patients is a fairly homogeneous one. However, the suitability of the out-patients as a comparison group for the depressive patients in this study is under examination and the ensuing items are a fairly rigorous test of this. The characteristics now to be scrutinised are among those which will be used as normal standards when the depressives come to be compared with the controls.

Size of the sibship in the patient's family of upbringing (Table 9a & b). The sibship was taken as consisting of one individual if the patient was an only child. If brothers and sisters were present, the size of the sibship was recorded as being 2, 3, 4, and 5 and over. Sibs who died in early life were included in the calculations but not miscarriages or stillbirths. There is found to be a close resemblance as to sibship-size

between medical and surgical patients ($p > .80$) and between males and females ($p > .50$).

Number of children in the patient's own family (Table 10a & b). Only married patients were considered in this respect since no unmarried patient admitted to having had children. The size of the married patient's family was recorded thus: no children, 1 child, 2 to 4 children, 5 or more children. There is no significant difference between the medical and surgical patients ($p > .05$) or between the males and females ($p > .10$) with regard to the number of children in their families.

Loss of a parent by death before the patient's 16th birthday (Table 1Loss of a parent by death before the patient's 16th birthday, parent-loss in either medical and surgical patients ($p > .05$) or in males and females ($p > .10$).

Loss of a parent for any reason, for at least three months, occurring prior to the patient's 16th birthday (Table 12a & b). Separation of the patient and his parent for any cause during the former's childhood was recorded and a close resemblance in respect of such separation exists between medical and surgical patients ($p > .50$) and between males and females ($p > .50$).

Complaint by the patient of a disturbed relationship with a parent in childhood (Table 13a & b). There is close resemblance in the proportion of medical and surgical patients ($p > .30$) and of males and females ($p > .80$) who make such a complaint.

Positive family history of mental disorder (Table 14a & b). Doubt would be raised about the suitability of the out-patients as comparison-material for depressives if it were shown that certain types of out-patient were more prone to familial mental illness than others. In this context, a positive family history refers to the individual's reporting a psychiatric illness occurring in a relative which was severe enough to require formal medical treatment. In fact, neither the medical and surgical patients ($p > .10$) nor the males and females ($p > .30$) report any such differential tendency.

Age of the parents at the time of the patient's birth (Tables 15a & b and 16a & b). There is a tendency for fewer mothers of the surgical patients, as compared with those of the medical patients, to be aged 36 years or more at the time of the patient's birth but the difference does not reach a significant level. ($p > .05$). There is no significant difference in maternal age between the males and females. ($p > .10$). As regards paternal age at the time of the patient's birth, there is close resemblance between the medical and surgical patients ($p > .50$) and between the males and females. ($p > .20$).

Age of the patient at the time of the parent's death (Tables 17a & b and 18a & b). Since the medical patients are younger on average than the surgical patients, rather more parents of the former group were still alive when the patient was interviewed and the same is true of the females as compared with the males. However, the differences are not significant, either for the age at mother's death or father's death.

Discussion

It must be stressed that the fourteen characteristics just described in detail were selected for comparison purposes before any data had been collected on the (44) out-patients. It was expected that some significant differences would be revealed when they came to be examined in relation to the out-patients and it was hoped that they would be reasonably few. The use of a two-way comparison, that between medical and surgical patients and between males and females, greatly increased the chance that inconsistencies within the whole group would be shown up. That no significant difference at all has been demonstrated suggests a considerable uniformity of environmental background and it seems not unreasonable to propose that this indicates a strong resemblance between this group of out-patients and the population of the Edinburgh area. To contradict this assertion, it would be necessary to show that male and female patients attending medical and surgical out-patient clinics all differed similarly from normal human beings in a considerable number of respects. Since a great many members of the general public become hospital out-patients at one time or another in their lives, this seems a most unlikely situation and it will be accepted in this study that the out-patients who have been examined are not unrepresentative of the general population.

Conclusion

A group consisting of medical and surgical out-patients is suitable for use as a control series in this study.

The Control Series

The Control Series

It was originally intended that, if out-patients proved suitable, a further group would be gathered to act as controls. However, when data-collection on the depressive patients was completed it was found that the depressive group and the group of out-patients already collected were closely matched in a number of ways and it was decided to use these out-patients as controls. Thus, the somewhat unusual situation occurred that the control series was completed before the definitive series was gathered.

Since the depressive patient group consists of individuals aged 16 to 60 years and the out-patient group of individuals aged 16 and over, those out-patients who were aged 61 and over were excluded from the control series in order to make the groups comparable for age-distribution. 47 patients were excluded in this way (23 males, 24 females), leaving a control series consisting of 163 out-patients. (69 males, 94 females). Otherwise, no adjustment was made to the out-patient group which will from now on be referred to as the control series.

Comparability of the depressive series and the control series

Comparability of the depressive series and the control series

By the early part of January, 1964 the study had reached a stage where it was practicable to begin the collection of data on the definitive series of depressive patients. The pilot study had demonstrated the aptness of the experimental method and the information gathered from medical and surgical out-patients had confirmed their suitability as a source of control material. Arrangements were therefore made to visit each of the psychiatric hospitals in the Edinburgh area at weekly intervals, beginning in the second half of January, 1964. On the investigator's first call at each hospital, all the cases of primary depressive illness there at that time were referred for interview. Thereafter, at each weekly visit those patients who had been admitted with depressive illness in the intervening week were seen by the investigator.

A detailed account of the process of data-collection has been given already. It suffices to say that no unforeseen obstacles arose and the study continued without interruption until July 1964 when the 50th male patient was admitted to the depressive series. No further patients were interviewed, since the intention was to obtain approximately 150 depressive individuals and the series now consisted of 153 such persons. In addition there were 30 patients who had been found to suffer from depressive illness secondary to another psychiatric condition, but after interview these were consigned to a separate 'Reject' category.

Normally, it would now have been necessary to obtain the control series. At first it had been intended to match each depressive patient

with a control individual comparable in age, sex, social class and religious persuasion. However, Medical Research Council colleagues advised that this type of comparison often resulted in a most atypical group of controls and that it was greatly preferable to compare matched groups rather than matched individuals. Fortunately, when the data obtained from the depressive patients and that from the medical and surgical out-patients was studied it was found that the two groups resembled each other closely in a number of demographic characteristics. When those medical and surgical out-patients over the age of 60 were excluded, the two series proved even more similar. As has already been explained, it was decided that the out-patients aged 16 to 60 years on whom information was already available could act most satisfactorily as a control series and so the need to seek further controls was obviated.

In order to demonstrate that this control series is suitable, statistical comparison by the chi-square method will be carried out between the depressives and the controls with regard to the following characteristics: distribution of age, sex, social class and religious persuasion.

Preliminary comparison of depressive patients and controls (All tables and figures referred to in this section will be found in Appendix 2, pp 178 to 184).

The depressive series consists of 153 patients (50 males, 103 females) aged 16 to 60 years. These patients live mainly in Edinburgh, Midlothian or West Lothian and only a small number come from elsewhere. As can be

seen in Table 19 the proportion of patients living outwith the City of Edinburgh is somewhat higher in the depressives than the controls. This is mainly because two of the psychiatric hospitals (Bangour and Rosslynlee) act as area hospitals for West Lothian and Midlothian respectively. Broadly speaking, however, it can be said that the two groups come from very much the same geographical area.

Age distribution Tables 20 and 21 show that the age-distribution of the depressives and the controls is very similar ($p = > .80$). Table 20 also shows the mean ages of the groups: that of the depressive group is 44.88 years, the males being on average rather older than the females (47.00 years and 42.54 years respectively). This compares very closely with the control group's mean age of 44.43 years (males 47.00 years and females 42.54 years). The two series are therefore closely matched for age.

Sex distribution Table 22 shows the sex-distribution of the depressives and the controls. It can be seen that the proportion of females is somewhat higher among the depressives than among the controls but the difference does not reach a level of significance ($p = > .05$). The two series are satisfactorily matched for sex-distribution.

Social class The social class pattern is very similar in the depressives and the controls. Table 23 shows that the depressives and the controls are both predominantly middle-class groups, probably reflecting fairly accurately the social class pattern in the district. The two series are closely matched for social class.

Religious persuasion Since the patients of both groups are, almost without exception, either Protestant or Roman Catholic, the religious affiliation has been designated Protestant and non-Protestant, the latter category being entirely Roman Catholic except for one patient who did not claim any faith. Once more there is a close resemblance between the depressives and the controls, ($p = > .50$) and this is shown in table 24. The two series are therefore closely matched for religious persuasion.

Obviously, the depressives and the controls are very similar as groups and it is accepted that the hypotheses in this study can usefully be tested by comparing the two series. It is suggested that, since the groups resemble each other so much in the above characteristics, any differences which may subsequently be found between them may be accepted with considerable confidence as being real and not due to artefact.

STATISTICAL PROCEDURE EMPLOYED IN PRESENT STUDY

STATISTICAL PROCEDURE EMPLOYED IN THE PRESENT STUDY

The use of epidemiological techniques in psychiatric research, both generally and with particular reference to this study, is discussed on p.39. In the interpretation of data obtained by these techniques, statistics plays a vital part. It seems important to stress that statistical method in psychiatric research should be as simple as is consistent with accuracy and usefulness: the application of subtle mathematical manœuvres to as yet relatively unsophisticated and non-objective psychiatric data is incongruous, save in the hands of the expert statistician.

The delineation of the depressive and control series has already been fully described. Having obtained the appropriate information from the subjects it was then possible to test the hypotheses on which the study was based. Each hypothesis deals with a particular factor said to be related to depressive illness and the main function of the statistical procedure is to demonstrate significant differences between depressives and controls in relation to possession of these factors.

The method employed

As each factor is considered in turn, the assumption is made that the factor and the depressive illness are unrelated, so that the proportion of individuals in the control and depressive groups demonstrating the factor should be the same. A table is constructed, dividing depressives and controls according to the presence or absence of the factor. On the assumption of no relation, the difference between the expected and observed numbers of individuals is calculated and thereafter, further calculation

is required to discover whether the differences found are of a magnitude likely to be due to chance or not.

The Chi-square (x^2) test is used for this purpose in the present study. The basic formula for this test is:

$$x^2 = \Sigma \frac{(O_i - E_i)^2}{E_i}$$

where O_i represents the observed frequencies, E_i the expected frequencies and i represents one to n, the number of cells in the table.

Where the difference between the observed and expected values is nil, x^2 is nil. As the differences increase, the value of x^2 increases. As the number of cells in the table increases, the value of x^2 can also be expected to increase and this introduces the necessity of considering the degree of freedom which is calculated thus:

$$n = (c - 1)(r - 1)$$

where n is the degree of freedom, c the number of columns and r the number of rows in the table.

With the values of x^2 and n to hand it is possible to obtain the level of significance from Fisher's Tables of x^2. This significance value denotes the degree of probability of a finding occurring by chance. The larger the value of x^2, the smaller becomes the level of probability: i.e. the less is the likelihood that the event is due simply to chance. The 5% level of probability ($p = .05$) is conventionally accepted as the critical level of probability and is used as such in this study. A value of probability (p) of .05 or less is considered to be significant.

Where the numbers in one or more of the cells in a four-fold table are small, the value of x^2 is more accurately obtained from a modification of the basic formula known as Yates' Correction:

$$x^2 = \frac{(ad - bc - \frac{a + b + c + d}{2})^2 (a + b + c + d)}{(a + b)(c + d)(a + c)(b + d)}$$

where ad is the larger of the two cross-products.

Interpretation of the results

When the x^2 test shows a probability level of 5% or less (i.e. an association occurring by chance only once in twenty occasions or less) it is accepted that the particular factor under examination occurs in depressives and controls with a significantly different frequency and the hypothesis is regarded as confirmed. Where the value is greater than 5%, the hypothesis is not confirmed.

It should be noted that the x^2 test is one of association but not of direction of association. The demonstration of a significant relationship between two events by this test does not allow the conclusion that the relationship is one of cause-and-effect, even where one event has occurred earlier in time than the other. However, the demonstration of parameters on which depressives differ significantly from normals provides a necessary starting-point for more interpretative forms of research.

THE HYPOTHESES : RESULTS

THE HYPOTHESES: RESULTS

(All tables referred to in this section will be found in Appendix 3a, pp 185 to 217)

It is now possible, in the light of data obtained from the depressive patients and the controls, to examine each of the ten hypotheses with which this study is concerned.

Of the 153 depressive patients, 102 (66.7%) were diagnosed as suffering from endogenous depression and 51 (33.3%) from neurotic depression. Since these two varieties of depression are considered by many to be discrete illnesses, each hypothesis will have to be considered first of all in relation to the entire depressive group and then in relation to endogenous and neurotic depression.

In addition, it should be noted that 31 (20.3%) of the 153 depressives had, at some time in their lives, made a suicide attempt. Since there is evidence (see p.34) that individuals who attempt suicide may be excessively prone to parental deprivation in childhood it is possible that the presence of 31 such patients may accentuate any apparent tendency the depressives have to an excess of childhood parent-loss. This has to be taken into account in certain of the hypotheses and will be dealt with where appropriate.

It should be noted that, while the proportions of attempted suicides in the endogenous and neurotic depressive categories are not significantly different, the percentage of attempted suicides is actually a good deal higher among the less severely depressed patients. It is, of course, very likely that successful suicide is commoner among the severely depressed, but it does seem that there is no necessary connection between the severity of a depressive illness and the tendency to make a suicide attempt. (Table 25).

Each hypothesis will now be discussed in turn.

1. Parental deprivation, by death or by other cause, predisposes towards depressive illness

a) Deprivation of parents by death

An individual whose parent died before his 16th birthday is considered to have been deprived of that parent by death during childhood.

Loss of a parent Here, the sex of the parent is not considered but simply whether the patient lost a parent by death during his childhood. A small proportion report the loss of both parents before the 16th birthday but these cases are not differentiated from the ones who have lost a single parent.

It is found that the proportion of depressives who have lost a parent is very similar indeed to that of the controls (Table 26a) but when the depressives are divided into endogenous and neurotic categories the picture changes considerably. It is now found (Table 26a) that almost twice the proportion of endogenous as compared with neurotic depressives have lost a parent in childhood with the controls lying almost exactly halfway between these two groups. As shown in table 27, the difference between the endogenous and neurotic depressives in this respect is not quite significant ($p > .05$) [redacted]. It is of interest to note that the percentages of endogenous and neurotic depressives in this series who have lost a parent in childhood (25.5% and 13.7% respectively) are very similar to those in patients with 'high depressive' and 'low depressive'

scores (27% and 12% respectively) reported by Beck et al. (1963) as having suffered parental bereavement before the age of 16 (see p.37).

Loss of father Depressives as a whole show little difference from the controls as to the proportion who have suffered paternal deprivation by death during the entire duration of childhood (Table 26b). However, when childhood is divided into the time-periods 0 to 5, 6 to 10 and 11 to 15 years, it is found that the depressives appear to show a trend towards excess paternal death occurring in the 11 to 15 years period. This trend is not quite significant ($p > .05$) as table 28 shows.

Endogenous and neurotic depressives do not differ significantly from the controls as to death of father during childhood.

Loss of mother There is a slight excess of depressives over controls who have lost mother by death before their 16th birthdays, but this excess does not reach anything like a significant level (Table 26c). The difference is much more marked for endogenous depressives ($p > .05$) but does not quite reach significance: neurotic depressives show a very slight deficiency of maternal death in childhood. Although the numbers involved are too small for useful statistical analysis, table 28 shows that there does not seem to be a noticeable trend for loss of mother to occur at any particular time in childhood.

Suicidal depressives Lest it be argued that the presence of patients who have attempted suicide materially alters the proportion of depressive individuals who have suffered parent loss, table 29 shows percentage parent-loss (loss of either parent, mother and father) in various

sub-categories of depression. It can be seen that removal of the attempted suicide group makes little difference to the figures for parental bereavement in endogenous and neurotic depression.

