JUVENILE DIABETES

AND

PERSONALITY DEVELOPMENT

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J.R. CLAYER,

M.B. B.S. (University of Adelaide)

Diploma of Psychological Medicine (University of Melbourne)

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"As you ought not to attempt to cure eyes without head, or head without body, so you ought not to treat body without mind".

Socrates 400 B.C.

I N D E X

REQUIREMENTS OF THE FACULTY OF MEDICINE

The Faculty of Medicine requires that candidates for the degree of Doctor of Medicine, on submitting their thesis -

(a) Submit therewith a declaration that the thesis or work is his own composition.

(b) Indicate wherein he considers the thesis or work to advance medical knowledge or practice.

These two requirements are complied with on the pages immediately following.

DECLARATION OF ORIGINALITY

I wish to state that this work is entirely original, planned and executed by myself with the assistance at interview of Miss J. Campbell, Dip. Tech. (Soc. Work).

The system of recording of the findings and the composition of the thesis is my own.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university, and to the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made in the text.

J.R. CLAYER

The main areas wherein this thesis is considered to advance medical knowledge are :

(a) The possible development of overt psychiatric illness in adults who have suffered from diabetes mellitus since childhood.

(b) The function of the illness juvenile diabetes mellitus as a psychological defence that can be utilised by the ego to resolve conflict.

(c) The role of the parents during the adjustment of the child's personality to the presence of diabetes.

(d) The role of the physician during the adjustment of the child's personality to the presence of diabetes.

(e) The attitudes and experiences of unstable diabetics and how these may have contributed to the instability of those persons' mental and physical health.

(f) The relationship between the personality of an individual with juvenile diabetes and the stability of that person's diabetes.

These areas are mainly dealt with in the Introduction (p. 8 to p. 14), and in Discussion and Conclusions (p. 141 to p. 170).

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CHAPTER I

INTRODUCTION

Many writers have attempted to relate the psychopathology of patients suffering from diabetes mellitus, to their pathophysiology. Such relationships have to some extent been empirically demonstrated. However, the nature of these relationships still remains an area of controversy and uncertainty.

When the present author became interested in this area of medicine, he initially explored the possibility expressed by a number of authors (Menninger, 1935; Joslin, 1951; Swift, Seidman and Stein, 1967); that diabetics were more emotionally disturbed than non-diabetics and that "the abnormal frailty of the diabetic can no longer be refuted" (Uhry & Cirilli, 1961). A study of the literature suggested that statements such as the latter were in the main based upon the prevalence of diabetes amongst mental hospital patient populations, and had not taken into consideration, sufficiently, such factors as :-

(1) The high proportion of older age patients in chronic hospital populations. (The incidence of diabetes being much greater amongst persons over forty).

(2) The diabetogenic nature of hospital diets.

(3) The diabetogenic nature of many psychotropic drugs.

The first of these factors was investigated by the author and M. Dumbrill, in 1966.

All patients within the institutions of the Mental Health Services of South Australia, and all patients attending the Eastwood Psychiatric Outpatients' Clinic, were assessed for the presence of diabetes by questioning and/or urinalysis. Within the patients of the Mental Health Services (3,388), the overall prevalence of diabetes was found to be 1.36% (Clayer and Dumbrill, 1967). This figure instead of being high was surprisingly low, lower in fact than that found for the population generally according to recent figures from an Australian survey of 3.1% (1.4% diagnosed, 1.7% undiagnosed) (Welborn, 1968).

The diabetic percentage of 1.36% amongst patients overall of the Mental Health Services was seen to be inflated by mental hospital "long stay" patients, whose mean age was 57 years, and amongst whom the prevalence of diabetes was 2.34%. As the prevalence of diabetes increases with age, the disproportionately large number of older people in the hospital population brings the overall prevalence of diabetes for the hospital population above that of the population at large.

The survey of Glenside Hospital patients was repeated in 1972, and the overall prevalence of diabetes had increased to 3.2%. This figure was again quite misleading, because although the number of diabetics had decreased by two, the hospital

population had been reduced from 1,203 to 697, and only statistically had the prevalence increased. Social workers at the hospital reported that it had proved more difficult to accommodate diabetic patients in the community than non-diabetic patients.

From these observations the author felt that statements regarding "increased mental frailty of diabetics" that were based upon such mental hospital surveys, had not been justified, and warranted further investigation.

In addition, work elsewhere by Charaten (1955) and others, highlighted the effect that the administration of phenothiazines might have on the incidence of diabetes amongst psychiatric patients, and work by Waitzkin (1966) related high incidence of diabetes in mental hospitals to age range and overweight.

Of interest to the author in the results of the 1966 survey was the low prevalence of diabetes in admissions to acute units (0.52%) and the low prevalence amongst outpatients (0.43%). Of particular interest was the fact that out of a total of 46 diabetics, only two had developed the disease before the age of 35 years, and only one (2%) of these could be described as suffering from juvenile diabetes. This seemed an unusually small representation of juvenile diabetics.

Joslin (1959) estimated that 25% of the diabetics attending his clinic were juvenile diabetics, and figures taken by the author from the diabetic clinic at The Queen Elizabeth Hospital, Adelaide, gave similar results. However, it is possible that juvenile diabetics

are more likely to attend such clinics because of the greater instability of diabetes at puberty. Other authorities - Knowles 1971; Geist, 1964; state that 5-10% of all diabetics are juvenile diabetics. Nonetheless, the figure of 2% juvenile diabetics in the Mental Health Services survey was seen as being particularly low.

Thus far, the investigation, rather than supporting the concept of increased mental illness in the diabetic, had suggested if anything, a reduced incidence of mental illness. This was particularly interesting in the case of juvenile diabetics, who are frequently reported as suffering from increased emotional trauma and emotional disturbance during childhood and adolescence as a result of the disease.

Juvenile diabetes and late onset diabetes are very different disease entities with respect to time of onset, pathophysiology and treatment, and could perhaps have different effects upon the mental health and personality of the individual with one or other disease.

Because of these observations, the author next investigated the mental health of a small group of juvenile diabetics, comparing it with that of a similar group of late onset diabetics. This investigation was under the auspices of the Department of Mental Health, University of Adelaide, with Professor W.A. Cramond.

The patient lists of the diabetic clinic at The Queen Elizabeth Hospital were searched, to find 10 diabetics aged between

40-45 years of age, who had developed diabetes before the age of 25. In addition, 10 diabetics matched with the first group for age and sex, (also between 40-45 years of age) were found who had developed diabetes after the age of 35 years.

Each patient completed the Cornell Index N.2 psychological questionnaire. An index of 23 or more is reported to screen about half those persons with serious neuro-psychiatric disturbances, and a moderate number of ostensibly healthy persons.

The results of the Q.E.H. investigation are shown on the accompanying table :-

Cornell Index Scores

Range of Scores	12	13-22	23	N
Juvenile Diabetes	5	3	2	10
Late onset Diabetes	2	5	3	10
TOTAL	7	8	5	20

These suggested a lower incidence of neuropsychiatric disorder amongst juvenile diabetics than amongst late onset diabetics of the same age.

A complicating factor in these groups was that the late onset diabetics had only suffered from their illness for 5-20 years,

and possibly had less years in which to adjust to their illness. Against this was the argument that the persons with juvenile diabetes had had to cope with the considerable stress of the illness during more formative years, and had been subjected to the stress over a more protracted period of time.

Other factors tended to rule out patients selected in this manner for further study :-

(1) Most diabetics do not attend special clinics as only "special" diabetics do, and therefore those selected from such a clinic would not represent a cross section of the diabetic community.

(2) Taking diabetics from the age range 40-45, meant selecting diabetics from a group who may have not had much access in the early years of their treatment to insulin, as this first became commercially available in the U.S.A. in 1923. The death rate in this group may have been particularly high.

Thus far, there had been no evidence that juvenile diabetics were particularly prone to psychiatric illness as adults. Although the clinical impression during these investigations had been that diabetics with emotional problems were hospitalised from time to time, the hospitalisation was not for neurosis or psychosis, but for stabilisation or treatment of an exacerbated diabetic state, and accordingly to a general hospital not a psychiatric one.

The questions "What role does diabetes play in the developing ego of the young diabetic?"; "What role does it have in the dynamic functioning of the juvenile diabetic when an adult?"; and "Does this affect the total personality structure of the adult juvenile diabetic, particularly with respect to mental illness?" were conundrums that led to the further investigation of the literature, the hypotheses developed, and study described in this thesis.

SUMMARY

The thesis explores some aspects of the role that the illness, juvenile diabetes mellitus, has in the dynamic functioning of young adult juvenile diabetics.

The introduction reviews previous investigations carried out by the author into the association of mental illness with the presence of diabetes and how these investigations led to the field of interest dealt with in this thesis.

The literature is then reviewed. An attempt has been made to confine this review to the main area of the thesis, but the difficulties associated with this are recognised. The review of the literature suggests :-

(a) that diabetics are emotionally disturbed during childhood and adolescence, partly from the presence of the diabetes and partly because of the attitude of others as a result of the diabetes.

(b) that diabetics do respond to emotional stress by losing stability of their diabetes which in turn, serves to reinforce any feelings of insecurity.

(c) that in addition to these features diabetics do appear to suffer from psychiatric disability to a greater extent than the general population.

(d) the suggestion is also made in the literature that the person with diabetes can use his illness to avoid conflict situations and pain.

If the latter is so, then the need to use neurotic and psychotic methods of avoiding conflict and pain, might be cut short or supplanted.

From this the present author suggests that if the diabetes is used by diabetics to avoid conflict situations, then in Freudian terms the diabetic is using his illness as a defence.

Three hypotheses are formulated :

1. Persons with juvenile diabetes who experience difficulty in dealing with conflict, will be found to be more unstable diabetically than persons with juvenile diabetes who do not experience this difficulty.

2. Loss of control of diabetes can function as a mechanism of defence for juvenile diabetics and consequently they will be found to show less evidence of a "neuroticism" * than non-diabetics.

3. Those persons with juvenile diabetes, who are diabetically unstable in adult life, will be found to have different attitudes and backgrounds from those with stable diabetes.

The study is constructed to compare a group of thirty young adult juvenile diabetic persons with a matched group of thirty non-diabetic persons who had been admitted to the same hospital as the diabetic persons during childhood at the same time, for a minor complaint.

The comparison is made with regard to "neuroticism" and use of neurotic defence mechanisms. It is also made to examine any correlation that might exist between neuroticism and admissions to hospital for treatment of the diabetic state.

* defined under "Methodology".

Is is also made to compare the background and attitudes of those diabetics requiring frequent hospitalisation as adults for diabetes, and those not requiring frequent hospitalisation.

The results do show a significant correlation between "neuroticism" and hospitalisation.

The results show that to some degree diabetics score less with regard to "neuroticism" and use of neurotic defence mechanisms than non-diabetics. They show that diabetics show less evidence of psychiatric illness than non-diabetics. They show that neuroticism as measured by the 16 P.F. can be significantly correlated with neurosis for non-diabetics but not for diabetics.

Some differences in background and attitudes are seen when the frequently hospitalised diabetics are compared with the infrequently hospitalised diabetics.

Conclusions are drawn as to the active role that diabetes appears to have in the dynamic functioning of some young diabetics, and how this may influence his likelihood of developing what are more usually recognised as neurotically defensive patterns of beha viour.

Discussion follows around the role that significant persons, notably the parents and physician, might have had in the development of a defensive role for the diabetic illness in some subjects.

CHAPTER II

REVIEW OF THE LITERATURE

The literature pertaining to emotional aspects of diabetes mellitus, has shown marked swings in orientation over the years.

Despite the fact that a pathophysiological response to emotional stress can be demonstrated in diabetic patients, Daniels (1939) on surveying the literature, was able to point out that of 3,333 articles on diabetes listed in the quarterly Cumulative Index, only 23 even related to emotional aspects of the disease. At that time and for approximately 5 years thereafter, attention was very much focussed on the personality of the diabetic and the role of emotional stress in the genesis of diabetes. The latter, however, has dropped almost entirely from the literature since then, mainly because of the lack of evidence of diabetes developing in the presence of intense emotional stress within combatants of two World Wars (Daniels, 1948).

In a further review of the literature, Treuting (1962) saw the topics covered as falling under three main headings other than "aetiology" :-

(1) The role of emotional factors in the course of the disease.

(2) Attitudes and reactions produced by the disease ("somatopsychic" factors).

(3) Methods of treatment incorporating the accepted knowledge about emotional features.

This thesis deals with the psychodynamic role that the illness plays within the personality structure of the diabetic and very few papers explore or discuss that topic specifically. However, those papers that do, and others that explore areas that relate to the psychodynamic role of diabetes, are reviewed here. Unfortunately, a great number are discursive and draw upon the authors' experiences and clinical impressions, rather than objective measurements.

Another problem is that some authors, particularly in earlier years, have not always differentiated between early onset diabetes and late onset diabetes. This is a very significant difference, particularly with respect to this work. Juvenile diabetes or early onset diabetes is, pathophysiologically, a very different problem from adult onset diabetes. Furthermore as juvenile diabetes frequently occurs in the first ten years of life, the effect it can bring to bear upon the personality is potentially much greater than that of an illness occurring in the 30's, 40's, and later.

Finally, many articles overlap. Articles dealing with pathological parent/child relationships arising from the presence of diabetes, overlap in their subject matter, articles dealing with diabetics acting out the conflict of parent/child problems through their diabetes. These in turn sometimes overlap other articles, e.g. those dealing with the "diabetic personality" and the "brittle diabetic personality".

Nonetheless, it was felt that something would be gained in clarity if an attempt was made to subdivide this review into four main areas that pertained to the area of investigation of the thesis.

The four main headings are :-

1. Pathophysiological responses to emotion and stress in Juvenile Diabetes.

2. Disturbed parent/child relationships in juvenile diabetes.

3. The personality of the Juvenile Diabetic -

   (a) Diabetes and personality development;

   (b) Diabetes and psychiatric illness.

4. The role and function of Diabetes in Conflict Situations.

REVIEW OF THE LITERATURE

1. Pathophysiological responses to emotion and stress in Juvenile Diabetes.

At the beginning of this review it was stated that "A pathophysiological response to emotional stress can be demonstrated in diabetic patients". This statement is to some extent based upon the demonstration of neuroanatomical pathways between the higher centres of the brain and the hypothalamic centres that control blood glucose levels directly, as well as affecting blood glucose levels indirectly, by bringing about sympathetic responses (McLean, 1958; Akert and Hummel (1963). More specifically, the statement is justified by the articles that immediately follow, describing experimental evidence of emotional stress affecting glucose metabolism.

Cannon (1920) demonstrated that fear and anxiety led to glycosuria in the normal human. Other workers have demonstrated the appearance of hyperglycemia following stress. Raeb & Rabinowitz (1936); Ellenberg, Osserman & Pollock (1952); Taylor, Levenson & Adams (1944).

Goldner (1958) .. "Stress, corticoids and diabetes" - commented on the fact that any individual, diabetic or non-diabetic, responds to stress be it disease, trauma or sudden and severe emotional disturbance, with metabolic change characterised by features that

include hyperglycemia, glycosuria and ketonuria. "This phenomenon represents part of the non-specific stress reaction" said Goldner, "but is exaggerated in the diabetic because it is superimposed upon a previously impaired carbohydrate metabolism".

Hinkle and Wolf (1956), and also in 1952 and 1953, reported upon experimental studies relating life stress to diabetes mellitus. They noticed on history-taking, a striking coincidence between the occurrence of stressful life situations and the clinical decompensation of the diabetes (Hinkle and Wolf .. "Human Metabolism and Diabetes Mellitus"). They carried out both long term studies and short term laboratory studies. They engaged the subjects in interviews during which they discussed events, attitudes etc., that were related to events that had been previously associated with episodes of ketosis or hypoglycemia. Blood specimens were taken from an indwelling venous needle. Controls (both non-diabetic and diabetic) underwent similar investigation with non-stressful interviews.

They found that the diabetic maintained his B.S.L. with much less constancy in the face of stress than the non-diabetic. The diabetic, presented with a rapidly changing series of threatening situations, underwent rapid and profound fluctuation in his B.S.L. Ketosis, they claimed, only occurred when the conflict concerned parents, parent figures or symbolic representations of such conflicts (e.g. threats to a dependent relationship).

Their experimental evidence and methodology appear sound. However, they then elaborated a theory of psychobiological meaning to diabetes. Briefly, this was that -

(1) The metabolic pattern of diabetes is an adaptive pattern of response to carbohydrate starvation which leads to an increase in the use of fat and ketone bodies as the fuel for muscular activity, with a decrease in carbohydrate metabolism.

(2) The diabetic pattern of metabolism represents an adequate and effective response of humans to carbohydrate starvation.

(3) Foods, affection and emotional and physical security, are intimately identified in infancy.

(4) Some persons, because of constitutional predisposition in later life, respond to cumulative psychological situations and physical stress, which involves loss of affection and security, as if they represented threats of starvation. In this situation they utilise a metabolic adaptation to starvation which is inappropriate and continue to do so even when food is given. The long continued use of this mechanism leads to irreversible changes of structure and function which is diabetes.

Hinkle's "starvation" theory created considerable interest at the time that it was first propounded, but has not stood up to the

test of clinical scrutiny. On the other hand, the biochemical observations have fitted in to both clinical observations and the other experimental work described.

There seems little doubt that emotional stress can produce hyperglycemia, glucosuria and ketosis in both diabetic and non-diabetic persons, and in some individuals hypoglycemia. The effect upon the diabetic will naturally be more disruptive than upon the non-diabetic. What interest has been shown in this phenomena either has been an attempt to explain the total metabolic change of diabetes as a single response (Hinkle and Wolf), or as in some of the following articles reviewed, an attempt to explain why or how the diabetic comes from time to time to develop hyperglycemic and acidotic episodes, in terms of his environment or interpersonal relationships.

Before reviewing such attempts to link emotional stress with stability of diabetes, it is appropriate to review how various authors consider the situation with regard to the presence of emotional stress in juvenile diabetics.

2. Disturbed parent/child relationships in Juvenile Diabetes.

Many authors have commented upon the emotional impact of chronic illness generally in a child and its effect with regard to the patient, parents and siblings. Both parents and child, initially assume responsibility for its appearance. Beverley (1936) found that 90% of a group of children said that they had become sick because they were "bad". Similarly, Schechter (1961) found that a large group of children with orthopaedic handicaps saw their illness as punishment.

According to Bender and Faretra (1963), illness tends to equal weakness, the boy seeing it as interfering with his masculinity, the girl seeing chronic illness as labelling her as "different" and "damaged". These fears being particularly threatening at late pre-school and early adolescence.

The emotional ramifications involve all aspects of the illness structure and all members of the family.

A. Freud (1951) writing of "the role of bodily illness in the mental life of children" drew attention to the effects of nursing, medical and surgical procedures, emphasising the increased attention and "babying" that a child receives in this area, and the tendency for this to produce regressive and dependent changes.

At the same time, she recognised the effect that restrictions of diet etc. had, in mobilising aggression and drew attention to the role the treating physician might be accorded by the patient.

The role of the doctor with regard to the child/parent relationship is an important one, and is dealt with specifically with regard to diabetes later. However, in general illness Bloom (1963) commented upon it, saying that "the quality of the doctor/patient relationship is an important variable in the patient's psychological response to all phases of their illness" and Duff and Hollingshead (1968) pointed out that "communications of patients and physicians were relative so that information sought by one and supplied by the other, was usually incomplete and often misleading".

Lipowski Z.J. (1969) writing of psychosocial aspects of disease, described the patient's psychological response to a given disease process or injury, as including three dimensions, the intra psychic (experimental), the behavioural and the social (interpersonal), i.e. what the patient perceives, feels and thinks, his actions and communications, and in particular his actions and communications with his friends and medical professionals.

In a paper by Maddison and Raphael (1971), the authors in writing of the social and psychological consequences of chronic disease in children, not only included the three dimensions but extended their consideration to other members of the family and to friends.

They used juvenile diabetes as a paradigm of the situation. The authors discuss problems arising from overdependence, restriction of activities and proneness to guilt, not only in the child but in the parent, and in particular the mother. They point out the possibility of the mother viewing the illness of the child as

punishment of their own misdeeds, and that the increased dependency needs in the child may reactivate the mother's own unresolved dependency conflict with overt and covert rejection.

They refer to the writings of Garrard and Richmond (1963), Natterson and Knudsen (1960) and Chodoff et al (1964), who described the mother's reaction to the child's illness as falling into distinct stages. Disorganisation of function, with denial, misinterpretations of medical advice, multiple opinions etc. Reintegration with the development of defences often an overdevelopment, for example the parent becoming overprotective but still using denial. Finally, mature integration with parents hopefully facing reality with regard to their child's illness. Unfortunately many parents do not achieve this stage spending years in grieving and denial.

Maddison and Raphael also point out that the other family members may also be affected, the father may feel neglected, the family may alter their relationships to some extent with the wider community of friends, neighbours and the extended family. Maddison and Raphael only briefly refer to diabetes in childhood as illustrating more than the usual range of problem situations, including dietary restriction, injections, rebellion, dependence etc.

Other authors, including Bruch and Howlett (1947), Palmer (1958), Kimball (1971); have stated that juvenile diabetes is unique in many of its characteristics and the effect its diagnosis and presence has upon the patient, his family and in particular upon the mother. This review then, will focus upon those papers which deal with disturbed parent/child relationships specifically associated with juvenile diabetes.

Sibling relationships have not been extensively investigated in research into juvenile diabetes, nor in fact, in research generally, as pointed out by Irish (1964) "Sibling interaction : a neglected aspect of family life research". Irish believes that the family as "a unity of interacting and intercommunicating persons" can be used as a basis for research on intra-family dynamics.

A number of papers mentioned in this review touch on the roles and reactions of other family members. One that deals specifically with sibling relationships, family interaction and diabetes, is that of Crain, Sussman & Weil (1966). Their study investigated the questions "Does a child who has diabetes behave differently from his non-diabetic sibling? Does the relationship between the diabetic child and his mother differ from that between the non-diabetic sibling and his mother?"

Nineteen diabetic children and sixteen siblings were studied, the age range represented lying between eight and eleven years.

It was found that the social-psychological functioning of the diabetic child did not differ significantly from that of the non-diabetic child who had a diabetic sibling.

With regard to the mother/diabetic and /non-diabetic relationship, it was found that for the diabetic the child's self-esteem and satisfaction was significantly related but for the non-diabetic, this was not so.

It is suggested by the authors that the mothers of diabetic children experience an increase in the strength of duty

and obligation toward their child because of the illness, and as a result, the emotional tie between the mother and the diabetic child is heightened. They further suggest that the presence of the illness is more harmful to the mother's non-ill child relationship than to the mother/ill child relationship.

Later authors, whilst recognising the heightening of the mother/ill child relationship, question the outcome of such heightening in some cases.

This present study examined juvenile diabetics who had reached adulthood. The dispersement of siblings that had occurred, made investigation of effects upon them, impractical.

Almost all that make any reference to pathological parent/child relationships, confine such concepts to the mother/child relationship. There are several possible reasons for this - one is, of course, that in fact the mother may develop pathological patterns of behaviour and may be the only parent to do so. Another factor in this may be that the mother is more involved in the day to day management of the child. Nonetheless, it is interesting that the father is mentioned in only one paper, and his role not explored.

The subject is discussed in further detail later .. (Chapter 6 - "Discussion and Conclusions").

Benedek (1948), in a paper presented to the Annual Meeting of the American Psychosomatic Society - "An Approach to the study of the Diabetic" - discussed the use of psychoanalysis as a research tool, and outlined a specific project involving as its basis, analysis of the emotional fluctuations of patients with diabetes with the following aims:-

(1) Observation of the correlations existing between emotional emotional fluctuations and metabolic reactions.

(2) Detection of behavioural responses which reflect the perception of metabolic dysfunction and physiologic change.

(3) Investigation of the presence or absence of some "basic biologic pattern" or "instinctual constellation" which primarily burdens the organism in such a way that the arising conflict/tension finally breaks the chain of the normal metabolic process and leads to the disease.

At the time of the paper, she had under study, six male and three female patients with diabetes, whose ages ranged from 8-37 years of age. In her discussion of this study, she spoke at some length of the trauma that the diagnosis produces in the patient and family. "If the individual is a young child, the anxiety of the parent with regard to the diabetes is soon transferred to the patient". She said that her observations suggested that the trauma of discovery of diabetes was deeper and more stirring than the anxiety induced by other chronic diseases. "Some patients", she said, "react as if all guilt related to oral gratification were mobilised, as if they somehow caused the disease themselves, and they become fearful that the responsibility for the course of the illness rests with them". "The mothers of the diabetic children, responded to the disease in a defensive manner. They behaved as if the diabetes of the child

proved that she, the mother, did not feed or love the child properly, and consequently she appears to show that the relationship between herself and the child is perfect". "To diminish her sense of guilt, the mother becomes over-zealous about the diet, and the child becomes aware that food which is regarded as poison may be used as a weapon". "Thus", said Benedek, "begins a sado-masochistic inter-dependence between mother and child".

Benedek stated that she could observe two types of character reaction in patients with diabetes :-

(1) Those who reacted with extreme compulsiveness in regard to diet, their ego being strong they were able to ward off anxiety by self-restriction.

(2) Those who responded with over-eating, and with spiteful, provocative and even delinquent, attitudes with regard to diet. These were individuals whose ego being weak, could not stand frustration - they neglected their diet, not only for the sake of primary pleasure, but also for secondary gain.

According to Benedek, the patient has a triangular internal struggle between food (danger), glucose content of urine (indicator of disease) and insulin (mediator), and uses this consciously as a battle-ground for all his emotions regardless of their origin.

Benedek claimed that the awareness of a decreasing blood sugar level and the anxious tension caused by it, could become a means of discharging many types of anxiety. The secondary processes of the

diabetes thus became an integrating part of the personality. Benedek spoke of the so-called "superstructure of the diabetic individual".

Benedek's correlation of rigid adherence to diet with "strong" ego, reflects to some extent the medical attitude current at that time, viz., that rigid control was necessary. It was only in 1948 that Tolstoi and others discarded the premise that sugar-free urine was necessarily the desired objective in the treatment of diabetes. Even so, it would seem that Benedek has on the one hand criticised the sado-masochistic element developing in some parent/child relationships, whilst praising fairly rigid adherence to diet. The fact is, that very few diabetics indeed adhere to the rigid expectations of physician and parent, although they may overtly pretend to (Cullen 1972). Benedek was apparently unaware of this feature. She does emphasise the important function that the diabetes has within the ego structure of the patient, although she is describing her impressions of a relatively small group (9).

Bruch (1949) wrote of her observations of 37 diabetic children attending a diabetic clinic - 17 girls, 20 boys - aged 4 to 15½ years. All had become diabetic before puberty, with age of onset ranging from 14 months - 12 years. Some had been known to the clinic for several years, others were only interviewed for the report presented. Both parents and child were interviewed.

The findings were continually compared with observations made on a group of obese children. On this, Bruch said : "The differences between the two groups are so striking, that the method of

investigation must be credited with a fair degree of validity".

One focus of enquiry was of traumatic events which might have been of significance in the development of the diabetes. Bruch's observation was that whereas diabetic families looked for such features, families of obese children avoided looking for them.

With regard to the psychological stability of the home, families of obese children appeared to have a very characteristic constellation, viz., small family, mother's personality overpowering and possessive, compensating for her own frustration through her children. The father in the family was relegated to a secondary position. In the families of diabetic children, they could find no characteristic features. Similarly, in the personality of the diabetic individual, they could find no characteristic pattern of structure. In this study, as in many others, attention was focussed upon the mother and, according to Bruch, mothers fell into one of three types, according to the degree of control they exercised in following the regimen laid down by the physician :-

(1) The one most desirable for the child, that of tolerant, relaxed acceptance, was least frequent.

(2) 25% of the mothers were perfectionistic but not overtly aggressive or punitive. The regulation of the patients' diabetes in these patients was fairly satisfactory and "adjustment" in general good. 5%, however, showed perfectionistic over-control in which all tasks became expressions of the mothers' need to do the right thing.

(3) The largest group was the one in which co-operation with the medical regimen was either erratic or persistently poor. In these, the mother was either -

(i) self-pitying, attributing blame to the child, presenting a masochistic image to the world; or

(ii) openly rejecting and hostile to the child.

Satisfactory regulation in this last group was the exception.

Bruch's paper seems to reflect to some extent, the swing to less rigid control of juvenile diabetes. Unfortunately, she does not define some of her terms, such as "adjustment" of the diabetic, and the methodology of her study is not well defined. However, her findings with regard to the mothers of diabetics are interesting in the light of other studies. The views of these two authors (Benedek and Bruch) are supported by Tunbridge (1965), although he adds nothing further.

Benedek and Bruch both, have focussed attention upon the role and reactions of the mother. They appear to agree that the mother in many cases, adopts sado-masochistic patterns of behaviour because of feelings of guilt over having produced a diabetic child. Bruch has a more comprehensive view of the different types of maternal behaviour that may arise, but neither appears at all interested in the role of the father. Furthermore, they give the impression that they consider the diabetic child to be a comparatively passive respondent

in the situation. They do not appear to have considered that the child may attribute some blame for his/her illness upon the mother and develop primary hostile and aggressive feelings towards her. In both cases, they have relied upon subjective observations of the factors they comment upon, rather than objective evaluation by standardised techniques.

Etzwiller and Sines (1962), reporting on "Juvenile Diabetes and its Management - Family, social and academic implications", carried out an extensive investigation of 74 juvenile diabetics attending a summer camp. They gained information by interviewing both diabetics and parents, and by asking diabetics to complete a Shipley Hartford Intelligence Scale, and the parents and diabetics to complete the M.M.P.I.. In addition, they asked for reports from physicians, school teachers and camp counsellors.

Although the I.Q. range for the diabetics did not differ from that of a control group, 52% of the boys and 11% of the girls were reported as having academic difficulties ranging from mild motivational difficulties to severe reading and other deficits. They reported that 12% of the group were rebellious and resentful, and as a consequence, were having difficulties in stabilising their diabetes.

With regard to the parents, however, they found no difference between the parents of the diabetic group and the parents of a control group.

It is interesting that this investigation, in which objective testing methods were used, could show no difference between parents of diabetics and parents of controls, contrasting with the findings of Benedek and Bruch. Unfortunately, the comparison of the diabetic group with the control group, with regard to personality, was very limited. The diabetic children and control children did not both complete an M.M.P.I.. Furthermore, the experience of the present author in South Australia, is that particular types of parents send their children to diabetic camps. This may not be so in the U.S.A., but the possibility has not been taken into consideration.

A paper that must be described as empirical because of the very systematic way in which it has been carried out, is one by Sterky (1963). Sterky carried out an extensive survey of diabetic school children in Stockholm. All school nurses in Stockholm were asked to report all cases of diabetes in schools. All private schools were approached similarly. From school health cards, he then selected a control group of non-diabetic children of the same sex, age, and school class, whose father had similar employment. In this way, he eventually obtained 119 matched pairs (114 males, 124 females). He examined many aspects of this group, including susceptibility to disease, consumption of calories, serum proteins, blood lipids etc., and summarised his results in Supplement 144, Acta Paed. Scand. The family background and state of mental health of the diabetic group he described in greater detail, in Acta Paed. Scand., Vol.52. It is this paper that is referred to here.

