THE ELECTROENCEPHALOGRAM IN MANIC-DEPRESSIVE PSYCHOSIS:

Relationship to psychological features and implications for a toxic-organic pathogenesis.

by

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I N T R O D U C T I O N.

This investigation was undertaken with a view in the first place to testing a claim of Pauline Davis as to the correlation, in manic-depressive psychosis, between certain psychological and electroencephalographic features, notably alpha frequency and irregular fast low voltage records which she termed "choppy".

The scope of our undertaking is, however, wider inasmuch as we shall be testing correlations with rhythms other than the alpha, and not only in respect of frequency but also of amplitude and per cent. time. Moreover the notion of "choppy" records will be subjected to critical analysis and replaced by a detailed characterisation of irregular or disorganised records.

Furthermore an attempt will be made to relate the electroencephalographic findings to the neuropathology described by certain Canadian and Italian workers, and also to the operation of a chemical or toxic factor probably of endocrine type, which may be identifiable with cortisone.

In conclusion we shall consider whether the data from psychological, neuropathological, endocrinological, biochemical and electroencephalographic fields in the realm of manic depressive psychosis are rendered ideologically more coherent and meaningful by the extension of an hypothesis evolved by Kallmann for schizophrenia and elaborated in our own previous work[1, 2]. According to this view schizophrenia is explained as being based on genetic predisposing and resistance

mechanisms....

mechanisms, the latter having its anatomical substratum in the reticulo-endothelial system, and being mirrored in the physical constitution in the Kretschmerian sense. The details of this pathogenetic theory are schematically as follows: a noxa probably of endocrine type gets past the inadequate resistance of an hereditarily weak reticulo-endothelial system (which is part and parcel of a certain constitution, the asthenic) and attacks the brain cells inflicting selective damage on the third to fifth cortical layers, a histological finding described by Nissl, Alzheimer, Josephy and others, as well as the injury to oligodendroglia found by Canadian and Italian workers already referred to.

In manic-depressive psychosis there is a firm foundation of genetic investigation by Kallmann, Rosanoff, Luxenberger, Humm and others to demonstrate an heredito-constitutional basis of a specific but different kind from that at work in schizophrenia. On the neuropathological side the evidence is that there is oligodendroglia damage as in schizophrenia but without the cortical degeneration characteristic of that condition. Moreover the recent extensive work on ACTH and cortisone has brought us as near, if not nearer to the identification of the hypothetical noxa than in schizophrenia. With these findings in mind, the following ideologically analogous hypothesis to that already enunciated for schizophrenia suggests itself. A similar endocrine noxa is at work in an organism of different physical and psychical constitution. The higher powers of resistance inherent in this different physical con-

stitution...

stitution means that although the cortical cells are attacked they do not suffer the permanent structural damage seen in schizophrenia but merely intermittent physico-chemical disturbance, which is associated on the clinical side with the self-limiting psychotic phases characteristic of the condition. The involvement of oligodendroglia provides objective evidence compatible with an assault on the brain by a chemical noxa. The difference in psychological symptomatology between manic-depressive psychosis and schizophrenia is explained on this theory in terms of two basically different psychological constitutions (characterised by cyclothymia and schizothymia) which manifest themselves in exaggerated form as a result of the influence on the brain of the chemical attack.

REFERENCE:-

1. Hurst, Lewis A. Electroencephalographic Support for the Heredito-Constitutional Organic View of Schizophrenia. M.D. Thesis, University of Pretoria, 1950.

2. Ibid : Electroencephalographic Support for a Genetically Oriented Concept of Schizophrenia. J. Nerv. Ment. Dis. 115, 95. Feb. 1952.

C H A P T E R I.

SURVEY OF RELEVANT E.E.G. LITERATURE.

It is from the work of Pauline Davis that the present work derives its inspiration. In a paper[1] written by her in conjunction with Hallowell Davis on "The Electroencephalograms of Psychotic Patients" in 1939 the general conclusion was drawn that in the mental hospital cases which included schizophrenics and manic-depressives there was a much higher proportion of low and a much lower proportion of high alpha indexes (i.e. per cent. time alpha) than in a normal control group. No specific conclusions as regards manic-depressives or schizophrenics were drawn.

In her 1940 article[2] on the "Evaluation of the Electroencephalograms of Schizophrenic Patients" consideration is given to a type of record which she terms "choppy" - a sort of record which also has relevance in the sphere of manic-depressive psychosis. The details regarding this type of record appearing in this paper will be considered a little further on in conjunction with those of a later paper.

In her 1941 study[3] on the "Electroencephalograms of Manic-depressive Patients" she deals specifically with the question of alpha frequency in relation to dominant phase and change of phase in the psychosis, and underlying personality types. Her material comprised 81 manic-depressive patients of whom 52 were diagnosed as manic-depressive depressed (MDD), 22 as manic-depressive manic (MDM) and 7 as manic-depressive mixed (MD mixed). None of the cases recorded had had any form of shock treatment.

Before...

Before her conclusions are enunciated it is necessary to record her classification of e.e.g. patterns which she recapitulates in the article under consideration from a previous one[4]:-

"A" type = dominated by alpha rhythm of approximately 10 c/s frequency.

"B" type = notably lacking in alpha rhythm; predominant fast rhythms.

"MF" type = alpha rhythm with faster rhythms.

"MS" type = alpha rhythm with slower rhythms.

"M" type = mixed frequencies covering a wide range of slow, alpha, and fast rhythms diffusely present throughout, none becoming dominant.

Davis summarises her findings as follows:-

"Findings reveal that there is very little change in the EEGs when patients diagnosed as MDD or MDM shift from one phase to another except when the level of consciousness is altered.

Those patients whose EEGs show erratic slow wave disturbances are those whose behaviour is unpredictable, regardless of diagnosis.

The majority of the MDD group have A or MS patterns with alpha frequencies of 10 cycles or slower. The MDM majority of the MDM group have MF patterns with alpha frequencies 10 cycles or faster.

Previous studies show a correlation between passive, dependent types of individuals and A patterns, and between aggressive, active, independent individuals and MF or B patterns.

It is the author's belief that if a person with an A pattern should develop MD psychosis he will be more apt to be diagnosed as MDD. If he has an MF or B pattern composed of fast frequencies he will be more apt to be diagnosed as MDM or as "agitated depression".

The EEGs have not yet yielded data concerning the factors responsible for the shifts in the manic-depressive phases when the level of consciousness is still unimpaired."

In elaboration of her conclusions as to personality types one may quote the following passage from her article:-

"Enquiry...

"Enquiry was then made into the histories of this group of patients as given in the anamneses, in order to discover how the personalities and behavior of these patients were characterised by the people who knew them before they became psychotic. Even though the characterizations in the histories showed overlap, there is a definite indication that the MDD group of patients, if one excludes those given the diagnosis of "agitated depression", appear to be different temperamentally from the MDM group. The MDD as a group appear fundamentally to be the passive, dependent type of individual, whereas the MDM group are more likely to be described as active, energetic and independent. Those given the diagnosis of "agitated depression" are found to be unsettled, restless, tense individuals. The activities of the two groups may be similar, but their reactions to their activities indicate different attitudes.

If the previous histories of these patients are considered apart from their diagnoses, there is a different correlation between their characteristic behavior in life and their EEG patterns. The passive, quiet, relaxed, inhibited patient is found more frequently to have an A or MS pattern with a 10 cycle or slower alpha, and the active, energetic, tense, or agitated patient is found to have an MF or B pattern with a 10 cycle or faster alpha."

The following table gives the detailed statistics:-

"TABLE I.

DISTRIBUTION OF EEG PATTERNS, ALPHA FREQUENCIES, and VOLTAGES BETWEEN MANIC-DEPRESSIVE DEPRESSED, MANIC-DEPRESSIVES MANIC AND MANIC-DEPRESSIVES MIXED

	MDD		MDM		MD mixed		
	No.	Per cent.	No.	Per cent.	No.	Per Cent	Total No.
Patterns:							
A	22	42	3	14	4	58	29
B	4	8	3	14	1	14	8
MF ...	3	6	12	54	1	14	16
MS ...	9	17	0	0	0	0	9
M	14	27	4	18	1	14	19
Total	52	100	22	100	7	100	81
Frequencies:							
8.5-9..	7	13	0	0	0	0	7
9-10...	14	27	4	18	1	14	19
10-10.5	25	48	12	55	4	57	41
10.5-11	0	0	0	0	0	0	0
11-12..	5	10	6	27	1	14	12
Total	51*	98*	22	100	6*	85*	79

Voltage...

Voltage:

Low	18	34	6	27	4	58	28
Average..	29	56	16	73	3	42	48
High	5	10	0	0	0	0	5
Total	52	100	22	100	7	100	81.

* One case in MDD and one in MD mixed were uncountable for frequency of alpha.
Alpha and voltage defined according to the recent paper of the author (1941).
Under voltage, low = 10-30 microvolts, avg.= 30-80 microvolts, high = over 80 microvolts."

In her 1942 paper Davis corroborated an observation of Lemere[5] made in 1936 as to a dominant alpha rhythm in manic-depressive patients. These showed 36% A type patterns - the greatest incidence of any pattern among either schizophrenics or manic-depressives. The latter also had the greatest incidence (50%) of alpha rhythms with a frequency of 10-10.5 c/sec. The schizophrenics on the other hand had double the number of e.e.g's with fast alpha rhythms and MF and B types were commoner in them. The high incidence of the A type patterns in manic-depressives, contrasted with schizophrenics, suggested to Davis that the "degree of organized or synchronized cortical activity" distinguishes the two groups. Walter[6] in 1944 found Lemere's claim of an unusually high amplitude and dominant alpha rhythm in manic-depressives (suggesting as this does that such persons would have an ability to disregard visual impressions and images), difficult to accept.

As regards personality types including abnormal ones falling short of frank psychosis one may quote Denis Hill[7]:-

> "Mention has already been made of the way in which differences of imagery are associated with differences in the blocking reaction of the alpha rhythm to visual stimulation. Since apprehension and fear will also result in blocking of the rhythm, one would expect little alpha rhythm in nervous, timid and chronically anxious subjects. This expectation is borne out by clinical experience,

the

the extremely tense patient having frequently a low voltage fast activity pattern with few rhythms in the alpha band. In terms of physiological psychology this can be interpreted as evidence that such subjects are directing their attention constantly to the sensory receptors or that the central visual apparatus is being used for visualisation, or that it is receiving sensory stimuli from receptors other than the visual ones. Since attention either to imagery processes or to the perceptions stimulated by visual or other exteroceptive sensations has the same effect on the alpha rhythm it would a priori seem unlikely that the alpha index would correlate well with the complex concepts of personality types. However, Lemere (1936) found that schizoid personalities had a low and cycloid personalities a high index. Gottlober (1938) related extraversion with a "good" alpha rhythm (i.e. a high index), but found no such relationship between introversion and a low index. Henry and Knott (1941) pointed out that since Gottlober's sample was loaded with "high alphas" (72%) and since both his samples had more extraverts than introverts, the "relationship" might be due to chance factors alone. These workers combined Gottlober's data with their own making in all 147 subjects. Of these, 58% were high alphas of whom 62% were extraverted; 42% were low alphas of whom 67% were extraverted. Again, of the 147 subjects, 64% were extraverted of whom 57% were high alphas and 36% were introverted of whom 62% were high alphas. Therefore an almost equal proportion of extraverts were found in both high and low alpha groups; and also an equal proportion of high alpha subjects in both extraverted and introverted groups.

Saul, Davis and Davis (1937) studied 70 individuals undergoing courses of psychoanalysis at the Institute in Chicago. A Freudian approach to personality differences was used. Although it is evident that such differences can only be expressed as complex concepts arrived at by a process of postulating a particular dynamical behaviour and are not concepts derived directly from observable data, yet they have one merit which is not shared by the Jungian or Kretschmerian approach. The Freudian postulates dispose of the difficulty that visual imagery used in phantasy thinking has the same effect on alpha rhythm as visualisation aroused by sensory stimulation. The schizoid-cycloid, introversion-extraversion modalities imply distinctions of this type, while the Freudian school differentiates essential "passivity" in all trends from essential "activity" in all trends. From this point of view there is no difference at the level of personality functioning between imaginal activity and activity aroused by sensory stimulation. The only difference is the extent of drive for experiencing, i.e., attention. The two-faced character of most psychoanalytical concepts makes

for...

> for difficulties, however, and early impressions have been modified. Davis and Davis (1939) state they prefer at present not to attempt to define precisely the trends which are to be postulated from the psychological data. "We have been impressed, however, by the fact that individuals with the greatest alpha activity seem to show the frankest and freest passive and receptive trends, while those with very little or no alpha rhythm show more frankly active tendencies. The trends are apparent most clearly, although not exclusively, in dreams. In the dreams of the very low alpha subjects there is conspicuous free activity and considerable masculine activity, while subjects in the very high alpha groups show less activity and more free receptivity and passivity." In the earlier report (Saul, Davis and Davis, 1937) the groups with little alpha activity had been described as those with "a freely indulged in drive to activity, independent aggressive social leaders, doers in reality rather than intellectual sublimation and personalities who dream of attacking and stealing the power, potency or ability of others". It is noticeable that the concept of extraversion is implied in this distinction and that this is contrary to the findings of Lemere and Gottlober. If we confine the interpretation to attention and degrees of attention, irrespective of whether attention is directed to external events or imaginal events, these observations would appear to have meaning. The findings of Golla, Hutton and Walter (1943), suggest that, since all individuals are not dependent for their thinking on visualisation, and since such differences are reflected in the alpha activity, investigation of the imagery type should be made before any further attempts to establish correlation between alpha rhythm characters and personality types."

Turning now to the definition and interpretation of Davis' choppy activity we may quote the author as saying it is "disorganized and of low voltage ranging from approximately 26 to over 50 c/sec. It is not artefact or muscle potential. It is an abnormal interference with the normal physiological activity of the cortex and is superimposed on the e.e.g. pattern sometimes permanently obliterating it. It may be diffuse or localized, intermittent, continuous or permanent. The "choppy" activity is outside the range of the alpha frequency and those frequencies which are characteristic of the MS and B patterns".

Very significant from the point of view of the hypothesis enunciated in the introduction is Davis' relating choppy activity with, in the first place, organic pathology, and, in the second place, chemical stimulation or irritation of the cortex. She develops the first theme in the 1940

1940 article on schizophrenics and corroborates it in her 1942 article when she says "more X-ray pneumoencephalographic findings on some of the patients in this series substantiate the previous indication and other evidence that "choppy activity is definitely associated with organic pathology". In the 1940 paper she cites three cases that demonstrate the association of organic brain disturbance and choppy activity. In the first case the neurogical condition had been investigated because of an abnormal response to metrazol and an inoperable porencephalic cyst was found in the right occipital lobe. The rest of the brain showed lesser but diffuse changes. An old fracture of the inner table of the skull was discovered in the region of the right occiput. There had been a head injury at the age of 7 months. In the second case although there had been no history of trauma, an X-ray of the skull showed hyperostoses, extensive calcification of the falx and very deep Pacchionian depressions in the parietal regions. In the third case the air encephalogram showed displacement of the ventricels to the right probably due to rotation. This pneumoencephalogram was inconclusive no definite disease having been demonstrated. She goes on to cite the findings of other authors who have described records similar to her choppy ones in admittedly organic brain conditions. In the case of General Paresis she cites H. Berger[8], in that of cerebral softening due to vascular thrombosis F. Lemere[9] and Janzen and Kornmiller[10] and in cerebral tumour R.S.Schwab[11]. In corroboration of her finding of choppy records in schizophrenia she points to similar records described in the same condition by Jasper, Fitzpatrick and Solomon[12].

Other literature not cited by Davis is in line with her claim of the existence of records corresponding to her choppy category in admittedly organic brain conditions and in

schizophrenia - Hoch and Kubis in Dementia Paralytica[13], Case and Bucy in brain tumours[14], Levin and Greenblatt in cortical atrophy and venticular dilatation[15] and Rubin in a group of schizophrenics, manic-depressives and traumatic psychosis with demonstrable cerebral atrophy[16].

It should be noted in passing that these other authors cited do not use Davis' term "choppy", but by diagrams, or other verbal characterisations including that of "flat records", indicate an identical or partially similar phenomenon.

As a variation on Davis' theme of choppy activity as an indicator of organic disturbance one may note the claim in her 1942 paper that such records are associated with mental deterioration in schizophrenics although they are lacking in the e.e.g's of individuals whose deterioration is associated with cerebral arteriosclerosis and old age.

Davis' second emphasis in the matter of the origin of choppy activity is direct stimulation of the cerebral cortex, and she illustrates it by reference to chemical stimulants notably Mescalin and Metrazol from her own work and certain anaesthetics from the work of others. She describes experiments conducted in conjunction with Sulzbach in which Mescalin was administered to normal subjects. Choppy e.e.g's and schizophrenic-like symptoms appeared simultaneously and at a later stage disappeared simultaneously. In conjunction with the same author Davis describes choppy records appearing in relation to Metrazol therapy[17]. She cites a similar phenomenon in relation to anaesthetics from the work of the following authors: Beecher and McDonough[18], Bremer[19] and Rheinberger and Jasper[20]. She rather arbitrarily at one

juncture....

juncture in the 1942 paper finds the source of the overstimulation or irritation of the cortex in unsynchronised activity within the central nervous system, whereas a chemical substance elaborated elsewhere in the body would be an inference as much in line with the experimental evidence as the one she has adduced. She uses her hypothesis to explain the greater incidence of choppy records in schizophrenics as compared with manic-depressives but this difference is equally well explained by the hypothesis enunciated in our introduction.

The relative incidence of choppy records in schizophrenics and manic-depressives is given by Davis as 61% as compared with 39%. A detailed comparison of the incidence of choppy records for different age groups is presented in the following table:-

	15-39 yrs. (111)		40-59 yrs. (67)		60+ yrs. (27)		Total (207)	
	No.	Choppy	No.	Choppy	No.	Choppy	No.	Choppy.
Numerical								
Schizophrenics	85	52	32	16	9	8	126	76
Manic-depressives	26	4	35	6	20	1	81	11
Total	111	56	67	22	29	9	207	87
Percentages								
Schizophrenics	77	47	48	24	31	27	61	37
Manic-depressives	23	3	52	8	69	3	39	5
Total	100	50	100	32	100	30	100	42.

One type of choppy record viz. the variety sometimes designated "flat", finds an explanation in fundamental electronic terms in the following passage from James O'Leary[21]:-

"Partial Synchronism of Discharging Elements.

> In recording from the CNS, the different elements active in a tissue are not necessarily, or usually, synchronised, as has been assumed above. Larger axons conduct more rapidly than smaller ones, and even if all are stimulated together the impulses may arrive at a recording lead out of step with each other. Negative phases of some elements will then coincide with the positive phases of others, and since the negative phases should in general be greater in potential-time area, the result can be a simple deflection of longer duration than the simple impulse in any one element would give rise to. Furthermore, if sense organs instead of axon pathways are stimulated (Bartley and Bishop, 1942) or if "spontaneous" activity is being recorded, anything may occur, from a completely random activity to the degree of synchronism occasioned by the mutual facilitation of parallel elements, a phenomenon that can in fact occur at synaptic regions. The limit of completely random activity may result in a constant record showing no activity at all, and to the degree that activity is asynchronous, the record is an unreliable measure of the activity giving rise to it.

Davis' notion of choppy activity is subjected to rigorous criticism by the British school notably Walter and Hill as the following passages from Hill's article in the symposium on electroencephalography already cited will show:-

> "She denied that it was due to muscle artifact - an obvious objection and one difficult to exclude. Walter (1942) notes that the amplifiers used by Davis had a much shorter time constant than those used by him and that the potentials described by her 'may really have been slower and smoother, but truncated by the short time constant of the coupling condensers'. The present writer found 3 records among 24 cases of chronic severely deteriorated apathetic schizophrenics and 3 among 9 recent schizophrenics which fulfilled the criteria of Davis's pure type 'choppy' rhythm. Eleven others showed some degree of 'choppiness' with an associated alpha rhythm dominance (Type 'A'), but it was clear that the phenomena ranged from what we clearly recognisable as muscle potential artifact to what could not be so definitely described. It was remarkable, however, that a similar 'choppiness' occurred in the tracings of the E.C.G. recorded simultaneously, and this obviously had an extra-cerebral source. In these cases a short time constant was used.

. . . . . .

> At the present time it must be admitted that anxious preoccupation with the internal environment, common in the schizophrenic, provides a physiological setting in which the 'choppy' activity can readily be explained as a result of alpha rhythm inhibition plus attenuated muscle potential artifact, and would be apparent when short time constants are used. In perhaps no other groups of patients are artifacts so likely to render interpretation of the records difficult."

One remark of Hill's in the same paragraph, viz., "Davis's untimely death has left her findings unsubstantiated, and it remains for others, helped by technological advances, to follow her lead", indicates that even if we reject Davis' findings in this regard, in whole or in part, the general notion underlying it may be redefined in such a way as to provide a fruitful starting point for new research. With this in view in our own study should we find Davis' interpretation untenable, we shall substitute for the notion of choppy activity an analysis of low voltage irregular or disorganised records. At the same time we may find that the organic and chemical interpretation of aetiology and pathogenesis best explains the observed facts.

It is relevant to the hypothesis we are considering in this work to describe the effects on the e.e.g. as they appear in the literature of two drugs which artificially induce states resembling the two phases of manic-depressive psychosis: ACTH (and cortisone) which characteristically includes a manic-like state and DFP which characteristically induces depression.

As regards the former, ACTH, Hoefer and Glaser report development of slow wave changes as characteristic. Cleghorn, Graham, Saffran and Cameron[25], however, found this in only one of their eight cases.

Hoefer...

Hoefer and Glaser report as follows on the salient findings in a series of 15 cases[22,23], further details of which may be obtained by consulting the relevant column of the table appearing in the following chapter of the present work:

"Electroencephalographic Observations.

Prior to their treatment with pituitary adrenocorticotropic hormone 7 of the patients had essentially normal electroencephalographic records. One patient had one normal and one slightly slow record. Seven patients had basically slightly slow records characterized by occasional runs of low to medium voltage activity at a rate of 5 to 7 cycles per second.

During the course of hormonal administration the records of 2 patients remained unchanged; records of one had been normal, of the other one had been slightly slow. The other 13 patients had significant changes of a moderate or severe degree in their records. These changes, which usually appeared three to five days after treatment was started, consisted of (a) reduction in amplitude, regularity and continuity of the basic alpha activity and slowing of the alpha activity, in the most striking case from a rate of 12 to 13 cycles per second to one of 7 to 8 cycles per second, and (b) the appearance of large amounts of slow activity (3 to 7 cycles per second) that occurred at random or in bursts, often increased in incidence or amplitude or both in response to hyperventilation.

In 1 instance spike activity appeared in addition to slowing, and in another there were runs of rapid activity (15 cycles per second) interspersed with the slow activity."

It is of interest in relation to an original case of my own to be reported later to note that in the detailed e.e.g. reports appearing in this article of Hoefer and Glaser's two cases occur which in addition to the development of slow activity with ACTH administration rapid activity is also reported. It is relevant also to note the use of the word "disorganization" in view of the development of such a concept later in our own work. The reference reads:

"Two electroencephalograms taken at the height of the psychosis showed pronounced disorganization of alpha activity, slow waves (4 to 7 cycles per second) and interspersed rapid activity."

The salient findings reported by Glaser, Randt, Hoefer, Merritt and Fraezer[24], for a slightly more extensive series of 21 cases are precisely similar.

With DFP (diisopropylfluorphosphonate) Rowntree, Nevin and Wilson[26] claim that the most characteristic finding is lowering of amplitude associated with diminution of alpha activity. Approximately 24 hours after the withdrawal of DFP an increase in amplitude with increased dominance and spread of the alpha rhythm was seen. No evidence of the epileptogenic action of the drug was observed. The incidence of e.e.g. changes was greater in normal and manic-depressive cases than in schizophrenics. Atropine in doses of 1-5 mgms. subcutaneously produced changes in the e.e.g. almost indistinguishable from those of the early stages of sleep, and did not counteract the effects of DFP on the e.e.g.

Hampson, Essig, McCauley and Himwich[27] describe the effect of the intracarotid injection of DFP into unanaesthetised, mildly curarised rabbits, in an attempt to follow out the claim that such a procedure results in e.e.g. patterns closely resembling those seen clinically during status epilepticus. They find that, within limits, the changes in the corticogram are proportionate to the amounts of this anticholinesterase administered.

> "Five EEG categories could be identified. (1) There was no change from the control record when injections were less than 0.1 mg./kg. of DFP. (2) Early diffuse changes, persisting for the duration of the experiments, were produced by doses averaging about 0.1 mg./kg. They consisted of increases in regularity, with some slight differences in amplitude and frequency. (3) Marked ipsilateral changes resulted from doses averaging 0.4 mg./kg. with more definite changes in rate and amplitude, limited to the cerebral hemisphere of the side injected, averaging 300 to 400 microvolts and a frequency of 7 to 8 per sec. (4) Marked bilateral changes were produced by doses averaging 0.8 mg./kg., with rectangular waves of high amplitude suggestive of those seen in psychomotor epilepsy. (5) Grand mal like patterns appeared bilaterally with doses averaging 1.0 mg./kg."

Precise..

Precise estimations of the decrease of cholinesterase activity in various parts of the brain are given and are shown to correlate to the degree of abnormality in the electrocorticogram.

ADDENDUM ON THE EFFECT OF SHOCK TREATMENT ON THE E.E.G.

As we have been unable to realise completely the ideal in our own investigation of using only untreated cases, it becomes necessary to describe work indicating the possibly disturbing effects on the e.e.g. of shock therapy.

The following are representative of findings as regards the effects of electro-convulsive therapy on the e.e.g. Pacella and Barrera[28], Taylor and Pacella[29] and Kennard and Willner[30] point out that the type and degree of abnormality is related to the type of pre-shock record: thus waves of epileptic type are likely to be more prominent after treatment, in cases with an epileptic tendency in the pre-shock records. However it is only in about 11% of cases with abnormal pre-shock records that these abnormalities last longer than in the cases with normal pre-shock records.

Bagchi, Howell and Schmale[31] enunciate a proposition which is widely accepted, viz. that in general the degree of electroencephalographic change varies 1) directly as the number of shocks and 2) inversely as the interval between them. They propound the view shared by many other workers that the more pronounced changes disappear relatively soon after the cessation of treatment, but they claim that even in cases that have maintained their improvement or have recovered, changes are

still...

still detectable 5 to 9 months after treatment. The types of change enumerated by them are general voltage increase, high voltage bursts (3 - 4 c/sec and 5 - 7 c/sec), long slow wave runs, increased incidence of single delta waves, general slowing of fundamental alpha wave band by 2 to 4 cycles per second, retention of or emphasis on the high frequency band (14 - 18 c/sec), spiky waves and abortive or genuine larval spike-and-wave patterns (the emphasis indicated by the underlining is mine).

Kennard and Willner in the paper just mentioned give the generally accepted estimate of the return to normal of the e.e.g. during the second or third post-shock month. The abnormalities described by them are slow, fast and paroxysmal bursts resembling those seen in epileptics, and in more prolonged treatments, a slow irregular pattern of extremely high voltage.

Mosovich and Katzenelbogen[32] agree with Bagchi, Howell and Schmale, in opposition to most other authors, regarding the prolonged persistence of the disturbances. They detect signs of cerebral dysrhythmia 10 months after treatment: in the case of courses of 3 to 15 shocks in 15%, in the case of 16 to 42 shocks in 50%.

As regards metrazol therapy Finley and Lesko[33] in a small series of 9 cases obtained the following results: 7 that received short courses either showed no changes of even a temporary nature (4 cases) or changes lasting no longer than a few days or weeks, whereas in the 2 cases who received long courses of treatment (18 and 20 seizures) the disturbances lasted for 6½ and 16½ months respectively. Proctor and Goodwin[34] claim a slower disappearance of abnormality in the e.e.g. with metrazol (phrenazol, cardiazol) than with electro-shock.

The...

The work of McNeel, Dewan, Proctor and Goodwin[35] and that of Hoagland and his associates[36,37,38,39] agree in the claim that the disturbances introduced into the e.e.g. by high dosage insulin treatment are short-lived. The possibility that abnormality already existing in the e.e.g. may be removed by insulin treatment should not be overlooked.

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C H A P T E R I I.

PHYSICAL AND HEREDITO-CONSTITUTIONAL FACTORS IN MANIC-DEPRESSIVE PSYCHOSIS.

1. Neuropathology.

Biopsy studies of the Montreal workers Penfield, Cone, Elvidge and Reed, confirmed by the autopsy studies of the Italian workers Cardona, Roberti and Bolsi, have demonstrated neuropathological changes affecting the origodendroglia in manic-depressive psychosis and schizophrenia, as well as in certain proved organic states. Furthermore experimental intoxication of animals by the Montreal and the Italian workers has produced similar changes in the oligodendroglia leading to the conclusion by Elvidge and Reed that "by analogy with the other states in which swelling of oligodendroglia cells is observed, it is justifiable to assume that in psychotic states also there may a causal toxic or metabolic factor". The bearing of this on the thesis we are developing is obvious.

Turning to the details of this work we refer first to the paper of Elvidge and Reed[1] published in 1938 on biopsy studies of the brain in schizophrenia and manic-depressive psychosis. They indicate that the investigation was undertaken at the suggestion of Dr Wilder Penfield with a view to studying particularly oligodendroglia cells, in the acute stages of the psychoses and during periods of remission. They refer to Penfield's work in collaboration with Cone[2] on the acute swelling of oligodendroglia including its occurrence in states of mental derangement. They quote Penfield and Cone's description of the process as follows:-

"The ...

"The mildest change is a hypertrophy marked by increase in the amount of protoplasm of the cell body and a pyknotic change in the nucleus. This is most striking in the cases in which the process is too mild to cause destruction. When the change is taking place rapidly there is little evidence of hypertrophy. The cell body undergoes hydropic swelling and there appear unstained vacuoles outlined by granules. The expansions come to be represented by granules as soon as the connecting protoplasm disappears. The cell body gradually disintegrates, and finally the pyknotic nucleus remains."

Elvidge and Reed refer also to important observations of Cardona[3] reported after the commencement of their own observations. Cardona noted swelling of oligodendroglia cells in autopsy material taken from psychotic patients. Elvidge and Reed point out that as this was autopsy and not biopsy material like their own, there was no guarantee that the changes were not the result of the agonal process.

They account for the previous negative findings in this field on the following grounds:- 1) in previous studies cerebral tissue was not obtained for examination during life and 2) staining methods for the oligodendroglia cells had only comparatively recently come to hand.

They divide swelling of oligodendroglia into two types for the purpose of their study 1) nuclei well preserved and of normal size and 2) nuclei shrunken, angulated and pyknotic, with intensified vacuolation of the cytoplasm.

The biopsy specimens were taken from the occipito-parietal region (usually on the right) 6 cm. above and 5 to 6 cm. lateral to the external occipital protuberance.

The controls consisted of 16 consecutive, non-psychotic patients on whom operations had been performed for a variety of reasons. 11 were epileptic: 6 operations were exploratory, 4 revealed cerebral scar and one a

cerebral....

cerebral tumour. 5 were not epileptic: 1 cerebral tumour, 1 birth injury, 1 abscess, 1 internal hydrocephalus and 1 cerebral atrophy. Among these controls the conclusion was drawn that in patients mentally normal and in the absence of an epileptic seizure, provided that we are not dealing with an inflammatory or degenerative process in the area examined, no swelling of the oligodendroglia cells was observed.

The 4 manic-depressives (2 depressed, 2 manic) showed the reaction of swelling of the oligodendroglia. Of the 13 schizophrenics examined all except 1, in whom the diagnosis was subsequently found to be erroneous, exhibited the same phenomenon.

This change in psychotic patients was found to occur at any depth in the white matter between the gray matter of the cortex and the ventricle. It is perhaps more prominent at a depth of 1 cm. and in the deeper layers. It may be patchy or generalised.

It is suggested, in view of the changes in the oligodendroglia cells, that the mental phenomena are associated with massive physiological disturbances in the associational and commissural fibre pathways in the brain. In this way, impulses from different parts of the brain are interrupted, with consequent disturbance and loss of control in the intellectual, volitional and emotional fields.

Penfield and Cone and the Italian workers Cardona, Roberti and Bolsi have also demonstrated swelling of the oligodendroglia resulting from the experimental intoxication of animals, and in human beings where death has been preceded by a protracted period of stupor and coma.

Elvidge and Reed in addition to their observation already cited that swelling of the oligodendroglia is not seen in patients who are mentally normal, (in the absence of epileptic seizures or inflammatory or degenerative changes in the neighbourhood) point out that in epilepsy it occurs in association with frequent seizures and describe it in a case of cerebral embolism.

2. Endocrinology and Biochemistry.

The only candidates among the endocrines that can lay any experimentally backed claim to being the chemical or toxic factor implicated in the hypothesis of manic-depressive psychosis which we are exploring are the interrelated substances the adreno-cortical hormone and cortisone. There is, in fact, a considerable body of recent experimental work implicating this substance as a possibly important aetiological factor.

The pioneer labours of Hoskins and Freeman[4,5] and of Pincus[6,7,8] and Hoagland[6] in the preparation of glycerine extract of suprarenal cortex, and the biochemistry of the steried substances, deserve mention, but their work will not be dealt with in detail as their studies concerned schizophrenia rather than manic-depressive psychosis. It may be mentioned in passing that Hoskins'[9] analysis and philosophy of the possible interrelationships of endocrine and other factors in the aetiology of mental disorder is a warning against a too naive view of endocrine substances as aetiological factors. He does, however, adduce evidence of the relationship of the adrenal glands to human functions at the personality level in the following conditions:-

(a) Addison's disease: depression of affect, with apathy or anxiety and occasionally

paranoid...

paranoid ideas;

(b) Subacute adrenal deficiency: fatiguability and general ineffectiveness;

(c) "Hyperadrenal" type: intense psychomotor activity;

(d) Cushing's Disease (oversecretion of adrenal cortex):

Aub's case:- well adjusted, highly intelligent adolescent slowed up mentally and physically and schoolwork deteriorated markedly. With recovery there was also a return to the psychological status quo.

One of the earlier pieces of work in this field that does not seem to have attracted the attention it merits is that of Perry C. Baird[10]. Inspired by the work of Walter B. Cannon on the relation of the adrenal gland to rage reactions with their analogy to the manic state, and Nolan D.C. Lewis' claim from his autopsy studies of manic-depressive patients that the adrenals generally exhibit cortical hyperplasias, undertook experiments in which adrenalectomised animals were injected with the blood of healthy and manic subjects. His conclusions are as follows:-

"(1) In these experiments an attempt has been made by means of adrenalectomized cats and rats to ascertain a rough biologic assay of the cortical hormone of the citrated whole blood of manic patients and of healthy subjects.

(2) Adrenalectomized cats, untreated, usually live on the average 5.5 days following removal of the adrenals (literature).

(3) Seven adrenalectomized cats were studied in the control series. These received intraperitoneal injections of Ringer's solution and of the citrated whole blood of healthy subjects. The average duration of life in this series of controls was 4 days.

(4) Adrenalectomized cats receiving citrated whole blood of manic patients lived an average of

11.5. days in one group of 4 cats, and 10.3 days in a second group of 7 cats.

(5) The average duration of life of all 11 experimental cats was 2.7 times as long as the average of all 7 control cats (10.7 days versus 4 days).

(6) Two adrenalectomized rats receiving citrated whole blood from manic patients lived eight times as long as 3 adrenalectomized rats receiving citrated whole blood from normal subjects (16 days versus 2 days, average figures).

(7) In one experiment, a transfusion of 500 cc. of citrated whole blood from a manic patient to a depressive patient had no effect.

(8) One adrenalectomized cat while receiving manic blood ate voraciously and exhibited dramatic rage reactions despite absence of adrenals. This animal's physical strength was truly remarkable. A second adrenalectomized cat while receiving manic blood was discovered quite by accident to possess unusual strength and endurance. Adrenalectomized rats receiving manic blood were very strong; they were very hard to manage, and were very difficult to inject. Rats receiving normal blood were weak and wobbly and were easily injected."

His discussion is as follows:

"These experiments have provided biological evidence that the blood of manic patients may differ from the blood of healthy subjects. The experiments were carried out to ascertain whether or not it might be possible to demonstrate in the blood of manic patients an increase in the circulating cortical hormone. It is not assumed that these experiments have proved this to be the case. It is assumed only that evidence has been found to indicate that adrenalectomized animals when injected with manic blood behave differently from similar animals injected with healthy blood. What the chemical difference between the two bloods may be remains to be discovered. The most striking observations in this series of experiments are in reference to the strength and activities of 2 of the rats and 2 of the cats injected with the blood of manic patients. A search for further evidence regarding the nature of this effect would surely seem justifiable.

This paper is preliminary in nature but it is published at this time because of the necessity of postponing further experimentation for an indefinite and uncertain period of time. Many more experiments and control studies should be done. Nothing can be done except at times when acutely manic patients are available for study. Blood specimens must then be collected at frequent intervals and transported promptly to the physiological laboratory

where...

where the adrenalectomized animals must be ready for use. Only the acutely manic patients seem ideal for diagnosis and study, and since the acutely manic patients often recover in a short time, the supply of manic blood may become unexpectedly eliminated. The collection of blood from patients acutely manic is hampered at times quite naturally by failure of the patient to co-operate.

Perhaps this report will stimulate interest in the manic psychosis as a physiological and general medical problem rather than as a purely psychological one. It may be hoped that other investigatbrs will continue these studies.

The following hypothesis is offered as an interpretation of the manic psychosis: The disease is due to overstimulation of the entire autonomic nervous system with prolonged maintenance of the rage reaction type of vascular bed (Wolff and Wolf). The two sides of this nervous system including both the sympathetic and the parasympathetic are functioning powerfully but equally and homeostasis is maintained, thus accounting for the fact that the blood sugar and certain other chemical determinations in the blood show no change even in violent manics (Whitehorn). This increased activity of the autonomic nervous system involves a discharge of nervous impulses to the intestinal tract and in some way brings about increased peristaltic movements and the diarrhoea usually observed in the manic. Increased nervous discharges are sent along the sympathetic nerve fibers which ascend the arterial tree leading to the anterior lobe of the pituitary gland, from which a reservoir of hormones breaks loose. These hormones from the "master gland" get into the circulation and bring about a tremendous increase of internal secretions from the thyroid, adrenals and gonads. The manic's excessive sexual drive is thus accounted for. The adrenals and the gonads would seem to dominate the pattern of glandular overactivity in the manic.

Since the cortical hormone functions in part to influence recovery from fatigue (Hartman et al.) it is presumed that adrenocortical overactivity in the manic psychosis serves to compensate for and aid in recovery from maniacal overactivity. The relationship of the cortical hormone to recovery from muscular fatigue (Hartman) might explain the rapid recovery from fatigue exhibited in the cat naps which so quickly bring about complete recovery from long overexertion in the manic.

The interglandular relationships as studied by Baird, Cloney and Albright in their cold room experiments provided much of the real background for the theoretical considerations which led to these researches, especially in regard to the intimate and constant influence which the anterior lobe of the pituitary seems to exert upon the function of the adrenal cortex. This line of thinking led inevitably to the assumption of pituitary overfunction after discovery of evidence of

adrenal...

adrenal cortex overfunction in the manic."

An investigation by Baker, Schairer, Ingle and Li[11] represents an experimental extension of the inter-glandular relationship suggested by the above passage by demonstrating that involution in the male reproductive system of rats is brought about by treatment with adrenocorticotropin.

Xavier, Abély and Sauguet[12] present biochemical, clinical and radiological data in a case illustrating their hypothesis of hypofunction of the anterior hypothesis and electively of the acidophile cells in the etiology of manic states.

The rapid development of the work on adrenocorticotrophic hormone (ACTH) and cortisone, testified to by the 1950/conferences and 1951 devoted to this field alone, has brought with it much evidence cognate to our theme. Before presenting this, however, it will be as well to outline the interacting factors in the physiology which in addition to helping us to understand the mechanism will serve to keep the chemical, endocrine factor in perspective - along the lines indicated by Hoskins' general philosophy in this sphere. We can do no better in this regard than by quoting Lehmann, Turski and Cleghorn[13] as follows:-

> "There are many links and junctions which may be attacked in the complex cycle which is involved in man's adrenocortical activity. Emotional stress such as is evoked by frustration, rage, fear, etc., affects first the hypothalamus. Hypothalamic stimulation is transmitted to the pituitary. The pituitary responds with secretion of the adrenocorticotrophic hormone (ACTH) which in turn stimulates the adrenal cortex to release its own hormones, some or one of which have cortisone-like activity. The hormones of the adrenal cortex finally produce their effect on the various target organs, in particular, the lymphoid tissue, but also on brain and muscle probably through their effect on carbohydrate and on sodium and potassium metabolism.

We...

> We may short-circuit this cycle at different points, but if we want to test the functional capacity of the adrenal cortex directly we must inject adrenocorticotrophic hormone."

The specific evidence relevant to our theme is in the first place the observation by a number of investigators[14,15,16,17,18,19,20] of the state of enhanced well-being, marked euphoria or frank mania that develops in the course of ACTH or cortisone treatment. Still more recently Rome and Braceland[21] stress the prominence of euphoric and manic responses to ACTH and cortisone, by an extensive review of the literature and in their own material. Their study of the psychological response is a detailed one, and they grade the reactions into four groups in terms of their severity.

Secondly there is the argument of Hemphill and Reiss[22,23] and several others[24,25,26,27] that ECT owes its therapeutic action to activating the adrenal cortex; and it is significant in this connection that ECT is more effective in the depressive than in the manic phase of the manic-depressive psychosis. Thirdly there is the remark of Lehmann and co-workers that certain observations in Addison's disease have contributed to the view that increased secretion of adrenocortical hormones will generally produce euphoric excitement. Finally, the role that the adrenal cortex plays in response to stress, i.e. the functional aspect, has been found to differ in schizophrenics and normals[28] and points the way to similar investigations in manic-depressive psychosis.