It may therefore be said that depressives as a whole do not appear to be more prone to lose parents by death before their 16th birthdays.

It is possible, although this study does not provide statistical confirmation, that endogenous depressives are excessively prone to parental bereavement and that neurotic depressives are correspondingly less likely to have suffered such bereavement. This is rather against the theory that neurotic depression owes more of its origin to environmental influences than endogenous depression.

It is also possible, but again not proven, that depressives show an excess of paternal deaths during the age-period 11 to 15 years and of maternal deaths throughout childhood.

There is no evidence whatsoever of the importance of parental death occurring early in childhood.

b) Deprivation of parents by causes other than death

In this section are examined patients whose parents have not died during their childhood but who have been separated from one or other parent for any reason other than death for a period of three months or more before their 16th birthday. The reasons for separation are not differentiated and may be pathological (eg. desertion by a parent), of

neutral significance (eg. absence of parent due to nature of his work) or fortuitous (eg. hospitalization of a parent or the patient).

Absence of a parent The percentage of individuals separated from their parents during childhood is somewhat lower in the depressives than in the controls, but not to a significant degree (Table 30). The endogenous depressives display rather less separation from the parents than do the neurotic depressives, but again not significantly so (Table 33) and neither group exceeds the degree of separation shown by the controls.

Absence of father The neurotic depressives show a rather higher percentage than the endogenous depressives and the controls of paternal absence in childhood but the difference is small (Table 31). This difference is slightly accentuated when the suicidal depressives are extracted from the endogenous and neurotic series but no significant difference can be demonstrated between any of the depressive sub-groups and the controls as to separation from father during childhood (Table 34).

Absence of mother The differences in maternal deprivation between depressives, endogenous depressives, neurotic depressives and the controls nowhere approach significance and none of the depressive groups shows a percentage of separation from mother higher than that of the controls (Tables 32, 33 and 34).

Therefore, in this study it can be stated that the depressives and the controls are very similar in respect of separation from the parents in childhood for a cause other than death.

Conclusion

The hypothesis is not proved. This study finds no confirmation that parental deprivation in childhood, by death or by other cause, predisposes toward depressive illness.

There is, however, inconclusive evidence that the presence of parental deprivation by death may be associated with an increased severity of depressive illness and that depressive illness may be associated with a tendency to excess loss of father by death during the period 11 to 15 years of age and of mother throughout the period of childhood.

2. The age of the parents is of significance in the aetiology of depressive illness in that the older the parent at the time of the individual's birth, the more likely is that individual to develop depressive illness.

This hypothesis was devised in an attempt to explain the alleged association between parental deprivation and depressive illness on a basis other than cause-and-effect. If, as this study appears to show, there is no evidence that parental deprivation and depression are especially related to each other, it is scarcely necessary to explain a relationship. However, the question of parental age at the time of the patient's birth is one worth examining in its own right.

The mean age of the fathers of the depressive subjects at the time of birth of the subjects is very similar to the mean age of the fathers of the control individuals; 33.19 years and 33.08 years respectively. (Table 35). The mean age at the birth of the subjects is also very similar in depressives' mothers and controls' mothers; 30.15 years and 30.37 years,

as shown in table 36. When the depressives are divided into endogenous and neurotic categories, the mean parental age at the birth of the subjects remains very constant. (Tables 37 and 38).

The parents of the depressives and the controls have been allotted to age-categories according to their age at the birth of the subjects to see if there is any specific trend in parental age at the time a depressive individual is born. However, comparison between depressives and controls shows marked similarity for paternal and maternal age, (Tables 35 and 36) and the same is true for comparison between endogenous depressives and controls, and neurotic depressives and controls. (Tables 37 and 38).

When endogenous and neurotic depressives are compared for paternal and maternal age, no significant difference is found. (Tables 37 and 38).

Conclusion

The hypothesis is not confirmed. There is no evidence that depressive individuals are born of older parents than are normal individuals.

3. Loss of a parent in childhood by death is more likely to cause a tendency to depressive illness than loss of a parent by a cause other than death.

It has already been shown that there is no significant difference between depressives and controls as to deprivation by death of a parent during childhood: nor is there a significant difference between depressives and controls as to the proportion who are deprived of parents by a cause other than death. It therefore cannot be said that either type of

deprivation is of importance in the causation of depression.

It is possible (see p. 100) that loss of a parent by death has an effect in increasing the severity of the depressive illness, an effect which loss by a cause other than death does not seem to have.

Conclusion

The hypothesis is not confirmed. There is no evidence that loss of a parent by death during childhood is of greater or lesser importance in the causation of depression than loss of a parent by a cause other than death.

4. Loss of mother during childhood is more important in predisposing to depressive illness than loss of father

Again, it must be stressed that this study has provided no proof that depressives and normals differ significantly as to loss of either parent during childhood, by death or by other cause. It is possible (Table 34) that there is a tendency to excessive paternal mortality in the late childhood (11 to 15 years) of depressives but this has not been proved. There is a slight excess of maternal deprivation by death throughout the childhood of depressives but the difference from the controls is not striking (Table 26c). There is no evidence whatsoever that loss of either parent in early childhood is of especial importance in the aetiology of depressive illness.

Conclusion

The hypothesis is not confirmed. There is no definite evidence that

loss of mother in childhood is of more importance than loss of father: such evidence as there is points to the opposite conclusion.

5. A disturbed parent-child relationship in childhood is important in producing a tendency to depressive illness

The information in this study about disturbed relationship with a parent in childhood has been obtained from the depressive himself. It could well be maintained that depressive patients, because of their gloomy frame of mind, are more likely to complain of an unhappy childhood than the less-introspective non-depressives and this argument is not easy to refute. It seemed that, during the investigation, the depressives and the controls were very similar in the manner in which they provided information: if anything, the very severely depressed patients were inclined to under-report because of difficulty in rousing themselves to recall events but this is merely an impression.

Because of the relatively small numbers involved, scrutiny of the causes of parent-child disharmony does not provide any indication that a particular type of relationship-disturbance can be incriminated. However, parental strictness and paternal alcoholism do seem to stand out as being somewhat commoner in depressives than controls. (Table 42a).

a) Disturbed relationship with a parent (Table 39). It is found that there is a highly significant difference between the depressives and the controls ($p < .01$) as to a complaint of disturbed relationship with a parent during childhood, the depressives being much more apt to

report such an occurrence. When endogenous depressives and suicidal depressives are separately compared with the controls, this significant difference is maintained. On the other hand, the difference between neurotic depressives and controls is small and non-significant.

It would therefore appear that individuals with the severer types of depression, but not those with less-severe depression, are more liable to a disturbed relationship with their parents than are normals.

b) Disturbed relationship with father (Table 40). No significant difference is found between the depressives as a whole and the controls as to disturbance of relationship with father, but endogenous depressives are significantly prone to such a disturbance ($p < .02$). Neurotic depressives and suicidal depressives show no significant difference from controls in this respect.

It can be said that there is a significant association between endogenous depression, but not neurotic depression, and a disturbed relationship with father during childhood.

c) Disturbed relationship with mother (Table 41). There is a very significant excess of depressives over controls ($p < .01$) who complain of disturbed relationship with mother in childhood and this excess is largely accounted for by the endogenous depressives. There is a somewhat smaller but still significant excess in the suicidal depressives, but there is once more a small and non-significant difference between the neurotic depressives and the controls.

It seems that severe depression, but not the less-severe variety, is

significantly related to a disturbed relationship between the patient and his mother-figure.

Conclusion

The hypothesis is partially confirmed. Depressives are excessively prone to a disturbed relationship with mother during childhood. Endogenous depressives are significantly prone to a disturbed relationship with both mother and father during childhood. Neurotic depressives do not differ significantly from normals as to disturbed relationship with either parent.

6. Persons suffering from depressive illness belong to a larger-than-average sibship in their family of upbringing.

It has been postulated, on purely theoretical grounds, that depressives tend to come from larger sibships than normal individuals (see p. 20). However, when the depressive group in this study is compared with the controls no such tendency is found. (Table 43). The endogenous depressives also show little difference from the controls. Neurotic depressives do show a slight tendency (Table 43) to belong to larger sibships but the difference does not approach a significant level.

Conclusion

The hypothesis is not confirmed. Depressives appear to belong to sibships which are of the same size as those to which normal individuals belong.

7. The ordinal position of the depressive individual in his sibship is of importance in the aetiology of his depressive illness

Attempts have been made at various times to demonstrate that the

ordinal position of the individual in his sibship has an influence on his liability to mental illness. (see p. 20). However, when depressive patients are assigned their ordinate rank and are compared with controls (Table 44) it is found that the difference between the depressives and the controls is almost non-existant ($p > .95$). When the depressives are divided into endogenous and neurotic categories, the similarities with the controls remain high. There is therefore no evidence that ordinal position has any influence on the aetiology of depressive illness.

Conclusion

The hypothesis is not confirmed.

There is a qualification to this conclusion. On reflection, it seemed that consideration of the ordinal position in the sibship was an unrewarding exercise anyway. To say that an individual is 4th in his sibship is a relatively meaningless statement. He could, for example be the 4th and last child or he could be the 4th of ten children: the differences of family relationship implied in these two situations may be profound. It therefore seemed more profitable to examine the position of the patient in the sibship relative to the other sibs.

Patients were designated as being first or last in the family and if they did not fall into either of these positions they were considered as belonging to the middle of the family. Only children were divided equally between the first children and the last. When the depressives were compared with similarly designated controls, highly significant differences emerged.

Table 45 shows that depressives as a group differ significantly from the controls as to the position of the individual in the sibship ($p < .05$). This difference is almost entirely due to the neurotic depressives who differ in a highly significant fashion from the controls ($p < .01$), whereas the endogenous depressives closely resemble the controls ($p > .30$).

The neurotic depressives are further compared with the controls in Table 46. Here, each sibship position - first, middle and last - is examined separately. There is no significant difference between neurotic depressives and controls so far as the first child in the family is concerned, but amongst the neurotic depressives there is a significant excess ($p < .01$) of individuals who belong to the middle of the family and a significant deficiency ($p < .01$) of those who belong to the last position in the family. In other words, neurotic depressives tend not to be the last child in a sibship.

A supplementary hypothesis has therefore been devised as follows: the position of an individual in his sibship relative to the other sibs is of importance in the aetiology of neurotic, but not endogenous, depressive illness.

This supplementary hypothesis is confirmed.

8. Depressive patients tend to remain unmarried more than do normal individuals and the fertility of married depressives differs from that of married non-depressives.

a) Celibacy in depressive patients The available evidence regarding

the civil state of depressive patients has been inconclusive till now. (see p. 21). When the depressive patients of this study are compared with the controls as to civil state (Table 47) it is found that a significant difference ($p < .02$) exists between them. A significant difference ($p<.01$) also occurs between the neurotic depressives and the controls but not between the endogenous depressives and the controls. Inspection of Table 47 suggests that there is a deficiency of married individuals and an excess of the unmarried among the depressives. When the depressives and the controls are compared for the proportion of individuals in each group who are unmarried, it is confirmed that there is a significant ($p < .05$) excess of the celibate among the depressives. A similar excess, but not quite reaching a level of significance, is found in the endogenous and neurotic depressives. (Table 48).

Table 47 also shows that there is an excess of divorced or separated individuals among the depressives, but the numbers are too small to allow of accurate statistical assessment.

Hopkinson (1963) differentiates between depressives of early and late onset (i.e. by his definition, where the first attack of affective illness has occurred before or after the age of 50 years) but fails to find either a diminished marriage-rate in manic-depressive illness or any effect on the marriage-rate of the age of onset of the condition. (see p.21). The data in this study allow his conclusions to be tested, but since the upper age limit of the present series of patients is 60 years there is a comparatively small number whose illness began after the age of 50. Therefore, they have been divided according to whether the first

onset of affective disorder appeared by the age of 45 years (early onset group) or after that (late onset group). When this is done it is found that there is an excess of the unmarried in both groups as compared with controls. This excess is highly significant in the late onset group ($p < .01$) but is not significant in the early-onset group. (Table 49). This finding is the more striking since a younger group would normally contain a higher proportion of unmarried individuals.

It therefore appears that depressives remain unmarried more often than normal people and this is especially true of depressives whose illness begins later in life.

b) Fertility of married depressives. Since the marriage-rate seems to be lower in depressives than in normals it is likely that the overall fertility of depressives will be below average. So far as the fertility of married depressives is concerned, the evidence to date has been controversial.

When the present depressive series is compared with the controls, little difference is noted between them so far as fertility pattern is is concerned (Table 50). Endogenous and neurotic depressives also closely resemble the controls in this respect. When the married depressives belonging to the early and late onset groups are compared with the controls there is again no significant difference (Table 51) although there does seem a tendency for fewer of the early onset individuals to have very large families, possibly because the illness itself has intervened to prevent childbearing.

Conclusion

The hypothesis is partly confirmed. Depressive patients are more

likely to remain unmarried than normal individuals and this is particularly true where the illness has begun after the age of 45 years: on the other hand, depressive illness seems to have no marked effect on the fertility of married patients.

9. Depressive patients more often present with a positive family history
9. Depressive patients more often present with a positive family history
of severe mental illness than normal individuals

This hypothesis scarcely needs confirmation in the present study since affective disorder is well-known for its familial tendency. However, it is necessary to show the importance of a positive family history before the next hypothesis can be tested.

A positive family history is taken to mean that a close relative of the subject has had a psychiatric illness severe enough to require medical treatment. Reports of relatives who were 'highly-strung', 'nervous', 'eccentric' etc., were not accepted unless medical intervention had occurred. Relatives accepted for inclusion were: grandparents, parents, sibs, children, aunts and uncles, nephews and nieces and cousins.

As expected, there is found to be a highly significant association between depressive illness and a positive family history of severe mental disorder ($p < .01$) as can be seen in Table 52. This is also true of endogenous and neurotic depressions.

Conclusion

The hypothesis is confirmed.

10. Individuals with severe depression more often have a positive history of severe mental illness than do individuals with less-severe depression

It is probable that the positive family history obtained from the depressive individuals is mostly that of affective disorder although no reliability can be placed on the diagnosis reported by the patients themselves. Since depressive illness has a strong heredo-familial background it would be interesting to discover whether it bred true not only in its form but also in its degree of severity. If so, the relatives of severely depressed patients should themselves suffer from a severe degree of affective illness and thus more often be recognized as psychiatrically ill.

Table 53 shows the result of comparison of the endogenous and neurotic depressives for the frequency with which they report a positive family history. Although the percentage of such reports is certainly higher in the endogenous group, the difference is not in any degree significant ($p > .20$).

Therefore, although the depressive illness itself has a strong tendency to familial occurrence it is likely that its degree of severity is ordained by factors other than heredity.

Conclusion

The hypothesis is not confirmed.

MISCELLANEOUS FINDINGS

MISCELLANEOUS FINDINGS

(All tables referred to in this section will be found in Appendix 3b, pp 218 to 227).

1 Maternal mortality and depressive illness

It has already been demonstrated (Table 26c and 28b) that there is no evidence that depressives lose their mothers in childhood more than other people. However, in preparing the data for the hypothesis dealing with that subject, the depressives and the controls were categorized according to their age at the time of mother's death and then compared. (Table 54). It was found that they differed significantly ($p < .02$) and inspection of the data suggested that the difference was due to an excess of maternal mortality occurring before the depressives' 26th birthday. Table 55 confirms that this excess is a significant one and demonstrates that it occurs mainly in the endogenous depressives. The same trend is discernible in the neurotic dpressives but not to a level of significance ($p > .20$).

It was shown in Table 36 that depressives and controls differ little in maternal age at the time of their birth. However, Table 56a shows that those mothers who die before their depressive children have reached the age of 26 years were considerably older on average when the depressive subject was born, than were the mothers of controls dying in the comparable period. It would seem that the older mothers of depressive patients have a tendency to die somewhat prematurely.