Patients were interviewed and observed during blood tests, telephone conversations were recorded with patients and parents. Hospital records were checked. Parents were interviewed for a minimum of 30 minutes and assessed in the manner devised by Nylander (1960).

Sterky's investigations showed that the frequency of mentally disturbed parents in the diabetic group was greater than that of the non-diabetic group. 40 mothers (27.6%) in the diabetic group and 14 (11%) in the non-diabetic group, were diagnosed as mentally disturbed. The most common disturbance was the occurrence of various symptoms of anxiety. 9 mothers of diabetic children and 2 of non-diabetic children, were diagnosed as disturbed, although there was no symptom of emotional disturbance in their case histories. Despite the high incidence of mentally disturbed mothers, no relationship was found between the presence of a broken home and anxiety neurosis in the diabetic child.

With regard to the symptoms of the children, the frequency of cases without symptoms was the same for the diabetic group (54.5%) as it was for the non-diabetic group (55.6%). However, the number of symptoms/cases amongst disturbed diabetics was higher than it was amongst disturbed non-diabetics.

Significant differences were found between the two groups as regards two symptoms -

(1) emotional lability (greater amongst diabetics);

(2) difficulty with companions (greater amongst diabetics).

Sterky compared the disturbed diabetics with the undisturbed, and found that -

(1) the disturbed diabetics more often had mentally disturbed mothers;

(2) the disturbed diabetics more often had poor diabetic control.

He commented that there was an increase in cases with anxiety symptoms and an increase in symptoms per case, with an increase in age, the most pronounced shift occurring after puberty. He found no difference in intellectual capacity between the two groups, nor was there a difference between those diabetics using rigid control, and those using loose control of their diabetes. He stated that "an inter-relation between mental disturbance and degree of diabetic control might possibly have been demonstrated".

Unfortunately Sterky did not indicate what he meant by poor control. A further criticism of his findings is that under the "mental symptoms" of the diabetic subjects, he included headache, abdominal pain, tiredness, anorexia, disorder of sleep, emotional lability, difficulty in concentration, anxiety, depression, aggression and difficulty with companions. Of these, headache, tiredness, anorexia, emotional lability, difficulty in concentration and anxiety, occur intermittently as a natural consequence of hypoglycemia or hyperglycemia. With respect to these features, Sterky's paper is rather loose. However, he has objectively assessed the parents of diabetics, and provided valuable information.

Swift, Seidman, and Stein (1967), in "Adjustment problems in Juvenile Diabetes", described a study of diabetics, to explore the following hypotheses :-

(1) Children with diabetes will show more emotional disturbance and social maladjustment than non-diabetic controls, as judged by clinical evaluation and test results.

(2) Parents of children with diabetes will differ from parents of control children in child rearing patterns and emotional relationships.

(3) Children with poorly controlled diabetes will show a greater degree of emotional and social disturbance than will children with well-controlled diabetes.

Swift and Seidman in an earlier study (1964) of 40 juveniles with diabetes, had found them to have greater anxiety, less adequate self-image, more disturbed dependence/independence, conflict and greater oral pre-occupation. The control of diabetes was significantly related to social and emotional adjustment, psychiatric classification, manifest anxiety, body image, duration of illness and emotional tone of home.

This particular study consisted of examining a group of 50 diabetic juveniles at a diabetic summer camp. The entire socio-economic range was represented. Control subjects were obtained from public and parochial schools encompassing the range of age, socio-economic status, and race distribution of the experimental group.

The mean age at which diabetes had been diagnosed was 7.54 years. The mean duration of diabetes was 3.96 years.

Both diabetics and controls were studied by a team consisting of a child psychiatrist, child psychologist, and a sociologist. Parents were interviewed and subjected to the Vineland Social Maturity Scale, Roth's Mother Child evaluation, and the PARI scale. Children underwent drawings analysis, the Weschler Intelligence Scale for Children, Sentence Completion Test, General Anxiety Scale for Children, and the Rorschach and Minnesota Test of creative thinking.

The results showed that the sample of juvenile diabetics was significantly more emotionally disturbed than the matched non-diabetic group. The result of 50% falling within psychiatric classification was midway between the 61% with psychological difficulty of Joslin (1951) and the 40% of Loughlin and Mosenthal (1944). They concluded that their results supported Treuting's (1962) observation that the disease itself produces many of the observed emotional problems.

The school adjustment of the diabetic juvenile was comparable with that of the control, and these findings were in agreement with those of Kubany, Danowski, and Moses (1956), Sterky (1963), and Weil and Ack (1964).

The emotional tone in the homes of the diabetics was more conflictive and strained than in the homes of the controls. Mothers'

extreme attitudes of over-protection, neglect and ambivalence, as well as domination, were significantly more common in the diabetic group. The fathers of diabetics showed evidence of suffering significantly more extreme domination and neglect than control fathers. An association between home adjustment and control of diabetes was established. Early age at onset and longer duration of illness corresponded to poorer control. The greater the intelligence and the higher the income, the better the control. This latter observation is in agreement with other workers, e.g. Fischer and Dolger (1946), described elsewhere.

A very circumscribed and careful evaluation of "coping mechanisms" used by families of juvenile diabetics was carried out by Koski (1969). The aim of her study was to discover the immediate reactions and later adjustment of diabetic children and their parents, to the diagnosis of the disorder.

Her series consisted of 60 diabetic children attending the diabetic outpatient clinic of the Children's Hospital University of Turku. This number represented one third of the total diabetic outpatient population. Children under 5 years were excluded. Age at diagnosis ranged from 2 years to 14 years.

Three psychological tests were administered - an intelligence test (Terman, Merrill and Lehtovaana), and two projective tests (Rosenzweig Picture Frustration Test, and the Halzmann Inkblot technique). Every child had at least one psychiatric interview or

play observation by the author. The total group was subdivided on the basis of poor control of the diabetes (P) or good or fair control (G, F,) groups of 23 and 24 respectively. In 47 cases, the mother was interviewed, in 4 cases the father, and in 9 cases both parents.

The incidence of emotional disturbance and psychosomatic conditions in the parents of the two groups was the same. She found that all children who had developed the disease prior to the age of 3 years, had poor control of their diabetes. She also found that all parents had expressed bewilderment and shock at diagnosis, and many had been depressed and sad.

Parents exhibited reactions of guilt and aggression, and Koski found that both parents and diabetics needed to develop external coping devices to handle daily tasks and problems, and internal coping mechanisms to handle feelings and reactions, such as anxiety, depression, etc.. Constructive external coping devices were described as parents showing a tolerant and responsible acceptance of the situation.

Non-constructive external coping devices were subdivided into -

(a) poor co-operation with dietary regimen;

(b) poor co-operation in medical check-ups;

(c) helplessness about dietary regimen;

(d) helplessness about insulin injections.

The following internal coping devices were described by Koski :-

Constructive -

(1) Many parents were able to admit to feelings of anxiety, loss and depression, and at the same time, were able to control them adequately.

(2) Some parents found enjoyment caring for their sick child in a manner that approximated sublimation.

Non-Constructive -

(1) Some parents were unable to admit to painful feelings caused by the child's illness and used denial.

(2) In some cases the denial of a feeling of helplessness led to an omnipient attitude regarding care of the child closely resembling reaction formation.

(3) Some parents had feelings of being permanently helpless, impotent and resigned.

(4) The experience of mental pain normally mobilises aggression towards the source of the pain. In some cases, this was directed towards the child.

(5) In some cases the person's own frightening impulses were first projected and then displaced with a phobia, e.g. of injections.

Constructive coping devices were more commonly used by families of "G, F," diabetics and Non-Constructive coping devices were more commonly used by families of "P" diabetics. Only two children

exhibited neurotic symptoms prior to diagnosis of diabetes. The incidence of stressful situations was equal in both groups. However, disturbances of bodily function, e.g. enuresis, were more common in diabetics than in controls (5 in the "G, F," group, 8 in the "P"). Speech and language difficulties were found only in "P" group diabetics.

Koski found one case of excessive separation anxiety and one case of manifest sexual misidentification (2) (both "P" group). Aggressive, antisocial behaviour, was found almost entirely in the "P" group (18), while anxious behaviour and manifest fearful behaviour appeared mainly in the "G, F," group (42). Difficulties in integrative behaviour were represented by three in the "G, F," group and 7 in the "P" group. In general assessment of the child's later adjustment, it was found that psychoneurosis and personality trait disorders were more common in the "P" group.

Although Koski did not find any greater degree of emotional disturbance amongst parents of poorly controlled diabetics, as compared with the parents of well-controlled diabetics, she did recognise that parents do respond pathologically to the presence of the diabetes, and describes in some detail how the parent behaves towards the diabetic as a result.

She also found that parents who developed unhealthy (non-constructive) coping devices, were more likely to have children with poorly controlled diabetes. As non-constructive coping devices included mobilisation of aggression to the child, and the development

of phobias, e.g. to injections, then the differentiation between "emotional disturbance" and "non-constructive coping device" would appear to be a semantic one.

Her results, then, suggest that parents with emotional problems, particularly those related to the diabetes, are more likely to have children with poorly controlled diabetes, and that children with psychoneurosis and personality trait disorders, are more likely to have poorly controlled diabetes.

It is perhaps worth noting again, that of the parents interviewed, 47 were mother alone, and 4 were fathers alone.

Stein, and Charles (1971), compared family backgrounds of a group of adolescent diabetics with that of a group of non-diabetic chronically ill adolescents. Both groups were from low socio-economic backgrounds. Ages ranged from 11 - 25 .. 38 diabetics, 38 controls.

Parental loss and severe family disturbance was found to be more common amongst the diabetic group (69%) than amongst the control group (19%). The authors postulated that the diabetic child was physiologically pre-diabetic and that the emotional deprivation of the loss and/or severe family disturbance, provided a psychological as well as a physiological "set" for the onset of clinical diabetes. The authors tend to subscribe to Mirsky's (1948) concept, that the development of diabetes represents a failure in physiologic and psychological adaptation to stress. It is outside the structure of this thesis to debate the role of psychological factors in the aetiology

of diabetes, but the paper is mentioned because of the high incidence of parental loss and family disturbance described amongst the families of diabetics.

All of the authors mentioned in this section, with the exception of Etzwiller & Sines, describe the families of diabetics as experiencing more discord than is found in the families of non-diabetics, although only Swift, Seidman & Stein, describe any psycho-pathology in the father. Even there, the implication is that this is a consequence of the pathological behaviour of the mother ("the fathers showed evidence of suffering significantly more domination and neglect than control fathers").

The authors in this section conclude that the mothers of diabetic children can become emotionally disturbed as a result of their child becoming diabetic. This disturbance may not manifest itself as a neurosis or psychosis, but in pathological patterns of behaviour with regard to the child's management, and in particular, to the management of the child's diabetes.

3. The Personality of the Juvenile Diabetic.

(a) Diabetes and Personality Development -

Although papers in this section may also refer to the parent/child relationship, they extend their assessment of the personality of the diabetic over a broad spectrum of personality characteristics. Some papers are of a discursive nature, based upon clinical observations; others are reports of psychometric evaluation; whilst others again fall somewhere between.

One of the earliest papers is that by Menninger (1935), writing on "The inter-relationships of Mental Disorders and Diabetes Mellitus". It is introduced at this stage because of its reference to the existence of a "diabetic personality". His paper contained 81 references, but much of his work and that of his predecessors, is now of largely historical interest. Working as he was in an era where virtually no treatment was available, much interest was focussed upon the toxic effects of the disease on brain function, the so-called "diabetic psychoses".

His paper studied 30 cases of mental disorder, associated with diabetes, 93 cases of uncomplicated diabetes and 400 uncomplicated cases of mental disorder.

Menninger arrived at these conclusions :-

(1) The diabetic illness does not bring about a specific mental disturbance, except in a small percentage of cases referred to as toxic psychoses or "diabetic psychoses".

(2) Psychological conflict and trauma may initiate diabetes.

(3) Mental disorder and diabetes never occur independently, they bear a relationship to one another.

(4) Certain fluctuations of a specific type occur with sufficient frequency in diabetic individuals, to suggest a descriptive picture of the "diabetic personality".

He stated that from clinical experience it seemed likely that there was a greater tendency to neurotic symptoms in diabetes than in some other large groups, and expressed the opinion that "actual psychoses" are comparatively rare in diabetes, basing his opinion on Masson's (1923) figure that 1.2% to 1.7% of diabetics develop psychoses.

Apart from the different therapeutic era in which Menninger worked, his observations must be regarded with reservation because of the lack of figures from "normal populations".

Although Menninger's paper is largely of historical interest, it is perhaps worth mentioning that Boudreau (1934), on searching the literature, found only 9 cases (including Menninger's) in which he felt it was justifiable to consider a relationship between the diabetes and the abnormal psychic state. He felt toxic effects were the primary factors involved.

Falstein, and Judas (1955), presented an analytical study of two diabetic boys, in which they explored the relationship between the patient's anxiety and his diabetic symptomatology, and emphasised

the sadomasochistic relationship between mother and patient. They concluded that there was nothing specific about the psychiatric problems of diabetics.

Menninger's concept of a "diabetic personality" has also been explored further. Dunbar (1943) reported on a group of 92 diabetics, age range 15-55 years; 48% male, 52% female.

She claimed that the personality structure of patients with diabetes differed from any other group structure. These differences ante-dated the illness by a good many years. Their educational level, she said, was above average. Rorschach tests supported the impression that hysterical traits and psychotic tendencies were prominent. Diabetic patients were distant, reserved, and inhibited. They tended to respond to stress with the all or none response of the infant. They showed little self-reliance.

Although she did not claim that these personality traits actually caused the diabetes, Dunbar did state that they were an important predisposing factor. Since Dunbar's original work, several authors have investigated her claims of the evidence of a "diabetic personality" (Lisansky, Crowell, etc.). As a result of their work, the concept is largely rejected today.

Lisansky (1948) used projective techniques, including the Rorschach, to assess the personalities of diabetics. She concluded that the diabetic had a drive for achievement, but that this was coupled with limited productivity, a tendency to constriction

and withdrawal, and conflict between a tendency to be outgoing and the tendency to be withdrawn. She concluded overall, however, that there was no personality structure that could be described as typical of the diabetic.

Crowell (1953) compared the personality patterns of juvenile diabetics with those of patients with rheumatic fever, to test the Dunbar hypothesis that these two disease entities are characterised by different personality patterns. He examined 31 patients with diabetes and 22 with rheumatic fever, out of a total of 34 diabetics and 22 patients with rheumatic fever. The age range for diabetic patients was 16-26, while the age range for the rheumatic fever patients was 14-22. Each patient underwent Rorschach and Minnesota Multiphasic Personality Inventory, and Taylor Anxiety Scale. He found no evidence of any difference between the two diseases, and he also demonstrated no personality differences between good and poor control diabetics. Unfortunately, Crowell's 56 patients were the only respondents to 120 letters he had sent out, and the bias that the omission of 64 non-respondents might have, cannot be calculated.

The limitations of the Rorschach as an objective psychometric research tool, reduces the validity of Lisansky's studies, but Crowell in using the M.M.P.I. as well, to some extent overcomes the limitation.

Although Dunbar's hypothesis of a "personality configuration", specific for diabetics, has not been supported in recent years, considerable support has been given to the suggestion

that juvenile diabetics do undergo personality changes as a result of their diabetes.

Much of the early work on the assessment of the diabetic personality was measurement of intelligence. The results of these investigations have been rather contradictory.

McGavin et al (1940), correlated I.Q. with occupation, and arrived at rather equivocal results. In one group, 5 out of 29 diabetics were working beyond their I.Q.. In another group, 10 out of 24 were working below.

Brown & Thompson (1940), found academic achievement of diabetic persons on a par with the achievement of their healthy siblings. They found diabetics to have a normal distribution of I.Q. and using the Woodworth-Cody psychyneurotic inventory, that diabetics approximated their siblings in this area also.

Eisele in 1942, who questioned 73 patients with diabetes of 20 years' duration, found that 42% attended College. This was at a time that only 7% of all Americans, 21 years or older, were attending College. However, of Eisele's group, 50% came from wealthy or professional homes.

Wert, Richey, and Eyre (1934), claimed higher I.Q.'s for diabetics, as did Grishaw, Wert, and Smith (1939) and Joslin, Root, et al (1947), and all of these authors have been accused of taking their samples from high socio-economic groups.

Teagarden (1939); Shirley, and Greer (1940); and Boulin, et al (1951); all found diabetics to have below average intelligence.

In 1956, Kubany, Danowski, and Moses, attempted to provide additional evidence relative to diabetic intelligence and personality problems. The diabetic population consisted of juvenile diabetics (i.e. the onset before 16 years of age) who had been treated at the Children's Hospital of Pittsburgh. The test used was M.M.P.I., and the Stanford Binet. 20 males and 20 females were thus tested, who were young adults. Mean I.Q. for males = 110, S.D. = 11.1. Mean I.Q. for females = 107, S.D. = 15.0. No characteristic personality pattern was found.

The results of these workers are contradictory, and in some cases the selection of diabetic persons has been loaded. Most of the investigations were comparatively early, and the level of testing was not particularly sophisticated at the time, in that the Stanford-Binet or a similar verbal I.Q. measure, was used.

One particularly careful assessment of intelligence in juvenile diabetics was carried out by Weil and Ack (1964). These authors established first of all, the intelligence of a group of juvenile diabetics, and compared them with a group of non-diabetics, then later repeated these and other tests to determine whether or not the presence of diabetes had brought about any deterioration in their effective intelligence.

Weil and Ack, administered the California Achievement tests in Reading and Arithmetic to 39 children with diabetes, and 16 non-diabetic siblings. Their results they compared with the previously determined intelligence quotients (Ack, Miller, and Weil, 1961).

These earlier experiments had indicated no significant differences in the Intelligence Quotients of diabetics with the exception of children who had developed diabetes before the age of 5 years. Their findings were that diabetic children are able to achieve scholastically, to an extent compatible with their mental development. As a group, diabetic children have intelligence quotients and achievement levels no different from those of non-diabetic siblings.

They stated that they were unable to recognise any instance in which the development of diabetes was associated with the origin of emotional difficulties in a previously stable situation.

The overall impression from the literature, is that there is no major difference in the basic intelligence of diabetics and non-diabetics, and that no measurable deterioration in intelligence takes place.

Assessment of intelligence measures only one aspect of the personality, and attempts have been made to assess the "adjustment" of the diabetic to his disease in a more total manner.

The influence of factors such as socio-economic status, age etc., on the adjustment of the individual personality to the disease, has also been considered.

McGavin, Schultz, Peden, and Bowen (1940), found that the earlier the child had diabetes, the more readily he accepted it emotionally as part of growing up. Loughlin and Mosenthal (1944), on the other hand, found the opposite; and Fischer (1946) found no difference related to age at onset at all.

Fischer and Dolger (1946), studied 46 patients, all of whom had been under 12 years of age when diagnosed. Of these, he had followed 23 for 15-20 years, and 20 for 10-15 years. Of the 43 -

6 made excellent "adjustment"to their diabetes;

13 made good "adjustment" to their diabetes;

13 made fair "adjustment" to their diabetes;

11 made poor "adjustment" to their diabetes.

According to Fischer and Dolger, the type of home, economic security and the contacts at school and in social life, all had special influence on the reaction of the diabetic child to the disease. Specific problems of childhood became less disturbing with maturity, but other problems relating to vocation and marriage, appeared.

(* "adjustment" = referred to a life pattern not disturbed by the presence of diabetes).

The specific effect of diabetes on behaviour was unrelated to age of onset, duration, or severity of the disease. Diabetic regimentation produced behaviour difficulties.

They concluded that diabetes mellitus produces many psychologic problems which may result in abnormal behaviour throughout childhood, adolescence, and adult life.

Wagner (1952), emphasised the problem in juvenile diabetes of the diabetic child having to cope permanently with diet restrictions and life preserving injections. He, too, emphasised the emotional impact of these and the need for the diabetic to have a well-balanced personality, if they are going to cope.

He pointed out the difference in the response of the adult to incurable disease and that of the child, the latter not grasping the seriousness of the situation, but realising the handicaps, the disadvantages of the disease, and that it disadvantages them with their contempories. He attributed the frequent admissions to hospital mainly to dietary excesses, not omission of insulin, and said these stigmatise the child even further - "as a result school attendance suffers and the child/parent relationship is strained and rather poor".

A more detailed investigation of similar areas was carried out by Bennett and Johannsen (1954). Because of the extensive nature of their investigation and conclusions, their work is described here in some detail.

Bennett and Johannsen, examined 58 children at Joslin summer camps for diabetics, whose ages ranged from 7 years to 9 years 11 months. The aim was to "investigate the fundamental patterns of personality that appear in diabetic children, and to attempt to relate aspects of these patterns to specific aspects of the child's life, medical, social, familial, etc.." Assessment was based on the Children's Apperception test, the Michigan Picture test, the Rosenzweig picture frustration study, the Rorschach test, the Goodenough Draw a Man, sociological information, information collected from the child and familial adults, concerning restrictions and ratings of the child's behaviour and attitudes by trained and untrained observers. Their conclusions were -

A. <u>The older the diabetic child;</u>
   (1) the more socially mature he appears,
   (2) the less intellectually free and creative he appears.

B. <u>The longer the child has had diabetes;</u>
   (3) the more socially capable and competent he appears,
   (4) the more restricted he feels, especially in diabetic matters.

C. <u>The older the child was when he developed diabetes;</u>
   (5) the better he is able to control his negative emotions.

D. <u>The greater the recommended insulin dosage per unit of body weight;</u>
   (6) the more socially mature and independent the diabetic child appears,
   (7) the more the diabetic child feels dependent,
   (8) the more the diabetic child appears depressed.

E. <u>The greater the glucose content of the urine per unit of carbohydrate intake;</u>
   (9) the more socially mature and independent the

diabetic child appears,

(10) the more the diabetic child feels dependent.

F. The higher the number of insulin reactions per unit of time;

(11) the more emotionally unstable the diabetic child appears,

(12) the more the diabetic child feels dependent.

G. The stronger the parental belief in a philosophy of restricting children in general;

(13) the greater is the diabetic child's feeling of being restricted,

(14) the more passive and dependent upon others the diabetic child appears,

(15) the more the diabetic child appears to have a constricted and unspontaneous personality.

H. The stronger the parental belief in a philosophy of restricting children in diabetic matters;

(16) the happier and better adjusted to the camp life the diabetic child appears.

I. The higher his socio-economic status;

(17) the better adjusted to his environment the diabetic child appears,

(18) the more intellectually mature the diabetic child appears.

J. Sex Differences;

(19) Diabetic girls appear to feel greater inner conflict than do diabetic boys.

Some of these authors' conclusions have been supported since then, whilst others have not. Their conclusions, particularly those such as H.16, may support this author's impression regarding the special nature of persons attending diabetic camps and the nature of their parents' personalities mentioned elsewhere.

Sheppe and Sheppe (1954) observed that diabetic patients in whose cases the disease was discovered during the first two decades of life, were prone to "exhibit evidence of emotional instability,

neurotic tendencies and maladjustment to environment and circumstances".

They based their opinions on a study of 55 cases (23 males, 32 females) chosen at random, whose current age ranged from 6-21 years - the one criteria for inclusion being that the illness was diagnosed before the age of 20 years.

The authors described the anxiety and resentment of the young diabetic, and the interaction, sometimes pathological, between patient and parents. They also described the feelings of being different, the embarrassment of hypoglycemic episodes at school and on the playing field, with resultant alienation and withdrawal, that the young diabetic experiences. They mentioned reduced opportunities for employment and claimed that educational attainment in this group is mediocre.

In Sheppe and Sheppe's study, 7 of the 23 boys left High School in first year. Scholastic grades were generally below average.

They suggested that marriage had a stabilising effect, and claimed that diabetics' normal sexual-social development is inhibited by fears and uncertainty regarding their diabetes, the commonest being :-

(1) Diabetics must never marry.

(2) All of my children will have diabetes.

(3) I can never have children.

(4) No boy/girl wants to marry a diabetic.

One boy resented his supposed inheritance and decided against marriage for fear of producing diabetic children.

Palmer (1958), writing in the Journal of the Indiana State Medical Association, "The Diabetic Personality", pointed out differences between diabetes and other long standing illness. He claimed that in diabetes the incentives of relief of discomfort and attainment of normal physical activity are lost as representing the rewards of good control. Instead, the patient is faced with interminable diet restrictions, eliminating many highly gratifying foods, e.g. ice cream, candy, and rich desserts. No other disease, he pointed out, requires the daily self-administration of hypodermic medication, and holds the same threat of disaster if this ritual is not observed. Personal responsibility is much greater, with urinalysis and use of discerning judgement in unusual situations. He suggested that these are the basic factors that produce the repetitive characteristics of the 'unco-operative patient'. Palmer discounted the possibility that "diabetic people possess a psychic structure peculiar to their illness". "If they react in hostile and devious ways to the tyranny of metabolic manipulation, it is not because they are diabetic - it is because they are people".

Fischer (1959) in a panel discussion (Hinkle, Fischer, Knowles, et al), spoke of the difficulties confronting the diabetic and his family. He claimed that the ability to cope varied with education, emotional stability, economic security, and strength of character of the parent.

He described the initial impact of the diabetes on the

younger child as being at first physical - injections, diet, etc. - he said the stigma then becomes more significant. Like all adolescents, he said, diabetics fear being different, but more so. Girls in particular, try to keep it secret and are afraid that boys will not be interested in them. This is very different from the view reported by Davis et al (1965). Fischer does not, in this report at least, consider the possibility that diabetes occurring early in life might establish patterns of behaviour, particular to diabetics, only that behavioural disturbance leads to diabetic instability.

Davis, Shipp, and Pattishall (1965), evaluated the attitudes of 58 diabetic girls and boys at a diabetic camp - 31 boys and 27 girls, aged 8-15, with duration of diabetes 5 - 1 years. Interviews by female teacher lasted 45 minutes, although not all questions were responded to.

All campers intended entering College, 53% intended careers in medicine or nursing. Only 2 campers felt that diabetes limited their educational opportunities. 29% thought they would do better than average in their occupation. 30% felt that diabetes had influenced their choice of occupation, and 22% named medical personnel who had directly influenced them. 85% of campers intended to marry, whilst 7% were undecided, and 7% said no. Half of those planning to marry intended having children, and of these 11% would limit the number of children because of diabetes, they stated. Only 33% thought diabetes interfered with their eating. 23% thought diabetes interfered with

school, 12% with play, and 12% with community activity. When asked to name the worst thing about their diabetes, 20% couldn't, and 50% named ketoacidosis, while at some time, 90% had had an insulin reaction and 25% feared having another. With regard to stigma, only 8% knew of people they did not wish to tell about their illness. When asked to name the worst diseases, only one named diabetes - in fact, the diabetics overwhelmingly chose diabetes to all conditions presented.

The author concluded that the impact of having a serious long term illness was not fully recognised by the group, and that they were denying many of its more frightening aspects.

Knowles et al (1965) carried out a prospective study over a ten year period on 108 patients from the Children's Hospital, Cincinnati. All had been diagnosed before the age of 16 years, and the group consisted of 55 men, 53 women. Mean age at diagnosis for females was 9 years, and for males, 10 years. Seven persons had died, and mean age at completion of study was 24.7 years.

92 patients were seen often enough to observe their emotional adjustment to diabetes. 13 expressed excessive drive for self-assertion. They rebelled against authority, over-ate, were self-destructive and attention-seeking. Diabetes aggravated the usual teenage drive for recognition, either because it caused rejection by parents or others, or because it simply produced anger and frustration in the patients. Hostility was directed initially towards the parents, later to teachers and employers. Another group of 13 had severe hidden anxiety and denied their illness by avoiding testing, diet, etc..

Partridge et al (1972) administered a questionnaire, designed to gauge adolescent responsibility, to both 54 diabetics and 200 non-diabetics, and said that the diabetics' view of the degree of control of their diabetes was realistic. Whereas the non-diabetic believes he was given responsibility too soon, they concluded, the diabetic does not. They found that the diabetic gains understanding of his disease at approximately 15 years of age.

Whereas the authors in the first section of this review of the literature confined their observations to pathology, arising from the parent/child relationships, the authors just described have focussed attention on a wider range of factors specific to the problem of diabetes. All of these authors describe factors that appear to have the potential ability to delay maturation and disturb the smooth adjustment of the diabetic subject to his illness.

3. The Personality of the Juvenile Diabetic.

.(b) Diabetes and psychiatric illness -

The papers that immediately follow, explore the possibility of psychiatric illness occurring as a consequence or concommitant of diabetes.

Many authors have suggested that psychiatric disorders are particularly common in patients with juvenile diabetes. Menninger's (1939) comments on this possibility have already been mentioned (p. 44). Daniels (1939), in evaluating psychic factors in diabetes mellitus, wrote of an increased incidence of neuroses in diabetics, but did not substantiate his claim with any evidence. Later, in 1948, he commented on the important fact, not often recognised, that the presence of diabetes can bring about the development of transient emotional changes, viz., he stated that hyperglycemia is associated with depression, and that hypoglycemia is associated with feelings of exhilaration or anxiety.

Mirsky (1948) stated that the reaction of the diabetic to his illness varies from that of psychotic, depressive, and hypochondriacal trends, to those of helplessness and apathy.

Kasin and Parker (1943), have claimed that cases of diabetes are rare amongst schizophrenic populations, and suggest that the presence of diabetes excludes schizophrenia.

One author, Dynes (1969), has taken the reverse position and suggested that diabetes when it does occur in schizophrenics, is a milder disease with less complications.

Yet another author, Rudolf (1970), stated that diabetics are more prone to schizophrenia.

Uhry and Cirilli (1961), stated "since the works of Lair in 1902, it has been commonly accepted that psychiatric disorders are more frequent amongst diabetics than in the normal population". They quote Duc (1952), who found 30 diabetic patients amongst the 6,000 patients in a mental hospital and compared this prevalence with the prevalence of 1.5/1,000 in Switzerland general population. They then progressed to describe their personal experience over 5 years, wherein they found 53 diabetic patients amongst 5,200 psychiatric patients attending various clinics.

They discussed their findings under -

(1) Psychiatric influence on the evolution of diabetes.

(2) The influence of diabetes on the psychiatric condition.

(3) The mental state of the juvenile diabetic.

Their conclusions were :-

"There is no specific psychiatric disease connected with diabetes, but these are clearly more frequent than in the normal population".

"Just as the diabetic state favours psychiatric disorders, emotional factors can produce acidotic episodes. Amongst the

recognised psychiatric disorders, depression in all its forms, is by far the most frequent".

"In the child there are no specific behaviour disorders, but stress is laid upon the role of hypoglycemic episodes, and the emotional trauma produced by the condition".

Uhry and Cirilli base their conclusions upon the incidence of diabetics in mental hospital populations. As has been mentioned in the introduction, diabetic populations within mental hospitals are increased by the older age of chronic mental hospital populations. Conclusions drawn from such populations are not likely to mirror the situation in the general population.

Stephens, and Marble (1951), reported on 80 children chosen at random at a diabetic camp for children. They found that 20 out of that 80, presented severe behaviour problems, but their investigation is reported only briefly and very little in the way of conclusions can be drawn from it.