In opposition to the above there are some important studies which we shall now outline which tend to rebut the role of ACTH and cortisone in the production of manic states, or the specificity of such a response.

The...

The first is that of Lehmann, Turski and Cleghorn on the eosinophil response to ACTH in the manic phase of manic depressive psychosis. They state that the aim of their investigation is "to gain some insight into the function of the adrenal cortex in the manic state. More particularly we wanted to test the hypothesis that manic conditions are caused by or associated with heightened activity of the adrenal cortex".

They describe their material as follows:-

> "Our material consisted of 10 manic-depressive patients. All of them were in the acutely manic phase. Only "clear cut" and typical cases who had suffered at least one previous attack and who presented no diagnostic problem were studied. None had received insulin or electroconvulsive therapy for at least three months prior to the test. Most of them, however, had received sedation and modified insulin therapy for several days or weeks."

The procedure was as follows: 8 patients were injected with 25 mgm. of ACTH (Armour) and 2 patients received 16 mgms. of ACTH while they were fasting and kept as quiet as possible. No sedative was administered during the test and within a period of at least 8 hours prior to it. The ACTH was dissolved in 5 c.c. normal saline solution and injected intramuscularly. The eosinophil count was selected as an index of adrenocortical activity. The counts were conducted immediately before the injection and 2, 4 and 6 hours later. Capillary blood and a phloxine-propylene-glycol stain was used.

The following is the summary of their results:-

> "1. The average basal eosinophil level of ten manic-depressive patients in the manic phase was within the normal range.
>
> 2. The average response to ACTH as reflected in the fall of the eosinophil count following an

injection of ACTH in these manic patients was well within the normal range.

3. A manic patient treated with cortisone for two weeks improved clinically and relapsed later.

4. A patient treated with electroconvulsive treatments showed increased adrenocortical activity as signified by the eosinophil count during the depressed phase and reduced adrenocortical activity when hypomanic.

5. No evidence has been found in this investigation to support the thesis that there exists a specific relationship between increased adrenocortical activity and manic states whether occurring spontaneously or in response to electroconvulsive therapy.

6. A manic state is not inconsistent with a reduction of adrenocortical reactivity."

A study by Cleghorn, Graham, Saffran and Cameron[29] which in a sense is the converse of the previous investigation, viz., an attempt to discover whether deficient ACTH is aetiologically related to the state of depression - also had negative or equivocal results as regards the hypothesis we are examining. They state, "if it is assumed that depression is the opposite of mania, then, because of the depression-like state in adrenal insufficiency one may speculate that ACTH would improve other clinical conditions exhibiting conspicuous depression." Among the investigations of others cited by these authors Forsham's[30] report of the restoration of a case of Simmond's disease from a dull vegetable-like state to her former active life and Thorn and Browne's[31] claim of marked improvement in mood by cortisone, are however accepted as evidence that adrenal cortical hormones may influence mood, in the manner we are postulating.

The procedure adopted in their original investigation was to administer ACTH in divided doses every 4 hours day and night. A total of about 100 mgm. was injected on each of the first few days and somewhat less

on...

on subsequent days, until a total of about 500 to 700 mgm. had been given. The 8 cases investigated all showed clinical signs of depression but were a heterogenous group as their clinical features included anxiety, agitation and delusions and four of the six women seemed to be in the early involutional period and one had had a fairly recent confinement. The tests to which they were subjected included a variety of psychological investigations, blood sugar and urinary ketosteroids, corticoids, uric acid/creatinine ratio and white blood counts and an electroencephalogram.

The summary of their conclusions reads:-

> "Eight cases showing signs of depression were treated for seven days, or more, with multiple daily injections of ACTH. Biochemical data showed that this provided a sustained activation of the adrenal cortex over this period. Clinical signs of slight improvement in mood were apparent a day or two after starting treatment in some cases, but no evidence of psychological or physiological change of significance except for a possible increase in tension, was observed by the tests utilized. Most of the cases subsequently improved with electroconvulsive therapy."

Extensive and important contributions in this field have come from Hoefer and Glaser, which indicate that although the manic reaction is one type of response to ACTH and cortisone, it is by no means the only or predominant type.

In their first paper, to which reference has already been made in Chapter I, they claim that there are two major groups of severe psychotic reactions induced by ACTH or cortisone - "one in which signs of an organic mental syndrome, such as a toxic delirium are present, and one without these manifesta-

tions...

tions. In both, affective and schizophreniform phenomena occur. Manic depressive psychoses seem to be somewhat special; they occur in transition from euphoria and elation; occurring as chronic or painful disabling symptoms are relieved, and usually appear without organic features being present. The pattern or content of these reactions is, in most cases, related to the previous personality structure of the patient. However, in some, but not all cases, have we been able to demonstrate abnormal prepsychotic personality patterns. Also, it should be noted that severe psychoses can occur in the absence of EEG changes and vice versa". Six schizophrenes showed no change as regards psychosis except one predominantly paranoid schizophrenic who developed acute catatonic features. "Also, we have noted no specific euphorizing effect of the drug, even in patients with depressive tendencies."

A second paper of these authors also alluded to in the last chapter, embodies a wealth of the factual detail of their work. The psychiatric procedure included evaluation of the pre-psychotic personality wherever possible and entailed frequent interviews during treatment. The details of the clinical, electroencephalographic and neuropsychiatric data appear in the accompanying table ;

Clinical/...

Clinical, Electroencephalographic and Neuropsychiatric Data on 15 Patients Receiving Pituitary Adrenocorticotropic Hormone.

Case	Age, Sex	Clinical Diagnosis.	Dosage of Drug Mg./ Day	Dosage of Drug Total (Mg.)	Duration of Drug Administration	Pretreatment Electroencephalogram	Electroencephalogram During Drug Administration.	Premorbid Personality Characteristics	Mental Changes During Drug Administration
1	40 M	Rheumatoid arthritis	60-15	1,125	27 days	1. Normal, 9-11/sec. 2. Slightly slow, 5-7/sec.	Disorganized, irregular, low voltage 3-5/sec, especially during hyperventilation.	Some emotional instability.	Mild euphoria, increased tension insomnia.
2	34 F	Rheumatoid arthritis	100-40	300	6 days	Normal, 10-12/sec.	Irregular, discontinuous alpha, rare 7/sec.	Schizoid features.	Moderate euphoria, verbal hyperactivity.
3	19 F	Rheumatoid arthritis	40	280	7 days	Normal, 9-11/sec.	Irregular, 5-7/sec., often in bursts.	No significantly abnormal features.	Mild euphoria.
4	62 F	Rheumatoid arthritis	60-25	4,200	5 mo.	Normal, 10-12/sec.	Irregular, 5-7/sec., some 15/sec.	No significantly abnormal features	Mild euphoria, mild tension, insomnia.
5	45 M	Rheumatoid arthritis	40	240	6 days	Slightly slow, 6/sec.	Irregular, 4-6/sec., increasing with hyperventilation.	No significantly abnormal features.	Mild euphoria.
6	42 F	Rheumatoid arthritis	100-40	580	13 days	Normal, 10-12/sec.	Irregular alpha slowing; disorganized 5-7/sec., 4-5/sec., and 15/sec.	Affective lability; suicide attempt.	Manic psychotic reaction.

37/...

Case	Age, Sex	Clinical Diagnosis	Dosage of Drug		Duration of Drug Administration	Pretreatment Electroencephalogram	Electroencephalogram During Drug Administration.	Premorbid Personality Characteristics.	Mental Changes During Drug Administration.
			Mg./ Day	Total (Mg.)					
7	49 M	Rheumatoid arthritis	75-40	315	7 days	Irregular, 10-12/sec.; some 5-7/sec.	Increased incidence of 5-7/sec.	No significantly abnormal features.	Mild euphoria.
8	43 M	Rheumatoid arthritis	100-40	340	7 days	Irregular, low voltage 5/sec.	No significant change.	No significantly abnormal features.	Very mild euphoria.
9	35 F	Dermatomyositis	100	1,800	18 days	Normal, 10-11/sec.; occasional rapid and spike 15/sec.	Alpha absent; low voltage 4-5/sec., especially parietooccipitally and during hyperventilation.	Emotional instability.	Stupor stage.
10	29 F	Dermatomyositis	100	900	9 days	Normal, 10-11/sec.	Alpha absent; low voltage 5-7/sec. and 4-5/sec., especially frontally and parietally, increasing during hyperventilation	No significantly abnormal features.	None
11	20 M	Regional Ileitis	50-100	1,400	15 days	Irregular, 5-7/sec.	Further slowing to 4-5/sec., especially during hyperventilation	Schizoid features.	None.
12	36 F	Toxic diffuse goiter	100	1,700	17 days	Rare alpha, disorganized, 4-6/sec.; 10-12/sec. activity during hyperventilation.	More disorganized; no alpha; further slowing to 3/sec. during hyperventilation.	No significantly abnormal features	Increased tension and irritability.

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Case	Age, Sex	Clinical Diagnosis	Dosage of Drug Mg./ Day	Dosage of Drug Total (Mg.)	Duration of Drug Administration	Pretreatment Electroencephalogram	Electroencephalogram During Drug Administration.	Premorbid Personality Characteristics.	Mental Changes During Drug Administration.
13	42 F	Toxic diffuse goiter	100	1,700	17 days	Alpha present; 12-13/sec.; occasional 4-7/sec.	Increased 4-7/sec.activity, especially during hyperventilation	No significantly abnormal features.	None.
14	24 F	Schizophrenia	200	2,000	10 days	Rare alpha; irregular 5-7/sec.	Further slowing to 3-4/sec.; increased incidence of 5-7/sec.; slow activity often in bursts.	Emotional instability; schizoid	No significant changes.
15	39 F	Schizophrenia	200	2,000	10 days	Normal, 10/sec.	No significant change	Emotional instability; schizoid	No significant changes.

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The neuropsychiatric changes are described as follows:

"Alterations in mood, affective responses and behavior were noted, in varying degree, in 10 of the 15 patients. The changes were mild to moderate in 8 of them. Those with rheumatoid arthritis showed, in general, an increasing feeling of well-being, alertness and some tension and irritability as the drug exerted its symptomatic effect on pain and movement. This occurred within the first three days of treatment. Six of these patients remained mildly elated or euphoric as long as the effect of the drug lasted but reverted rapidly, within one or two days, to their previous state after treatment was discontinued. One patient (case 2 in the table) became increasingly elated and showed progressive euphoria, hyperactivity and incessant talking. Administration of the drug was discontinued because of this reaction. One of the 2 patients with toxic diffuse goiter became more tense and irritable during the treatment; this occurred with a rise in basal metabolic rate (from +53 per cent. to +75 per cent). The other patient did not manifest significant changes. Pronounced psychologic alterations were not noted in 1 case of dermatomyositis in which there was initial improvement in clinical symptoms. The patient with regional ileitis (basically a schizoid personality and possibly with a borderline psychosis) did not display further changes in his personality reactions. The 2 patients with schizophrenia also showed no definite alterations in mental symptoms; however, further investigation of the treatment of this disorder with pituitary adrenocorticotropic hormone is in progress."

They offer the following reflections bearing on the nature of the neuropsychiatric changes:-

"Minor mental reactions such as euphoria have been reported in cases of rheumatoid arthritis treated with cortisone and pituitary adrenocorticotropic hormone. These reactions can probably be regarded as normal responses to relief from chronic disease or acute painful symptoms. One patient (case 1) after therapy with adrenocorticotropic hormone was treated with cortisone and was capable of describing the different effects of the two drugs. Both relieved the arthritis and produced a feeling of wellbeing or mild euphoria. With the former drug the patient was tense, irritable, insomnic and

unable...

unable to concentrate because of mental hyperactivity. While receiving cortisone the patient felt 'more nearly normal'; had no difficulty in sleeping and was able to concentrate and carry on his business. Electroencephalographic changes occurred while he was receiving cortisone, but to a lesser extent than during therapy with adrenocorticotropic hormone.

In this series, more severe mental changes have been observed. At least two important factors should be considered in relation to these disturbances.

1. The occurrence of an organic mental reaction related to the physiologic changes previously discussed. The stuporous state of 1 patient (case 9) of this series and the correlated electroencephalographic abnormality can be regarded as an example of this type of reaction.

2. A released psychotic reaction with exaggeration of premorbid personality trends.

This could be considered, for example, in case 6 of this series (manic psychotic reaction). Certainly both factors could be operating in any particular case. Many diseases now under treatment with pituitary adrenocorticotrophic hormone (rheumatoid arthritis and allergic states) have received intensive psychiatric investigation. The role of the adrenal cortex in relation to personality changes has also been emphasized recently. Neuropsychiatric disturbances (particularly paranoid manifestations) have been described in states of hyperadrenalism. Schizophrenic patients are reported to show defective adrenocortical responses to stress."

In his most recent article[32] Glaser summarises the position regarding Neuropsychiatric changes in relation to ACTH as follows:-

"One of the most serious complications of the induced hyperadrenal state is the appearance of a psychosis (10, 11). The exact incidence of these major reactions is now known, however, it appears to be about 5% of all cases treated. There seem to be two groups of psychotic reactions. In certain cases a functional affective psychosis, usually of the manic type, but occasionally depressive, can develop. This is most usually seen in patients obtaining marked, rapid relief from pain and motor disability, as in rheumatoid arthritis, and is in most, but not all cases, related to the previous personality configuration. Other patients have developed an organic psychotic reaction, a 'toxic delirium,' with schizophreniform and affective features and often associated with

41/...

> electroencephalographic changes. Some of these latter reactions may be related to potassium depletion. The mechanism of these changes in central nervous system function is under detailed investigation at the present time."

H. Houston Merrit[33], who has worked in conjunction with Hoefer and Glaser, in a Conference Talk delivered at the Institute of Living in February, 1951, on his experiences with ACTH in certain neurological diseases for which there is as yet no effective treatment, stressed also that the mental reactions are of varying type, and not limited to euphoria or manic reactions, e.g., various psychotic manifestations developed in 7 of 34 cases of Cushing's syndrome collected over a period of years. The varied psychotic reactions under ACTH or cortisone did not in his opinion correlate with the e.e.g. abnormalities observed - loss of alpha rhythm and the development of slow, irregular activity, all transient phenomena.

This section would not be complete without further reference to biochemical aspects of manic-depressive psychosis.

A contribution from the Proceedings of the Second Clinical ACTH Conference worth citing from the point of view of biochemical change underlying or paralleling clinical and neuropsychiatric change in response to ACTH is that of Ransohoff, Brust, Reiser, Mirsky and Ferris[34]. The following case is reported:

> "The electroencephalographic changes were in the form of bursts of slow activity, the occurrence of which we have graded from one to four plus" "Slow activity appeared in the electroencephalogram on the thirty-second day of ACTH, at which time the patient was agitated

and...

> and anxious. On the forty-first day, mercuhydrin was given for 'desalting' purposes; there was a simultaneous increase in urine potassium excretion and a further fall in serum potassium. In an electroencephalogram taken in the course of the diuresis, bursts of slow activity occurred more frequently; the next day the T waves of the electrocardiogram became iso-electric, charted as a two plus change, and within 36 hours the patient was frankly psychotic. Four days later she was still psychotic, and electroencephalographic and electrocardiographic changes were marked. Six grains of potassium chloride were given orally at this time. Within 12 hours the patient was no longer psychotic; the electroencephalogram showed only a rare burst of slow activity, and the electrocardiogram was normal. However, the next day, in the course of a glucose tolerance test, the patient again became psychotic, the electroencephalogram, abnormal. There was no change when ACTH was discontinued, and in addition electrocardiographic abnormalities reappeared. Four days past ACTH supplementary potassium(.....) was again given and the disappearance of the psychosis, and the improvement in electroencephalogram and electrocardiogram were as dramatic as previously."

The conclusion drawn is: "Thus, the data suggest that there is a definite correlation between the psychotic state, electroencephalographic changes and potassium depletion."

The "Summary and Discussion" of the work as a whole reads: "Certain of the 'toxic side effects' of ACTH administration have been observed, namely excessive nervousness, weakness, e.c.g. changes and ileus. The findings are consistent with a state of potassium depletion. In addition, the third patient became frankly psychotic; simultaneous e.e.g. changes comparable to those described by Hoefer and Glaser and electrocardiographic changes consistent with potassium depletion were obtained, and the psychosis disappeared and the e.e.g. and e.c.g. returned to normal following the administration of potassium."

In discussion of this paper Dr I.McQuarrie cited a case of Dr. Cleghorn's in whom a depressive psychosis

temporarily...

temporarily lifted when given large amounts of potassium chloride.

Hoefer and Glaser in the J.A.M.A. article cited offer the following speculations on the biochemical aspect with special reference to the electroencephalographic changes:-

> "In order to attempt a fuller understanding of these observations a review of the pertinent physiologic effects of the hormone is indicated. These physiologic changes are generally due to the induced hyperactivity of the adrenal cortex. The most significant alterations are: sodium and chloride retention with associated water retention, potassium excretion, elevated serum carbon dioxide-combining capacity (with occasional hypochloremic alkalosis), decreased sodium and chloride in the sweat, increased gluconeogenesis with hyperglycemia, a diabetic-type dextrose tolerance curve and increased deposition of liver glycogen, decreased serum inorganic phosphorus, falls in circulating eosinophils and lymphocytes associated with a leukocytosis (neutrophilic), increased uric acid excretion, decreased serum cholesterol (free), increased calcium excretion, increased excretion of 11-oxysteroids, 17-ketosteroids and creatine, and a negative nitrogen balance. In some patients there develop acneform eruptions, hypertension and hirsutism. These changes occur to a varying degree in each instance. The drug therefore produces increased secretion of the three major groups of adrenal steroids: electrolyte regulating, carbohydrate regulating and androgens. Many of the foregoing occur in Cushing's syndrome, and this clinical picture has been approximated in several patients receiving hormonal therapy.
>
> The electroencephalographic changes cannot be explained adequately on the basis of these known physiologic alterations at the present time. In this series there was no conclusive correlation between the electroencephalographic abnormalities and changes in blood sugar or electrolytes. The following factors should be considered:
>
> 1. Alterations in dextrose metabolism. In most cases hyperglycemia occurs, but there may be defects in intermediary metabolism or in cerebral utilization of dextrose.
>
> 2. Interference with the acetylcholine cycle. Torda and Wolff reported defective in vitro synthesis of acetylcholine by brains of rats treated with the hormonal agent. Yet in other in vitro experiments adrenocortical steroids seem to enhance the synthesis of acetylcholine.

3. Water...

3. Water retention. This would seem to be significant, yet patient 14 of this series gained 23 pounds (10.4 Kg.) as the result of hydration and was 1 of the 2 patients without electroencephalographic abnormalities.

4. Disturbances in potassium balance. A decrease in serum potassium occurs, but too little is known to correlate this with electroencephalographic alteration.

5. Alkalosis, although an inconstant finding, may be an important factor. Hyperexcitability of neurons is known to occur in the presence of this state and is particularly seen in tetany. After pituitary adrenocorticotropic hormone therapy, changes in serum calcium are too variable to be considered significant in this respect.

6. A peculiar 'toxic' effect of the hormone or of excessive adrenocortical steroids might be considered. Selye has reported an anesthetic or hypnotic effect of large doses of steroids. Adrenocortical steroids have also been reported to have anticonvulsant properties, but the mechanism of this effect has not been clarified.

7. One other possible factor is the hypertension produced in some cases, particularly those treated for several weeks. In 1 case of acute lupus erythematosus, not included in this present study, a subarachnoid hemorrhage followed an acute rise in blood pressure after treatment with adrenocorticotropic hormone for three days.

It is evident that the electroencephalographic changes cannot be attributed to any one of the factors already enumerated. It is probable that several of these or other as yet unknown factors are operating to produce these electroencephalographic abnormalities in any individual case.

Previously there have not been reports of electroencephalographic changes after administration of the hormone. However, there are several brief observations of electroencephalographic changes in relation to adrenocortical steroid administration or dysfunction of the adrenal cortex. Grenell and McCawley noted 'increase in amplitude and some change in frequency of brain waves' after administration of adrenocortical extract to cats and 'incipient changes of a similar nature' after administration of this extract to human subjects. Boland and Headley noted increase in frequency of alpha

> waves after administration of cortisone. We have observed 2 patients with rheumatoid arthritis who have been treated with cortisone, one after an initial course of pituitary adrenocorticotropic hormone therapy. In both of these a slight slowing of alpha activity appeared which was much less pronounced than that observed in the series of patients receiving the latter drug.
>
> It seems, therefore, that there is a significant relationship between adrenocortical activity and the electrical activity of the brain. At present the physiologic basis of this is obscure. Prior to treatment 8 of our 15 patients had shown mildly abnormal electroencephalographic tracings. This would strongly suggest metabolic or other changes of a minor degree reflecting on activity of the central nervous system."

A thorough investigation into biochemical differences between psychotics (manic depressives and schizophrenics) and normals was conducted by Altschule, Promisel, Parkhurst and Grunebaum[35].

They summarise their conclusions as follows:

> "Changes in eosinophil count, uric acid and 17-ketosteroid excretion and sweat sodium concentration after the injection of ACTH are not diminished in psychotic patients as compared with the changes in non-psychotic subjects. Patients with schizophrenia or manic-depressive psychoses appeared to show greater than normal changes in carbohydrate metabolism after the injection of ACTH."

The action of diisopropylfluorophosphonate (DFP) may have some bearing on the hypothesis we are considering, for according to the work of Rowntree, Nevin and Wilson it has characteristically the opposite effect to ACTH and cortisone in the schizophrenic and manic-depressive patients they tested where it tended to produce depression. This should be coupled with the fact that biochemically it is the most active of anti-cholenesterase compound.

And...

And in conclusion let us turn to biochemical findings less obviously related to our hypothesis.

R. Klein's[36] investigation on clinical and biochemical investigations in a manic-depressive with short cycles also relates specifically psychiatric and biochemical features. He reports the following items in respect of one of his cases:-

> "Biochemical investigations were carried out during a number of cycles. The patient was kept on a constant diet with constant fluid and salt intake. Of the constituents investigated, abnormal values were shown only by blood cholesterol and by urinary excretion of cortin and beta-17-ketosteroids. Special tests relating to water and salt metabolism were carried out. When three pints of water were given on an empty stomach, the peak of urinary output occurred regularly two hours after administration in the manic phase, and after the third hour in the depressive phase. If 10 units of pituitrin were injected when the water was given, diuresis and dilution of urine continued to occur earlier in the manic phase. When salt (10 gm.) was administered with the usual quantity of fluid at breakfast excretion of both salt and water was more delayed in depressive stages than in manic phases. During depression, then, increased sleep was associated with salt and water retention, and in mania, sleeplessness was associated with release of salt and water. Depression corresponded with a normal night pattern, mania to the day pattern. The normal daily biphasic pattern was thus replaced by a cycle determined by the duration of the manic and depressive phases. A disturbance of a regulatory diencephalic mechanism was considered possible."

A study of H.L. Wikoff[37] suggests that the bromine content of the blood in both manic and depressive phases are below normal but above the average for the remission group of manic-depressive psychosis.

3. <u>Heredito-Constitutional Framework</u>.

To my mind the most satisfactory and up-to-date survey of the genetic position in the realm of manic-depressive psychosis and involutional melancholia is

made...

made by Franz J. Kallmann in his paper The Genetics of Psychoses - An analysis of 1,232 Twin Index Families, prepared for the Congrès International de Psychiatrie, Paris, 1950[38].

In his own original investigation he applied very rigorous diagnostic criteria for manic-depressive psychosis as the following passage shows:-

> "As a matter of general deliniative principle, our diagnosis of manic-depressive psychosis was based on the periodicity of acute, self-limited depressions, unadulterated manic states, or varying combinations of both. These psychotic episodes were expected to manifest themselves before the fifth decade of life and often occurred in persons of cyclothymic temperament; that is, in persons capable of establishing satisfactory human contact despite minor periodic mood alterations. If the clinical evidence was limited to one major attack of elation or depression prior to the involutional period, the tendency to diminutive but definitely cyclic mood swings was considered a mandatory criterion. Such cycloid equivalents were seen in periodic intensifications of irritability, uninhibited overactivity, dipsomanic restlessness, and rude aggressiveness with intolerance towards criticism, or in recurring manifestations of diminished activity, obscure fatigue, despondent anxiety, and hypochondriacal dejection. Alternation or a mixture of manic and depressive features seemed fairly common, although the frequency of depressions definitely exceeded that of manic states.
>
> The classification of manic-depressive psychosis was not accepted, if a depression was clearly reactive and occurred in a generally stable and well-adjusted person in response to an unusual constellation of distressing experiences, or if it appeared largely situational in a chronically neurotic or involutional setting, that is, under conditions of habitual vulnerability to stress. Neither reactive nor "neurotic" depressions were included in this survey, although some of them may have been closely related to the clinical syndrome of periodical depressions described by Pederson, Poort and Schou as an 'independent nosological entity' in predominantly asthenic persons. Of course, common, verified cases of presenile brain atrophy (Alzheimer, Pick) were also omitted."

Kallmann goes on to give his criteria for diagnosis of involutional psychosis as follows:-

"On...

> "On the other hand, primary menopausal and presenile depressions, agitated anxiety states associated with hypertension or similar somatic conditions, and other non-periodical forms of depressive behavior in the involutional period (50-69 years of age) were placed in the category of involutional psychosis, together with the straight cases of involutional melancholia characterized by restless agitation, rigid-compulsive obstinacy, and varying combinations of depressive, obsessional and delusional symptoms."

Further light as regards Kallmann's basic notions concerning involutional psychoses is afforded by the following passage in his summary of the paper under consideration:-

> "It is indicated by this part of the analysis that the diagnostic category of involutional psychoses is either less homogeneous clinically or more complex pathogenetically than those of schizophrenia and manic-depressive psychosis, although the effect of certain genetic relationships is readily apparent. There is reason to believe that many cases of involutional psychosis require varying combinations of etiological components, the most important of which are involutional changes in physical and mental adaptability, cumulative strain and emotional insecurity due to increasingly conspicuous signs of aging, and some basic personality traits (rigidity, compulsiveness, oversensitivity) frequently associated with schizoid personality deviations. It is also likely that a few cases are late-developing and attenuated process of schizophrenia precipitated only by the impact of the involutional vicissitudes of life, although our material includes no more than one dizygotic twin pair with a schizophrenic psychosis in one partner and with an involutional psychosis in the other. Some other cases are possibly related to the emotional vulnerability of cycloid personality types, but there is little doubt that the principal genetic affinity of involutional psychosis is to the group of schizoid personality traits and, therefore, to the schizophrenic disease entity rather than to that of manic-depressive psychosis."

The manic-depressive and involutional psychosis material of Kallmann's study comprise 23

monozygotic...

monozygotic and 52 dizygotic manic-depressive twin-pairs and 29 monozygotic and 67 dizygotic involutional psychosis twin pairs - and their families. The findings may be schematically represented as follows (part of Table II in Kallmann's article):

From Kallmann:
The Genetics of Psychosis,
Paris 1950.

Excerpt from **TABLE II**

Distribution of Psychoses in Psychotic Twin Index Families

	Psychotic Twin Index Cases		Adult Members of Twin Family Unit available for Study (over 14 years of age)				Total Number of Persons	Corrected Expectancy Rates* in Relation to Original Psychosis						Collective morbidity Rates *** for Parents and Siblings			
	Monozygotic	Dizygotic	Co-twins	Full Siblings	Half Siblings	Parents		General Population	Parents	Half Siblings	Full Siblings	Dizygotic Co-twins	Monozygotic Co-twins	Schizophrenia	Manic-depressive Psychosis	Involutional & Senile Psychosis	Emotional Instability
Manic-Depressive	23	52	68	184	12	122	461	0.4	23.4	16.7	23.0	26.3	95.7**	-	21.2	1.8	13.4
Involutional	29	67	78	256	14	159	603	1.0 (including senile	6.4	4.5	6.0	6.0	30.9	4.3	0.8	10.0	6.8

* Related to one-half of the persons in the age group 15-44 and to all persons over age 44 with respect to schizophrenia and manic-depressive psychosis; to all persons over age 44 with respect to involutional psychosis; and to all persons over age 59 with respect to senile psychosis.

** Uncorrected since the corrected percentage exceeds 100.

*** Related to all persons over age 14 with respect to schizophrenia, manic-depressive psychosis and emotional instability; and to all persons over age 44 with respect to involutional and senile psychoses.

Kallmann's comparison of these taint figures of his with those of other workers is a convenient method of presenting these findings of others here:-

> "The task of comparing our taint figures for manic-depressive family units with those procured by previous investigators is rendered rather difficult by the quantitative limitations of, and various technical discrepancies among, the clinical samples which have been available in this group. Generally speaking, our figures are about halfway between 10.0 and 33.3 per cent offered by Wagner with reference to siblings with and without one manic-depressive parent, and they are moderately higher than the rates obtained by Slater[39] for the parents of manic-depressive index cases (11.5 - 17.5 per cent), by Röll and Entres[40] for the siblings (9.1-11.1) and parents (10.4-12.2), and by Luxenburger[41] and Rosanoff's research team[42] for dizygotic cotwins (5.9-16.4 without statistical correction). The diagnostic peculiarity of Hoffmann's[43] survey have already been stressed by Slater, and it is also certain that Tomasson's[44] finding of an equally high expectancy rate for both the siblings of manic-depressive patients and a corresponding general population (about 7 per cent) is valid only under such unusual demographic conditions as apparently prevail in regard to the isolated population of Iceland."

The above might profitably be elaborated somewhat by giving the figures of twin studies of other investigators. Luxemburger in 25 sets of manic-depressive twins found the high concordance rate of 96% for the monozygotic pairs and a low concordance for the dizygotic pairs. Rosenoff's material comprised 90 pairs, 23 monozygotic and 67 dizygotic. The monozygotic and dizygotic concordance rates were 70% and 16% respectively. Humm's[45] 22 sets comprised 8 monozygotic and 14 dizygotic pairs. Concordance among the former was 75% and among the latter 7%.

Turning to the type of genetic mechanism underlying manic-depressive psychosis we may cite the following passage from Kallmann's paper in which he

argues...

argues the case for irregular dominance in manic-depressive psychosis as opposed to recessiveness with respect to the main genotype of schizophrenia. (In the course of this rival hypotheses are alluded to):-

> "The balance of evidence concerning the mode of inheritance operating in the two major types of psychosis points to recessiveness with respect to the main genotype of schizophrenia, and to irregular dominance with respect to that of manic-depressive psychosis. It was quite easy for Slater and Csik and Mather[46] to refute Rosanoff's theory of two dominant factors for manic-depressive psychosis, one autosomal and the other sex-linked. More difficult to disprove is the theory of multifactorial inheritance as favored by Penrose[47] and other geneticists, especially since it is necessary to assume the operation of both secondary constitutional modifiers and salient environmental influences in order to explain the tendency of manic-depressive phenomena to vary phenotypically in monozygotic twin partners as well as in other members of the same family unit. According to Penrose's hypothesis, there are a number of different types of manic-depressive predisposition, most of which are assumed to be inherited as dominants, while the usually delayed onset of the disease in the male is ascribed by him to selective modification by nature, that is, to the fact that the male reproductive period continues longer than that of the female. It would seem preferable, however, to accept the contention of Slater and Luxemburger that a single-dominant type of inheritance is not precluded by the available evidence for the transmission of the principal genetic factor for manic-depressive psychosis.
>
> In any case, there is an increase (from an expected rate of about 0.5 per cent to an observed rate of 5.0 per cent) in the number of consanguineous marriages found among the parents of our schizophrenic-index cases, but not a single instance of such a mating has been discovered among the parents of our small sample of manic-depressive index twins. In addition, approximately 60 per cent of manic-depressive twin index cases come from matings between one normal and one manic-depressive or cycloid parent, while the preponderant trend of transmission in schizophrenic index families is in the collateral rather than in the direct line of descent. More refined statistical tests of the hypothesis of dominance are complicated by the fact that the sibships of our manic-depressive index cases include 65 more or less unclassifiable siblings in addition to 32 manic-depressive, 43 cycloid and 84 normal persons. However, if the unclassified persons are omitted and the cycloid persons are added to the clearly manic-depressive cases, the ratio of affected to unaffected persons is 0.9 1, closely approximating the ideal ratio of 1 : 1.

53/...

~~From Kallmann:~~
~~The Genetics of Psychoses~~
~~Paris 1950~~

From Kallmann:
The Genetics of Psychoses,
Paris 1950.

Excerpt from T A B L E III

Reproductive Trends in normal and psychotic Twin Family units

Type of Family Unit	Rate of Celibates				Rate of Married Persons Without Children				Number of Children Per Fertile Married Person			
	Twins		Siblings		Twins		Siblings		Twins		Siblings	
	With Psychosis	Without Psychosis	With Psychosis	Without Psychosis	With Psychosis	Without Psychosis	With Psychosis	Without Psychosis	With Psychosis	Without Psychosis	With Psychosis	Without Psychosis
Schizophrenic (Over Age 45)	50.7	33.3	43.5	17.1	9.8	24.3	24.6	19.9	2.4	2.5	2.0	2.6
Manic-Depressive (Over Age 45)	27.8	14.3	26.6	6.1	22.2	7.1	26.6	13.6	1.7	2.0	2.0	3.1
General Twin Population (Over Age 60)	-	13.3	-	11.7*	-	19.2	-	15.5	-	3.0	-	3.2

* Celibacy rate for the general population over age 60 of the State of New York (U.S.Census 1940) : 11.6%.

Kallmann introduces a note on the reproductive rate of manic-depressives to explain the relative rarity of the condition as follows:-

> "The relative infrequency of manic-depressive psychosis seems largely explained by factors of selection, which tend to reduce the reproductive rate of the carriers of the dominant genotype. Although the reduction of marriage rates is less pronounced in the manic-depressive than in the schizophrenic group of index families, it is clearly demonstrated by the comparative reproductive data tabulated in Table III, that manic-depressive twins and siblings marry less frequently, tend more often to remain childless when married and produce fewer children if fertile, than is true for the non-psychotic persons among their cotwins and siblings as well as for the general population. In fact, the fertility rates of manic-depressive twins are even lower than the corresponding rates of schizophrenic twins, and it may also be of interest that the chance of finding a mate is less favorable for a non-psychotic member of a manic-depressive sibship, if the relationship is to a manic-depressive cotwin rather than to a manic-depressive brother or sister.
>
> The differences in the celibacy and fertility rates of psychotic and non-psychotic twins in the manic-depressive sample are from 27.8 to 14.3 per cent and from 1.7 to 2.0 children per married person, respectively. The corresponding differences between the two groups of siblings are from 26.6 to 6.1. per cent and from 2.0 to 3.1 children. Although the given differences fail, on account of the relatively small size of the sample, to meet the criteria of statistical significance at the 1 per cent level of confidence, they show a sufficiently consistent trend to be taken as an indication of a diminished chance of reproduction for manic-depressive persons. Since a majority of these patients may be expected to be only heterozygous carriers of the pathological genotype, it follows that reproduction by transmission through the collateral lines of descent will be less frequent in the manic-depressive than in the schizophrenic type of psychosis."

(Table of celibacy and fertility rates appears opposite).

The transition from the field of genetics to that of constitution in the field of manic-depressive psychosis is effected in the following paragraph from Kallmann's article (for the illustrations alluded to it will be necessary to refer to Kallmann's paper itself):-

"Some...

> "Some clinical data recorded in the long-term observation of our series of concordant one-egg twin pairs seem to confirm the much-discussed theory that the affective instability and biochemical dysfunction produced by the manic-depressive genotype are likely to show a considerable range of phenotypical variability and probably are correlated with the genetic factors for gout and diabetes and especially with a tendency to obesity. The extent to which the trends and cycles of pathological mood alterations may vary on the basis of the same genotype, is graphically illustrated in figure 3 for a 17-year period in the history of the B. twins (Fig.2), two unmarried men who are active in similar professions but have frequently displayed affective swings in opposite directions. It is also interesting to note that in the developments of the originally completely similar and equally pyknicobese C. twins (Fig.4), a definite difference in the present severity of their clinical symptomatology corresponds with a pronounced variation in the degree of their obesity as indicated by a weight difference of over 35 pounds. While the stouter twin still shows an almost continuous succession of depressions, the slimmer twin has been free of severe depressive attacks for several years."

Having entered the field of constitution we must first refer to the constitutional system enunciated by Ernst Kretschmar[48] in his Physique and Character, by far the most influential work on this subject. The details of this system are far too well known to warrant extensive exposition here. The central argument as it affects our theme is that the manic-depressive psychosis and the normal personality type from which it arises are associated with a special type of physique, the pyknic, in contrast to schizophrenia and the normal personality type from which it arises, that are associated with other types of physique, notably the asthenic but also the athletic and dysplastic.

Among Kretschmer's disciples are Wertheimer and Hesketh[49] whose original contribution was evolving an anthropometric index based on skeletal points alone which they claim provides the most accurate method of

distinguishing...

distinguishing pyknic, asthenic and athletic types. This constitutional index bears the imprint of di Giovanni's conception that the impression of the existence of morphological types is based on the relationship of trunk volume to limb length.

Nolan D.C. Lewis[50,51,52,53] has made a contribution in the realm of internal anatomy comparable to that of Kretschmer for external indications of physique. From his extensive autopsy studies he finds a high or over-development of the arterial, lymphatic, endocrine and gastro-intestinal systems in contrast to the hypoplastic condition of these systems in dementia praecox. This forms the basis on the physical side of Lewis' hypercompensatory (Manic-depressive psychosis) and regressive (dementia praecox) types.

W.H. Sheldon's[54,55,56] well-known somatotypes are in essence merely a reformulation of the Kretschmerian typology in terms of three independent variables each of which is identified with the degree of development of an embryonic layer. Corresponding temperamental variables are enunciated and an association claimed with the appropriate physical variables. Although to my mind this system is derived on an a priori basis rather than from a critical analysis of empirical findings, the notion of the athletic and asthenic tendencies (otherwise named by Sheldon) as an expression of the degree of development of the mesodermal embryonic layer has been fruitful when reinterpreted in the light of Kallmann's constitutional views implicating the reticulo-endothelial system which is a mesodermal structure.

M. Sahai[57] in his work on Circular Mentality and the Pyknic Body Type employs a much more authentic

approach...

approach than the last-mentioned author for he applies the statistical technique of the tetrad criterion to actual empirical data, viz., circular mentality as defined by eight traits and the pyknic bodily constitution defined by six traits. He concludes that:

> "Physical traits taken singly do not correlate significantly with the total score of circularity. Hence - so far as relation to the mental side goes, single bodily characteristics do not mean anything. It is the type - the total makeup of the body that counts and notany one physical quality or the other.
>
> The total bodily makeup, however, does seem to be mirrored somehow in the face, as seen in the correlation of photographs and circularity.
>
> The mental characteristics taken singly are more significant as regards their relation to the physical type. But here also the correlations are invariably lower than the correlation of the total character with the total physique and in the case of three traits viz. sociability, frankness, tendency to enjoy the gifts of life, are less than 4 P.E. and hence quite insignificant.
>
> There is in all probability a covariation between circularity, the mental side, the pyknicality, the physical side - there being a correlation of .36 + .04 in the combined results of the two pools. Through significant, this correlation is not of an order of magnitude which would justify an attempt at estimating the character of an individual from an examination of his body."

(An extensive survey of the work of the above writers and of a great number of other constitutionalists will be found in my work (reference 1)referred to in the Introduction, pp. 62 - 116.)

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C H A P T E R III.

MATERIAL AND PROCEDURE OF THIS INVESTIGATION.

The material of this investigation comprises 167 e.e.gs of manic-depressive and involutional melancholic patients of Weskoppies Hospital, Pretoria. This number includes 48 repeats. (The detailed distributions are set forth in the tables in the following chapter). In addition there are 2 e.e.gs of a patient who developed a manic state under cortisone treatment - one during the latter part of the psychotic episode and one after it had subsided. The patients were transported by van from Pretoria to the National Institute for Personnel Research, Johannesburg, which meant that from the point of view of psychiatric and psychological assessment I was in their company for two periods of about an hour during the journeys as well as during the test and often at other times of the day - perhaps a rather unique feature of this study.

These recordings were carried on for a period of over two years, from 21st April, 1949 to 21st June, 1951.

1. Clinical and Psychological Assessment.

A standard classification of manic-depressive psychosis and its sub-groups was adopted. The diagnosis of the condition as manic-depressive psychosis was dependent on the strict conception of the disease quoted from Kallmann in the last chapter. The sub-groups employed were as follows:-

1) mania (plain), chronic mania, recurrent mania;

2) depression, recurrent depression;

3) ...

3) alternating, i.e. with normal intervals between psychotic episodes which are of both manic and depressive types;

4) circular, i.e. episodes of both manic and depressive types running into each other;

(5) attacks of double form i.e. each psychotic episode comprising a manic and a depressive phase merging into each other but with intervals of normality between every group of these double attacks. One case only of this type occurred in our series and for statistical reasons it was accordingly grouped with the circular cases).

The standard view of involutional melancholia was adopted rather than the wider concept of involutional psychosis enunciated by Kallmann and cited in the last chapter. Thus we here included only cases of melancholic mental content without impairment of the intellectual functions, occurring for the first time in the involutional period.

The degree of the mania or depression at the time of the e.e.g. was assessed on a 3-point scale, as follows:-

Mania

Degree 1 : Hypomania - euphoric and/or aggressive, mildly overactive, talkative in a rapid fashion with a tendency to distractibility and mild flight of ideas. (M_1)

Degrees 2 and 3: Moderate and gross exaggeration of the features of degree 1, often associated with fleeting delusions of grandiose and persecutory types. (M_2)

Depression/...

Depression

Degree 1 : Relatively mildly depressed mood, with mild inhibition or agitation but without delusions of depressed type. (D_1)

Degrees 2 and 3: Exaggeration of the depressed mood and of the agitation or inhibition (amounting in Degree 2 to mild and in Degree 3 to profound stupor) of degree 1 and often with overt or indirect evidence of delusions of depressed type. (D_2 and D_3).