This is a puzzling finding, but Table 56b provides a partial explanation. Here, the causes of death of those mothers who died before the individual's

26th birthday are recorded. The numbers are too small for statistical evaluation but it can be seen that much of the difference in maternal mortality between depressives and controls is accounted for by an excess of mothers of depressives who die of cancer.

Following this clue, the causes of maternal death in all depressives and controls have been studied (Table 57) and it is found that a highly significant excess ($p < .01$) of the depressives' mothers have been reported as dying of cancer. It is therefore suggested that some connection exists between cancer in the mother and depression in the child and that a number of mothers dying in middle age of cancer cause the excess of bereavement observed in the under 26 group of depressive patients. The fact that these women are slightly older to begin with probably means that they have reached the danger-period for cancer at a rather earlier stage in the lives of their children.

This finding can be criticized on the grounds that it is based entirely on the patient's evidence, but it seems likely that a diagnosis of cancer, of all diseases, would register itself on the mind of anyone whose mother died of it. It is interesting to note that depressives and controls show no significant difference in the age at which they lose father by death (Table 58) and paternal death due to cancer occurs to an almost identical degree ($p > .50$) in both groups. (Table 59). This tends to highlight the significance of the findings for the cause of death in mother.

It is not possible, on available evidence, to speculate whether there is some constitutional link between depression and cancer, or

whether the suffering undergone by the mother who develops cancer has some predisposing effect towards depression in the child. The latter explanation seems a little more likely since the cancer occurring in the mothers does not appear to be of a specific site.

Conclusion

Endogenous depressive illness is significantly related to an excessive maternal mortality occurring before the depressive's 26th birthday. This may be connected with a significant relationship which exists between depression and a history of death due to cancer in the mother.

2. Twins and depressive illness

It has proved impossible to obtain an accurate estimate from the literature of the proportion of adults in the general population who are twins. Slater (1953) suggests that about 2.2% of British adults are twins but admits that this is only an informed guess. Gates (1952) points out that the incidence of twin births appears to vary widely with race, stature and geographical location, but that in Western Europe and the United States about 1 birth in 80 produces twins. This means that approximately 1 new-born infant in 40 (2.5%) is an individual twin. Since twins are usually smaller at birth than other children and are excessively prone to inter-current illnesses their mortality rate is somewhat higher than normal. It is probable that between 1 in 40 and 1 in 50 of the adult British population are twins.

In this study, the control group of 163 medical and surgical out-patient

contains 3 individual twins and this proportion (1 in 54.3) agrees quite closely with the estimated figure. The ages of these three twins are 37, 44 and 58 (average 46.33 years), all are male and all had partners of the same sex although two lost their partners in infancy.

The situation is quite strikingly different among the depressives. Here 11 twins have been identified in 153 patients, giving the very high proportion of 1 in 13.9. Of the 11, 5 are same-sex twins: one individual was aware of being an identical twin and a second of being non-identical, but the other same-sex twins were unable to be certain of this. 4 of the twins had lost their partner in infancy.

Only one of the depressives reported that the twin-partner had ever required psychiatric treatment: she is the identical twin and she stated that her sister had required electroconvulsive therapy for a depression similar to her own. Another twin, a male, reported that his twin brother was nervous but had never sought treatment.

The twins seem to occur in fairly even proportion among depressive males and females: 4 out of 50 males and 7 out of 103 females. This also holds for the distribution between endogenous (7 out of 102) and neurotic (4 out of 51) depression. As a group, the depressive twins are considerably younger on average than the rest of the depressives: 37.55 years as opposed to 45.45 years for non-twins.

It is interesting to note that none of the twins, either depressives or controls, has lost a parent by death before the age of 24 years, but 5 (45.5%) of the depressive twins report a disturbed relationship with father

in childhood. 6 depressive twins (54.5%) have a positive family history of severe mental illness: 5 of the 6 suffer from endogenous depression, (i.e. 5 out of the 7 twins with endogenous depression have a positive family history).

None of the depressive twins has a history of affective illness occurring more than four years prior to the present episode but this may be because they are a comparatively youthful group. The average age of first onset of affective illness is 36.18 years as compared with 39.26 years for the depressives as a whole. While it does look as though these twins are liable to develop depression at an earlier age than other people, the numbers are too small to provide statistical confirmation of this.

Since none of the twins has a long history of affective disorder it is not possible to compare them with the other depressives to discover whether they require more frequent admissions to hospital than non-twins. It is certainly possible, if depression begins earlier in twins, that they will be readmitted to hospital more often than non-twins and so cause an apparent increase in the numbers occurring within a given time. However, this seems unlikely to cause such a striking excess as has been obtained in the present series.

So far as can be discovered, there has been no previous suggestion of an excess of twins in a group of patients suffering from depressive illness.

Conclusion

In the present group of depressive patients twins are present greatly in excess of the expected number. These depressive twins are notable for:

1) the early age at which the first onset of affective illness occur;
2) the high proportion who have a positive family history of severe mental illness;
3) the high proportion who report a disturbed relationship with father in childhood;
4) the complete absence of parental deprivation by death during the individual's childhood and early adult life.

3. Gynaecological operations and depressive illness

When the medical and surgical out-patients who eventually became the control series were interviewed, note was taken of the presenting physical complaint and also of any previous physical illness. To ensure uniformity of data, similar enquiries were subsequently made of the depressive patients.

As a result, it was found that 10 (9.7%) of the 103 female depressive patients had undergone some form of gynaecological operation since the beginning of 1963: that is, in approximately the year prior to interview. At least 6 of these 10 women had had a dilatation and curettage which is often a non-specific form of operation. In the similar period prior to interview only 2 (2.1%) of the 94 female control patients had undergone any form of gynaecological procedure.

The numbers are too small for useful statistical assessment but it is interesting that such a comparatively high proportion of female depressive in-patients should have so recently required gynaecological intervention.

It is possible that an operation could have precipitated a depressive illness but Hopkinson (1963b) has pointed out that a considerable proportion of depressive individuals suffer from a prolonged prodromal phase before

frank symptoms of affective illness appear. It seems not unlikely that a number of these women have attended the gynaecologist while in the early stage of a depressive illness and that their complaints relating to the genital tract were somatic symptoms of depression.

Conclusion

It is probable that many women in the prodromal stage of depressive illness undergo unnecessary operative procedures because the psychological basis of their physical complaints is not appreciated.

4. Readmission of depressive patients to hospital

Nowadays it is the enlightened policy of most psychiatric hospitals to discharge in-patients as soon as treatment has been effective and this of course applies to patients with affective disorder. However, it must be emphasized that even the individual attack of depression can be very prolonged and this long-term aspect of the illness does not seem to be greatly affected by modern treatment.

It is noteworthy that, of the 153 depressive in-patients in this study, 33 (21.6%) have had a previous period of in-patient treatment for affective illness within the year prior to interview and all but 3 of these suffer from endogenous depression. 60 (39.2%) of the 153 depressives have had at least one previous admission in the five years prior to this present attack and of these, 51 are endogenous depressives.

There is no need to stress the tendency to recurrence of depressive illness but these figures indicate how high the recurrence rate may be.

It is obvious that close supervision of depressive patients, especially those with endogenous depression, is required for a considerable period after discharge from hospital.

Conclusion

21.6% of the depressive subjects in this study (29.4% of those with endogenous depression) had a previous period of in-patient psychiatric treatment within the year prior to their present admission. 39.2% of the depressive subjects (50% of the endogenous depressives) had at least one previous admission to hospital for psychiatric treatment in the five years prior to the present admission.

5. Loss of a sib by death during childhood and the subsequent development of depressive illness

The loss of a child is likely to cause considerable grief in a household and it seems possible that the sibs of the dead child would be deeply impressed by the event. On an assumption similar to that which claims parental deprivation as an aetiological factor in depression it was decided to ascertain whether depressives were more often deprived of sibs during their childhood than were normals.

In the course of obtaining information about the size of the individual's sibship each person was asked whether his parents had lost any children by death, so a record of sibling mortality was available for both depressives and controls. Examination of these data shows that a similar number of depressives and controls report the death of a pre-adult sib

in their families ($p > .50$): 35 (22.9%) of depressives and 34 (20.9%) of controls. (Table 60).

When the deaths are divided into those which occurred before the subject's birth and those which occurred during his childhood, a slight excess of the latter is found. (Table 61). This excess is not significant ($p > .30$). It therefore seems that child-mortality is not excessively high in the depressive's family of upbringing and the depressive himself does not suffer bereavement of a sib during childhood to a significantly greater degree than normal.

Conclusion

There is no evidence that losing a sib by death during childhood predisposes an individual to depressive illness.

DISCUSSION OF THE RESULTS

DISCUSSION OF THE RESULTS

A leading article in the British Medical Journal (1964) bemoans the prevailing vagueness about the nature of depression and the lack of any generally acceptable classification of the illness. This situation is not unique to depression which is, if anything, one of the more readily-definable of the psychiatric syndromes. It is obviously difficult to investigate mental illness when it is known beforehand that the basic premises, methods and results of the research will fail to find general approval. This sometimes engenders the nihilistic attitude that diagnosis is irrelevant in psychiatry. This study has been conducted in the opposite belief: namely, that the present imprecision in diagnosis must be improved upon.

Partly towards this end, an attempt has been made to diagnose the cases under study as carefully as possible and to accept only those cases which most psychiatrists would agree as suffering from a primary depressive illness. By this means it is hoped that, should the findings be considered worthy of confirmation, it will be comparatively simple for other workers to be certain that they are examining the same condition.

As well as this it is obviously important when studying a particular condition to eliminate as many irrelevant variables as possible. It is more than possible that previous studies on the relationship between parental deprivation and depression have produced false results because the patients were not cases of pure depression. Unfortunately it is

almost impossible to find an uncontaminated case, but the nearer to the ideal one gets in this type of research the greater will be the confidence that any correlations demonstrated will be referable to the illness under examination. The depressives in this study are perhaps not typical of depressives as a whole but it can surely be said that each one is suffering from a typical case of depressive illness and the aim of this research is to investigate such cases. That the patients are hospitalized and probably represent the severer types of depression may be advantageous since it seems not unlikely that the more severe the depressive illness the grosser and more easily recognizable may be the aetiological factors which are being sought.

It is accepted that a retrospective method of study is potentially inaccurate and it is agreed that information obtained from patients alone may sometimes be suspect. For this reason, the information sought was simple and factual and of a type which the layman could fairly be expected to provide. In the event, it seemed that the patients, even the iller ones, were able to respond much more satisfactorily than was at first feared would be the case. In any case, this study is not intended to produce the last word in its field. Rather, it represents an attempt to discover facts about certain aspects of the background of depressive illness. These facts may be valuable in themselves but their main purpose is to provide a basis for the more efficient deployment of future research into the condition.

The importance of careful design of a research-project is often overlooked in psychiatry. Research must be planned so that the results

avoid the charge of being either esoteric or patently unsubstantiated by facts. The planning of the present study was a prolonged affair but this paid handsome dividends because the investigation, once under way, ran perfectly smoothly.

A vital part of the investigation was the obtaining of a suitable control series and it will be noted that this process took almost as long as the collection of data on the depressive patients. Such attention to detail is essential. One of the surprising findings in the study is the high frequency of parental death in childhood among the controls, a group in which there is no reason to believe that childhood bereavement is excessively high. It appears to be quite normal for approximately one-fifth of the population to lose a parent by death before the 16th birthday and lack of appreciation of this has probably led a number of workers into quite erroneous speculation about a relationship between bereavement and mental illness.

As a by-product of the present study, it is possible that other workers may consider medical and surgical out-patients attending a general hospital as potentially suitable to act as controls for some types of psychiatric research.

Wherever necessary, the terms used in this research have been defined in the interests of communication. The objection may be raised that at times the undefinable has been defined with consequent concretization of essentially abstract concepts. It is suggested that the apparent specificity

of some of the results will encourage belief in the meaningfulness of the concepts employed and vindicate the objective outlook adopted in the study.

The results of the study are fairly wide-ranging and a number of them are quite unexpected. They have been placed under four general headings: aspects of parental deprivation; demographic characteristics; parental morbidity and mortality; miscellaneous findings. Each category will be discussed in turn.

Aspects of parental deprivation

In the review of the literature an attempt was made to show that much of present-day thinking on parental deprivation and its relation to mental illness has been derived from studies performed on children raised in bad institutional conditions. The evidence that the profound psychological ill-effects often observed in these children resulted from separation from the parents, especially mother, was never good, but the concept has been widely accepted. Parental deprivation in relation to depressive illness has been the subject of a number of inconclusive investigations (p. 36) but the tendency of psychoanalytic psychiatry to equate mourning for the loved object with depression has led many people to believe that an association between loss of a parent in childhood and the subsequent development of depressive illness has been proved.

Unfortunately for these theories, the first negative finding in this study is that depressives as a whole are no more apt to lose parents by death during childhood than are the controls. It is true that there is a small excess of depressives losing mother before the 16th birthday but

the difference does not approach a significant level and there is certainly no hint of a raised frequency of maternal mortality in the allegedly crucial first five years of life of the depressive patient. Although the literature usually stresses the importance of the mother-child relationship, there is some evidence that loss of the father by death when the individual is aged 11 to 15 years may occur to excess in depressives but the numbers involved are too small to allow statistical certainty.

It may be thought that death of a parent is too unsubtle an occurrence to be of aetiological importance in depression, so separation of the child and parent for causes other than death has been investigated. However, it is found that the depressives are actually very slightly less liable to have been separated from a parent for a period of three months or more during childhood than the controls, the difference not being significant. Neurotic depressives show a small, and once-more non-significant, excess of paternal absence as compared with the controls and this is quite contrary to most of the theory on the effects of childhood parental deprivation.

It therefore appears that neither deprivation of the parent by death nor deprivation by a cause other than death is an important factor in the aetiology of depression itself. However, death of a parent before the individual's 16th birthday may well influence the severity of a

depressive illness when it occurs. This is implied by the finding that endogenous depressives show a considerably higher frequency than the controls, and the neurotic depressives a correspondingly lower frequency than the controls, of parental death during childhood. The differences between endogenous, neurotic and control groups are not significant but almost certainly would be if the numbers involved were larger. It is interesting that the percentages of endogenous and neurotic depressives found to have lost a parent before the 16th birthday (25.5% and 13.7% respectively) are almost identical with the figures obtained for 'high depressed' and 'low depressed' patients(27% and 12% respectively) by Beck et al. (1963) in one of the more painstaking studies of parental deprivation in depression. It is unfortunate that this last-named study contains no control series, but it is suggested that the finding in the present study that neurotic depressives are less liable than controls to suffer from death of a parent during childhood must indicate that parental deprivation is not an aetiological factor in depressive illness.

Although physical separation from the parents does not seem to relate to the aetiology of depression, even if it is capable of increasing the severity of the illness, it is reasonable to enquire whether emotional deprivation in childhood has any important effect. Each patient and control was asked to state if there had been a disturbed relationship with either parent during the period of childhood. The endogenous depressives report such a disturbance with both mother and father to a degree

significantly in excess of that reported by the controls. The neurotic depressives do not differ to any significant extent from the controls. This suggests that there may be some aetiological effect and while the numbers involved do not allow of statistical interpretation it is thought that parental overstrictness and habitual overindulgence in alcohol by father may be important causes of the impaired emotional rapport between the endogenous depressive and his parent.

Following the now-discarded assumption that parental death in childhood might be aetiologically related to depression, it was decided to investigate the death of sibs occurring during the early life of the individual. There is no evidence that depressives are excessively prone to experience the death of a sib.

Demographic characteristics of depressive patients

It has been a marked impression when interviewing most of the depressive patients that, apart from their illness, they differ very little from the controls. Without attempting to arrange it so, it was found that the depressive and control series were closely matched for social class and religious persuasion. It is impossible to be dogmatic about these similarities since the depressives in the study are a highly-selected group, but other investigators have had much the same experience (p.17).