Ives (1961) surveyed 370 patients with diabetes, and found four cases of "mental aberration" directly related to hypoglycemic episodes, and one case immediately following diabetic coma. Excluding these, she found 45 patients with "mental derangement", in whom episodes of hypoglycemia and diabetic coma were more frequent than in the remainder of the 370 patients.

"Mental aberration" included 9 patients with "personality disorder", 22 patients who were diagnosed as psychotic, and 14 patients mentally deteriorated. The 9 personality disorders were anxiety

state - 1; "personality problem for years" - 1; heroin addict with schizophrenic personality - 1; psychoneurosis - 2; patients who had attempted suicide one or more times - 4.

In a study of personality patterns in patients with diabetes mellitus of long duration, Murawski, Chazan, Baladimos and Ryan (1970), carried out M.M.P.I. assessments on 112 patients of whom 67 had been awarded the Quarter Century Victory Medal for having been found free of vascular complications after 25 years of diabetes.

They compared the two groups by the use of a reduced M.M.P.I., confining the patients to answering only the first 399 of the total 566 questions. They found that both medal and non-medal patients fell between normal limits for the M.M.P.I.. Overall, they found that non-medal persons scored higher than medal persons. They found that for non-medal and medal patients, male and female scores for depression were particularly high. (Slawson and others (1963), found this to be so in newly diagnosed diabetics, but found that there were similar changes in patients hospitalised for other reasons.)

Murawski et al, suggested that for diabetics at least, this depression might continue into later life, and they suggested a link between depression and diabetes. They admitted, however, that elevated depression scores have been recognised in chronic disease generally (Ruesch, 1946).

The diabetics as a group were not found to be withdrawn from social contact; rather to the contrary, they sought out contact

with people. Nonetheless, feelings of pessimism, hopelessness and depression, were strong. Non-medal males scored higher than medal males in all but one scale, and higher than female non-medal patients.

According to the authors, their high scores on the F. Scale suggested that the male non-medal patients were more disturbed than the medal patients, and had a need to present themselves in poor health. They also appeared to be patients who might deviate from socially acceptable practices or disregard social customs or mores.

The authors extrapolated from this, that the non-medal diabetic patients might also have cut corners in medically prescribed dictates as well. They suggest, because of higher Ma. scores, that the diabetic males were more given to overactivity and emotional excitement. The female medal and non-medal scores differed less. In fact, for the majority of scores, non-medal females scored lower than medal patients.

Despite this, the authors said that the patterning of the M.M.P.I. scores suggested that medal patients acknowledge less vitality and less impulsiveness than non-medal patients, and are more accepting of their physical disability.

As a result of their findings, the authors hypothesise that :-

(1) Certain personality characteristics interfere with acceptance of and adaptation to, the disease.

(2) Early complications either exaggerate existing personality characteristics or actually produce personality changes.

(3) A third factor or mechanism responsible for both the vascular complications and personality differences existing.

It would seem that the authors have used the very limited information available from a reduced M.M.P.I. to draw considerable conclusions and interpretations.

A fascinating report by Shepherd (1971), of "Diabetes Mellitus of Juvenile Onset with 40 years survival and no Gross Damage", is in fact an in depth study of, and by, a 50-year old physician with diabetes. In this, he writes at length of emotional factors. In particular, he writes of the effect that the physician has upon parents' attitudes and thus indirectly upon the social and emotional immaturity of the young diabetic.

He says that from his experiences, one of the major problems is that often the child has been repeatedly over-protected, cautioned and forbidden, ardently desired activities, which are normal ones for non-diabetic children; he reacts by taking advantage of his situation in the only way he can find.

If he cannot, then he makes himself believe that he does not want to. So what had initially been externally imposed protective restrictions, became unconscious internally imposed and often excessive restrictions. These can lead to self-withdrawal and self-isolation.

Despite the limitations of some papers, the majority opinion from this review of the literature, appears to be that diabetes

leads to an increase in psychological disturbance, ranging from adjustment problems of adolescence, to frank psychiatric disorder.

4. The Role and Function of Diabetes in Conflict Situations.

Clinical observations and empirical evidence described so far, indicate that, first, autonomic pathways do exist that make it possible for emotional stress to influence the diabetic state. Second, the literature has indicated that the diabetic is more likely to experience emotional stress, both indirectly through the emotional and personality responses of the parents to the diabetes, and directly through the impact that the diabetes has upon the patient.

In this section, the literature is reviewed with regard to the way in which these various factors may interact, particularly when conflict situations arise.

Rosen & Lidz (1949), studied 12 patients who had been repeatedly admitted with acidosis, out of 50 diabetics randomly chosen. All 12 were consciously and deliberately abandoning their diabetic regimen to escape untenable life situations. Ten of these patients were attempting suicide by seclusion, although few of the 12 could be described as suffering from classifiable syndromes. Nonetheless, according to the authors, there was a "mixture of depressive, schizophrenic and psychopathic irresponsibility" in all.

Despite differences in diagnoses, there were certain similarities in the personality traits. All were poorly integrated with unusually weak ego structure. All tended to fall back upon

regressive patterns when confronted by frustration. Immaturity was evident, and sexual maladjustment was common. Ten of the twelve had intense sibling rivalry for parental affection.

Tunbridge (1953) stated that the reasons why patients fail to maintain satisfactory control, fall into 3 categories .. psychological, social, and educational; and that psychological causes are especially prominent in the juvenile diabetic. In some papers, such as that of Katz (1957), the psychological problem described is a personality disorder with diabetic instability arising from dietary and insulin neglect.

Katz studied 26 patients with juvenile diabetes (15 male, 11 female), seen between January 1950, and December 1955, and in his opinion, 11 of these patients had behaviour problems. These behaviour problems manifested themselves in manipulation of the diabetic diet.

Similarly, Stearns (1959) described self-destructive behaviour in four young patients with diabetes mellitus. This self-destructive behaviour was conscious and achieved by deliberate abandoning of their regular insulin. The four patients were 2 girls aged 20 and 22, and two boys aged 20 and 21.

In another article (1953), he stated that the precipitating factor may be some action or attitude of the physician based on his lack of awareness of the significance of the patient's behaviour, or lack of skill in handling the issues arising in the course of treatment.

Sheppe and Sheppe (1954) observed that diabetic patients in whose cases the disease was discovered during the first two decades of life, were prone to "exhibit evidence of emotional instability, neurotic tendencies and maladjustment to environment and circumstances". They believed that insufficient attention had been devoted to the recognition and control of the psychic factors in the therapeutic programme of the young diabetic.

Their opinions arose out of a study mentioned earlier, of 55 cases, chosen at random, the one criteria for inclusion being that the illness was diagnosed before the age of 20 years. This group was composed of young diabetics ranging in age from 6-21 years, with an average duration of diabetes of 5 years and 7 months (32 girls, 23 boys). 18 patients had married. There were no psychotic persons in the group, but three persons had severe neuroses.

Sheppe and Sheppe recognised the possibility of these diabetics having "labile" diabetes because of poor adherence to diet and because of the disturbances in the endocrine system due to puberty. However, they stressed the effect of psychogenic factors on the diabetes through the autonomic nervous system. They stated that such psychosomatic episodes occur in normal persons but produce only mild transient effects, whilst in the diabetic, more severe effects follow.

They summarised these effects as follows :-

Stress - normal individual → adrenalin - fight or flight - protective value

Stress - Normal individual → transient glycosuria and hyperglycemia - of no value to organism.

Stress - diabetic individual → hyperglycemia, glycosuria, ketonuria, polyuria - detrimental to organism.

Other authors, e.g. Starr, introduce the concept of unconscious psychodynamic processes bringing about diabetic instability.

Starr, (June 1955) writing of "Psychosomatic consideration of diabetes in childhood", pointed out that despite the medical pre-occupation with increasingly successful attempts to reduce physical aspects of diabetic morbidity during the insulin era, and the swing away from over-rigid control, in his experience a segment of diabetic children defied consistent regulation. The paediatrician's increased armamentarium of metabolic, endocrine and neurophysiological understanding, had little effect on this group, but Starr claimed that they might have been diabetically stabilised had they not been subject to both emotional instability and parental instability.

Broadly classifying the psychosomatic spectrum as consisting of psychological pseudosomatic reactions, psychophysiological reactions, psychopathophysiological reactions, and somatopsychological reactions, he included diabetes under psychopathophysiological reactions/ Under pseudosomatic reactions, he included case histories of children simulating diabetes. Under psychophysiological reactions in diabetes, he described diabetics with anxiety states, who thereby give a false impression of being hypoglycemic.

He included under psychopathophysiological reactions in juvenile diabetics, cases in which hypoglycemia or hyperglycemia, occur as a consequence of emotional stress, referring to Hinkle's work in this area.

Under somatopsychological reactions in diabetic children, Starr described depressive reactions following onset of illness, reactions of inferiority, cerebral damage following hypoglycemia, and secondary gain by a diabetic child successfully manipulating his mother.

He discussed in some depth under the heading of "The More Common Psychological Problems in the Management of Juvenile Diabetes", the "maternal factor" in child care of the disease. "Unless the mother/child, the physician/mother, and the physician/child relationships are largely harmonious and conflict-free, complications will inevitably arise in the instrumentation of otherwise beneficial paediatric recommendations".

Starr pointed out that in normal development, the child becomes increasingly self-sufficient and autonomous, but where complications such as diabetes arise, the interpersonal weaning process is decelerated and sometimes never conclusively achieved. Some mothers, he claimed, exploit and intensify this over-dependent trend in their diabetic child, while others may attempt to escape from the increased reliance of their child.. As a result, in several such families, the diabetic child will undergo psychological stagnation, and his achievement of psychic maturation never fully materialises.

He stated that one can predict the nature of the family's and the child's adjustment to the sudden appearance of juvenile diabetes, by a careful evaluation of the pre-diabetic emotional state of affairs. According to Starr, the diabetic management for some patients becomes the arena and battleground for the expression of irrational pre-existing attitudes in the mother/child scene.

Starr described what he considers to be the common pathological parental attitudes :-

(1) The overly anxious and danger alerted parental pattern. The child is vigilantly watched, and as a result is continually in a flight or fight readiness. He is flooded with intense anxiety and repeatedly subject to anxiety states.

(2) The overly indulgent, overly permissive and excessively dedicated parental pattern. Parents have excessive guilt, cannot say "no". The child exploits the parents.

(3) Controlling, punitive, withholding and overly perfectionistic parents. For these parents, the only objective is to achieve a metabolically perfect diabetic. Even if this is achieved by the complete submergence of the child's personality, the parents are still dissatisfied, and never allow the child to forget that he is a diabetic with a rigid ritual. Not infrequently, this child rebels against his parents, and against his diabetes.

(4) The disinterested, delinquent, egocentric and grossly neglectful parental pattern. These patterns do not exist in pure culture and may vacillate from one to another.

According to Starr, the doctor too, sometimes behaves, or appears to the child to behave, in a fashion similar to that of the parents. The patterns described may in turn produce in the child, one of the following end results :-

(1) An excessively anxious and endangered (paranoid) personality.

(2) A compulsive, overly regulated and regimented personality.

(3) A depressive and self-destructive personality.

(4) A delinquent and rebellious personality.

(5) A submissive, passive, and excessively dependent personality.

Starr's comments bring together various points made by authors already described, in particular the parent/child conflict, and how it can lead to emotional and behavioural problems in the diabetic patient. He has developed this further, by relating such problems to difficulty in the management of the diabetic state.

Unfortunately, Starr does not substantiate his comments by any documentation apart from an isolated case history.

Peck and Peck wrote in 1956, of "Tautologous diabetic coma". They illustrated this by describing a patient who, from 12 years to 20 years of age, had had 50 admissions to hospital with diabetic coma. The patient came from a broken home, with an alcoholic father and mother. Not only had the father been alcoholic, but also the stepfather was in gaol for beating his wife, and the mother was gaoled for immorality. It was then that the patient began having his series of diabetic comas. Psychotherapy and the removal of the patient from the home situation, brought termination of these episodes, where medical treatment had failed.

In discussion of the case, Rickets, Smyth (Ireland), Whittaker (London), Green (Amsterdam), all commented on similar cases. Green likened the behaviour to psychoneurosis. Striker, having failed to control the episodes of diabetic acidosis in one of his patients, performed pre-frontal leucotomy, and this successfully terminated the episodes.

Dobson, et al (1958), claimed that acidosis occurs more frequently in persons of low socio-economic status.

In a panel discussion - Hinkle, Fisoher, Knowles, and Stunkard (1959), Hinkle spoke of the role of environment and personality in the management of difficult diabetic patients, and stated that difficult diabetics were :-

(1) patients with exceedingly labile forms of the disease;

(2) patients whose behaviour make their management difficult;

(3) patients who cannot or will not follow a diet;

(4) children with problems peculiar to the diabetic child.

Knowles commented on the ability of the blood sugar level to vary considerably, and pointed out that exercise, infection, trauma and emotional disturbances, could cause this to happen. When asked what part emotional factors played, he reported on the 3-year records of 80 diabetic patients. Of these, 8 had suffered severe hypoglycemic episodes and amongst these, 6 were for physiological reasons, but in 2 of the 8, no organic or emotional reasons could be found. 12 of his 80 patients had developed ketosis needing medical attention, with 2 of these due to infection; 2 apparently not associated with emotional

stress; and 8 apparently associated with emotional stress.

He suggested that situations arose wherein the patient used his diabetes to assert himself, or that situations occurred, threatening the patient who had spent his life in a very protective environment fostered by an over-solicitous family.

Fischer, referring to difficulties in the management of the juvenile diabetic for psychological reasons, stated that all diabetic children and their parents, should have psychiatric help from the onset of the disease.

Cohen, and others (1960), found that the commonest precipitating factor causing acidoses in 20 out of 52 patients, was omission of insulin. In half of these, specific emotional disturbances were directly related to the omission of the insulin, whilst in the other half, simple neglect was found to be the cause. Unfortunately, no further details of this aspect of their study are given, the rest of their paper being devoted to physical details of dehydration, blood electrolytes etc..

Molnar (1964) does not accept psychological factors as a cause of diabetic lability. "We do not believe that lability is psychogenic but brittleness certainly can be aggravated as much by emotional oscillation and swings in mood, as by all the physical stresses in life."

Schless (1964), stated that recurrent episodes of diabetic acidosis occur as a result of emotional crises, and that these episodes

occur despite adequate insulin therapy, and in the absence of organic disturbance or disease of any kind, other than the diabetes.

Schiff (1964) pointed out that every illness or injury has its concommitant psychic disturbance. Chronic illness produces deeper disturbances and chronic illnesses in children particularly so, because, he said, the reaction of the parents and their interaction with the child, are most traumatic.

He stated that the emotional problems of diabetic children and their parents fall into three time periods -

(1) onset;

(2) day to day control;

(3) adolescence.

In each of these, Schiff said, somatopsychic and psychosomatic mechanisms operate. He described emotional responses of shock, denial, resentment, rejection, and over-protection, occurring in parents and/or children at onset.

In day to day control, he described the diabetes being used as a weapon in the battle between parents and child. He also recognised that changes in blood sugar level are accompanied by changes in mood and that the family must recognise the significance of behaviour swings. In early stages of hypoglycemia, as in alcoholic intoxication, latent or suppressed feelings may be expressed.

He discussed the need during adolescence, for the physician to make the child his primary concern, and the reality that some adolescents need rigid control, whilst others need less rigid control..

Geist (1964), in writing of the psychological aspects of diabetes, stated that the diet of the diabetic presents psychological problems, and that there are two reactions to diet. First, extreme compulsiveness in observance in those who are able to ward off the anxiety by self-restriction, who have a sense of martyrdom in denying themselves even what the diet allows. Second, complete violation of observance in those who deliberately and systematically over-eat, become spiteful, provocative, and develop strong delinquent attitudes in regard to their diet. They over-eat to punish others or to strain the limits of control. According to Geist, they are usually people who have weak egos, and cannot stand frustration. In psychological terms they neglect their diet not only for primary pleasure, but also for secondary gain, principally attention.

Although it is hard to determine at times whether Geist is stating personal observations or paraphrasing other authors, he does draw attention to the possibility of the diabetes providing primary and secondary gain.

Weil, Sussmann and Grain (1967), studied glycosuria occurring in 28 diabetic children (age 6-12). The children were resident in a summer camp and the authors noted that emotional interaction in groups produced fluctuations in the amount of urinary glucose of the individual. They also noted that the older the child, the greater the fluctuation, concluding that the child nearer adolescence was more sensitive and aware of group attitudes etc., and this in turn produced a more significant emotional response that was expressed by glycosuria.

Pond (1968) .. "Special Problems of the Diabetic Child" - pointed out that "diabetes mellitus in a child is more labile and difficult to control than it is in an adult.

This may be related as a cause or effect to problems of temperament, or social and psychological adjustment to the handicap, as well as to the normal lability of a child's metabolism. The mechanisms of control by diet and insulin contribute to the emotional difficulties".

She went on to state that "tight control is essential for the maintenance of health and growth and demands a fairly rigid diet in terms of meal times and the quantity of carbohydrate consumed".

She wrote of the diabetes being used as a weapon. The passive child finds it a shield, she said, from uncongenial situations; school, games or social occasions, whereas the more extroverted child turns his diabetes into a "damaging sword". It is not uncommon, she stated, for the advent of the diabetes in a child to be the herald of the break-up of an unstable marriage, or by contrast, the extra demand on parents to care for a difficult diabetic child, may apparently heal a marital rift.

Recurrent hypoglycemia or ketotic upsets, both potentially dangerous to the child's own health, tend to be repeated before examinations or other stress situations. Sometimes they seem to be unconsciously motivated neurotic symptoms against the child's own self.

Rather naive at times with regard to the diabetic child's attitude to diet, she makes statements which may well be true, but does

not substantiate them in this article with facts or figures.

Bolinger (1971), writing of "Brittle Diabetes", supports one of the claims made earlier by Bennet and Johannsen (1954), as he too claims that a difference in the ability to cope with diabetes exists between the two sexes; "the effects of emotional disturbance on diabetic regulation are well known, and are particularly apparent in the young female".

Knowles (1971), writing of the difficulty in managing patients with juvenile diabetes, mentioned the interaction of the disorder, the environment and the personality of the patient.

In his opinion, the most common problem arises from the young person's use of diabetes as a force in his attention-seeking conduct, when passing from childhood to adult years, and the presence of diabetes only intensifies the anxiety existing in parents already confronted today with problems of adolescent children.

Knowles suggested that the physician can help best by assuming the authoritative role, setting limits, attempting to have the patient face up to the situation, and being always available as friend and counsellor. He said "even the most rebellious of young persons will turn eventually to his physician, when the latter has made sincere efforts to develop a sound doctor/patient relationship. This relationship will do much to help the young person mature, and gain insight into his own likes and dislikes, and their effects on his disorder".

Kimball (1971), writing on "Emotional and Psychosocial Aspects of Diabetes Mellitus", in 'Medical Clinics of North America', stated that there were certain emotional factors that could be identified for the patient whose diabetes goes out of control, or who suddenly experiences a rapid deterioration in a previously stable condition. The physiological processes involved are subject to conditioning. He pointed out that the work of Miller and Dicara, at Rockefeller University, suggests that physiological dysfunctions subject to control in part or wholly by the autonomic system, may be aggravated or exacerbated by the same or similar stimuli that have precipitated previous occurrences of dysfunction. These stimuli may include environmental stresses or the exacerbation of renewed pathological conflicts.

Kimball suggested that the clinician, by "tuning in" on the circumstances attending the fluctuation in his patient with diabetes, may be able to direct his patient's attention to this and, together with the patient, form a therapeutic alliance in attempting to forestall or prevent a future constellation of circumstances predisposing to decompensation in the homeostatic diabetic state.

Kimball also commented on other aspects of what he calls the "autonomic lability" of the diabetic. The fluctuations in blood glucose level, which have a direct effect upon the perceptual processes and the cognitive functions of the diabetic, also have an indirect and very far reaching effect on his total life style adaptation. He stated that the physician's major concern in the effective management

of the illness, is the reaction of the individual to his illness.

He pointed out that the onset of a severe illness for any person comes as a shock, but that when this occurs in middle age the shock has, to some extent, been prepared for and the individual, however reluctantly, is already partially conditioned.

He also pointed out that this is not the case for the individual with juvenile diabetes. The disease comes at a time when concepts of vulnerability, destructibility and mortality, are ego-alien. When reality forcefully intervenes with both the acuteness and constancy of such a condition, the whole subsequent development of such concepts is altered. Together with the subsequent influence of his illness on his relationship with others and his physical development, the onset of disease seriously disrupts the execution and completion of the psychological tasks set for him in his particular life stage. The severity and consequence of the disruption will depend upon which stage he is in at the time of onset, and his ability and the ability of others to adapt to this interference, so as to minimise its impact.

For the child who is gradually edging his way towards independence from parents, catastrophic illness and subsequent management means, at the best, a slowing, and at worst, a retrogression in this process.

Should illness strike during a stage where the drive for independence is particularly rapid, such as during adolescence, the illness and its management may loom large and become a focal issue around which the skirmishes and sometimes battles of adolescent rebellion, are waged. When this occurs, the chance that the individual

will ever be able to approach the management of his illness objectively, is diminished, for he will always have difficulty separating it from the other issues involved in the separation of child from parent, and generation from generation.

Coupled with the usual delay in physical development and maturation endured by individuals with chronic illness in general, and diabetes in particular, the alienation, isolation, and subsequent sense of anomy of the adolescent, is intensified. These burdens impede the completion of progressive life styles.

Kimball emphasised the need to give as much responsibility as possible for managing the illness, to the patient. He stressed that the parents and physician should be seen as consultants and not as imposers of a routine. He emphasised that physicians should be available to hear the subject's and his parents' feelings and attitudes about his illness, and its effects on his life.

The role that diabetes mellitus plays in the dynamic functioning of the juvenile diabetic's ego, as indicated by the literature, is both complicated and confused.

One point that appears to be agreed upon, is that the diabetic child and adolescent is more prone to emotional disturbance and psychiatric disorder (Starr 1955; Sheppe and Sheppe 1954; Swift, Seidman & Stein 1967). This is attributed partly to disturbed parent/child relationships, and partly to the direct effect of the illness on the diabetic's life. A frequently made assertion, is that

the parent (particularly the mother) develops a pathological attitude as a defence against her feelings of guilt for having produced a diabetic child, and thus engenders in the child, pathological responses that are sometimes expressed through the diabetes (Benedek 1949; Sterky 1963; Starr 1955).

Certainly the diabetic state responds pathophysiologically to emotional change (Hinkle and Wolf, 1956), and many articles have been written describing how the diabetic expresses hostility, escapes conflict, manipulates his environment and the people in it (particularly his parents), by means of his diabetes.

Some writers suggest that this manipulation is conscious (Stearns, 1959; Cohen et al, Rosen and Lidz, 1949), some that it is unconscious (Schless, 1956; Peck and Peck, 1956; and Pond, H, 1968).

What part does this mechanism take in the overall personality and how does it influence the development of the personality?

Groen (1956), discussing the problem of repeated admission to hospital with acidosis following emotional stress, likens this behaviour to a psychoneurosis.

Striker (1956), having failed to control a series of acidotic episodes in a diabetic, eventually had pre-frontal leucotomy performed on the patient and successfully dealt with the problem.

The long term view by some authors, is that the juvenile diabetic as an adult, is more prone to mental illness (Murawski et al, Daniels, 1939; Ives, Menninger, Uhry and Cirilli, and Sheppe and Sheppe, 1954). In the view of other authors, there is little

difference between the personalities of diabetics and non-diabetics (Weil and Ack, 1964; Brown and Thompson, 1940). Some authors (Kasin and Parker, 1943) even suggest that diabetes reduces the likelihood of certain psychiatric illnesses, viz., schizophrenia, occurring. Other authors, e.g. Rudolf (1970), refute this.

In summary, the literature indicates that :-

(a) diabetics are emotionally disturbed during childhood and adolescence, partly from the presence of the diabetes, and partly because of the attitudes of others as a result of the diabetes;

(b) diabetics do respond to emotional stress by losing stability of their diabetes, which in turn serves to reinforce any feelings of insecurity;

(c) the presence of diabetes in a young person can influence the development of that individual's personality;

(d) in addition to these features, diabetics do appear to suffer from psychiatric disability to a greater extent than the general population in adult life.

CHAPTER III

HYPOTHESES

Greenson (1959) defined the term defence as "all the operations of the ego, both conscious and unconscious, both simple and complicated, which have as their motive the avoidance of pain".

Freud (1926) stated that the term "mechanism of defence" should be employed "explicitly as a general designation for all techniques which the ego makes use of in conflict....."

There is a strong suggestion from the literature that diabetics make use of their illness in conflict, some authors describing this use as being conscious, others as it being unconscious. The autonomic responses to stress influencing glucose metabolism, provide a ready mechanism by which unconscious use of diabetes in conflict could be brought about.

Concommitant with that, is the further suggestion from the literature that the more emotionally disturbed a diabetic patient is, the more likely that patient is to be unstable diabetically, and thereby the more likely he is to be frequently hospitalised.

A third suggestion from the literature, is that diabetic patients are more prone to psychological disabilities than non-diabetics. These disabilities range from difficulty in maturation, personality disorders and neuroses, to depression and other psychoses.

Most of these observations regarding psychological disability have been made of children and adolescents, or of mental hospital populations.

If the diabetic does use his illness consciously or unconsciously in conflict situations, as the literature suggests, then in Greenson terms it is being used as a mechanism of defence. The question then arises; if this is so, what effect might that have on the use of other defences such as neurotic defences, and what effect might it have on other aspects of the juvenile diabetic's personality? For example - emotionally disturbed juvenile diabetics may be hospitalised in medical wards from diabetic acidosis or hypoglycemia long before any neurotic behaviour becomes manifest.

From these conclusions and impressions, the following hypotheses were developed :-

(1) Persons with juvenile diabetes who experience difficulty in dealing with conflict, will be found to be more unstable diabetically than persons with juvenile diabetes who do not experience this difficulty.

(2) Loss of control of diabetes can function as a mechanism of defence for juvenile diabetics, and consequently they will be found to show less evidence of "neuroticism"* than non-diabetics.

(3) Those persons with juvenile diabetes who are diabetically unstable in adult life, will be found to have different attitudes and backgrounds from those with stable diabetes.

* Defined under methodology.

CHAPTER IV

THE PRESENT STUDY

The aim of the present study was to :-

(a) Compare a group of young adult "juvenile diabetic" persons, that was equally representative of both sexes, and representative of the general population of juvenile diabetics, with a group of young non-diabetic adults having a history of admission to hospital, that had occurred at the same time in childhood as that of the diabetic. The comparison to be made with regard to levels of "neuroticism" and use of neurotic defence mechanisms.

(b) Examine any correlation that might exist between neuroticism and admissions to hospital for treatment of the diabetic state.

(c) Compare the background and attitude of those diabetics requiring comparatively frequent hospitalisation as adults, and those not requiring frequent hospitalisation.

A. Selection of Juvenile Diabetic Group :

It was decided to select young adults with juvenile diabetes, because -

(a) they would have had full benefit of contemporary medical therapeutics in the control of their illness;

(b) they would have most recent memory of childhood experiences and attitudes;

(c) the influence of additional varying factors, e.g. long-standing relationship with spouse, children etc., would be kept to a minimum.

On the advice of the consulted statistician and clinical psychologist, it was decided to include in the survey, 30 juvenile diabetics (15 male, 15 female), this being regarded as a sufficient number for statistical purposes, and a realistic number from the point of view of accessibility of subjects.

Initially, it was intended that patients attending the Queen Elizabeth Hospital Diabetic Clinic, be asked to participate in the investigation. However, for the reasons given earlier, it transpired that the Clinic dealt with an excessive number of diabetic persons with problems and was not representative of the population of juvenile diabetics in any comprehensive sense.

Second, the Diabetic Association was considered. This is an Association constituted to assist, advise, and mutually support persons suffering from diabetes. A particular interest is shown by this organisation in juvenile diabetics. At first the association appeared to present a suitable alternative point of contacting people of the type sought, but once again, preliminary investigations discouraged continuation of this approach.

Many juvenile diabetics are resentful of the attention focussed on the diabetic aspect of their personality and are most anxious to be seen by their peers as being no different. For these reasons and others, they leave the Association at the earliest opportunity. Only two of the diabetics in the present study had remained members of the Diabetic Association. It is the author's impression that those juvenile diabetics who remain within the Association, tend to be of a particular personality, or more correctly, are often diabetics with parents of a particular personality.

Third, it was considered that the general medical practitioners in a small localised country practice, would be aware of all diabetics in their district. A preliminary investigation of one such district - the Upper Murray River District (Barmera, Berri, Loxton, Renmark), was made. This revealed, surprisingly, that the general practitioner in fact, knew very few of the diabetics in his area.

Finally, it was realised, following enquiry amongst physicians specialising in diabetes in Adelaide, that almost all children in Adelaide developing juvenile diabetes up until the age of 12, and therefore (presumably) prior to adolescence, were admitted to the Adelaide Children's Hospital for diagnosis and treatment. The Adelaide Children's Hospital contains both private and public beds, and patients from all social strata are admitted.

Permission to make use of the medical records of that Hospital was obtained. This provided the names and parental names

and addresses of all children admitted to the A.C.H., and in particular, of those admitted between the years of 1950 and 1965 inclusive. This in turn, provided potentially a group of adults with an age range in 1971 of 18-34 (approximately), who had been diagnosed as suffering from juvenile diabetes, either during their twelfth year or prior to it.

From this list of persons, those whose names or whose parents' names were currently listed as being resident in the metropolitan area of Adelaide, in the publication 'Directory of South Australia' (250,000 names), were selected, and attempts made to trace their current whereabouts.

A total of 38 names thus gained, were investigated to achieve the required numbers of 15 female diabetic persons and 15 male diabetic persons. Thirty-eight diabetics represents more than 73% of the estimated juvenile diabetics under 12, in the metropolitan area (see Appendix).

Of the eight excluded, two persons were overseas or living interstate; two were untraceable; one was excluded because he was currently being accommodated at Minda Home for intellectually retarded persons; two persons had died. One, a male, had died at the age of 24 years, in 1964. Cause of death was asphyxia from aspiration of vomitus during diabetic coma. He was blind and suffered, in addition, from fragilitas ossium. The other, a female, died in 1963, aged 19, whilst training as a nurse. Cause of death - drowning in bath during hypoglycemic episode.

All diabetics contacted, agreed to participate in the programme.

B. Selection of Comparison Group :

From the outset, it was realised that to evaluate the degree of "neuroticism" that developed in diabetics, they would have to be assessed against a group of persons as closely matched as possible. This group could not be selected from say, the ranks of the public service, as presumably any persons so disturbed as to be unable to work, would be excluded by such a selection process. This proved to be the case, as the eventual method of selection brought about the inclusion of a young man suffering from compensation neurosis, awaiting the settlement of his claim and currently unemployed.