Our material contained examples of both Degree 2 and 3 depressions but none of Degree 3 mania for the obvious reason that no such grossly excited case could be transported and be submitted to an e.e.g. test. For statistical purposes, therefore, we have decided to group Degrees 2 and 3 depression for the sake of uniformity with the manics - so that in both cases there are sub-groups exhibiting a milder and a severer degree of the tendency in question.

The question of what is meant by a mixed phase merits special consideration as there is often a tendency to refer to circular or even alternating forms of manic depressive psychosis as mixed in view of the fact that both types of phase are represented. In the present study such a usage is emphatically rejected, the term being used in the strict sense of the co-existence at one and the same time of symptoms characteristic of both the manic and the depressed phase - or at the very least extremely rapid fluctuations within the span of seconds between manic and depressive features. These states are classified in Kraepelin's standard system under the

heads...

heads of maniacal stupor, agitated depression, unproductive mania, depressive mania, depression with flight of ideas and akinetic mania. Henderson and Gillespie regard all of these, with the exception of agitated depression and sometimes maniacal stupor, as transition phases (between manic and depressed attacks).

Insight into the composition of such mixed states may be obtained by regarding them as mixtures of varying degrees of the three psychological components 1) mood, elated or plus, depressed or minus, 2) motility, overactivity or plus, inhibition or minus, 3) psychic tempo, as revealed in rapid talk with distractibility and flight of ideas rated as plus, or in retardation of speech and varying degrees of inaccessibility rated as minus. Accordingly we have rated all our cases at the time of the test as plus or minus on each of these components and a table of the varying constellations accompanied by verbal characterisations will appear in the presentation of results. Only the contrasting groups of agitated and inhibited depressions are sufficiently large to warrant statistical analysis. This latter contrast holds out hopes of being fruitful and rich in implications in view of the claims (1) on the electroencephalographic side by Davis (already attended to) as to a relative predominance of A and M type records in the inhibited and of MF or B records in the agitated type of depression and (2) on the psychological side by Dom T.V. Moore, on the basis of Hsi Hsun's factor studies, of a difference between the two types of depression brought about by possession or absence of the mutually exclusive independent variables "anxiety" and "retardation".

In addition to a clinical and psychological

assessment...

assessment of each case at the time of the test an assessment was made on the basis of a thorough study of the case record as to whether the manic or depressive phases were predominant or whether they were equal.

Thus, to summarise, our salient psychiatric data to appear in a subsequent statistical analysis we may say that as regards the phase of the test cases were classified as 1) manic, 2) depressed, 3) normal, 4) mixed and as regards the predominant phase of the case as 1) manic, 2) depressed, 3) manic = depressed.

(As regards the symbolic representation of predominant phase on the forms appearing in the appendix - where only one type of phase, manic or depressed occurs, the entry is M or D, when both types of phase occur the symbol for the predominant phase appears on top and that for the less predominant below it in a bracket, and when they are equally prominent no bracketing is employed.)

Our psychiatric and psychological assessment of every case was checked by a review of the case at the end of the project. There was moreover a precaution against diagnostic subjective bias in the fact that no case was included in our series where the diagnosis of manic-depressive Psychosis or Involutional Melancholia had not also been made independently by the doctors' conference of Weskoppies Hospital (average size of conference 7 to 8 doctors - approximately half of whom can lay claim to senior psychiatric experience).

2. Electroencephalographic Procedure.

Instrument and Apparatus.

A 6-channel Ediswan electroencephalograph* was employed and for the later recordings an Ediswan analyser also. Chlorided silver electrodes covered with gauze and

* Except for 6 cases done on a one-channel Garcean machine at Weskoppies Hospital.

soaked...

soaked in a saline solution were held in position on the scalp by means of a rubber and whalebone cap of the type commonly used in beauty salons. The standard Grey Walter placement of the electrodes was adopted.

Recording Technique.

This also followed Grey Walter's[3] standard procedure. In the great majority of cases the patient was lying supine on a couch with a head-rest designed to present minimal interference with the electrodes. As the subjects were mental patients a few cases were too resistive or otherwise unco-operative for this position and they were tested in the sitting posture. The usual paper speed was 1.5 c/sec. Eye closure and eye opening as well as hyperventilation was required of all sufficiently co-operative cases. Stroboscopic flicker was also employed but the results do not form a part of this report.

Records were invariably for several minutes and the hyperventilation period was for three minutes.

The interval between the e.e.g. and the time of the last meal was also noted, as the degree of starvation or satiety as reflected notably in the blood sugar level is known to affect the e.e.g.

The interval between the e.e.g. and shock therapy and the extent of the course of shock treatment were also recorded in every case for reasons mentioned in the last chapter.

3. Electroencephalographic concepts employed.

The concepts of the e.e.g. rhythms current in the British school of Grey Walter[4] were adopted. The standard sub-divisions of this school are into alpha,

beta...

beta, theta and delta rhythms which are defined and conceived of as follows:-

Alpha "A rhythm of about 10/c/s (8-13 c/s) associated with physiological inactivity of the parieto-occipital areas and usually attenuated by physiological stimuli". The amplitude range is from 5 to 100 microvolts. "It 'blocks' with visual stimuli and to a lesser extent with mental and auditory activity although the extent to which this latter is due to conditioning responses is not clear. There is however a relation between the amount of visual imagery employed during thought and the type of alpha rhythm, those with small and intermittent alpha using predominantly visual images (M type), those with a classically responsive alpha being able to produce visual images when wanted (the C or R type), and those with a persistent alpha which is hard to block finding it difficult to produce a visual image (P type). The latter tend to use auditory, kinaesthetic and other images. It is not known whether specific training in visual imagery during maturity would produce any permanent modification in the type of alpha rhythm, but it is noteworthy that alpha activity of the blind may become very susceptible to blocking by auditory or other stimuli. Alpha activity is rarely monorhythmic but

contains...

contains a number of separate components. It is closely associated with visual perception and integration, and probably plays a large part in imagination. A possible mechanism for its function is that of a scanning mechanism which oscillates in a characteristic fashion so long as nothing is projected on the visual cortex for analysis, but as soon as this does happen the oscillation is diminished according to the size and complexity of the field and whilst examination takes place. Signals are then despatched to other centres in the form of frequency modulated action potential volleys, since the representation in the association areas resulting from the scansion of the projected visual field will be a function of time of the spatial pattern" (A.C. Mundy-Castle)[5]. Grey Walter has built a model consisting of a photocell projected on to a cathode ray oscilloscope screen and fed back into the CRO again which is capable of carrying out the above functions and which behaves in a similar manner. A.C. Mundy-Castle[6] has devoted an article to the hypothesis of the alpha rhythm as a scanning mechanism.

Beta "A rhythm with a frequency between 15 and 30 c/s." Its average amplitude is 20 microvolts and its usual location is frontocentral. It is possible that it is augmented by sensory repose. Its functional significance is unknown. It is possible to interpret...

pret it as an extension of the hypothesis of scanning in connection with the alpha rhythm to regard it as an harmonic of alpha, as a rhythm of 14 to 30 c/sec. has sometimes been reported with the blocking of the alpha rhythm. It is associated with anxiety in normals and is said to be characteristic of anxiety neurosis.

Theta "A rhythm of 4 - 7 c/s. most common in the parieto-temporal areas, and sometimes associated with emotional activity". Its normal average amplitude is 10 microvolts in adults and 50 microvolts in children. It characterises the early stages of functional development of cortico-basal mechanisms. Abnormal theta activity suggests a lesion in the vicinity of the thalamic nuclei or third ventricle. "As a result of its deep origin it is rarely focal, being evident as generalised activity and apparent in all channels. It is also associated with functional disorders notably aggressive psychopathy where frequent bursts of 4 - 6 c/s activity may be seen arising in the post-central regions. If voluntary hyperventilation is carried out by such cases as these, thus disturbing the normal acid-base balance (ph) in the cerebral blood supply, a highly abnormal response may also be apparent in the form of persistent 2-3 c/sec. activity together with occasional paroxysmal outbursts

of the...

of the 4-6 c/sec. components. A normal response to hyperventilation may show some slow activity but little more, whilst the return to the undisturbed state is extremely rapid. Hill[8] has called the above psychopathic disturbance 'Dysrhythmic Aggressive Behavior' (D.A.B.), attributing it to incomplete cortical development. An act of aggression by such a personality could conceivably be carried out without consciousness of the actions concerned, due to removal of cerebral control over the hypothalamus. Hypoglycaemia, hyperventilation, hydration and alcohol all help to increase dysrhythmia and are probably the chief contributors to D.A.B. attacks. Most noticeable with such electrical activity as this is its similarity to that found in some types of epileptic disturbance, also marked by loss or diminution of consciousness and precipitated by similar stresses. The occurrence of an aggressive psychopath seems to be determined by a combination of an electrically unstable cortex with unfavourable biochemical and environmental stresses." (A.C.Mundy-Castle).

Delta "A pathological slow rhythm of 3 c/s. or less". Rhythms of this low frequency occur physiologically in the early stages of cortical maturation and also in sleep in adults when the normal average amplitude is 100 microvolts. Abnormal delta activity is usually indicative

of ...

of cortical disfunction due to the destruction of brain cells. It occurs focally in acute local cerebral lesions - trauma, tumour, abscess, etc. It is generally accepted that the lower the frequency and the greater the amplitude the more acute the lesion. It occurs in a diffuse fashion with raised intercranial pressure, concussion, toxic conditions with disturbance of consciousness and generalised inflammatory and degenerative conditions.

The concept of gamma activity is rejected by the British school.

The table appearing upon our forms in the Appendix provides spaces for the recording of the average frequency, the average amplitude, the location and the per cent. time for each of these rhythms. There is also space for the recording of responsiveness to visual stimulation and hence the classification of the alpha rhythm as M, P, or R (C).

We have already entered into an extensive discussion of Pauline Davis' notion of "choppy" records. Although in our opinion such records were due in part to the presence of muscle artifact not recognised as such by Davis, we nevertheless feel that the underlying general notion of irregular records due to disorganisation of rhythms to be a fruitful one, especially in relation to the hypothesis of a disturbance of rhythms and their integration by a toxic and organic process in manic-depressive psychosis

We...

We have therefore recorded irregular records and have sought an explanation of this irregularity in terms of the absence or excess of certain rhythms and the constellations of their intermixtures - in the first place by direct inspection of the records and later in several cases by an inspection of the analyser trace (frequency analysis spectrum).

Opposite "choppy" on our forms we have noted where the record appears to be irregular with a rough tentative explanation, in the terms to which we have just referred, of how this came about. Afterwards, however, a more systematic search for such records was undertaken from this point of view, the results of which appear in our presentation of results: this gives a more adequate impression of our findings in this regard than do the preliminary entries on the form.

The forms also provide a space for the response to hyperventilation.

Finally, the records are classified as normal, questionably normal or abnormal in terms of the criteria of abnormality laid down on pages 379 and 380 of Hill and Parr's Electroencephalography[8] already referred to. They are as follows:-

> "In order to enable a clinical interpretation to be made from records, a series of criteria of abnormality was drawn up in 1945 which could be applied to the record by observation and measurement.
>
> The introduction of automatic wave-form analysis into the E.E.G. recording technique has naturally modified these criteria and enabled a more accurate theory to be laid down. Modifications due to automatic analyser methods are noted in italics under each item. (Underlining instead of italics here).
>
> The criteria refer in all cases to the adult (sexually mature) male or female.

(1) A ...

(1) A dominant rhythm of less than 8 c/s in the record.

In terms of energy content of the various frequency bands, this corresponds to an energy peak at a frequency of less than 8 c/s which is more than 50% greater than any above 8 c/s from any area.

(2) A burst of less than 8 c/s in which the amplitude is over 50% of the dominant rhythm; or a burst of less than 8 c/s in which the amplitude is less than that of the dominant rhythm, but which is localisable.

(3) An unstable dominant frequency; i.e., one which appears to increase or decrease repeatedly by more than 10%.

Variation of the main energy peak in the 8-13 c/s band by more than 1 c/s from epoch to epoch, or the presence of many harmonically related components.

(4) Burst at a frequency exceeding 4 c/s, in which the amplitude is over 50% of that of the dominant frequency. These have, however, been observed in subjects with no clinical features.

(5) The recurrence of random single waves or complexes with a voltage higher than that of the dominant frequency and not associated with it.

In this case the frequency spectrum shows energy in the low frequency bands, or an unusual arrangement of the spectrum indicating a continuous or intermittent rhythm masked in the primary record.

(6) The failure of arousal stimuli to stop the dominant rhythm, e.g. intense mental effort with eyes open or shut, eye movements, etc.

The failure of any stimulus whatever to reduce the 8-13 c/s energy peak.

(7) Asymmetry of the rhythm in the two hemispheres: (a) amplitude asymmetry of more than 50%, or (b) consistent frequency asymmetry of a measurable order.

This asymmetry applies only to the peak in the 8-13 c/s band unless a very long epoch is taken.

(a) The peak amplitude of the 8-13 c/s band is more than twice the amplitude in the other hemisphere.

(b) Any consistent difference in the 8-13 c/s peak frequency in the two hemispheres.

(8)...

(8) The appearance of (a) rhythmic outbursts of high voltage waves at a frequency of 2-3 c/s and (b) simusoidal or spike complexes, and (c) rhythmic outbursts of waves of a higher frequency immediately after two minutes' overbreathing.

The presence of harmonically related peaks of similar size throughout the spectrum.

Note: The effects of overbreathing are more complex than was at first supposed."

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1. CRUDE DATA - TABLES AND DEFINITIONS OF DISORGANISED TYPES.

C H A P T E R IV.

PRESENTATION OF RESULTS.

In this chapter it is proposed to present our results as follows:-

First we shall set forth our crude data in the form of Tables which will indicate the distribution of our clinical material in terms of predominant psychotic phase, phase at test, change of phase, psychological and psychiatric constitution of mixed phases, standard clinical sub-groups, age, sex, race, etc. Secondly we shall submit the results of the statistical analysis of the crude data. Thirdly we shall describe in some detail the clinical and electroencephalographic features of a manic-like psychosis, whichdeveloped in the course of administration of cortisone for the treatment of rheumatoid arthritis - as bearing on the hypothesis of the role of cortisone in the aetiology and pathogenesis of manic depressive psychosis which we have been considering.

TABLE I.

PREDOMINANT PHASE.

Predominant Phase - prior to Test		Manic	Depressed	Manic=Depressed	
Involutional Melancholia			18 191, 64,259, 444, 92,136, 343, 65,465 504, 59, 99, 162, 72, 66, 60, 85,400		18
Manic-Depressive Psychosis	Recurrent, Chronic, Plain Mania	25 49,261,365, 608,234, 51, 50,208, 98, 252,467,456, 91,322,399, 73.N.E.'s: 51,174, 90, 113, 88, 48, 158, 47, 89.			25
	Recurrent, Chronic, Plain Depression		17 601, 67,603, 446, 82,209, 345,219,193, 407,367,542, 324,602, N.E.173, N.K. 93, 98.		17
	Alternating	12 74,260,189, 38, 39, 58, 90,366,593, 222. N.E.'s: 49, 98.	2 425, 137	9 93,253,146, 102,344,161, 83, 52, 63.	23
	Circular	20 145,420, 36, 323, 37,426, 528,527, 89, 543,233, 57, 251,522,272. N.E's: 117, 101,100, NK's:51,8348	7 346,220,369, 505,497,424, 84.	7 495,138,101, 398,584,496, 100.	34
		57	44	16	117

PHASE AND SEVERITY OF PHASE AT TEST.

Phase at Test / Severity of Phase			Manic		Depressed			Normal Phase	Mixed Phase	
			Degree I	Degree II	Degree I	Degree II	Degree III			
Involutional Melancholia	Agitated Depression				2. 136, 66		3. 65, 59 162	2. 191, 72		18
	Retarded Depression				3. 64,259 400	7. 85, 60 99,504 455,343 444	1. 92			
Manic-Depressive Psychosis	Recurrent, Chronic Plain Mania		10. 73,322 456,365 49, N.E. 51,113 88, 89 47	11. 261, 50 208, 98 252,467 91,399 N.E. 90, 48 168				4. 608,234 51. N.E. 174		35
	Recurrent, Chronic, Plain Depression	Agitated Depression				1. 601	2. 67,603	000'445		4
		Retarded Depression			6. W.K.98 82,345 219,542 N.E.173	3. 407,193 W.K.93	4. 209,367 824,602			13
	Alternating		8. 63,146 253, 90 189,260 74. N.E.98	3. 593,161 N.E.49	4. 39,425 844, 52			3. 38,102 83	5. 58 366 222 93 137	23
	Circular		6. N.E.100 100,496 497,272 426.	6. 36,528 89,251 W.K. 51,6348			2. 846,138	9. 823,527 543,220 495,101 [illegible] N.E.101	11. 145 57 420 84, 233 522, 369 505, 424 298 NE. 117	34
			24	20	15	11	12	19	16	117

TABLE III A.

COMPARISON IN SAME INDIVIDUAL OF MENTAL STATE AT DIFFERENT TESTS.

Cases with Changed Type or Degree of Phase.

SCALE: D3 - D2 - D1 - O - M1 - M2 - M3.

\+ ⟶ ⟵ -

Serial No.	State at first E.e.g.		State at second E.e.g.		Degree of Shift.
234	234	O	R1	M1	+1
37	37	O	R1	M1	+1
37	R1	M1	R2	D1	-2
N.E.98	N.E.98	M1	R1	O	-1
N.E.47	N.E.47	M1	R1	O	-1
51	51	O	R1	M1	+1
66	66	D1	R1	D3	-2
90	90	M1	R1	O	-1
N.E.51	N.E.51	M1	R1	O	-1
72	73	O	R1	D1	-1
38	38	O	R1	M1	+1
162	162	D3	R1	D2	+1
209	209	D3	R1	O	+3
39	39	D1	R1	M2	+3
39	R1	M2	R2	O	-2
58	58	M2	R1	O	-2
424	424	D2	R1	M1	+3
60	R1	D2	R2	O	+2
83	83	O	R1	D1	-1
345	345	D1	R1	O	+1
63	63	M1	R1	O	-1
497	497	M1	R1	M2	+1
426	426	M1	R1	O	-1
N.E. 88	N.E. 88	M1	R1	O	-1
52	52	D1	R1	O	+1

Total No. of Repeated Tests = 25.

TABLE III B.

COMPARISON IN SAME INDIVIDUAL OF MENTAL STATE AT DIFFERENT TESTS.

Cases with Unchanged Type and Degree of Phase.

SCALE: D3 - D2 - D1 - O - M1 - M2 - M3.

\+ ⟶ ⟵ -

Serial No.	First E.e.g.	Second E.e.g.	State at both Tests.
234	234	R2	O
145	145	R1	M2
74	74	R1	M1
90	R1	R2	O
400	400	R1	D1
N.E.101	N.E.101	R1	O
N.E.158	N.E.158	R1	M2
N.E.100	N.E.100	R1	M1
38	38	R2	O
60	60	R1	D2
420	420	R1	M2 D2
49	49	R1	M1
261	261	R1	M2
260	260	R1	M1
36	36	R1	M2
365	365	R1	M1
82	82	R1	D1
85	85	R1	D2
100	100	R1	M1
189	189	R1	M1
84	84	R1	D1 M1
323	323	R1	O
608	608	R1	O

Total No. of Repeated Tests = 23.

TABLE IV.

CLASSIFICATION OF PSYCHOLOGICAL CONSTITUTION OF MIXED PHASES AT TEST.

(29 cases and 3 repeats).

Ser. No.	Mood	Motility	Psychic Tempo	M D Assessment	No. of Cases	Psychological Characterisation
603	-	+	-	D3	11	Agitated Depression (Kraepelin).
601	-	+	-	D2		
67	-	+	-	D3		
92	-	+	-	D3		
66	-	+	-	D1		
136	-	+	-	D1		
65	-	+	-	D3		
59	-	+	-	D3		
52	-	+	-	D1		
83R1	-	+	-	D1		
162R1	-	+	-	D2		
(84	-	+	+	D1 M1	1+1R	Depressive mania (Kraepelin)
(84R1	-	+	+	D1) M1)		
369	-	-	+	D2 M1	1	Depression with flight of ideas (Kraepelin)
522	+ -	+ -	+	M1 (D1)	1	Raised psychic tempo with fluctuating mood and motility.
98	+	+ -	+ -	M2	1	Euphoria with fluctuating motility and psychic tempo.
222	-	+ -	-	D2 M1	1	Predominantly depressed phase with fluctuating motility
366	+ -	-	+ -	D1 M1	1	Retardation with fluctuating mood and psychic tempo
57	+ -	+	+	M1 D1	9+3R	Predominantly manic phase with rapidly fluctuating affect.
233	+ -	+	+	M1 D1		
398	+ -	+	+	M2 D1		
145))	+ -	+	+	M2 D1		
145) R1)	+ -	+	+	M2 D1		
93	+ -	+	+	M2 D1		
58	+ -	+	+	M2 D1		
137	+ -	+	+	M1 D1		
39R1	+ -	+	+	M2 D1		
N.E. 117	+ -	+	+	M2 D1		
420))	+ -	+	+	M2 D2		
420) R.1)	+ -	+	+	M2 D2		
424	+	-	-	D2 M1	2	Predominantly depressed phase with rapidly fluctuating affect.
505	+	-	-	D3 M1		

T A B L E IVa

CLASSIFICATION OF MIXED PHASES at Test in Terms of Predominance of Manic or Depressed Phase

(excluding 11 agitated depressions and 3 repeats)

Dominant Manic	6
Dominant Depressed	3
Manic = Depressed	7

TABLE V

SEX AND

RACE DISTRIBUTION

		Europeans		Non-Europeans		
		Males	Females	Males	Females	
	Involutional Melancholia	6. 504, 162 92, 444 400, 72	12. 191, 66 259, 64 136, 99 343, 85 455,60,65,59			18
Manic - Depressive Psychosis	Recurrent, chronic, plain mania	11. 51, 234 252, 467 91, 399 208, 49 73, 261 50	5. 98, 322 456, 365 608	5. N.E's: 88, 158 113, 89 90	4. N.E's: 48,47 51, 174	25
	Recurrent, Chronic, Plain Depression — Agitated Depression	1. 603	2 +1. 67 601 1'000': 445			4
	Recurrent, Chronic, Plain Depression — Retarded Depression	2. 602 209	10. 542, 219 345, 407 193, 367 324, 2 WK.		1. N.E.: 173	13
	Alternating	11. 39, 52 161, 90 146, 253 260, 74 593, 93 38.	10. 83, 102 366, 222 58, 137 189, 63 344, 425		2. N.E's: 98 49	23
	Circular	11. 420, 37 584, 145 398, 233 251, 89 528, 36 1 WK.	20. 426, 272 100, 496 84, 369 505, 57 424, 522 101, 543 527, 323 220, 495 138, 346 497, 1 WK.	1. N.E.: 117	2. N.E's: 100 101	34
		42	60	6	9	117

T A B L E VI.

AGE DISTRIBUTION.

Age	5-year Groups	Cases (denoted by serial nos.) in each group	Group Totals
Below 55 years.	20-24	608. N.E's 173, 117.	3
	25-29	219, 527. N.E's 90, 89.	4
	30-34	522, 601, 445. N.E.174. W.K. F.E. 4998.	5
	35-39	137, 233, 91, 407. N.E.158.	5
	40-44	272, 73, 528, 208, 399, 251, 425, 324, 209, 584. W.K. F.E's. 4993, 51.	12
	45-49	252, 505, 74, 344, 39, 602, 543. N.E.113.	8
	50-54	369, 63, 98, 593, 138, 367, 82, 603, 59, 455, 66, 495, 38, 72. N.E's 101, 49,51, 88.	18
			55
Above 55 years.	55-59	420, 58, 424, 398, 84, 57, 322, 49, 89, 542, 343, 60, 259, 323. N.E's 48, 98.	16
	60-64	162, 93, 90, 467, 161, 346, 345, 67, 400, 101, 102, 234	12
	65-69	426, 100, 253, 146, 50, 52, 65, 92, 444,604, 220, 83, 51. N.E.100. W.K. M.E. 8348.	15
	70-74	36, 222, 145, 189, 193, 37. N.E.47.	7
	75-79	497, 366, 365, 261, 99, 86, 136, 64, 191.	9
	80-84	456, 496, 260.	3
			62
			117

TABLE VI A

TABLE SHOWING THE INCIDENCE OF ABNORMAL, NORMAL AND QUESTIONABLY NORMAL RECORDS IN THE TWO AGE GROUPS: GROUP I BELOW 55 YEARS AND GROUP II ABOVE 55 YEARS.

Group	Abnormal Records		Normal Records		? Normal Records		Totals
	No.	%age	No.	%age	No.	%age	
Group I Below 55 years	12	21.8182%	32	58.1818%	11	20.0000%	55 100.00%
Group II Above 55 years	16	25.8065%	32	51.6129%	14	22.5806%	62 100.00%

TABLE SHOWING THE INCIDENCE OF ABNORMAL, NORMAL AND QUESTIONABLY NORMAL RECORDS IN THE TWO AGE GROUPS (I - BELOW 55 YEARS, II - ABOVE 55 YEARS), WITH THOSE CASES WHO HAVE HAD E.C.T. REMOVED FROM GROUP.

Group	Abnormal		Normal		? Normal		Totals
	No.	%age	No.	%age	No.	%age	
Group I	9	24.3243%	21	56.7568%	7	18.9189%	37 99.9999%
Group II	13	26.5306	26	53.0612	10	20.4081	49 99.9999%
							86

TABLE VII

INTERVAL BETWEEN TEST AND E.C.T.

No Treatment	86. 36, 37, NE47, NE48, NE49, 50, NE51, 52, 57, 59, 63, 64, 67, 73, 82, 83, 84, 85, NE88, NE89, 90, 91, 92, 93, 98, NE98, 99, 100, NE100, 101, 102, NE113, NE117, 136, 138, 145, 146, NE168, 161, NE173, NE174, 189, 191, 193, 208, 220, 222, 233, 234, 251, 253, 259, 260, 261, 272, 324, 343, 344, 345, 346, 365, 366, 367, 398, 399, 400, 407, 424, 425, 426, 444, 445, 455, 456, 497, 504, 505, 522, 528, 593, 601, 602, 603, WK.FET.51, WK.FE.4993, WK.ME.8348.
Over 1 year	11. 49, 89, 209, 252, 322, 369, 420, 467, 542, 584, 608.
Over 3 mos.	12. 51, 58, 60, 74, NE90, NE101, 162, 219, 323, 496, 527, WK.FE.4998.
Over 6 weeks	4. 38, 39, 65, 72.
Less than 6 weeks.	4. 66, 137, 495, 543.

T A B L E VIIa

TABLE SHOWING THE INCIDENCE OF ABNORMALITY, NORMALITY AND QUESTIONABLE NORMALITY OF RECORDS IN THE FIVE GROUPS - CLASSIFICATION BASED ON LENGTH OF TIME BETWEEN TEST AND E.C.T. IF ANY.

Group	Abnormal Records		Normal Records		? Normal Records		Totals
	No.	%age	No.	%age	No.	%age	
No Treatment	22	25.5814%	47	54.6512%	17	19.7674%	86 100.00%
Over 1 year	0	0.0000%	7	63.6364%	4	36.3636%	11 100.00%
Over 3 months	3	25.0000%	6	50.0000%	3	25.0000%	12 100.00%
Over 6 weeks	1	25.0000%	2	50.0000%	1	25.0000%	4 100.00%
Less than 6 weeks	2	50.0000%	2	50.0000%	0	0.0000%	4 100.00%
Totals	28	23.9316%	64	54.7009%	25	21.3675%	117 100.00%

CLASSIFIED INTO TWO GROUPS: I "NO TREATMENT" AND "OVER 1 YEAR" TOGETHER, AND II "OVER 3 MONTHS", "OVER 6 WEEKS" AND "LESS THAN 6 WEEKS" TOGETHER.

Group	Abnormal		Normal		? Normal		Totals
	No.	%age	No.	%age	No.	%age	
I	22	22.6804%	54	55.6701%	21	21.6495%	97 100.00%
II	6	30.0000%	10	50.0000%	4	20.0000%	20 100.00%
Totals	28	23.9316%	64	54.7009%	25	21.3675%	117

TABLE VIII

INCIDENCE OF DISORGANISED RECORDS IN

1) MANIC-DEPRESSIVE PSYCHOSIS GROUP AND INVOLUTIONAL MELANCHOLIA GROUP, AND IN

2) GROUP OF YOUNG NORMAL ADULTS.

	Manic-Depressive Psychosis and Involutional Melancholia Group			Young Normal Adults	
	Serial Nos.	No. in each	Percentage in each	No. in each	Percentage in each
A. Type	51, 89 322,100 324, 84 251,323 527,369 73, 85 50,420 219, 72 N.E's 158, 49	18	24.6575 %	10	30.3030 %
Flat A. Type	504, 52 N.E.88	3	4.1096 %	5	15.1515 %
Borderline A. Type	57,261 345,424 74, 99 191,505 366,367 193, 82 425,343 162, 39 91, 83	18	24.6575 %	8	24.2424 %
B. Type	60,426 259, 49 145,209 63,608 253. N.E.100	10	13.6986 %	6	18.1818 %
Paroxysmal B. Type	90, 58 38, 64	4	5.4795 %	4	12.1212%
Borderline B. Type	346,146 234, 93 601,222 252, 37 260,593 N.E's 101,173	12	16.4384 %	0	0%
D. Type	208, 98 36,N.Es 98, 89 47,113	7	9.5890 %	Not investigated	
Borderline D. Type	N.E.90	1	1.3699 %	Not investigated	
TOTALS		73		33	

ADDENDUM TO TABLE VIII

Definitions of Disorganised Types.

A type: Records showing low voltage, rare alpha activity considerably disturbed by relatively low voltage fast rhythm ranging from 14 to 30 C/sec. of a diffuse nature. Some intrusion of low voltage diffuse theta activity is sometimes apparent.

A variant of the above manifesting itself in the form of flat records was originally treated by us as a separate type which we designated C. After careful consideration we now classify these records under A.

Davis' "choppy" activity may be regarded as a variant form of A but with a higher frequency of the fast component than that designated in our definition of the A type.

B type: Records showing excessive diffuse theta activity of medium voltage combined with typical A type characteristics. The alpha activity is sometimes of somewhat greater amplitude than in the A type however.

Borderline A and B types: Those in which the characteristic activity is of a less clear nature, and often showing a relatively well formed though intermittent alpha rhythm.

D type: Records showing excessive fast activity as in the A type but with a well developed alpha rhythm.

TABLE VIII A

INCIDENCE OF DISORGANISED RECORDS IN

1) THOSE PREDOMINANTLY MANIC PRIOR TO TEST, AND IN

2) THOSE PREDOMINANTLY DEPRESSED PRIOR TO TEST.

	Predominantly manic prior to test.			Predominantly depressed prior to test		
	Serial Nos.	No. in each Gp.	Per-centage in each	Serial Nos.	No. in each Gp.	Per-centage in each
A. Type	420, 89 73,322 251, 51 323,527 50. N.E's 158, 49	11	26.8293%	84, 324 219, 85 369, 72	6	24.0000%
Flat A. Type	N.E.88	1	2.4390%	504	1	4.0000%
Borderline A. Type	57, 39 366, 91 74,261	6	14.6341%	162,425 343, 82 424,506 193,191 99,367 345	11	44.0000%
B. Type	49,145 426,608 N.E.100	5	12.1951%	259,209 60	3	12.0000%
Paroxysmal B. Type	38, 58, 90	3	7.3171%	64	1	4.0000%
Borderline B. Type	222,252 234, 37 260,593 N.E.101	7	17.0732%	601,346 N.E.173	3	12.0000%
D. Type	98,208 36. N.E's 89,98 47,113	7	17.0732%			
Borderline D. Type	N.E.90	1	2.4390%			
TOTALS		41	100%		25	100%

TABLE VIII B

INCIDENCE OF DISORGANISED RECORDS IN

1) THOSE MANIC AT TIME OF TEST, AND

2) THOSE DEPRESSED AT TIME OF TEST.

	Manic at test.			Depressed at test.		
	Serial Nos.	No. in each Gp.	Percentage in each	Serial Nos.	No. in each Gp.	Percentage in each
A. Type	100, 89 73,322 261, 50 N.E's 158, 49	8	26.6667%	85,219 324	3	14.2857%
Flat A. Type	N.E.88	1	3.3333%	52,504	2	9.5238%
Borderline A. Type	91, 74 261	3	10.0000%	39,162 425,345 367,343 82,193 99	9	42.8571%
B. Type	49,426 63,253 N.E.100	5	16.6667%	209, 60 259	3	14.2857%
Paroxysmal B. Type	90	1	3.3333%	64	1	4.7619%
Borderline B. Type	252,593 260,146	4	13.3333%	601,346 N.E.173	3	14.2857%
D. Type	98,208 36. N.E's 89, 98 47,113	7	23.3333%			
Borderline D. Type	N.E.90	1	3.3333%			
TOTALS		30			21	

T A B L E IX.

TABLE SHOWING THE INCIDENCE OF NORMAL, ABNORMAL AND QUESTIONABLY NORMAL RECORDS IN THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND IN THE GROUP OF YOUNG NORMAL ADULTS.

GROUP	NORMAL	ABNORMAL	QUESTIONABLY NORMAL	TOTALS
Manic-Depressive Psychosis, etc.	64	28	25	117
Young Normal Adults	128	15	18	161

2. STATISTICAL ANALYSIS OF RESULTS.

I TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE GROUP PREDOMINANTLY MANIC PRIOR TO TEST AND THE GROUP PREDOMINANTLY DEPRESSED PRIOR TO TEST - ALSO SHOWING THE 't' VALUES FOR THE DIFFERENCES IN THESE MEANS.

E.E.G. VARIABLE	PREDOMINANTLY MANIC PRIOR TO TEST			PREDOMINANTLY DEPRESSED PRIOR TO TEST			DIFFERENCE BETWEEN MEANS	't' VALUE FOR THIS DIFFERENCE
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	10.3565 c/s	54	1.0881	9.7440 c/s	42	0.8939	0.6125	t = 2.9540 p = <.01
Alpha Amplitude	25.2037 μ	54	17.8869	24.7381 μ	42	15.1749	0.4656	t = 0.1351 p = <.90
Alpha Percent Time	42.5614 %	57	31.2036	41.7502(5) %	40	29.3746	0.811150	t = 0.1291 p = <.90
Beta Frequency	18.9457 c/s	46	3.0218	19.1552 c/s	29	3.9261	0.2095	t = 0.2601 p = <.80
Beta Amplitude	10.8841 μ	46	7.4711	12.0862 μ	29	11.2480	1.2021	t = 0.5567 p = <.60
Theta Amplitude	22.5200 μ	25	14.0858	21.7647 μ	17	11.9977	0.7553	t = 0.1808 p = <.90
Age	53.4035 yrs	57	15.3427	54.8182 yrs	44	14.2322	1.4147	t = 0.4740 p = <.70

χ^2 between alpha frequency (above and below mean 10.0446) and Predominant Phase prior to test.

$\chi^2 = 12.5823$ $p = .001$. Significant at 1 % level.

I A

2 x 2 CONTINGENCY TABLE.

χ^2 Between Alpha Frequency (above and below ~~10.3~~ 10.0446 c/sec.) and Predominant Phase during Period of Hospitalisation (prior to Test) (Manic, Depressed).

Mean for Total Group = 10.0446.

Predom. Phase / Alpha Freq.	Manic	Depressed	
Above 10.3 c/sec.	31	9	40
Below 10.3 c/sec.	23	33	56
	54	42	96

$$\chi = \frac{1}{n_1 n_2} S \left\{ \frac{1}{a+a^1} (an_2 - a^1 n_1)^2 \right\}$$

$$\frac{1}{54}(31 \times 56 - 23 \times 40)^2 = \frac{1}{54}(1736 - 920)^2 = \frac{816^2}{54} = \frac{665856}{54} =$$

$$= 12330.6667 \rightarrow$$

$$\frac{1}{42}(9 \times 56 - 33 \times 40)^2 = \frac{1}{42}(504 - 1320)^2 = \frac{816^2}{42} = \frac{665856}{42} =$$

$$= 15863.7143 \rightarrow$$

$$S = \frac{28184.3810}{2240} .$$

$$= 12.5828. \rightarrow$$

Significant. $\check{p} = <.001. \rightarrow$

T A B L E IB.

To test the significance of the difference in Mean Alpha frequency between those predominantly manic and those predominantly depressed during the period of hospitalisation prior to the test.

Predominantly Manic Group.	Predominantly Depressed Group.
Mean alpha frequency = 10.6018(5)	Mean alpha frequency = 9.9881
Standard deviation = 1.0871	Standard deviation = 0.8947
N = 54	N = 42

Sw = 1.0077 →

t = 2.9603 →

Significant. (at the .63 level. p = .006).

II. This series of statistics concerns the relationship of the phase at test - manic or depressed - and degrees of severity of these phases on a 3-point scale to the same important e.e.g. variables itemised in I.

There too the only significant difference is that alpha frequency is significantly higher in the manic group at test than in the depressed group at test, at the .1% level (P = .001).

It should be made quite clear that the manic and depressed groups with which we are dealing here do not primarily represent changed psychotic phase in the same individuals, which is dealt with in the next series of statistical results (III). The case of a significant difference here is thus likely to be a function of predominant phase dealt with in I, (cases being more likely to be in their predominant phase at any given moment including the time of the test than otherwise) than of change of phase which is shown to be accompanied by no significant change in the e.e.g. variable under consideration in the next series of statistics, III.

The age factor in the three grades of depression receives attention in the last table II(f) of this series.

II. PHASE AT TEST CORRELATED WITH E.E.G. VARIABLES.

E.E.G. VARIABLE	MANIC AT TEST			DEPRESSED AT TEST			DIFFERENCE BETWEEN MEANS	VALUE OF t
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	10.2134	41	1.1604	9.5811	37	0.8581	0.6323	$t = 2.7125$ $\hat{p} = <.01$
Alpha Amplitude	24.2439	41	16.0164	24.8649	37	15.1263	0.6210	$t = 0.1755$ $\hat{p} = <.90$
Alpha Percent Time	41.3605	43	30.9471	47.0297	34	28.2593	5.6692	$t = 0.8287$ $\hat{p} = <.50$
Beta Frequency	19.2273	33	3.1334	18.7600	25	3.4062	0.4673	$t = 0.5419$ $\hat{p} = <.60$
Beta Amplitude	11.1212	33	8.1325	11.9800	25	12.0004	0.8588	$t = 0.3247$ $\hat{p} = <.80$
Theta Amplitude	22.5000	18	12.9368	19.2857	14	10.9963	3.2143	$t = 0.7435$ $\hat{p} = <.50$
Age	57.1364	44	14.3693	54.5789	38	13.7568	2.5575 yrs	$t = 0.8199$ $\hat{p} = <.50$

II A

2 x 2 CONTINGENCY TABLE

χ^2 BETWEEN ALPHA FREQUENCY (ABOVE AND BELOW 10.0446 C/SEC.) AND PHASE AT TIME OF TEST (MANIC, DEPRESSED).

Phase at Test	Manic	Depressed	
Above 10.2857 c/sec.	23	7	30
Below 10.2857 c/sec.	18	30	48
	41	37	78

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

$$= \frac{(23 \times 30 - 7 \times 18)^2 \times 78}{41 \times 37 \times 48 \times 30}$$

$$= \frac{(690 - 126)^2 \times 78}{1617 \times 1440}$$

$$= \frac{564^2 \times 78}{2184480} \qquad = \frac{318096 \times 78}{2184480}$$

$$= \frac{24811488}{2184480} = 11.3581 \rightarrow$$

Significant $\tilde{P} = <.001$

TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE TWO GROUPS: MANIC DEGREE I AT TEST AND MANIC DEGREE II AT TEST; ALSO SHOWING THE DIFFERENCES BETWEEN THE MEANS AND THE 't' VALUES FOR THESE DIFFERENCES.

E.E.G. VARIABLE	MANIC DEGREE I AT TEST			MANIC DEGREE II AT TEST			DIFFERENCE BETWEEN MEANS	't' VALUE FOR DIFFERENCE
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	9.8690	21	1.0795	10.5750	20	1.1322	0.7060	$t = 2.0440$ $p = < .05$
Alpha Amplitude	27.0000	21	15.3933	21.3500	20	16.1471	5.6500	$t = 1.1471$ $p = < .30$
Alpha Percent Time	41.2391	23	30.2892	41.5000	20	31.6864	0.2609	$t = 0.0276$ $p = > .90$
Beta Frequency	18.5882	17	2.7668	19.9062(5)	16	3.3505	1.378050	$t = 1.2916$ $p = < .20$
Beta Amplitude	10.6471	17	9.1583	11.6250	16	6.8408	0.9779	$t = 0.3458$ $p = < .80$
Theta Amplitude	23.1818	11	13.5299	21.4286	7	11.8666	1.7532	$t = 0.2804$ $p = < .80$
Age	61.2083 yrs.	24	14.0417	52.2500 yrs.	20	13.1866	8.9583 yrs.	$t = 2.1656$ $p = < .05$

TABLE SHOWING MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE GROUPS: DEPRESSED DEGREE I AT TEST, DEPRESSED DEGREE II AT TEST AND DEPRESSED DEGREE III AT TEST.

E.E.G. VARIABLE	DEPRESSED DEGREE I AT TEST			DEPRESSED DEGREE II AT TEST			DEPRESSED DEGREE III AT TEST		
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.
Alpha Frequency	9.7667	15	0.9806	9.5000	10	0.8367	9.4167	12	0.6396
Alpha Amplitude	23.6333	15	12.6971	22.5000	10	11.8849	28.3750	12	19.1672
Alpha Percent Time	45.6667	15	28.5158	40.4000	10	25.4016	56.6678	9	28.2820
Beta Frequency	18.4091	11	2.9450	18.6429	7	2.6685	19.4286	7	4.4754
Beta Amplitude	9.4545	11	6.2721	7.7143	7	2.1853	20.2143	7	18.7538
Theta Amplitude	20.0000	6	11.3470	20.0000	4	12.7475	17.5000	4	7.5000
Age	52.0000 yrs.	15	16.0125	58.0909 yrs.	11	14.5818	54.5833 yrs.	12	8.0154

TABLES SHOWING THE DIFFERENCES BETWEEN THE MEANS OF THE E.E.G. VARIABLES INDICATED AND THE 't' VALUES FOR THESE DIFFERENCES. COMPARING THREE GROUPS: THOSE DEPRESSED DEGREE I, THOSE DEPRESSED DEGREE II AND THOSE DEPRESSED DEGREE III AT TEST.