The results obtained in the present investigation regarding marriage and fertility in depressive illness must take their place in a

controversial field, but the differences from the controls appear quite striking. It is found that, as an entire group, depressives are significantly more liable than controls to remain unmarried. This is true especially of those patients whose first onset of affective disorder is after the age of 45 years. At first this may appear anomalous since it would seem more likely that an earlier onset of depression would act as a barrier to marriage. Certainly the early onset group has a slightly higher proportion of the unmarried than the controls but the difference is not significant. The explanation of the high rate of celibacy in late-onset depressives is probably that suggested by Ødegård (1946) who finds a higher prevalence of mental illness in the unmarried and who attributes this to an excess of abnormal pre-psychotic personalities which militates against marriage.

In those depressives who are married, the illness appears to have little effect on fertility except that early-onset depressives show a slight tendency to have fewer families of very large size. This effect may well be due to the intervention of the illness itself.

The ordinal position of the patient in his sibship seems to be of no significance in depressive illness but as already explained (p.108) the concept of ordinal position is probably almost meaningless anyway. When the position of the individual in the sibship relative to the other sibs (i.e. whether he is first, middle or last in the family) is observed instead, the results are very interesting indeed. It is found that

neurotic depressives, but not endogenous depressives, have a very marked tendency to be in the middle of the sibship and an equally marked tendency not to be the youngest child. The finding is so positive as to give confidence as to its integrity, but the nature of the data in the study does not allow any interpretation of the phenomenon. It may be that being last in the family protects an individual to some extent from developing depressive illness, despite the view of Munroe to the contrary (p. 20) or it may be that the hurly-burly of life in the middle of the family has a predisposing effect towards depression. The protective effect of being a youngest child seems to be the more likely explanation.

Parental age has proved to be of no significance in the aetiology of depression as there is no tendency for depressives to be born of older parents. Since this possibility was postulated in an attempt to explain an excess of parental deprivation in depression which no longer seems to need explanation, it is not surprising that the finding is negative.

Parental morbidity and mortality

A not-expected finding is the highly significant excess of depressives who report a history of severe mental illness in their families. This excess is presumably due in the main to relatives who suffer from affective disorder but the information supplied by the patient-informants is not sufficiently precise to make sure of this. When the severe and less-severe depressives are compared it is found that a slightly higher proportion of the former admit to a positive family history of mental

disorder but the difference is not large. Thus, while the familial tendency of depression is undoubted, it cannot be said that the evidence from this study indicates a similar tendency for the degree of severity of the condition. This may suggest that depression owes its origin to hereditary influences but that the manner in which it manifests itself is determined by environmental factors.

Although depressives have not been found to be unusually liable to suffer from parental mortality in childhood, it has emerged that they exhibit a significant excess over the controls of maternal mortality prior to their 26th birthday. This is mainly due to a relatively large number of mothers of depressives dying when the subjects are aged 16 to 25 years. At first this appears inexplicable but examination of the data indicates that it is associated with a striking tendency for the mothers of depressives to die of cancer. So far as is known, this highly significant association between depression in the child and cancer in the mother has never previously been reported. The finding is emphasized by the fact that no excess of paternal death from cancer is reported by the depressives. Fascinating possibilities are raised here which will require further studies to elucidate. It seems unlikely that the finding indicates a constitutional link between depression and cancer because the cancer appears to be of a variety of types, but the possibility cannot be ruled out. A more reasonable explanation perhaps is that individuals who must perforce watch mother die of a prolonged and painful illness when they themselves

are at an impressionable age are somehow predisposed to develop depressive illness in later life. Either way, it would appear that a population at risk of depression has been delineated.

Miscellaneous findings

Another fortuitous discovery which may be of considerable importance is that the depressive series contains much more than the expected number of twins. The previous literature contains no reference, so far as can be seen, to an association between twinning and depression. The depressive twins are in some ways distinct from the other depressives: they tend to develop depression earlier and they show a total lack of parental deprivation by death, but a family history of mental illness and a history of disturbed relationship with father during childhood is commoner. It cannot altogether be an upbringing as a twin which predisposes to depression since a proportion of them have lost their twin-partners in infancy. Is it possible that this is an example of a pre-natal environmental influence which somehow produces a tendency for twins to develop depression with less provocation than other people ? Or are depressive families more apt to produce twins ?

The rationale of twin studies of hereditary factors in mental illness has been under a good deal of criticism lately. (Tienari, 1964). If it could be shown that concordance-rates for manic-depressive illness are artificially high because twins are in any case more liable to depression than normal this would raise further doubts as to the method's usefulness.

It is somewhat unexpected to discover that attempted suicide is rather more common in neurotic than in endogenous depression. It may be that severely depressed individuals are too retarded to attempt suicide although this seems unlikely since there is a strong association between psychotic depression and successful suicide. Perhaps it is more feasible to suggest that attempted suicide, while often associated with depression, is a separate syndrome with its own precipitating factors and natural history and is fairly independent of the degree of severity of the depression.

Finally there are two findings which are of practical rather than theoretical importance. The first is that a considerable proportion (9.7%) of the females in the depressive series have undergone a gynaecological operation in the year prior to their present admission to hospital, as compared with 2.1% of the control females in the comparable period. 6 of the 10 depressive women involved underwent a dilatation and curettage, a procedure often carried out for want of something more specific to do, and it is a fair likelihood that at least some of these women could have been saved an operation had they been recognized as suffering from a psychiatric disorder. It is obvious that a screening method at the level of the gynaecological clinic is urgently required and that there is great scope for psychiatric education and research in the field of gynaecology.

The second practical finding deals with readmission of depressives to hospital. While it is well known that affective disorders have a phasic tendency and that the readmission rate for depression is necessarily high, it is somewhat alarming to find that 21.6% of all the depressives in the

series (29.4% of the endogenous depressives) have had a previous period of in-patient psychiatric treatment during the year prior to the present admission. Furthermore, it is found that 39.2% of the whole depressive group (exactly half of the endogenous depressives) have had at least one psychiatric admission in the five years before the present admission. It is evident that early readmission is one facet of the policy of early discharge of depressive patients. There is no need to stress that depressives, and especially those admitted with the endogenous form of the illness, require much more prolonged follow-up and supervision than they often receive at present.

Conclusions

It is difficult to discuss the rather varied results of this study in overall terms. It seems that the importance of the hereditary aspect of depressive illness has been stressed but there is a strong indication that the expression of the illness - for example, the age at first onset and the degree of severity - is influenced to a great extent by environmental factors. These influences may possibly be pre-natal, as with twinning; may occur in childhood, as with position within the sibship or disturbed relationship with a parent; or may occur even in adolescence and early adult life, as with death of the mother from cancer. It is as though a number of more or less specific provocative or protective factors exist and as each individual progresses through life he is bound to meet at least some of them. The algebraic sum of their effects, acting on an hereditary predisposition, will apparently determine the manifestation of the depressive illness.

It has not been possible to demonstrate whether the position of an individual in his sibship is a provocative or a protective factor, but if it should be the latter, it raises a topic of great importance. The demonstration of a specific factor protecting against depressive illness would give rise to the hope that other such factors might exist. If these could be discovered, it could ultimately lead to the formulation of more precise therapeutic tools or even to a workable concept of preventive psychiatry.

Obviously, all the findings in this study must be confirmed before they can be finally accepted, but that such apparently specific results can be obtained by the relatively crude methods of present-day psychiatric research is an indication of the wealth of factual material which is to hand. There is certainly no need for a pessimistic attitude in the investigation of psychiatric illness.

Indications for future research

All the findings in this study suggest possible lines of enquiry and, for example, each of the factors which appear to predispose towards depression needs to be investigated in greater depth to demonstrate the nature of the relationship between the factor and the illness. As regards the importance of parental deprivation to depressive illness, it is unlikely that further retrospective studies will produce much information of note. It would be more valuable to set up a carefully-designed and controlled ongoing study of a large cohort of infants and actually observe the

immediate and late effects of parental deprivation. This would have to encompass the entire lifetime of the subjects and would be extremely expensive of manpower, time and resources. Whether the results as they relate to parental deprivation would be commensurate with the effort is a matter of some doubt, but certainly there would be great enhancement of knowledge on the development, both normal and abnormal, of the individual.

Of greater immediate interest is the type of research which could produce fairly specific results in the shorter term and perhaps the most fascinating would be the study of depressive twins. If twins are indeed more liable to depression than other people, it might be easier to distinguish in them specific predisposing factors which in turn would provide insight into the aetiology of depression in general.

The association of cancer in the mother and depression in the child suggests two main avenues of research. Obviously there must be psychopathological factors of great interest involved in the relationship and these require exploration in depth. As well as this, it would be most illuminating to ascertain the nature of the relationship: is the cancer a predisposing psychological factor or is there some physical connection between a tendency to cancer and a tendency to depression ? If the latter, the prospects for biochemical research are limitless.

Lastly, it is suggested that the gynaecological out-patient clinic would be a most fruitful source of psychiatric material for investigation. Not only must there be a considerable number of almost purely psychiatric

cases attending such a clinic but there must be many patients with an admixture of physical and psychiatric complaints who would provide excellent material for research into psychosomatic aspects of gynaecological illness.

SUMMARY OF RESULTS

SUMMARY OF RESULTS

1. Depressives as a whole show no greater tendency than a group of control individuals to lose a parent by death prior to the 16th birthday.

2. Endogenous depressives are more liable, and neurotic depressives less liable, to lose a parent by death prior to the 16th birthday as compared with the group of control individuals.

3. There is no evidence that death of the mother during childhood is more important in the aetiology of depression than death of the father, nor is there evidence that death of the mother in early childhood predisposes the individual to depression.

4. There is no evidence that death of the mother during childhood is more important in the aetiology of depression than loss of the mother for a cause other than death.

5. There is no evidence that death of a sib during childhood of an individual predisposes that individual to depressive illness.

6. As compared with controls, endogenous depressives report a highly significant excess of disturbed relationship with both mother and father during childhood whereas neurotic depressives report a frequency of disharmony with the parents very similar to that of the controls.

7. With reference to the disturbed relationship between the endogenous depressive and his parents, parental overstrictness and habitual drunkenness in the father may be factors of importance.

8. The size of the sibship in the individual's family of upbringing appears to have no significant relationship with a tendency to depressive illness.

9. The ordinal position of the individual in his sibship does not predispose to depression but the position of the individual in the sibship relative to the other sibs is significantly related to neurotic depression: neurotic depressives, as compared with controls, show a significant tendency to be middle children and not to be the youngest of the family.

10. There is a significant excess of unmarried individuals in the depressive group, largely due to an excess of the celibate in those depressives whose first onset of affective illness occurred after the age of 45 years.

11. Depressive illness does not have a significant effect in reducing the ability of married individuals to bear children.

12. Depressive patients appear to be very similar to controls with regard to social class distribution and religious persuasion.

13. The age of the parent at the time of the individual's birth is of no significance to the aetiology of depressive illness.

14. Depressive patients report a significantly higher frequency of family history of severe mental illness than do the controls.

15. Endogenous depressives do not report a significantly higher frequency of family history of severe mental illness than do neurotic depressives.

16. Endogenous depressives show a significantly greater tendency to lose mother by death before their 26th birthday than do controls.

17. A highly significant excess of depressive patients as compared with the controls, report that mother died of cancer. There is no difference between depressives and controls as to death of father due to cancer.

18. A much higher than expected number of twins is found in the depressive series.

19. Although the difference is not significant, the proportion of individuals who have attempted suicide is somewhat higher among neurotic than among endogenous depressives.

20. 9.7% of the female depressive patients have undergone a gynaecological operation in the year prior to their present psychiatric admission as compared with 2.1% of the female controls.

21. 21.6% of the patients in the depressive series (29.4% of the endogenous depressives) have had a previous psychiatric admission in the year prior to the present admission. 39.2% of all the depressives (50% of the endogenous group) have had at least one previous admission for psychiatric illness in the five years prior to the present admission.

22. 20.2% of the control patients, in whom there is no reason to think that parental deprivation has occurred to excess, have lost at least one parent by death before the 16th birthday.

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REFERENCES

Astrup, C., Fossum, A. and Holmboe, R. A follow-up study of 270 patients with acute affective psychoses. Acta psychiat. neurol. scand., 1959, 34, suppt. 135.

Barry, H. Jr., A Study of bereavements. An approach to problems in mental disease. Amer. J. Orthopsychiat. 1939, 9 : 355.

Barry, H. Jr. and Lindemann, E., Critical ages for maternal bereavement in psychoneuroses. Psychosom. Med. 1960, 22 : 166.

Barry, H. III and Barry, H. Jr., Season of birth. An epidemiological study in psychiatry. Arch. gen. Psychiat. (Chicago) 1961, 5 : 292.

Batchelor, I.R.C. and Napier, M.B., Broken homes among attempted suicides. Brit. J. Delinqu., 1953, 4 : 99.

Beck, A.T., Sethi, B.B. and Tuthill, R.W., Childhood bereavement and adult depression. Arch. gen. Psychiat. 1963, 9 : 295.

Bender, L., Infants reared in institutions. Bull. Child Welfare League of America, 1945, 24 : 1.

Böök, J.A., A genetic and neuropsychiatric investigation of a North Swedish population. Acta genet. (Basel) 1953, 3 : 345.

Bowlby, J., The influence of early environment. Int. J. Psycho-Anal., 1940, 21 : 154.

Bowlby, J., Forty-four juvenile thieves : their characters and home life. Int. J. Psycho-Anal., 1944, 25 : 107.

Bowlby, J., Childhood bereavement and psychiatric illness. In Aspects of Psychiatric Research. ed. Richter, D. Oxford Univ. Press, 1962.

Bradley, J.J., Severe localized pain associated with the depressive syndrome. Brit. J. Psychiat. 1963, 109 : 741.

Brown, F., Hypochondriasis in depression. J. ment. Sci., 1936, 82 : 314.

Brown, F., Depression and childhood bereavement. J. ment Sci. 1961, 107 : 754.

Bruhn, J.G., Broken homes among attempted suicides and psychiatric outpatients. J. ment. Sci. 1962, 108 : 772.

Casler, L., Maternal deprivation : a critical review of the literature. Monogr. Soc. Res. Child Developm., 1961, 26, no. 2.

Census 1961 Scotland County Report, City of Edinburgh. H.M.S.O. Edinburgh, 1963.

Clark, J.A. and Mallett, B.L., A follow-up study of schizophrenia and depression in young adults. Brit. J. Psychiat., 1963, 109 : 491.

Clark, R.E., Psychoses, income and occupational prestige. Amer. J. Sociol., 1949, 54 : 433.

Classification of Occupations, 1960. H.M.S.O. London, 1960.

Curran, D., The differentiation of neuroses and manic-depressive psychoses. J. ment. Sci., 1937, 83 : 156.

Curran, D. and Mallinson, W.P., Depressive states in war. Brit. med. J., 1941, 1 : 305.

Dewsbery, J.P., Involutional melancholia. Med. Press, 1954, 232, no. 6013.

Earle, A.M. and Earle, B.V., Early maternal deprivation and later psychiatric illness. Amer. J. Orthopsychiat., 1961, 31 : 181.

Eaton, J.W. and Weil, R.J., Culture and Mental Disease. Glencoe, Illinois, 1955.

Essen-Möller,E., Untersuchungen über die Fruchtbarkeit gewisser Gruppen von Geisteskranken. Acta psychiat. neurol. scand., 1935, suppt. 8.

Faris, R.E.L. and Dunham, H.W., Mental Disorders in Urban Areas. Hafner Publishing Co., New York, 1960.

Fischer, L.K., The Significance of atypical posturing and grasping behaviour during the first year of life. Amer. J. Orthopsychiat., 1958, 28 : 368.

da Fonseca, A.F., Affective equivalents. Brit. J. Psychiat., 1963, 109 : 464.