It was determined then, to select the comparison group in a manner as identical as possible to that used in selecting the diabetic group. For this reason, the comparison group was obtained by taking at random from the medical records of the Adelaide Children's Hospital, the names and parents' names and addresses of children who had been admitted to the A.C.H. between 1950 and 1965 inclusive, with a short term illness (less than 4 weeks).

From this, those persons whose parents' name and address was currently listed as being resident in the metropolitan area of Adelaide in the publication 'Directory of South Australia', were selected to form a group of thirty persons who formed pairs with the diabetic subjects. They were matched with regard to age, sex, and

year of admission to the A.C.H.. A total of 37 names found in this manner were investigated, to provide the thirty matched pairs.

The remaining seven were excluded for the following reasons - one was deceased, killed in a road accident; one was excluded because it was discovered he had developed asthma subsequent to his admission to the Adelaide Children's Hospital; two persons had moved interstate; and three persons were untraceable.

The procedure adopted was to locate the diabetic person and then locate the person to act as a matched pair. This was necessary as the interviews took place over a period of fourteen months, and age discrepancies between matched pairs would have eventuated.

The diagnostic categories represented on medical records for the admission of the members of the comparison group to the Adelaide Children's Hospital, are presented in Table 9 of the Results.

All persons agreed to co-operate in the programme.

Initial contact in all cases had been by personal visit to the residence of the subject.

METHODOLOGY -

(a) <u>The Interview</u> :

The initial interview was conducted jointly by the author and a psychiatric social worker in the subject's home.

All subjects were told in the broadest sense, that the investigation was being carried out to evaluate the part that illness played in people's lives, and some of the effects thereof. They were told that the investigation was being carried out with the assistance

of the Adelaide Children's Hospital, and that the records there indicated that they had been a patient there in a particular year, for a specified reason. It was stated that because of this, their co-operation in answering a few questions and completing some questionnaires, would be appreciated.

This explanation sufficed, although frequently assurances regarding confidentiality were necessary, as were occasional reassurances regarding some of the more personal questions.

The interview was semi-structured in that it followed the format outlined in the standardised interview form shown in Appendix. (All subjects were allotted a code number, related to the Roche computer questionnaire, diabetics receiving odd numbers, non-diabetics even numbers). Questions were asked by the social worker, the author only asking additional questions if he felt there was any ambiguity in a particular reply.

The interview for non-diabetics was comparatively brief, the only purpose being to establish certain facts such as occupation, level of education, etc.. (No attempt was made to determine neuroticism, use of defence mechanisms, from the verbal interview).

The possibility of interviewing other family members and of carrying out psychological testing on them was considered. In fact, in one early study this was attempted.

However, the confusion and anxiety that were produced in family members, and the inconsistency and uncertainty of the presence of family members, brought about the decision to confine the investigation to the subjects themselves.

(b) Psychological testing :

The assessment of neuroticism, use of defence mechanisms, etc., was entirely entrusted to psychometric methods, viz., Cattell's 16 Personality Factor Inventory (16 P.F.), Cornell Index (Form N.2), and Minnesota Multiphasic Personality Inventory (M.M.P.I.).

The interview with non-diabetics usually lasted 20-30 minutes. At the end of this, the subject was asked if he would complete the three psychological tests described. This would as a rule lead to some expostulation on the part of the subject, but in all cases eventual agreement. The need to complete the tasks alone was impressed upon the subject, and upon the other members of the family. All families gave assurances both before and after testing and impressed with their appreciation of the need to observe test conditions. The validity of such test conditions was considered very carefully before the study was begun. It was recognised that subjects and their families could give incorrect advice or interfere with test conditions, but it was realised that if this were their intention, then it could be achieved no matter what test conditions were enforced.

Balanced against this risk was the serious possibility that the presence of an interviewer during the whole time needed for completion of three psychological tests (over 2 hours) would create an unnatural setting for the test, and could lead to an experimental set.

The opinion formed then after testing, was that the test conditions had been achieved and the test results were valid. Some confirmation of this opinion was provided in that the M.M.P.I. includes a well established measure of validity and scores achieved

by all subjects indicated that "the test results of the subject appear valid, and that he/she seems to have made an effort to answer the items truthfully and to follow the instructions accurately".

Three to four days later, both interviewers returned and the author would ask specific questions, if in the Cornell Index questions 32 (Did you ever have a nervous breakdown?) and 35 (Were you ever a patient in a mental hospital?) had been answered in the affirmative.

Although the Fowler programme allows for follow-up of responses to "critical items", no questions relating to possible psychopathology that may have been suggested by the results of the psychological tests were asked, as it was considered that this would have been unnecessarily intrusive within the terms of the study, and would have been contrary to the empirical basis for the M.M.P.I. and 16 P.F. (Rump, 1975).

(c) The Interview with Diabetic Subjects :

This was conducted in the manner described above. As with the non-diabetic group, no attempt was made to assess neuroticism or use of neurotic defence mechanisms, this being solely determined by the M.M.P.I. and 16 P.F.. However, an attempt was made with each diabetic patient, to assess certain attitudes of the subject relating to the diabetes, and to have the subject assess the attitudes of others during childhood. The methodology of this assessment is given in succeeding paragraphs.

Retrospective reporting was called upon to some extent in this interview. The validity of such reporting has been investigated

by a number of workers (Pyles, Stolz, and McFarlane, 1935; and Haggard, Bzekstad and Skard, 1966).

The most relevant study has been carried out by Rosenthal (1963). She has investigated the accuracy of memories regarding relationships with parents and social and emotional characteristics of adolescence and pre-adolescence. The study involved 100 adults whose ages ranged from 38-40. Product moment correlations were computed between retrospective adolescent and adult variables. She found a high degree of correlation between subjects' memories and observers' ratings obtained during adolescence, although the reliability was greater amongst men than women.

The questioning with regard to attitudes mentioned, followed the semi-structure shown in Appendix.

The several preliminary studies carried out by the author have been briefly described in the introduction.

From these, various patterns appeared to emerge with regard to the attitudes and experiences of those diabetics who had achieved "stable" adult diabetes and those who had not.

These attitudes and experiences were collected by the author into a number of scales in an attempt to determine whether or not these impressions could be verified statistically.

To avoid the possibility of the early impressions gained by the author influencing his assessment of those factors in the study proper, he obtained the assistance of a psychiatric social worker, J. Campbell, Dip. Tech. (Social Work) in assessing them.

The type of scale developed by the author for the study was similar to that developed by Likert (1932). The Likert procedure does not require the classification of items by a group of judges. Items are selected solely on the basis of responses of subjects to whom they are administered in the course of developing the test. Likert type scales call for a graded response to each statement. The response is usually expressed in terms of five categories - strongly agree, agree, undecided, disagree, and strongly disagree. To score the scale, the responses are credited 5, 4, 3, 2, 1. The individual scores are interpreted in terms of empirically established norms, Anastasi (1969).

The questions were put by the psychiatric social worker, both interviewers scored their sheets. Scores were compared after each interview. The nature of the system was as described, and consequently led to virtually no disagreement. If the subject asked for clarification, it was given along the lines indicated in the assessment scales (Appendix).

The criteria for assessing at one level or another are also given in the Appendix.

The attitudes enquired into were -

(1) Parents' (both father and mother individually) :

(a) Initial reaction to the diabetes, scored on a Scale 1-5, ranging from placid to disturbed.

(1) (cont'd)...

(b) Attitude towards control of diabetes, viz., diet, urinalysis, insulin administration, and behaviour. Assessed on Scale from 1-5, ranging from liberal to restrictive.

(c) Interest in problems of diabetes. Assessed on Scale 1-5, ranging from indifferent to interested.

(2) Patient's attitude to illness during childhood :

(a) Reaction to illness at diagnosis, assessed on Scale from 1-5, ranging from placid to disturbed.

(b) Reaction to restrictions and responsibilities of diabetic state assessed on Scale 1-5, ranging from resentful to accepting.

(c) Response to social adjustments of diabetic state assessed on Scale 1-5, ranging from non-challenge to challenge.

(d) Adherence to regimes, viz., urinalysis, diet, behaviour, assessed on Scale 1-5, ranging from liberal to conformist.

(e) Self-evaluation of effect of diabetes on patient's social and educational and emotional life, assessed on scale 1-5, ranging from disrupted to undisrupted.

(f) Self-evaluation of effect of diabetes upon relationships with peers, assessed on Scale 1-5, ranging from alienated to non-alienated.

(g) Self-assessment regarding whether or not diabetes was ever used consciously to escape difficult situations, assessed

on a Scale 1-5, ranging from no conscious use to frequent conscious use.

(3) Patient's assessment of the relationship with treating physician during childhood :

(a) Relationship with doctor, assessed on Scale 1-5, ranging from cold to warm.

(b) Frequency of contact, assessed on Scale 1-5, ranging from infrequent to frequent.

(c) Doctor's attitude to control, diet, urinalysis, behaviour, assessed on Scale 1-5, ranging from restrictive to liberal.

In addition, sections (2) and (3) were assessed in an identical manner, but with respect to diabetic's current attitudes to illness and current doctor/patient relationship.

Interview with diabetic patients lasted 1 - 1½ hours.

C. Assessment of Neuroticism :

This was assessed by means of two questionnaires :-

(1) Cattell's 16 Personality Factor Inventory (16 P.F.);

(2) Minnesota Multiphasic Personality Inventory (M.M.P.I.).

(1) The possible use of Cattell's Neuroticism Scale Questionnaire (N.S.Q.) was considered - it does possess the advantage of presenting

a total figure in raw scores, comparable one group with another. The 16 P.F., on the other hand, requires conversion of the raw scores into sten scores (standardised for the American population) before the second order factor of neuroticism can be calculated. However, the 16 P.F. provides a far more comprehensive assessment of personality generally, and with regard to the assessment of neuroticism, the authors, Cattell et al (1970), state "The best function of the N.S.Q. is as a brief survey or screening test when time is not enough for the full 16 P.F.".

(2) Neuroticism was also scored from the M.M.P.I.. There are several scales for neuroticism available from the M.M.P.I.. The one used in this study was the "neurotic triad" of McKinley and Hathaway (1944). This comprises the combined scores for Hs., D. & Hy.

These two scores for neuroticism (16 P.F. and M.M.P.I.) represent different characteristics. The 16 P.F. is generally regarded as a test more applicable to "normal" people whilst the M.M.P.I. is seen as being a test more applicable to "ill" persons. According to Delhees (1970), the 16 P.F. aims at "source traits", whilst the M.M.P.I. measures "surface traits".

A syndrome, according to Delhees, in physical or psychological medicine, is a typical surface trait in that the parts generally tend to appear or disappear together. A source trait on the other hand, is a factor observed from factor analysing the correlation matrices in which the surface trait correlation clusters may be observed as part of the correlation matrix, i.e. it measures those factors that correspond to the underlying determinants of the observed surface traits .. "A surface trait test indicates purely descriptively, how far a given individual falls into a known psychiatric syndrome group, and a source trait measurement shows what underlying dynamic source traits account for that particular individual being so high on the surface trait" (Delhees, 1970). The source traits measured include "rigidity in doing things (factor A)"; not being quick to grasp ideas (factor B); lack of confidence and resilience (factor O); being impatient, dependent, impractical (factor I); etc., (Cattel 1962). It is thus also a measure of ability to handle stress or conflict situations.

Evaluation of the neuroticism scores both for the 16 P.F. and M.M.P.I., were carried out by the Research Assistant. In addition, the M.M.P.I. score sheets were transferred to data processing sheets and sent to Roche Laboratories, Nutley, New Jersey, U.S.A., where they were processed by computer. (Fowler 1969).

D. Measurement of Use of Neurotic Defence Mechanisms by M.M.P.I. :

Haan (1963, 64, 69), and Kroeber (1963), have proposed a model of ego functioning which includes both coping and defence

mechanisms. In Haan's model, "defence mechanisms", viz., intellectualisation, doubt, denial, projection, regression, and primitive defence, represent mechanisms of the ego, which she has assessed on the basis of longitudinal data from personality development, various relationships of ego functions to change in I.Q. and to social mobility and to Rorschach performance. Because of their rigidity, distortion and less differentiated thinking, these mechanisms fit the description of what are commonly regarded as neurotic defence mechanisms.

The processes according to Haan, involved in the defence mechanisms are the classical ones, first suggested by Freud, and elaborated by Anna Freud (1937). They are contrasted with "coping mechanisms" which are defined to parallel the defence processes, but are contrasted in that coping mechanisms are "flexible, purposive, reality oriented, and differentiated."

For example, "projection" involves a process of apprehending another's feelings as does "empathy", its coping counterpart. But projection is rigid, distorting, etc., whereas empathy is flexible, purposive etc..

The defence mechanisms with their coping counterparts are :-

Defence Mechanisms	Coping Mechanisms
Isolating	Objectivity
Intellectualisation	Intellectuality
Rationalisation	Logical analysis
Doubt	Tolerance of ambiguity
Denial	Concentration

Defence Mechanisms	Coping Mechanisms
Projection	Empathy
Regression	Regression in service of ego
Displacement	Sublimation
Reaction formation	Substitution
Repression	Suppression

Haan later (1965) was able to establish correlations between various patterns of M.M.P.I. response and seven of these defence mechanisms. Investigation of Rationalisation did not lead to any significant relationship between ratings for that defence and the inventory. For the remainder, the mean reliability of the indices of defence mechanisms, calculated by a Z transformation was 0.68 for men and 0.55 for women. These means did not include isolation which for women was unreliable (0.36) and reaction formation which was unreliable for men.

The Kuder-Richardson Formula 20 Reliabilities for the remaining defence scales were :-

Intellectualisation	0.67
Doubt	0.74
Denial	0.81
Projection	0.59
Regression	0.83
Displacement	0.75
Repression	0.54

Because the raw scores obtained for these defences from the M.M.P.I. differ from defence to defence in this study, each was expressed as a percentage.

The Cornell Index ratings for neuropsychiatric disorder have not been used. It was realised after the investigation had been extensively begun, that the test lacked the sensitivity of the other tests included in the battery.

Diabetic Stability :

The most stringent measure of diabetic stability was considered to be the frequency of hospitalisation for diabetic problems during the two-year period prior to the study interview.

This information was obtained from the diabetic subjects at interview, and confirmed where possible by checking hospital case notes.

The criteria for allocation of numerical value is as follows :-

1. No admissions over two-year period.
2. One admission over two-year period.
3. Two admissions over two year period.
4. Two admissions per year.
5. More than two admissions per year.

CHAPTER V

RESULTS

In the results of this study, the following abbreviations have been used :-

NT - Neuroticism measured as a second order factor from Cattell's 16 Personality Factor Inventory.

NR - Neuroticism measured from Minnesota Multiphasic Personality Inventory (Neurotic Triad, McKinley & Hathaway).

F.H. - frequently hospitalised.

I.H. - infrequently hospitalised.

N. - number.

P. - probability.

All reported correlations are Pearson Product-moment correlations (r).

The results are displayed in the following order :

1. Results of preliminary investigation.
2. Comparison of the two study groups (diabetic and non-diabetic) with regard to certain variables.
3. Results pertinent to the first hypothesis -
   (a) Correlation of Neuroticism (NT) factor with hospitalisation.
   (b) Identification of high neuroticism (high NT) diabetic and non-diabetic subjects.
   (c) Identification of F.H. diabetic subjects.

3. (d) Examination of the prevalence of frequent hospitalisation among high NT diabetics compared with that amongst low NT diabetics.

4. Results pertinent to the second hypothesis -

(a) Cattell's second order neuroticism (diabetic group compared with non-diabetic group).

(b) Neuroticism - M.M.P.I. (McKinley & Hathaway) (diabetic group compared with non-diabetic group).

(c) Use of defence mechanisms (Haan) by diabetic group and non-diabetic group.

(d) Psychiatric illness from M.M.P.I. scores (computer assessment). Diabetic and non-diabetic groups.

(e) Correlation between neuroticism (NT) and neuroticism (NR) for both diabetic and non-diabetic groups.

(f) Correlation between neuroticism (NT) and use of defence mechanisms (Haan) for both diabetic and non-diabetic groups.

5. Results pertinent to third hypothesis -

Comparison of frequently hospitalised (F.H.) diabetic group and infrequently hospitalised (I.H.) diabetic group on :

(a) 16 P.F.

(b) Familial discord rating.

(c) Assessment of experience, and attitudes of F.H. diabetics compared with that of I.H. diabetics.

The raw data from which these results have been calculated are included in the Appendix.

The criteria of significance used throughout this study, has been the probability of a finding being accidental should be less than 0.05.

Where a comparison of scores has been made the t-test has been applied as the measure of statistical significance. Where a comparison

of frequencies has been made, the chi-square test has been used; but in those instances where the numbers involved have been relatively small, e.g. in the comparison of attitudes described in the hospitalised and non-hospitalised diabetic groups, then the Fisher exact probability test has been applied. One of these non-parametric tests has been applied to scores in certain cases in addition to the t-tests, after dichotomizing the scores: this has been done as a safeguard, needed lest the possibly non-normal nature of some variables make the t-test assumptions inappropriate. According to Diem (1962) "Such a procedure is in order provided that it does not result in the mistake of assuming that a significance is doubly guaranteed when two or more tests give a significant result".

The correlation coefficient r has also been used in a number of specific cases. In addition, a multiple regression has been carried out using the five-point hospitalisation scale as the criterion variable, and initially including sex and age as control variables, and 22 other test and interview predictor variables (nearly the maximum possible within the limitations of this procedure). The figures were processed using the S.P.S.S. computer programme for multiple regression (Nie, Bent and Hull, 1970) on the University of Adelaide computer, the printout indicating the variables significantly related to hospitalisation and to each other. This initial analysis was followed by a final analysis using predictor variables only the five variables found to be significantly correlated with hospitalisation in the initial analysis. The final printout indicated the independence of the variables with regard to their influence upon the overall correlation with hospitalisation and the Beta coefficient indicated their relative importance in this respect.

RESULTS

2. Comparison of Selected Variables within the Study Groups : Diabetic (N = 30) and Non-Diabetic (N = 30).

(a) Selected Variables :

Tables 1 to 9 illustrate the comparison between diabetic and non-diabetic males and females, with regard to the selected variables. Experimental design matched each diabetic man and woman with a counterpart in the control group for age, sex, and age at admission to hospital, and consequently there was no variance in these factors. However, the age, sex, and age of admission are given in Tables 1 and 2 as the range is of some interest.

There were a greater number of very young girls (age < 7 years) admitted to the Adelaide Children's Hospital, than very young boys. Consequently at the time of interview, the mean age of the female members of the study group was found to be 21.70 years, as against 25.17 years for the male members.

Koski (1969) found that all diabetics who developed the disease before the age of 3 years, had poor control of diabetes. The youngest age of any diabetic in this present study at diagnosis, was four years. Koski's observation with regard to poor control as a result of very early onset of diabetes, does not apparently apply to this study.

Table 1

Pairs - Age at Interview

Age	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	N.
Male Pairs	2	2	3	2		2	2	2	30
Female Pairs	4	4	4	2			1		30
N.	12	12	14	8		4	6	4	60.

Mean - Males 25.17 S.D. 4.75 Overall Mean 23.43
Females 21.70 S.D. 3.08 S.D. 4.39.

Table 2

Pairs - Age at Admission to Adelaide Children's Hospital

Age	4	5	6	7	8	9	10	11	N.
Male Pairs	1	1			1	3	4	5	30
Female Pairs	4	2	3	1	1		1	3	30
N.	10	6	6	2	4	6	10	16	60

Mean - Males 9.27 S.D. 2.06 Overall mean 8.03
Females 6.8 S.D. 2.63 S.D. 2.68

Tables 3 and 4 show the marital status of the research group. Although more than twice as many non-diabetic females were married - 7 compared with 3; the difference was not significant.

The marriage rate for males was identical in both groups.

Table 3

Marital Status

Females :

	Married	Single
Diabetic	3	12
Non-Diabetic	7	8

$x^2 = 2.4$ d.f. = 1 $p > 0.05$

Table 4

Males :

	Married	Single
Diabetic	6	9
Non-Diabetic	6	9

$x^2 = 0.$ d.f. = 1

With regard to socio-economic categories*, all categories were represented in both the diabetic and non-diabetic groups (Table 5).

There was little difference between the distributions within these groups $x^2 = 0.595$, the difference being not significant.

Table 5

Socio-Economic Category - Based on Own or Husband's Occupation

	1	2	3	4	5	N.
Diabetic	4	4	8	4	10	30
Non-Diabetic	4	3	8	6	9	30

$x^2 = 0.595$ d.f. = 4 $P > 0.05$

* socio-economic categories are delineated under "Appendix".

Table 6 shows the level of education reached by the diabetic and non-diabetic subjects. The distribution for the two groups is equivalent.

Table 6

Level of Education

	Primary	Secondary					Tertiary	N.
		1st	2nd	3rd	4th	5th		
Diabetic	2	3	4	7	7	2	5	30
Non-Diabetic		3	2	11	9	4	1	30

$x^2 = 7.14$ $df = 6$ $p > 0.05$

Factor B from the 16 P.F. Inventory gives an estimate of verbal intelligence. Table 7 shows the sten scores for the subjects from the diabetic and non-diabetic groups. The distribution of scores from the two groups is not significantly different.

Table 7

Intelligence by Cattels 16 P.F.

	2	3	4	5	6	7	8	9	10	N.
Diabetic N = 30	2	1	2	5	8	6	4	1	1	30
Non-Diabetic N = 30	1	-	2	7	9	4	4	2	1	30

d.f. = 8 $x^2 = 2.458$ $p > 0.05$

All but one of the diabetic group and all but one of the non-diabetic group were Australian born (see Table 8). In the case of the diabetic group the non-Australian was English in origin. In the case of the non-diabetic group, the non-Australian was Italian in origin.

Table 8

Country of Origin

	Australia	Outside Australia
Diabetic	29	1
Non-Diabetic	29	1

In Table 9, the final diagnoses at time of admission to A.C.H. for the members of the non-diabetic group are given, to illustrate the wide range and relatively minor nature of the illness. Whilst recognising the possible role of psychological factors in any admission of children to hospital, no diagnosis is obviously based on psychological factors.

Table 9

Diagnostic Reason for Admission to A.C.H.

Control Group

Diagnosis	No.
Appendicectomy (minor path.)	1
Appendicectomy (path.)	3
Bronchitis	2
Concussion	3
Fracture	3
Gastro-enteritis (organism detected)	2
Gastro-enteritis (organism not detected)	1
Herniorrhaphy	1
Hyphaema	1
Intussusception	1
Investigation of twin	1
Orchidopexy	1
Otitis media with perforation	3
Pink disease	1
Pneumonia	1
Ruptured ovarian cyst	1
Tonsillitis	3
Wringer injury	1
TOTAL	30

RESULTS

3. Comparison of Diabetic Subjects and Non-Diabetic Subjects.

(a) Results Pertinent to the First Hypothesis -

The first hypothesis stated that :

"Persons with juvenile diabetes who experience difficulty in dealing with conflict, will be found to be more stable diabetically than persons with juvenile diabetes who do not experience this difficulty".

For reasons given under "Methodology", difficulty in dealing with conflict was measured by means of the second order factor for neuroticism obtained from Cattell's 16 P.F. inventory.

This does not statistically give a "sten" score with a range of 0-10, but has a virtually unlimited range. Because of the lack of any Australian figure, the preliminary investigation already described was conducted to obtain a range of scores for nurse applicants and trainee nurses, giving some indication of how the study group compared with other groups. This was not strictly necessary, as the scores were used in the study to compare two groups.

High NT Diabetic and Non-Diabetic Subjects :

It was necessary to delineate those diabetic and non-diabetic subjects who had greatest difficulty coping with conflict, to compare their frequency of hospitalisation.

To so delineate these persons, the mean (4.63) of the total group, diabetics and non-diabetics (N = 60) has been used.

Using this criteria, 11 diabetics and 14 non-diabetics were identified as high neuroticism (high NT subjects) - Table 10.

Table 10

Second Order Neuroticism (NT)

Diabetic Subjects

Number	Score	
569813	8.93	High NT Diabetic Subjects
569821	8.02	
569797	7.25	
569771	6.71	
569781	6.64	
569775	5.83	
569805	5.32	
569809	5.19	
569825	4.77	
569793	4.76	
569785	4.71	
569787	4.61	
569815	4.45	
569831	4.36	
569791	4.34	
569823	3.96	
569779	3.94	
569795	3.62	
569817	3.32	
569829	3.26	
569777	3.02	
569803	2.83	
569799	2.78	
569819	2.76	
569789	2.68	
569783	2.47	
569807	2.42	
569827	2.35	
569773	2.31	
569801	0.79	

N = 30 Mean = 4.28
S.D. = 1.86

$t = 1.19$ $p > 0.05$

Non-Diabetic Subjects

Number	Score	
569782	10.00	High NT Non-Diabetic Subjects
569828	9.53	
569810	9.07	
569820	7.98	
569814	7.73	
569804	7.54	
569776	7.43	
569830	7.19	
569806	7.02	
569778	6.87	
569772	6.20	
569802	6.06	
569818	5.34	
569780	4.67	
569808	4.36	
569796	4.26	
569824	4.20	
569792	3.54	
569790	3.38	
569794	3.18	
569774	3.12	
569800	2.96	
569826	2.94	
569784	2.91	
569812	2.70	
569822	2.39	
569816	2.04	
569798	1.86	
569788	1.77	
569786	1.18	

N = 30 Mean = 4.98
S.D. = 2.54

OVERALL MEAN = 4.63

RESULTS

4. Frequently Hospitalised Diabetics and Infrequently Hospitalised Diabetics.

It was necessary to delineate those diabetics who were comparatively uncontrolled diabetics. This assessment was made using a scale of 1-5, to record the frequency of admission to hospital for re-stabilisation of the diabetes during the two year period immediately preceding the interview.

The scale values were :-

1 = No admissions over two year period.
2 = One admission over two year period.
3 = Two admissions over two year period.
4 = Two admissions per year.
5 = More than two admissions per year.

The results are shown in Table 11 and in Appendix.

Persons who had needed two admissions or more over the two year period and who scored 3 or more, were classified as "frequently hospitalised" (F.H.) diabetics. Those who scored 2 or less, were classified as "infrequently hospitalised" (I.H.) diabetics.

Seven diabetics were thus delineated as F.H. diabetics. In fact, all of these seven also had a history of frequent hypo, and/or hyperglycemic episodes during that period, and could be described as poorly controlled diabetics.

The distribution of age, sex, marital status and socio-economic category is given in Table 12.

The group consists of 3 males and 4 females. All but one are single. All socio-economic categories are represented with the exception of Group 4.

Table 11

Scores for Hospitalisation - Diabetic Subjects

Range	Median	Mode	Mean	S.D.	N.
1-5	1	1	1.77	1.1	30

Table 12

Frequently Hospitalised Diabetics

(Age, Sex, Marital Status, and Socio-economic Category).

Code No.	Sex	Age	Marital Status	Socio-economic Category
569775	Male	24	Single	5
569291	Male	29	Married	5
569781	Female	22	Single	1
569813	Female	18	Single	3
569819	Male	22	Single	2
569825	Female	18	Single	3

The possibility that persons who experience difficulty in handling stress have greater use of hospitalisation for diabetes, has been examined in two ways :

(1) The number of high NT diabetics who are also frequently hospitalised diabetics, has been compared with the number of low NT diabetics who are frequently hospitalised. This comparison is displayed in Table 13. Five of the eleven high NT diabetics are frequently hospitalised, as compared with two of the 19 low NT diabetics. The difference is significant.

Table 13

Hospitalisation & Neuroticism of Diabetic Subjects

	High NT (Diabetics)	Low NT (Diabetics)	N.
Hospitalised Diabetics	5	2	7
Non-Hospitalised Diabetics	6	17	23
N.	11	19	30

(Fisher exact probability $p < 0.05$)

(2) The correlation for hospitalisation and neuroticism (NT) was calculated (Table 14). The scores for hospitalisation and Cattel neuroticism are displayed in the Appendix. The correlation is significant.

Table 14

	Mean	S.D.	r.	Shape of r. curve	P
Hospitalisation	1.80	1.3	0.60	0.36	<0.01
Cattell Neuroticism	4.28	1.87			

(3) The correlation for hospitalisation and neuroticism (NR).was also calculated. The correlation coefficient (r.) was 0.2. This correlation is not significant $p > 0.05$. (see Table 15.)

Table 15

	Mean	S.D.	r.	Shape of r. curve	P.
Hospitalisation	1.77	1.14	0.20	1.3	> 0.05
Neuroticism (M.M.P.I.)	159.4	7.49			

5. Results pertaining to the Second Hypothesis.

The second hypothesis states that :-

"Loss of control of diabetes can function as a mechanism of defence for juvenile diabetics, and consequently they will be found to show less evidence of "neuroticism" than non-diabetics".

The results of assessment of Neuroticism (NT) were displayed in Table 10, and are summarised in Table 16.

Although a difference in the means of 0.7 does exist, application of the t. test indicates that the difference is not statistically significant.

Table 16

Second Order Neuroticism from the 16 P.F.

	Range	Mean	S.D.	Difference in means	t.	P.
Diabetic Group N = 30	0.79-8.93	4.28	1.86	0.70	1.2	>0.05
Non-Diabetic Group N = 30	1.18-10.0	4.98	2.54			

The results for Neuroticism (NR) as measured by the M.M.P.I. (McKinley & Hathaway) are shown on Table 17. Once again the

mean for the diabetic group is lower than that of the non-diabetic group. The chance probability associated with a difference of the size obtained lies between 0.05 and 0.06, so that it is not quite significant.

Table 17

Neuroticism (Nr) by M.M.P.I.

	Range	Mean	S.D.	Difference in means	t.	P.
Diabetic Group N = 30	130 - 203	159	18.3	13	1.65	> 0.05
Non-Diabetic Group N = 30	125 - 274	172	39.2			

Use of neurotic defence mechanisms (Haan) was measured, and the result shown in Table 18.

The diabetic group again gave results with a lower mean, the difference (14) being significant.

Table 18

Use of Neurotic Defence Mechanisms (Haan)

	Range	Mean	S.D.	Difference in means	t.	P.
Diabetic Group N = 30	249 - 382	325	26.8	14	1.79	< 0.05
Non-Diabetic Group N = 30	278 - 430	339	33.6			

The use of neurotic defence mechanisms by High NT members of both groups (diabetic and non-diabetic) have been compared with the use of neurotic defence mechanisms by low NT members of both groups.

The results are shown in Table 19.

In the non-diabetic group there is a significantly greater use of defence mechanisms by the high NT members.

In the diabetic group, the high NT members do not have a significantly greater use of defence mechanisms than the low NT members, nor do they have a significantly greater use of defence mechanisms than the low NT non-diabetic subjects.

Table 19

Scores for use of Defence Mechanisms - High & Low NT - Diabetic & Non-Diabetic

	High NT		Low NT		t.	P.
	Mean	S.D.	Mean	S.D.		
Non-Diabetic Group N = 30	353	29.8	326	30.3	2.45	< 0.05
Diabetic Group N = 30	328	18.7	323	29.7	0.57	> 0.05

A further indication of emotional disturbance was provided by the overall assessment of the M.M.P.I. scores by computer.

Those subjects of whom printout indicated serious psychopathology, are enumerated in Table 20.