Alpha Frequency

Differences in Mean Alpha Frequency →

	Depressed Degree I	Depressed Degree II	Depressed Degree III
Depressed Degree I		Diff. 0.2667 c/s	Diff. 0.3500 c/s
Depressed Degree II	t = 0.7046 p̂ = <.50		Diff. 0.0833 c/s
Depressed Degree III	t = 1.0661 p̂ = <.30	t = 0.2648 p̂ = <.80	

't' values for these differences ←

Alpha Amplitude

Differences in Mean Alpha Amplitude →

	Depressed Degree I	Depressed Degree II	Depressed Degree III
Depressed Degree I		Diff. 1.1333 μ	Diff. 4.7417 μ
Depressed Degree II	t = 0.2241 p̂ = <.90		Diff. 5.8750 μ
Depressed Degree III	t = 0.7713(5) p̂ = <.50	t=0.8420 p̂= <.50	

't' values for these differences ←

Alpha Percent Time

Differences in Mean Alpha Percent Time →

	Depressed Degree I	Depressed Degree II	Depressed Degree III
Depressed Degree I		Diff. 5.2667 %	Diff. 11.0011 %
Depressed Degree II	t = 0.4718 p̂ = <.70		Diff. 16.2678 %
Depressed Degree III	t = 0.9176 p̂ = <.40	t = 1.3212 p̂ = <.30	

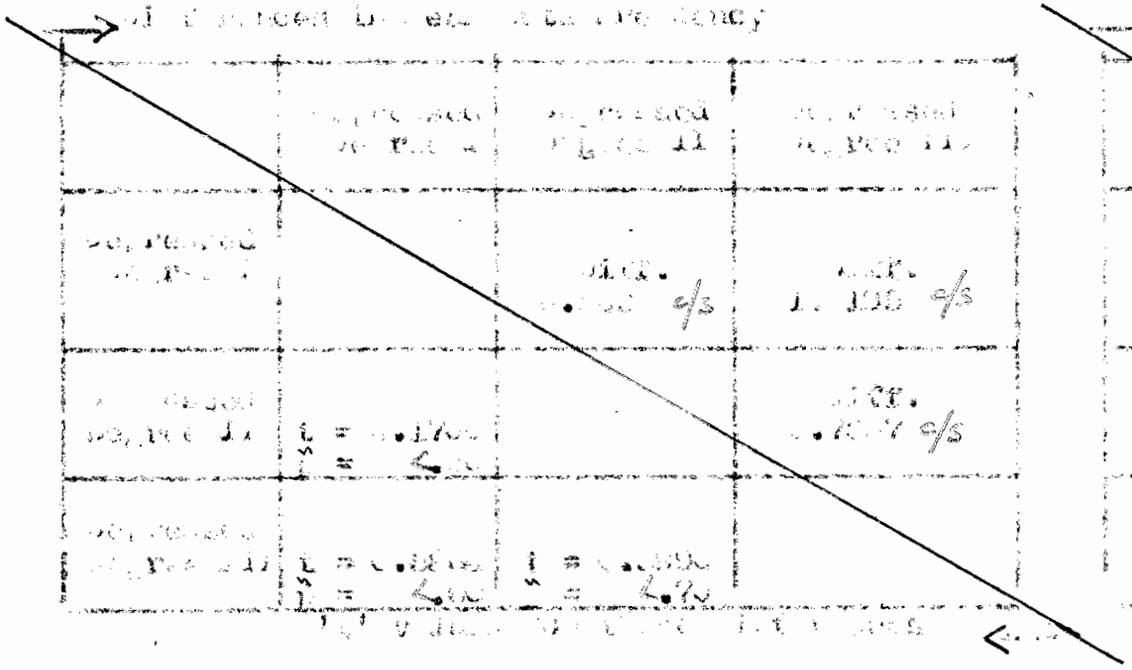
't' values for these differences ←

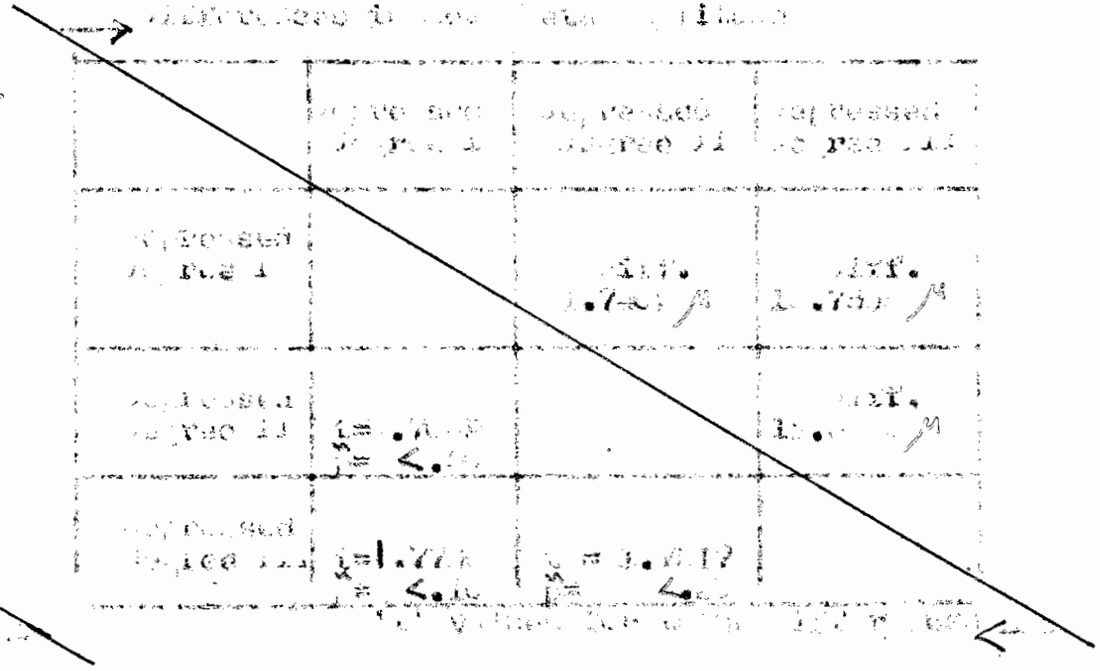
Theta Amplitude

Differences in Mean Theta Amplitude →

	Depressed Degree I	Depressed Degree II	Depressed Degree III
Depressed Degree I		Diff. 0.0000 μ	Diff. 2.5000 μ
Depressed Degree II	No 't' Value		Diff. 2.5000 μ
Depressed Degree III	t = 0.3790 p̂ = <.80	t=0.3381 p̂= <.80	

't' values for these differences ←





II F

TABLE SHOWING THE DIFFERENCES IN MEAN AGE BETWEEN THE THREE GROUPS INDICATED AND THE 't' VALUES FOR THESE DIFFERENCES.

→ Differences in Mean Age

	Depressed Degree I	Depressed Degree II	Depressed Degree III
Depressed Degree I		Diff. 6.0909 yrs.	Diff. 2.5833 yrs.
Depressed Degree II	t = 0.9942 $\hat{p}$ = <.40		Diff. 3.5076 yrs.
Depressed Degree III	t = 0.5088 $\hat{p}$ = <.70	t = 0.7236 $\hat{p}$ = <.50	

't' values for these differences ←

III. This section of the statistics is concerned with determining whether, in the individual case where there is a change in psychotic phase - from manic to depressed or vice versa, or in the degree of severity of phase - assessed on a 3-point scale, there is a corresponding change in either of the e.e.g. variables, alpha frequency or beta frequency. No significant changes were discovered to accompany such shifts.

MANIC-DEPRESSIVES.

III MEANS AND STANDARD DEVIATIONS OF ALPHA FREQUENCY AND t VALUES FOR THE DIFFERENCES BETWEEN MEANS OF THE GROUPS SHOWING VARYING DEGREES OF PHASE SHIFT.

Group	N	1st Test		2nd Test		Difference between Means	t value
		Mean	S.D.	Mean	S.D.		
Unchanged Phase	21	10.3810 c/s	1.1429	9.9048 c/s	1.0069	0.4762 c/s	1.4327
One Degree Shift	15	9.9667 c/s	0.8256	10.1667 c/s	1.1817	0.2000 c/s	0.5372
Two Degree Shift	5	9.2000 c/s	0.7483	9.3500 c/s	0.4359	0.1500 c/s	0.3373
Three Degree Shift	3	9.8333 c/s	0.6241	9.7500 c/s	0.6124	0.0833 c/s	0.1650
1, 2 and 3 Degree Combined	23	9.7826 c/s	0.8446	9.9348 c/s	1.0559	0.1522 c/s	0.5395

None of the differences is significant.

MEANS AND STANDARD DEVIATIONS OF SHIFT OF ALPHA FREQUENCY FOR THESE FOUR GROUPS.

Group	N	Mean Shift	S.D. of Shift
Unchanged Phase	21	0.7619 c/s	0.7810
One Degree Shift	15	0.4667 c/s	0.6511
Two Degree Shift	5	0.3500 c/s	0.2000
Three Degree Shift	3	0.4167 c/s	0.3118
1, 2 and 3 Degree combined	23	0.4348 c/s	0.5477

TABLE SHOWING THE DIFFERENCES IN MEAN ALPHA [illegible] AND THE 't' VALUES FOR THESE DIFFERENCES.

	Unchanged Phase	One Degree Phase Shift	Two Degree Phase Shift	Three Degree Phase Shift	1,2 & 3 Degree Phase Shift combined
Unchanged Phase		Diff. 0.2952	Diff. 0.4119	Diff. 0.3452	Diff. 0.3271
One Degree Phase Shift	t=1.1955 $\hat{p}$= <.10		Diff. 0.1167	Diff. 0.0500	
Two Degree Phase Shift	t=1.1535 $\hat{p}$= <.20	t=0.3804 $\hat{p}$= <.80		Diff. 0.0667	
Three Degree Phase Shift	t=0.7451 $\hat{p}$= <.50	t=0.1277 $\hat{p}$= >.90	t=0.3758 $\hat{p}$= <.80		
1 & 2 & 3 Degree Phase Shift Combined.	t=1.6201 $\hat{p}$= <.25				

III B TABLE SHOWING MEANS AND STANDARD DEVIATIONS OF BETA FREQUENCY FOR THE GROUPS INDICATED AT FIRST AND SECOND TEST. t VALUES GIVEN FOR THE DIFFERENCE BETWEEN THE MEANS AT FIRST TEST AND THE MEANS AT SECOND TEST.

N	Group	First Test		Second Test		Difference between Means	t Value
		Mean	Stand. Dev.	Mean	Stand. Dev.		
12	One Degree Phase Shift	19.1250 c/s	2.5259	18.5417 c/s	3.2687	0.5833 c/s	0.4892 P =<.7
4	Two Degree Phase Shift	19.3750 c/s	0.4146	17.2500 c/s	2.5125	2.1250 c/s	1.6690 P =<.2
3	Three Degree Phase Shift	20.8333 c/s	7.1919	18.0000 c/s	0.8165	2.8333 c/s	0.6780 P =<.6
18	Unchanged Phase	19.0556 c/s	2.9003	20.2778 c/s	1.3457	1.2222 c/s	1.6210 P =<.2

TABLE SHOWING MEANS AND STANDARD DEVIATIONS OF SHIFT IN BETA FREQUENCY FOR THE GROUPS INDICATED.

Group	Mean β Shift	Stand.Dev.	N
One Degree Phase Shift	3.4167 c/s	1.7658	12
Two Degree Phase Shift	2.6250 c/s	1.8498	4
Three Degree Phase Shift	6.5000 c/s	5.3072	3
Unchanged Phase	3.1667 c/s	1.8484	18

III C.

TABLE SHOWING THE DIFFERENCES IN MEAN BETA FREQUENCY SHIFT BETWEEN THE GROUPS INDICATED AND THE t VALUES FOR THESE DIFFERENCES.

DIFFERENCES BETWEEN GROUPS IN MEAN BETA SHIFT.

	Group with a one Degree Phase Shift	Group with a two Degree Phase Shift	Group with a three Degree Phase Shift	Group with Unchanged Phase
Group with a one Degree Phase Shift		Diff. 0.7917 c/s	Diff. 3.0833 c/s	Diff. 0.2500 c/s
Group with a two Degree Phase Shift	t= 0.7686 P= <.5		Diff. 3.8750 c/s	Diff. 0.5417 c/s
Group with a three Degree Phase Shift	t=1.8093 P= <.1	t=1.3903 P= <.3		Diff. 3.3333 c/s
Group with Unchanged Phase	t=0.3693 P= <.8	t=0.5301 P= <.7	t=2.1782 P=<.05	

t VALUES FOR THE CORRESPONDING DIFFERENCES.

IV. In this series of statistics a comparison is made of the e.e.g. variables alpha frequency amplitude and percent time, beta frequency and amplitude and theta amplitude in the standard clinical subgroups described in Chapter III. In the first place (Table IV) the comparison is made between the major clinical subdivision into involutional melancholia and manic depressive psychosis, and thereafter in the statistics that follow IV a - g the division is into involutional melancholia, mania (recurrent, chronic and plain), depression (recurrent, chronic and plain), alternating form and circular form. Finally in IVh the age factor receives attention.

The following positive findings emerge:

(a) as between the involutional melancholia group and the manic group (recurrent, chronic and plain), with regard to alpha frequency, there is a significantly lower mean (.1 percent level) in the former case, but

this may be explicable in terms of the significantly higher mean age in this group (1 percent level).

(b) There is a significantly higher alpha frequency (5 percent level) in the involutional melancholic group than in the circular group, probably due to the significantly higher mean age in the former group (2 percent level).

(c)...

(c) The significantly higher mean alpha frequency in the manic (recurrent, chronic and plain) than in the depressed (recurrent, chronic and plain) cannot be explained in terms of an age difference (Age $P < .20$).

TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE INVOLUTIONAL MELANCHOLIA AND MANIC-DEPRESSIVE GROUPS. ALSO SHOWING THE DIFFERENCES BETWEEN THE VARIOUS MEANS AND THE 't' VALUES FOR THESE DIFFERENCES.

E.E.G. VARIABLE	INVOLUTIONAL MELANCHOLIA GROUP			MANIC-DEPRESSIVE GROUP			DIFFERENCE BETWEEN MEANS	't' VALUE FOR THIS DIFFERENCE
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	9.4118 c/s	17	0.7517	10.1579 c/s	95	1.1378	0.7461 c/s	t = 2.6002 p̌ = ∠.02
Alpha Amplitude	22.3529 μ	17	13.1863	24.7368 μ	95	16.2598	2.3839 μ	t = 0.5714 p̌ = ∠.60
Alpha Percent Time	47.2222 %	18	31.9802	43.0320 %	94	29.7710	4.1902 %	t = 0.5406 p̌ = ∠.60
Beta Frequency	19.2500 c/s	10	1.7642	18.9408 c/s	76	3.4488	0.3092 c/s	t = 0.2776 p̌ = ∠.80
Beta Amplitude	8.8000 μ	10	3.2496	11.0812 μ	76	9.1683	2.2812 μ	t = 0.7767 p̌ = ∠.50
Theta Amplitude	24.3750 μ	8	10.7347	22.5769 μ	39	13.7200	1.7981 μ	t = 0.3484 p̌ = ∠.80
Age	63.8889 yrs	18	9.2248	53.3333 yrs	99	14.6599	10.5556 yrs	t = 2.9438 p̌ = ∠.01

TABLE SHOWING THE MEANS AND STANDARD DEVIATIONS OF THE E.E.G. VARIABLES INDICATED FOR THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED.

E.E.G. Variable	Involutional Melancholia			Recurrent, Chronic and Plain Mania			Recurrent, Chronic and Plain Depression			Alternating Form			Circular Form		
	Mean	Stand. Dev.	N	Mean	Stand. Dev.	N	Mean	Stand. Dev.	N	Mean	Stand. Dev.	N	Mean	Stand. Dev.	N
Alpha Frequency	9.4118 c/s	0.7517	17	10.6146 c/s	1.1085	24	9.6912 c/s	0.6831	17	10.1087 c/s	1.2850	23	10.0968 c/s	1.1172	31
Alpha Amplitude	22.3529 μ	13.1863	17	27.8333 μ	17.6958	24	27.4118 μ	17.7591	17	20.6957 μ	14.9125	23	23.8710 μ	14.3386	31
Alpha Percent Time	47.2222%	31.9802	18	49.6400%	29.3648	25	43.5721%	24.0693	14	38.5000%	27.7876	23	40.8906%	32.6778	32
Beta Frequency	19.2500 c/s	1.7642	10	19.5000 c/s	3.2787	18	19.0000 c/s	4.2426	13	17.6579 c/s	2.2422	19	19.4615 c/s	3.6002	26
Beta Amplitude	8.8000 μ	3.2496	10	12.4444 μ	10.1241	18	10.1538 μ	8.0370	13	11.4211 μ	5.9121	19	10.3527 μ	10.7041	26
Theta Amplitude	24.3750 μ	10.7347	8	22.0000 μ	12.6886	10	15.0000 μ	10.3510	7	21.8750 μ	11.7094	8	27.1786 μ	15.0684	14
Age	63.8889 yrs	9.2248	18	51.8400 yrs	16.0691	25	45.0588 yrs	13.7776	17	59.2174 yrs	10.9105	23	54.5882 yrs	14.1280	34

IV$_B$.

TABLE SHOWING THE DIFFERENCES IN MEAN ALPHA FREQUENCY BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE t VALUES FOR THESE DIFFERENCES.

DIFFERENCES IN MEAN ALPHA FREQUENCY. →

	Involutional Melancholia. Mean ∝ Freq. = 9.4118 S.D. = 0.7517	Recurrent, Chronic and Plain Mania. Mean ∝ Freq. = 10.6146 S.D. = 1.1085	Recurrent, Chronic and Plain Depression. Mean ∝ Freq. = 9.6912 S.D. = 0.6831	Alternating Form. Mean ∝ Freq. = 10.1087 S.D. 1.2850	Circular Form. Mean ∝ Freq. = 10.0968 S.D. = 1.1172
Involutional Melancholia		Diff. 1.2028 c/s	Diff. 0.2794 c/s	Diff. 0.6969 c/s	Diff. 0.6850 c/s
Recurrent, Chronic and Plain Mania.	t = 3.8800 P = <.001 Significant		Diff. 0.9234 c/s	Diff. 0.5059 c/s	Diff. 0.5178 c/s
Recurrent, Chronic and Plain Depression.	t = 1.1344 P = <.30	t = 3.0435 P = <.01 Significant		Diff. 0.4175 c/s	Diff. 0.4056 c/s
Alternating Form	t = 1.9946 P = <.10	t = 1.4467 P = <.20	t = 1.0438 P = <.40		Diff. 0.0119 c/s
Circular Form	t = 2.2577 P = <.05	t = 1.7100 P = <.10	t = 1.3602 P = <.20	t = 0.0363 P = >.90	

t VALUES FOR THESE DIFFERENCES. ←

TABLE SHOWING THE DIFFERENCES IN MEAN ALPHA AMPLITUDE BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE t VALUES FOR THESE DIFFERENCES.

→ DIFFERENCES IN MEAN ALPHA AMPLITUDE.

	Involutional Melancholia Mean∝Amp.= 22.3529 S.D. = 13.1863	Recurrent,Chronic and Plain Mania Mean∝Amp. = 27.8333 S.D. = 17.6988	Recurrent,Chronic and Plain Depression Mean∝Amp. = 27.4118 S.D. = 17.7591	Alternating Form Mean∝Amp. = 20.6957 S.D. = 14.9125	Circular Form Mean∝Amp. = 23.8710 S.D. = 14.3386
Involutional Melancholia		Diff. 5.4804 ^	Diff. 5.0589 ^	Diff. 1.6572 ^	Diff. 1.5181 ^
Recurrent,Chronic and Plain Mania	$t_{\hat{P}}$ = 1.0805 $\hat{P}$ = < .30		Diff. 0.4215 ^	Diff. 7.1376 ^	Diff. 3.9623 ^
Recurrent,Chronic and Plain Depression	$t_{\hat{P}}$ = 0.9433 $\hat{P}$ = <.40	$t_{\hat{P}}$ = 0.0750 $\hat{P}$ = >.90		Diff. 6.7161 ^	Diff. 3.5408 ^
Alternating Form	$t_{\hat{P}}$ = 0.3646 $\hat{P}$ = <.80	$t_{\hat{P}}$ = 1.4915 $\hat{P}$ = <.20	$t_{\hat{P}}$ = 1.1145 $\hat{P}$ = <.30		Diff. 3.1753 ^
Circular Form	$t_{\hat{P}}$ = 0.3606 $\hat{P}$ = <.80	$t_{\hat{P}}$ = 0.9172 $\hat{P}$ = <.40	$t_{\hat{P}}$ = 0.7514 $\hat{P}$ = <.50	$t_{\hat{P}}$ = 0.7909 $\hat{P}$ = <.50	

t VALUES FOR THESE DIFFERENCES. ←

TABLE SHOWING THE DIFFERENCES IN MEAN ALPHA PERCENT TIME BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE t VALUES FOR THESE DIFFERENCES.

→ DIFFERENCES IN MEAN ALPHA PERCENT TIME.

	Involutional Melancholia Mean∝% Time= 47.2222 S.D. = 31.9802	Recurrent,Chronic and Plain Mania Mean∝% Time = 49.6400 S.D.= 29.3648	Recurrent,Chronic and Plain Depression Mean∝% Time = 43.5721 S.D.=24.0693	Alternating Form Mean∝% Time = 38.50 S.D.= 27.7876	Circular Form Mean∝%Time= 40.2906 S.D.= 32.6778
Involutional Melancholia		Diff. 2.4178 %	Diff. 3.6501 %	Diff. 8.7222 %	Diff. 6.3316 %
Recurrent,Chronic and Plain Mania	$t_{\hat{P}}$ = 0.2566 $\hat{P}$ = <.80		Diff. 6.0679 %	Diff. 11.1400 %	Diff. 8.7494 %
Recurrent,Chronic and Plain Depression	$t_{\hat{P}}$ = 0.3554 $\hat{P}$ = <.80	$t_{\hat{P}}$ = 0.6582 $\hat{P}$ = <.60		Diff. 5.0721 %	Diff. 2.6815 %
Alternating Form	$t_{\hat{P}}$ = 0.9333 $\hat{P}$ = <.40	$t_{\hat{P}}$ = 1.3468 <.20	$t_{\hat{P}}$ = 0.6653 $\hat{P}$ = <.60		Diff. 2.3906 %
Circular Form	$t_{\hat{P}}$ = 0.6622 $\hat{P}$ = <.60	$t_{\hat{P}}$ = 1.0482 $\hat{P}$ = <.30	$t_{\hat{P}}$ = 0.2754 $\hat{P}$ = <.80	$t_{\hat{P}}$ = 0.2844 $\hat{P}$ = <.80	

← t VALUES FOR THESE DIFFERENCES.

TABLE SHOWING THE DIFFERENCES IN MEAN BETA FREQUENCY BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE 't' VALUES FOR THESE DIFFERENCES.

→ Differences in Mean Beta Frequency / 't' values for these differences ←	Involutional Melancholia Mean Beta freq. = 19.2500 S.D. = 1.7642	Recurrent, Chronic and Plain Mania Mean Beta freq. = 19.5000 S.D. = 3.2787	Recurrent, Chronic and Plain Depression Mean Beta freq. = 19.0000 S.D. = 4.2426	Alternating Form Mean Beta freq.= 17.6579 S.D. = 2.2422	Circular Form Mean Beta freq.= 19.4615 S.D. = 3.6002
Involutional Melancholia		Diff. 0.2500 c/s	Diff. 0.2500 c/s	Diff. 1.5921 c/s	Diff. 0.2115 c/s
Recurrent, Chronic and Plain Mania	t = 0.2226 p̆ = <.90		Diff. 0.5000 c/s	Diff. 1.8421 c/s	Diff. 0.0385 c/s
Recurrent, Chronic and Plain Depression	t = 0.1744 p̆ = <.90	t = 0.3705 p̆ = <.80		Diff. 1.3421 c/s	Diff. 0.4615 c/s
Alternating Form	t = 1.9456 p̆ = <.10	t = 2.0045 p̆ = <.10	t = 1.1665 p̆ = <.30		Diff. 1.8036 c/s
Circular Form	t = 0.1766 p̆ = <.90	t = 0.0361 p̆ = >.90	t = 0.3556 p̆ = <.80	t = 1.9247 p̆ = <.10	

TABLE SHOWING THE DIFFERENCES IN MEAN BETA AMPLITUDE BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE 't' VALUES FOR THESE DIFFERENCES.

→ Differences in mean Beta Amplitude

	Involutional Melancholia Mean Beta amp. = 8.8000 S.D. = 3.2496	Recurrent, Chronic and Plain Mania Mean Beta amp. = 12.4444 S.D. = 10.1241	Recurrent, Chronic and Plain Depression Mean Beta amp. = 10.1538 S.D. = 8.0370	Alternating Form Mean Beta Amp.= 11.4211 S.D. = 5.4121	Circular Form Mean Beta amp.= 10.3527 S.D. = 10.7041
Involutional Melancholia		Diff. 3.6444 μ	Diff. 1.3538 μ	Diff. 2.6211 μ	Diff. 1.5527 μ
Recurrent, Chronic and Plain Mania	t = 1.0989 p = < .30		Diff. 2.2906 μ	Diff. 1.0233 μ	Diff. 2.0917 μ
Recurrent, Chronic and Plain Depression	t = 0.5000 p = < .70	t = 0.6754 p = < .60		Diff. 1.2673 μ	Diff. 0.1989 μ
Alternating Form	t = 1.2957 p = < .30	t = 0.3886 p = < .80	t = 0.5146 p = < .70		Diff. 1.0684 μ
Circular Form	t = 0.4471 p = < .70	t = 0.6511 p = < .60	t = 0.0590 p = > .90	t = 0.3928 p = < .70	

't' values for these differences ←

TABLE SHOWING THE DIFFERENCES IN MEAN THETA AMPLITUDE BETWEEN THE FIVE STANDARD CLINICAL SUB-GROUPS INDICATED AND THE 't' VALUES FOR THESE DIFFERENCES.

Differences in mean Theta Amplitude / 't' values for these differences	Involutional Melancholia Mean Theta amp.= 24.3750 S.D.= 10.7347	Recurrent, Chronic and Plain Mania Mean Theta amp.= 22.0000 S.D. = 12.6886	Recurrent, Chronic and Plain Depression Mean Theta amp. = 15.0000 S.D. = 10.3510	Alternating Form Mean Theta amp.= 21.8750 S.D. = 11.7094	Circular Form Mean Theta amp.= 27.1786 S.D. = 15.0684
Involutional Melancholia		Diff. 2.3750 μ	Diff. 9.3750 μ	Diff. 2.5000 μ	Diff. 2.8036 μ
Recurrent, Chronic and Plain Mania	t = 0.4217 $\check{p}$ = $<$.70		Diff. 7.0000 μ	Diff. 0.1250 μ	Diff. 5.1786 μ
Recurrent, Chronic and Plain Depression	t = 1.7155 $\check{p}$ = $<$.20	t = 1.2028 $\check{p}$ = $<$.30		Diff. 6.8750 μ	Diff. 12.1786 μ
Alternating Form	t = 0.4451 $\check{p}$ = $<$.70	t = 0.0215 $\check{p}$ = $>$.90	t = 1.1964 $\check{p}$ = $<$.30		Diff. 5.3036 μ
Circular Form	t = 0.4615 $\check{p}$ = $<$.70	t = 0.8243 $\check{p}$ = $<$.40	t = 1.9128 $\check{p}$ = $<$.10	t = 0.8557 $\check{p}$ = $<$.50	

TABLE SHOWING THE DIFFERENCES IN MEAN AGE BETWEEN THE FIVE GROUPS INDICATED ANT THE 't' VALUES FOR THESE DIFFERENCES.

DIFFERENCES IN MEAN AGE. →

	Involutional Melancholia	Recurrent, Chronic and Plain Mania	Recurrent, Chronic and Plain Depression	Alternating Form	Circular Form
Involutional Melancholia		Diff. 12.0489 yrs	Diff. 18.8301 yrs	Diff. 4.6715 yrs	Diff. 9.3007 yrs
Recurrent, Chronic and Plain Mania	t = 2.8540 p = <.01		Diff. 6.7812 yrs	Diff. 7.3774 yrs	Diff. 2.7482 yrs
Recurrent, Chronic and Plain Depression	t = 4.7765 p = <.001	t = 1.4200 p = <.20		Diff. 14.1586 yrs	Diff. 9.5294 yrs
Alternating Form	t = 1.4534 p = <.20	t = 1.8439 p = <.10	t = 3.6289 p = <.001		Diff. 4.6292 yrs
Circular Form	t = 2.5171 p = <.02	t = 0.6967 p = <.50	t = 2.2895 p = <.05	t = 1.3252 p = <.20	

't' VALUES FOR THESE DIFFERENCES. ←

V. The numbers of cases in the various types of mixed phase delineated in Table IV are too small to warrant statistical analysis, except a comparison between retarded depression and agitated depression as regarding certain e.e.g. variables. When such a comparison is undertaken on the basis of predominant phase (Table V), mean alpha frequency is significantly higher (at the 2% level) in the retarded depression group than in the agitated depression group*. The difference cannot be accounted for on the basis of age as statistical analysis indicates no significant difference between the two groups in this regard ($P < .70$). When the comparison is undertaken on the basis of phase at test (Table VA) no significant difference is disclosed in respect of alpha frequency (or any of the other e.e.g. variables listed).

Footnote: * This finding is seemingly in conflict with Pauline Davis' claim that agitated, tense cases have MF records, and relaxed inhibited subjects have MS records.

TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE RETARDED DEPRESSION GROUP AND THE AGITATED DEPRESSION GROUP - ALSO SHOWING THE DIFFERENCES BETWEEN THE MEANS AND THE 't' VALUES FOR THESE DIFFERENCES.

(These groups are derived from the Group: Recurrent, Chronic and Plain Depression) as predominant phase.

E.E.G. VARIABLE	RETARDED DEPRESSION			AGITATED DEPRESSION			DIFFERENCE BETWEEN MEANS	't' VALUE FOR DIFFERENCE
	Mean	N	Stand.Dev.	Mean	N	Stand.Dev.		
Alpha Frequency	9.8846 c/s	13	0.6252	8.8333 c/s	3	0.2369	1.0513 c/s	2.8020 $P = <.02$
Alpha Amplitude	26.6154 μ	13	18.7628	28.3333 μ	3	15.4561	1.7179 μ	0.1463 $P = <.9$
Alpha Percent Time	41.3085 %	13	23.4978	Impossible to assess Percentage Time for this group			-	-
Beta Frequency	19.6364 c/s	11	4.3120	15.0000 c/s	1	0.0000		*
Beta Amplitude	8.3636 μ	11	6.1092	30.0000 μ	1	0.0000		*
Theta Amplitude	16.6667 μ	6	10.2740	5.0000 μ	1	0.0000		*
Mean Age	45.2308 yrs	13	14.0337	49.3333	3	11.3237	4.1025	0.4683 $P = <.70$

* Not possible to do 't' tests since N of Group II (Agitated Depression) is too small.

TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE RETARDED DEPRESSION GROUP AND THE AGITATED DEPRESSION GROUP - ALSO SHOWING THE DIFFERENCES BETWEEN THE MEANS AND THE 't' VALUES FOR THESE DIFFERENCES.

(These groups are derived from the Group : Depressed at Test).

E.E.G. VARIABLE	RETARDED DEPRESSION			AGITATED DEPRESSION			DIFFERENCE BETWEEN MEANS	't' VALUE FOR THIS DIFFERENCE
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	9.6786 ~/s	28	0.8781	9.2778 ~/s	9	0.7111	0.4008 ~/s	t = 1.2413 p = < .30
Alpha Amplitude	25.2143 μ	28	15.4506	21.5556 μ	9 ✓	10.9250	3.6587 μ	t = 0.1936 p = < .90 ✓
Alpha Percent Time	44.7861 %	28	28.3257	57.5000 %	6	25.4542	12.7139 %	t = 1.0130 p = < .40
Beta Frequency	18.5952 ~/s	21	3.4836	19.6250 ~/s	4	2.8146	1.0298 ~/s	t = 0.5546 p = < .60
Beta Amplitude	11.6905 μ	21	12.2518	13.5000 μ	4	10.4523	1.8095 μ	t = 0.2757 p = < .80
Theta Amplitude	19.0909 μ	11	9.7227	20.0000 μ	3	14.7196	0.9091 μ	t = 0.1302 p = < .90
Age	53.3793 yrs.	29	14.1797	58.4444 yrs.	9	11.4711	5.0651 yrs.	t = 0.9742 p = < .40

VI. Although the matter of an age factor entering into significant differences between individual e.e.g. independent variables has always been evaluated statistically in the relevant sections it is deemed advisable, in view of the fact that in our material there is a substantial proportion of cases above the age of 55, in whom the question of the influence of cerebral arteriosclerotic and senile brain changes on the e.e.g. arises, to also compare the age groups up to and over 55 on the basis of a more general e.e.g. criterion. Such a criterion exists in the classification into normal, abnormal and questionably normal records, by the British School, as set forth in Chapter III of the present work. Using this criterion no significant differences emerge in the two age groups (whether the few E.C.T. treated cases are included or excluded).

VI.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF ABNORMAL RECORDS BETWEEN THE TWO AGE GROUPS:

GROUP I - BELOW 55 YEARS AND GROUP II - ABOVE 55 YEARS.

GROUP I	GROUP II
No. of A records = 12	No. of A records = 16
Percentage A records = 21.8182%	Percentage A records = 25.8065
Total N of Group = 55	Total N of Group = 62
p_1 = 21.8182%	p_2 = 25.8065%
q_1 = 78.1818%	q_2 = 74.1935%

Standard Error of Difference = 7.8674 →

Difference between percentages = 3.9883 →

Critical Ratio = .5069 →

Not Significant.

VIA.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF QUESTIONABLY NORMAL RECORDS BETWEEN THE TWO AGE GROUPS:
GROUP I - BELOW 55 YEARS AND GROUP II - ABOVE 55 YEARS.

GROUP I	GROUP II
No. of ? N records = 11	No. of ? N records = 14
Percentage ? N records = 20.0000%	Percentage ? N records = 22.5806%
Total N = 55	Total N = 62

p_1 = 20.0000% $\qquad$ p_2 = 22.5806%

q_1 = 80.0000% $\qquad$ q_2 = 77.4194%

Standard Error of Difference = 7.5688 →

Difference between percentages = 2.5806 →

Critical Ratio = .3410 →

Not Significant.

VIB.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF ABNORMAL RECORDS BETWEEN THE TWO AGE GROUPS: GROUP I - BELOW 55 YEARS AND GROUP II - ABOVE 55 YEARS, E.C.T. CASES BEING EXCLUDED FROM THESE TWO GROUPS.

GROUP I	GROUP II
No. of A records = 9	No. of A records = 13
Percentage A records = 24.3243%	Percentage A records = 26.5306%
Total Group = 37	Total Group = 49

$p_1 = 24.3243\%$ $\quad$ $p_2 = 26.5306\%$

$q_1 = 75.6757\%$ $\quad$ $q_2 = 73.4694\%$

Standard Error of Difference = 9.4620 →

Difference between percentages = 2.2063 →

Critical Ratio = .2332 →

Not Significant.

VIC.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF QUESTIONABLY NORMAL RECORDS BETWEEN THE TWO AGE GROUPS: GROUP I - BELOW 55 YEARS AND GROUP II - ABOVE 55 YEARS, E.C.T. CASES BEING EXCLUDED FROM THESE TWO GROUPS.

GROUP I	GROUP II
No. of ? N records = 7	No. of ? N records = 10
Percentage ? N records = 18.9189%	Percentage ? N records = 20.4081%
Total Group = 37	Total Group = 49
p_1 = 18.9189%	p_2 = 20.4081%
q_1 = 81.0811%	q_2 = 79.5919%

Standard Error of Difference = 8.6376 →

Difference between percentages = 1.4892 →

Critical Ratio = .1724 →

Not Significant.

VII. With a view to assessing distortion of our results by the fact that a few subjects had received electro-convulsive therapy, a comparison was undertaken as to the incidence of abnormal and questionably normal records (using criteria of British School) in the following two groups:-

(1) those who had had no treatment and those treated over one year prior to the test (by which time experimental studies agree that all post E.C.T. effects on the e.e.g. have disappeared);

(2) those treated for less than one year*. No significant differences were found.

Footnote: * (The further subdivisions of this group appearing in the table represent the varying periods claimed by different workers as maximal for E.C.T. effects on the E.E.G.)

VII.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE PERCENTAGE OF ABNORMAL RECORDS BETWEEN THE GROUP I - NO E.C.T. AND NO TREATMENT FOR OVER 1 YEAR PRIOR TO TEST AND THE GROUP II - E.C.T. OVER 3 MONTHS, OVER 6 WEEKS AND LESS THAN 6 WEEKS PRIOR TO TEST.

GROUP I	GROUP II
No. of A records = 22	No. of A records = 6
Percentage A records = 22.6804%	Percentage A records = 30.0000%
Total N of group = 97	Total N of Group = 20

p_1 = 22.6804%
q_1 = 77.3196%

p_2 = 30.0000%
q_2 = 70.0000%

Standard Error of Difference = 11.0941 →

Difference between percentages = 7.3196 →

Critical Ratio = .6598 →

Not Significant.

VIIA.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF QUESTIONABLY NORMAL RECORDS BETWEEN

GROUP I - NO E.C.T. PLUS NO TREATMENT FOR OVER 1 YEAR AND GROUP II - TREATMENT OVER 3 MONTHS AGO, OVER 6 WEEKS AGO AND LESS THAN 6 WEEKS AGO.

GROUP I	GROUP II
No. of ? N records = 21	No. of ? N records = 4
Percentage ? N records = 21.6495	Percentage ? N records = 20.0000%
Total N of Group = 97	Total N of Group = 20
p_1 = 21.6495%	p_2 = 20.0000%
q_1 = 78.3505%	q_2 = 80.0000%

Standard Error of Difference = 28.6917 →

Difference between percentages = 1.6495 →

Critical Ratio = .0577 →

Not Significant.

VII. This section of the statistics concerns a comparison of the incidence of what we have chosen to term "disorganised" records - which on one view may be regarded as an indication of organic or biochemical disturbance in the following groups:-

(a) the combined manic depressive and involutional melancholic group as compared with a group of 161 normal young adults;

(b) manic and depressed groups, assessed both in terms of predominant phase and of phase at test.

As regards (a) - there is a significantly greater incidence of A and B type disorganised records, both separately and combined in the manic depressive plus involutional group than in the normal group, when the borderline A and B records are included. When the borderline groups are separated off from the A and B groups respectively, in the case of A the significant difference persists in both sub-divisions, while in the case of B it does so only in the borderline group.

The general effect of all this is to open a way for a toxic-organic hypothesis as to the nature of manic depressive psychosis.

As regards (b) no significant difference is demonstrated between the two phases.

V I II DISORGANISED RECORDS

To test the significance of the difference in the incidence of A type (including borderline A) Records between 1) the Manic-Depressive Psychosis and the Involutional Melancholia Group and 2) the Group of Young Normal Adults.

Group 1.	Group 2.
No. of A type Records = 39	No. of A Type Records = 23
Total N of Group = 117	Total N of Group = 160
Percentage of A Records = 33.3333%	Percentage of A Records = 14.3750%
p1 = 33.3333%	p2 = 14.3750%
q1 = 66.6667%	q2 = 85.6250%

Standard error of difference = 5.1659 →

Difference between percentages = 18.9583

Critical Ratio = 3.6699 →

Significant at the ·1% level. p = less than·001

Separating A and borderline A.

A type records.

Group 1.	Group 2.
No. of A type Records = 21	No. of A type Records = 15
Total N of Group = 117	Total N of Group = 160
Percentage of A type Records = 17.9487	Percentage of A type Records = 9.3750
p1 = 17.9487%	p2 = 9.3750%
q1 = 82.0513%	q2 = 90.6250%

Standard error of difference = 4.2305 →

Difference between percentages = 8.5737

Critical Ratio = 2.0266 → (p = less than ·05).

Borderline A type records.

Group 1.	Group 2.
No.of borderline A types = 18	No.of borderline A types = 8
Total N of Group = 117	Total N of Group = 160
Percentage of borderline A's = 15.3846%	Percentage of Borderline A's = 5%
p1 = 15.3846%	p2 = 5.0000%
q1 = 84.6154%	q2 = 95.0000%

Standard error of difference = 3.7543 →

Difference between percentages 10.3846

Critical Ratio = 2.7661 →

Significant at the 1% level.

VIII A

To test the significance of the difference in the incidence of B type (including borderline B) Records between 1) the Manic-Depressive Psychosis and the Involutional Melancholia Group and 2) the Group of Young Normal Adults.

Group 1.	Group 2.
No. of B type Records = 26	No. of B type records = 10
Total N of Group = 117	Total N of Group = 160
Percentage of B type Records = 22.2222%	Percentage of B type Records = 6.2500%
p = 22.2222%	p = 6.2500%
q = 77.7778%	q = 93.7500%

Standard error of difference = 4.2936 →

Difference between percentages = 15.9722
Critical Ratio = 3.7200 →

Significant at the ·1% level. p = less than ·001.

Separating B and borderline B records.

B type records.