Foulds, G.A., Psychotic depression and age. J. ment. Sci., 1960, 106 : 1394.

Foulds, G.A., A quantification of diagnostic differentiae. J. ment. Sci., 1962, 108 : 389.

Fromm-Reichmann, F., Discussion of a paper by O.S. English. Psychiatry, 1949, 12 : 133.

Gates, R.G., Human Genetics. Macmillan Co., New York, 1952.

Goldfarb, W., Emotional and intellectual consequences of psychologic deprivation in infancy : a revaluation. In Psychopathology of Childhood, ed. Hoch and Zubin. Grune and Stratton, London, 1955.

Goodman, N., Relation between maternal age at parturition and incidence of mental disorder in the offspring. Brit. J. prev. soc. Med., 1957, 11 : 203.

Garmany, G., Depressive States : their aetiology and treatment. Brit. med. J., 1958, 2 : 341.

Gregory, I., Studies of parental deprivation in psychiatric patients. Amer. J. Psychiat., 1958, 115 : 432.

Hamilton, M., A rating scale for depression. J. Neurol. Neurosurg. Psychiat., 1960, 23 : 56.

Hamilton, M. and White, J.M., Clinical syndromes in depressive states. J. ment. Sci., 1959, 105 : 985.

Hansen, S., The inheritance of mental disease. Eugen. News 1938, 23 : 21.

Hare, E.H., Mental illness and social class in Bristol. Brit. J. prev. soc. Med., 1955, 9 : 191.

Harrington, J.A. and Cross, K.W., Cases of attempted suicide admitted to a general hospital. Brit. med. J., 1959, 2 : 463.

Helgason, T., The frequency of depressive states in Iceland as compared with the other Scandinavian countries. Acta psychiat. scand., 1961, suppt. 162.

Hemphill, R.E., Incidence and nature of puerperal psychiatric illness. Brit. med. J., 1952, 2 : 1232.

Hilgard, J.R., Newman, M.F. and Fisk, F., Strength of adult ego following childhood bereavement. Amer. J. Orthopsychiat., 1960, 30 : 788.

Hilgard, J.R. and Newman, M.F., Parental loss by death in childhood as an etiological factor among schizophrenic and alcoholic patients compared with a non-patient community sample. J. nerv. ment. Dis., 1963, 137 : 14.

Hopkinson, G., Celibacy and marital fertility in manic-depressive patients. Acta psychiat. scand., 1963 (a), 39 : 473.

Hopkinson, G., The onset of affective illness. Psychiat. et. Neurol. (Basel) 1963 (b), 146 : 133.

Hopkinson, G., A genetic study of affective illness in patients over 50. Brit. J. Psychiat., 1964, 110 : 244.

Imboden, J.B., Canter, A. and Cluff, L., Separation experiences and health records in a group of normal adults. Psychosom. Med., 1963, 25 : 433.

Ingham, H.V., A statistical study of family relationships in psychoneurosis. Amer. J. Psychiat., 1949, 106 : 91.

Jackson, D.D., The Etiology of Schizophrenia, Basic Books, New York, 1960.

Jones, D. and Hall, S.B., Significance of somatic complaints in patients suffering from psychotic depression. Acta psychother. (Basel) 1963, 11 : 193.

Juel-Nielson, N., Bille, M., Flygenring, J. and Helgason, T., Incidence of depressive states (Aarhus County investigation). Acta psychiat. scand., 1961, suppt. 162.

Kallman, F., Heredity in Health and Mental Disorder, Norton. New York, 1953.

Kallman, F., The genetics of mental illness. In the American Handbook of Psychiatry, ed. Arieti, S. Basic Books, New York, 1959.

Kay, D.W.K., Observations on the natural history and genetics of old age psychosis : a Stockholm material 1931-37. Proc. Roy. Soc. Med., 1959, 52 : 791.

Kiloh, L.G. and Garside, R.F., The independence of neurotic depression and endogenous depression. Brit. J. Psychiat., 1963, 109 : 451.

Knowles, J.B., Rating methods and measurement of behaviour. In Methods of Psychiatric Research, ed. Sainsbury, P and Kreitman, N. Oxford Univ. Press, London, 1963.

Kraines, S.H., Mental Depressions and their Treatment, Macmillan. New York, 1957.

Leading Article, Drugs for depression. Brit. med. J., 1964, 2 : 522.

Leighton, A.H., Lambo, T.A., Hughes, C.H., Leighton, D.C., Murphy, J.M. and Macklin, D.B., Psychiatric Disorder among the Yoruba. Cornell Univ. Press, Ithaca, New York, 1963.

Levine, S., Noxious stimulation in infant and adult rats and consummatory behaviour. J. comp. physiol. Psychol., 1958, 51 : 230.

Lewis, A.J., Melancholia. A clinical survey of depressive states. J. ment. Sci., 1934, 80 : 277.

Lewis, A.J., Fertility and mental illness. Eugen. Rev., 1958, 50 : 91.

Lidz, R.W. and Lidz, T., The family environment of schizophrenic patients. Amer. J. Psychiat., 1949, 106 : 332.

Lilienfeld, A.M., Epidemiological methods and influences in studies of non-infectious diseases. Publ. Hlth. Rep. (Wash.) 1957, 72 : 1.

Lin, T., A study of the incidence of mental disorder in Chinese and other cultures. Psychiatry, 1953, 16 : 313.

Lin, T. and Standley, C.C., The Scope of Epidemiology in Psychiatry. Public Health Papers No. 16, World Health Organization, Geneva, 1962.

McLelland, W.J., Differential handling and weight gain in the albino rat. Canad. J. Psychol., 1956, 10 : 19.

Madow, B. and Hardy, S.E., Incidence and analysis of the broken family in the background of neurosis. Amer. J. Orthopsychiat., 1947, 17 : 521.

Malzberg, B., Is birth order related to incidence of mental disease. Amer. J. phys. Anthrop., 1938, 24 : 91.

Malzberg, B., Psychiat. Quart., 1948, 22, suppt.

Malzberg, B., Mental disease in relation to economic status. J. nerv. ment. Dis., 1956, (a), 123 : 257.

Malzberg, B., Education and mental disease in New York State. Ment. Hyg., 1956,(b),40:177.

Mapother, E. and Lewis, A.J., In Price's Textbook of the Practice of Medicine, 5th ed., London, 1937.

Metropolitan Life Insurance Co., Statistical Bulletin, 1944, 25 : 3.

Meyer-Gross, W., Slater, E. and Roth, M., Clinical Psychiatry, 2nd ed., Cassell, London, 1960.

Montagu, M.F.A., The sensory influences of the skin. Texas Rep. Biol. Med., 1953, 11 : 291.

Morozova, T.N. and Shumskii, N.G., The relation of extrinisic factors to endogenous depressions. Zh. Nevropat. i Psikhiat., 1963, 63 : 1515.

Munroe, R.L., Other psychoanalytic approaches (Adler, Jung, Renk). In the American Handbook of Psychiatry, ed. Arieti, S. Basic Books, New York, 1959.

Norton, A., Incidence of neurosis related to maternal age and birth order. Brit. J. soc. Med., 1952, 6 : 253.

Ødegård, Ø., Marriage and mental disease. J. ment. Sci., 1946, 92 : 35.

Ødegård, Ø., New data on marriage and mental disease. J. ment. Sci., 1953, 99 : 778.

Ødegård, Ø., The epidemiology of depressive psychoses. From Gaustad Mental Hospital, Norway. Acta psychiat. Scand., 1961, 37, suppl. 162:133.

Oltman, J.E., McGarry, J.J. and Friedman, S., Parental deprivation and the "broken home" in dementia praecox and other mental disorders. Amer. J. Psychiat., 1951, 108 : 685.

Oswald, I., Deprivation of parents during childhood. Brit. med. J., 1958, 1 : 1515.

Palmer, D., Factors in Suicidal attempts (a review of 25 consecutive cases). J. nerv. ment. Dis., 1941, 93 : 421.

Pollock, G.H., Childhood parent and sibling loss in adult patients. Arch. gen. Psychiat., 1962, 7 : 295.

Pugh, T.F., Jerath, B.K., Schmidt, W.M. and Reed, R.B., Rates of mental disease related to childbearing. New Eng. J. Med., 1963, 268 : 1224.

Rabin, A.I., Personality maturity of Kibbutz and non-Kibbutz children as reflected in Rorschach findings. J. proj. Tech., 1957, 21 : 148.

Registrar General, Statistical Review of England and Wales for 1949. Supplement on General Morbidity, Cancer and Mental Health. H.M.S.O., London, 1953.

Registrar General, Statistical Review of England and Wales for 1950-51. Supplement on General Morbidity, Cancer and Mental Health. H.M.S.O., London, 1955.

Reid, D.D., Epidemiological Methods in the Study of Mental Disorders. Public Health Papers No. 2, World Health Organisation, Geneva, 1960.

Reitman, F., On the predictability of suicide. J. ment. Sci., 1942, 88 : 580.

Rheingold, H.L., The modification of social responsiveness in institutional babies. Monogr. Soc. Res. Child Develpm., 1956, 21, no. 2.

Rheingold, H.L. and Bayley, N., The later effects of an experimental modification of mothering. Child Developm., 1959, 31 : 363.

Ribble, M., The Rights of Infants : Early Psychological Needs and their Satisfactions. Columbia Univ. Press, 1943.

Robins, E., Schmidt, E.H. and O'Neal, P., Some interrelations of social factors and clinical diagnosis in attempted suicide. Amer. J. Psychiat., 1957, 114 : 221.

Roth, M., The natural history of mental disorder in old age. J. ment. Sci., 1955, 101 : 281.

Roth, M., The phenomenology of depressive states. (McGill University Conference on Depression). Canad. psychiat. Ass. J., 1959, 4, special suppt.

Roth, M. and Kay, D.W.K., Affective disorder arising in the senium. J. ment. Sci., 1956, 102 : 141.

Roth, M. and Kay, D.W.K., Social, medical and personal factors associated with vulnerability to psychiatric breakdown in old age. Geront. clin. 1962, 4 : 147.

Rüdin, E., Praktische Ergebnisse der psychiatrischen Erblichkeitsforschung. Die Naturwiss., 1930, 18 : 273.

Sainsbury, P., Psychosomatic disorders and neurosis in outpatients attending a general hospital. J. psychosom. Res., 1960, 4 : 261.

Simon, W., Attempted suicide among veterans. J. nerv. ment. Dis., 1950, 111 : 451.

Slater, E., The inheritance of manic-depressive insanity and its relation to mental defect. J. ment. Sci., 1936, 82 : 626.

Slater, E., Psychotic and Neurotic Illnesses in Twins. Medical Research Council Special Report Series. No. 278. H.M.S.O., London, 1953.

Sørensen, A. and Strömgren, E., Prevalence of depressive states (The Samsø investigation). Acta psychiat. scand., 1961, suppt. 162.

Spitz, R.A., Hospitalism : an inquiry into the genesis of psychiatric conditions in early childhood. part 1. Psychoanal. Stud. Child, 1945, 1 : 53.

Stein, L. and Sklaroff, S.A., Stages of family growth. Paper read at the Royal Statistical Society, London, 1957 (Unpublished).

Stengel, E., Further studies on pathological wandering. (Fugues with the impulse to wander). J. ment. Sci., 1943, 89 : 224.

Stengel, E., Classification of Mental Disorders. Bull. World Health Organization, 1960, 21 : 601.

Stenstedt, Å., A study in manic-depressive psychoses. Acta psychiat. neurol. scand., 1952, suppt. 79.

Stenstedt, Å., Involutional melancholia. Acta psychiat. scand., 1959, suppt. 127.

Tait, A.C., Harper, J. and McClatchey, W.T., Initial psychiatric illness in involutional women. J. ment. Sci., 1957, 103 : 132.

Tienari, P., Psychiatric illnesses in identical twins. Acta psychiat. scand., 1963, suppt. 171.

Tietze, C., Lemkau, P. and Cooper, M., Schizophrenia, manic-depressive psychosis and socio-enonomic status. Amer. J. Sociol., 1941, 47 : 167.

Titley, W.B., Prepsychotic personality of patients with involutional melancholia. Arch. Neurol. Psychiat., 1936, 36 : 17.

Wahl, C.W., Some antecedent factors in the family histories of 568 male schizophrenics of the U.S. Navy. Amer. J. Psychiat., 1956, 113 : 201.

Walton, H.J., Suicidal behaviour in depressive illness. J. ment. Sci., 1958, 104 : 884.

APPENDIX 1

The outpatient material. Fig. 1, Tables 1 to 18.

FIGURE 1

SEX AND AGE DISTRIBUTION OF THE POPULATION OF THE CITY OF EDINBURGH AND OF THE GENERAL HOSPITAL OUTPATIENTS INTERVIEWED IN THIS STUDY.

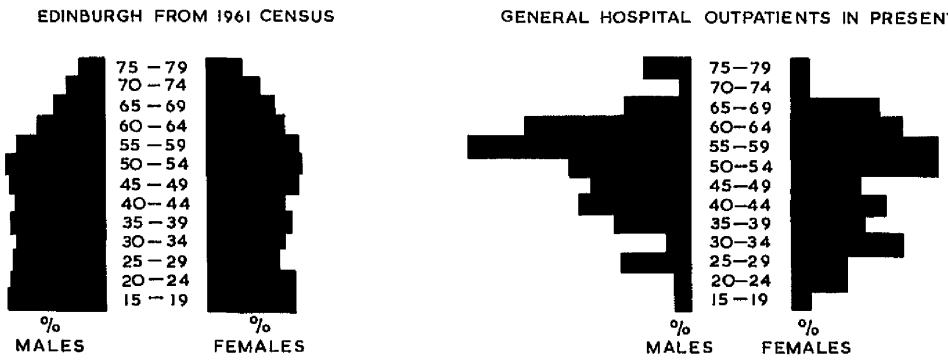

Table 1

Place of Residence of the Out-patients

Place of Residence	No. of Patients
Edinburgh	172
Midlothian or West Lothian	27
Elsewhere	11
Total	210

Table 2a.

Ages of the Out-patient: a) Medical and Surgical

Medical Out-patients		Surgical Out-patients	
Age group	Ages of Patients	Age group	Ages of Patients
16 - 25	17 18 20 20 20 20 21 22 23 25 25	16 - 25	16 21 25 25
26 - 35	26 28 28 28 29 29 30 30 33 33 34 34 34 34 35	26 - 35	27 27 28 30 30 32 33 34 34
36 - 45	36 36 37 37 37 37 39 39 39 39 40 41 41 41 [redacted] 42 43 43 43 43 44 44 45 45	36 - 45	37 37 37 38 39 40 40 40 42 43 43 44 44 44 44 45
46 - 55	46 46 46 47 48 48 49 50 50 50 50 50 51 51 51 51 52 52 53 53 53 54 54 55 55 55 55	46 - 55	46 47 48 49 49 49 49 50 51 51 51 51 51 52 53 53 54 54 54 55 55
56 - 65	56 56 56 56 57 58 58 58 58 58 59 59 59 59 59 60 60 60 61 61 61 61 61 61 61 62 62 62 63 64 64 64	56 - 65	56 56 56 57 57 57 57 58 58 58 58 59 59 59 59 59 60 60 60 61 61 61 61 63 64 64 64 65 65 65 65
66 and over	67 68 68 68 72 76 77 79 79	66 and over	66 67 67 67 68 68 68 68 72 74 75 79
Mean age 47.61 years		Mean age 51.52 years	

Mean age of the 210 medical and surgical out-patients, 49.34 years.

Table 2b.