Only indications such as "The test results are strongly suggestive of a major emotional disorder", and "The test results are strongly suggestive of a serious psychiatric disorder", were used to include subjects in this group.

The results for serious psychopathology, as measured by conventional methods (M.M.P.I.), show a greater number of non-diabetic subjects being assessed as having serious psychopathology, the difference being significant.

Table 20

	Serious Psychopathology indicated	Serious Psychopathology not indicated	x^2	P.	d.f
Diabetic Subjects N = 30	4	26	4.42	<0.05	1
Non-Diabetic Subjects N = 30	11	19			

Summarising the results for this section thus far, the findings are :-

1. No significant difference between the diabetic group and non-diabetic group with regard to "difficulty in handling stress, i.e. Neuroticism as a second order factor from the 16 P.F. (NT).
2. Marginally significant difference between the diabetic group and non-diabetic group with regard to "Neurosis" neuroticism, i.e. neuroticism as measured by M.M.P.I. (NR).
3. A significant difference between the diabetic and non-diabetic groups with regard to use of neurotic defence mechanisms (Haan).
4. Within the non-diabetic group, high NT persons show a greater use of neurotic defence mechanisms than low NT persons, while in the diabetic group, no difference is seen in the use of neurotic defence mechanisms by high and low NT persons.
5. A significant difference between the diabetic and non-diabetic groups with regard to the presence of serious psychopathology.

These findings suggest the possibility that in the non-diabetic subjects, difficulty handling stress is dealt with in a significant number of cases, by neurotic defences or by other psychopathological means, and that difficulty handling stress may be handled by some diabetics by means that are not standardly recognised, and are not measured by standard methods such as the M.M.P.I.

If neuroticism (NT) represents stress arising internally (see methodology), and neuroticism (NR) represents the neurotic management of that stress, then one should be able to show a positive relationship between Neuroticism (NT) and Neuroticism (NR).

However, as it is hypothesised that some diabetic subjects may deal with stress by other means, it is hypothesised that in the diabetic group Neuroticism (NT) and Neuroticism (NR) may not be so related.

To examine this possibility, correlations have been calculated for the two groups using "The Pearson Product moment correlation coefficient".

The results are shown in Table 21 and Table 21(a).

For the diabetic group no significant correlation was found between neuroticism (NR) and Neuroticism (NT).

Table 21

Neuroticism (NT) c.f. Neuroticism (NR) M.M.P.I.
(Diabetic Group N = 30)

	Mean	S.D.	Correlation Coefficient	P.
Neuroticism 16 P.F.	4.28	1.87	0.35	> 0.05
Neuroticism M.M.P.I.	159	18.3		

For the non-diabetic group the correlation between Neuroticism (NT) and Neuroticism (NR) was significant.

Table 21(a)

Neuroticism (NT) c.f. Neuroticism (NR) M.M.P.I.
(Non-Diabetic Group N = 30)

	Mean	S.D.	Correlation Coefficient	P.
Neuroticism 16 P.F.	4.98	2.54	0.48	< 0.05
Neuroticism M.M.P.I.	172	39.2		

The correlation for Neuroticism (NT) from the 16 P.F. and use of defence mechanisms (Haan), is shown for the diabetic group in Table 22.

This shows no significant correlation between Neuroticism (NT) and use of defence mechanisms for the diabetic group.

Table 22

Diabetic Group Correlation of NT and Defence Mechanisms

	Mean	S.D.	Correlation Coefficient	P.
Neuroticism (16 P.F.)	4.28	1.86	0.06	>0.05
Defence Mechanisms (Haan)	32.5	26.8		

The correlation for Neuroticism (NT) and use of defence mechanisms for the non-diabetic group is shown in Table 23.

This does show a significant correlation between Neuroticism (NT) and use of defence mechanisms for the non-diabetic group.

Table 23

Non-Diabetic Group Correlation of NT and Defence Mechanisms

	Mean	S.D.	Correlation Coefficient	P.
Neuroticism (16 P.F.)	4.98	2.54	0.45	<0.05
Defence Mechanisms (Haan)	339	33.5		

6. Results pertinent to the Third Hypothesis.

The third hypothesis states :

"Those persons with juvenile diabetes who are diabetically unstable in adult life, will be found to have different attitudes and backgrounds to those with stable diabetes".

It has already been mentioned that those diabetics classified as "frequently hospitalised" (F.H.) were those who were diabetically unstable.

7. Sixteen Personality Factor Results.

The mean scores (raw) for the hospitalised diabetics (N = 7) have been compared with those for the non-hospitalised diabetics (N = 23).

The scores are shown in Table 24.

Although the hospitalised diabetics showed a higher mean score for factors - O, E, A, Q.2, G, Q.1, and I, and lower mean scores for factors - Q.3, H, F, B, and N, the application of t. test indicated that these differences were not significant.

However, Factor C was significantly lower for the hospitalised diabetics and Q.4, L, and M, were all significantly higher.

Application of t. test in all these instances gave a $p < 0.05$.

According to Cattell's criteria, this suggests that the hospitalised diabetics were emotionally less mature, lacking in frustration tolerance, changeable, evasive, neurotically fatigued, worrying, easily annoyed, and more prone to psychosomatic complaints than non-hospitalised diabetics.

In addition, it suggests that they were more mistrustful and doubting, more self-opinionated, deliberate in their actions and unconcerned about other people.

They were more unconventional, unconcerned, bohemian, egocentric, sensitive and imaginative. They tended to be somewhat irresponsible, impracticable and undependable.

They tended to be poor team members and were rejected in a group situation, and take a poor view of group unity, orderliness and leadership. They tended to be tense, excitable, restless, fretful and impatient.

The results suggest, on the other hand, that non-hospitalised diabetics were more emotionally mature, stable, calm, realistic about life, having considerable ego strength. They were adaptable, cheerful, composed and altruistic. They also tended to be anxious to do the right thing, practical and conformist, and somewhat inclined to be narrowly correct and unimaginative.

However, they also tended to be calm, relaxed, composed and not easily frustrated.

Table 24

Specific Means for Cattel 16 Personality Factors - Hospitalised Diabetics and Non-Hospitalised Diabetics.

Cattel Factor	Q.3	C	O	Q.4	L	H	E	F	A	Q.2	B	G	Q.1	I	M	N
Hospitalised N = 7	10.0	12.3	13.4	14.1	9.7	10.6	11.3	13.1	12.0	13.7	6.7	13.1	10.6	10.9	13.7	10.4
S.D.	2.8	3.3	4.0	4.3	1.7	5.6	4.2	6.0	2.5	3.5	2.3	3.4	3.8	3.2	3.4	1.7
Non-Hospitalised N = 23	11.7	15.9	10.0	9.0	7.7	12.3	10.8	15.0	11.4	10.8	7.3	12.2	9.4	9.6	10.6	10.7
S.D.	2.7	3.4	2.3	3.4	2.8	4.6	4.2	3.6	2.7	3.2	1.9	2.7	2.0	2.6	2.2	2.6
t.	1.4	2.4	2.0	12.76	2.25	0.74	0.28	0.79	0.55	2.0	0.64	0.64	0.81	0.98	2.14	0.36
P.	N.S.	$<.05$	N.S.	$<.02$	$<.05$	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	$<.05$	N.S.

Familial discord was measured from the M.M.P.I., using the criteria of Harris and Lingoes (1955). A score of 5 or more from a possible maximum of 11, indicates significant familial discord.

The mean for the diabetic group was 3.07 (S.D. 2.31). The mean for the control group was 3.4 (S.D. 2.41).

Hospitalisation scores are displayed with familial discord scores in Table 25 for diabetic subjects.

The correlation r. between hospitalisation and familial discord was found to be 0.4, which was significant.

In all, eight diabetics have a history of significant familial disoord. Four of these diabetics are also frequently hospitalised.

Table 25

Hospitalisation and familial discord. Diabetic group N = 30.

	Range	Median	Mean	S.D.	Correlation Coefficient r.	P.
Hospitalisation	1-5	1	1.77	1.1	0.4	<0.05
Familial Discord (M.M.P.I.)	0-9	2	3.07	2.31		

Tables 26 and 27.

Parents' reaction to the discovery of diabetes in their child.

The following scale was used :-

1 = not disturbed at all
2 = very occasionally disturbed
3 = even
4 = more than occasionally disturbed
5 = very disturbed.

Table 26

Father's Early Reaction to presence of Diabetes in Subject.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.57	1.27	2.12	<0.05
Non-Hosp. Diabetics (N = 23)	3.78	1.28		

DISTRIBUTION				
Scoring	> 3	= 3	< 3	P.
Hospitalised Diabetics (N = 7)	2	2	3	>0.05
Non-Hosp. Diabetics (N = 23)	17	0	6	

Overall Mean = 3.50
S.D. = 1.36

Table 27

Mother's Early Reaction to presence of Diabetes in Subject.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	4.29	0.76	0.56	> 0.05
Non-Hosp. Diabetics (N = 23)	4.09	1.08		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	6	1	0	> 0.05
Non-Hosp. Diabetics (N = 23)	19	0	4	

Overall Mean = 4.13
S.D. = 1.0

From the results, it can be seen that whilst the fathers of the hospitalised diabetics were less disturbed (mean 2.57) than the fathers of non-hospitalised diabetics (mean 3.78) - there was no significant difference in the reactions of the mothers of the two groups.

63% of the fathers scored more than 3, whilst 83% of the mothers scored more than 3.

It can also be seen that overall, the fathers were less disturbed (mean = 3.5) than the mothers (mean = 4.13), this difference being significant. t. = 2.03, d.f. = 58. $P < 0.05$.

Tables 28 and 29.

Parents' Interest in their Child's Diabetic State.

The following scale was used :-

1 = no interest at all
2 = occasional interest
3 = even
4 = frequently showed interest
5 = very interested.

Table 28

Fathers' Interest in the Diabetic State during Childhood.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	3.43	1.27	0.44	> 0.05
Non-Hosp. Diabetics (N = 23)	3.65	1.3		

DISTRIBUTION				
Scoring	> 3	=3	<3	P.
Hospitalised Diabetics (N = 7)	4	2	1	>0.05
Non-Hosp. Diabetics (N = 23)	16	3	4	

Overall Mean = 3.6
S.D. = 1.28

Table 29

Mothers' Interest in the Diabetic State during Childhood

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	4.57	0.79	0.15	> 0.05
Non-Hosp. Diabetics (N = 23)	4.52	0.67		

DISTRIBUTION				
Scoring	> 3	=3	<3	P.
Hospitalised Diabetics (N = 7)	6	1	0	>0.05
Non-Hosp. Diabetics (N = 23)	21	2	0	

Overall Mean = 4.53
S.D. = 0.68

Although there was no significant difference between the mothers of the hospitalised and non-hospitalised diabetics, nor between the fathers, there was a significant difference between the mothers and fathers - the mothers of the diabetic subjects being more interested in the child's condition than the father. 67% of fathers score more than 3 for interest, whilst 90% of mothers did the same. The difference in means is 0.87. t. = 3.48, d.f. = 58, P. < 0.05.

Tables 30 and 31.

Parents' Attitude towards the need for Control of the Diabetes.

The following scale was used :-

1 = very liberal

2 = liberal in many things

3 = even

4 = restrictive in many things

5 = very restrictive.

Table 30

Fathers' Attitude towards Control of Diabetes

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	3.43	1.39	0.38	> 0.05
Non-Hosp. Diabetics (N = 23)	3.22	0.67		

DISTRIBUTION				
Scoring	> 3	= 3	< 3	P.
Hospitalised Diabetics (N = 7)	3	3	1	> 0.05
Non-Hosp. Diabetics (N = 23)	3	18	2	

Overall Mean = 3.27

S.D. = 0.87

Table 31

Mothers' Attitude towards Control of Diabetes

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	3.71	1.6	0.51	> 0.05
Non-Hosp. Diabetics (N = 23)	4.04	1.06		

DISTRIBUTION				
Scoring	> 3	= 3	< 3	P.
Hospitalised Diabetics (N = 7)	5		2	> 0.05
Non-Hosp. Diabetics (N = 23)	16	6	1	

Overall Mean = 3.97

S.D. = 1.19

There was no significant difference between the parents of the hospitalised diabetics and the parents of non-hospitalised diabetics.

Mothers do appear to expect more control of the diabetic's state than do fathers. The difference between the two means being 0.70. t. = 2.5 P. < 0.05.

Only 20% of fathers scored more than 3 for control of diabetes, whilst 70% of the mothers were reported to have exerted this much control.

Table 32

Diabetic Subjects' Assessment as Recalled from Childhood, of their Early Reaction to the Diabetes.

The following scale was used :-

1 = not disturbed at all

2 = very occasionally disturbed

3 = even

4 = more than occasionally disturbed

5 = very disturbed.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	3.71	1.6	0.82	>0.05
Non-Hosp. Diabetics (N = 23)	4.22	0.67		

DISTRIBUTION				
Scoring	> 3	=3	<3	P.
Hospitalised Diabetics (N = 7)	5	0	2	> 0.05
Non-Hosp. Diabetics (N = 23)	22	0	1	

The large majority (90%) stated that they were more than occasionally disturbed by the realisation that they were diabetic, and there was no significant difference between the comment of either group.

Table 33

Diabetic Subjects' Recalled Attitude, Resentment and Hostility, felt as a Child, to the Imposed Restrictions, such as Diet, Injections, Urinalysis, Behaviour Modification.

The following scale was used :-

1 = resentful and overtly angry

2 = frequently resentful

3 = even

4 = only occasionally resentful

5 = not resentful.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	2.29	1.6	0.52	>0.05
Non-Hosp. Diabetics (N = 23)	1.91	0.95		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	2	0	5	> 0.05
Non-Hosp. Diabetics (N = 23)	2	0	21	

Both groups described considerable resentment (87% overall).

There was no significant difference between the two groups.

Table 34

Diabetic Subjects' Recalled Assessment of the Degree of Disruption to Social, Educational and Emotional Life, by Interference of Diabetic Factors as a Child.

The following scale was used :-

1 = life had been severely disrupted

2 = life had been somewhat disrupted

3 = even

4 = life generally undisrupted, some minor disruption

5 = undisrupted.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.0	1.7	0.12	>0.05
Non-Hosp. Diabetics (N = 23)	2.08	1.04		

DISTRIBUTION				
Scoring	> 3	=3	<3	P.
Hospitalised Diabetics (N = 7)	2	0	5	>0.05
Non-Hosp. Diabetics (N = 23)	4	1	18	

The majority (76.7%) stated that their lives had been disrupted. A greater number of the diabetics who in later life were not hospitalised frequently, stated that their lives had not been severely disrupted, but the difference between the two groups was not significant.

Table 35

Diabetic Subjects' Recalled Assessment of Degree of Alienation from Peers, that Presence of Diabetes had Caused.

The following scale was used :-

1 = very conscious of differences (alienated)

2 = very conscious of certain differences

3 = even

4 = very occasionally conscious of differences

5 = no difference (non-alienated).

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.43	1.8	0.37	>0.05
Non-Hosp. Diabetics (N = 23)	2.17	1.1		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	3	0	4	>0.05
Non-Hosp. Diabetics (N = 23)	4	1	18	

There is no significant difference between the two groups. 73% of all diabetics felt that there had been considerable alienation during childhood.

Table 36

Diabetic Subjects' Recall of their Response to the Need for Social Adjustment as a Child,

i.e. Whether or Not the Diabetic Responded to the Need for Adjustment by Seeing the Illness as a Burden or as a Challenge.

The following scale was used :-

1 = illness seen as a burden

2 = illness often seen as a burden

3 = even

4 = illness occasionally seen as a challenge

5 = illness definitely seen as a challenge

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.0	1.4	0.54	>0.05
Non-Hosp. Diabetics (N = 23)	1.7	0.78		

DISTRIBUTION				
Scoring	> 3	=3	< 3	P.
Hospitalised Diabetics (N = 7)	1	0	6	>0.05
Non-Hosp. Diabetics (N = 23)	1	1	21	

90% of all diabetics responded by seeing the illness as a burden.

There is no significant difference in the assessments of the two groups.

Table 37

Diabetic Subjects' Recall of their Adherence to Regimes Concerning Diet, Behaviour, Urinalysis, etc..

The following scale was used :-

1 = never conformed

2 = occasionally conformed

3 = even

4 = usually conformed

5 = always conformed.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	4.7	0.49	2.21	<0.05
Non-Hosp. Diabetics (N = 23)	4.0	1.2		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	7	0	0	>0.05
Non-Hosp. Diabetics (N = 23)	18	1	4	

Some difference is demonstrated, 100% of the diabetic group later hospitalised frequently were very conformist, whereas only 60.1% of the group not frequently hospitalised were very conformist. The difference is significant P. $<$ 0.05, according to the t. test, although not to the Fisher.

Table 38

Diabetic Subjects' Recall of the Doctors' Attitude to Control of Diet, Behaviour, Urinalysis, etc..

The following scale was used :-

1 = very liberal

2 = liberal in many things

3 = even

4 = restrictive in many things

5 = very restrictive.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	4.0	1.3	0.91	>0.05
Non-Hosp. Diabetics (N = 23)	3.48	1.41		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	4	2	1	>0.05
Non-Hosp. Diabetics (N = 23)	12	4	7	

More than half of each group saw the doctor as being restrictive. Although more diabetics in the non-hospitalised group regarded their doctor as liberal (30% c.f. 14%), the difference is not significant.

Tables 39 and 40.

Diabetic Subjects' Conscious Use of their Diabetic Illness to Escape Difficult Situations.

The following scale was used :-

1 = conscious use was greater than once per year

2 = conscious use was once per year

3 = more than once or twice ever

4 = only once

5 = never.

Table 39

Conscious Use of Diabetes as a Child, to Escape Difficult Situations

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	3.57	1.6	0.82	>0.05
Non-Hosp. Diabetics (N = 23)	4.13	1.4		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	4	1	2	>0.05
Non-Hosp. Diabetics (N = 23)	16	2	5	

Table 40

Conscious Use of Diabetes as an Adult, to Escape Difficult Situations

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	3.71	1.7	1.1	>0.05
Non-Hosp. Diabetics (N = 23)	4.48	1.08		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	4	1	2	>0.05
Non-Hosp. Diabetics (N = 23)	18	1	4	

Although less (22%) diabetics from the N.H. group consciously used their diabetes in this way during childhood, than did those from the group who were hospitalised (29%), this difference is not statistically significant.

In adult life the situation is much the same, 29% of hospitalised patients still using their diabetes at times to consciously escape difficult situations whilst 17% of non-hospitalised diabetics are using their diabetes in this way.

Although application of the t. test to this difference in adult life gives a P. > 0.05.

Table 41

Diabetic Subjects' Assessment of their Reaction to Diabetes as an Adult,

i.e. Whether or Not they felt Disturbed by the Reality of being a Diabetic.

The following scale was used :-

1 = not disturbed at all

2 = very occasionally disturbed

3 = even

4 = more than occasionally disturbed

5 = very disturbed.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.1	1.3	0.77	>0.05
Non-Hosp. Diabetics (N = 23)	1.70	0.87		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	2	0	5	>0.05
Non-Hosp. Diabetics (N = 23)	2	0	21	

Of the diabetics still being hospitalised, 29% still felt considerably disturbed whereas 9% of the diabetics who were not being hospitalised felt so disturbed.

The difference between the two groups is not significant.

Table 42

Diabetic Subjects' Attitude of Resentment and Hostility to the Imposed Restrictions such as Diet, Injections, Urinalysis, and Behaviour Modification.

The following scale was used :-

1 = resentful and angry

2 = frequently resentful and angry

3 = even

4 = occasionally resentful and angry

5 = not resentful or angry.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	3.3	1.6	1.79	>0.05
Non-Hosp. Diabetics (N = 23)	4.48	0.79		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	4	0	3	>0.05
Non-Hosp. Diabetics (N = 23)	21	1	1	

Only 3% of all diabetics still felt resentful (scored less than 3) and this figure in the main was derived from diabetics still being hospitalised. The difference in attitude is not significant.

Table 43

Diabetic Subjects' Assessment of the Degree of Disruption to their Social, Educational and Emotional Life, by the Interference of Diabetic Factors.

The following scale was used :-

1 = life severely disrupted

2 = somewhat disrupted life

3 = even

4 = life generally undisrupted

5 = undisrupted.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.71	1.89	1.85	>0.05
Non-Hosp. Diabetics (N = 23)	4.17	1.07		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	3	0	4	>0.05
Non-Hosp. Diabetics (N = 23)	18	2	3	

Only 23% felt that their life was still being disrupted to any extent (scoring less than 3). Once again this figure is derived in the main from those diabetics still being hospitalised (57%), but the difference is not significant. P. >0.05.

Table 44

Diabetic Subjects' Assessment of the Degree of Alienation from his Peers that they felt the Presence of Diabetes had Brought About.

The following scale was used :-

1 = very conscious of differences (alienated)

2 = very conscious of certain differences

3 = even

4 = very occasionally conscious of differences

5 = no differences (non-alienated).

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	2.7	1.58	2.58	<0.05
Non-Hosp. Diabetics (N = 23)	4.43	1.12		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	2	1	4	<0.05
Non-Hosp. Diabetics (N = 23)	19	2	2	

57% of the hospitalised group still felt considerably alienated by their disease, scored less than 3, whereas only two (9%) of the non-hospitalised group felt so. The mean for alienation (hospitalised diabetic group) is 27. The mean (non-hospitalised diabetic group) is 4.43. t. = 2.58.

The difference between the two groups is significant. P. <0.05. by both t. test and Fisher test.

Table 45

Diabetic Subjects' Response to the Need for Social Adjustment, i.e. Whether or Not the Diabetics Responded to the Need for Adjustment by Seeing the Illness as a Burden or as a Challenge.

The following scale was used :-

1 = illness seen as a burden

2 = illness often seen as a burden

3 = even

4 = illness occasionally seen as a challenge

5 = illness definitely seen as a challenge.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	3.14	1.86	0.97	> 0.05
Non-Hosp. Diabetics (N = 23)	3.87	1.32		

DISTRIBUTION				
Scoring	> 3	= 3	< 3	P.
Hospitalised Diabetics (N = 7)	3	1	3	> 0.05
Non-Hosp. Diabetics (N = 23)	14	6	3	

While there had been some change of response of the hospitalised diabetics, the non-hospitalised diabetics had in many cases changed from seeing it as a burden to seeing it as a challenge.

Whereas only 9% had seen it as a challenge in childhood, 87% did so as adults (score of 3 or more).

However, the difference between the two groups, hospitalised and non-hospitalised, is not significant. P. > 0.05.

Table 46

Diabetic Subjects' Adherence to Regimes concerning Diet, Behaviour, Urinalysis, etc.

The following scale was used :-

1 = never conformed

2 = occasionally conformed

3 = even

4 = usually conformed

5 = always conformed.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	1.86	1.46	0.2	>0.05
Non-Hosp. Diabetics (N = 23)	1.74	1.25		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	1	0	6	>0.05
Non-Hosp. Diabetics (N = 23)	3	0	20	

There is no difference present. 14% of hospitalised diabetics being conformist as against 13% non-hospitalised.

Table 47

Diabetic Subjects' Appreciation of the Doctor's Attitude to Control of Diet, Behaviour, Urinalysis.

The following scale was used :-

1 = very liberal

2 = liberal in many things

3 = even

4 = restrictive in many things

5 = very restrictive.

MEANS				
	Mean	S.D.	t.	P.
Hospitalised Diabetics (N = 7)	4.0	1.4	2.72	<0.05
Non-Hosp. Diabetics (N. = 23)	2.61	1.51		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	6	0	1	<0.05
Non-Hosp. Diabetics (N. = 23)	7	3	13	

More hospitalised diabetics saw their physician as being restrictive and the difference between their experiences and those of the non-hospitalised group is significant. P. < 0.05 by both t. test and Fisher test.

Table 48

Diabetic Subjects' Recalled Degree of Warmth and Approachability that they had for their Relationship with their Physician during Childhood.

The following scale was used :-

1 = cold and remote

2 = often cold and remote

3 = even distribution

4 = usually warm and approachable

5 = always warm and approachable.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	2.57	0.98	2.29	<0.05
Non-Hosp. Diabetics (N = 23)	3.69	1.46		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	1	3	3	>0.05
Non-Hosp. Diabetics (N = 23)	14	4	5	

Only one (14%) in the hospitalised group described their relationship as usually warm as against 14 (61%) of the non-hospitalised group, and there is a significant difference in the experiences of the two groups.

Table 49

Diabetic Subjects' Perceived Degree of Warmth and Approachability in their Relationship with their Physician.

The following scale was used :-

1 = physician cold and remote

2 = usually cold and remote

3 = even

4 = usually warm and approachable

5 = always warm and approachable.

MEANS				
Hospitalised Diabetics (N = 7)	Mean	S.D.	t.	P.
	2.57	1.5	2.126	<0.05
Non-Hosp. Diabetics (N = 23)	3.91	1.34		

DISTRIBUTION				
Scoring	>3	=3	<3	P.
Hospitalised Diabetics (N = 7)	2	1	4	<0.05
Non-Hosp. Diabetics (N = 23)	17	3	3	

The hospitalised diabetics more often saw their physician as usually cold and unapproachable. 57% scored less than 3, whereas only 13% of the non-hospitalised did so.

The difference between their experiences and those of non-hospitalised diabetics is significant. t. = 2.126, whilst the application of the Fisher probability test to the distribution of scores above and below 3, gives a $P. < 0.001$.

Tables 50 and 51.

Distribution of Diabetic Subjects who Experienced a Warm or Cold Relationship with their Physician, and Who are Frequently or Infrequently Hospitalised.

Eight diabetic subjects had experienced familial discord during childhood. The number is almost too small for statistical analysis.

The Fisher exact probability test has been applied, but the results are not statistically significant.

Table 50

Comparison of F.H. Diabetic Subjects and I.H. Diabetic Subjects
(Childhood relationship with physician)

Relationship with Physician	Cold	Warm	N
F. Hospitalised Subjects	4	0	4
I. Hospitalised Subjects	1	3	4
P = 0.08			8

Table 51

Comparison of F.H. Diabetic Subjects and I.H. Diabetic Subjects
Adult relationship with physician)

Relationship with Physician	Cold	Warm	N
F. Hospitalised Subjects	3	1	4
I. Hospitalised Subjects	2	2	4
P = 0.43			8

Using the S.P.S.S. programme Version 5.8 (Nie, Bent and Hull, 1970), a correlation coefficient matrix was obtained with 25 variables for the 30 diabetic subjects, viz., order of testing, sex, age, familial discord, age of onset, neuroticism (NT), Neuroticism (NR), Neurotic defences, hospitalisation, intelligence, father's reaction to diabetes, mother's reaction to diabetes, father's attitude to control, mother's attitude to control, social adjustment in childhood, social adjustment in adulthood, adherence to regimen in childhood, conscious use during childhood, relationship with doctor in childhood, doctor's attitude to control in childhood, social adjustment in adult life, adherence to regimen in adult life, conscious use in adult life, relationship with doctor in adult life, doctor's attitude to control in adult life.

Hospitalisation was considered as the criterion variable. The variables found to be significantly correlated to hospitalisation were shown in Table 52.

Table 52

Variable	r	P
Neuroticism (NT)	.60	$<.001$
Father's attitude to control	.58	$<.001$
Doctor's attitude to control in adult life	.42	$<.05$
Neuroticism (NR)	.55	$<.01$
Familial discord	.40	$<.05$

Because the five variables might themselves be intercorrelated, the multi-correlation of those five variables with the criterion (Hospitalisation) was determined. The multiple correlation coefficient was found to be 0.82 ($F_{5, 24}$) = 9.58, $P < 0.001$). Each of the five variables made some contribution to the multiple regression independent of the others, but the most marked independent contributions to the multiple correlation with hospitalisation were Neuroticism NT and father's attitude to control (see Table 53).

Table 53

Variable	P	Multiple R	Beta Coefficient
Neuroticism NT	.001	.597	.28
Father's attitude to control	.003	.735	.27
Doctor's attitude to control	.074	.771	.13
Neuroticism NR	.126	.794	.34
Familial discord	.124	.816	.25

From the correlation coefficient matrix, other significant correlations of interest were found, and these are shown in Table 54.

Table 54

Variables	Simple r	P	Nature of Relationship
Neuroticism (NR) / Social adjustment (adult life)	- 0.53	< .01	↓ Neur. ↑ Chall.
Adherence to regime (adult life) / Social adjustment (adult life)	- 0.54	< .01	↑ Conform. ↓ Chall.
Relationship to doctor (adult life) / Familial discord	- 0.53	< .01	↑ Disc. ↓ Warmth
Relationship to doctor (adult life) / Doctor's attitude to control (adult life)	- 0.52	< .01	↑ Control ↓ Warmth

CHAPTER VI

DISCUSSION AND CONCLUSIONS

The results of this investigation describe certain characteristics of a group of 30 diabetic patients, aged between 18 and 35 years, amongst whom the age of onset of the diabetes ranged from 4 years to 11 years. The duration of the diabetic state for these persons extended from 8 years to 21 years. It is hoped that by tracing the diabetic group in the manner described under Methodology, some biases found in other studies have been avoided.

The diabetic group has been compared with a control group selected in an identical fashion, and matched by pairs with individual members of the diabetic group with respect to age, sex, and age of admission to hospital as a child.

The two groups have been compared on the basis of other variables, viz., level of education, intelligence, distribution through the socio-economic groups, country of origin and marital status. No significant difference could be found in these respects between the two groups.

The Adelaide Children's Hospital admits both public and private patients. This factor plus the relatively small and circumscribed nature of the Adelaide Metropolitan area is the probable reason for the similarity in the two groups with regard to socio-economic grouping and level of education.

The results do differ from those of Joslin and Root (1947), and Wert, Richey, and Eyre (1934), who claimed that diabetics had higher I.Q.'s than non-diabetics, and again from Shirley & Greer (1940), and Boulin (1951), who claimed that diabetics had lower I.Q.'s than non-diabetics.

The diabetic group has been subdivided into "stable" and "unstable" diabetic subjects on the basis of frequency of hospitalisation as described under Methodology and Results. The non-hospitalised group consists of 23 diabetic persons - twelve males and eleven females. The hospitalised group consists of 7 diabetic persons - three males aged 24, 29, and 22, and four females aged 18 (2), 22, and 25. All socio-economic categories were represented except category four. One male was married, and none of the female subjects were married.

There was no significant difference between hospitalised diabetics and non-hospitalised diabetics with regard to age at onset of the diabetes, nor of the duration of the diabetes. All the diabetic subjects in this study suffer from juvenile diabetes, not adult onset diabetes. In this respect the diabetic group differs from the group described by Murawski et al, in which some M.M.P.I. characteristics were compared for medal (i.e. patients free from vascular complications after 25 years) and non-medal patients. In that investigation, no distinction was made as to whether the persons studied were suffering from adult onset diabetes or juvenile diabetes.

The distinction has been made in this investigation because :-

(a) Adult onset diabetes arises later in life when the patient has already developed concepts of the reality of death and the threat to the individual's existence is not so unexpected.

(b) Juvenile diabetes occurring in childhood is a far more traumatic experience. As has been pointed out by Kimball (1971), it occurs at a time when concepts of vulnerability, destructability and mortality, are ego alien.