Group 1.	Group 2.
No. of B type Records = 14	No. of B type Records = 10
Percentage of B type Records = 11.9658%	Percentage of B type Records = 6.25

Critical Ratio = 1.6061

Not significant.

Borderline B type records.

Group 1.	Group 2.
No. of Borderline B type Records = 12	No. of Borderline B type Records = 0
Percentage of Borderline B type Records = 10.2564%	Percentage of Borderline B type Records = 0

Critical Ratio = 3.6507

Significant at.1% level.

Therefore Borderline B account for significant difference of group as a whole.

VIIIB.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF ALL "A" PLUS ALL "B" TYPES BETWEEN I. THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND II. THE GROUP OF YOUNG NORMAL ADULTS.

Group 1.	Group 11.
No: of "A" & "B" type records= 66	No: of "A" & "B" type records = 33
Total N of Group = 117	Total N of Group = 160
Percentage of "A" & "B" type records = 56.4103%	Percentage of "A" & "B" type records = 20.6250%
p_1 = 56.4103%	p_2 = 20.6250%
q_1 = 43.5897%	q_2 = 79.3750%

Standard Error of Difference = 5.5900 →

Difference between percentages = 35.7853 →

Critical Ratio = $\frac{35.7853}{5.5900}$ = 6.4016 →

Highly Significant.

V I I I(c).

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF A TYPE RECORDS.

between 1) those predominantly manic and
2) those predominantly depressed
during the period of hospitalisation prior to the test.

Group 1.	Group II
No: of A type Records = 18	No. of A type Records = 18
Total N of Group = 57	Total N of Group = 44
Percentage of A type records = 31.5789%	Percentage of A type records = 40.9091%
p_1 = 31.5789%	p_2 = 40.9091%
q_1 = 68.4211%	q_2 = 59.0909%

Standard error of difference = 9.6357 →

Difference between percentages = 9.3302 →

Critical Ratio = .9683 →

Not significant. ($\bar{p}$ = .50)

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF B TYPE RECORDS.

between 1) those predominantly manic and
2) those predominantly depressed
during the period of hospitalisation prior to the test.

Group 1.	Group II
No. of B type Records = 15	No. of B type Records = 7
Total N of Group = 57	Total N of Group = 44
Percentage of B type Records = 26.3158%	Percentage of B type Records = 15.9091%
p_1 = 26.3158%	p_2 = 15.9091%
q_1 = 73.6842%	q_2 = 84.0909%

Standard error of difference = 8.0264 →

Difference between percentages = 10.4067 →

Critical Ratio = 1.2966 →

Not Significant. ($\bar{p}$ = ± .2) (± 20% level)

VIII D

To test the significance of the difference in the incidence of A type records

between 1) those manic at test and
2) those depressed at test.

Group 1.	Group 2.
No. of A type Records = 12	No. of A type Records = 14
Total N of Group = 44	Total N of Group = 38
Percentage of A type Records = 27.2727%	Percentage of A type Records = 36.8421%
p1 = 27.2727%	p2 = 36.8421%
q1 = 72.7273%	q2 = 63.1579%

Standard error of difference = 10.3108

Difference between Means = 9.5694

Critical Ratio = .9281

Not significant. (p = ± less than .4)

(less than 40% level).

To test the significance of the difference in the incidence of B type Records

between 1) those manic at test and
2) those depressed at test.

Group 1.	Group 2.
No. of B type Records = 10	No. of B type Records = 7
Total N of Group = 44	Total N of Group = 38
Percentage of B type Records = 22.7273%	Percentage of B type Records = 18.4211%
p1 = 22.7273%	p2 = 18.4211%
q1 = 77.2727%	q2 = 81.5789%

Standard error of difference 8.9141

Difference between percentages = 4.3062.

Critical Ratio = .4831

Not significant. (p = ± less than .7)

(less than 70% level).

IX. In this section our psychotic group (manic depresives plus involutional melancholics) is compared with the group of normal young adults as to the incidence of abnormal, questimnably normal and normal records (using criteria of British School). Comparisons are made (a) with and (b) without E.C.T. treated cases.

Analysis shows that in the case of both (a) and (b) there is a significantly higher incidence of abnormal and a significantly lower incidence of normal records in the manic depressive plus involutional group.

(In the case of questionably normal records P falls from $<.05$ to $<.1$ when the E.C.T. cases are excluded).

This, although a less specific type of criterion than that of disorganised records in VIII, parallels and supports the findings described there. It shows moreover that we have to do with normality and abnormality in the strict usage of the British e.e.g. school - more grist to the mill of the toxic organic hypothesis of manic depressive psychosis.

IX.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF ABNORMAL RECORDS BETWEEN I THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND THE GROUP OF II YOUNG NORMAL ADULTS.

Group I.	Group II.
No: of A records = 28	No: of A records = 15
% age A records = 23.9316%	% age A records = 9.3168%
Total Group = 117	Total Group = 161
p_1 = 23.9316%	p_2 = 9.3168%
q_1 = 76.0684%	q_2 = 90.6832%

Standard Error of Difference = 4.5615

Difference between percentages = 14.6148

Critical Ratio $= \frac{14.6148}{4.5615}$ = 3.2039

Significant at the 1% level

$p = < .01$

IX A.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF QUESTIONALLY NORMAL RECORDS BETWEEN I THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
No: of ?N records = 25	No: of ?N records = 18
%age ?N records = 21.3675%	%age ?N records = 11.1801%
Total N of Group = 117	Total N of Group = 161
p_1 = 21.3675%	p_2 = 11.1801%
q_1 = 78.6325%	q_2 = 88.8199%

Standard Error of Difference = 4.5308

Difference between percentages = 10.1874

Critical Ratio = $\frac{10.1874}{4.5308}$ = 2.2485

(Significant level lies @ 5%

p = <.05)

IX B.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF NORMAL RECORDS BETWEEN I THE MANIC-DEPRESSIVE PHYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I	Group II
No: of N records = 64	No: of N records = 128
%age of N records = 54.7009%	%age of N records = 79.5031%
Total N of Group = 117	Total N of Group = 161
p_1 = 54.7009%	p_1 = 79.5031%
q_1 = 45.2991%	q_1 = 20.4969%

Standard Error of Difference = 5.5947 →

Difference between percentages = 24.8022 →

Critical Ratio = $\frac{24.8022}{5.5947}$ = 4.4332 →

Significant at the .1% level.

($\tilde{p}$ = <.001)

IX C.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF ABNORMAL RECORDS BETWEEN THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP (E.C.T. CASES EXCLUDED) AND THE GROUP OF YOUNG NORMAL ADULTS.

Group 1.	Group 11.
No: of A records = 22	No: of A records = 15
Percentage A records = 25.5814%	Percentage A records = 9.3168%
Total N of Group = 86	Total N of Group = 161
p_1 = 25.5814%	p_1 = 9.3168%
q_1 = 74.4186%	q_1 = 90.6832%

Standard Error of Difference = 5.2330. →

Difference between percentages 16.2646 →

Critical Ratio = $\frac{16.2646}{5.2330}$ = 3.1081 →

Significant at the 1% level

$p = < .01$

IX D.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF QUESTIONABLY NORMAL RECORDS BETWEEN I. THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP (E.C.T. CASES EXCLUDED) AND II. THE GROUP OF YOUNG NORMAL ADULTS.

Group 1.	Group 11.
No: of ?N records = 17	No: of ?N records = 18
Percentage ?N records = 19.7674%	Percentage ?N records = 11.1801%
Total N of Group = 86	Total N of Group = 161
p_1 = 19.7674%	p_2 = 11.1801%
q_1 = 80.2326%	q_2 = 88.8199%

Standard Error of Difference = 4.9608 →

Difference between percentages = 8.5873 →

Critical Ratio = $\frac{8.5873}{4.9608}$ = 1.7310 →

Not Significant

($p = < .1$)
(10% level).

IX E.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF NORMAL RECORDS BETWEEN I. THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP (E.C.T. CASES EXCLUDED) AND II. THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
No: of N records = 47	No: of N records = 128
Percentage N records = 54.6512%	Percentage N records = 79.5031%
Total N of Group = 86	Total N of Group = 161
p_1 = 54.6512%	p_2 = 79.5031%
q_1 = 45.3488%	q_2 = 20.4969%

Standard Error of Difference = 6.2402 →

Difference between percentages = 24.8519 →

Critical Ratio = $\frac{24.8519}{6.2402}$ = 3.9825 →

Significant @ .1% level

($p = < .001$)

X. In this section a comparison is made between our total psychotic group (manic depressives and involutional melancholics) and our group of 161 normal young adults as regards certain important e.e.g. variables.

(a) The salient conclusions emerging from a comparison on alpha frequency, amplitude and percent time, beta frequency and amplitude and theta amplitude are as follows:-

In the case of alpha frequency a significant difference at the 5% level was found, while in those of amplitude and percent time the differences were significant at the 1 percent level. In the first case the age factor ($P = < .001$) is probably responsible but in the second and third we are almost certainly dealing with an intrinsic difference as these characteristics, on the basis of much experimental work are known not to vary appreciably with age.

Beta frequency is significantly higher (5 percent level) and theta amplitude is significantly higher (1 percent level) in the psychotic group but in the latter case this may be related to the mean age difference.

(b) As regards the incidence of Beta and Theta activity, the former is significantly higher and the latter significantly lower ($P < .001$ in both cases) in the psychotic group.

(c) There is no significant difference between the incidence of any of the three alpha types distinguished by Grey Walter and his school (C or R, P & M) in the psychotic and normal group.

TABLE SHOWING THE MEANS, STANDARD DEVIATIONS AND NUMBERS (IN EACH GROUP) OF THE E.E.G. VARIABLES INDICATED FOR THE MANIC-DEPRESSIVE PSYCHOSIS AND INVOLUTIONAL MELANCHOLIA GROUP AND THE GROUP OF YOUNG NORMAL ADULTS. ALSO SHOWING THE DIFFERENCES BETWEEN THE MEANS AND THE 't' VALUES FOR THESE DIFFERENCES.

E.E.G. VARIABLE	MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP			YOUNG NORMAL ADULT GROUP			DIFFERENCE BETWEEN MEANS	't' VALUE FOR THE DIFFERENCE
	Mean	N	Stand. Dev.	Mean	N	Stand. Dev.		
Alpha Frequency	10.0446(43) c/s	112	1.1206	10.3198 c/s	161	0.9832	0.275157 c/s	$t_{\bar{p}}$ = 2.1467 $\bar{p}$ = <.05
Alpha Amplitude	24.3750 μ	112	15.8547	31.9872 μ	161	20.9280	7.6122 μ	$t_{\bar{p}}$ = 3.2536 $\bar{p}$ = <.01
Alpha Percent Time	43.7054 %	112	30.1762	56.1000 %	161	31.0944	12.3946 %	$t_{\bar{p}}$ = 3.2789 $\bar{p}$ = <.01
Beta Frequency	18.9767 c/s	86	3.2992	17.9352 c/s	85	3.0310	1.0415 c/s	$t_{\bar{p}}$ = 2.1488 $\bar{p}$ = <.05
Beta Amplitude	10.8519 μ	86	8.7205	8.7413 μ	85	5.1429	2.1106 μ	$t_{\bar{p}}$ = 1.9249 $\bar{p}$ = <.1
Theta Amplitude	22.8830 μ	47	13.2766	16.6001 μ	105	11.9145	6.2829 μ	$t_{\bar{p}}$ = 2.8992 $\bar{p}$ = <.01
Age	54.9573 yrs	117	14.4720	22.4000 yrs	161	5.0380	32.5573 yrs	t = 26.5017 $\bar{p}$ = <.001.

XA.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF BETA ACTIVITY BETWEEN I THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP, AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
Percentage beta activity = 73.5043%	Percentage beta activity = 52.7950 %
No. of cases with beta = 86	No. of cases with beta = 85
N = 117	N = 161
p_1 = 73.5043 %	p_2 = 52.7950 %
q_1 = 26.4957 %	q_2 = 47.2050 %

Standard error of difference = 5.6679. →

Difference between percentages = 20.7093. →

Critical Ratio = $\frac{20.7093}{5.6679}$. = 3.6538. →

$\hat{p}$ = <.001. Significant.

XB.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF THETA ACTIVITY BETWEEN I THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP, and II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
Percentage theta activity = 40.1709 %	Percentage theta activity = 64.5963 %
No. of cases with theta = 47	No. of cases with theta = 104
N = 117	N = 161

p_1 = 40.1709 %
q_1 = 59.8291 %

p_2 = 64.5963
q_2 = 35.4037

Standard error of difference = 5.8946 →

Difference between percentages = 24.4254 →

Critical Ratio = $\frac{24.4254}{5.8946}$ = 4.1437 →

$\breve{p}$ = <.001. Significant.

XC.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF 'C' TYPE ALPHAS BETWEEN I THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP, AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
No. of 'C' type alphas = 65	No. of 'C' type alphas = 102.
Percentage of 'C' type alphas = 59.6330	Percentage of 'C' type alphas = 63.3540
N = 109	N = 161
p_1 = 59.6330 %	p_2 = 63.3540 %
q_1 = 40.3670 %	q_2 = 36.6460 %

Standard error of difference = 6.0419.

Difference between percentages = 3.7210.

Critical Ratio = $\frac{3.7210}{6.0419}$. = 0.6159.

$\hat{p}$ = <.60

XD.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF 'P' TYPE ALPHAS BETWEEN : I THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIA GROUP, AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
No. of 'P' type alphas = 10	No.of 'P' type alphas = 16
Percentage of 'P' type alphas = 9.1743	Percentage of 'P' type alphas = 9.9379
N = 109	N = 161
p_1 = 9.1743 %	p_2 = 9.9379
q_1 = 90.8257 %	q_2 = 90.0621

Standard error of difference = 3.6337 →

Difference between percentages = 0.7636. →

Critical Ratio = $\frac{0.7636}{3.6337}$ = 0.2101. →

P = <.80

XE.

TO TEST THE SIGNIFICANCE OF THE DIFFERENCE IN THE INCIDENCE OF 'M' TYPE ALPHAS BETWEEN: I THE MANIC-DEPRESSIVE AND INVOLUTIONAL MELANCHOLIC GROUP; AND II THE GROUP OF YOUNG NORMAL ADULTS.

Group I.	Group II.
No. of 'M' type alphas = 34	No. of 'M' type alphas = 43
Percentage of 'M' type alphas = 31.1927	Percentage of 'M' type alphas = 26.7081
Total N = 109	Total N = 161
p_1 = 31.1927 %	p_2 = 26.7081 %
q_1 = 68.8073 %	q_2 = 73.2919 %

Standard error of difference = 5.6435.

Difference between percentages = 4.4846.

Critical Ratio = $\frac{4.4846}{5.6435}$ = 0.7946

$\therefore p > .50$

3. PARTICULARS OF CASE WHO DEVELOPED MANIACAL STATE DURING CORTISONE TREATMENT.

3. PARTICULARS OF CASE WHO DEVELOPED MANIACAL STATE DURING CORTISONE TREATMENT.

(a) INFORMATION FROM PRETORIA HOSPITAL RECORD.

Reg. No. 2130/51.
Admitted 15.2.1951. Discharged 19.3.1951.
Diagnosis on admission and discharge : Rheumatoid arthritis.

History:
Main complaints : (1) Pain in joints, 4 years
(2) tiredness, 3 years
(3) loss of weight.

Pain, which was burning in character, started in the upper arms. It spread to the elbows and hands which resulted in limitation of movement, e.g. inability to comb her hair. Later she experienced pain in the feet, with swelling entailing the wearing of larger shoes, then the knees were affected. At present the spinal column, hips, hands and elbows are the joints most involved. For the past week unable to use knife and fork. The pain was helped by heat. The joints have become stiff. As regards the malaise that she has experienced for the past two years, it is worse in the morning and wears off towards night.

---

20 years previously she had a rash which was attributed to her poor nervous state.
Climacteric: 45 - no trouble.
Menarchy : 15.
1937 left breast amputated ? cancer found.

Psychological: Patient is a nervous person; becomes excited easily. She has noticed that if she gets upset her arthritis becomes worse. Cries easily (family characteristic). No domestic difficulties nor any particular financial difficulties. Does not drink or smoke. Patient becomes dispirited in the early morning but this passes by 11 a.m. Has many friends.

General examination: An elderly woman, intelligent, lying comfortably in bed, her mental condition looks good at present.

Detailed clinical examination revealed nothing of note apart from her rheumatoid arthritis, a good impression of which is gained from her X-ray report of 15.2.1951.

X-ray of hands and fingers: There is evidence of a measure of generalised osteoporosis which is most advanced around the joints. Periarticular soft tissue swelling is clearly visible in the second, third and fourth proximal interphalangeal joints of the right hand and round the third and possibly also the second proximal interphalangeal joints of the left hand. Early bone destruction is detectible in the head of the proximal phalange of the left third finger and the head of the proximal phalange of the right index finger. The joint spaces are still within normal limits. The picture is typical of rheumatoid arthritis.

Record ....

Date	Total Units
19.2.51	50
20.2.51	100
21.2.51	100
22.2.51	75
23.2.51	100
24.2.51	100
25.2.51	100
26.2.51	100
27.2.51	100
28.2.51	100
29.2.51	100
30.2.51	100
31.2.51	100
1.3.51	100
2.3.51	100
3.3.51	100
4.3.51	100
5.3.51	100
6.3.51	100
7.3.51	75
8.3.51	75
9.3.51	75
10.3.51	75
Total	1825

Other medication : phenobarbitone 2 grains 10.30 p.m., 10.3.1951.

Progress notes:

25.2.1951 The pains disappeared after the first 12 hours. There is more movement in her joints. The ~~first~~ fist can be closed to a greater extent. Can knit - an impossibility during the past year. Walking is not painful - just the muscles of the back of her leg feel stiff. Appetite also improved.

9.3.1951 Complains of transient attacks of memory loss. Psychologically the patient appears a little emotionally unstable. After reassurance the patient became calmer.

10.3.1951 Since this morning the patient has been peculiar. This afternoon she became very queer mentally. She repeats words or sentences and frequently rings the bell. She gets up repeatedly. She appears to be undergoing mental conflict and does not wish to see visitors. She complains that she has not slept for the last three nights. B.P. 160-90 5.30 p.m.; 140-90 9 p.m. After receiving 2 grains of phenobarbitone she calmed down and slept well.

Discharge note:

As the previous report indicates the patient responded rapidly. She began to improve 12 days after the commencement of treatment. The pain left her and the movements of the joints, especially the fingers, became practically normal. This picture of improvement was also accompanied by a wonderful euphoria, although at times she also looked a little depressed.

About a week ago thepatient suddenly became manaical - developed very vivid hallucinations of religious content - was difficult to control, cried out in a loud voice and was at times also very confused.

Cortisone treatment was then immediately stopped but the patient's condition remained unchanged. She was visited by a psychiatrist and she was discharged in a state of mental confusion, but the arthritis was beautifully improved (almost cured).

Laboratory Reports on Blood:

	5.2.1951	19.2.1951.
Hb	105%	94%
R.B.Cs.	5,400,000	4,730,000
W.B.Cs.	19,100	10,600
Eosinos	-	2%
Basos	-	2%
Polys	81%	57%
Lymphos	16%	38%
Large Monos	3%	1%
Platelets	Normal	Normal
V.d.Bergh	Neg.	Neg.

Blood for estimation of serum proteins and K.

		19.2.1951	26.2.1951	5.3.1951	12.3.1951
Total protein	gm.%	6.20	6.38	7.45	6.02
Albumin	gm.%	3.30	3.87	7.76	3.25
Globulin	gm.%	2.9	2.51	4.69	2.77
Kalium	mgm%	20.0	16.9	18.4	16.3

(b) INFORMATION FROM WESKOPPIES HOSPITAL RECORD.

Reg.No. F.E.T. 52.
Admitted 20.3.1951. Discharged 14.4.1951.

Admission documents: Specialist psychiatrist states: She is noisy and screams and talks nonsense. She is restless and difficult to control. In the General Hospital she was talkative, elated, and showed flight of ideas. At times she makes such exclamations as: the sacrifice is on the fire. She received cortisone and during the treatment acute mania developed.

Pre-psychotic history given by husband: She had been depressed for four months preceding cortisone treatment, which he attributed to the pain and crippling effect associated with her rheumatoid arthritis.

Mental S.9 report: It is reported that during the first three days of her stay here she was in a very excited state - restless, noisy, resistive and violent and that she required sedatives. Although her excitement subsided considerably after that, she is still garrulous and exhibits flight of ideas with emotional instability. She states moreover that two of her fellow-patients have been broadcasting her whole life-history since childhood ....

childhood and that other patients are acting it. (Last sedative before first e.e.g. test was given at 3.20 p.m. on the previous afternoon).

Subsequent history at Weskoppies:

At the time of her first e.e.g. test on 20.3.1951 she had subsided from the state of acute mania (E2) in which she had been for her first three days at Weskoppies to one of hypomania in which she was talkative, mildly restless, euphoric and in which ideas of reference were still present. Her condition improved further until at the time of her discharge she was normal although lacking insight into the morbid nature of the ideas of reference with hallucinatory accompaniments experienced during the earlier part of her stay. Her second e.e.g. was performed on the day of her departure, viz., 14.4.1951.

DIAGNOSIS

(a) Verbal **Maniacal state attendant on administration of cortisone**

(b) Symbolic

Predominant Phase	State at Test
	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.T.52** (b) N.I.P.R.	**61**	**F**	**E**		**23.3.51**	**10.30a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **9.3.1951.**

Admissions to Mental Hospitals: **20.3.1951.**

Clinical History:

Husband reports that for about 4 months prior to cortisone treatment she was depressed, a fact which he attributed to the pain and crippling effect of her rheumatoid arthritis. On the 19th day of cortisone treatment (9.3.51) she showed mild emotional instability and complained of transient episodes of memory loss. The next day she was restless, kept on ringing for attention, repeated words or sentences, complained that she had not slept for three nights and refused to see visitors. She required a sedative (phenobarbitone). Immediately prior to her admission to Weskoppies on 21.3.1951 she is described as restless, noisy, difficult to control and very talkative with flight of ideas and elated. On one occasion she exclaimed "Die offer is op die vuur". During first 3 days at Weskoppies in a very excited state (M2) - restless, noisy, resistive, violent, and requiring sedatives. The became calmer, but mood fluctuated and described ideas of reference with hallucinations.

State at Test: **Over-active, euphoric, talkative, with ideas of reference.**

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report ~~(A.C. Mundy Castle)~~ **(L. A. Hurst)**

This record is normal. Alpha activity of standard origin and a frequency of 8.75 c/sec. dominates the record, being of high voltage (50 microvolts) and high percentage time (80%). Fast activity at 18 c/sec. is sporadic, scanty, ill-defined and of low voltage.

Hyperventilation evokes no appreciable change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.75	50	occ-par	80				
Beta	18	5	gen	5				
Theta								
Delta								
"Choppy"								

Hyperventilation **No change.**

Normality Normal **Questionably Normal** **Abnormal**

DIAGNOSIS **R1**

PSYCHOLOGICAL PATTERN at Test

(a) Verbal **Maniacal state attendant on administration of cortisone**

(b) Symbolic

Predominant Phase	State at Test
	0

Mood	Motility	Psychic Tempo
0	**0**	**0**

Registered No. (a) Weskoppies **F.E.T.52** (b) N.I.P.R.	Age	Sex	Race	RH or -H	E.E.G. Date	E.E.G. Time	Time of last meal
	61	**F**	**E**		**14.4.1951**	**10a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **Normal, but lacked insight into the morbid nature of her former ideas of reference and accompanying hallucinations.**

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report ~~(A. Cox, Dundee Castle)~~ (L. A. Hurst)

This record is normal. Alpha activity of standard origin dominates the record, being of high average amplitude(50 microvolts) and of high percentage time (80%). Beta activity at 18 c/sec. is sporadic, ill-defined and of low voltage.

The only difference between the properties of alpha and beta rhythms in this and the previous record is that the frequency of the alpha rhythm has decreased from 8.75 to 7.9 c/sec. This may prove a highly significant finding if it may be interpreted in the sense that with the wearing off of the effect of the cortisone there is a falling off in the frequency of the alpha rhythm to the original normal level.

Summary of Features relevant for statistical purposes

Resting

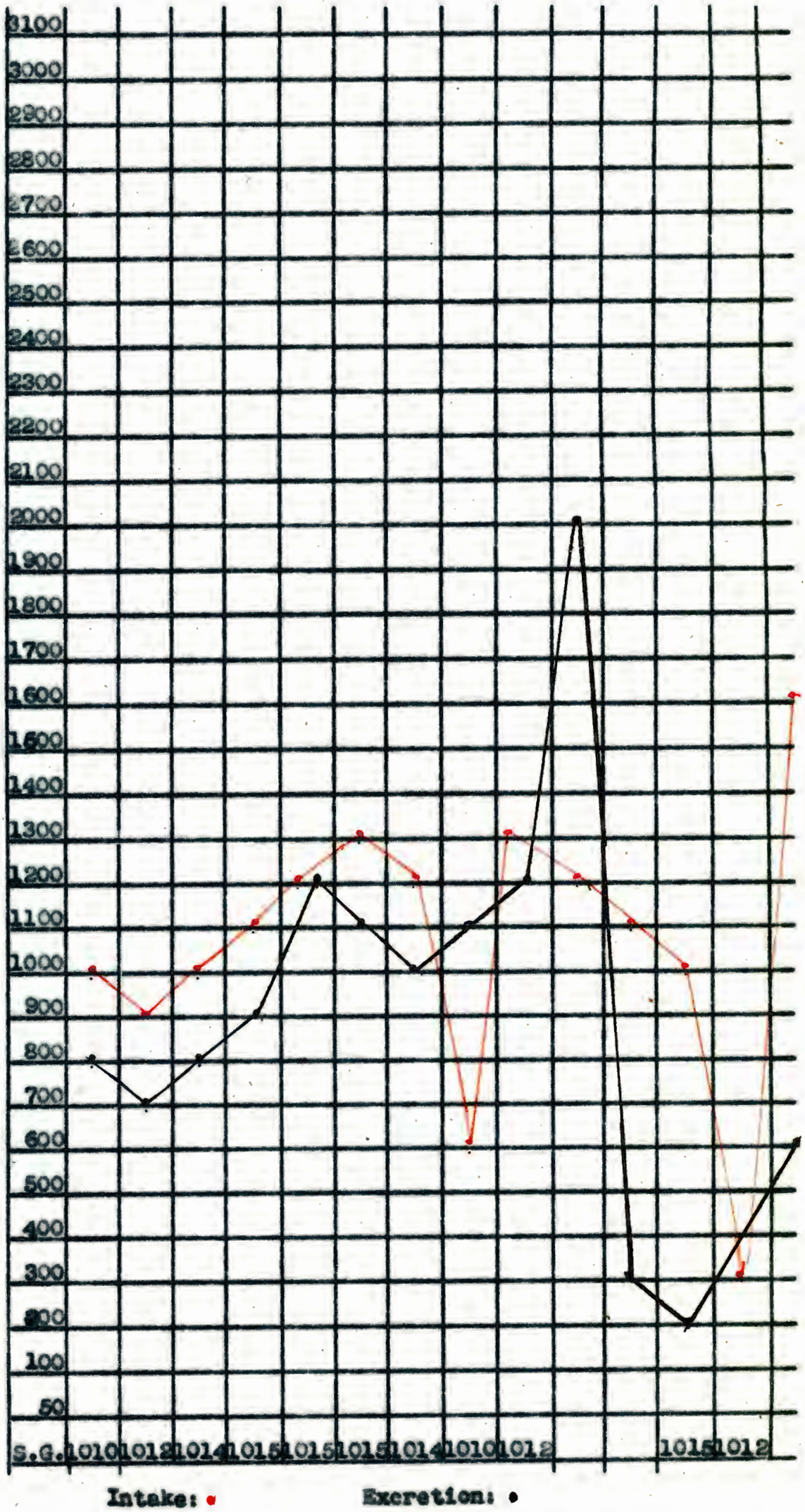
	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**7.9**	**50**	**occ-par**	**80**				
Beta	**18**	**5**	**gen**	**5**				
Theta								
Delta								
"Choppy"								

Hyperventilation

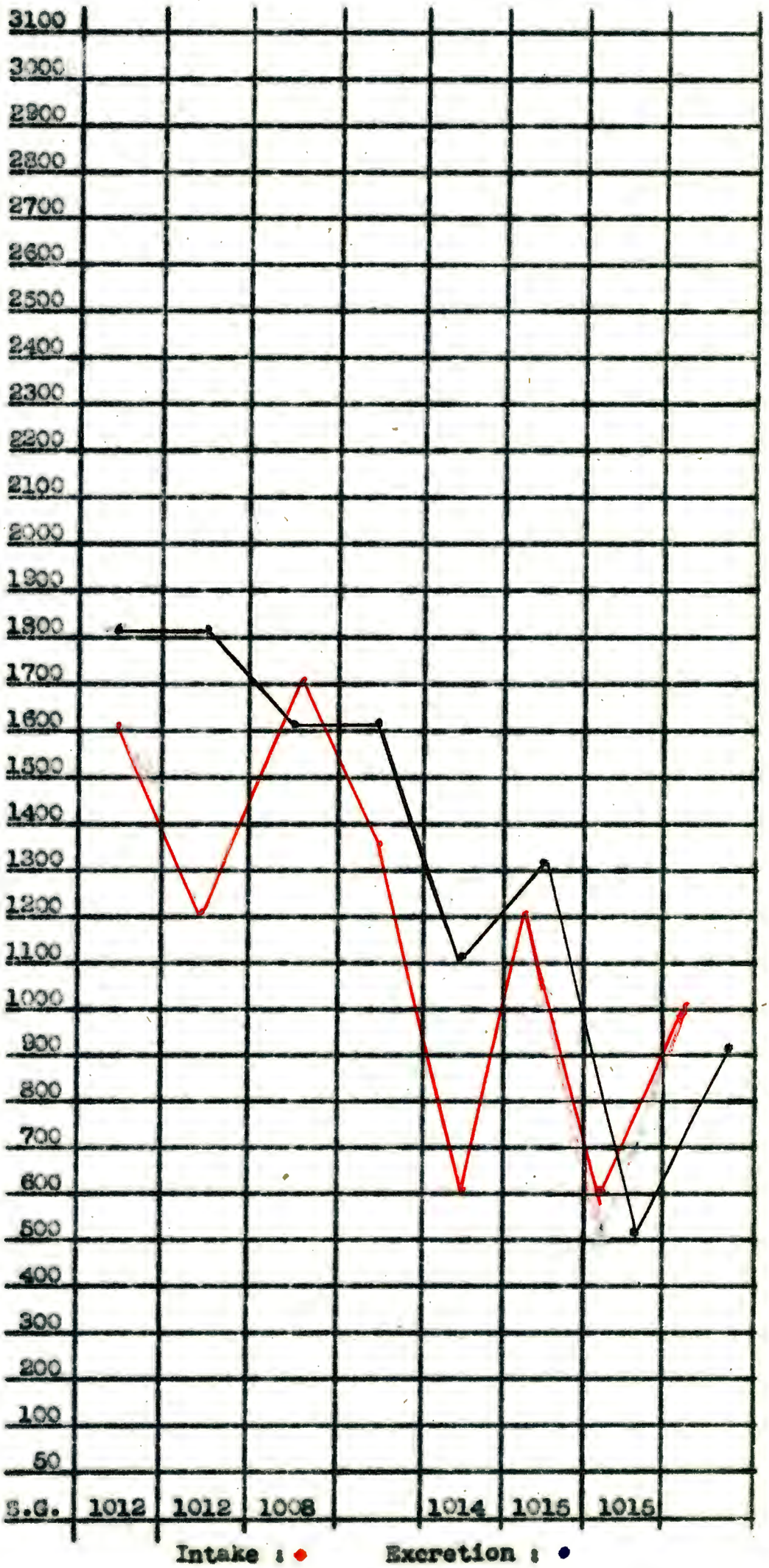
No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

GRAPHS OF FLUID INTAKE AND EXCRETION.



GRAPHS OF FLUID INTAKE AND EXCRETION.



Significance of this Case.

The salient electroencephalographic finding in this case is a fall in alpha frequency from 8.75 to 7.9 c/sec, accompanying a psychiatric change from hypomania (rated as M_1 on our scale) to normality, and the presumed wearing off of the effect of cortisone. This change in alpha frequency of 0.85 c/sec. lies within the range of normal variability for recordings at different times - both on the basis of our own sample (see statistical table III) and on that of the more extensive material of the British School: paragraph (3) of the quotation at the end of our Chapter III from Appendix IV of Hill and Parr's "Electroencephalography" indicates that anything under a variation of 1 c/sec. or 10% of the dominant frequency, from epoch to epoch, does not constitute instability of the dominant frequency.

These findings would accord with the hypothesis that in manic states artificially induced by cortisone, as in the naturally occurring cases of Pauline Davis' and our own investigations, change in psychotic phase or degree thereof is not associated with a significant change in alpha frequency.

It should be noted that in the case under consideration we have to do with a low alpha frequency. It will be borne in mind that in our naturally occurring cases predominantly manic patients showed a marked tendency towards high alpha frequencies. Should therefore the findings in our artificially induced case prove to be typical on the basis of investigation of a large series of cases, an aetiological rôle of cortisone in the manic state would be indicated.

C H A P T E R V.

SUMMARY, CONCLUSIONS AND DISCUSSION.

1. This investigation comprises psychiatric, psychological and electroencephalographic study of 99 manic-depressive cases and 18 involutional melancholics. Clinical assessments were made in terms of predominant phase, phase and severity of phase at test, changed degree of type of phase in the same individual, standard clinical sub-groups and purity of mixture of phase. Psychological assessments were made in terms of mood, motility and psychic tempo. E.e.g. assessments were made in terms of all or some of the categories incidence, frequency, amplitude and percent. times with reference to each of the rhythms distinguished by the British school, viz., alpha, beta, theta and delta. A special study of disorganised records was also undertaken. 48 of the e.e.g. recordings were repeated (25 with changed, 23 with unchanged degree or type of phase), and 2 recordings were carried out on a case that developed a manic-like psychosis during cortisone treatment, making a total of 167 e.e.g's. All but six of these were done on a 6-channel Ediswan machine. These six were done on a one-channel Garceau apparatus.

Perhaps a unique feature of this study on the clinical side was the close and intensive assessment of the cases at and around the time of the test, rendered possible by the fact that they were transported from Weskoppies Hospital, Pretoria, to Johannesburg and back by van by the writer (a journey of over an hour each way),

on...

as well as their being under observation at the time of the test and at irregular intervals during the day.

2. An association between fundamental psychiatric and psychological features on the one hand, and the best explored electrical brain rhythm on the other was demonstrated by our investigation, viz., that the manic phase with its positive rating of mood, motility and psychic tempo shows a tendency to be associated with high alpha frequency, and that the depressed phase with its negative ratings on the same three psychological variables shows a tendency to be associated with low alpha frequencies.

This is true of

(a) Predominant phase of the case (significant at .1 percent level).

(b) The phase at test - which may be a reflection of (a) also significant .1 percent level.

There is no significant difference in age between these groups.

It is <u>not</u> true of change of phase or change of degree of phase in the same individual at different tests. (Degrees of depression and mania were rated on a three-point scale: D1, D2, D3 and M1, M2, M3, in order of increasing severity. In assessing shift of phase the following scale was therefore employed: D3 - D2 - D1 - M1 - M2 - M3. Shift to the right was rated plus and to the left minus. 1-step, 2-step and 3-step shifts were compared <u>inter se</u> and as a combined group they were compared with the group of cases that had shown no shift between tests - as regards quantitative change of e.e.g. characteristics, notably alpha frequency).

These findings confirm those of Pauline Davis.

3. A /...

3. A special study of irregular or disorganised records was undertaken as an extension of Davis' theme of "choppy" records and her interpretation of their origin on a toxic-organic basis. With the assistance of frequency analysis three groups of disorganised records (with less well defined borderline groups) were defined. In the A type salient features are poor alpha and excessive beta activity. In the B type there is excessive diffuse theta activity of medium voltage superimposed upon A type characteristics. D type records show excessive fast activity as in the A type but with a well developed alpha rhythm. A "flat" variant A type occurs, originally designated C, but later incorporated as in principle it does not differ from the A type, in spite of its different appearance. A further variant of the A type is one corresponding to what Davis describes as a "choppy" record, in which there is considerable fast activity with a frequency of over 30 c/sec.

Statistical analysis reveals that there is a significantly higher incidence of A and B type disorganised records, both separately and combined, in our psychotic group than in a group of 161 normal young adults when the borderline A and B records are included. When the borderline groups are separated off from the A and B groups respectively, in the case of A the significant difference persists in both subdivisions, while in the case of B it does so only in the borderline group.

The significantly higher incidence of disorganised records in our manic-depressive and involutional melancholia group may be adduced as evidence for a toxic-organic aetiology and pathogenesis of these conditions,

on/...

on the basis of the type of evidence offered by Davis taken in conjunction with the oligodendroglia damage described by Canadian and Italian workers and recent work on cortisone. An alternative explanation is a psychological one, viz., that the attenuation of the alpha rhythm which is so prominent a feature of A type records is brought about by some mental process such as attention, e.g., preoccupation with delusional ideas in cases of depression. Against such an explanation is the absence of significant differences in the incidence of A and B type records in manic or depressed cases (both in terms of predominant phase and phase at test), as these phases contrast psychologically and nowhere more than in the matter of attention.

Our findings may therefore be regarded as having contributed something to the toxic-organic view of manic-depressive psychosis. It at the same time extends the hypothesis of my previous work on electroencephalographic support for a genetically oriented organic view of schizophrenia. The comprehensive hypothesis covering the findings of the earlier study on schizophrenia and the current one on manic-depressive psychosis and involutional melancholia may be formulated in broad general outline as follows: Both conditions are explained in terms of a toxic-endocrine assault on the brain - the differences as to extent and type of neuropathology, and the content, severity and chronicity of psychiatric symptomatology being determined by differences in physical constitution (and resistance) and prepsychotic psychological constitution which are genetically grounded.

4. An ...

4. An individual case meriting special discussion is that of a patient suffering from rheumatoid arthritis who developed a manic-like state after fairly prolonged administration of cortisone. An e.e.g. was done when the psychotic state was already subsiding but was nevertheless still definitely one of hypomania, and another one after she had recovered. The mean alpha frequency fell from 8.75 c/sec. at the first test to 7.9 c/sec. at the second test. This change in alpha frequency of 0.85 c/sec. lies within the range of normal variability for recordings at different times, both on the basis of our own sample and on that of the more extensive material of the British School: paragraph (3) of Appendix IV of Hill and Parr's "Electroencephalography" indicates that anything under a variation of 1 c/sec. or 10% of the dominant frequency from epoch to epoch does not constitute instability of the dominant frequency.

These findings would accord with the hypothesis that in manic states artificially induced by cortisone, as in the naturally occurring cases of Pauline Davis' and our own investigations, change in psychotic phase or degree thereof is not associated with a significant change in alpha frequency.

It should be noted that in the case under consideration we have to do with a low alpha frequency. It will be borne in mind that in our naturally occurring cases predominantly manic patients showed a marked tendency towards high alpha frequencies. Should therefore the findings in our artificially induced case prove to be typical on the basis of investigation of a

large...

large series of cases, an aetiological rôle of cortisone in the manic state would be indicated.

5. Certain difficulties are also raised for the Heymans-Wierama-Bleeheuvel view of temperament by the finding that change of phase in the individual manic-depressive is not accompanied by a shift in alpha frequency, in view of the fact that Mundy-Castle's work indicates that there is a tendency for primary function to correlate with high alpha frequency and secondary function with low alpha frequency. The difficulty is, however, not insurmountable, for after all the view that mania is primary function writ large and depression secondary function writ large is a popular one and does not stand up to critical scrutiny. It is probably true that what we have termed mood and motility are as important, if not more so, in a clinical assessment of a case as manic or depressed as is psychic tempo, which is our clinical variable most likely to have affinities with primary and secondary function. The number of cases in our series which are disparate as regards positive and negative values for psychic tempo on the one hand and mood and motility on the other is unfortunately inadequate to a statistical solution of the problem. In the case of retarded and agitated depression, however, where mood and psychic tempo may be regarded as similar but motility be taken as minus and plus respectively alpha frequency is found to be significantly higher in the former case at the 2% level. It would thus appear that alpha frequency and motility are inversely related (in the manic

depressive...

depressive group). This finding is in conflict with Davis' observation that agitated and terse cases have MF records and relaxed inhibited cases have MS records.

Another hypothesis that might help to explain our finding of the importance of predominant clinical phase as the determinant of alpha frequency is that this predominant phase indicates the basic temperament of the subject and that swings towards the opposite phase are brought about by some extraneous factor or process (e.g. cortisone).

6. Statistical analysis of mean alpha frequency between the different standard psychiatric sub-groups of our material revealed the following positive findings: Firstly, between the involutional melancholia group and manic group there is a significantly lower mean in the former case (at the .1 percent level) but this may be explicable in terms of the significantly higher mean age in the former case (at the 1 percent level). Secondly, between the involutional melancholia group and the circular form manic cases the significantly higher alpha frequency (at the 5 percent level) is probably explicable in terms of the significantly higher mean age in the former group (at 2 percent level). In the third case, however, namely, between the manic group and depressed group within the manic depressives, the higher alpha frequency in the manic group (significant at the 1 percent level) cannot be explained in terms of an age difference (age $P < .20$).

7. A comparison of the total psychotic group and the group of normal young adults yielded the following results:-

(i)...

(i) Alpha characteristics.

(a) The mean alpha frequency is significantly lower in the psychotic group (at the 5 percent level) but this is probably due to the higher mean age (significant at the .1 percent level).

(b) The mean alpha amplitude is significantly lower in the psychotic group (at the 1 percent level).

(c) The mean alpha percent time is significantly lower in the psychotic group (1 percent level). (These findings (b) and (c) are probably intrinsically meaningful, as these e.e.g. characteristics are not known to vary appreciably with age). They also connect up with the findings as regards low voltage disorganised records found in our psychotic group, and discussed elsewhere.