Ages of the Out-patients: b) Male and Female

Male Outpatients		Female Out-patients	
Age Group	Ages of Patients	Age Group	Ages of Patients
16 - 25	16 21 25 25 28	16 - 25	17 18 20 20 20 20 21 22 23 25 25
26 - 35	27 28 28 33 35	26 - 35	26 27 28 29 29 30 30 30 30 32 33 33 34 34 34 34 34 34
36 - 45	37 37 37 37 38 39 40 41 41 43 43 43 44 44 44 44 45	36 - 45	36 36 37 37 37 39 39 39 39 40 40 40 41 42 42 43 43 43 44 44 45 45
46 - 55	46 46 48 48 49 49 49 49 50 50 51 51 51 51 52 53 53 53 54 55 55 55	46 - 55	46 46 47 47 48 49 50 50 50 50 51 51 51 51 51 52 52 53 53 54 54 54 54 55 55 55
56 - 65	56 56 56 57 57 57 57 58 58 58 58 59 59 59 59 59 59 60 60 60 61 61 61 61 61 63 63 64 64 64 64 64 65	56 - 65	56 56 56 56 57 58 58 58 58 58 59 59 59 59 60 60 60 61 61 61 61 61 61 62 62 62 64 65 65 65
66 and over	67 67 67 68 68 72 75 76 79 79	66 and over	66 67 68 68 68 68 68 72 74 77 79

Mean age 51.92 years

Mean age 47.33 years

Table 3

Civil State of the Out-patients compared with that of the Edinburgh Population

i) Male Out-patients

Civil State	Out-patients%	Edinburgh Population* %
Single	10.9	27.1
Married	79.3	67.8
Widowed	9.8	4.5
Divorced	-	0.6
Total	100%	100%

ii) Female Out-patients

Civil State	Out-patients%	Edinburgh Population* %
Single	11.9	28.4
Married	72.9	56.2
Widowed	13.6	14.4
Divorced	1.7	1.1
Total	100%	100%

* Figures obtained from the 1961 Census report.

Table 4.

Distribution of the Out-patients

according to Sex and Clinic Status

Number of Patients	Male	Female	Total
Medical	48	69	117
Surgical	44	49	93
Total	92	118	210

Table 5

Distribution of the Out-patients according to Age Group

a) Medical-Surgical

Age Group	No. of Patients: Medical	Surgical
16 - 35	26	13
36 - 45	23	16
46 - 55	27	21
56 - 65	32	31
66 and over	9	12
Total	117	93

$x^2 = 4.131$ 4 d.f.

$p = > .30$ N.S.

b) Male-Female

Age Group	No. of Patients: Male	Female
16 - 35	10	29
36 - 45	17	22
46 - 55	22	26
56 - 65	33	30
66 and over	10	11
Total	92	118

$x^2 = 7.340$ 4 d.f.

$p = > .10$ N.S.

Table 6

Distribution of the Out-patients according to Civil State

a) Medical-Surgical

Civil State	No. of Patients: Medical		No. of Patients: Surgical	
Single	16		8	
Married	90		69	
Widowed	10	11	15	16
Divorced	1		1	
Total	117		93	

$x^2 = 3.592$ 2 d.f.

$p = > .10$ N.S.

b) Male-Female

Civil State	No. of Patients: Male		No. of Patients: Female	
Single	10		14	
Married	73		86	
Widowed	9	9	16	18
Divorced	-		2	
Total	92		118	

$x^2 = 1.677$ 2 d.f.

$p = > .20$ N.S.

N.B. In the calculation of significances, the figures for divorce were so small that they had to be included with those for the widowed.

Table 7

Distribution of the Out-patients according to Social Class

a) Medical-Surgical

Social Class	No. of Patients: Medical	Surgical
1 and 2	29	25
3	52	46
4 and 5	36	22
Total	117	93

$x^2 = 1.328$ 2 d.f.

$p = > .50$ N.S.

b) Male-Female

Social Class	No. of Patients: Male	Female
1 and 2	22	32
3	44	54
4 and 5	26	32
Total	92	118

$x^2 = 0.292$ 2 d.f.

$p = > .80$ N.S.

Table 8

Distribution of the Out-patients according to Religious Persuasion

a) Medical-Surgical

Religious Persuasion	No. of Patients: Medical	Surgical
Protestant	106	77
Non-Protestant	11	16
Total	117	93

$x^2 = 2.755$ 1 d.f.

$p = > .05$ N.S.

b) Male-Female

Religious Persuasion	No. of Patients: Male	Female
Protestant	83	100
Non-Protestant	9	18
Total	92	118

$x^2 = 1.354$ 1 d.f.

$p = > .20$ N.S.

Table 9

Size of the Sibship in the Patient's Family of Upbringing

a) Medical-Surgical

Size of Sibship	No. of Patients: Medical	Surgical
1	7	8
2	16	13
3	21	20
4	13	10
5 and over	60	42
Total	117	93

$x^2 = 1.269$ 4 d.f.

$p = > .80$ N.S.

b) Male-Female

Size of Sibship	No. of Patients: Male	Female
1	4	11
2	11	18
3	20	21
4	11	12
5 and over	46	56
Total	92	118

$x^2 = 2.640$ 4 d.f.

$p = > .50$ N.S.

Table 10

Number of Children in the Patient's Own Family

a) Medical-Surgical

No. of Children	No. of Patients: Medical	Surgical
Patient unmarried	16	8
0	20	14
1	18	19
2 - 4	49	49
5 and over	14	3
Total	101	85

$x^2 = 6.931$ 3d.f.

$p = > .05$ N.S.

b) Male-Female

No. of Children	No. of Patients: Male	Female
Patient unmarried	10	14
0	10	24
1	17	20
2 - 4	49	49
5 and over	6	11
Total	82	104

$x^2 = 4.964$ 3d.f.

$p = > .10$ N.S.

In both instances, unmarried patients were excluded from these calculations as nom admitted to having had children.

Table 11

Loss of a Parent by Death

before the Patient's 16th Birthday

a) Medical-Surgical

	No. of Patients		
	Medical	Surgical	
Parent lost	28	13	x^2 = 3.320 1 d.f
Parent not lost	89	80	p = > .05 N.S.
Total	117	93	

b) Male-Female

	No. of Patients		
	Male	Female	
Parent lost	15	26	x^2 = 1.108 1 d.f.
Parent not lost	77	92	p = > .10 N.S.
Total	92	118	

Table 12

Loss of a Parent due to Any Cause, for a Period of at least Three Months, prior to the Patient's 16th Birthday

a) Medical-Surgical

	No. of Patients		
	Medical	Surgical	
Parent lost	52	45	$x^2 = 0.310$ 1 d.f.
Parent not lost	65	48	$p = > .50$ N.S.
Total	117	93	

b) Male-Female

	No. of Patients		
	Male	Female	
Parent lost	42	55	$x^2 = 0.195$ 1 d.f.
Parent not lost	50	63	$p = > .50$ N.S.
Total	92	118	

Table 13

Complaint by the Patient of a Disturbed Relationship with a Parent during Childhood

a) Medical-Surgical

	No. of Patients	
	Medical	Surgical
Disturbed relationship	18	20
No disturbed relationship	99	73
Total	117	93

$x^2 = 1.334$ 1 d.f.

$p = > .30$ N.S.

b) Male-Female

	No. of Patients	
	Male	Female
Disturbed relationship	16	22
No disturbed relationship	76	96
Total	92	118

$x^2 = 0.048$ 1 d.f.

$p = > .80$ N.S.

Table 14

Presence of a Family History of Mental Disorder

a) Medical-Surgical

	No. of Patients	
	Medical	Surgical
Positive family history	19	9
No family history	98	84
Total	117	93

$x^2 = 1.930$ 1 d.f.

$p = > .10$ N.S.

b) Male-Female

	No. of Patients	
	Male	Female
Positive family history	14	14
No family history	78	104
Total	92	118

$x^2 = 0.483$ 1 d.f.

$p = > .30$ N.S.

Table 15

Age of Mother at the Time of the Patient's Birth

a) Medical-Surgical

Mother's age group	No. of Patients: Medical	Surgical
16 - 25	35	28
26 - 35	53	53
36 and over	29	12
Total	117	93

$x^2 = 5.220$ 2 d.f.

$p = > .05$ N.S.

b) Male-Female

Mother's age group	No. of Patients: Male	Female
16 - 25	24	39
26 - 35	53	53
36 and over	15	26
Total	92	118

$x^2 = 3.297$ 2 d.f.

$p = > .10$ N.S.

N.B. In dealing with maternal age at the time of the patient's birth a smaller number of age-categories was utilized than for paternal age (Table 16a & b) as it was surmised that the maternal ages would cluster more closely.

Table 16

Age of Father at the Time of the Patient's Birth

a) Medical-Surgical

Father's age group	No. of Patients Medical	Surgical
Before 25	19	16
26-30	35	26
31-35	23	26
36-40	20	11
41 and over	20	14
Total	117	93

$x^2 = 2.721$ 4 d.f.

$p = > .50$ N.S.

b) Male-Female

Father's age group	No. of Patients Male	Female
Before 25	12	23
26-30	29	32
31-35	27	22
36-40	11	20
41 and over	13	21
Total	92	118

$x^2 = 5.441$ 4 d.f.

$p = > .20$ N.S.

Table 17

Age of the Patient at the Time of Mother's Death

a) Medical-Surgical

Age of the Patient	No. of Patients: Medical	Surgical
0-15	12	6
16-25	5	6
26-35	21	19
36 and over	38	32
Mother still alive	41	30
Total	117	93

$x^2 = 1.685$ 4 d.f.

$p = > .70$ N.S.

b) Male-Female

Age of the Patient	No. of Patients: Male	Female
0-15	9	9
16-25	5	6
26-35	20	20
36 and over	36	34
Mother still alive	22	49
Total	92	118

$x^2 = 7.291$ 4 d.f.

$p = > .10$ N.S.

Table 18

Age of the Patient at the Time of Father's Death

a) Medical-Surgical

Age of the Patient	No. of Patients: Medical	Surgical
0-15	17	10
16-25	18	11
26-35	25	18
36 and over	26	33
Father still alive	31	21
Total	117	93

$x^2 = 4.731$ 4 d.f.

$p = > .30$ N.S.

b) Male-Female

Age of the Patient	No. of Patients: Male	Female
0-15	8	19
16-25	13	16
26-35	18	25
36 and over	35	24
Father still alive	18	34
Total	92	118

$x^2 = 9.394$ 4 d.f.

$p = > .05$ N.S.

APPENDIX 2

Comparability of depressives and controls. Tables 19 to 24.

Table 19

Geographical area in which the Depressives and Controls dwell

	Depressives		Controls	
Area	No. of Patients	%	No. of Patients	%
City of Edinburgh	95	62.1	130	79.7
Midlothian/West Lothian	49	32.0	22	13.5
Elsewhere	9	5.9	11	6.8
Total	153	100%	163	100%

Table 20

Ages of the Depressive Patients

(The ages of the control patients will be found in Appendix I , Tables 2a & b)

Age Group	
16 - 25	16, 17, 17, 17, 18, 21, 23, 23, 23, 24, 25, 25.
26 - 35	26, 26, 26, 27, 28, 28, 29, 29, 30, 30, 30, 30, 31, 31, 31, 32, 33, 33, 34, 34, 34.
36 - 45	36, 37, 37, 38, 38, 38, 38, 39, 39, 40, 40, 40, 41, 41, 41, 41, 41, 41, 42, 42, 42, 42, 42, 42, 43, 43, 43, 43, 43, 43, 43, 43, 44, 44, 44, 44, 44, 44, 44, 45, 45, 45, 45, 45, 45.
46 - 55	46, 46, 47, 47, 47, 47, 48, 49, 49, 49, 50, 50, 50, 50, 50, 50, 50, 51, 51, 51, 51, 52, 52, 52, 52, 52, 52, 53, 53, 54, 54, 54, 54, 54, 55, 55, 55, 55, 55.
56 - 60	56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 57, 57, 57, 58, 58, 58, 58, 58, 58, 58, 59, 59, 59, 59, 59, 60, 60, 60, 60, 60, 60, 60, 60, 60, 60.

Mean age of the depressive patients 44.88 years:

Males 47.00 years

Females 42.54 years

Mean age of the control patients 44.43 years:

Males 47.00 years

Females 42.54 years

Table 21

Comparison of depressive patients and controls as to age-distribution

	Depressives		Controls	
Age-group	No. of Patients	%	No. of Patients	%
16 - 25	12	7.8	15	9.2
26 - 35	21	13.7	24	14.7
36 - 45	45	29.4	39	23.9
46 - 55	40	26.1	48	29.4
56 - 60	35	22.9	37	22.7
Total	153	100%	163	100%

$x^2 = 1.425$ 4 d.f. $p = > .80$ N.S.

Table 22

Comparison of depressive patients and controls

as to sex-distribution

	Depressives		Controls	
Sex of the Patient	No. of Patients	%	No. of Patients	%
Male	50	32.7	69	42.3
Female	103	67.3	94	57.7
Total	153	100%	163	100%

$x^2 = 3.117$ 1 d.f. $p = > .05$ N.S.

Table 23

Distribution of depressive patients and controls as to social class

	Depressives		Controls	
Social Class	No. of Patients	%	No. of Patients	%
1 and 2	34	22.2	42	25.8
3	75	49.0	73	44.8
4 and 5	44	28.8	48	29.4
Total	153	100%	163	100%

$x^2 = 0.719$ 2 d.f. $p = > .50$ N.S.

Table 24

Distribution of depressive patients and controls as to religious persuasion

	Depressives		Controls	
Religious Persuasion	No. of Patients	%	No. of Patients	%
Protestant	130	85.0	141	86.5
Non-Protestant	23	15.0	22	13.5
Total	153	100%	163	100%

$x^2 = 0.149$ 1 d.f. $p = > .50$ N.S.

APPENDIX 3a

The hypotheses : results. Tables 25 to 53.

Table 25

Comparison of the proportion of endogenous and neurotic depressives who have attempted suicide

Total number of depressive patients	153
Total number of patients who have attempted suicide	31

	Endogenous depressives		Neurotic depressives	
	No. of patients	%	No. of patients	%
Patients who have attempted suicide	18	17.6	13	25.5
Non-suicidal patients	84	82.4	38	74.5
Total	102	100%	51	100%

$x^2 = 1.143$ 1 d.f. $p = > .20$ N.S.

Table 26a.

Childhood deprivation due to parental death: comparison between depressives and controls

a) Loss of either parent

	Depressives							
	All depressives		Endogenous		Neurotic		Controls	
	No.	%	No.	%	No.	%	No.	%
Deprived of parent	33	21.6	26	25.5	7	13.7	33	20.2
Not deprived	120	78.4	76	74.5	44	86.3	130	79.8
Totals	153	100%	102	100%	51	100%	163	100%
x^2	.075	1 d.f.	1.003	1 d.f.	1.061	1 d.f.		
Level of significance (p)	> .70		> .30		> .30			
	N.S.		N.S.		N.S.			

Table 26b.

Childhood deprivation due to parental death: comparison between depressives and controls

b) Loss of father

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Deprived of father	20	13.1	15	14.7	5	9.8	22	13.5
Not deprived	133	86.9	87	85.3	46	90.2	141	86.5
Totals	153	100%	102	100%	51	100%	163	100%
x^2	.010	1 d.f.	.084	1 d.f.	0.459	1 d.f.		
Level of significance (p)	> .90		> .70		> .30			
	N.S.		N.S.		N.S.			

Table 26c.

Childhood deprivation due to parental death: comparison between depressives and controls

c) Loss of mother

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Deprived of mother	17	11.1	14	13.7	3	5.9	12	7.4
Not deprived	136	88.9	88	86.3	48	94.1	151	92.6
Totals	153	100%	102	100%	51	100%	163	100%
x^2	1.369	1 d.f.	2.883	1 d.f.	.002	1 d.f.		
Level of significance (p)	> .20		> .05		> .95			
	N.S.		N.S.		N.S.			