(c) Adult onset diabetes does not threaten death so dramatically. Treatment in most cases consists only of diet. The sudden, unexpected, and rapidly developing trauma of hypoglycemia, is virtually confined to patients with juvenile diabetes

(d) With regard to personality, juvenile diabetes occurs at a time of maximum developmental significance.

Diabetes occurring in an older person is more likely to modify or extend existing personality traits, e.g. the obsessive compulsive personality will lead a rigidly controlled diabetic life, the acting out psychopathic personality may use his diabetes deliberately to manipulate his environment.

The child with diabetes on the other hand, is more likely to have his/her developing personality modified by the effects the diabetes has upon them and/or the persons in their environment. Bruch (1949) alludes to this ego development when she writes of the ego superstructure that the diabetes causes to be constructed upon the ego of the diabetic patient.

Kimball (1971) has suggested that physiological alteration of perceptual processes and cognitive functions may have far reaching effects upon life style adaptation. Because this study was primarily designed to focus attention on some aspects of this possible development, only patients with juvenile diabetes were selected and then juvenile diabetics who had developed the disease before the age of twelve years.

Their conscious use of diabetes in childhood and adult life was enquired into, and all subjects appeared to be frank and free of guilt

when discussing this factor. Of the thirty diabetic subjects, ten stated that they had consciously used their diabetes during childhood. Seven of these diabetics were from the 23 stable diabetics and three from the seven unstable diabetics. Eight diabetic subjects said that they still use their diabetes in adult life, five of these being amongst the 23 stable diabetics and three from the seven unstable diabetics. There was no significant difference between conscious usage by the stable group of diabetics and conscious usage by the unstable group.

Conscious use during childhood appeared to be a more emotionally involved behaviour. The use was either to avoid difficult situations at school or to express hostility against authority figures including the physician. The former was usually achieved by "not feeling well", the latter by deliberately over-eating.

All diabetics who admitted to consciously using their diabetes in adult life, claimed to do so for minor reasons only, e.g., to gain a day's sick leave for recreational purposes. As far as could be ascertained from the diabetics themselves, their physicians, and relatives, none of the currently unstable diabetics were hospitalised because of deliberate manipulation of diet or insulin.

Conscious use of diabetes appears to have little relevance to instability of diabetes in adult life for this group of diabetic patients, although it may have had relevance to instability during their childhood.

The First Hypothesis.

"Juvenile diabetics who experience difficulty in dealing with conflict, will be found to be more unstable diabetically than persons with juvenile diabetes who do not experience this difficulty."

One aspect of those papers that have looked at emotional disturbance and how it pertains to control of diabetes, is that emotional disturbance has been measured by the existence of recognisable psychiatric syndromes. If the psychiatric syndrome is handling anxiety, albeit unhealthily, e.g. by conversion, then this could possibly reduce the effect that the anxiety might have upon the physiological state.

It is for this reason that not only were measures of psychiatric syndromes, e.g. neurotic illnesses from the M.M.P.I. used in this study, but also second order neuroticism from Cattell's 16 P.F. inventory (NT).

As has been mentioned earlier under Methodology, this measures the underlying determinants of symptoms, the "source traits" which give rise to neurotic symptoms in persons with neurotic personalities, and is a measure of difficulty in handling conflict. The suggestion that neuroticism (NT) and neurosis, represent different forms of personality component, is borne out by results given later.

One difficulty in using neuroticism (NT) as a measure, is that although second order neuroticism scores are derived from sten scores, they are not themselves sten scores, and consequently are not limited to a range of ten.

Because there were no available Australian figures for neuroticism (NT), a further examination of this factor was made using a selection from all applicants for employment as nurses at Glenside Hospital, and a selection of trainee nurses employed at Glenside Hospital. The selection was made to provide two groups matched for age and sex with the study group.

The mean score for nurse applicants was 4.88 (S.D. 2.22), the mean score for trainees was 3.45 (S.D. 1.84). Within the study group the mean for diabetic subjects was 4.28 (S.D. 1.86) with a range 0.79 to 8.93. The mean for the non-diabetic subjects was 4.98 (S.D. 2.54) with a range 1.18 to 10.00.

The overall mean for the study group was 4.63. This is a little below that of the nurse applicant group and higher than that of the trainee nurse group. The study group's figure for neurosis, neuroticism etc., would probably be higher than that of most groups chosen for comparison in a similar study, as such comparison groups are usually taken from a working population such as the trainee nurse group.

Like the trainee nurse group, a comparison group from a working population would have excluded by selection (hopefully), those more neurotic applicants for positions. As the diabetic group was found by tracing admissions to the Adelaide Children's Hospital of 20 years standing, some members of course were not currently employed - one person, for example, was working at a sheltered workshop.

Similarly, the control group being selected in an identical fashion, included several persons who were not currently employed. One person was receiving sickness benefits for symptoms that suggested a diagnosis of compensation neurosis.

In short, the experimental group would by nature of its manner of selection, include a greater number of unhealthy persons than would a group selected from a working population such as the State Public Service.

As both the diabetic and non-diabetic subjects were selected in an identical fashion, a comparison of the characteristics of the two groups should be valid. In fact, with regard to neuroticism (NT), there was no significant difference in the means of the diabetic and non-diabetic groups ($t = 1.19$, $P > 0.05$).

Stability of diabetes was measured by the need for hospitalisation over the two-year period prior to assessment, assessed on the basis of a scale of 1-5, described under "Methodology". It so happened that all diabetics who scored 3 or more for hospitalisation (i.e. who had been admitted to hospital at least twice during the two-year period), also had a history of repeated hyper and/or hypoglycemic episodes.

Diabetics who scored above the mean (4.63) for neuroticism (NT) were classified as high neuroticism (High NT) diabetics. Of the seven diabetic subjects who scored 3 or more for hospitalisation, five were high NT diabetics. This disproportionate representation of high NT diabetics amongst the frequently hospitalised diabetics is statistically significant. Applying the Fisher exact probability test, P was found to be less than 0.05.

The correlation coefficients of 24 variables with frequency of hospitalisation were obtained. Five variables gave significant correlations, Neuroticism NT, Neuroticism NR, familial discord, doctor's attitude

to control and father's attitude to control. The multiple correlation coefficient being 0.82 ($F_{5, 24}$) = 9.58 $P < 0.001$). Each of the five variables was shown to have some relationship to the multiple correlation that was independent of the others, but the most marked contribution was that of Neuroticism (NT) (Table 52).

The finding that neuroticism (NT) can be correlated with hospitalisation, is particularly interesting as most of the physicians responsible for the treatment of the frequently hospitalised diabetic patients were at a loss to explain the reason for the deterioration in the diabetic state that necessitated admission to hospital. In one case, so perplexed was the physician, that he had the patient investigated for epilepsy in an attempt to explain the phenomena (to no avail). Another physician describing his patient, stated without prompting that he didn't know why the diabetic state suddenly went out of control, the patient was most co-operative and diligent : he suspected that emotional factors were probably responsible.

None of the admissions to hospital, during the two-year period referred to was, for any of the seven "frequently hospitalised" diabetic patients, associated with disease, trauma or alteration of insulin or diet.

In summary then, of the seven diabetics who had been frequently hospitalised during the two-year period prior to interview, five were from the group of eleven diabetics who scored above the group mean for Neuroticism (NT), a statistically significant over-representation.

The correlation coefficients for both Neuroticism (NT) and Neuroticism (NR) with hospitalisation were found to be significant. Multiple regression indicated that of the five variables that were significantly correlated with hospitalisation, the variable of most importance was Neuroticism (NT).

It would seem, then, that these findings support the first hypothesis, viz., "juvenile diabetics who experience difficulty in dealing with conflict, will be found to be more unstable diabetically than persons with juvenile diabetes who do not experience this difficulty".

The Second Hypothesis.

The second hypothesis stated that "Loss of control of diabetes can function as a mechanism of defence for juvenile diabetics, and consequently they will be found to show less evidence of neuroticism than non-diabetics".

The scores for neuroticism (NT) as measured by Cattell's 16 P.F. inventory, have already been described, and it has been pointed out that the difference between the mean for the diabetic group and the mean for the non-diabetic group, is not significant. (Diabetic group mean 4.28, S.D. 1.86. Non-diabetic group mean 4.98, S.D. 2.54. ($t. = 1.2$, $P. > 0.05$). When the scores for neuroticism (NR) as measured by the McKinley and Hathaway neurotic triad, of HS. D. and Hy,

from the M.M.P.I. are examined, once again a difference is found, and although by the criteria of this thesis the difference is not significant, i.e. $P. > 0.05$, the difference is such that P. lies between 0.05 and 0.06.

The M.M.P.I. neuroticism should be measuring more specifically the use of neurotic defence mechanisms as it supposedly measures surface traits, rather than the source traits etc. Therefore, when the scores for the use of specific neurotic defence mechanisms using Haan's method are examined, it is not surprising that the difference between the two groups, diabetic and non-diabetic, becomes even more marked. Here the difference is significant. Diabetic group mean 325, S.D. 26.8. Non-diabetic group mean 339, S.D. 33.6, $t. = 1.79$, $P < 0.05$.

Finally, when a more holistic attempt is made to determine whether there is any difference in overall unhealthy handling of internal stress by taking the overall computer assessment of psychiatric disability, again a significant difference is found in that of the 30 diabetic subjects only four are found by M.M.P.I. assessment to have major psychiatric disability, whilst 11 of the 30 non-diabetic subjects are so assessed.

It could be argued, that the more emotionally disturbed diabetic persons have died and thus removed themselves from the investigation.

However, the investigation approached only those persons who developed the disease before 12 years of age as the Adelaide Children's Hospital does not accept children older than 12. At the same time, figures for the prevalence of diabetes are only available for children under 15 years of age. Although limited to children under 12, the investigation contacted 73% of all persons developing diabetes under 15 years between 1950 and 1966. This means that more than 80% of diabetic children under 12 years of age were contacted, and of these only two had died.

The absence of any significant difference between the diabetic and non-diabetic group with regard to Neuroticism (NT) by 16 P.F., on reflection, is to be expected. If the 16 P.F. does measure the source traits as is claimed, i.e. the existence of difficulty in handling internal conflict, rather than the surface traits manifesting it, then diabetic subjects should not be any less likely to experience such difficulty whatever their method of dealing with it might be.

Nonetheless, the absence of any significant difference is interesting in the light of the emphasis that has been placed in the literature upon the emotional trauma that diabetes creates in young diabetics, and the suggestions of increased "mental frailty" that have been made.

When neurotic surface traits are measured (Neuroticism NR), the difference between the diabetic and non-diabetic subjects becoming more marked, does suggest that the diabetic subjects are not using neurotic methods of dealing with stress to the same extent that non-diabetic subjects are, and when a significant difference is found between the use of neurotic defence mechanisms using Haan's assessment, this suggestion appears to be supported.

The significant difference between the assessment of serious psychopathology by M.M.P.I. in diabetic subjects and non-diabetic subjects extends this support beyond neurotic methods of handling stress.

The suggestion is further supported when a significant correlation (0.48) is shown to exist between Neuroticism (NT) and neurosis (NR). (M.M.P.I. neurotic triad of neuroticism); and between Neuroticism (NT) and the use of neurotic defence mechanisms (0.45) as measured by Haan's methods, for non-diabetic subjects, while an absence of any such significant correlation is demonstrated for diabetic subjects.

Finally, it was seen that High NT non-diabetic subjects made greater use (353) of neurotic defence mechanisms than low ^{N}T non-diabetic subjects (326). This is to be expected but the finding that there was no difference between high NT and low NT diabetic subjects in the use of defence mechanisms, and that their usage was no different from that of the low NT non-diabetic subjects, again supports the hypothesis

that the diabetic subjects with high Neuroticism (NT) scores are dealing with that neuroticism in some manner other than using neurotic defence mechanisms.

Although diabetic subjects differ from non-diabetic subjects in that Neuroticism (NT) cannot be correlated with the neuroticism (NR), nor with use of neurotic defence mechanisms, it has already been shown that Neuroticism (NT) can be correlated with hospitalisation for diabetic subjects. Such a correlation can not be demonstrated for the non-diabetic subjects, as the design of the study excluded from the control group any persons with a chronic illness, and no person in that group had been hospitalised more than once in the two-year period preceding interview.

Reference has already been made to the observation in this as well as in other studies, that the diabetic can use his illness to consciously express hostility or to avoid stressful situations. If the diabetic patients in this study are to be believed, such conscious use is not a major source of relief from anxiety in adult life.

Whether conscious use is made of the diabetes or not, the juvenile diabetic in early years should become aware consciously or unconsciously, of the fact that his diabetes alters the environment in which he functions, and that a deterioration in his diabetic state will influence people in his environment even more.

Selye (1950), Cannon (1920) and Hinkle and Wolf (1956), all have shown that emotional stress will alter the blood glucose level, and

although this returns to normal within a short space of time for the non-diabetic individual, it produces longer standing and more disruptive effects in the diabetic. The child with juvenile diabetes is more prone to emotional disturbance than the non-diabetic child, whether it be due to the impact of the disease itself or the impact of the disease upon important persons in the diabetic's environment. If the diabetic child is exposed to emotional stress, his diabetic state will become disturbed. In a responsive environment, this will attract attention and if no infective, traumatic or dietary cause can be found, it is possible that someone, parent or physician, will investigate the presence of any emotional factors.

Should such a child be in an environment that is not sensitive to such changes and the emotional stress continues, then the diabetes will continue to be disturbed until eventually hospitalisation becomes necessary.

Removal to hospital -

(a) removes the patient from the stressful environment;

(b) almost certainly brings attention.

If the first described situation develops, i.e. the environment is responsive and attention is focussed upon areas of emotional stress, then the problem may be resolved by help from parent or physician. In this situation, the diabetes has served as an "early warning system". Some diabetic children will, as a result of the emotional stress and parental help, develop mature coping mechanisms as part of a healthy total personality development.

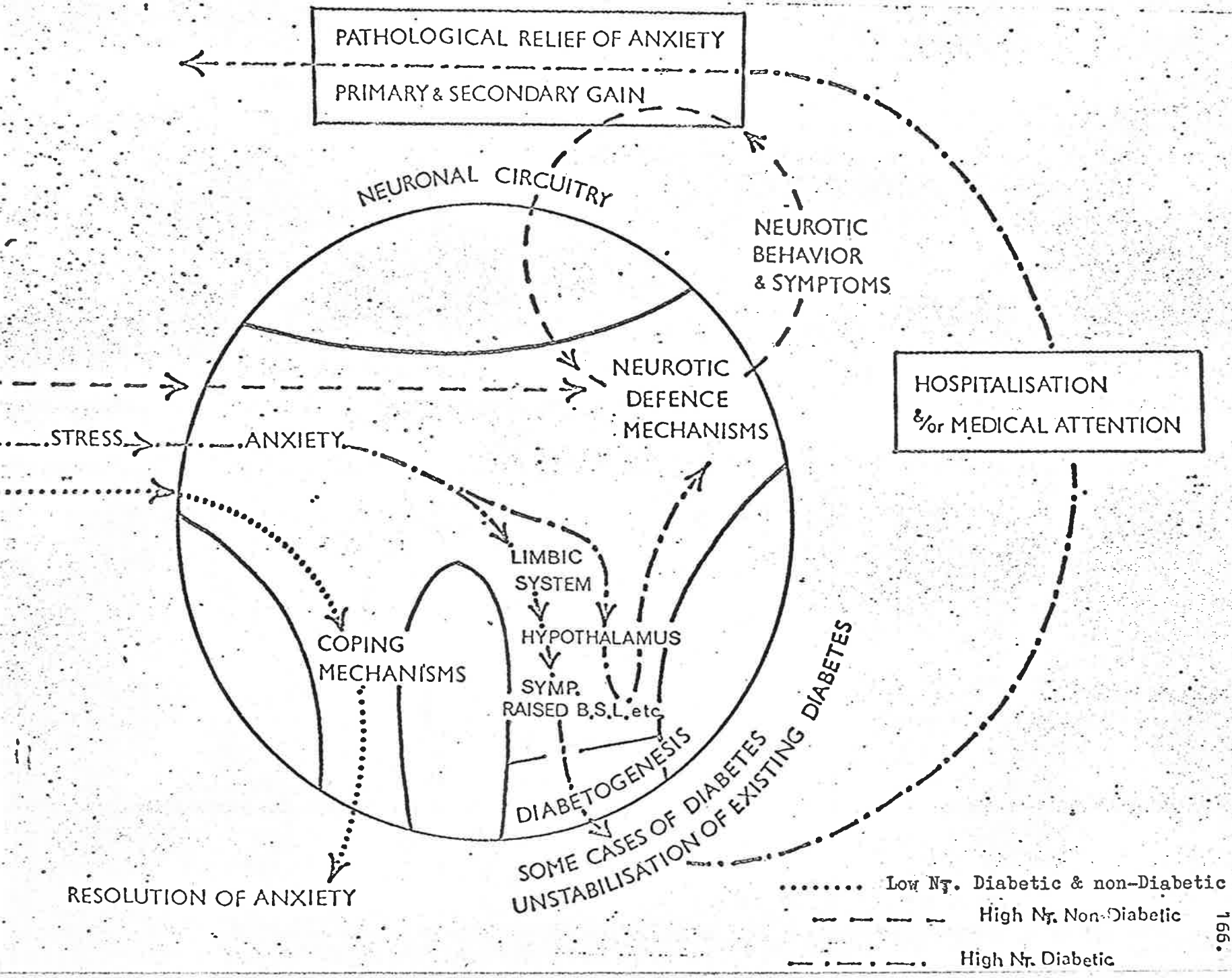
In the case of those diabetic children who have more limited means of communicating emotional stress, because of poor ego development, the attention attracted by the deteriorating diabetic state, has obviated the need to resort to immature means of communicating, such as neurotic or psychotic behaviour.

If the second described situation develops, i.e. th environment is insensitive and unresponsive to the presence of emotional stress and the emotional stress continues unrelieved, then the diabetic deterioration will also continue until the state of ill-health will necessitate hospitalisation.

Hospitalisation represents reward of the unstable diabetes, reward in the sense of removal from the stressful situation, increased attention and possibly removal of the original cause of stress. It allows regression to take place more easily, and it may enable the anxiety associated with the emotional stress to be "bound" to a physical illness entity. Unhealthy "success" of this kind may well cause such patterns of behaviour to be utilised on later occasions in those developing personalities whose neurotic defences might otherwise have been called upon.

In both cases the diabetic person's likelihood of having to make use of neurotic mental mechanisms that might eventually lead to him being classified as mentally ill, has been reduced.

The process has been described schematically on the following page.


PATHOLOGICAL RELIEF OF ANXIETY
PRIMARY & SECONDARY GAIN
NEURONAL CIRCUITRY
NEUROTIC BEHAVIOR & SYMPTOMS
NEUROTIC DEFENCE MECHANISMS
HOSPITALISATION &/or MEDICAL ATTENTION
STRESS
ANXIETY
LIMBIC SYSTEM
HYPOTHALAMUS
SYMP. RAISED B.S.L. etc
COPING MECHANISMS
DIABETOGENESIS
SOME CASES OF DIABETES
UNSTABILISATION OF EXISTING DIABETES
RESOLUTION OF ANXIETY
..... Low Nr. Diabetic & non-Diabetic
— — — — High Nr. Non-Diabetic
— . — . — . High Nr. Diabetic

Such a process provides a reasonable explanation of the success claimed by Striker (1956), of a patient with recurrent acidosis whose diabetic problem was relieved by leucotomy.

The second hypothesis stated that "Loss of control of diabetes can represent a mechanism of defence for diabetics, and consequently they will be found to show less evidence of neuroticism than non-diabetics".

In one sense, the hypothesis has not been supported. Although diabetic subjects did show less evidence of neuroticism, the difference was not statistically significant for Neuroticism (NR) or (NT). At the same time, diabetic subjects did show significantly less evidence of psychiatric illness, and diabetics demonstrated significantly less use of neurotic defence mechanisms.

Finally, the positive correlation of Cattell's neuroticism, with use of neurotic defence mechanisms and neurosis for non-diabetic subjects, and the absence of any such significant correlation for diabetic subjects suggests that the diabetic does use some mechanisms other than neurotic defence mechanisms, to deal with emotional stress, and to this extent supports the hypothesis that loss of control of diabetes can represent a mechanism of defence.

The Third Hypothesis.

"Those persons with juvenile diabetes who are diabetically unstable in adult life, will be found to have different attitudes and backgrounds from those with stable diabetes".

Koski (1969) compared poor control and fair control of juvenile diabetic children. Murawski, et al (1970), administered a

partial M.M.P.I. to adult diabetics, and compared medal (free of vascular complications) patients and non-medal patients, and Crowell (1953), comparing diabetic patients with rheumatic fever patients, found no difference between good and poor control diabetics. Other than these studies, there are no specific assessments comparing stable diabetics with unstable diabetics. Unfortunately, Murawski did not differentiate between patients with juvenile diabetes and patients with late onset diabetes.

The results of this current study suggest that for patients with juvenile diabetes, attitudes and experiences of childhood are very different from attitudes and experiences of adult life. For example, whilst 90% of the diabetic group were disturbed as children at being diabetic and 87% felt resentful, only 29% were still disturbed as adults and 3% still resentful.

73% of diabetics felt alienated from their peers by the restrictions and limitations brought about by their diabetes during childhood, but only 16% felt alienated as adults. Perhaps not surprisingly, those diabetics still being hospitalised were more likely to feel alienated, as 43% of the hospitalised group felt alienated against only 9% of the non-hospitalised group in adult life.

It is also interesting to note that although 90% of diabetics saw their illness as a burden during childhood, in adult life 87% saw it more as a challenge.

A feature, commonly found among the diabetic subjects, was that the diabetic, as a child, found himself disturbed, alienated and

burdened by his diabetic state. This is the situation frequently described by authors writing of the psychological problems of juvenile diabetes.

However, in the large majority (87%) of persons in this study, a strong reaction formation to feelings of inferiority developed during adolescence, and the diabetes began to be seen more as a challenge. The young diabetic set about to "prove" himself or herself to be "as good" as his non-diabetic peers. This varied in its nature. At least three diabetics had entered into sport and achieved state championship level. One had travelled the world as a nurse to "prove (she) could do it", another deliberately took a position as a tutor on a remote outback station, again to prove she could do it.

Five of the diabetic group reached tertiary level of education as against only one of the non-diabetic group, despite equal intelligence and socio-economic states.

The impression gained was that the over-determined need to prove onself in many instances, propels the resentful young diabetic through his adolescence rather over-vigorously, but then leaves him/her advantageously placed so that he no longer feels resentful, alienated or disturbed. Unfortunately there were mishaps as a result of this over-determined response in one or two cases, with ketotic or hypoglycemic episodes developing.

The correlation coefficient matrix indicated a significant negative correlation between the extent to which a diabetic conformed to dietary restriction, testing etc., and his tendency to see his diabetes as a challenge rather than a burden.

At the same time the matrix also indicated a significant negative correlation between Neuroticism (NR) and the tendency to see the diabetes as a challenge rather than a burden (Table 53).

In fact, the majority of diabetics had adopted less conformist behaviour with regard to diet, urinalysis etc., in adult life, and it is perhaps surprising that there was no difference in this respect between hospitalised and non-hospitalised diabetic subjects, 13% compared with 14%.

Cattell's 16 P.F. inventory revealed only five areas of difference between the hospitalised and non-hospitalised groups, that could be regarded as statistically significant. They were factors Q.4, C, and M, which were higher for the hospitalised subjects and C factor, which was lower for the hospitalised group.

This suggests that hospitalised diabetic persons are emotionally less mature, lacking in frustration tolerance, changeable, evasive, neurotically fatigued, worrying, easily annoyed, and more prone to psychosomatic complaints than non-hospitalised diabetics.

In addition, it suggests that they are inclined to be more mistrustful and doubting, more self-opinionated, deliberate in their actions and unconcerned about other people. They may be more unconventional, unconcerned, bohemian, egocentric, sensitive and imaginative. They tend to be somewhat irresponsible, impracticable and undependable. Hospitalised persons are more likely to be poor team members, to be rejected in a group situation, and take a poor view of group unity, orderliness and leadership. They tend to be tense, excitable, restless, fretful and impatient.

Both the Likert scale and the 16 P.F. indicated that the F.H. diabetic is alienated from his peers.

It could be suggested that frequent hospitalisation during childhood and/or adulthood may have brought about this alienation, but only two members of the hospitalised group have been hospitalised more than twice a year either during childhood or adulthood.

The personality characteristics and difficulties described could also be related to poor relationships in the childhood home situation, and the review of the literature refers to many suggestions that this is disturbed in the families of diabetic children, and in particular in the families of unstable diabetic children.

Familial discord has been objectively assessed in this study, using the scale from the M.M.P.I. of Harris and Lingoes (1955). A maximum score of 11 can be thus obtained, and a score of 5 or greater indicates the presence of significant familial discord during childhood.

Reference has also been made to the part the physician might play in the parent/child/physician relationship of the diabetic child. The relationship that the diabetic patient experienced with his/her physician has been assessed on a Likert scale.

With regard to familial discord, the mean for the diabetic group was 3.07 (S.D. 2.35) and the mean for the non-diabetic group was 3.40 (S.D. 2.41). The correlation coefficient hospitalisation/familial discord has been assessed and is 0.4. This is a significant correlation $P. < 0.05$.

From Table 50 it can be seen that eight diabetics scored 5 or more, showing evidence of familial discord. Four of the eight diabetics with familial discord, are frequently hospitalised diabetics. It is interesting that these four also reported their relationship with their physician to be cold or indifferent during childhood.

Four of the eight diabetics with familial discord were not frequently hospitalised. All but one described their relationship with their physician during childhood in the maximum positive terms.

Seven diabetics in all were frequently hospitalised. Six of these described their relationship with their physician during childhood as cold or indifferent (Table 48). Five (71%) described their relationship with their physician in adult life (Table 49) as cold or indifferent. In contrast, of the non-hospitalised diabetics, nine (39%) had such a poor relationship during childhood and only six (26%) during adult life. Again these findings are significant. All but one of the diabetics who experienced familial discord and a poor relationship with their physician during childhood, are unstable diabetics as adults. Of the three diabetics without a history of familial discord, but who are frequently hospitalised, two described their relationship with their physician as poor or indifferent.

The results of this study tend to corroborate the findings of previous authors, that emotional disturbance in the home is reflected in less stable diabetes. It further suggests that these disturbed relationships may continue through to influence the diabetes into adult life.

The role of the consultant physician may have played a significant part in minimising the effect of the familial discord in some patients.

Most writers have focussed attention on the mother as the pathological member of the three. Starr (1955) is one who has

discussed in some depth the "maternal factor" and suggested that "unless the mother/child, the physician/mother, and the physician/child relationships are largely harmonious and conflict free, complications will arise in the instrumentation of otherwise beneficial recommendations".

He has pointed out that in normal development the child becomes increasingly self-sufficient and autonomous, but where complications such as diabetes arise, the interpersonal weaning is decelerated and sometimes never conclusively achieved. Some mothers, he said, exploit and intensify this over-dependent trend, whilst others attempt to escape from increased reliance in their child. As a result in several families, the diabetic child will undergo psychological stagnation, and his achievement of psychic maturation never fully materialises.

Although the figures from the study described in this thesis tend to support the contention that familial discord in childhood produces a person who is likely to show poor control of his/her diabetes, not only in childhood but in later life, none of the diabetics were aware of particular hostility towards their mother. All described their mother in the terms "I loved my mother, my mother was a good woman". Although this could represent unconscious denial, similar denial was not demonstrated in the attitudes expressed towards some fathers.

At the same time, all but one of the mothers were described as being very restrictive in their attitude towards control of the diabetes, and all but one very disturbed on discovering their child to be diabetic. The fathers, on the other hand, were not only less

disturbed, but showed no inclination to exert strong control over the diabetic state.

It is possible that the attention that has been focussed upon the mother has arisen from the more active role she is called upon to play in the therapeutic programme of the child juvenile diabetic.

It is interesting that one of the few significant differences between hospitalised and non-hospitalised diabetics, was that fathers of non-hospitalised diabetic patients were seen by their children as being more disturbed by the discovery of diabetes, than were the fathers of the hospitalised diabetic subjects.

Although the observations of the diabetic subjects indicated that the fathers of non-hospitalised diabetics were no more interested than the fathers of hospitalised diabetics, the finding that they were more disturbed, suggests that the fathers of non-hospitalised diabetics may have been more emotionally responsive to their child's psycho-physiological state.

Another finding from the correlation coefficients with hospitalisation, was that the second most significant correlation and significant as an independent factor (Table 52) was a positive correlation between frequency of hospitalisation and the degree of control exerted upon the diabetic patient's life by his/her father.

Any conclusions drawn from these findings can only be speculative, but they do suggest that research until now that has focussed upon only one or two family members, usually the child and/or the mother has been inadequate.

As Irish (1964) has pointed out, the family should be seen as a complex of interactions. The mother or the patient may have been seen more often as unhealthy, simply because they were more easily seen, or because the pathological processes terminated in their behaviour, or it may have been that they were more accessible to therapists and thereby attracted attention more readily.

As with a clock that shows the wrong time, the fact that the hands are in the wrong position can mean that any one or more of a hundred contributing parts is faulty. Noting the apparent and accessible fault, and setting the hands right, does not really deal with the basic problem.

It may be too, that other parts have to be in certain states beofre a particular part can upset the balance.

The findings with regard to the father's attitudes, together with the fact that the only overt criticism of parents was directed towards the father, suggests that his role, although perhaps a passive one, may well have been far more influential than has been previously thought. It adds emphasis to the role of the physician in the parent/child/physician relationship.

Authors such as Knowles (1971) have suggested that one of the most common problems in juvenile diabetes, arises from the young person's use of diabetes as a force in his attention-seeking conduct, when passing from childhood to adult years.

Knowles and others have mentioned the possible psycho-therapeutic role of the physician. It has been mentioned that of the eight diabetes in this study with a history of familial discord, those

three who are not frequently hospitalised as adults are those who enjoyed a good relationship with their physician during childhood.

In addition to this, it has been seen that 6 of the 7 diabetics who are frequently hospitalised, had poor relationships with their physicians during childhood. Five of the seven have poor relationships with their current physician. This occurs despite more frequent contact of these patients with their physician.

The correlation matrix indicated a negative correlation between warmth of relationship with physician and frequency of hospitalisation of -0.34, which fails marginally to achieve significance.

It could be argued that the presence of familial discord made it difficult for the diabetic to relate to his physician. However, as those three diabetics who maintained control over their diabetes despite a background of familial discord, differed from those without control, in that they had enjoyed a warm relationship with their physician, then it would seem that perhaps the physician can and does interrupt the psycho-pathophysiological processes that arise from disturbed parent/child relationships. Furthermore, three diabetics are relatively unstable despite a lack of familial discord. Two of these describe their physician as cold and unapproachable, during their childhood and adult life.

It would not be unreasonable to believe then, that the physician/patient relationship might contribute to psychopathophysiological responses in the patient and thus encourage the development of unstable diabetes.