(d) A (or C), P & M alpha types: These three alpha types are distinguished by Grey Walter in terms of the responsiveness to visual stimulation. No significant difference is found in the incidence of any of the three between our psychotic and normal group.

(ii) Beta characteristics.

Beta frequency is significantly higher in the psychotic group (5 percent level).

(iii) Theta characteristics.

Theta amplitude is significantly higher in the psychotic group (1 percent level), but this may have some relation to the difference in mean age between the two groups.

(iv) Beta and Theta incidence.

The incidence of beta activity is significantly higher and of theta activity significantly lower (both .1 percent level) in the psychotic group.

S. As...

6. As will be noted from the foregoing, care has always been taken to state the bearing of the age factor. In addition a special investigation of the influence of the age factor on the normality or otherwise of the e.e.g. (in terms of the criteria of the British School) was undertaken, in view of the fact that about half of our psychotic material falls into the age group 55 and over, where arteriosclerotic and senile brain changes might affect the e.e.g. Statistical analysis, however, revealed no significant differences as to the incidence of normal, questionably normal and abnormal records between the age groups of up to and over 55 years of age.

Similar care was taken to evaluate the possibly distorting effect of electro-convulsive therapy on the e.e.g. As the estimates of post e.c.t. disturbances in the e.e.g. vary from 6 weeks to a year, in our study untreated cases were grouped with cases treated over a year before testing, and compared with cases treated within the year before the test. There was no significant difference in the incidence of abnormal and questionably normal records as between the two groups.

A P P E N D I X.

EXPLANATORY NOTE.

This appendix comprises first forms embodying psychological, psychiatric and electroencephalographic particulars of individual cases.

The symbols appearing on the forms, relating to psychological and psychiatric data have been explained in Chapter III. A certain amount of explanation is, however, still needed as regards entries appearing in the Table headed: Summary of Features relevant for statistical purposes. The heading Frequency indicates average frequency. Entries under Responsive refer to responsiveness to visual stimulation unless otherwise specified and are made on a 3-point scale. Entries against "Choppy" are of a very preliminary and tentative nature. Subsequently a separate and more systematic study of all records was undertaken from the standpoint of their disorganisation with results which have been recorded in Chapter IV.

C = classical and R = responsive have been used interchangeably in describing alpha type.

Considerable and Excessive have been used interchangeably to indicate the highest degree percentage time on a 3-point scale. Eventually the former term came to be preferred as the latter term might carry with it the unjustifiable connotation of abnormality. Rare and Medium represent degrees 1 and 2 on the 3-point scale.

The Appendix also includes without critical evaluation, merely for record purposes, a report on a sleep record of a manic depressive patient (manic phase) and for comparison a report from the literature on the sleep record of a manic depressive psychosis (depressed phase).

Then follow examples of statistical methods used.

Finally photographic samples of disorganised e.e.g. records appear.

A P P E N D I X.

1. FORMS WITH PSYCHIATRIC, PSYCHOLOGICAL AND E.E.G. DATA.

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.4498** (b) N.I.P.R. **36**	**70**	**M**	**E**		**21.4.49**	**10 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1925**
28.9.1926 and 14.9.1929

Clinical History:

Psychotic history dates back to 18 months before first admission. Before and during his first admission there were depressive and manic episodes. Discharged recovered 2.3.1928. Re-admitted in September 1929. Since then in chronic hypomanic state with maniacal exacerbations. The hypochondriasis present indicates a depressive admixture.
(Depressed fracture high posterior left parietal region approximately 1½ inches from midline sustained in 1915).

State at Test:

Talkative, noisy, boastful, megalomanic, euphoric, flight of ideas, interfering and personal.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal record, with considerable fast activity arising in fronto-central regions at 18 - 24 c/sec. The alpha rhythm was at 10 and 11 c/sec., of medium voltage and blocked normally to visual stimuli. A rhythm at 9 c/sec. appeared on the par-temp. leads, also of medium voltage, probably related to alpha function. These areas in particular gave the record a choppy appearance due to mixture of alpha + faster beta frequencies.
Hyperventilation caused no change other than a decrease in beta activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**20**	**occ**	**80**	**C**	**3**		**Also 9 c/s.rhythm par-temp.**
Beta	**21**	**v.low volt. fr.cent.**		**70**				
Theta								
Delta								
"Choppy"	**Superimposition of fast activity on alpha produced slight "choppiness" in the Davis sense (ACM-C).**							

Hyperventilation

Decreased beta activity .

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular.**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.4498** (b) N.I.P.R. **36 R.1**	72	M	E	RH	26.4.51.	9.30a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Garrulous, exalted, delusional.

E.C.T. a. Interval preceding e,e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to excessive medium voltage frontal fast activity at 14 - 24 c/sec., this sometimes appearing in short generalised paroxysmal bursts.

The alpha rhythms were at 9 - 11 c/sec blocking normally and of high voltage.

Hyperventilation augmented the fast activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	50	occ	60	C	3	2	Blocked by vis.stim
Beta	19	20	front	concid				Numerous short gen.bursts at 24 c/s. amp.25. 14-122 c/s. and sometimes 24 c/s. augmente by eye opening.
Theta								
Delta								
"Choppy"	Paroxysmal beta.							

Hyperventilation

Beta 22 c/sec, amp. 30 increases in bursts - strong frontall

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M	C

PSYCHOLOGICAL PATTERN

Mood	Motility	Psychic Tempo
C	C	C

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 37 M.E.7172	70	M	N		21.6.49	11 a.m.	7.15 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1899, 1935, 12.10.1936 (current).

Clinical History: Since onset of illness subject to frequent phases of mania and hypomania, in which he is silly, playful, exhibits flight of ideas and a tendency to misidentify people, over-activity with compulsive acts and interfering behaviour. Normal and mildly depressive phases intefvene between manic attacks.

Physical: right eye and portion of right frontal bone missing due to injury during World War I.

State at Test: Normal, having just recovered from hypomanic attack.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Record abnormal due to persistent activity at 6.5 7 c/sec., evidently related to alpha at 8 and 9 c/sec. since it blocked with visual stimuli, but did not arise in occiput but further forward. Beta activity at approximately 18 c/sec, sometimes disturbed alpha activity and produced choppiness of record. This beta was low in voltage but fairly frequent and persistent.

Hyperventilation augmented the theta and alpha components, in addition to occasional medium voltage delta waves underlying them at 3 c/sec.. These disappeared rapidly whilst the increased general amplitude persisted for approximately 30 secs..

Summary of Features relevant for statistical purposes

esting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	50	occ	100	C	3		7 c/sec.component related to alpha.
Beta	18	5	fronto-cent.	80				
Theta	6.75	80	post-cent.	100				
Delta								
"Choppy"								

yperventilation (AC-AC) due to beta disturbing alpha.

'Alpha - F.8, amp.70, loc. occ., duration 36. Beta - nil. Theta - F.6.5, amp.70, loc. post-central, continuous. Delta - F.3, amp.50, generalised rare. Delta mixed with theta at 6 c/sec.

ormality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at [illegible]

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.7172 (b) N.I.P.R. 37 R1	70	M	E		22.9.49	2.45 p.m	12 noon

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

Clinical History:

For past few days has been restless, turning on taps, playful, and has exhibited flight of ideas. Ground parole has had to be stopped.

State at Test: Displays flight of ideas, is silly, restless and playful by turns, puns and indulges in misidentifications.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was less abnormal than before due to an upward shift in occipital frequency, from (6.5 - 9 c/sec) up to (less 7 to 10 c/sec.) The 7 c/sec activity arose more deeply than the alpha components, and sometimes appeared in short generalised bursts. Frontal activity at 10-14 c/sec of low voltage was also apparent, whilst mean amplitudes and percent-time of all activity had fallen. The alpha rhythms showed a normal blocking response.

Hyperventilation augmented all resting activity. It is noteworthy that blood sugar level was probably higher on this occasion - response to hyperventilation was less abnormal.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	17.5 ~~front.& occ.~~		50	C	3		Frontal alpha at 10-11 c/sec., amp. 10, was rare. Occ. alpha at 8,9 and 10 c/sec. amp. 50 at a % time of 50.
Beta	~~13.5~~	10	~~frontal~~	50				
Theta	7	25	~~post-cent.~~	50				
Delta								
"Choppy"	Paroxysmal 7 c/sec.activity.							

Hyperventilation

Frontal alpha, amplitude increased from 10 to 15. Occ. alpha from 25 to 40. This latter activity also observable in parietal region. Theta amp. increased from 25 % up to 50. Alpha & theta duration both l

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

PSYCHOLOGICAL PATTERN at [illegible]

(a) Verbal [illegible] - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	D1

Mood	Motility	Psychic Tempo
-	0	0

Registered No.	Age	Sex	Race	RH or [illegible]	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies 37R2 M.E.7172 (b) N.I.P.R.	72	M	B		1.3.51		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History:

Mildly depressed for past two weeks.

State at Test:

Mood one of mild depression but motility and psychic tempo average.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to domination by medium-high parieto-occipital 7 c/s activity together with fronto-central 6 c/s rhythms. A somewhat marked and rare 8 - 9 c/s occipital alpha rhythm was seen, but patient's apparent (by E.E.G.) drowsiness obviated a blocking response, an inverse relationship often occurring. Numerous bursts of generalised fast activity at 16-18 and 20-22 c/s also occurred. Typical 2 - 3 c/s delta sleep waves appeared at some stages.

Hyperventilation augmented all these phenomena.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.7	15	front.& occ.	rare	*	1		Frontal F.12,occ. F.8,9.Usually masked by 7 c/sec.
Beta	19	25	gen.& front					
Theta	6.5	50	par-occ-fr.	90	**		2	Blocked by eye opening.
Delta	2.5		sleep waves					
"Choppy"	gen.bursts 20 c/s.near spikes & paroxysmal.							
Hyperventilation	Beta F.18, amp.25, gen.bursts. Theta F.6, amp.70, gen.burst. Delta F.3, amp.70, gen.bursts.							

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal. Abnormal

* Beta F.16-18,amp.30,gen.bursts strong frontally.Beta F.20-22,amp 20 generalised.

** Theta:6 c/s.strong frontally due to sleep;7 c/s.par.occ.

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.S.7740 (b) N.I.P.R. 38	52	M	B		21.4.49	2.5p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1932.

Admissions to Mental Hospitals: 19.3.1941, 22.11.1946(current)

Clinical History:

Depressive attacks in 1932 and 1937 in both of which he attempted suicide. During the 1941 admission he was predominantly anxious and depressed but there was occasional mild excitement with flight of ideas. **During the current admission manaical phases have predominated. In them he is restless, interfering, garrulous, exalted and at times violent. In the less prominent depressive phases he expressed suicidal ideas. There have been occasional mixed phases. Psychotic phases interrupted by normal phases.**

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. **1 month, 17 days.**
b. No. shocks and other particulars **7 shocks from 1.2.1949 to 4.3.1949.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Record abnormal. There was an excessive amount of fast activity at 14 - 18 c/sec. which completely concealed an underlying alpha rhythm probably of 11 - 12 c/sec. Amplitude of beta approximately 20 pu as opposed to 10 pu of alpha. The resulting appearance could certainly be described as "choppy". The fast activity appeared to arise post-centrally, but was fairly generalised.

Hyperventilation produced no change in record.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11.5	10	par-occ	?	M ?	0		
Beta	16	20	gen.but-central	100				
Theta								
Delta								

"Choppy" **Yes (AM-MC). Alpha continually disturbed by beta - 16 prominent**

Hyperventilation

No change.

Normality ~~Normal~~ . ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.S.7740 (b) N.I.P.R. 39.R1	54	M	E		5.4.51	12.20p.m.	B.7, L.12.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Euphoric, garrulous with mild flight of ideas, winked knowingly, and expressed hypochrondiacal ideas without evidencing appropriate affect.

E.C.T. a. Interval preceding e.e.g. 1 year, 9 months, 25 days.
b. No. shocks and other particulars. 4 shocks from 27-30.6.49.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive generalised medium voltage fast activity at 14 - 30 c/sec, this often appearing in paroxysmal bursts. A low voltage occipital alpha rhythm at 10 - 11 c/sec. was also present though usually marked by the faster frequencies. Diffuse theta at 4 - 7 c/sec. of medium-low voltage was also present. Hyperventilation caused some alpha augmentation.

(12 and 13 c/sec. alpha recorded in schema as well as 10 and 11 c/sec. alpha).

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11.5	10	occ	?	M	1		Masked by beta.
Beta	21.5	25						
Theta	5.3	20	diffuse		some/wl	1		Numerous parox bursts. Par-blocked.*
Delta								
"Choppy"	Paroxysmal.							

Hyperventilation

Slight increase in alpha otherwise little change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

* 20 c/sec. in large generalised bursts, greatest occipitally up to 50 microvolts.

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M	**O**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	**O**	**O**

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.7740** (b) N.I.P.R. **38.82**	**54**	**M**	**E**		**26.4.51**	**11.50a.m.**	**B.7, L.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **Normal.**

E.C.T. a. Interval preceding e.e.g. **1 year, 9 months, 26 days.**
b. No. shocks and other particulars **4 shocks from 27-30.6.1949.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal, being dominated by excessive generalised medium voltage fast activity at 14 - 18 and 23 - 25 c/sec., with some short paroxysmal bursts occurring. Spikes and sharp waves of random origin were also observed. A marked and low voltage "M" type alpha rhythm at 10 c/sec. was present, as was rare low voltage diffuse 5 - 6 c/sec. activity.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**M**	**10**	**occ**	**rare**	**M**			**Masked.**
Beta	**16.4**	**30**	**gen**	**v.consid.**	-			**Gen. perox. bursts up to 40 microvolts. Blocked partially with eye opening.**
Theta	**5.5.**	**10**	**diffuse**					
Delta								

"Choppy" **Low amp. alpha. Much beta. paroxysmal. Spikes and sharp waves.**

Hyperventilation

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

NOTE: Isolated sharp waves, random position: some true bilateral spikes, posterior origin, probably parietal.

DIAGNOSIS

(a) Verbal M.D.P. - alternating.

(b) Symbolic

Predominant Phase	State at Test
M (D)	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	-

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.7994 (b) N.I.P.R. 39	46	M	E		21.4.49	3.45p.m	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1944.

Admissions to Mental Hospitals: 28.7.1944, 11.4.1946 and 20.6.1947 (on transfer - current).

Clinical History:

Has been subject to episodes of mania and depression since 1944. The latter have been less frequent and less intense.

State at Test:

Mildly depressed, apprehensive and agitated and hypochondriacal.

(Has started developing furuncles which one member of the nursing staff claims to have noticed as heralding a manic attack.

E.C.T. a. Interval preceding e.e.g. 2 months, 17 days.
b. No. shocks and other particulars 7 shocks from 1-4.3.1949 (intensive). During 1948, 19 shocks.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The record was normal, but did show continuous low voltage beta activity at 16 c/sec. arising from the pre-central areas. The alpha rhythm showed considerable modulation as a result of mixture of 10 + 11 c/sec. components at approximately 25 µv, blocked fully to visual stimuli, but remained undisturbed by the beta activity.

Hyperventilation (poor) produced no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	25	occ	87	C	+		Consid. modulation caused only very slight disturbance of alpha.
Beta	16	10	pre-centr	consid				
Theta								
Delta								
"Choppy"								

Hyperventilation

Hyperventilation poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies E.E.7994 (b) N.I.P.R. 39.R1	47	M	E		2.2.50	9.40a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Euphoric, garrulous with flight of ideas, mildly megalomanic. While the electrodes were being applied, he became agitated and during the test momentary depression interrupted the predominantly manic picture.

E.C.T. a. Interval preceding e.e.g. 3 months, 15 days.
b. No. shocks and other particulars 5 shocks from 14-17.10.49 (intensive). 8 shocks from 21-26.6.49 (intensive).

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a medium-voltage parietal alpha rhythm at 9.5-10 c/sec. which showed a normal blocking response. Some very low voltage generalised 18-20 c/sec.activity was also occasionally observed.

Hyperventilation was impossible.

The e.e.g. thus shows a decrease in mean alpha frequency when compared with that recorded on 21/4/49 (rated as M - D1) viz. 9.75 c/sec. as opposed to 10.5 c/sec. (D)
There was also a decrease in percentage time from 87 to 70.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.75	40	par-occ	70	C	3		10 dominant freq.
Beta	19	5	gen	?				
Theta								
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal: **M.D.P. - alternating.**

(b) Symbolic

Predominant Phase	State at Test
M (D)	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.7994** (b) N.I.P.R. **39.R2**	**48**	**M**	**E**		**5.4.51**	**2.25p.m.**	**1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **Normal.**

E.C.T. a. Interval preceding e.e.g. **11 months, 13 days.**
b. No. shocks and other particulars **5 shocks, 19-24.2.50 (intensive), 5 shocks, 14-17.10.49 (intensive), 8 shocks 21-26.6.49 (intensive).**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with alpha rhythm of medium voltage at 9 - 10 c/sec with considerable low voltage occipital 20 c/sec activity also present. Analysis revealed slight 5 c/sec present.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	40	(p)occ	85	C	3		
Beta	20	10	occ	consid.				
Theta	5	5	occ + d	rare				
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal [illegible] recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.N.693 (b) N.I.P.R. [illegible]	72	F	No.		8.1[illegible].49	9.15a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1917
26.6.1917

Clinical History:

Numerous manic phases in which she is restless, noisy, talkative and resistive.

State at Test:

Garrulous, silly and over-active.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars, Nil.

B. E.E.G. DATA.
Report (A.C. Mundy-Castle)

The E.E.G. was normal.
There was a medium voltage alpha rhythm at 10.5 - 11 c/sec which blocked normally. It arose in the parieto-occipital areas and was greater on the left.
Very low voltage underlying generalised fast activity at 20 - 22 c/sec was also sometimes observed, although it was usually masked by alpha activity.
No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.75	80	par-occ	85	C	3		(Greater on left
Beta	21	10	gen	med				- usually masked.
Theta								
Delta								
"Choppy"								

Hyperventilation

Uncooperative. ~~Normal records~~

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	**O**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	**O**	**O**

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time	Time of last meal
F.N.693	73	F	NE		**29.3.51**		

A. PSYCHIATRIC AND ~~PSYCHOLOGICAL~~ DATA. **Pd. 47 Bd.**

Onset:

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. : **over 3 months.**
b. No. shocks and other particulars : **18 shocks from 6.6.1950.**

B. E.E.G. DATA.
Report (A.C. Mundy-Castle)

Normal E.E.G. with medium-high voltage occipital alpha rhythm at 10-11 c/s blocking normally but often disturbed by considerable underlying generalised low voltage fast activity at 14 and 18-30 c/s. Rare occipital 5 - 7 c/s rhythms of low voltage were also seen.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	**10.5**	**60**	**(par)occ**	**85**	**C**	**3**		
Theta	**19**	**20**	**gen**	**consid.**	**v.f**	**1**		**Some inc.of 25-30 c/s.**
Delta	**6**	**5**	**occ**	**rare**				**during A/S.**
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.N.2351 (b) N.I.P.R. N.E.48	c55	F	ME		7.12.49	10.15a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1945.

Admissions to Mental Hospitals: 17.10.1949.

Clinical History:

Manic attack in 1945 for which she was not hospitalised. Before admission she exposed herself, sang, slept badly, and described transitory hallucinations and delusions. On admission was restless, noisy, distractible, euphoric, and burst into song at the interview. Her condition has continued in this state.

State at Test:

Very talkative with flight of ideas and exalted.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive medium-low voltage generalised fast activity at 18 - 26 c/sec, this sometimes occurring in paroxysmal outbursts and often spikelike in character.

The alpha rhythms were at 12 - 13 c/sec. of occipital origin, showing a partial blocking response and always considerably disturbed by beta activity.

Some fast activity at 14-16 c/sec. was also occasionally observed.

Poor hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12.5	50	occ	40	C	2		Percentage time difficult - excessive beta
Beta	19.7	25.7	gen	85+				
Theta	19.7	25.7	gen	85+				
Delta								
"Choppy"	Ep.	Short gen.	parox. fast activity with diphasic spikes predominantly occipital.					

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
49 8083	68	M	E	IH	28.4.49	9.30 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1945**

6. 1. 1949. Nursing Home in 1945.

Clinical History:

Manic attack 3½ years before admission to Weskoppies Hospital treated successfully with E.C.T. in private nursing home. Relapsed two months before admission to Weskoppies. At Weskoppies: talkative, flight of ideas, euphoric, boastful, mildly erotic.

Machine-gun bullet nicked root of nose in 1918 but no fracture was exposed by X-ray - small scar present.

State at Test:

As above.

E.C.T. a. Interval preceding e.e.g. **3 years 9 months.**

b. No. shocks and other particulars **12 shocks.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal

There was a/fairly stable and regular alpha rhythm of medium low voltage at 9 and 10 c/sec. which blocked fully to visual stimuli. A fair amount of low voltage beta activity was also apparent, arising post-centrally at 18 - 20 c/sec. with rare 14 c/sec. activity. This beta rhythm caused occasional disturbance of the alpha activity.

3 minutes hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	20	par-occ	60	C	3		
Beta	16.5	5	post-cent	50				
Theta								
Delta								

"Choppy" **No. Alpha occasionally disturbed by beta.**

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
+	+	+

Registered No.	Age	Sex	Race	RH or ~~RH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8083 (b) N.I.P.R. 49 R1	60	M	E		19.4.51	12 noon	B.F.T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Euphoric, talkative, with mild flight of ideas. Has been in chronic hypomanic phase since last e.e.g. Has had cardiac illness.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of questionable normality due to excessive medium-low voltage diffuse theta activity at 5 - 7 c/sec, this causing marked irregularity of the medium voltage occipital alpha rhythms at 8 - 9 c/sec, these blocking normally. Considerable low voltage fast activity at 15 - 18 and 24 - 27 c/sec was also present, the latter sometimes occurring in generalised runs and being augmented by eye closure.

Hyperventilation evoked a single paroxysmal generalised 1/7th sec. wave of medium voltage.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	30	occ.	88	C	3		
Beta								
Theta	21	10	post.	consid.		2		
Delta	6	20	diff.post+					
"Choppy"								
Hyperventilation	Paroxysmal. Rare gen.parox.single waves 1/6 - 1/7 sec.50 microvolts.							

Single paroxysmal generalised 1/7 sec. wave of medium voltage.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal

(b) Symboli~~c~~ M.D.P. - alternating

Predominant Phase	State at Test
M ~~(D)~~	~~M~~

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.N.738 (b) N.I.P.R. N.E.49	254	F	NE	~~TH~~	~~8.12.49~~	~~9.45a.m.~~	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1922.

Clinical History: 29.11.1922.

During the earlier part of her stay at Weskoppies depressive episodes were more prominent than manic ones but later on the position was reversed, and she has for a long time been in a state of chronic mania.

State at Test:

Restless, talkative, resistive and erotic. (While waiting to be tested, exposed herself and pulled out grass from the N.I.P.R. lawn).

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive medium-low voltage fast activity at 15 - 16 and 20 - 24 c/sec, the former parieto-occipital and the latter generalised.

Alpha activity was rare and of medium-low voltage at 11 - 13 c/sec, arising occipitally.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12	8	par-occ	v.rare	M	1		
Beta	18.5	20	gen.p.occ	80+				15-16 c/s.par.occ.
Theta								20-24 c/s.gen.
Delta								
"Choppy"	Fast and rather low-voltage.							

Hyperventilation

Nil.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal — M.D.P. - chronic hypomania

(b) Symbolic

Predominant Phase	State at Test
M	M

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
◆	◆	◆

Registered No.	Age	Sex	Race	RH or Rh	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.H.2678 (b) N.I.P.R. 50	69	M	E		28.4.49	11 a.m.	B.7,-F.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1908 Current 2.3.1921

Clinical History: On admission: Restless, talkative with flight of ideas, decorative, mischievous, interfering, rapidly changing bizarre delusions.

Course: During earlier years of hospitalisation there were remissions but he has now been in a state of chronic hypomania for years.

Physical condition: Hypertensive.
Family history : Mother was patient at Grahamstown Mental Hospital.

State at Test:

As on admission.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA,
Report (A.C. Mundy-Castle)

The record was abnormal due to persists existence of persistent low voltage beta at 14, 16, 18-20 and 30 c/sec. alpha activity was extremely rare at 10, 11 and 12 c/sec. No response to visual stimuli. Record could presumably be regarded as choppy due to irregularity and complexity of the fast activity.

Hyperventilation augmented amplitude and amount of alpha activity which appeared at 20 uu, 10-12 c/sec. There was also a slight increase in the amplitude of the beta rhythms.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11	5	Occ. V.rare		M	0		
Beta	19.6	5	Gen.	10				
Theta								
Delta								

"Choppy" Yes (AC.M-C).V.flat record.Activity somewhat obscured by muscle artefact.

Hyperventilation

Alpha F.11,amp.increased to 20,occipital,during hypervent.only.

Normality ~~Normal~~ ~~Questionably normal~~ Abnormal

DIAGNOSIS

(a) Verbal

M.D.P. - Recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
0	0	0

Registered No.	Age	Sex	Race	RH or ~~IH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 51 M.E.5215	66	M	E		28.4.49	12 noon	B.7 a.m, T.10.X

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1916

Clinical History: 1916, 1918, 1919, 1927, 1930, one other (documents lost), current 19.5.1933.

Since 1916 he has been subject to manic attacks in which he is excited, restless, garrulous with flight of ideas. At times these phases assume the dimensions of acute mania with violence.

Left frontal scar due to head injury in youth.

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. 6 months, 24 days.

b. No. shocks and other particulars 30.9.48 - 4.10.48, 5 shocks.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The record was abnormal on account of its remarkably low voltage, which was such that activity could hardly be seen at normal gains.

Increased amplification revealed occasional low voltage alpha at 11 and 12 c/sec., together with considerable low voltage beta at 16 - 22 c/sec., this being fairly continuous.

Hyperventilation augmented the beta activity very slightly, also occasional bursts of alpha.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~11.5~~	3	par-occ	15	M	0	0	
Beta	~~18.7~~	3	~~post-cent~~	85				
Theta								
Delta								
"Choppy"	~~Too flat (ACM-C).~~							

Hyperventilation

Occasional bursts of high amplitude alpha and beta.

Normality Normal. ~~Questionably Normal.~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania.**

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.5215	~~68~~ 67	M	E		6.4.50	11.15a.m	B.7,T.10.30
(b) N.I.P.R. 51 M.1							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Voluble, puns, and paranoidal.

E.C.T. a. Interval preceding e.e.g. **6 months, 28 days.**
b. No. shocks and other particulars **6.9.49-8.9.49, 5 shocks.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to excessive low voltage fast activity at 20 - 26 c/sec.of a generalised nature. Alpha activity was rare, the rhythms being at 11 - 12 c/sec. and of low voltage. Hyperventilation augmented all resting activity.

There appears to have been an upward shift in the beta spectrum since the last recording, but no alpha change.

The patient slept during recording. A detailed analysis is available for inspection.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11.5	15	occ	rare				
Beta	23	10	gen	60				14-16 c/s. amp.20, on eye closure and when awakened from sleepy state (not true sleep).
Theta								
Delta								
"Choppy"								

Hyperventilation

Alpha amp. increased from 15 to 20.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

M.D.P. - recurrent mania

(a) Verbal

(b) Symbolic

Predominant Phase	State at Test
M	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or TM	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.N.978 (b) N.I.P.R. N.E.51	63	F	NE		8.12.49	12 noon	8.7,T.10.16

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1926.

Admissions to Mental Hospitals: 23.4.1926.

Clinical History:

Since admission to Weskoppies her history has been one of recurrent attacks of mania in which she is garrulous, noisy, restless, collects rubbish and on occasion becomes violently resistive.

Nearly blind.

State at Test:

Mildly over-active and talkative.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a low voltage persistent alpha at 10 - 11 c/sec. of parieto-occipital origin, this showing no response to visual stimuli.

Rare low voltage 14 - 15 c/sec. was also observed parieto-occipitally.

Hyperventilation caused no change.

It would appear that she is completely blind.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	14	par-occ	71	P	O		
Beta	14.5	5	par-occ	rare				
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	**O**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	**O**	**O**

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or ~~RH~~	E.E.G. Date	E.E.G. Time	Time of last meal
F.N.978 N.E.51 R1	**c54**	**F**	**NE**		**29.3.51**	**3.5 p.m.**	**1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with medium-low voltage occipital alpha rhythm at 9 - 12 c/sec. showing little blocking response and often disturbed by underlying diffuse theta activity at 5 - 7 c/sec. Low voltage fast rhythm at 14 and 18 - 24 c/sec. were also detected.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**20**	**(p) occ**	**72**	**P**	**1**		**Irreg.Greater rt.**
Beta	**17.5**	**5**	**occ**	**rare**				
Theta	**6**	**10**	**diffuse consid**					
Delta								
"Choppy"	**Rather irregular record.**							

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.6773 (b) N.I.P.R. 52	68	M	E		28.4.49	2.15 p.m.	1.15 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1906

Admissions to Mental Hospitals: 6.3.1941 as volutary boarder, 26.7.1941 and 5.8.1941(current) as certified case.

Clinical History:

Psychotic episodes prior to admission at ages 25, 28 and 58. During earlier part of his dentention at Weskoppies manic states predominated - euphoric, restless, talkative with flight of ideas and at times hallucinated and delusive. Last manic attack in 1947. Since then he has been predominantly mildly depressed. Periods of relative normality have always been interspersed between psychotic attacks. State at test

State at Test:

Mildly depressed and agitated.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The record was rendered confusing by excessive muscle artifact. Its normality was doubtful, the alpha frequency being at 9 - 10 c/sec., rare occurrence and very low voltage. There also appeared to be a certain amount of generalised rather diffuse beta activity at 18 - 22 c/sec., also of very low voltage.

Hyperventilation increased amount and amplitude of beta. No other change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9.5~~	~~9~~	~~par-occ~~	~~20~~	~~M~~	~~0~~	~~0~~	
Beta	~~16~~	~~4~~	~~gen~~	~~20~~				
Theta								
Delta								
"Choppy"	~~Not apparently (ACM-C). Low v, rare alpha, Very low v. beta.~~							
Hyperventilation	Beta f. 18-22, amp.8.							

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test.
M D	O

PSYCHOLOGICAL PATTERN AT EEG

Mood	Motility	Psychic Temp.
O	O	O

REGISTERED NO:	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time.	Time of last meal.
a. Weskoppies **ME.6773** b. N.I.P.R. **52 R.1**	**70**	**M**	**E**		**21.6.51**	**10.30**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

within normal limits.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars. } **Nil.**

B. E.E.G. DATA.
Report (A.C. Mundy-Castle).

The e.e.g. was flat in appearance, showing low voltage occipital alpha rhythms at 8-10 c/sec. of rare occurrence and considerably disturbed by almost continuous low voltage gen. fast activity at 18-30 c/sec. Some but not all of this may have been of muscular origin. Some diffuse theta activity at 5 - 7 c/sec. was detected by frequency analysis.
Hyperventilation augmented the alpha and theta rhythms
The record is of the low voltage fast disorganised type

Summary of Features relevant for statistical purposes.

Resting.

	Frequency	Av. Amp.	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	9	occ	v.rare	M	O		
Beta	24	5	gen	v.consid	**some but not all muscle**			
Theta	6	4	diffuse	med				
"Choppy".	**low voltage**	**fast**	**disorganised**	**type.**				

Hyperventilation.

Alpha and theta rhythms augmented.

Alpha amp = 12
Theta amp = 10

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal.

ES

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or ~~Rh~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4836 (b) N.I.P.R. 57	57	F	E		5.5.49	9.30a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: Many years before current admission

Clinical History: Current: 21.4.1949. Several other admissions - details not available

For Seven days before admission she spoke and prayed incessantly, tore her hair, crawled about and did not sleep or eat.

Since admission: talkative, distractible, flight of ideas, decorative and has been personal. At one stage she was tearful and asked forgiveness for whatever wrong she may have done.

She is a woman with a mousteche and a deep voice. History of malaria.

State at Test:

Talkative and inclined to sing but with occasional depressive moments with self-deprecatory remarks. (Wept later on during during morning when discussing death of her children).

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal. There was a medium voltage alpha rhythm at 11 c/sec. which blocked fully to visual stimuli. Occasional beta activity at 16 - 18 and 25 c/sec. was also observed, but of such low voltage that it was concealed by the alpha activity.

Hyperventilation revealed two further components at 12 x 13 c/sec., these disappearing with cessation of overbreathing.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~11~~ 21.5	~~35~~ 6	~~occip.~~ loc. gen. diffuse	~~60~~ med.	C			
Beta								
Theta								
Delta								
"Choppy"	~~Not choppy (ACM-C), although beta very low voltage and usually obscured by alpha.~~							

Hyperventilation

12 and 13 c/sec. amp. 25 occipital alpha components appeared after 40 seconds.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
~~M~~ (D)	M2 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or H	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. F.E.4555 58	57	F	E		5.5.49	10.45 a.m.	B.7,T.10.40

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1935
3.5.1946

Clinical History:

8 Psychotic attacks between the age of 40 and her current admission at the age of 54. Became psychotic again 2 weeks before admission.

On admission: Talked incessantly, showed flight of ideas, was euphoric and conscious of an unusual sense of well-being and of mental clarity. The course of her illness since then has been one of manic or hypomanic attacks, episodes of mild depression and intervals of normality which latter do not last more than three weeks.

State at Test:

Extremely garrulous with marked flight of ideas, facetious and playful but wept for a period of about 5 minutes during the test.

E.C.T. a. Interval preceding e.e.g. 3 months, 10 days.
b. No. shocks and other particulars: Last course intensive, 25/26 Jan. 4 shocks. During 1948 31 shocks

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to the excessive amount of fast activity at 15 - 18 c/sec., medium voltage and of central origin. This caused considerable irregularity of activity in general and disturbed the high voltage alpha rhythms at 9, 10 and 11 c/sec. The latter were in evidence for approximately 30% of the time and blocked partially to visual stimuli. Their origin seemed to be rather far forward, since amplitude was sometimes greatest in the fronto-parietal and fronto-temporal leads. This record may be regarded as "choppy".

Hyperventilation revealed no changes, although muscle and movement artefact made appraisal difficult.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	10	75	post-cent	30	C	2		Amp. sometimes greatest front.
Theta	16.5	20	cent	100				
Delta								
"Choppy"								

Hyperventilation (AC.M-C). But high voltage alpha.

Apparently no change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**0**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	**0**	**0**

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4555** (b) N.I.P.R. **68 R.1**	**59**	**F**	**E**		**12.4.51**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. **8 months.**

b. No. shocks and other particulars : **Intensive - 2 shocks on 12.8.50. 6.5.49-6.7.50 31 shocks.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal.

There was a complex medium voltage occipital alpha rhythm at 8 - 13 c/sec blocking normally, but considerably disturbed by underlying medium low voltage diffuse fast and slow activity at 14 - 25 and 4 - 7 c/sec respectively. Several generalised short paroxysmal medium voltage bursts of delta activity at 2 - 3 c/sec occurred, often associated with beta rhythm, whilst considerably more delta activity arose from the right temporal area than any other.

Hyperventilation caused some augmentation of delta rhythm from the right parieto-temporal region.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**19.7**	**15**	**occ**	**35**	**0**	**3**		**Complex irreg. Peak ID.**
Beta	**5.7**	**20**	**diffuse consid.**			**1**		**Blocked v.s.but 20 slightly incr.**
Theta	**2.5**	**40**	**post consid.**					
Delta	**Paroxysmal.**		**diff.+rt.temp. consid.**					**Short gen.parox.bursts assoc. 14-15 c/s.**
"Choppy"								

Hyperventilation

Delta amp. increased from 40 to 50 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D3**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4832** (b) N.I.P.R. **58**	**53**	**F**	**E**		**5.5.49**	**11.45a.m.**	**B.7,T.10.45**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **End of 1948.**

19.4.1949.

Clinical History:

Mental illness started about four months before admission. On admission she was intensely depressed, retarded and inaccessible to the extent of complete mutism.

State at Test:

Depressed, agitated, extremely apprehensive.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting e.e.g. was normal, displaying low voltage undisturbed sinusoidal alpha waves at 10 + 11 c/sec. arising occipitally. No other activity was apparent.

Hyperventilation was impossible due to patient's agitated state.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**10**	**occ**	**60**	**M**	**1**		
Beta								
Theta								
Delta								
"Choppy"	**No (ACM-C).**							

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4623 (b) N.I.P.R. 60	56	F	E		5.5.49	2.15p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1940.

Admissions to Mental Hospitals: 3.2.1947.

Clinical History:

Depression developed gradually over a period of 9 years preceding admission to Weskoppies.

Admitted to Weskoppies after attempting suicide by cutting throat. After a period of insomnia, during which she often shouted and screamed, she was depressed and retarded on admission.

Course: Depressed, with ideas of unworthiness, self-accusatory and áreference, with occasional hallucinatory accompaniments, e.g. voices calling her a great bastard.

State at Test:

Depressed, inhibited, with delusions of depressed type similar to those described above, and also similar hallucinations.

E.C.T. a. Interval preceding e.e.g. 7 months, 5 days.
b. No. shocks and other particulars 5 shocks from 20-30.9.48.

B. E.E.G. DATA.

Report (A.G. Mundy-Castle)

The e.e.g. was abnormal in view of the almost continuous theta activity at 4 and 5 c/sec. arising in the occipital areas at 30 µv. Frequencies at 6 and 7 c/sec. were also evident, whilst the alpha at 8 + 9 c/sec. was much disturbed and often not apparent. The rhythms were thus highly irregular, with no definite pattern about them. There was also considerable beta activity arising centrally at 18 c/sec. and fairly low voltage. Both the alpha and theta components were responsive to visual stimuli.

Hyperventilation caused no change other than greater persistence of the 4 + 5 c/sec. activity together with a slight increase in amplitude.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	20	par-occ	30	C	2	often masked by occ.theta	
Beta	18	10	cent	70				
Theta	5.5	30	occ	100			2	Blocks with eye opening
Delta								
"Choppy"	Possibly (AC.M-C). Highly irregular due to variety of low frequency rhythms as much as the beta.							
Hyperventilation								

Theta amplitude increases from 30 to 45 microvolts and its average frequency is 4.5. Record dominated by occipital theta.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal

Involutional melancholia.

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HR	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. F.E.4623 60.R1	56	F	E		5.5.49	3.30	

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

-

Clinical History:

-

State at Test:

Depressed, inhibited, with delusions of depressed type similar and hallucinatory accompaniments.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars 7 months, 5 days.
5 shocks from 20-30.9.48.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The repeat was to establish the origin of the 4 - 5 c/sec. theta rhythms. These were found to be occipital and almost certainly from the visual cortex, since not only did they block to visual stimuli but showed the same phase relationships as activity evoked by photic stimulation.

The general characteristics of the record were as before, although the beta activity was better defined and showed frequencies at 18 - 21 c/sec. arising centrally. The beta activity also showed slight blocking to eye opening, but certainly arose further forward than the occiput. The records were of a choppy nature, this brought about, however by mixture of the numerous complex theta

Summary of features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~8.6~~	~~20~~	~~par.-occ~~	~~?30~~		2		alpha rhythms
Beta	~~19~~	~~10~~	~~cent.~~	~~80~~				Largely masked.
Theta	~~6.6~~	~~30~~	~~occ~~	~~100~~		1		Occas.incr. c.eye closur
Delta						3		Blocks to vis.stimulatio

"Choppy" ~~Yes (AC-MC) . Mixture of numerous complex theta and alpha rhythm~~

Hyperventilation

Nil.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **60.R2** **F.E.4623**	**58**	**F**	**E**		**12.4.51**		
(b) N.I.P.R.							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals:

Clinical History:

State at Test: **Normal.**

E.G.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) **The e.e.g. was abnormal and complex, dominant occipital activity being of medium-low voltage at 4-5 c/sec. combined with considerable fast activity at 15-16 c/sec. A rare and masked low voltage alpha rhythm at 8-10 c/sec. was apparent. Of more generalised distribution was medium-low voltage activity at 6-7 and 18-25 c/sec. Some generalised paroxysmal bursts of slow and fast activity were observed. Hyperventilation augmented the alpha and theta components considerably.**

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av Amp	Loc	%	Type	Responsive V	Responsive M	Remarks
Alpha	19.5	13.75	~~post~~ occ gen. occ	~~rare~~ consid		3	18-25	augly eye closure.
Beta	5.5	25	occ	consid				Some query alpha v.s. 6-7 more diffuse. Some gen. parox. 4-5.
Theta								
Delta	Complex, paroxysmal.							
"Choppy"								

Hyperventilation **Alpha voltage augmented to 17.5, theta voltage augmented to 35, duration 40 seconds. Theta waves sometimes spike-like due to beta accompaniment.**

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

PSYCHOLOGICAL PATTERN at [illegible]

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M D	Ml

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.4.2936** (b) N.I.P.R. **63**	53	F	M		12.5.49	9.30a.m.	~~7 a.m.~~

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1924.**

Admissions to Mental Hospitals: **First 5.6.1924, then 3 others, particulars not available.**

Clinical History: **26.1.1930 (current).**

Depressive and manaical episodes equally prominent and they have been separated by normal phases.

State at Test:

Talkative and displays poor judgment; also mildly euphoric.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) **The e.e.g.was abnormal.There was a medium voltage alpha rhythm at 8 and 9 c/s.which arose in the par.-occ.areas and showed partial blocking to visual stimuli. It was considerably disturbed by almost continuous 4-7 c/s.occ.activity at 50 µv,this also being responsive to visual stimuli.Some beta at 16 c/sec.added further to the complexity of rhythms.The dominant frequency in the theta band was at 5 c/s., this and the 4 c/s.component sometimes appearing as generalised activity. Any choppiness must be regarded as slow.**

Hyperventilation increased the amount and amplitude of the 4 and 5 c/s.rhythms which proceeded to dominate the record after 20 secs. There was also an increase in fast activity after 2½ mins. in the form of post-central 16-20 c/s.rhythms. The record returned to its resting state after 1 minute.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	40	par-occ	40	C	2		
Beta	16	15	post-cent	66		1	Diffin.slightly	eyes open.
Theta	5.5	50	occ	100		4 c/s.often in runs and these with 5 c/s extend to frontal regions.		
Delta								
"Choppy"	Could be called "slow choppy",							
Hyperventilation	but irregular is better (C-C).							