Table 27

Comparison of Endogenous and Neurotic Depressives as to Childhood deprivation due to parental death

	Loss of Either Parent		Loss of Father		Loss of Mother	
	Parent lost	Not lost	Father lost	Not lost	Mother lost	Not lost
Endogenous depression	26	76	15	87	14	88
Neurotic depression	7	44	5	46	3	48
Totals	33	120	20	133	17	136
χ^2	2.782 1 d.f.		.746 1 d.f.		1.409 1 d.f.	
Level of significance (p)	> .05		> .30		> .20	
	N.S.		N.S.		N.S.	

Table 28

The period in childhood in which the parent died: comparison between depressives and controls

a) Death of Father

	Period in Childhood			
	0-5 years	6-10 years	11-15 years	Total
Depressives	5	4	11	20
Controls	12	5	5	22

$x^2 = 5.203$ 2 d.f. $p = > .05$ N.S.

b) Death of Mother

	Period in Childhood			
	0-5 years	6-10 years	11-15 years	Total
Depressives	7	5	5	17
Controls	4	4	4	12

Table 29

The percentage of depressives who have been deprived of a parent by death during childhood: comparison between different types of depressive illness in this respect

Diagnostic category	Death of either parent	Death of father	Death of mother
		(Figures percent)	
All depressives	21.6	13.1	11.1
Endogenous depressives	25.5	14.7	13.7
Neurotic depressives	13.7	9.8	5.9
Non-suicidal endogenous depressives	23.8	13.1	14.3
Non-suicidal neurotic depressives	13.2	7.9	7.9
Suicidal depressives	25.8	19.4	6.5
Controls	20.2	13.5	7.4

Table 30

Absence of a parent, for a cause other than death, during a period of more than three months in the subject's childhood: comparison between depressives and controls

a) Absence of either parent

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Parent absent	42	27.5	26	25.5	16	31.4	51	31.3
Not absent	111	72.5	76	74.5	35	68.6	112	68.7
Totals	153	100%	102	100%	51	100%	163	100%
x^2	.549	1 d.f.	1.009	1 d.f.	.000	1 d.f.		
Level of significance (p)	> .30		> .30		1			
	N.S.		N.S.		N.S.			

Table 31

Absence of a parent, for a cause other than death, during a period of more than three months in the subject's childhood: comparison between depressives and controls

b) Absence of father

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Father absent	40	26.1	24	23.5	16	31.4	48	29.4
Not absent	113	73.9	78	76.5	35	68.6	115	70.6
Totals	153	100%	102	100%	51	100%	163	100%
x^2	.426	1 d.f.	1.099	1 d.f.	.051	1 d.f.		
Level of significance (p)	> .50		> .20		> .80			
	N.S.		N.S.		N.S.			

Table 32

Absence of a parent, for a cause other than death, during a period of more than three months in the subject's childhood: comparison between depressives and controls

c) Absence of mother

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Mother absent	12	7.8	9	8.8	3	6.3	16	10.9
Not absent	141	92.2	93	91.2	48	93.7	147	89.1
Totals	153	100%	102	100%	51	100%	163	100%
χ^2	.400	1 d.f.	.073	1 d.f.	.336	1 d.f.		
Level of significance (p)	> .50		>.70		> .50			
	N.S.		N.S.		N.S.			

Table 33

Comparison of Endogenous and Neurotic Depressives as to absence of parent, for a cause other than death, during a period of more than three months in the subject's childhood

	Absence of Either Parent		Absence of Father		Absence of Mother	
	Parent Absent	Not Absent	Father Absent	Not Absent	Mother Absent	Not Absent
Endogenous depression	26	76	24	78	9	93
Neurotic depression	16	35	16	35	3	48
Totals	42	111	40	113	12	141
x^2	.591 1 d.f.		1.110 1 d.f.		.102 1 d.f.	
Level of significance (p)	> .30		> .20		> .70	
	N.S.		N.S.		N.S.	

Table 34 The percentage of depressives who have lost a parent in childhood for a period of more than three months, due to a cause other than the parent's death: comparison between different types of depressive illness in this respect

Diagnostic category	Absence of either parent	Absence of father	Absence of mother
		(Figures percent)	
All depressives	27.5	26.1	7.8
Endogenous depressives	25.5	23.5	8.8
Neurotic depressives	31.4	31.4	6.3
Non-suicidal endogenous depressives	22.6	20.2	9.5
Non-suicidal neurotic depressives	34.2	34.2	7.9
Suicidal depressives	32.3	32.3	3.2
Controls	31.3	29.4	10.9

Table 35 Age of father at time of the individual's birth: depressives v. controls

Average age of father at time of depressive patient's birth: 33.19 years

Average age of father at time of control individual's birth: 33.08 years

Age of father at time of birth	Depressives	Controls
- 25	21	26
26 - 30	36	48
31 - 35	43	42
36 - 40	29	22
41 -	23	25
Totals	152*	163

$x^2 = 2.536$ 4 d.f. $p = >.50$ N.S.

* 1 patient could provide no information about father's age

Table 36

Age of mother at time of the individual's birth: depressives v. controls

Average age of mother at time of depressive patient's birth: 30.15 years

Average age of mother at time of control individual's birth: 30.37 years

Age of mother at time of birth	Depressives	Controls
16 - 20	7	5
21 - 25	34	41
26 - 30	44	54
31 - 35	37	32
36 - 40	20	22
41 -	11	9
Totals	153	163

$\chi^2 = 2.335$ 5 d.f. $p = > .80$ N.S.

Table 37

Age of father at time of the individual's birth: endogenous and neurotic depressives v. controls

Average age of father at time of endogenous depressive's birth: 33.54 years

Average age of father at time of neurotic depressive's birth: 32.49 years

Average age of father at time of control individual's birth: 33.08 years

Age of father at time of birth	Depressives: Endogenous	Depressives: Neurotic	Controls
- 25	11	10	26
26 - 30	26	10	48
31 - 35	26	17	42
36 -	38	14	47
Totals	101*	51	163

Endogenous depressives v. controls	$\chi^2_2 = 2.980$	3 d.f.	$p = \geq .30$	N.S.
Neurotic depressives v. controls	$\chi^2_2 = 2.478$	3 d.f.	$p = > .30$	N.S.
Endogenous depressives v. neurotic depressives	$\chi^2 = 4.181$	3 d.f.	$p = > .20$	N.S.

* 1 patient could provide no information about father's age.

Table 38

Age of mother at time of the individual's birth: endogenous and neurotic depressives v. controls

Average age of mother at time of endogenous depressive's birth: 30.48 years

Average age of mother at time of neurotic depressive's birth: 29.35 years

Average age of mother at time of control individual's birth: 30.37 years

Age of mother at time of birth	Depressives: Endogenous	Depressives: Neurotic	Controls
- 25	25	16	46
26 - 30	30	14	54
31 - 35	27	10	32
36 - 40	20	11	31
Totals	102	51	163

Endogenous depressives v. controls	$\chi^2 = 1.918$	3 d.f.	p = > .50	N.S.
Neurotic depressives v. controls	$\chi^2 = 0.523$	3 d.f.	p = > .90	N.S.
Endogenous depressives v. neurotic depressives	$\chi^2 = 1.346$	3 d.f.	p = > .70	N.S.

Table 39

Complaint by the individual of a disturbed relationship with a parent during childhood: comparison between depressives and controls

	Depressives								Controls	
	All depressives		Endogenous		Neurotic		Suicidal			
	No.	%	No.	%	No.	%	No.	%	No.	%
Disturbed relationship	49	32.0	37	36.3	12	23.5	11	35.5	29	17.8
No disturbance	104	68.0	65	63.7	39	76.5	20	64.5	134	82.2
Totals	153	100%	102	100%	51	100%	31	100%	163	100%
x^2	8.548	1 d.f.	11.466	1 d.f.	0.803	1 d.f.	4.960	1 d.f.		
Level of significance (p)	< .01		< .01		> .30		< .05			
	SIG.		SIG.		N.S.		SIG.			

Comparison between each category of depression and the controls

Table 40

Complaint by the individual of a disturbed relationship with father during childhood: comparison between depressives and controls

	Depressives								Controls	
	All depressives		Endogenous		Neurotic		Suicidal			
	No.	%	No.	%	No.	%	No.	%	No.	%
Disturbed relationship	36	23.5	28	27.4	8	15.7	8	25.8	25	15.3
No disturbance	117	76.5	74	72.6	43	84.3	23	74.2	138	84.7
Totals	153	100%	102	100%	51	100%	31	100%	163	100%
x^2	3.436	1 d.f.	5.754	1 d.f.	.003	1 d.f.	1.976	1 d.f.		
Level of significance (p)	> .05		< .02		> .95		> .10			
	Sig.		Sig.		N.S.		N.S.			

Comparison between each category of depression and the controls

Table 41

Complaint by the individual of a disturbed relationship with mother during childhood: comparison between depressives and controls

	Depressives								Controls	
	All depressives		Endogenous		Neurotic		Suicidal			
	No.	%	No.	%	No.	%	No.	%	No.	%
Disturbed relationship	28	18.3	22	21.6	6	11.8	6	19.4	11	6.7
No disturbance	125	81.7	80	78.4	45	88.2	25	80.6	152	93.3
Totals	153	100%	102	100%	51	100%	31	100%	163	100%
χ^2	9.698	1 d.f.	12.646	1 d.f.	1.261	1 d.f.	5.253	1 d.f.		
Level of significance (p)	< .01 SIG.		< .01 SIG.		> .20 N.S.		< .05 SIG.			

Comparison between each category of depression and the controls.

Table 42a.

Causes of disturbed relationship with a parent during childhood, as related by the patient

a) Disturbed relationship with father or father-figure

Cause of disturbance	Depressives	Controls
Habitual drunkenness of father	9	5
Father overstrict	8	4
Father aloof or absent much of the time	7	7
Father's quarrelsomeness	3	3
Physical illness	3	3
Mental illness	3	1
Poor relationship with stepfather	3	2
Totals	36	25

Table 42b.

Causes of disturbed relationship with a parent during childhood, as related by the patient

b) Disturbed relationship with mother or mother-figure

Cause of disturbance	Depressives	Controls
Mother overstrict	7	1
Mother aloof or absent much of the time	5	4
Mother's quarrelsomeness	7	2
Physical illness	5	1
Poor relationship with stepmother	2	3
Adultery committed by mother	2	0
Totals	28	11

Table 43

The size of the sibship in the patient's family of upbringing: comparison between depressives and controls

Size of Sibship	Depressives: All depressives		Depressives: Endogenous		Depressives: Neurotic		Controls	
	No.	%	No.	%	No.	%	No.	%
1 (only child)	13	8.5	11	10.8	2	3.9	13	8.0
2	19	12.4	12	11.8	7	13.7	28	17.2
3	27	17.6	21	20.6	6	11.8	36	22.1
4	21	13.7	15	14.7	6	11.8	17	10.4
5	22	14.4	15	14.7	7	13.7	18	11.0
6	15	9.8	10	9.8	5	9.8	15	9.2
7 and over	36	23.5	18	17.6	18	35.2	36	22.1
Totals	153	100%	102	100%	51	100%	163	100%
x^2	3.523 6 d.f.		4.024 6 d.f.		5.967 5 d.f.*			
Level of significance (p)	> .70 N.S.		> .50 N.S.		> .30 N.S.			

* Categories 1 and 2 combined because of small numbers

Table 44 **Ordinal position of the individual in his family of upbringing:**
Comparison between depressives and controls

Ordinal position	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
1	45	29.4	32	31.4	13	25.4	53	32.5
2	36	23.5	25	24.5	11	21.5	40	24.5
3	28	18.3	19	18.6	9	17.6	23	14.1
4	12	7.8	6	5.9	6	11.8	12	7.4
5	8	5.2	5	4.9	3	5.9	11	6.7
6	9	5.9	7	6.9	2	3.9	9	5.5
7 and over	15	9.8	8	7.8	7	13.7	15	9.2
Totals	153	100%	10 2	100%	51	100%	163	100%
x^2	1.313	6 d.f.	1.697	6 d.f.	2.459	4 d.f.*		
Level of significance (p)	> .95		> .90		> .50			
	N.S.		N.S.		N.S.			

* Categories 5, 6, 7 and over combined in this calculation because of the small numbers involved.

Table 45 Position of the individual in family of upbringing in relation to other sibs: comparison between depressives and controls

Position in family	Depressives: All depressives		Depressives: Endogenous		Depressives: Neurotic		Controls	
	No.	%	No.	%	No.	%	No.	%
First	37.5	24.5	25.5	25.0	12	23.5	46.5	28.5
Middle	76	49.7	45	44.1	31	60.7	59	36.2
Last	39.5	25.8	31.5	30.9	8	15.7	57.5	35.3
Totals	153	100%	102	100%	51	100%	163	100%
x^2	6.142	2 d.f.	1.672	2 d.f.	10.848	2 d.f.		
Level of significance (p)	< .05		> .30		< .01			
	Sig		N.S.		Sig.			

N.B. 1. If the patient is neither first nor last in the sibship he is considered as belonging to the middle of the family.

2. Only children are counted as half-first, half-last, in the family.

Table 46

Position of the neurotic depressive patient in family of upbringing in relation to other sibs: comparison with controls

a) Individuals who are first in the family compared with the rest

	First in the family	The remainder	Total
Neurotic depressives	12	39	51
Controls	46.5	116.5	163

$x^2 = .468$ 1 d.f. $p = > .30$ N.S.

b) Individuals in the middle of the family compared with the rest

	Middle of the family	The remainder	Total
Neurotic depressives	31	20	51
Controls	59	104	163

$x^2 = 9.740$ 1 d.f. $p = < .01$ SIG.

c) Individuals who are last in the family compared with the rest

	Last in the family	The remainder	Total
Neurotic depressives	8	43	51
Controls	57.5	105.5	163

$x^2 = 7.004$ 1 d.f. $p = < .01$ SIG.

N.B. Only children are counted as half-first, half-last

Table 47 Distribution of depressive patients and controls as to civil state

Civil State	Depressives: All depressives		Depressives: Endogenous		Depressives: Neurotic		Controls	
	No.	%	No.	%	No.	%	No.	%
Unmarried	37	24.2	24	23.5	13	25.4	23	14.1
Married	98	64.1	69	67.6	29	56.8	129	79.1
Widowed	11	7.2	7	6.9	4	7.8	9	5.5
Divorced or separated	7	4.5	2	2.0	5	9.8	2	1.2
Totals	153	100%	102	100%	51	100%	163	100%
x^2	8.872	2 d.f.	4.590	2 d.f.	10.431	2 d.f.		
Level of significance (p)	< .02 Sig.		> .10 N.S.		< .01 Sig.			

As the numbers of divorced and separated individuals is small, for the purposes of this calculation they have been included in the group of widowed individuals.

Table 48

Comparison between depressives and controls as to celibacy

Civil State	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Unmarried	37	24.2	24	23.5	13	25.4	23	14.1
Others	116	75.8	78	76.5	38	74.6	140	85.9
Totals	153	100%	102	100%	51	100%	163	100%
x^2	5.139	1 d.f.	3.802	1 d.f.	3.558	1 d.f.		
Level of significance (p)	< .05		> .05		>.05			
	SIG.		N.S.		N.S.			

Table 49

Celibacy in patients whose depression is of early or late onset: comparison with controls

	Early onset depressives		Late onset depressives		Controls	
Civil state	No.	%	No.	%	No.	%
Unmarried	21	20.4	16	32	23	14.1
Others	82	79.6	34	68	140	85.9
Totals	103	100%	50	100%	163	100%
x^2	1.838 1 d.f.		8.051 1 d.f.			
Level of significance (p)	> .10		< .01			
	N.S.		SIG.			