One girl in particular in this study had been constantly re-admitted to hospital with acidosis and expressed very marked hostility towards her physician because of his apparent indifference to her problems at a time of extreme maturational and developmental significance for her. Eventually a severe emergency arising from her diabetic state enforced a transfer to another warmer physician. She almost immediately improved and has been stable now for some years.

Another diabetic, a male aged 21, who had been stable for some time, was admitted to hospital for routine investigations and subsequently became unstable whilst in hospital. The only significant factor during that admission was that he came under the care of a physician who repeatedly asked the patient each day that he saw him, who he was and how long he had been in hospital.

It was the impression of the author that many physicians have difficulty in evaluating the impact of their personality upon the patient or the influence that they can bring to bear upon the control of the illness through their relationship with the patient. Unfortunately, the physician who produced the most negative reaction was sometimes the one who did make a conscious attempt to be warm and approachable in his relationship with his patient. It did occur that a physician was seen by one patient as warm and approachable and seen by another as cold and rejecting.

The consultant physician dealing with the brittle diabetic will almost always explore any emotional factors that might be relevant with the patient and where appropriate, with the parents. It may be

necessary for the consulting physician who has such a patient where adjustment of diet and insulin are unproductive, and where all attempts to resolve emotional problems have had no effect upon the diabetic state, to consider transferring the patient to another physician, as a therapeutic measure.

To summarise - hospitalised diabetics are shown by this study to differ from non-hospitalised diabetics, in that they feel themselves to be alienated from their peers. Objective evaluation by personality inventory further supports this observation, by indicating that the hospitalised diabetic differs from the non-hospitalised by being less able to participate in groups, is more rejected by groups, is more egocentric, mistrustful, relates poorly, etc.. It is unlikely that this alienation of the hospitalised patient is a direct result of hospitalisation, as only two of the seven hospitalised diabetics were admitted to hospital more than twice a year.

Many writers have suggested that the families of diabetic children are disturbed and in particular, that the families of unstable diabetic children are disturbed. This study supports such suggestions, as four of the seven hospitalised diabetics have evidence of significant familial discord in childhood as measured by the M.M.P.I., and there is a positive and significant correlation between familial discord and hospitalisation as an adult.

Unlike previous studies, this study does not emphasise the mother as being the pathological factor. Certainly the mother is seen as being more restrictive than the father, but she is also seen as being

more interested and more concerned. Most importantly, no difference is found between attitudes of mothers of hospitalised diabetics and mothers of non-hospitalised diabetics. It may well be that the degree of attention focussed upon the role of the mother emanates merely from the fact that the mother is forced into the role of having to supervise the diabetic regimen.

From the present study, there is evidence that this is accepted by the diabetic. The only significant difference in parental attitudes found was that non-hospitalised diabetics remembered their fathers as being more disturbed on finding their child to be diabetic.

It is possible that the maternal control is more tolerable if the father is concerned about what is happening to his child.

The results suggest that a concerned father figure, viz., the physician, has an ameliorating effect on the familial discord, and increases the likelihood of the diabetic personality developing into a stable diabetic individual in adult life, further supporting the contention that the father has a more significant role in the diabetic's developing personality and his ultimate life style, than has been previously given cognisance.

Three hypotheses have been proposed and explored. The first of these, that persons with juvenile diabetes who experience difficulty in dealing with conflict will be more unstable diabetically than persons with juvenile diabetes who do not experience this difficulty, repeats a statement often found in the literature, but one that has not been

supported statistically. The evidence from this present investigation has shown that a significantly greater number of diabetic patients with high scores for neuroticism, require hospitalisation for control of their diabetic state than do patients with low scores for neuroticism. In addition, a significant positive correlation has been shown to exist between scores for neuroticism and scores indicating frequency of hospitalisation. These findings appear to support the hypothesis stated.

The second hypothesis that loss of control of diabetes could function as a mechanism of defence for juvenile diabetics, and consequently juvenile diabetics would show less evidence of "neuroticism" than non-diabetics, has also been explored.

Although the investigation has demonstrated a difference in the mean scores of diabetic and non-diabetic subjects when neuroticism as a second order factor of the 16 P.F. inventory was measured, this difference was not statistically significant. Neuroticism as measured by the M.M.P.I. however, demonstrated a more significant difference, and measurement of the use of neurotic defence mechanisms as devised by Haan, showed a clearly significant difference with the diabetic group using less neurotic defences than the non-diabetic group. In this respect, the second hypothesis was supported.

Support appears to be added by the demonstration that a positive and significant correlation existed between Neuroticism (NT) and Neuroticism (NR), and between Neuroticism (NT) and use of neurotic defence

mechanisms for the non-diabetic subjects, but not for the diabetic subjects.

The finding that high NT non-diabetic subjects make greater use of neurotic defence mechanisms than low NT non-diabetic subjects, whereas high NT diabetic subjects show no greater use of neurotic defence mechanisms than either low NT diabetic or low NT non-diabetic subjects, appeared to lend further support to the second hypothesis.

Finally, the third hypothesis that persons with juvenile diabetes who are diabetically unstable in adult life will have different attitudes and backgrounds from those with stable diabetes, has been explored and discussed.

It is probably true to say that no major differences have been demonstrated between the two groups. However, differences with regard to the personality characteristics of alienation, difficulty in interpersonal relationships etc., have been shown to exist to a significant degree, and to this extent the third hypothesis has been supported.

These differences have been discussed with respect to the parent/child relationships described by the diabetic subjects, and the doctor/patient relationships. An attempt has been made to relate the findings of all three areas of investigation in a meaningful way. In particular, an attempt has been made to relate diabetic stability to the personality development of the young person confronted with the trauma that diabetes presents. This in turn has been related to the role of the parents and physician in the adjustment of the young diabetic patient,

and how their presence can influence his development into an emotionally and physically stable adult.

APPENDIX

APPENDIX

RESULTS OF PRELIMINARY INVESTIGATIONS REFERRED TO IN THE INTRODUCTION :

TABLE I shows the number of diabetics present in Glenside Hospital in 1966, and the number of diabetics expected from other surveys. Although the prevalence among the 40 - 49 group and the 50 - 59 group is rather larger than expected, (3:1 and 8:5), the prevalence in the older age group is much lower (8:12 and 5:29).

Six years later (1972) the total number of diabetics had not altered markedly (22 in 1972 against 24 in 1966), but the total patient at population at Glenside had dropped in the same time to 691 from 1203. This brought the proportion of diabetics from 50% of the expected figure to 76% of that figure.

APPENDIX

TABLE I

PREVALENCE OF DIABETES FOR DIFFERENT AGE GROUPS AMONGST LONG-STAY PATIENTS .. GLENSIDE HOSPITAL, 1966.

Age Group	Number of Patients	Diabetic Females	Diabetic Males	Total Diabetics	Expected Total
- 29	81	-	-	-	1
30-39	120	-	-	-	-
40-49	210	3	-	3	1
50-59	241	5	3	8	5
60-69	233	6	2	8	12
70 +	318	5	-	5	29
TOTAL:	1203[2]	19	5	24	48

Total long-stay patients 1,203[2] (Male 645, Female 558)

Diabetics 24 (2.0%)

1. Welborn, T.A. - Cunderdin Diabetes Survey, 1967.

2. Total includes Intellectually Retarded Patients. Data published previously (Clayer & Dumbrill, 1967) did not.

APPENDIX

TABLE II

PREVALENCE OF DIABETES FOR DIFFERENT AGE GROUPS AMONGST LONG-STAY PATIENTS .. GLENSIDE HOSPITAL, 1972.

Age Group (years)	Number of Patients.	Diabetic Females.	Diabetic Males.	Total Diabetics	Expected Total of Diabetics
- 29	51	-	-	-	-
30-39	80	-	-	-	-
40-49	74	-	-	-	-
50-59	137	4	2	6	3
60-69	127	3	5	8	6
70 +	222	8	-	8	20
TOTAL:	691	15	7	22	29

Total number of Long Stay patients 691
(Males 373, Females 318).

Diabetics 22 (3.2%).

APPENDIX

TABLE III

PREVALENCE OF JUVENILE DIABETES AND THE REPRESENTATIVES IN ADELAIDE

POPULATION, ADELAIDE, 1965.

City Area		
Age Group	Males	Females
0 - 4	1010	911
5 - 9	784	796
10 - 14	621	651

Metropolitan Area		
Age Group	Males	Females
0 - 4	24811	23785
5 - 9	24079	23262
10 - 14	17653	16911
Total No.	66543	63958

Total for State		
Age Group	Males	Females
0 - 4	45068	43161
5 - 9	42292	40338
10 - 14	30650	29086

Juvenile Diabetics are estimated as being 1/2,500 of the population under the age of 15 years, (Geist 1964), (Knowles 1971).

In the metropolitan area, from where the diabetic group was drawn the population of under 15 years was 130,501. In the population there should have been 52 diabetics under 15 years of age. The study group of diabetics only included persons under 12 years of age.

APPENDIX

Results of Preliminary Investigation into Second order Neuroticism.

Because of the absence of any Australian normative data for second order neuroticism (Cattell), a preliminary evaluation of second order neuroticism was made (Table 1a) :

(a) from nurse applicants, N = 30

(b) from nurse trainees, N = 30.

These persons were matched for age and sex with the subjects comprising the diabetic and non-diabetic groups. Mean score for the nurse trainee group was 3.45; S.D. 1.84. The higher score for nurse applicants (4.88) reflects the highly selected nature of the persons accepted for psychiatric nurse training (see Discussion section).

The range and mean of the nurse applicants was similar to the range and mean of the two study groups (diabetic and non-diabetic).

TABLE IV

Second Order Neuroticism (16 P.F.)

(Nurse Applicants and trainee nurses, Glenside Hospital)

	Range	Median	Mean	S.D.
Nurse Applicants N = 30	0.63 - 9.30	4.48	4.88	2.22
Trainee Nurses N = 30	0.24 - 7.21	3.18	3.45	1.84

APPENDIX

CASE HISTORY

Mr. G.B. - Male, married (separated) .. Roche No. 569791.
Age at interview - 29 years (5/3/71).

Mr. G.B. developed diabetes at the age of 5 years 7 months.

His family background was a disturbed one. His father was a psychiatric nurse who was dismissed for drunkenness on duty, and alcoholism had been a problem of long standing prior to this. His parents separated at approximately the same time as G.B. and his wife.

G.B. described his father as unintérested in the problem of his diabetes. His mother on the other hand, was probably ambivalent, at some times showing excessive interest. For example, she continued to administer his injections until he was 19 years of age. At the same time, she never insisted upon him avoiding the eating of sweets, etc..

His relationship with his doctor was a somewhat hostile one, and his attitude towards his diabetes could best be described as indifferent.

His intelligence would have been in the average range, as he scored 6 on the "B" intelligence factor of the 16 P.F. inventory, and he reached second year High School.

He consciously used his diabetes during childhood, particularly during adolescence, when he would pretend to be unconscious to gain attention, and this would result in his being taken home from school.

The assessment of his attitude and experiences with regard to diabetes during childhood, was that initially he felt occasionally disturbed

at the thought that he was diabetic. He was occasionally resentful of the restrictions and responsibilities that diabetes imposed, and the illness often represented a burden to him.

However, he always conformed to the diabetic regimes. His life, he felt, had been somewhat disrupted, but he only occasionally felt aware of differences between himself and his peer group. He consciously used his diabetes to escape conflict situations in the manner already described, more than once a year. His relationship with his doctor, he felt, was often a cold and remote one, and his doctor's attitude towards control was one that was very restrictive.

He knew his wife for seven years before their marriage, but they had not related well after this, and separated in 1968.

Prior to their separation, he had been admitted only once to hospital in over five years. This was on 23/8/65 because of a hypoglycemic episode.

Six weeks after his wife left him (26/12/68) he was admitted to hospital again because of hypoglycemia.

Thereafter, he was admitted as follows :

17/7/69	-	following a vehicular accident during hypoglycemia
2/9/69	-	for stabilisation of diabetes
5/12/69	-	for stabilisation of diabetes
7/3/70	-	for stabilisation of diabetes
18/11/70	-	vomiting and anorexia followed by hypoglycemia
26/7/72	-	fractured clavicle during hypoglycemic episode.

The assessment of his current attitude at interview on 5/3/71, was that he was resentful of the restrictions and responsibilities that

diabetes represented. The illness was seen neither as a burden nor as a challenge, and he had become rather non-conformist with regard to diabetic regimens. He felt that his life had been severely disrupted by the presence of diabetes, but felt equivocal as to whether or not he had been alienated from his peers in any way. He had only used his diabetes once in adult life, and that had been to gain a day's sick leave from work. He felt that his doctor's attitude towards him was evenly distributed between being cold and remote and warm and approachable. His doctor's attitude towards control of the diabetes was seen as being very restrictive.

Although he described his attitude towards diabetic regimens as non-conformist, the doctors responsible for his therapy did not feel that any of his admissions to hospital had been precipitated by failure to follow instructions regarding diet or insulin therapy. However, the patient's diabetic state had become so unstable that he was granted an invalid pension and at the time of the interview, was employed in a sheltered workshop.

The staff of the diabetic clinic that he attended were aware of the possibility that emotional factors could be playing a part in the instability of his diabetes. They accordingly referred him for psychiatric assistance. He was seen by a female doctor with very limited psychiatric experience, to whom he related poorly, and did not continue to attend appointments.

In March 1972, he was attacked by a group of youths whilst at the beach and suffered fractures to some bones of the face, and died at home some days later. The actual cause of death is not certain.

The results of the 16 P.F. inventory do not indicate any great degree of pathology, nor do the results of the M.M.P.I.. His score for the neurotic triad of McKinley & Hathaway was 182, which was above the mean for the diabetic group (159). However, his score for use of defence mechanisms was 333, which was above the mean for the diabetic group (325) but below that of the non-diabetic group (339). The total assessment of his personality from the M.M.P.I. is included in this appendix.

In summary, the clinical picture is one of a young man with a history of disturbed family relationships, who experienced some difficulty relating to others, including his doctors.

He very definitely used his diabetes consciously during childhood and adolescence, to avoid conflict situations, and to gain attention.

Although he showed a tendency to minimise some of his problems, there was no evidence in standard psychiatric terms of psychiatric disability.

There had also been virtually no conscious use of his diabetes during adult life, according to him and according to his medical records. Nonetheless, from the time that his wife left him in 1968, his diabetes became unstable, causing amongst other episodes, a vehicular accident, a fractured clavicle, and possibly his death.

ROCHE PSYCHIATRIC SERVICE INSTITUTE

MMPI REPORT

CASE NO: 569791 RPSI. NO: 17032
AGE 0 MALE SEP. 08,1971

THE TEST RESULTS OF THIS PATIENT APPEAR TO BE VALID. HE SEEMS TO HAVE MADE AN EFFORT TO ANSWER THE ITEMS TRUTHFULLY AND TO FOLLOW THE INSTRUCTIONS ACCURATELY. TO SOME EXTENT THIS MAY BE REGARDED AS A FAVORABLE PROGNOSTIC SIGN SINCE IT INDICATES THAT HE IS CAPABLE OF FOLLOWING INSTRUCTIONS AND ABLE TO RESPOND RELEVANTLY AND TRUTHFULLY TO PERSONAL INQUIRY.

THIS PATIENT APPEARS TO BE A HYPER-SENSITIVE, RESENTFUL AND HOSTILE PERSON WHO IS OFTEN FATIGUED AND DEPRESSED. ALTHOUGH HIS PRESENTING COMPLAINTS MAY BE MEDICAL IN NATURE, HIS PERSONALITY PROBLEMS STAND OUT MORE PROMINENTLY THAN THE PHYSICAL DISTRESS. HE IS LIKELY TO HAVE A LONG HISTORY OF INTERPERSONAL DIFFICULTIES AND REJECTION OF CLOSE ASSOCIATIONS. HIS HOSTILITY AND SUSPICIOUSNESS HANDICAP HIM IN SOCIAL SITUATIONS. THIS CONDITION IS A CHRONIC, STABLE ONE AND IS LIKELY TO SHOW LITTLE CHANGE OVER TIME.

THERE ARE UNUSUAL QUALITIES IN THIS PATIENT'S THINKING WHICH MAY REPRESENT AN ORIGINAL OR ECCENTRIC ORIENTATION OR PERHAPS SOME SCHIZOID TENDENCIES. FURTHER INFORMATION IS REQUIRED TO MAKE THIS DETERMINATION.

HE IS A RIGID PERSON WHO MAY EXPRESS HIS ANXIETY IN FEARS, COMPULSIVE BEHAVIOR AND RUMINATION. HE MAY BE CHRONICALLY WORRIED AND TENSE, WITH MARKED RESISTANCE TO TREATMENT DESPITE OBVIOUS DISTRESS.

SOME ASPECTS OF THIS PATIENT'S TEST PATTERN ARE SIMILAR TO THOSE OF PSYCHIATRIC PATIENTS. APPROPRIATE PROFESSIONAL EVALUATION IS RECOMMENDED.

NOTE: ALTHOUGH NOT A SUBSTITUTE FOR THE CLINICIAN'S PROFESSIONAL JUDGMENT AND SKILL, THE MMPI CAN BE A USEFUL ADJUNCT IN THE EVALUATION AND MANAGEMENT OF EMOTIONAL DISORDERS. THE REPORT IS FOR PROFESSIONAL USE ONLY AND SHOULD NOT BE SHOWN OR RELEASED TO THE PATIENT.

ROCHE PSYCHIATRIC SERVICE INSTITUTE

SCALE SCORES FOR MMPI

CASE NO: 569791 RPSI. NO: 17032
AGE 0 MALE SEP. 08.1971

SCALE	?	L	F	K	HS	D	HY	PD	MF	PA	PT	SC	MA	SI
RAW	1	4	4	12	6	28	18	19	23	17	20	21	20	29
K-C	1	4	4	12	12	28	18	24	23	17	32	33	22	29
T-C	OK	50	53	49	52	77	53	62	55	76	69	71	63	54

SCALE	ES	MT	A	R	LB	CA	DY	DO	RE	PR	ST	CN	AT	SO-R
RAW	45	22	23	13	9	18	33	13	17	12	20	27	24	25
T-C	51	79	64	45	49	66	65	45	42	51	55	55	65	26

WELSH CODE **'268'794-5031/:#

CRITICAL ITEMS

THESE MMPI TEST ITEMS, WHICH WERE ANSWERED BY THE PATIENT IN THE DIRECTION INDICATED, MAY REQUIRE FURTHER INVESTIGATION BY THE CLINICIAN. THE CLINICIAN IS CAUTIONED, HOWEVER, AGAINST OVERINTERPRETATION OF THESE ISOLATED RESPONSES.

182 I AM AFRAID OF LOSING MY MIND. (TRUE)

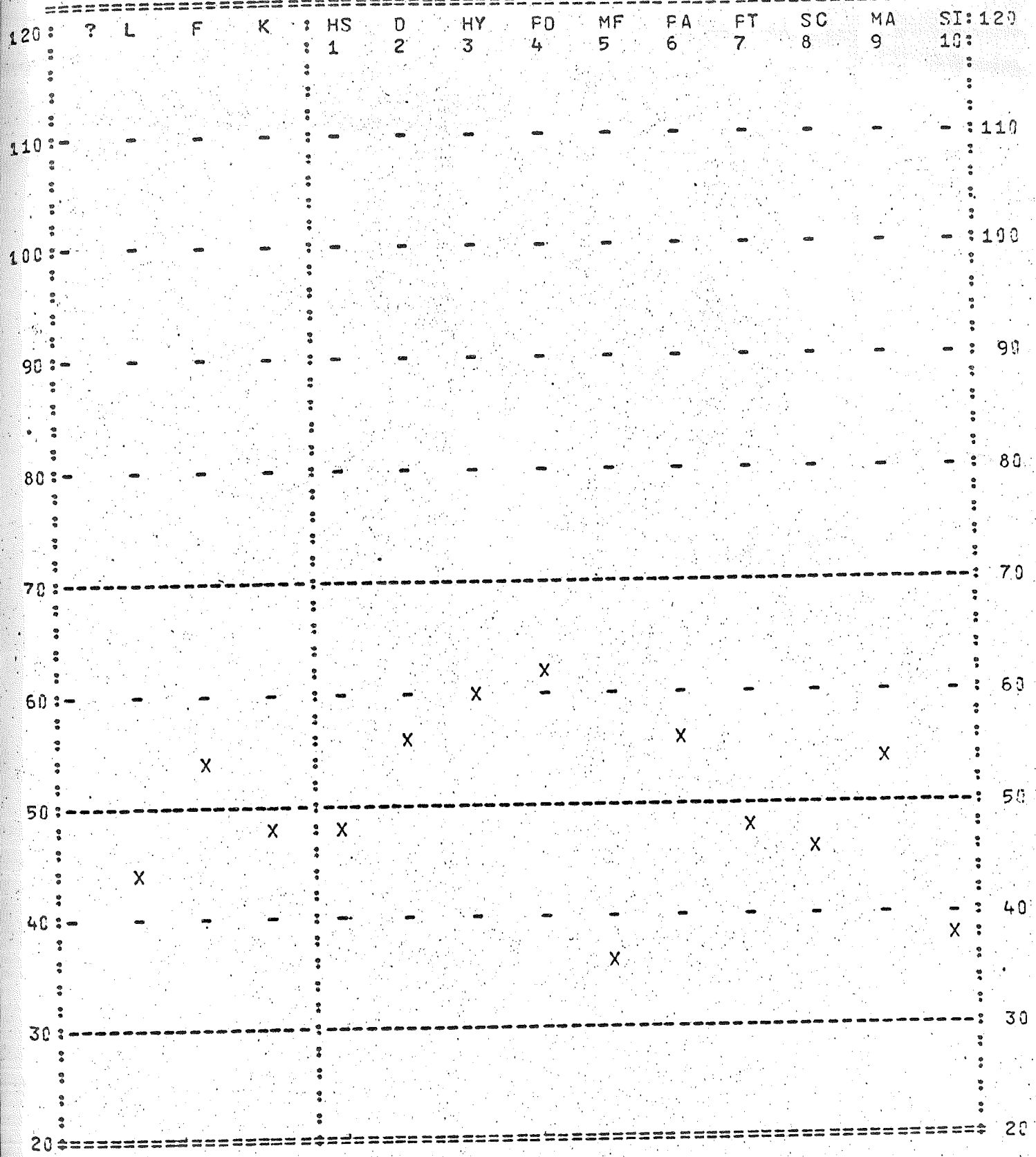
209 I BELIEVE MY SINS ARE UNPARDONABLE. (TRUE)
339 MOST OF THE TIME I WISH I WERE DEAD. (TRUE)

139 SOMETIMES I FEEL AS IF I MUST INJURE EITHER MYSELF OR SOMEONE ELSE. (TRUE)
337 I FEEL ANXIETY ABOUT SOMETHING OR SOMEONE ALMOST ALL THE TIME. (TRUE)

CASE NO: 569819
AGE 22 MALE

MMPI PROFILE

RPSI NO: 17133
JUNE 25,1973



	?	L	F	K	HS	D	HY	PD	MF	PA	PT	SC	MA	SI
R	5	2	5	12	5	19	22	19	14	10	10	8	17	13
K	5	2	5	12	11	19	22	24	14	10	22	20	19	13
T	OK	44	55	49	49	56	60	62	37	56	48	46	55	38

16 P.F. TEST PROFILE (FORM A,B, C.)

Age : . . . . . Date : . . . . . No:

Sten ( )	Second Order Anx.	Neur.	Exv.	Low Score Description	Sten Profile 1 2 3 4 5 6 7 8 9 10	High Score Description
5	-.20			Lax, Insure (Low Integration)		Controlled, Exact (Self-Sentiment Control)
4	-.18	-.30		Emoticnal, Unstable (Low Ego Strength)		Mature, Calm (High Ego Strength)
5	+.30	+.30		Confident, Unshakable (Confidence)		Insecure, Anxious (Timidity)
5	+.38	+.40		Phlegmatic, Composed (Low Ergic Tension)		Tense, Excitable (High Ergic Tension)
5	+.19			Trustful, Adaptable (Inner Relaxation)		Suspecting, Jealous (Protension)
7	-.17	-.12	+.48	Timid, Shy (Threctia)		Adventurous, "Thick-skinned" (Parmia)
5		-.19	+.33	Submissive, Mild (Submissive)		Dominant, Aggressive (Dominance)
5		-.44	+.41	Glum, Silent (Desurgency)		Enthusiastic, Talkative (Surgency)
6			+.17	Aloof, Cold (Schizothymia)		Warm, Sociable (Cyclothymia)
5			-.16	Dependent, Imitative (Group Dependence)		Self-Sufficient, Resourceful (Self-Sufficiency)
6		-.08		Dull, Low Capacity (Low 'g')		Bright, Intelligent (High 'g')
7		-.11		Casual, Undependable (Low Super-ego strength)		Conscientious, Persistent (High Super-ego Strength)
3		-.10		Conservative, Accepting (Conservatism)		Experimenting, Critical (Radicalism)
5		+.25		Tough, Realistic (Harria)		Sensitive, Effeminate (Premsia)
6	3.74^{+}	6.33^{+}	1.26^{-}	Conventional, Practical (Praxernia)		Bohemian, Unconcerned (Alaxia)
6				Simple, Awkward (Naivete)		Sophisticated, Polished (Shrewdness)

GENERAL INTERVIEW

NAME : NUMBER :

ADDRESS : DATE OF INTERVIEW :

SEX :

OCCUPATION :
& SALARY :

or SPOUSE'S OCCUPATION :

or PARENTS' OCCUPATION :

MARITAL STATUS :

COUNTRY OF ORIGIN :

NUMBER OF SIBLINGS :

SOCIAL GROUP (1 - 5)

HISTORY OF PSYCHIATRIC ILLNESS :

HISTORY OF PHYSICAL ILLNESS :

RELATIONSHIP WITH FATHER :

RELATIONSHIP WITH MOTHER :

INTELLIGENCE (16 P.F.) :

LEVEL OF SCHOOLING :

DIABETIC INTERVIEW

AGE OF ONSET OF DIABETES :

CURRENT INSULIN DOSAGE :

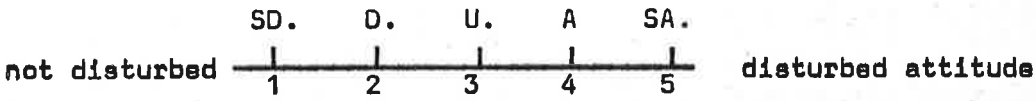
GENERAL PROBLEMS ASSOCIATED WITH DIABETES :

HYPO/HYPER GLYCEMIC EPISODES OTHER THAN HOSPITALISATION :

1. FATHER'S ATTITUDE TO DIABETES :

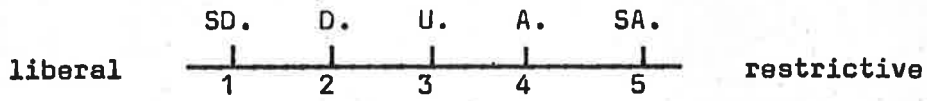
(a) Initial reaction to illness -

Father was disturbed when he found that I was suffering from diabetes.



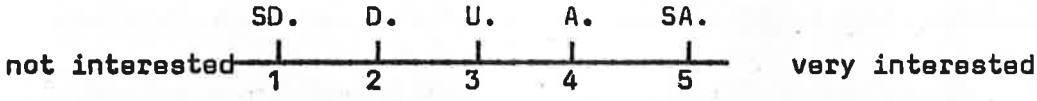
(b) Attitude towards control of diabetes, viz., diet, urinalysis, insulin administration, behaviour -

Father was strict in controlling my diabetes.



(c) Interest in diabetic problems -

Father was interested in the management of the diabetes.

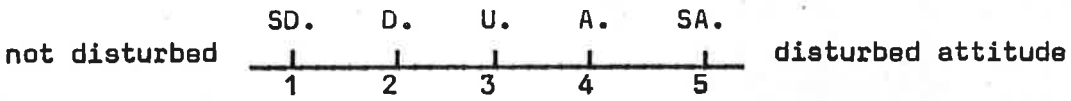


DIABETIC INTERVIEW

2. MOTHER'S ATTITUDE TO DIABETES :

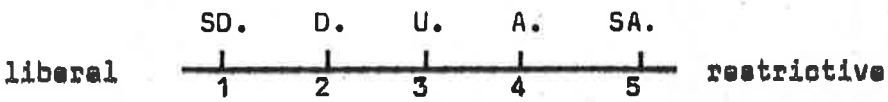
(a) Initial reaction to illness -

Mother was disturbed when she found that I was suffering from diabetes.



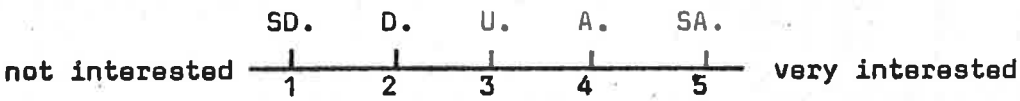
(b) Attitude towards control of diabetes, viz., diet, urinalysis, insulin administration, behaviour -

Mother was strict in controlling my diabetes.



(c) Interest in diabetic problems -

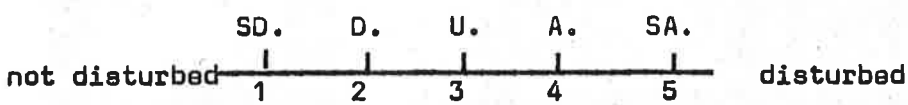
Mother was interested in the management of the diabetes.



3. SUBJECT'S ATTITUDE TOWARDS DIABETES DURING CHILDHOOD (12 years) :

(a) Initial reaction to illness -

You were disturbed at discovering that you were a diabetic.

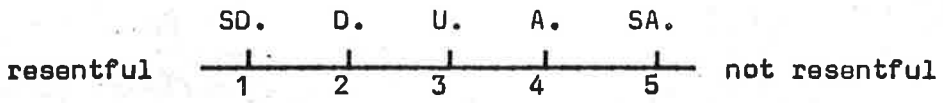


DIABETIC INTERVIEW

3. (cont'd)...

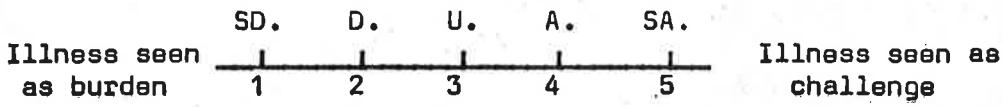
(b) Reaction to restrictions and responsibilities of diabetic state -

You were not resentful of the restrictions and responsibilities that diabetes imposed.



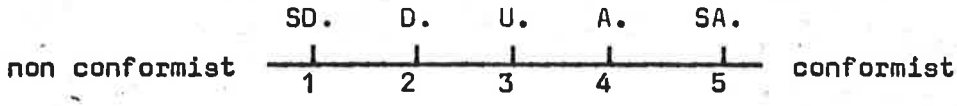
(c) Response to need for social adjustments to diabetic state -

You saw the diabetes more as a challenge than as a burden.



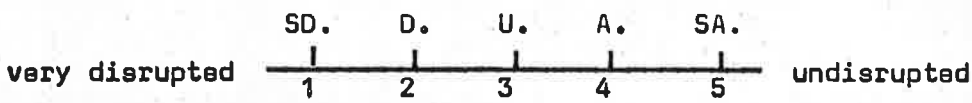
(d) Adherence to regimes, viz., urinalysis, diet, behaviour -

You obeyed the doctor's instructions with regard to diet, testing, etc.