Beta av. F. 18, duration 1 minute. Theta F.5, av.amp.65, 1 minute. More 9 c/sec. alpha after hyperventilation. Increased beta after 2½ mins hyperventilation.Higher voltage 5 c/sec.theta after 20 secs hv.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M D	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.2936 (b) N.I.P.R. 63 R.1	55	F	E		17.5.51	9.40a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g.)
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report ~~(A.C. Mundy-Castle)~~ (A.C. Mundy-Castle)

The e.e.g. was abnormal due to repeated long runs of high voltage occipital slow activity at 4 - 5 c/sec, often together with lower voltage 6 - 7 c/sec.rhythms. There was a normal high voltage parieto-occipital alpha rhythm at 8 - 9 c/sec. blocking fully, whilst frequencies at 11 - 13 c/sec. were observed more frontally. Low voltage diffuse fast activity at 18 - 22 c/sec. was also detected.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	38.3	Fr.-cent&pcm.	65	C	3		Complex ant.11-13 c/s
Beta	20	5	gen	consid				rhythms.
Theta	5.5	80	occ	consid.	- Prolonged runs of 5 c/s.up to 100 microvolts.			
Delta								
"Choppy"	Sp. - rare gen.single spikes 50 microvolts,+ paroxysmal.							

Hyperventilation

Alpha F.10, amp.20, occ. Theta F.5, amp.90, occ. long runs.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4362 (b) N.I.P.R. 64	78	F	E	RH	12.6.49	10.45a.m.	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **About 1924.**

Admissions to Mental Hospitals: **6.6.1944.**

Clinical History:

Depressed for about 20 years prior to admission to Weskoppies. According to admission documents she imagined herself to be a criminal wanted by the police. Shortly after admission she attempted suicide by strangulation, stating that the night nurse had called her a traitor and that she believed that her son up North might have done away with himself. She stated also that she wished to die. She was also full of doubt as to who were the living and who were the dead.

Course: There has been fluctuation in the degree of depression and at its height agitation is in evidence.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) **The e.e.g. was of questionable normality. There was an extremely complex "M" type alpha rhythm showing frequencies at 8,9,10,11 and 12 c/sec. arising in the parieto-occipital areas and showing very little blocking response. The 8-10 c/sec. components were of somewhat greater amplitude but less persistent than the 11-12 c/sec. activity. It seems possible that the latter may not actually be alpha, but the fact that there is little blocking response makes this conclusion difficult to verify. There was considerable further low voltage fast activity at 16-20 c/sec., arising post-centrally, although muscle artefact was also ~~present~~ prevalent. Occasional bursts of med. voltage gen. theta activity at 5-7 c/s. were observed, these often being mixed with the slower of the alpha components (8&9 c/s).**

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~10~~	~~15~~	par.occ	~~20~~	M	1		These outbursts appeared paroxysmally*.
Beta	~~18~~	~~10~~	post-cent	~~15~~		1		Incr. with eye closure.
Theta	6	25	post-cent	rare				Gen. bursts mixed with alpha up to 50 microvolts.
Delta								
"Choppy"	No. Bursts of theta infrequent usually associated with slower alpha, 8&9 c/sec. (ACM-C). Paroxysmal.							
Hyperventilation	Poor. Increase of alpha activity at 8-9 c/sec.							

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

* **Poor hyperventilation revealed little change other than increased alpha at 8 and 9 c/sec.**

The record was not really 'choppy'.

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or ~~TH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.2986 (b) N.I.P.R. 65	65.	F	E		12.5.49	12 noon	B.7,T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1932.**

Clinical History: **11.11.1932.**

3 Months before admission attempted suicide with a carving and attempted to injure her baby by sitting on it. On admission looked worried and depressed, expressed ideas of self-accusation and of ruin and also nihilistic delusions. Her mental condition has remained essentially unchanged except for transitory response to e.c.t.

State at Test:

Very depressed and inaccessible but signs of marked signs of agitation.

E.C.T. a. Interval preceding e.e.g. **1 month, 13 days.**
b. No. shocks and other particulars **4 shocks from 22-29.3.1949, 7 shocks earlier 1949, 13 shocks 1948.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a medium voltage alpha rhythm at 8 and 9 c/sec. which blocked fully to visual stimuli. It arose in the parieto-occipital areas, but often showed clearly in the frontal leads. There was also a certain amount of low voltage beta at 20-25 c/sec. The record was not choppy.

Hyperventilation was poor, and revealed no changes other than increased alpha and beta activity, with no increase in amplitude.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	~~8.5~~	~~45~~	~~par-occ~~	~~70~~	C	3		Considerable beating, often of high amp. frontally.
Theta	~~22.5~~	~~5~~	~~post-cent~~	~~rare~~				
Delta								
"Choppy"								

Hyperventilation ~~No~~ **Very poor.** No change other than greater resistance of alpha and also slight increase of beta at 20 c/sec. (ACM-C).

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	+	0

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4737 (b) N.I.P.R. 66	51	F	E		12.8.49	2.5 p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1948.**

Admissions to Mental Hospitals: **26.4.1948.**

Clinical History:

She became depressed, agitated and suicidal 2 months before admission to Weskoppies Hospital.

At Weskoppies she has been in a state of agitated depression which fluctuates in severity spontaneously to some extent and has responded temporarily to E.c.t. At the height of her depression she is usually agitated, tearful, restless and fidgety but her depression is of stuporous type on occasion.

State at Test:

Mildly depressed and agitated and is apprehensive about the test.

E.C.T. a. Interval preceding e.e.g. **1 month, 6 days.**

b. No. shocks and other particulars: **8 shocks from 21.3.49 to 6.4.49. 9 shocks during Aug. and Sept. 1948.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) **The e.e.g. was abnormal due to excessive slow activity.**

There was a persistent type alpha rhythm of low voltage 8-10 c/sec. which failed to block to visual stimuli, arising occipitally. It was considerably disturbed by irregular slow activity at 4-7 c/sec.,6 and 7 being the predominant rhythms at approximately 40 µv. Spatial analysis showed these to arise in the precentral areas. The e.e.g. was not choppy.

Hyperventilation caused a slight increase in both theta and alpha activity.

(Schema shows 4 c/sec. theta also).

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	20	occ	? 30	?	0		Complex rythms due to admixture of theta.
Beta								
Theta	5.5	up to 40	[illegible]	consid				6 & 7 predominant.
Delta								
"Choppy"	No(ACE-C) - slow and irregular.							

Hyperventilation

Slight increase in the amount of theta, duration 1 minute. Av.amp. 40 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional Melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.L.4737 (b) N.I.P.R. 66 R1.	51	F	E		17.8.49	9.15a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Severe stuporous depression.

E.C.T. a. Interval preceding e.e.g. **1 month, 22 days.**
b. No. shocks and other particulars **4 shocks from 20-26/6/1950.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was still abnormal due to excessive underlying theta at 4 - 7 c/sec, although amplitudes appeared somewhat lower. The alpha rhythms were still persistent at 8 - 10 c/sec.

Response to hyperventilation : slight increase in amount of theta activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive O	Responsive M	Remarks
Alpha	9	20	occ					
Beta								
Theta	5.5	25	gen					Sometimes in bursts.
Delta								
"Choppy"								

Hyperventilation

Amount of theta increased - 36 to 1 minute. Theta amplitude increased to 40.

Normality ~~Normal~~ ~~Questionably~~ Normal Abnormal

DIAGNOSIS **M.D.P. - recurrent depression** PSYCHOLOGICAL PATTERN at Test

(a) Verbal

(b) Symbolic

Predominant Phase	State at Test
D	D3

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or FH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies 67 (b) N.I.P.R. F.E.3647	61	F	E	FH	12.5.49	3.45 p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1912. 6.4.1938

Clinical History:

Husband describes an attack as having occurred in 1912, lasting some months in which she was depressed, refused food and expressed persecutory delusions. Two months before current admission she became depressed, refused food, stating it was poisoned, and was resistive. Since admission she has been depressed, unoccupied, inaccessible and resistive. She has often required to be dressed and spoon-fed.

State at Test:

She looks apprehensive and agitated. She breaks her habitual silence once by a request to go back to the hospital.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was probably normal, although a comprehensive record was impossible due to patient's agitated state. Eyes were opened throughout. There was a medium voltage alpha rhythm at 9 c/sec. probably of the persistent type. There also appeared to be a certain amount of medium voltage beta activity at 14-16 c/sec. arising post-centrally, although muscle artifact rendered analysis difficult.

Hyperventilation was impossible.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	?50	occ	?	? p	?		Eyes open whole time. Much muscle and movement artefact.
Beta	? 15	30	?post-cent	med				
Theta								
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	C

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
0	0	0

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.6.7366** (b) N.I.P.R. **72**	**58**	**M**	**E**		**23.6.49**	**9.15a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1943.**

18.7.1944.

Clinical History:

About a year prior to admission to Weskoppies, was seen in an agitated state at Johannesburg Hospital. Shortly before admission to Weskoppies he was agitated, depressed, made suicidal threats and attempts and expressed self-accusatory ideas. Since admission he has been depressed and agitated apart from relatively normal phases following shortly upon e.c.t.

State at Test:

Within normal limits, perhaps very mildly depressed but insufficiently to assess as D1.

E.C.T. a. Interval preceding e.e.g. **1 month, 14 days.**

b. No. shocks and other particulars **9 shocks from 23.6.49 to 11.4.49. During 1947 13 shocks; during July 1946 5 shocks followed by fractured spine.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was probably normal although somewhat complex. The alpha rhythms were difficult to distinguish, being of extremely low voltage and showing no change with eye closure, but apparently at 10 - 12 c/sec. arising in the parieto-occipital regions. A frontal rhythm (probably theta) at 7 - 8 c/sec, 40 mv., was evident fairly continuously, sometimes appearing in short bursts. It is this which is of doubtful normality.

Otherwise there was considerable fast activity at 15 - 18, 24 and 30 c/sec and of central origin. Hyperventilation caused no change other than some augmentation of alpha activity at 10 - 12 c/sec.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**11**	**5**	**par-occ**	**rare**	**M**			
Beta	**23.6**	**5**	**par-temp**	**90**				
Theta	**7.5**	**40**	**front**	**65**				
Delta								
"Choppy"								

Hyperventilation **Low voltage complex record**

alpha amplitude increased from 5 to 10 microvolts.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.H.7366 (b) N.I.P.R. 72.R1	55	M	E	~~LH~~	15.2.51	3.30p.m.	12 noon

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Looks mildly depressed and complains of a feeling of general weakness.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal though complex e.e.g. with a low voltage occipital alpha rhythm showing peaks at 9 and 11 c/sec, with less 10 c/sec. activity also present. Little change with eye opening. Considerable low voltage diffuse and occipital fast activity at 14 - 18 c/s was present, as was diffuse low voltage theta rhythm at 5 - 6 c/sec No change with intermittent hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	10	occ	rare	M	1		Complex
Beta	16	9	diff.occ+	consid				
Theta	5.5	5	diffuse	consid				
Delta								
"Choppy"	Complex low-voltage record.							

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8122 (b) N.I.P.R. 73	43	M	E		25.5.49	11 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1929
1929, 10.5.49.

Clinical History:

In Grahamstown Mental Hospital during 1929. Reported to have been in exuberant maniacal state for 2½ years preceding current admission to Weskoppies Hospital. He believes himself to be female on one side and attempted to amputate the testicle on that side by tying a piece of copper wire on it. On admission he displayed an abnormal sense of well-being, was restless, talkative and displayed marked flight of ideas including punning and rhyming. He is very interfering in the ward. His mania declined slowly a few days after admission.

State at Test:

Talkative, mildly distractible and slightly coarse. His mood was one of mild euphorbia.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of questionable normality and undoubtedly choppy. The alpha rhythm at 10 - 12 c/sec, 45 mv., showed little blocking response, and was continually disturbed by considerable faster activity of an irregular nature at 14 - 24 c/sec and approximately 45 mv., apparently of central origin, but appearing chiefly in the occipital leads. There was also occasional evidence of slower medium voltage activity at 4 - 8 c/sec also of deep central origin.

Hyperventilation caused an increase in amplitude of the alpha and beta components. The patient underwent numerous episodes of apparently causeless laughter. These were usually preceded by a general suppression of activity.

Summary of Features Relevant for Stereotreatment.

Resting

	Frequency	Av. Amp.	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11 ~~10.5~~	45 ~~45~~	occ ~~occ. fr. amp~~	? 60 ~~? 90~~	P 9	-	-	Occasional waves at 100 microvolts.
Beta	~~12~~ 6	45	(post-cent rare (sometimes pre-cent.					Mixed with other activity - difficult to distinguish.
Theta								
Delta								
"Choppy"	Yes (A.C.M-C) - undoubtedly.							

Hyperventilation Alpha F.10-12, amp. increased from 45 to 60. Beta F.14-20, amp. increased from 45 to 70

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - ~~schizoaff~~ alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies ME.7876 (b) N.I.P.R. 74	48	M	E		25.5.1949	10.30a.m.	7.30 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1919.

Admissions to Mental Hospitals: 7.8.1932, 26.4.1944 and 16.8.1949 (current).

Clinical History:

Particulars of attack at age 18 unknown. Before his admission to Bloemfontein Mental Hospital in 1932 he was described as depressed and worried and as expressing persecutory ideas.

On admission he was talkative and restless and shortly afterwards broke window-panes.

During his second admission at Bloemfontein during 1944 he is described as restless, noisy, "optimisties-godsdienstig". On admission to Weskoppies in August, 1947, he was restless, talkative, noisy, euphoric and expressed grandiose delusions predominantly of religious content. At Weskoppies several hypomanic and manic phases have been recorded, but also one depressed phase following E.C.T.

State at Test:

Talkative, with flight of ideas, alternately mildly quarrelsome and mildly playful, and coarse.

E.C.T. a. Interval preceding e.e.g. 4 months, 4 days.

b. No. shocks and other particulars 4 shocks from 20-21.1.1949 (intensive). In 1948, 8 ~~shocks, 1937, 13~~ shocks.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, but contained a considerable amount of low voltage fast activity at 14-18 c/sec. arising from the fronto-central regions and also appearing fairly strongly in the occipital leads, where it caused mild disturbance of the low voltage alpha rhythms at 11-13 c/sec. These latter showed slight blocking to visual stimuli. The record was not really choppy.

Hyperventilation caused only a slight general increase in amplitude.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12	15	par-occ	40	M	1		
Beta	15.5	10	fr.cent	? 50				
Theta								
Delta								

"Choppy" Not really (ACM-C). Mixture of alpha and beta ryhthms.

Hyperventilation

General increase in amplitude.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating.

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.b.7876 (b) N.I.P.R. 74.R1	42	M	B	RH	6.4.1950.	12 noon	8.7.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative, with flight of ideas, playful and aggressive by turns, occasional obscenity.

E.C.T. a. Interval preceding e.e.g. 9 months, 12 days.
b. No. shocks and other particulars 8 shocks from 21-24.6.1949 (intensive).

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive diffuse low voltage fast activity at 14-24 c/sec. this being the dominant activity. It was partially blocked by eye opening.

There was a rare low voltage occipital alpha rhythm at 11-13 c/sec., also showing a partial blocking response and being considerably disturbed by the faster rhythms. Occasional generalised bursts of 14-16 c/sec. activity also occurred, these of medium-low voltage.

Hyperventilation augmented all existing rhythms.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	12	20	occ	rare	M	2		
Theta	17	15	diff & occ	75	parox	2.		14-24 esp.par.temp. All blocked by v.s.
Delta								
"Choppy"								

Hyperventilation

Alpha amp. increased from 20 to 30 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. F.E.3322 82	54	F	E		2.6.49	9.15 a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1934
3.5.1936

Clinical History:

She became depressed 8 months before admission to Weskoppies and was treated in a private nursing home where she was resistive and ran away in her bedclothes.

On admission she was depressed, miserable, inhibited, hypochondriacal and expressed ideas of unworthiness and self-accusation. During the earlier part of her stay there were phases of restlessness and agitation and times when she took nourishment only with difficulty and at which her intimate habits were faulty. Since the beginning of 1945, the intensity of her depression has fluctuated and there have been brief periods of relative normality. Physical features: fractured femur 25.7.1940. Fainted 21.11.1947. Right-sided hemiparesis May 1948.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to generalised low voltage irregular delta activity at 2 - 3 c/sec (found usually with raised intracranial pressure and toxic conditions). Otherwise the picture was normal, showing an alpha rhythm at 9 - 11 c/sec, 40 mv, rising occipitally and blocking normally. It was sometimes apparent frontally. There was also occasional low voltage 5 and 14 c/s activity arising post-centrally.

Poor hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	40	occ. occ. as fr	55				
Beta	14	5	post-cent	med				
Theta	5	5	post-cent	rare				
Delta	3.5	5	gen		Irregular.			
"Choppy"								

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.3322** (b) N.I.P.R. **82 R.1**	56	F	E		10.5.51		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Mildly depressed and inhibited.

E.E.G. a. Interval preceding e.e.g.) **Nil**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g.was within normal limits,though of a complex nature. There was a multi-rhythmic occipital alpha rhythm at 9 - 13 c/sec.blocking fully and of medium-high voltage. Considerable low voltage occipital fast activity at 14-30 c/sec.was also present, as were diffuse medium-low voltage theta rhythms at 4 - 7 c/sec.

During hyperventilation some fairly high voltage occipital sharp waves were observed, otherwise no change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11	45	occ	55	C	3		
Beta	22	9	occ	consid.		1		Eye closure inc.16 c/s.blocked eye opening.
Theta*	6	20	diffuse	med	Grtr.eyes open:occ.l			
Delta								
"Choppy" Hyperventilation	? Ep. - v.sharp waves,hv.							

Some very sharp occipital waves appear.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

*** 4 c/sec. with eyes open only, plus occ.**

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M D	**0**

PSYCHOLOGICAL PATTERN at [illegible]

Mood	Motility	Psychic Tempo
0	**0**	**0**

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.3620** (b) N.I.P.R. **82.**	**65**	**F**	**E**		**2.6.49**	**11.15a.m.**	**B.7, L.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1926.**

5.2.1938.

Clinical History:

Several psychotic attacks diagnosed as manic-depressive psychosis during the 12 years prior to admission to Weskoppies. Immediately prior to admission she is described as excitable, restless, talkative, aggressive and euphoric.

On admission she was agitated, and apprehensive, and spoke of doing away with herself and of a feeling that her brain would not work.

Course: Several manic and depressive attacks of equal prominence. Psychotic attacks are interspersed by normal phases, often of considerable duration.

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, showing a somewhat irregular, choppy-like, alpha rhythm with components at 12, 13, 14 and 15 c/sec. arising in the parieto-occipital regions. The last two rhythms are not alpha but appear to be related. Blocking was complete with the 12 and 13 c/sec. components.

Hyperventilation caused no abnormal responses, but did reveal an unusual frontal rhythm at 8-10 c/sec. of approx. 15-20 mv. This could have been due to eye tremor, but seems unlikely.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**12**	**20**	**par-occ**	**60**	**C.inf**	**2**		
Beta	**15**	**10**	**par-occ**	consid				
Theta								
Delta								

"Choppy" **Irregular, possibly choppy (A.C.M-C)**

Hyperventilation

Frontal rhythm av. 9 c/sec., amp. 17.5 microvolts, duration 1' at least shortly after beginning of hyperventilation. This is to be regarded as an unusual response.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	-

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.M.3620** (b) N.I.P.R. **83 R1**	**65**	**F**	**E**		**12.4.51**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **In a state of mild agitated depression.**

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to the appearance of numerous short paroxysmal bursts of medium high voltage delta activity at 2-3 c/sec.associated with theta activity at 4-5 c/sec.and followed by runs of low voltage beta activity at 14-16 c/sec.

There was a medium voltage parieto-occipital alpha rhythm at 8-11 c/sec.blocking normally to visual stimulation but often disturbed by continuous medium voltage diffuse theta activity at 4-7 c/sec. which was also blocked by visual stimulation. Numerous runs of low voltage diffuse beta activity at 14-15 c/sec.were observed.

Hyperventilation produced an increase in theta activity and increased both the frequency of occurrence and the length of the burst of delta activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10**	**35**	**parietal**	**55**	**C**	**3**		**Numerous sharp waves - greater**
Beta	**14.5**	**12.5**	**gen**					**right.**
Theta	**5.5**	**40**	**gen-posterior**	**-**	**Responsive v.s.**			
Delta	**2.5**	**max 45**	**gen**	**-**	**Paroxysmal bursts - details above.**			
"Choppy"	**Paroxysmal record**							

Hyperventilation **Decrease in alpha. Beta f.15. Theta f.5.5. Delta - gen. paroxysmal bursts at 2-3 c/sec. assoc.with theta at 4-5 c/sec.and followed by beta. Longer than in resting record.**

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
D (-)	D1 M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3344 (b) N.I.P.R. 84	59	F	E		2.6.49	12 noon	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1917.

Admissions to Mental Hospitals: 25.3.1918, 28.11.1933, and 27.6.1935 (current).

Clinical History

4 Months before first admission became depressed, wept copiously and expressed hyponchondriacal delusions. Similar picture during first admission. Before second admission she wept and expressed ideas of ruin. During this admission was agitated, tearful and spoke of impending ruin. She was discharged not improved.

Before current admission she ate glass with suicidal intent and expressed delusions of depressed type. On admission she voiced delusions of ill-health and unworthiness. Since admission she has been predominantly depressed with corresponding delusions but there have been occasional transitions into manic phases in which she has been talkative, noisy and has expressed grandiose delusions.

State at Test:

Mildly depressed, talkative, expresses fantastic hypochondriacal delusions and deplored her father's attitude which prevented her chances of marriage. Voiced mild persecutory delusions but also referred to unusual psychic powers.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal but choppy with increased amplification. There was a rare low voltage alpha at 9, 10 and 11 c/sec. which showed a slight blocking response to visual stimuli. It arose parieto-occipitally, and sometimes appeared frontally. It was disturbed by considerable faster activity at 14 - 16 and 20 - 22 ~~sec~~ c/sec., this also arising post-centrally or centrally.

Hyperventilation caused one short run of 6 c/sec. activity to appear after 1 minute and no other change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	10	par-occ.fr	rare	M	1		
Beta	18	7.5	gen &par-occ					Probably central in origin.
Theta								
Delta								
"Choppy"	Choppy with increased amplification (ACM-C).							

Hyperventilation

Rare low voltage alpha. Considereble beta.

One short run theta F.6, amp.15 after one minute.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
D (M)	D1 M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3344							
(b) N.I.P.R. 84 M1	61	F	E		7.6.51	11.15a.m.	B.7;T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Same mixture of manic and depressive features as at previous test.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive low voltage irregular generalised fast activity at 14-30 c/sec., this sometimes appearing in short paroxysmal bursts. A rare low voltage alpha rhythm at 10-13 c/sec. was occasionally seen as were low voltage diffuse 5 - 7 c/sec. theta rhythms.

Hyperventilation = no change.

Type A disorganised record: excessive irregular low voltage beta and little alpha: frequencies up into the Davis "choppy" range.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	11.5	15	par-occ	v.rare	m	1		
Theta	22	10	diffuse	consid		1		Gen.parox.bursts at approx. 20 c/sec.isome-times aug.by eye closure.
Delta	6	8	diffuse	rare		1	?aug.by eye opening	
"Choppy"								

Hyperventilation Yes - Type A, see report.

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
F.E.2057 85	77	F	E		2.6.49	2.15 p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1925
4. 7. 25 - Voluntary Boarder.
3. 10.25 - Certified case.

Clinical History: During her period as a voluntary boarder she was depressed, expressed hypochondriacal ideas, gave a history of being "highly strung" and of having come from a nervous family. During her detention as a certified case she has been unemployable for the most part, has refused nourishment at times and has made suicidal attempts: on one occasion was found ~~nude~~ nude on the floor with a piece of cloth tied round her neck, and on another she tried to burn herself with boiling water because "God told her to do it". She has also thrown herself out of bed. She has had phases of marked agitation. She has often expressed ideas of sin and unworthiness as well as nihilistic delusions, often with hallucinatory accompaniments, e.g. the hospital is Hell where she was sent for one sin and she hears the Devil calling her "that horrid woman".

State at Test: Depressed and inhibited. While discussing Satan verges on tears.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was probably normal though undoubtedly choppy. The alpha rhythms were at 9 and 10 c/sec and blocked normally. They were disturbed by considerable fast activity at 14 - 16 and 20 - 22 c/sec, this appearing as generalised. The alpha components were confined to the parieto-occipital areas. General amplitude was 20 mv.

Hyperventilation caused no changes.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	9.5	20	par-occ	70	C	2		
Theta	18	10	gen	? 70				
Delta								
"Choppy"								

Hyperventilation Without doubt (AC.M-C). Mixture of alpha and beta.

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~ 222

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RI or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.2057** (b) N.I.P.R. **85 R.1**	**79**	**F**	**E**		**10.5.51**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **Depressed, inhibited and delusional.**

E.C.T. a. Interval preceding e.e.g. **9 months, 28 days**
b. No. shocks and other particulars **3 shocks from 8-12.8.1950.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with medium voltage occipital alpha rhythm at 9 - 10 c/sec. Lower voltage tempero-occipital activity at 8 c/sec, was also present. Considerable low voltage posterior fast activity at 18 - 24 c/sec. was also detected. 5, 6 and 7 c/sec. rhythms were occasionally seen from the parieto-temporal regions, these greater on the right (as was the 8 c/sec. rhythm).

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9**	**32.5**	**par.temp.occ.**	**60**	**C**	**2**	**8**	**c/s.from temps. greater right.**
Beta	**21**	**18**	**occ**	**consid**	**- by analysis.**			
Theta	**6**	**8**	**F.temp.**	**rare**				
Delta			**(greater rt.)**					
"Choppy"								

Hyperventilation

Slight increase in alpha amplitude.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania.

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.N.7821 (b) N.I.P.R. NE.88	c.50	M	NE		8.6.1950	11.35a.m.	B.7,T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1949.

Clinical History: 11.4.1949, 29.4.1949 (current).

During first admission at Weskoppies, talkative, restless but recovered soon and was discharged 12 days after admission.

At time of current admission was restless, decorative, aggressive, garrulous and interfering. Remissions and exacerbations since then.

State at Test:

Over-active, talkative, with flight of ideas. Aggressive and playful by turns.

E.C.T. a, Interval preceding e.e.g.
b, No. shocks and other particulars } Nil.

B. E.E.G. DATA.
Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to the lack of any observable activity whatsoever.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha					M			
Beta								
Theta								
Delta								
"Choppy" ?	NO OBSERVABLE ACTIVITY.							
Hyperventilation ?								

Very Poor. No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies 88 R.1	51	M	NE		18.6.51	2.30 p.m	1 p.m.
(b) N.I.P.R. MN.7821							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History:

State at Test: Relatively normal.

E.E.G.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) The e.e.g. was abnormal due to excessive low voltage theta activity at 4 - 7 c/sec. of a diffuse nature. Analysis revealed very low voltage rare alpha activity at 8 - 10 c/sec. together with low voltage generalised fast activity at 14 - 30 c/sec. At standard amplification the record was flat in appearance.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive O	Responsive V	Responsive M	Remarks
Alpha	9	4	occ v.rare		M				Only seen by analyser; poor and invisible.
Beta	24	4	gen ? consid						
Theta	5.5	10	diffuse excessive						
Delta									
"Choppy"	Yes. Flat type.								

Hyperventilation

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.7299 (b) N.I.P.R. 89	59	M	E	RH	9.6.42	8.15a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1926.

Admissions to Mental Hospitals: 13.1.1941, 24.2.1944 (current).

Clinical History:

In 1926 he was depressed with persecutory ideas for 4 months but was not hospitalised. During first admission at Weskoppies in 1941 he was predominantly depressed with occasional manic episodes. Just prior to his current admission he was in a mixed phase, for although excited and talkative he spoke of being in "die poel die hel".

State at Test: On admission he was depressed and retarded.

Course: Up to Feb. 1946 he fluctuated between manic and depressed phases. Since then he has been in a state of chronic mania. He is often violent and destructive and ideas of wealth are prominent. There was transitory improvement after e.c.t. in May 1948.

Garrulous, alternately aggressive and playful, obscene, personal and expresses ideas of wealth.

E.C.T. a. Interval preceding e.e.g. 1 year, 21 days.
b. No. shocks and other particulars 5 shocks from 12-18.5.48.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) The e.e.g. was of questionable normality and very low voltage. The alpha rhythms were at 10-11 c/sec, arose parieto-occipitally, and blocked fully to visual stimuli. They were disturbed by fairly continuous low voltage fast activity at 14-18 and 20-22 c/sec, apparently of fronto-central origin. This gave the record a choppy appearance.

Poor hyperventilation caused no change.

Eye opening blocked evoked responses, whilst these persisted for 7 secs. after cessation of stimulus at fast frequencies with eyes closed.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	15	par-occ	55	C	3		
Beta	19	10	gen.fr.cent.	X				
Theta								
Delta								
"Choppy"	Choppy appearance, irregular (ACm-C).							

Hyperventilation

Mixture of low-voltage alpha and beta rhythms.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal

(b) Symbolic M.D.P. - recurrent mania.

Predominant Phase	State at Test
M	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. M.N.7923 NE.89	26	M	NE		8.6.1950	12.15p.m.	B.7, T.10.30.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1947.

Clinical History: 15.11.1947

Manic episodes in which he is reckless, noisy, euphoric, talkative with flight of ideas, and expresses grandiose and persecutory delusions.

State at Test:

Mildly euphoric and talkative.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of questionable normality due to excessive generalised and occipital low voltage fast activity at 20 - 26 c/sec, the occipital activity being alpha variant. The medium-low voltage rhythms were thus irregular, and at 9 - 10 c/sec, blocking normally. Rare frontal 8 - 9 c/sec low voltage activity was also seen, as were low voltage 5 - 6 c/sec occipital rhythms.

Hyperventilation evoked a few isolated medium-low voltage ¼ sec. parieto-occipital waves.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp.	Location	% Time	Type	Responsive 2V	Responsive M	Remarks
Alpha	†20-25	8	cent.&occ*	60	some	*Some		8-9 frontal amp.15 20-22 occ.&v.f. too.
Beta					&v.f.*	with typical notched		
Theta	5.5	10	occ	rare	Plus underlying ? alpha variant slow.			
Delta								
"Choppy"	Alpha irregular due to beta. Alpha variants paroxysmal features. Voltage probably too high for choppy.							
Hyperventilation	True isolated ¼ c/sec.waves, 25 microvolts, parieto-occipital evoked.							Epileptic or epileptoid

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

†Gen.fast in rare bursts up to 28 c/sec.

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4810 (b) N.I.P.R. 90	60	M	E		9.6.1949	10.20a.m	B.7,T.10.5.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1931.

Admissions to Mental Hospitals: 2.3.1931.

Clinical History: July 1931 depressed, Sept. 1932 manic, Feb.1935 manic, Feb.1936 manic, March 1936 manic, Sept. 1938 manic, Sept.1939 manic, March and Sept. 1940 manic, March 1941 depressed and agitated, Sept. 1944 first depressed then hypomanic, March 1945 depressed, during 1945 and 1946 several manic and depressed phases, since then ~~my~~ depressive phases more common than hypomanic ones.

Psychotic phases always separated by phases of normality.

State at Test:

Talkative, restless, picking up rubbish.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g.was probably abnormal. There was a low voltage rare alpha rhythm at 9-11 c/sec.arising occipitally and showing no blocking response. It was considerably disturbed by continuous fast activity at 15-18 and 20-22 c/sec.arising generally and of medium low voltage. This appeared to be of deep origin. The activity was choppy in appearance. Very occasional runs of low voltage 6 c/sec.activity were seen occipitally.

Hyperventilation augmented all activity,over which the fast rhythms now predominated. An increase in the 6-7/band was also observed after 3½ mins. c/sec.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	18.5	10	gen.cent	95				
Beta	6	10	occ	rare				
Theta								
Delta								
"Choppy"	Activity choppy in appearance (ACM-C).							

Hyperventilation

Theta, F.6-7 c/sec., amp. 20, occ.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	~~≠~~ 0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
0	0	0

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4810 (b) N.I.P.R. 90.R1	62	M	E		~~#~~5.3.51	2.30p.m.	12 noon

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Within normal limits, looks very slightly depressed but insufficiently so to classify as D1.
(Hit on right ear in right parietal region last night by fellow patient).

E.C.T. a. Interval preceding e.e.g. 1 year,6 months,27 days.
b. No. shocks and other particulars 11 shocks from 4-19.7.1949.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive medium-low voltage fast activity at 14 - 18 and 20 - 28 c/sec, the latter often occurring in generalised paroxysmal bursts, and disturbing the somewhat irregular occipital alpha rhythms at 9 - 11 c/sec. also of medium low voltage; these blocking normally. Diffuse low voltage theta activity at 6 - 7 c/sec. was also seen.
No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~≠~~ 10	15	(p)occ	49 ~~82~~	C	3		Some 8 p.temp.
Beta	20	14 ~~≠~~	p.occ & gen consid					Some gen.bursts p.-occ-cent. cons.
Theta	6	8	diffuse					Stronger fr.-par.
Delta								
"Choppy"	? ? Paroxysmal beta interrupting irregular alpha.							

Hyperventilation

Alpha amp.30, occ. Little other change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or ~~Rh~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4810 (b) N.I.P.R. 90.R2	62	M	E		~~1x3.51~~ 26.4.51	2.20p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. **1year,6 months, 27 days.**
b. No. shocks and other particulars **11 shocks from 4-19.7.1949.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to occasional generalised bursts of low voltage fast activity at 15 - 25 c/sec. arising primarily from the parieto-temporal areas. Considerable low voltage diffuse theta activity at 4 - 6 c/sec. was also present. A low voltage occipital alpha rhythm at 8 - 10 c/sec. blocked normally but was present only 4% time.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9~~	~~15~~	~~occ~~	~~42~~	C	3		
Beta	~~20~~	~~10~~	~~p.temp&gen~~	~~?~~				Numerous short bursts up to 40 microvolts.
Theta	~~5~~	~~8~~	~~gen~~	~~conoid~~				
Delta								
"Choppy"								

Hyperventilation ~~Irregular. Rather low voltage. Beta bursts.~~

No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal

M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. MN.7921 N.E.90	c27	M	NE		8.6.50	2.25p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1949 or before.

Clinical History: 19.2.1949.

Story of 2 previous unprovoked assaults on police - dates unknown. On admission to Weskoppies restless, talkative, noisy, resistive, euphoric, with grandiose plans and schemes. The degree of his mania has fluctuated somewhat.

State at Test:

Talkative, exalted, planning to be the king of the world but too young to reign.

E.C.T. a. Interval preceding e.e.g. 4 months, 15 days.

b. No. shocks and other particulars 2 shocks, 22-23/1/1950.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, with a medium-low voltage/parieto-occipital alpha rhythm at 9 - 10 c/sec blocking normally. Rare frontal 11 c/sec activity was also seen.

Hyperventilation evoked some medium voltage irregular 3 - 5 c/sec activity, this persisting for 1 minute.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	17.5	fr.par.occ.	85	C	2		Alpha strong frontally - F.11,amp.15. Par.-occ.alpha F.9&10 amp.20.
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

Theta, 4-5 c/sec. and delta 3 c/sec. both of amplitude 45 microvolts elicited in parietal, temporal and occipital regions

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.B.8037 (b) N.I.P.R. 91	38	M	E		9.6.49	11.5 a.m.	B.7, T.10.5

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Prior to 1948.

Admissions to Mental Hospitals: ~~6. 1. 48, 4. 8. 48.~~ 6. 1. 48, 4. 8. 48.

Clinical History:

First admission to Weskoppies was as an observation case, charged with assault and having a history of episodic mental disturbance. For the first week at Weskoppies he was restless, noisy and heard God speaking to him but he recovered rapidly after that. At the time of his current admission to Weskoppies he was restless, aggressive, talkative, megalomanic, and misidentified people. He showed fluctuations in the intensity of his mania after that.

History of head injury 1946 resulting from stones thrown at him by natives. He sustained scalp wounds but was not rendered unconscious.

State at Test:

Talkative, boastful of his boxing prowess (including "crocking" Johnny Ralph), expressing illusions of identity, stating that Dr Hurst is his grandfather and that his wife is Dr Hurst's daughter.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal but of very low voltage. The alpha rhythms were at 10 - 12 c/sec, and showed a slight blocking response. They arose occipitally at about 5 - 8 mv. Some very low voltage Beta at 14 - 15 c/s was seen to disturb them occasionally, whilst low voltage central theta at 5 - 6 c/sec was also sometimes apparent.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11	8	occ	40	M	2		Extremely low voltage.
Beta	14.5	3	occ	? rare				
Theta	5.5	5	cent	10				
Delta								
"Choppy"								

Hyperventilation V. low voltage. Mixed rhythms.

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

Involutional melancholia

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 92 M.E.5716	66	M	E		~~9.6.49~~	~~11.30a.m~~	B.7,T.10 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1935
8.11.1935

Clinical History:

Became depressed and agitated 5 weeks before admission to Weskoppies. On admission: depressed, inhibited, and delusional.

Course: has remained depressed, apprehensive and delusional. He has been predominantly retarded with episodes of agitation.

State at Test:

Depressed, resistive, mute and inaccessible,

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal, showing an alpha rhythm of low voltage at 8 + 9 c/sec with occasional components at 7 and 10 c/sec. It arose in the parieto-occipital areas and blocked fully to visual stimuli.

Hyperventilation was not completed due to unco-operativeness.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	15	par-occ	95	C	3		
Beta								
Theta	7	15	par-occ	rare				"Slow alpha".
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

M.D.P. - alternating.

(b) Symbolic

Predominant Phase	State at Test
M	Mz

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Temp
+ −	+	+

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. M.E.8068 93	61	M	E		2.6.49	2 p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1909.

Clinical History: 1909, 1917, 1919, 1924, 1927, 1931, 1932, 1940 and 18.11.1948:

First admission - particulars unknown. Second admission - manic. Third admission - first depressed, then manic. Fourth admission - first depressed, then manic. Fifth admission - acute mania. Sixth admission - acute mania, later depressed. Seventh admission - first depressed, later manic and then again depressed. Eighth admission - first depressed, later manic. Current admission - first depressed, then hypomania has alternated with depression with normal intervals. Mixed phases also occur.

State at Test:

Restless, distractible, talkative, but occasionally in a whisper voices hypochondriacal, nihilistic and persecutory ideas and looks depressed while doing so. He has with him a lot of rubbish he has hoarded.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to the occasional appearance of activity at 3 - 5 c/sec. in the parieto-occipital areas. This disturbed the alpha rhythms at 8 and 9 c/sec. of medium voltage also from the same area. Blocking response was slight.

Hyperventilation was impracticable.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	20	par.occ	95	C			
Beta								
Theta	4	20	par.occ	rare				
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - chronic mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	- +	- +

Registered No.	Age	Sex	Race	RH or ~~RH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4713 (b) N.I.P.R. 98	52	F	E		16.6.49	9.20 a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1948 first definite knowledge of psychosis. Previous history not available.

Admissions to Mental Hospitals: 22.1.1948

Clinical History:

Admitted to Weskoppies for observation for theft of cheque and subsequently certified.

Before admission: excitable, aggressive, wandered about, assaulted people and expressed persecutory ideas. While being examined played with buttons of doctor's coat.

On admission: restless, expressed grandiose and hypochondriacal delusions, was abusive and obscene.

Since admission: restless, interfering, noisy, talkative, abusive, intermittently megalomaniac and occasionally faulty in intimate habits.

There is also an alcoholic history.

State at Test:

Silly, amorous but quiet and unproductive mentally on the whole, but occasional outbursts of rapid talk. On the way back was talkative, voiced fantastic, grandiose ideas and her conversation had a strongly erotic colouring.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of questionable normality. The alpha rhythms were at 10 and 11 c/sec. of medium voltage and blocked fully. They arose in the parieto-occipital areas. There were also occasional runs of frontal activity at 8 and 9 c/sec. and medium voltage, possibly related to the alpha rhythms. These components were all considerably disturbed by lower voltage fronto-central fast activity at 20 - 26 c/sec, thus giving the record a choppy appearance.

Hyperventilation augmented the frontal 8 - 9 c/sec. components but caused no other change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	55	fr.cent,p.occ.	35	? C	?3	?	8,9 fr.cent.rare.
Beta	22.7	20	fr.cent.	? 60				
Theta								
Delta								

"Choppy" Yes (AC.M-C). Beta disturbing alpha. But high voltage.

Hyperventilation

Fronto-central alpha at 8 - 9 c/sec. Amp. increased from 50 to 55 microvolts, duration 1 minute. Continuous frontal activity.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - Alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+
-		

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.C.96** (b) N.I.P.R. **N.E.98**	**57**	**F**	**Col.**		**29.6.50**	**12.30 pm**	**B.7, 1.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA

Onset: **1927**

Admissions to Mental Hospitals: **First - 14.12.1927, current 19.2.1929.**

Clinical History: **Her history was one of manic episodes with occasional transitory depressions and intervals of normality, in the earlier stages. More recently depression has not been in evidence and there have been prolonged periods of hypomania with manic exacerbations, and short periods of normality.**

State at Test: **Mildly hypomanic - over active, talkative and somewhat euphoric.**

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. medium voltage occipital alpha rhythm at 9-10 c/sec. blocking fully. Present 60% time.