Table 50

The number of children in the married individual's family: a comparison between depressives and controls

No. of children	Depressives: All depressives		Depressives: Endogenous		Depressives: Neurotic		Controls	
	No.	%	No.	%	No.	%	No.	%
0	14	12.1	10	12.8	4	10.5	24	17.1
1	25	21.6	20	25.6	5	13.2	28	20.0
2	40	34.5	27	34.6	13	34.2	42	30.0
3	23	19.8	14	17.9	9	23.7	19	13.6
4	5	4.3	2	2.6	3	7.9	14	10.0
5 and over	9	7.6	5	6.4	4	10.5	13	9.3
Totals	116	100%	78	100%	38	100%	140	100%
x^2	6.022	5 d.f.	5.757	4 d.f.*	3.682	4 d.f.*		
Level of significance (p)	> .30	N.S.	> .20	N.S.	> .30	N.S.		

* Categories 4 and 5 and over combined because of small numbers.

Table 51 The number of children in the married individual's family:

a comparison between depressives of early and late onset and controls

	Early onset depressives		Late onset depressives		Controls	
No. of children	No.	%	No.	%	No.	%
0	11	13.4	3	8.8	24	17.1
1	15	18.2	10	29.4	28	20.0
2	27	32.9	13	38.2	42	30.0
3	20	24.3	3	8.8	19	13.6
4	2	2.4	3	8.8	14	10.0
5 and over	7	8.5	2	5.9	13	9.3
Totals	82	100%	34	100%	140	100%
x^2	6.319 4 d.f.		3.072 4 d.f.			
Level of significance (p)	> .10 N.S.		> .50 N.S.			

Categories 4 and 5 and over combined because of small numbers.

Table 52

A positive family history of severe mental disorder:
comparison between depressives and controls

	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
Positive family history	55	35.9	40	39.2	15	29.4	21	12.9
Negative family history	98	64.1	62	60.8	36	70.6	142	87.1
Totals	153	100%	102	100%	51	100%	163	100%
x^2	22.978	1 d.f.	24.482	1 d.f.	7.525	1 d.f.		
Level of significance (p)	< .01		< .01		< .01			
	Sig.		Sig.		Sig.			

Table 53

Comparison between endogenous and neurotic depressives as to a positive family history of severe mental disorder

	Endogenous depressives	Neurotic depressives
Positive family history	40	15
Negative family history	62	36
Totals	102	51

$x^2 = 1.392$ 1 d.f. $p = > .20$ N.S.

APPENDIX 3b

Miscellaneous results. Tables 54 to 64.

Table 54

The age of the depressive at the time of mother's death: a comparison with the controls

Age of the individual at mother's death	Depressives	Controls
0 - 15	17	12
16 - 25	16	7
26 - 35	14	30
36 and over	50	43
Mother still alive	56	71
Totals	153	163

$x^2 = 12.305$ 4 d.f. $p = < .02$ SIG.

Table 55

The age of the individual at the time of mother's death: comparison between depressives and controls

Age of individual at mother's death	Depressives						Controls	
	All depressives		Endogenous		Neurotic			
	No.	%	No.	%	No.	%	No.	%
0 - 25 years	33	21.6	24	23.5	9	17.6	19	11.7
26 years and over	120	78.4	78	76.5	42	82.4	144	88.3
Totals	153	100%	102	100%	51	100%	163	100%
x^2	5.607	1 d.f.	6.415	1 d.f.	1.194	1 d.f.		
Level of significance (p)	< .02		< .02		> .20			
	Sig.		Sig.		N.S.			

Table 56a.

Causes of death, as reported by the subjects, in those mothers who died before the subject's 26th birthday

a) Depressives

Cause of maternal death	No. of maternal deaths occurring when the subjects are aged: 0 - 15 years	16 - 25 years	Total
Cancer	6	4	10
Intercurrent infection	3	2	5
Heart disease	0	3	3
Childbirth	4	0	4
Miscellaneous or unknown	4	7	11
Totals	17	16	33

Mean age of mothers dying when the subject is aged 0 - 25 years: 32.13 years

Mean age of mothers dying when the subject is aged 0 - 15 years: 29.82 years

Mean age of mothers dying when the subject is aged 16- 25 years: 34.43 years.

Table 56b.

Causes of death, as reported by the subjects, in those mothers who died before the subject's 26th birthday

b) Controls

Cause of maternal death	No. of maternal deaths occurring when the controls are aged: 0 - 15 years	16 - 25 years	Total
Cancer	0	2	2
Intercurrent infection	3	0	3
Heart disease	0	1	1
Childbirth	1	0	1
Miscellaneous or unknown	8	4	12
Totals	12	7	19

Mean age of mothers dying when the control is aged 0 - 25 years: 29.77 years

Mean age of mothers dying when the control is aged 0 - 15 years: 30.33 years

Mean age of mothers dying when the control is aged 16 - 25 years: 28.80 years.

Table 57

Mothers who die of cancer: a comparison between depressives and controls

	No. of individuals whose mothers died of cancer		
	Before individual's 26th birthday	After individual's 26th birthday	Totals
Depressives	10	14	24
Controls	2	3	5

$x^2 = 15.204$ 1 d.f. $p = < .01$ Sig.

Table 58

The age of the depressive at the time of father's death: a comparison with the controls

Age of the individual at father's death	Depressives	Controls
0 - 15	20	22
16 - 25	20	19
26 - 35	23	29
36 and over	43	42
Father still alive	46	51
Totals	152*	163

$x^2 = .712$ 4 d.f. $p = > .90$ N.S.

* 1 patient had no information regarding father's death

Table 59a

Fathers who die of cancer: a comparison between depressives and controls

	No. of individuals		
	Father died of cancer	Father did not die of cancer	Totals
Depressives	7	145	152*
Controls	10	153	163

$x^2 = .359$ 1 d.f. $p = > .50$ N.S.

* 1 patient had no information regarding father's death

Table 60

Report by an individual that his parents lost one or more children by death: comparison between depressives and controls

	No. of individuals who report:		
	Death of a sib	No death of a sib	Totals
Depressives	35	118	153
Controls	34	129	163

$\chi^2 = .188$ 1 d.f. $p = > .50$ N.S.

Table 61

Death of one or more sibs during the individual's childhood:

comparison between depressives and controls

	Death of a sib:			
	Before individual's birth	During individual's childhood	No sib-death	Totals
Depressives	11	24	118	153
Controls	16	18	129	163

$x^2 = 1.999$ 2 d.f. $p = > .30$ N.S.

APPENDIX 4

The Questionnaire.

1. Date of Interview ..... First Interviewed by Dr. .....

CODE NO.

Type of Patient: (Ring) Med. O.P. Surg.O.P. Psych.I.P.

Hospital ..... If I.P., Date of Admission .....

---

2. SURNAME ..... MARITAL STATE: (Ring) S M D Sep W

FIRST NAMES ..... OCCUPATION .....

ADDRESS ..... HUSBAND'S OCCUPATION .....

..... SOCIAL CLASS: .....

AGE ..... SEX ..... RELIGION: (Ring) Prot. R.C. Jewish Other None

D.O.B. .....

GENERAL PRACTITIONER: NAME ..... ADDRESS .....

---

3. History of Psychiatric Illness: (Ring) Yes No

Previous Psychiatric Illness

Approx. Year	Type of Illness	Duration	Treatment	Where Treated	I.P./O.P.

4. PRESENT PSYCHIATRIC ILLNESS

Clinical Diagnosis ..... If Depression: (Ring) Neurotic Endogenous

Duration .....

Personality Disorder: (Ring) Present Absent Type .....

Associated Factors: (Ring) Other Psychosis Neurosis Mental Defect Alcoholism Epilepsy Other

Precipitating Factors: (Ring) Present Absent

Details of any Above:

5. FAMILY HISTORY

MOTHER'S SURNAME ..... FATHER'S SURNAME .....

FIRST NAMES ..... FIRST NAMES .....

MAIDEN NAME .....

BIRTHPLACE ..... BIRTHPLACE .....

LAST ADDRESS ..... LAST ADDRESS .....

PLACE OF DEATH ..... PLACE OF DEATH .....

CAUSE OF DEATH ..... CAUSE OF DEATH .....

AGE AT PATIENT'S BIRTH ..... AGE AT PATIENT'S BIRTH .....

PATIENT'S AGE AT MOTHER'S DEATH ..... PATIENT'S AGE AT FATHER'S DEATH .....

FAMILY HISTORY OF MENTAL ILLNESS: (Ring) Yes No

NO. OF CHILDREN BORN ALIVE TO MOTHER

AGE AND SEX OF PATIENT'S CHILDREN Age

Sex

6. PERSONAL HISTORY

MULTIPLE BIRTH: (Ring) Yes No

MOTHER ABSENT DURING CHILDHOOD: (Ring) Yes No FATHER ABSENT DURING CHILDHOOD : Yes No

REASON ..... REASON .....

PERIOD: 0-2 3-5 6-10 11-15 PERIOD: 0-2 3-5 6-10 11-15

DURATION: <3/12 <6/12 <1 year > 1 year DURATION: <3/12 <6/12 <1 year > 1 year

SURROGATE ..... SURROGATE .....

7. FACTORS CAUSING DISTURBANCE IN FAMILY RELATIONSHIPS

CAUSE	MOTHER		FATHER	
	AGE OF PATIENT	DURATION	AGE OF PATIENT	DURATION
DIVORCE				
DESERTION				
PHYSICAL ILLNESS				
MENTAL ILLNESS				
TRAVELLING				
ARMED FORCES				
OTHER				
OTHER DISTURBING FACTORS PARENTAL DISCORD				
ALCOHOLISM				
NEGLECT				
CRUELTY				

8. PHYSICAL ILLNESS

PRESENT ILLNESS OR DISABILITY ..... DURATION .....

....

PREVIOUS ILLNESSES OR DISABILITIES ....

....

....

....

....

APPENDIX 5

The reject series.

THE REJECT SERIES

Although it was arranged that the investigator should see only cases of primary depressive illness it was inevitable that a certain number of patients with depression secondary to other psychiatric conditions would be referred for interview. 30 patients were rejected from the depressive series on this account but information was gathered on them exactly as with the other depressives.

All of these 30 individuals suffer unmistakeably from a depressive illness but in their case this is secondary to a personality disorder or some form of neurotic illness. (No case of depression secondary to another psychosis was apparently referred). In 27 (90%) a form of personality disorder (usually long-term manifestations of anxiety or inadequacy) is present and in 10 (33.3%) neurotic symptoms are prominent alongside the depression. It will be remembered that in the depressive series, 102 patients (66.7%) were diagnosed as suffering from endogenous, and 51 (33.3%) as suffering from neurotic, depression: in the rejects the ratio is exactly reversed, being 10 (33.3%) with endogenous, and 20 (66.7) with neurotic, depression. The proportion of women to men is high in the rejects, there being 24 females (80%) and 6 males (20%). There is, incidentally, one twin (a female) in the reject series. A high proportion (33.3%) have attempted suicide at some time.

The rejects tend to fall into a narrower age-range than the patients in the depressive series: 23 (76.7%) are found in the age-group 36 -55 years as compared with 56.3% of the depressives. There is a tendency for

a higher proportion of rejects as compared with depressives (40% as opposed to 28.7%) to come from the two lowest social classes. Probably because of this social class bias the rejects tend to have been born into rather larger families than the depressives and they themselves tend to produce a larger number of children.

As compared with the depressives a somewhat higher proportion of rejects (16.7% as against 13.1%) report that they lost father by death in childhood and a higher proportion (46.7% as against 32.0%) complain of a disturbed relationship with a parent during childhood.

Apart from the presence of another psychiatric condition in the reject patients, none of the comparisons between rejects and depressives mentioned till now have been found to reach a level of significance according to the chi-square calculation , but this is probably due to the small number of individuals in the reject series. In fact, the only significant difference which has been demonstrated between the two groups is the presence of an excess of Roman Catholic individuals among the rejects (30% as opposed to 15% of the depressives; $p < .05$) and this is probably a reflection of the social class differences between the groups.

Patients with other psychiatric conditions often develop depression, Sometimes of very severe degree, and the depressive symptoms may be quite indistinguishable from those of primary depression. However, there will be a history of previous or concurrent symptoms of the primary disorder. Some authorities describe such cases as neurotic depressive but this term,

as previously explained (p.14) is used quite differently in the present study. It is considered that there was full justification for excluding such patients from the definitive series of depressives since the presence of extraneous psychological factors could only complicate the investigation into the aetiology of the depression itself.

APPENDIX 6

The symptom-sign inventory.

THE SYMPTOM-SIGN INVENTORY

It is generally agreed that clinical diagnosis of psychiatric conditions is thoroughly unsatisfactory, partly because of vagueness of criteria and partly because psychiatrists often find difficulty in agreeing on diagnosis, not only with other psychiatrists, but even with themselves on subsequent occasions. Foulds (1962) says, "Even if psychiatrists could be shown to be highly reliable under optimal conditions, their diagnosis could only serve as the criterion by which to develop some more objective, public and quantitative means of classification." Recognizing the especial need for objectivity in research work, it seemed desirable to employ some form of psychological test to verify clinical assessment.

The diagnosis of primary depression was made on the basis of two independent opinions: those of the referring psychiatrist and the investigator. This introduced a modicum of objectivity, but it was hoped that it would be possible to demonstrate by means of a test that the investigator's classification into endogenous and neurotic depression was an acceptable one.

Although this was an addition to the original concept of the study, it did not in any way interfere with the method of data-collection. The test which was introduced was a modification of the Runwell Symptom-Sign Inventory (Foulds, 1962). The original Inventory is a broad-focus diagnostic test, containing sub-sections dealing with the various psychiatric conditions and the section on depression is designed to differentiate between

endogenous and neurotic types. With the advice of Dr. Foulds, the questions on depressive illness were extracted and were formed into a questionnaire, a copy of which is reproduced at the end of this appendix.

This questionnaire was used by the investigator on 60 patients. Each patient was asked the twenty questions it contained and their answers were recorded on an all-or-none basis: an affirmative was regarded as 'True' and a negative answer as 'False'.

The application of the Inventory presented no difficulties but unfortunately its value was nullified because most of the patients were receiving antidepressant treatment at the time of testing. In fact, many of the patients had been receiving treatment for a considerable period, even before admission. It was found that their responses were greatly modified and as psychological tests are largely dependent on the patient's current mental state no conclusions could be drawn from the results as to his pre-treatment mental condition. On the other hand, the clinician is able to draw on the previous history in his assessment of the illness. The invalidation of the test in this way is obviously an important point to remember in this era of vigorous therapy of affective illness.

Inspection of the Inventory-data showed that it could not be analyzed, although with considerably larger numbers interpretation might well have been possible. Therefore, it was not possible to make a more objective verification and the differentiation of endogenous from neurotic depression regrettably remains on a clinical basis.

SURNAME	CHRISTIAN NAME
SEX	REFERENCE NUMBER
AGE	OCCUPATION
MARITAL STATUS S M W D Sep.	DATE OF TESTING

Are you afraid that you might be going insane?

Have you a pain, or feeling of tension, in the back of the neck?

Are you afraid of going out alone?

Do you cry rather easily?

Does the future seem pointless?

Do you ever seriously think of doing away with yourself because you are no longer able to cope with your difficulties?

Can people read your thoughts and make you do things against your will by a sort of hypnotism?

Are you unnecessarily careful in carrying out even simple everday tasks like folding clothes, reading notices etc?

Do you think other people regard you as very odd?

Do you feel you cannot communicate with other people because you don't seem to be on the same "wave-length"?

Is there something unusual about your body - like one side being different from the other and meaning something different?

Do you ever do things in a dream-like state without remembering afterwards what you have been doing?

Are you worried about having said things that have injured others?

Are you an unworthy person in your own eyes?

Are you a condemned person because of your sins?

Are you troubled by waking in the early hours and being unable to get off to sleep again (if you don't have sleeping pills)?

Because of things you have done wrong, are people talking about you and criticising you?

Do you cause harm to people because of what you are?

Are you ever so "worked-up" that you pace about wringing your hands?

Do you ever go to bed feeling you wouldn't care if you never woke up again?