(e) Self-evaluation of effect of diabetes upon patient's social, educational and emotional life -

You did not find that having diabetes disrupted your social, educational or emotional life.



3. (cont'd)...

(f) Self-evaluation of effect of diabetes upon relationships with peers -

You found yourself no different from the others at school and home.

	SD.	D.	U.	A.	SA.	
alienated	1	2	3	4	5	non alienated

(g) Self-assessment re. whether diabetes was ever used consciously to escape difficult situations -

You never consciously used your diabetes to avoid an unpleasant situation or to gain some advantage.

	SD.	D.	U.	A.	SA.	
frequent conscious use	1	2	3	4	5	no conscious use

4. SUBJECT'S ASSESSMENT OF THE RELATIONSHIP WITH TREATING PHYSICIAN DURING CHILDHOOD :

(a) Relationship with doctor -

You got on well with your doctor and found him easy to talk to and understanding.

	SD.	D.	U.	A.	SA.	
cold & remote	1	2	3	4	5	warm and approachable

(b) Doctor's attitude to control, diet, urinalysis, behaviour -

Your doctor was strict with regard to control, diet, testing etc.

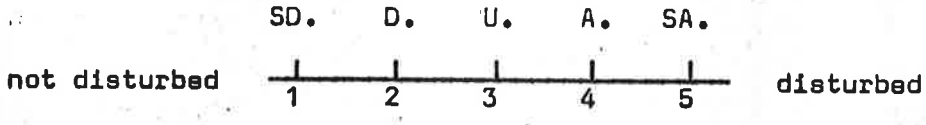
	SD.	D.	U.	A.	SA.	
very liberal	1	2	3	4	5	very restrictive

DIABETIC INTERVIEW

5. SUBJECT'S CURRENT ATTITUDE TOWARDS DIABETES :

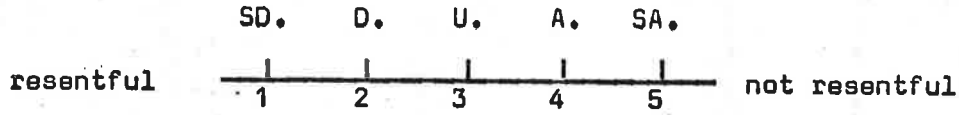
(a) Current reaction to illness -

You are disturbed now at being a diabetic.



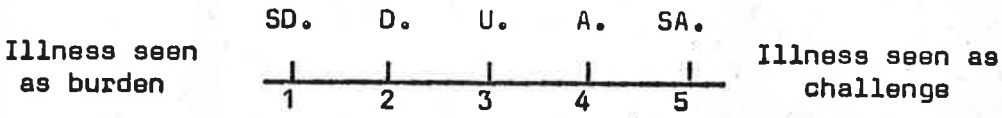
(b) Reaction to restrictions and responsibilities of diabetic state -

You are not resentful of the restrictions and responsibilities that diabetes imposes on you.



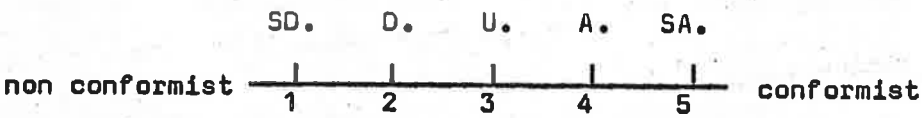
(c) Response to need for social adjustments to diabetic state -

You see the diabetes more as a challenge than a burden.



(d) Adherence to regimes, viz., urinalysis, diet, behaviour -

You obey the doctor's instructions with regard to testing, diet, etc.



DIABETIC INTERVIEW

5. (cont'd)...

(e) Self-evaluation of effect of diabetes upon patient's social, educational and emotional life -

You do not find that having diabetes disrupts your social, educational or emotional life.

	SD.	D.	U.	A.	SA.	
very disrupted	1	2	3	4	5	undisrupted

(f) Self-evaluation of effect of diabetes upon relationships with peers -

You find yourself no different from others at work or home.

	SD.	D.	U.	A.	SA.	
alienated	1	2	3	4	5	non alienated

(g) Self-assessment re. whether diabetes was ever used consciously to escape difficult situations -

You never consciously use your diabetes to avoid an unpleasant situation or to gain some advantage.

	SD.	D.	U.	A.	SA.	
frequent conscious use	1	2	3	4	5	no conscious use

6. SUBJECT'S ASSESSMENT OF CURRENT RELATIONSHIP WITH TREATING PHYSICIAN :

(a) Relationship with doctor -

You get on well with your doctor and find him easy to talk with and understanding.

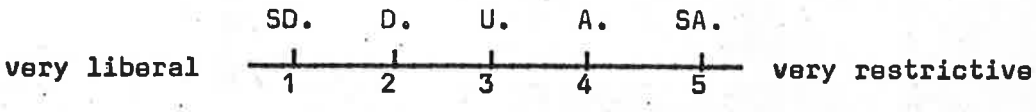
	SD.	D.	U.	A.	SA.	
cold and remote	1	2	3	4	5	warm and approachable

DIABETIC INTERVIEW

6. (cont'd)...

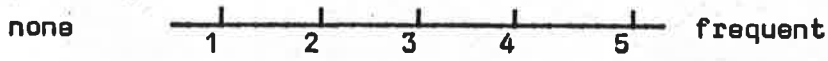
(b) Doctor's attitude to control, diet, urinalysis, behaviour -

Your doctor is strict with regard to control, diet, testing, etc.

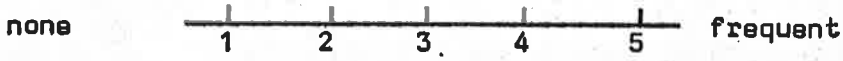


7. FREQUENCY OF ADMISSION TO HOSPITAL :

Childhood (16 years) -



Recently (last two years) -



SCALE FOR ASSESSMENT

PARENTAL INITIAL REACTION TO ILLNESS :

1 = not disturbed at all
2 = very occasionally appeared disturbed
3 = even
4 = more than occasionally appeared disturbed
5 = very disturbed.

PARENTAL ATTITUDE TOWARDS CONTROL OF DIABETES :

1 = very liberal
2 = liberal in many things
3 = even
4 = restrictive in many things
5 = very restrictive.

PARENTAL INTEREST IN DIABETIC PROBLEMS :

1 = no interest at all
2 = occasional interest
3 = even
4 = frequently showed interest
5 = very interested.

SUBJECT'S ATTITUDE TOWARDS DIABETES :

Reaction to illness -

1 = not disturbed at all
2 = very occasionally disturbed
3 = even.
4 = more than occasionally disturbed
5 = very disturbed.

SUBJECT'S ATTITUDE TOWARDS DIABETES (cont'd)...

Reaction to restrictions and responsibilities -

1 = resentful and overtly angry
2 = frequently resentful
3 = even
4 = only occasionally resentful
5 = not resentful.

Response to need for social adjustment -

1 = illness seen as burden
2 = illness often seen as burden
3 = even
4 = illness occasionally seen as challenge
5 = illness definitely seen as challenge.

Adherence to regimes -

1 = never conformed
2 = occasionally conformed
3 = even
4 = usually conformed
5 = always conformed.

Effect of diabetes upon social, educational, and emotional life -

1 = Life severely disrupted
2 = Life somewhat disrupted
3 = Even
4 = Life generally undisrupted
5 = Undisrupted.

Effect of diabetes upon relationships with peers -

1 = Very conscious of differences (alienated)
2 = Very conscious of certain differences

SUBJECT'S ATTITUDE TOWARDS DIABETES (cont'd)...

Effect of diabetes upon relationships with peers .... cont'd.

3 = Even

4 = Very occasionally conscious of difference

5 = No difference (non-alienated).

Conscious use of diabetes -

1 = Conscious use greater than once/year

2 = Conscious use once a year

3 = Conscious use more than once or twice ever

4 = Conscious use once

5 = No conscious use.

RELATIONSHIP WITH PHYSICIAN :

Warmth -

1 = Physician cold and remote

2 = Physician usually cold and remote

3 = Even

4 = Physician usually warm and approachable

5 = Physician always warm and approachable.

Physician's attitude to control, diet, urinalysis, etc. -

1 = Very liberal

2 = Liberal in many things

3 = Even

4 = Restrictive in many things

5 = Very restrictive.

APPENDIX

ASSESSMENT OF SOCIO-ECONOMIC STATUS

In this study, assessment of socio-economic status has been made on the scale developed by Mai (1970), who has pointed out that in Australia, there is at present no uniformly accepted system for the classification of socio-economic status. The classification used by the Commonwealth Bureau of Census and Statistics, has 11 categories, is only partly based on occupational prestige, and is not suitable for research purposes.

Krupinski, Stoller & Baikie (1966), have used the following five-tier system :-

I Professional, Semi-professional, and Managerial
II Own business, shop or farm
III Clerical and Sales
IV Skilled
V Semi-skilled and Unskilled

and Mai has extended this system to a hierarchical ordering of occupational groups illustrated in the following pages :-

CATEGORY I

UPPER PROFESSIONAL

Architects, engineers, and surveyors
Natural scientists and university teachers
Medical practitioners and dentists
Pharmacists
Clergymen and religious workers
Judges, magistrates, barristers, and solicitors
Accountants, auditors, and economists
Ship and aircraft officers.

CATEGORY I (cont'd)...

MANAGERIAL

Public service administrators and overseas officials
Inspectors and local government inspectors
Managers (manufacturing)
Managers (building and construction)
Managers (transport, storage and communication)
Managers (finance)
Managers (commerce)
Managers (personal services)
Managers (rural services)
Managers (business services and other)

GRAZIERS, AND WHEAT AND SHEEP FARMERS

Wheat and sheep farmers
Graziers

LOWER PROFESSIONAL

Nurses and professional medical workers
Teachers
Writers, creative artists and entertainers
Draftsmen and technicians
Other professional workers
Wool classers

CATEGORY II

OTHER FARMERS

Fruit, vegetable and sugar cane growers, poultry farmers and other primary producers
Mixed farmers and farmers
Dairy farmers

SELF-EMPLOYED SHOP PROPRIETORS

Shop proprietors (self-employed)

CATEGORY III

CLERICAL SALES AND RELATED WORKERS

Bookkeepers and cashiers
Clerks, typists and office machine operators
Public servants
Insurance and real estate salesmen
Commercial travellers
Stationmasters, postmasters and transport inspectors
Postal officers, and telephone and telecommunication workers

CATEGORY IV

MEMBERS OF ARMED SERVICES AND POLICE FORCE

Policemen
Members of Armed Services

CRAFTSMEN AND FOREMEN

Tailors, cutters and related tradesmen
Blacksmiths and moulders
Precision instrument makers, watchmakers and jewellers
Fitters and turners, toolsetters and toolmakers
Mechanics and vehicle body builders
Plumbers, welders and boilermakers
Electricians and radio and T.V. mechanics
Carpenters and cabinetmakers
Painters and decorators
Bricklayers, plasterers and related tradesmen
Building and construction foremen
Printing machinists, compositors and related tradesmen
Bakers, confectioners and brewers

CATEGORY V

SHOP ASSISTANTS

Shop Assistants

OPERATIVES AND PROCESS WORKERS

Textile and clothing factory workers
Leather and shoe factory workers

CATEGORY V (cont'd)...

OPERATIVES AND PROCESS WORKERS .. cont'd.

Metal workers and iron workers
Sheetmetal workers
Linesmen and electrical and metal process workers
Wood machinists and box and basket makers
Sawmill and wood factory workers
Glass factory and pottery workers
Food and beverage production workers
Chemical and paper production workers
Rubber and plastic production workers
Miscellaneous craftsmen and process workers
Lifting equipment and stationary engine operators
Earthmoving and construction equipment operators
Railway and tramway repairmen and oilers and greasers

DRIVERS

Drivers and workers in railway, road and sea transport

PERSONAL, DOMESTIC AND OTHER SERVICE WORKERS

Service station attendants and salesmen
Gardeners and groundkeepers
Fire brigade men and protective service workers
Cleaners, caretakers, domestic service workers, maids and housekeepers
Cooks and chefs
Catering workers and waiters
Bartenders
Hairdressers and beauticians
Launderers and dry cleaners
Athletes and sportsmen
Photographers, undertakers and service workers
Hospital and medical attendants

MINERS

Non-metalliferous miners and quarrymen
Coal miners
Metalliferous miners and mineral treaters

FARM AND RURAL WORKERS

Farm workers (exc. grazing and dairy farm)
Grazing station hands
Shearers
Dairy farm workers
Hunters, trappers and fishermen
Timber getters and forestry workers

CATEGORY V (cont'd)...

LABOURERS

Labourers and tradesmen's assistants in electrical and metal manufacturing
Building and construction labourers
Packers and labourers in glass, ceramics, chemical and manufacturing
Waterside workers
Storemen and packers and transport labourers
Labourers in textile and clothing factories
Labourers in food and drink processing factories
Labourers in electricity, gas and water production supply
Labourers

RAW SCORES .. NON-DIABETIC SUBJECTS.

Subject	Age	Sex	Social Grade	Married/Single	Level of Educ.	Neurot(N)16PF	Neurot(N)MMPI	Neurot,Def,Haar	Psychpath.MMPI	Famil.Discord	16 Personality Factors															
											Q3	C	O	Q4	L	H	E	F	A	Q2	B	G	Q1	I	M	N
569778	22	F	5	M	3	687	175	338	-	2	6	7	6	7	5	2	1	3	4	10	6	8	6	7	5	5
569786	33	M	5	M	2	118	140	381	-	1	8	9	5	4	3	6	6	7	5	5	9	4	7	5	4	6
569782	21	F	5	M	3	10	236	362	P	8	8	6	10	8	6	3	4	1	7	8	6	4	5	9	7	9
569772	29	M	5	M	1	6.2	180	335	-	3	6	3	8	5	6	5	4	5	7	9	7	6	6	7	3	6
569826	19	F	1	S	4	294	160	291	-	3	4	8	7	5	5	2	5	7	5	5	7	6	6	4	3	3
569796	19	M	1	S	5	426	164	329	P	3	7	3	2	5	1	7	4	5	4	6	6	4	8	7	6	4
569792	22	F	2	S	3	354	154	333	-	3	7	7	5	5	5	5	6	5	7	6	5	5	3	4	5	4
569830	19	M	5	S	1	719	225	353	P	2	9	4	6	6	4	4	2	3	4	6	6	3	4	5	3	4
569814	19	M	5	S	4	773	151	368	-	4	5	4	10	7	5	3	4	6	6	6	5	4	6	8	5	3
569812	28	M	4	S	5	270	155	367	-	1	9	7	6	3	1	5	5	5	6	5	8	4	7	4	7	3
569824	25	F	3	M	3	42	143	316	-	1	4	8	6	4	9	5	3	5	3	7	2	7	3	6	1	9
569788	21	F	3	S	4	177	148	326	-	2	10	2	1	1	2	6	4	6	4	6	10	9	5	7	5	9
569800	21	M	1	S	4	296	170	332	-	1	7	8	2	3	1	4	4	4	6	7	6	4	6	7	7	8
569794	21	F	5	M	4	318	133	281	-	0	9	7	6	3	2	6	7	3	5	7	5	8	4	4	7	6
569822	20	M	3	S	5	239	139	313	-	3	4	3	4	7	8	7	10	8	6	5	5	3	7	3	6	5
569802	20	F	4	M	4	606	143	358	-	3	3	5	6	7	4	2	5	4	8	7	5	7	5	5	3	5
569774	24	M	5	M	3	312	162	347	-	3	5	7	3	3	6	6	5	2	1	9	5	6	6	4	5	6
569810	25	M	5	S	3	907	261	430	P	3	3	2	9	7	6	1	1	3	6	4	5	4	6	10	8	4
569808	23	F	3	S	3	436	161	315	-	0	5	5	6	4	5	6	7	6	5	7	6	5	4	9	6	5
569818	18	F	3	S	3	534	137	343	-	6	4	5	7	6	5	5	7	3	5	6	6	6	6	4	2	5
569790	32	M	2	M	1	338	225	380	P	2	3	7	6	4	1	7	5	5	8	5	6	8	4	6	4	7
569820	24	F	3	M	3	798	165	342	P	3	6	4	10	8	6	3	5	5	5	8	4	7	5	7	6	5
569780	23	M	4	M	4	467	125	320	P	3	5	4	6	3	3	6	7	2	4	7	8	4	7	5	6	3
569798	22	F	3	S	2	186	147	278	-	4	6	9	4	3	2	7	5	4	7	6	7	6	4	4	6	7
569784	19	F	3	S	4	291	274	302	P	7	7	6	3	3	5	6	5	4	5	5	5	4	7	5	6	6
569806	18	F	3	S	5	702	157	300	P	4	3	2	5	6	8	3	4	5	4	7	4	2	5	7	8	4
569816	21	M	4	M	3	204	131	325	-	6	4	5	4	5	8	3	8	7	4	6	8	4	7	3	6	6
569828	29	M	1	S	T	953	225	340	P	9	3	1	8	7	6	1	1	3	6	8	8	3	6	10	8	4
569804	22	M	4	S	4	754	197	368	-	9	7	3	6	7	10	4	6	4	5	10	6	3	8	10	7	3
569776	30	F	4	M	3	743	207	387	P	2	5	5	9	8	7	1	3	3	2	8	8	5	7	2	6	10

APPENDIX

RAW SCORES - DIABETIC SUBJECTS

Subject	16 Personality Factors															
	Q3	C.	O.	Q4	L.	H.	E.	F.	A.	Q2	B.	G.	Q1	I.	M.	N.
569821	14	8	15	16	10	8	6	10	10	19	3	16	6	12	12	10
569805	9	8	10	16	7	7	11	15	11	6	7	15	9	11	11	14
569775	9	15	12	15	12	15	15	13	12	10	8	12	9	8	14	8
569797	4	11	15	12	9	11	6	14	14	11	5	8	9	11	9	7
569785	11	15	9	8	11	15	12	9	7	11	12	12	12	11	13	8
569771	14	15	9	9	8	3	4	9	13	7	8	11	6	12	14	9
569809	15	13	11	11	4	9	6	14	10	16	5	7	11	9	9	12
569825	6	16	14	14	8	8	11	18	14	15	5	13	12	14	15	9
569781	7	14	17	18	12	4	11	16	8	17	10	7	10	15	20	11
569813	11	11	19	19	9	5	6	2	12	14	7	15	7	12	14	13
569793	12	19	15	6	3	7	6	9	12	13	8	10	9	10	14	9
569787	8	18	10	11	13	17	17	15	10	8	8	16	7	12	13	11
569829	13	20	8	8	6	18	9	18	11	6	9	12	5	8	7	8
569831	11	15	7	7	8	10	13	9	9	11	8	12	9	9	10	10
569815	12	14	11	10	10	16	7	19	11	16	6	9	10	8	11	10
569791	11	14	9	10	8	17	13	13	11	10	6	17	7	8	12	12
569823	17	17	9	7	7	14	7	16	14	11	4	12	7	9	10	7
569779	9	16	11	16	11	7	10	18	15	9	8	15	13	12	12	15
569795	15	17	10	8	1	14	16	14	14	9	9	13	10	14	19	14
569817	10	17	10	13	7	12	5	18	11	13	10	14	10	11	14	11
569777	14	14	8	5	9	14	12	17	12	9	7	16	11	12	10	9
569803	9	17	10	8	5	14	16	13	11	13	9	11	8	11	8	14
569799	11	15	12	11	9	11	14	17	14	10	8	11	10	8	10	13
569819	12	18	8	7	9	17	17	20	11	11	8	12	13	7	9	10
569789	16	21	11	10	8	15	15	14	10	16	5	17	11	5	8	9
569783	7	22	10	4	6	4	11	12	4	10	8	15	9	5	10	10
569807	8	13	7	7	10	14	14	16	15	15	5	14	10	12	11	15
569827	12	17	7	7	6	13	15	17	19	13	6	9	13	8	7	9
569773	11	17	14	11	11	17	7	21	15	5	7	11	8	10	14	10
569801	13	19	7	2	8	22	17	20	10	10	7	11	10	4	11	14

RAW SCORES - DIABETIC SUBJECTS

Subject	Neuroticism (NT) 16 PF	Neuroticism (NR) M.M.P.I.	Neurotic Def. (Haan)	Psychopathology (M.M.P.I.)	Father			Mother			Childhood Attitudes							Child/ Doctor/ Patient/ Relation-ship.		
					Disturbed	Control	Interest	Disturbed	Control	Interest	Disturbed	Resentful	Burdened	Conformity	Disruption	Alienation	Consc. Use	Warmth	Control	Constancy
569821	8.02	141	331	P	3	3	3	5	4	3	5	1	1	5	1	1	5	3	5	2
569805	5.32	146	348	-	4	3	3	4	5	5	4	1	1	3	2	2	5	5	2	5
569775	5.83	181	332	-	2	3	4	5	4	5	4	2	2	4	1	1	4	3	3	5
569797	7.25	161	310	-	5	3	3	5	5	5	5	4	1	5	1	1	3	5	5	1
569785	4.71	151	327	-	2	3	2	4	4	4	4	1	2	2	4	2	2	5	2	1
569771	6.71	181	350	P	4	2	4	4	4	4	4	2	2	4	2	2	1	1	5	4
569809	5.19	167	343	-	2	3	4	2	1	5	4	2	1	2	1	1	5	2	3	2
569825	4.77	149	304	-	4	5	4	4	5	5	5	1	2	5	1	1	5	2	2	1
569781	6.64	197	343	P	4	4	4	4	5	4	5	1	1	5	1	1	2	1	5	5
569813	8.93	263	337	P	1	5	3	5	5	5	1	5	1	5	5	5	5	3	5	1
569793	4.76	141	289	-	4	3	1	4	3	4	4	1	2	4	1	1	3	3	5	5
569787	4.61	167	346	-	4	3	4	5	3	3	4	2	1	4	2	2	1	4	2	1
569829	3.26	142	315	-	5	4	5	5	4	5	2	4	1	5	1	5	5	5	1	2
569831	4.36	138	325	-	5	3	5	5	3	3	4	4	4	4	4	1	5	1	5	1
569815	4.45	142	319	-	4	5	4	5	5	5	5	2	2	5	2	1	5	5	4	2
569791	4.34	182	333	-	3	3	1	3	2	5	2	4	2	5	4	4	1	2	5	1
569823	3.96	142	301	-	5	3	5	5	5	5	4	2	2	4	4	3	5	3	5	1
569779	3.94	166	310	-	5	3	4	2	5	4	4	2	2	5	2	2	5	2	5	3
569795	3.62	160	332	-	5	3	1	4	4	5	4	2	2	4	2	2	5	5	2	2
569817	3.32	162	331	-	5	3	3	5	5	5	5	2	1	5	4	2	5	1	3	2
569777	3.02	165	249	-	2	4	5	5	5	5	4	2	1	5	1	2	5	5	2	2
569803	2.83	160	318	-	5	3	1	4	5	5	4	1	2	4	1	4	5	4	4	3
569799	2.78	130	272	-	1	3	4	4	3	5	5	1	1	1	1	1	2	5	5	4
569819	2.76	165	360	-	1	1	5	4	1	5	4	2	5	4	1	4	3	4	3	1
569789	2.68	158	360	-	2	3	4	2	3	4	4	2	3	2	2	4	5	5	1	1
569783	2.47	166	340	-	4	3	4	5	4	5	5	2	1	4	2	2	5	3	4	2
569807	2.42	169	315	-	4	3	4	5	5	5	5	1	1	5	3	4	5	4	3	3
569827	2.35	134	301	-	4	5	5	2	3	4	4	1	1	5	2	2	3	5	4	1
569773	2.31	139	329	-	2	3	4	4	4	4	4	2	2	5	2	2	5	3	3	5
569801	0.79	174	382	-	4	3	5	4	5	5	5	1	2	5	2	2	5	4	5	2

RAW SCORES - DIABETIC SUBJECTS

Subject	Admission to Hospital as Child	Current Insulin Rx.	Adult Attitudes							Adult/Dr./Pat. Relat.			Admission to Hosp. as Adult	Familial Discord	Age	Sex	Social Grade	Married/Single	Age when diagnosed	Level of Education
			Disturbed	Resentful	Burdened	Conformity	Disruption	Alienation	Cons. Use	Warmth	Control	Constancy								
569821	5	2x	1	5	5	1	5	1	5	1	4	1	3	9	25	F	3	S	9	4
569805	1	50	2	4	5	1	5	5	5	1	4	1	2	6	29	F	1	S	11	T
569775	3	2x	2	4	5	1	4	2	5	5	1	1	3	5	24	M	5	S	4	3
569797	3	60	4	2	1	5	2	1	3	5	2	1	2	3	28	M	5	S	7	P
569785	1	75	2	4	5	2	2	5	2	5	3	1	2	2	32	M	3	M	11	P
569771	1	70	2	4	1	2	5	5	5	3	1	1	1	1	21	M	3	S	6	4
569809	2	10	1	5	5	1	4	5	5	4	1	3	1	2	21	F	5	S	11	1
569825	3	70	2	4	2	2	5	5	1	1	4	1	3	7	18	F	3	S	10	4
569781	5	168	4	2	1	2	1	1	3	2	5	1	5	6	22	F	1	S	11	T
569813	2	60	4	2	1	5	2	2	5	2	5	4	4	1	18	F	3	S	10	4
569793	2	76	2	4	5	1	5	3	5	4	5	1	1	1	21	F	5	M	10	2
569787	2	76	2	4	5	1	4	5	5	5	1	1	2	2	32	M	3	M	11	3
569829	1	45	1	5	4	1	3	5	5	5	1	1	1	0	29	F	3	M	9	3
569831	3	56	1	5	3	1	5	5	5	5	3	1	1	2	30	M	3	M	6	5
569815	1	40	2	3	3	1	4	3	5	5	4	2	2	6	21	M	5	S	8	1
569791	2	2x	1	1	3	1	1	3	4	3	5	3	4	4	29	M	5	M	5	2
569823	1	60	1	5	5	2	5	5	5	3	1	1	1	1	20	M	4	S	11	4
569779	4	2x	4	4	2	1	5	5	2	1	5	1	1	7	22	F	3	S	4	2
569795	2	80	2	5	5	1	3	2	2	4	2	2	2	2	23	F	2	S	5	5
569817	3	54	1	5	5	2	4	4	4	5	2	1	1	2	19	F	2	S	11	4
569777	3	96	1	5	3	2	4	5	5	5	1	1	1	1	31	M	1	M	10	T
569803	1	64	1	5	3	1	5	5	5	4	2	2	1	1	21	F	5	M	10	3
569799	3	34	2	4	5	2	4	4	5	5	2	1	1	2	22	F	1	S	11	T
569819	2	40	1	5	5	1	1	5	5	4	4	1	3	1	22	M	2	S	5	3
569789	2	60	1	5	5	1	5	5	5	4	3	1	1	1	25	M	5	S	6	1
569783	3	90	1	5	4	1	5	5	5	3	1	3	1	2	19	M	4	S	4	T
569807	2	40	1	5	3	4	5	5	5	4	2	2	1	3	18	F	2	S	8	3
569827	3	40	1	5	5	1	5	5	5	5	4	1	1	6	21	M	5	M	4	2
569773	3	2x	2	5	4	1	5	5	5	1	5	2	1	4	18	F	5	S	9	4
569801	3	2x	2	5	3	5	2	5	5	4	5	2	1	2	24	M	3	S	4	3

EDUCATION .. P = Primary Level
1)
2)
3) = year of High School
4)
5)
T = Tertiary Level

APPENDIX

VARIABLES.

1. Patient number
2. Age
3. Familial discord
4. Sex
5. Age of onset of diabetes
6. Neuroticism (NT)
7. Neuroticism (NR)
8. Neurotic defences
9. Hospitalisation
10. Intelligence
11. Father's reaction)
12. Mother's reaction)
13. Social adjustment)
14. Adherence to regime) Childhood
15. Conscious use of diabetes)
16. Relationship to doctor)
17. Doctor's attitude to control)
18. Social adjustment)
19. Adherence to regime)
20. Conscious use of diabetes) Adult life
21. Relationship to doctor)
22. Doctor's attitude to control)
23. Father's attitude to control
24. Mother's attitude to control

LIST OF VARIABLES

	VAR002	VAR003	VAR004	VAR005	VAR006	VAR007	VAR008	VAR009	VAR010	VAR011	VAR012	VAR013
VAR003	-.10											
VAR004	-.40	.20										
VAR005	.04	-.10	.46									
VAR006	.08	.28	.14	.27								
VAR007	-.17	-.16	.03	-.06	.46							
VAR008	-.02	-.01	-.15	-.30	.06	.35						
VAR009	.05	.40	.06	.06	.60	.55	.25					
VAR010	.20	-.32	.07	.08	-.14	.12	.08	.02				
VAR011	.01	.10	.07	-.10	-.09	-.27	-.03	-.27	.05			
VAR012	.10	-.16	-.07	.26	.22	.08	-.14	.12	.09	.15		
VAR013	.04	-.19	-.36	-.40	-.23	-.13	.29	.01	.09	-.13	-.14	
VAR014	-.18	.31	.03	-.24	.09	.23	-.05	.25	-.16	.42	.32	-.12
VAR015	-.31	.07	.32	-.02	-.21	-.09	-.04	-.31	-.29	.17	.12	
VAR016	.32	-.15	-.17	-.00	-.31	-.29	-.20	-.22	-.06	-.17	.03	-.12
VAR017	-.28	.17	-.05	-.17	.30	.19	-.06	.15	-.16	.13	.04	-.01
VAR018	.14	-.10	-.02	.10	-.38	-.53	.01	-.31	.02	-.20	-.11	.09
VAR019	-.13	-.18	-.03	.04	.18	.50	.06	.11	-.15	-.03	.29	-.25
VAR020	-.03	-.33	-.20	.01	-.16	-.03	.09	-.30	-.24	-.25	.19	-.00
VAR021	.34	-.53	-.46	-.07	-.31	-.19	-.19	-.34	.28	.02	.18	.07
VAR022	-.17	.47	.22	-.12	.09	.14	.19	.42	-.05	-.13	-.32	.22
VAR023	-.09	.21	.25	.17	.28	.37	-.14	.58	.04	.03	.18	-.06
VAR024	-.15	.22	.20	.18	.12	.15	-.19	-.01	.05	.44	.44	-.41

	VAR014	VAR015	VAR016	VAR017	VAR018	VAR019	VAR020	VAR021	VAR022	VAR023
VAR015	.19									
VAR016	-.24	.08								
VAR017	.22	-.22	-.43							
VAR018	-.50	.08	.34	-.42						
VAR019	.25	.04	.08	.30	-.54					
VAR020	-.10	.08	.13	.11	.28	-.08				
VAR021	-.23	-.21	.38	-.18	.28	.04	.24			
VAR022	.30	-.01	-.14	.34	-.23	.09	-.21	-.52		
VAR023	.38	-.03	-.35	.29	-.41	.18	-.30	-.28	.36	
VAR024	.45	.38	.05	.08	-.46	.45	-.26	-.24	.04	.12

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