No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**40**	**occ.**	**60**	**C**	**3**		
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.C. 96** (b) N.I.P.R. **N.E.98.R.1**	**57**	**F**	**Col**		**29.3.51**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. with medium voltage occipital alpha rhythm at 9 - 10 c/s blocking normally. A medium voltage frontal rhythm at 8 - 9 c/s was also present, this also blocked by eye opening. Rare low voltage diffuse 5 - 7 c/s and 14 - 18 c/s also present.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	30	front.& occ	51	C	3		(Frontal 8/9 c/sec.
Beta	16	5	diffuse consid.					(parietal 9-10 c/sec.
Theta	6	20	diff.,front+					
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional Melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or Wit	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3476 (b) N.I.P.R. 99	75	F	E		16.11.49	10.40 a.m	B.7, T.10.20

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Unknown period before admission.
Admissions to Mental Hospitals: Weskoppies 11.6.36

Clinical History: Before admission: Agitated, depressed, ideas of sin; On admission: Similar picture. Stated that through her thousands of millions of souls had been lost. Believed her children were to be hanged and said that it was she and not they who had merited such a fate.
Course: There has been some fluctuation in the intensity of her depression. At times she has been agitated, at others inhibited. When relatively accessible, e.g. in Dec. 1946, there was no evidence of intellectual deterioration.

State at Test: Depressed, inhibited and uncommunicative. Severe grade 2 depression.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

: The E.E.G. was normal. There was a stable, beating alpha rhythm at 9 and 10 c/sec. of medium amplitude arising in the parieto-occipital areas and blocking fully to visual stimuli. The 9 c/sec. alpha dipole appeared to be transverse as opposed to the fore-and-aft orientation of the 10 c/sec. component.

Hyperventilation evoked no changes.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	9.5	50	par-occ	75	C	3		The 9 c/sec.dipole-transverse;the 10 c/sec.dipole antroposterior.
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M D	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.3203** (b) N.I.P.R. **100**	**68**	**F**	**E**		**16.6.49**	**11.25 a.m**	**B.7,T.10.15**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1934**

Admissions to Mental Hospitals: **3.7.1934**

Clinical History:

Before admission: depressed, feeling of impending disaster, destructive, turned out fire on floor. At time of admission ate and slept badly, wandered about sobbing and moaning. Stated "I must move the building before tonight. I don't know how to do it".

Course: Up to 1941 in state of agitated depression with occasional transitory auditory hallucinosis. Since 1941, emotionally labile - moods of agitatdd depression alternating with phases of euphoria, restlessness, aggression, violence or silliness. Manic phases have predominated during this time. Some intellectual deterioration apparent latterly.

State at Test:

Talkative, and mildly euphoric.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of extremely low voltage, but normal (probably). The alpha rhythms were rare at 11-13 c/sec. and showed no blocking response. Some very low voltage beta at 16 - 17 and 24 - 30 c/sec. was observed in the parieto-temporal regions.

Hyperventilation was impossible.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**12**	**8**	**occ**	**15**	**M**	**0**		
Beta	**21.75**	**5**	**gen.p.temp consid**					**16-17 greater on eye closure.**
Theta								
Delta								
"Choppy"	**Low voltage record.**							

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	MX Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~EH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.S.3203 (b) N.I.P.R. 100 R.1	70	F	E		10.5.61		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative, euphoric, restless.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with rare medium voltage occipital alpha rhythm at 10-11 c/sec. and less 9 c/sec. Low voltage occipital fast activity at 14-24 c/sec. was often present, with less 6-7 c/sec. activity.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	35	occ	13	M	1		
Beta	19.3	5	occ.consid.	consid.				
Theta	6	8	occ	med				
Delta								
"Choppy"								

Hyperventilation

Little change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**Ml**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.N.1031** (b) N.I.P.R. **N.E.100**	**68**	**F**	**NE**		**29.6.50**	**2.20p.m.**	**1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1927.**

Admissions to Mental Hospitals: **13.4.1927.**

Clinical History:

On admission to Weskoppies she was in a depressed state with hypochondriacal delusions. During first part of her detention she fluctuated between manic and depressed phases without intervals of normality but for many years past she has been in a chronic manic state - over-active, talkative and euphoric, often expression grandiose delusions.
Severely defective vision.

State at Test:

Talkative, over-active and euphoric.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal.

No alpha activity was present, the dominant rhythms being at 6 - 7 c/sec. of low voltage and occipital origin. These were irregular and poorly defined. They may represent a slowed alpha rhythm.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta								
Theta	**6.5**	**15**	**occ**	**60**	**? slowed alpha. Ill-defined and irregular.**			
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.N.1031** (b) N.I.P.R. **N.E.100. M1**	**69**	**F**	**NE**		**29.3.51**	**2.30p.m.**	**1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative, over-active, mildly euphoric.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal, being dominated by low voltage parieto-occipital slow activity at 6 - 7 c/sec. alpha activity was rarely seen, at 8 c/sec and of very low voltage. Analysis revealed low voltage fast rhythms at 18 - 24 c/sec.

Hyperventilation caused slight augmentation of the slower components.

(Theta at 5 appears in schema).

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8	8	occ	rare	M	0		
Beta	19.5	3	diffuse	5				
Theta	6	12	par-occ	80		1	Slight incr. eyes closed	
Delta								
"Choppy"								

Hyperventilation

Slight increase in amplitude of theta

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M D	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
0	0	0

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.3584** (b) N.I.P.R. **101**	60	F	E		16.6.49	12.15p.m.	~~B.7, T.10.30~~

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1919.**

Admissions to Mental Hospitals: **30.8.1935 and 28.11.1937 (current).**

Clinical History:

Treated at home during first attack at age 30. During detention at Bloemfontein Mental Hospital in 1935 she was depressed, agitated and expressed ideas of sin and self-accusation stating that she was doomed and had been forsaken by God. She became depressed five months prior to her current admission. On admission she was restless, agitated, extremely miserable and exclaimed "Oh God, I am finished".

Course: She remained depressed, agitated and expressed delusions of depressed type until May, 1941, when her first manic attack occurred in which she was restless and talkative with flight of ideas. Since then manic and depressive attacks have alternated, usually running into each other.

State at Test:

Within normal limits. Although talkative this is not to an extent to warrant classification as M1.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a low voltage alpha rhythm at 12 and 13 c/sec. which showed partial blocking to visual stimuli. Some very low voltage fast activity at 20 - 22 c/sec. was also occasionally apparent arising post-centrally. It was not of sufficient amplitude to be considered doubtful. The alpha was greater on the right.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12.5	30	occ	78	C	2		**Greater right.**
Beta	21	5	gen.p.temp. ? occ.					
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular (attacks of double form)

(b) Symbolic

Predominant Phase	State at Test
M (D)	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.N.1065 (b) N.I.P.R. N.M.101	51	F	NE		29.6.50	2.45p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1925.

29.11.1925, 25.10.1927 (current).

Clinical History:

Her clinical history has been one of frequent manic attacks usually immediately followed by milder and briefer depressive episodes and then relative normality.

State at Test:

Within normal limits. Looks very slightly depressed but not sufficiently so to rate as D1.

E.C.T. a. Interval preceding e.e.g. c. 5 months.
b. No. shocks and other particulars 3 shocks during Jan. 1950.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.e.g. within normal limits.
A low-voltage often ill-defined parieto-occipital alpha rhythm at 10-11 c/sec. showing no blocking response. Rare diffuse slow disturbances of 5-7 c/sec. low voltage theta activity were also seen.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	12	par-occ	40	M	0		Fairly strong fr. and ill-defined alpha.
Beta								
Theta	6	8	diffuse	rare				
Delta								
"Choppy"	Low voltage.		Mixed alpha and theta.					

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular (attacks in double form)**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**O**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	**O**	**O**

Registered No.	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.N.1065** (b) N.I.P.R. **N.E.101.R1**	**52**	**F**	**ME**		**29.3.51**	**12.30p.m.**	**B.7.T.10.30.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Within normal limits, looks slightly depressed but insufficiently so to classify as D1.

E.C.T. a. Interval preceding e.e.g. **About 5 months.**

b. No. shocks and other particulars **5 shocks Sept.-Oct. 1950.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal but complex, showing a medium voltage parieto-occipital alpha rhythm at 8-10 c/sec. blocking only slightly. Lower voltage diffuse theta activity at 5 - 7 c/sec. was common, whilst analysis revealed low voltage fast activity at 14-25 c/sec. c/sec. of parieto-occipital origin. Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9**	**30**	**par-occ**	**70**	**P**	**1**		
Beta	**19.5**	**5**	**par-occ**	**- by analysis**				
Theta	**6**	**15**	**diff.r.occ.**					
Delta								
"Choppy"	**No. Cf. original record.**							

Hyperventilation **No change.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M D	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or ~~EH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.2706 (b) N.I.P.R. 102	62	F	E		16.6.49	2.15p.m.	1.15-p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1916.

Clinical History: 1916, 17.1.1922, 13.3.1927, and 12.9.1930 (current).

Until May 1931, acute manic phases predominated the picture: in them she was restless, noisy, destructive and resistive. Since that date depressive phases have predominated.

State at Test:

Within normal limits mildly hypochondriacal, but insufficiently so to warrant classification as D1.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was an alpha rhythm of medium voltage at 9 - 11 c/sec. which blocked normally. It was slightly disturbed by very low voltage underlying fast activity at 20 - 24 c/sec. of a generalised nature.
Hyperventilation revealed no changes.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	20	par-occ	70	C	2		
Beta	22	5	gen	rare				
Theta								
Delta								

"Choppy" Slightly irregular due to disturbance of alpha by v.low voltage beta.

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania.**

(b) Symbolic

Predominant Phase	State at Test
M	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~CF~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.N.7977** (b) N.I.P.R. **N.E.113**	**48**	**M**	**NE**		**27.7.50**	**11.15a.m.**	**B.7,T.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **Unknown.**

Admissions to Mental Hospitals: **Records of two previous admissions could not be traced, probably because of changed name. 9.5.1950(current).**

Clinical History:

Admitted to Weskoppies as Governor-General's decision case having assaulted a native female with intent to do grievous bodily harm. On admission he was free from mental disorder but subsequently became restless, noisy and destructive with transient, auditory hallucinations.

State at Test:

Over-active, talkative, euphoric and playful.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits.

There was a medium-high voltage occipital alpha rhythm at ~~XXXXX~~ 9 - 10 c/sec. blocking normally, also considerable low voltage diffuse fast activity at 15 - 24 c/sec, this often strong frontally. The patient slept initially, sleep rhythms apparently normal.

No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	60	(p) occ	85	C	3		
Beta	19.7	10	diffuse	? 70 +	?some alpha v.f.			Considerable beta. Strong frontally.
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or -	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.N.O.386							
(b) N.I.P.R. N.B.117	20	M	NE	-	8.8.50	10.10a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Feb. 1950.

Admissions to Mental Hospitals: 19.7.1950.

Clinical History:

For 5 months preceding admission to Weskoppies he was described as being depressed.

Admitted to Weskoppies as an observation case, charged with the theft of a bicycle.

At Weskoppies: restless, voluble, megalomanic and predominantly euphoric with transient lapses into mild depression. Fleeting visual and auditory hallucinations.

State at Test:

Garrulous, mildly megalomanic, no current hallucinosis. Trace of underlying sadness at times.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive recurrent runs of medium-high voltage occipital 4 c/sec. activity, this often in bursts, and sometimes associated with 3 c/sec.rhythms. It caused considerable disturbance of the medium voltage occipital alpha rhythms at 9 - 11 c/sec. whilst all these rhythms were blocked by eye opening, thereby suggesting involvement of the visual areas.

Hyperventilation augmented the slow rhythms slightly.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	40	occ	67	C	3		
Beta	15	5	occ	rare				
Theta	4.25	55	occ	63				3 Recurrent, sometimes paroxysmal. 3 occasionally assoc. 4 c/sec. 7 c/sec. with eyes open 15 microvolts.
Delta								
"Choppy"	paroxysmal.							

Hyperventilation

Slight augmentation of 4 c/sec.

Normality Normal Questionably Normal Abnormal

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D1

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.2644**							
(b) N.I.P.R. **136**	**75**	**F**	**E**		**18.8.49**	**10.20**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1929.**

Admissions to Mental Hospitals: **28.12.1929, and 15.3.1930 (on transfer - current).**

Clinical History:

Has been in a continuously depressed state. Agitated at times.

Secondary senile mental deterioration has intervened latterly and since 1946 she has had occasional epileptiform seizures of senile type.

State at Test:

In a state of mild agitated depression.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to frequent runs of medium to high voltage irregular slow activity at 2 - 4 c/sec. arising over a large area in the region of the right temporal lobe.

The alpha rhythms were at 10 - 11 c/sec.of medium voltage, but showed only a slight blocking response.They were disturbed slightly by low voltage faster generalised activity at 18 - 24 c/sec., this being somewhat greater on the right.

Hyperventilation augmented the delta rhythms, no other change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	30	par-occ	70	P	1		
Beta	21	~~mm~~	~~15.cent~~rt.+	80				
Theta	4	75	)rt.temp.					
Delta	2.5	75	)lobe,large					Short runs fairly frequent.
"Choppy"	? Paroxysmal.		are					

Hyperventilation

Augmented delta rhythms.ab

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
D (M)	M1 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or Rh	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4785 (b) N.I.P.R. 137	39	F	E		18.8.49	11 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1945

Admissions to Mental Hospitals: 29.11.1945, 21.1.1946, 27.2.1948, and 9.11.1948(current).

Clinical History:

First admission: depressed, delusional, hallucinated. Recovered.

Second admission: tearful, depressed, forlorn, dejected, delusional. Improved.

Third admission: fluctuating between elation and talkativeness on the one hand and depression on the other. Recovered.

Fourth admission: depressed, manic, mixed and relatively normal phases have occurred.

Goitre operation in 1942.

State at Test:

Talkative, with mild flight of ideas and mild euphoria at beginning of test but re-acted later with fear and tearfulness.

E.C.T. a. Interval preceding e.e.g. 4 weeks, 5 days.

b. No. shocks and other particulars 11 shocks between 17.3.49 and 15.7.49.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal. The alpha rhythms were of low voltage at 9 + 10 c/sec. and only rarely apparent. They blocked normally.

Hyperventilation evoked no change.

[illegible]tist

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	15	par-occ	35	C	3		Rare alpha.
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.S.3857 (b) N.I.P.R. 138	54	F	E		XXXXXX 18.8.49	11.40a.m.	B.7,T.10.15

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1939.

Admissions to Mental Hospitals: 22.11.1939.

Clinical History:

On admission was restless, destructive and showed flight of ideas.
Course: Manic episodes progressively replaced by phases of stuporous or mixed phases.

State at Test:

Mute, retarded but tearful.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.e.g. was normal. Medium voltage alpha rhythms at 8 - 9 c/sec., showing normal blocking response. Slightly disturbed by generalised underlying fast activity at 16 - 22 c/sec. of low voltage.
No response to hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	25	occ.	70	C	2		
Beta	18.7	7.5	gen.front.	? 70		1		Greater with eyes open
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality . Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M2 D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.5191** (b) N.I.P.R. **145**	**71**	**M**	**E**		**25.8.49**	**9 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1933 or before.**

Admissions to Mental Hospitals: **18.3.1933**

Clinical History:

On admission: Elated, restless, talkative with grandiose and persecutory ideas.

Course: Has alternated between mild depression and fairly marked mania in which he is talkative, decorative, euphoric, megalomanic and erotic. Mixed phases are common.

State at Test: **Talkative with flight of ideas, megalomanic and predominantly euphoric but transient lapses into depression.**

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal but of extremely low voltage. The alpha rhythms were at 9 and 10 c/sec, but only apparent for 10 - 15% time and showing no blocking response. Very low voltage generalised beta at 22 - 24 c/sec was apparent fairly frequently. Occasional occipital rhythms at 7 c/sec were observed of low voltage. A "flat" record. No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**10**	**occ**	**15**	**M**	**0**		**Rarely present more**
Beta	**23**	**4**	**gen**	**? 50**		**1**		**with eyes opened.**
Theta	**7**	**10**	**occ**	**v.rare**				
Delta								
"Choppy"	**"Flat" (AC.M-C).**							

Hyperventilation

Alpha, F.8-10, amp. 15. Slight increase in alpha.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

PSYCHOLOGICAL PATTERN at Pg 4

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M2 D1**

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.5191** (b) N.I.P.R. **145 R.1**	**73**	**M**	**E**		**5.4.51**	**10.15 a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative with flight of ideas, megalomanic, and predominantly euphoric with occasional brief lapses into depression.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. with low voltage occipital alpha rhythm at 8 - 10 c/s, with little 9 c/s present. Considerable diffuse low voltage fast activity at 16 - 35 c/s, and rare low voltage occipital slow rhythms at 5 - 7 c/s.
Hyperventilation caused some alpha augmentation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	20	occ	35	M	1		Little 9 c/sec.
Beta	20.5	?	diffuse	consid	?alpha v.f.			
Theta	6	5	occ	rare				
Delta								
"Choppy"								

Hyperventilation

Increased alpha otherwise little change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M D	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or [illegible]	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8004 (b) N.I.P.R. 146	69	M	E	—	25.8.49	9.55a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Unknown.

Admissions to Mental Hospitals: 31.5.1947 and 17.5.1948.

Clinical History:

Episodes of excitement in which he is restless, noisy, resistive and delusional are the prominent feature. Mild depressive and normal phases also occur. Memory and orientation intact.

Head injury sustained in motor-bike accident in 1945.

State at Test:

Talkative, euphoric and shows flight of ideas. Well orientated.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was mildly abnormal due to excessive low voltage slow activity at 5 - 7 c/sec, this being post-central and seen chiefly in the parieto-temporal areas.

The activity as a whole was of low voltage, with a poorly formed alpha rhythm at 8 - 9 c/sec. present for 25% of the time. A rhythm at 13 c/sec. was occasionally seen occipitally of very low voltage, whilst fairly continuous low voltage post-central beta at 16-18 c/sec. contributed to the general irregularity of wave forms. No change occurred with poor hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	20	par.occ	25	M	0		Poor, irregular.
Beta	17	5	par.occ	? 65		1		Greater with eyes open
Theta	6	20	P.temp.& post-cent.	40				Fairly continuous.
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ Abnormal

DIAGNOSIS

M.D.P. - recurrent mania

(a) Verbal

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.M.8005 (b) N.I.P.R. M.E.158	c38	M	NE		6.10.[illegible]	3.45p.m.	12 noon.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA. 1943.

Onset:

Admissions to Mental Hospitals: 12.12.1943, 2.8.196[illegible] (current).

Clinical History: During both admissions at Weskoppies she has been restless, noisy, interfering, euphoric, has shown flight of ideas and expressed grandiose delusions.

State at Test: Very talkative, expansive and megalomanic, claiming to be king of the Shangaans.

E.G.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with very rare parieto-occipital low voltage alpha rhythm at 12 - 13 c/sec. showing no blocking response. Slightly more diffuse low voltage fast activity at 20 - 27 c/sec. often strong frontally and occasionally in bursts.

Hyperventilation augmented the alpha rhythms, and evoked one burst of generalised medium-low voltage slow-activity at 6 - 7 c/sec.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12.5	6	par-occ	rare	M	0		
Beta	23.7	8	anterior+	consid				Diffuse - rare bursts.
Theta								
Delta								
"Choppy"	Low voltage. Beta bursts.							

Hyperventilation

Alpha percentage time increased. One generalised theta burst, 6-7 c/sec, amp. 30.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	**M2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.N.8005** (b) N.I.P.R. **N.E.168 R1.**	**c38**	**M**	**ME**		**29.3.51**	**9.30 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test: **Talkative, with flight of ideas, exalted, claiming to be King George.**

E.C.T. a. Interval preceding e.e.g. **3 months, 9 days.**

b. No. shocks and other particulars **9 shocks from 9.10.1950 to 20.12.1950.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.E.G. of questionable normality due to occasional generalised bursts of low voltage fast activity ranging from 14 - 24 c/sec. The alpha rhythm appeared to be at 10 c/sec, although was not often present, whilst a 13 c/sec. rhythm was often observed but with a wider spatial distribution. Diffuse low voltage theta rhythm at 5 - 6 c/sec. was also detected.

Hyperventilation augmented alpha activity considerably.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**11.5**	**8**	**occ**		**M**			
Beta	**18.7**	**5**	**gen**					**Occas.bursts mixed with 13 c/s**
Theta	**5.5**	**5**	**diffuse**					
Delta								
"Choppy"	**Low voltage alpha, beta and theta. Beta bursts.**							
Hyperventilation								

Alpha F.10, amp.30, p.occ. Beta F.19, amp.10, gen.

Normality Normal Questionably Normal Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M D	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8162 (b) N.I.P.R. 161	64	M	E		12.9.49	9.20 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Previous attacks, dates unknown, before 1947 admission.

Admissions to Mental Hospitals: 13. 1. 47, 17. 8. 49.

Clinical History:

During first admission he was in a state of acute agitated depression from which he recovered spontaneously. On the occasion of his second admission he was restless, noisy, obscene, playful and aggressive by turns, garrulous with flight of ideas, rapidly changing grandiose delusions.
Head injury at age 2½ in the left frontal region.

State at Test:

As above.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal. There was a complex low voltage alpha rhythm with frequencies at 10 - 13 c/sec., 11 - 13 being most predominant although the alpha itself was rare. It showed a slight blocking response, and was occasionally disturbed by faster activity at 14, and 18 - 20 c/sec., of low voltage and generalised nature. The alpha itself sometimes stretched forward to the frontal areas.
Poor hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11.5	15	par-occ	15	M or D	1		Talking may have blocked alpha.
Beta	16.5	7.5	parocc (sometimes gen.)	rare	14 c/s. 10% time.			
Theta								
Delta								
"Choppy"								

Hyperventilation Poor. No change except slight increase alpha.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional Melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D3**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	-

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
M.E.8076 **162**	**31**	**M**	**E**		**2.5.48**	**10.45a.m.**	**B.F. 8.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1947.**

Admissions to Mental Hospitals: **17.4.1947, 8.6.1948 and 17.12.1948 (current).**

Clinical History:

Psychotic symptoms developed shortly before admission. Condition shows transitory response to e.c.t.

State at Test:

Acutely depressed and agitated and making spontaneous noises indicative of distress. Grunts at most in response to questions.

E.C.T. a. Interval preceding e.e.g. **6 months, 16 days.**
b. No. shocks and other particulars **5 treatments from 7-15.2.1948 5 treatments 1948, 7 treatments 1947.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a classical low voltage par-occipital alpha rhythm at 10 - 11 c/sec., with some occasional 9 c/sec., which blocked fully. No other activity apparent. % time alpha = 85%.

Hyperventilation caused no changes.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10**	**20**	**par-occ**	**85**	**C**	**3**		
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

Alpha more persistent only. Poor hyperventilation.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	+	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.8076**							
(b) N.I.P.R. **162.21**	**63**	**M**	**E**		**5.4.51**	**11.30a.m.**	**8.7.7.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Depressed and somewhat agitated but speaks a little.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting e.e.g. was within normal limits showing a medium-low voltage parieto-occipital alpha rhythm at 9 - 11 c/sec. blocking normally. Rare 8 c/sec. activity was also observed, this being strong frontally. Considerable low voltage diffuse fast activity at 18 - 24 c/sec. was also present. Rare 5 - 6 c/sec. low voltage rhythms of occipital origin were also detected.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**25**	**par-occ**	**55**	**C**	**3**		**8 c/sec.strong frontally.**
Beta	**21**	**8**	**gen**	**condd**		**1**		
Theta	**5,5**	**8**	**occ**	**rare**				
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - depressed.**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.N.2399.** (b) N.I.P.R. **NE.173**	**c.20**	**F**	**NE**		**7.12.50**	**12.12p.m.**	**B.7,T.10.15.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1950.**

Admissions to Mental Hospitals: **29.11.1950.**

Clinical History:

Before admission to Weskoppies, attacked husband and children with homicidal intentions and set fire to two huts apparently in a state of agitated depression. On admission she was depressed, inhibited, and described auditory illusions and hallucinations which soon passed over. She stated she was depressed because of her husband's infidelity.

Scar on vertex - states self-inflicted 5 months ago. (Apparently suicidal attempt).

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits but of a complex nature, there being 2 parieto-occipital alpha components, one at 8 c/sec, the other at 11 c/sec, both of very low voltage but showing a blocking response. A fair degree of parieto-temporo-occipital 7 c/sec. activity of low voltage was also present, this being augmented by hyperventilation.

It is possible that the true alpha was at 11 c/sec. and that the 8 c/sec. component was of <u>obscure</u> significance, but one cannot be certain of this.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	15	par-occ	40	M	2		9 & 11 c/s. components.
Beta								
Theta	7	10	par-temp-occ	173				
Delta								
"Choppy"	Complex.							

Hyperventilation

Theta F. 6.5, amp.15, diffuse, 1 minute.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or EH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.M.2395 (b) N.I.P.R. N.E.174	32	F	NE	RH	7.12.50	2.15 pm	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1938
18.11.1950

Clinical History:

One psychotic attack for which she was not hospitalised 12 years before current one (details of symptoms not available). For two weeks before current admission she was excited, violent, obstructive and incontinent. On admission: restless, noisy, undressed herself and paraded about naked, euphoric and transient auditory hallucinosis. There was a gradual return to normal.

Old frontal scar.

State at Test:

Within normal limits although somewhat coy and easily provoked to mirth (not quite Ml).

E.C.T. a. Interval preceding e.e.g,
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. with medium voltage parieto-occipital alpha rhythm at 11-13 c/s blocking normally. During blocking medium low voltage theta rhythms at 4-6 c/s were observed of occipital origin. Diffuse low voltage fast activity at 16-c/s was also sometimes seen.

No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~12~~	~~40~~	~~par-occ~~	~~71~~	C	3		Sometimes strong frontally.
Beta	~~18~~	~~10~~	~~diffuse~~	med				
Theta	~~5~~	~~20~~	~~occ~~	~~? 30~~		1		with eyes open ?masked: sometimes with eyes closed.
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4859 (b) N.I.P.R. 189	70	F	E		15.9.49	9.10a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1919.

Admissions to Mental Hospitals: 21.1.1919, 10.5.1928, 4.8.1932, 1.1.1941. 17.10.1944, 6.7.1949(current)

Clinical History:

There have been several manic and hypomanic episodes but only one episode of acute depression. During her current period of detention at Weskoppies, in addition to manic and hypomanic phases there have been occasional mixed phases, with a slight depressive component.

State at Test:

Talkative, with mild flight of ideas.

E.C.T. a. Interval preceding e.e.g. } M11
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a medium voltage regular alpha rhythm at 10 - 11 c/sec. whoch blocked fully. Very low voltage generalised fast activity at 20 - 24 c/sec. was revealed with increased amplification, this being greatest on the parieto-temporal leads.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	35	occ	75	c	3	possibly	generalised - masked by alpha and frontal muscle.
Beta	22	10	par-temp	med				
Theta				rare				
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4859** (b) N.I.P.R. **189 R.1**	**72**	**F**	**E**		**17.5.51**	**11 a.m**	**B.7,T.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Mild flight of ideas, talkative in snatches and in a ruminative fashion, illusions of identity, paranoidal. (Reported to be interfering and over-active in ward.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, showing a medium voltage occipital alpha rhythm at 10 - 12 c/sec. blocking fully. Low voltage fast diffuse rhythms at 18-26 c/sec. were also detected.

Hyperventilation augmented all resting activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**11**	**45**	**occ**	**82**	**C**	**3**		
Beta	**21.75**	**5**	**?diffuse**	**?**				**.....Masked.**
Theta								
Delta								
"Choppy"								

Hyperventilation

Alpha F.12, amp.40, occ. Beta amp. 10, diffuse.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3479 (b) N.I.P.R. 191	78	F	E		15.9.49	10.45 p.m.	8.7 a.m., T.10.15

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Some years before 1936.

Admissions to Mental Hospitals: 17. 6. 1936.

Clinical History: Several suicidal attempts before admission to Weskoppies. On admission she was depressed and apprehensive, stating that there were papers in the building that ~~kkayxxkkxxid~~"catch up her thoughts and follow through her mind".

Course: She has fluctuated btween acute agitated depression through mild depression to relative normality.

Fainting attacked occurred during May 1946.

State at Test: Normal.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting E.E.G. was normal though somewhat complex. There was a rare low voltage alpha at 9 - 10 c/sec which showed a partial blocking response. It was of parieto-occipital origin. Considerable low voltage beta at 20 - 22 c/sec of a generalised nature caused slight underlying disturbances, whilst occasional short generalised bursts of medium voltage activity at 12 - 15 C/Sec were observed.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	20	par-occ	20	C	2		
Beta	17.25	9.5	gen.occ	? 80				12-15, 10-20 amp., occ., rare bursts. 20-22 4 amp, gen., ? 80%.
Theta	7	20	gen					
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or ~~HE~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4892 (b) N.I.P.R. 193	73	F	B		15.9.49	12.15 p.m.	B.7.T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1922.

Admissions to Mental Hospitals: 18.6.1949.

Clinical History:

Details of psychotic attack at age 46 unknown, apart from the fact that he was depressed. Present psychotic attack commenced 3 weeks prior to current admission. At Weskoppies has been resistive and has required to be fed. Has given expression to delusional ideas of depressed type - of sin, ill-health and ruin, and also secondary persecutory ideas.

State at Test:

Very depressed and inhibited. Fears we intend burying her.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.e.g. was normal. There was a low voltage alpha rhythm at 9 - 10 c/sec which blocked normally, but was disturbed slightly to become irregular by underlying generalised fast activity at 15 - 20 c/sec of low voltage. It was not choppy, however.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	15	par-occ	45	C	2		
Beta	17.5	5	gen	? 60		1		Greater with eyes open.
Theta								
Delta								

"Choppy" No (AE.M-C). Irregular - alpha disturbed by beta.

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 208	43	M	E		22.9.49		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1930**

Clinical History: **22.11.1930, 8.8.1943, 19.1.1948 and 26.8.1949 (current).**

During manic attacks: restless, talkative, with flight of ideas, delusional, transient visual hallucinosis and interfering.

State at Test:

Talkative with flight of ideas, obscene, amorous, aggressive and playful by turns and expressions illusions of identity.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to excessive occipital fast activity of medium voltage at 14 - 16 c/sec., this often disturbing the medium voltage alpha rhythms at 11 - 13 c/sec., and apparently closely related to them. The alpha activity showed partial blocking.

Hyperventilation was unsatisfactory, and no changes occurred.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12	20	par-occ	? 60	C	2		Also frontal at 10 c/s
Beta	15	20	par occ	? 60				amp 20
Theta								
Delta								

"Choppy" **Irregular due to disturbance of medium voltage alpha rhythms by excessive beta.**

Hyperventilation

Poor. No change.

Normality Normal Questionably Normal Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.S.8155 (b) N.I.P.R. 209	40	M	E		22.9.49	3.20p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1938.

19.6.1945 and 26.4.1946 (on transfer - current).

Clinical History:

Several attacks of depression since the age of 29. He is reported to have been depressed for seven years prior to his admission to Bloemfontein mental hospital in June, 1945. At Weskoppies he has been in a state of acute stuporous depression. When he does speak he has given expression to delusions of depressed type.

State at Test:

Depressed, retarded and mute.
On the trip over there was a momentary decrease in the intensity of his depression and he made a few brief replies to questions. Apparently apprehensive about test.

E.C.T. a. Interval preceding e.e.g. 3 years, 4 months, 26 days.

b. No. shocks and other particulars 12 seizures terminating 26.4.1946. 18 seizures during 1945.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.e.g. was normal but of extremely low voltage. Increased amplification revealed a low voltage rare alpha at 9 - 10 c/sec which blocked to visual stimuli. It was slightly disturbed by lower voltage post-central beta activity at 18 - 19 c/sec, this being more marked with eyes open.
Hyperventilation caused slight augmentation of alpha activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	8	occ	25	C	2		Blocked with increased amplification otherwise flat.
Beta	15.5	4	occ	45				
Theta								
Delta								
"Choppy"	Possibly - flat record.							

Hyperventilation

Alpha amplitude increased from 8 - 12 microvolts.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.8155** (b) N.I.P.R. **209.R1**	**M 42**	**M**	**E**		**5.4.51**	**9.40a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal. Communicative and normally cheerful. It is reported that he is sociable and working well in the ward at present.

E.C.T. a. Interval preceding e.e.g. **1year,4 months, 11 days.**
b. No. shocks and other particulars **9 shocks from 30.9.49 to 24.10.49.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with low voltage somewhat rare occipital alpha rhythm at 8-10 c/sec. together with considerable diffuse low voltage 4 - 7 and 18 - 20 c/sec. activity.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	15	occ	37	M	0.1		10 dominant.
Beta	18	5	occ	consid.	diff.			
Theta	5.5	10	diffuse	consid.				
Delta								
"Choppy"								

Hyperventilation

No hyperventilation.

Normality Normal Questionably Normal Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.B.4826** (b) N.I.P.R. **219**	**28**	**F**	**E**		**29.9.49**	**9.30 am**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1944 first definite attack. Depression at mother's death ? pathological.**

Admissions to Mental Hospitals: **23.3.1949 (treated at Northfield Nursing Home, 1948).**

Clinical History:

At Weskoppies:

Prior to E.C.T. depressed, tearful, with delusions of sin and of ill-health. Improved after E.C.T. and went on leave on 28.5.1949 only to return on 12.9.1949 in much the same state as before the treatment.

State at Test:

Mildly inhibited and depressed; hypochondriacal and complaining of insomnia.

E.C.T. a. Interval preceding e.e.g. : **5 months, 2 days.**

b. No. shocks and other particulars : **11 shocks between 2nd and 27th April, 1949.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal but of unusually low voltage. There appeared to be a somewhat complex low voltage alpha rhythm with components at 8 - 11 c/sec, but no blocking response (so little alpha). There was also some occipital low voltage fast activity at 16 c/sec.

Hyperventilation caused slight augmentation of alpha activity. (Alpha at 12 also mentioned in scheme).

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10**	**3**	**par-occ**	**rare**	**M**	**0**		
Beta	**16**	**6**	**occ**	**rare**				
Theta								
Delta								
"Choppy"								
Hyperventilation	**low voltage record.**							

Alpha amplitude increased from 3 to 10. 12 c/sec. disappears as well as parietal representation of alpha.

Normality Normal ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
D (M)	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4970** (b) N.I.P.R. **220**	**65**	**F**	**E**		**29.9.49**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1928.**

Admissions to Mental Hospitals: **29.8.1949.**

Clinical History:

Particulars of first psychotic attack at age 44 unknown. On admission to Weskoppies she was depressed and inhibited and stated that she heard people saying that she had burned somebody. She has had episodes of restlessness with euphoria interrupting her predominant state of depression.

State at Test:

Within normal limits. Too mildly depressed to classify as D1.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was mildly abnormal. There was a somewhat irregular alpha rhythm at 11 and 12 c/sec. of medium voltage and which blocked normally. It arose in the occipital areas, and was occasionally disturbed by runs of medium voltage post-central theta activity at 5 - 7 c/sec. A rhythm at 8 c/sec was also sometimes seen in the parieto-temporal areas. (The runs of theta were abnormal).

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.75	32.5	par.temp.occ.	75+	C	3		F.8, amp.20, par. temp.20%. 11-12 amp.45, occ.75%+. Rarely closed eyes
Beta								
Theta	6	up to 40	post-cent	rare ~~10%~~				
Delta								
"Choppy"								

Hyperventilation

Very poor. No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

PSYCHOLOGICAL PATTERN at test

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2 M1

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 222 F.E.2675	71	F	K		29.9.42	11.30 a.m.	B.7, F.10.15

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1929**
10.10.1929

Clinical History:

Her history has been one of episodes of mania and depression separated by periods of relative normality. These latter have become briefer and less frequent during the past ten years. The manic phases have been much more prolonged than the depressed ones.

State at Test:

Depressed, retarded and inaccessible except that at one stage she skipped off the couch in a manic fashion.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal. There was a complex low voltage alpha rhythm arising in the parieto-occipital areas showing two peaks of activity, one from 8 - 10 c/sec, the other at 11 - 12 c/sec and of lower voltage. The former showed a normal blocking response. The record was often disturbed by generalised bursts of medium voltage 7 c/sec activity, these occasionally associated with faster activity at 16 - 18 c/sec and of low voltage. These latter rhythms were also present in the resting record, being more clear with the eyes opened, when they were chiefly of occipital origin.
Hyperventilation was impossible.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	14	par-occ	7 35	C	3		8-10 & 11-12 alt.
Beta	17	15	occ	med		1		The 8 & 9 c/s.
Theta	7	20	fr.-cent.	in gen. bursts				appear to be visual.
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M1 D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.8163** (b) N.I.P.R. 233	**36**	**M**	**E**		**6.10.49**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1945**

Admissions to Mental Hospitals: **11.9.1949**

Clinical History:

First attack at age 32. Became mentally disordered again three months before current admission. During this period he showed flight of ideas and often burst into tears.

At Weskoppies: over-active, talkative, distractible, restless, noisy, interfering, euphoric with mildly grandiose and persecutory ideas. From this state there were frequent sudden lapses into depression.

State at Test:

Expression rather sad but he is aggressive and surgent when conversed with.

(Euphoric and singing on trip over).

E.C.T. a. Interval preceding e.e.g. b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal. There was a regular stable low voltage alpha rhythm at 12 - 13 c/sec of occipital origin which blocked fully. Very rare low voltage occipital fast activity at 24 c/sec was also seen, this being harmonically related to the alpha activity.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**12.5**	**20**	**occ**	**47**	**C**	**3**		
Beta	**24**	**5**	**occ**	**rare**				**Second harmonic.**
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	0

PSYCHOLOGICAL PATTERN at

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4049 (b) N.I.P.R. 234	62	M	E		6.10.49	2.15 p.m	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1907

Admissions to Mental Hospitals: 7 admissions. First June, 1907; current 23.5.1920.

Clinical History:

His clinical history has been one of recurrent episodes of manic excitement in which he is silly, restless and talkative, with intervals of normality. He has been predominantly relatively normal or hypomanic of recent years.

State at Test: Normal.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal.

There was a regular stable alpha rhythm of medium - low voltage at 9 - 10 c/sec arising in the parieto-occipital areas and which blocked fully.

Poor hyperventilation revealed no changes.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9.5~~	~~25~~	~~par-occ~~	~~62~~	C	3		Pure, regular, stable
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4049 (b) N.I.P.R. 234 R1	63	M	E		1.3.51		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History:

State at Test: Mildly restless, talkative and euphoric.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle): The E.E.G. was normal with a medium-voltage monorhythmic alpha rhythm at 10 c/s arising parieto-occipitally but strong frontally and blocking normally to visual stimuli.

There was a very rare low-voltage diffuse theta ryhthm at 5 - 7 c/s which was strong frontally. A short run of low voltage beta rhythm at 21 - 22 c/s usually appeared occipitally on eye closure.

Hyperventilation appeared initially to block the alpha rhythm but this returned after approx. 25 seconds. A slight increase in the amplitude of the theta rhythm was also observed.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.25	30	par-occ.front+		C	3		Appar. monorhythmic.
Beta	21.5	occ 5	occ	rare	v.f.	3		On eye closure.
Theta	6	5	diff.frontal +	v.rare				
Delta								
"Choppy"								

Hyperventilation

Alpha frequency 10 c/sec. Blocked alpha rhythm returns after 25 seconds. Theta amplitude increases from 5 to 9 microvolts.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

(b) Symbolic

Predominant Phase	State at Test
M	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.4049 (b) N.I.P.R. 234 R2	63	M	E		26.4.51	11 a.m.	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.
(was hypomanic last week).

E.G.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits, although considerable frontal and diffuse low voltage slow activity at 4-6 c/sec.was present. There was a medium-low voltage parieto-occipital alpha rhythm at 9-10 c/sec. with rare 11 c/sec. present, all these blocking normally. Low voltage fast activity at 14-24 c/sec. was also detected.

Hyperventilation caused an increase of alpha amplitude.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~10~~	~~20~~	par-occ	30	C	3	Par.origin - phase reversal	
Beta	~~19~~	~~5~~	diffuse			2	Eye closure evoked l.v. burst 20-24 c/s.occ.	
Theta	~~5~~	~~10~~	fr.cent-diff.					
Delta								
"Choppy"								

Hyperventilation

Alpha amp. increased.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

PSYCHOLOGICAL PATTERN at Test

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.H. 251 (b) N.I.P.R.	40	M	B	~~RH~~	20.10.49	10.5a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1947.**

1.10.1949.

Clinical History:

During his attack in 1947 he embarked on wild schemes and a course of ruinous behaviour. This recurred in August 1949, but when his wife threatened to leave him he cried and became hysterical, and on the holiday that followed he was restless and continued with his wild schemes.

At Weskoppies he has been restless, resistive, violent and has displayed flight of ideas and rapid mood fluctuations between euphoria and depression.

State at Test:

Talkative, singing in snatches and still bent on wild schemes.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.e.g. was of questionable normality. There was a very low voltage irregular alpha rhythm at 8 - 10 c/sec. showing no blocking response, and considerably disturbed by complex generalised faster activity with dominant frequencies at 20 - 22 c/sec. Occasional generalised activity at 6 - 7 c/sec. of medium voltage was also observed.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta	21	b	occ	rare	M	O		Prob. alpha, very low voltage.
Theta	6.5	b	occ-gen	? 95				
Delta			post-cent (sometimes gen. & fr.)	rare				
"Choppy"								

Hyperventilation: **Irregular low-voltage fast record.**

No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No. (a) Weskoppies (b) N.I.P.R.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
252		M	B	~~RH~~	20.10.49	~~10.35 a.m.~~	~~8.7, 1.10.15~~

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1925

Admissions to Mental Hospitals: 1944, 13.9.1946, 27.9.1949(current)

Clinical History:

For his first two manic episodes, in 1925 ~~and 1925~~ and 1944, he was not sent to a mental hospital but during the latter he was treated in a private nursing home. During his first admission to Weskoppies he has several manic episodes. For five months prior to his current admission he indulged in ruinous spending. Since readmission to the hospital he has been interfering, abusive, has exposed himself, has been exalted and outlined wild schemes.

State at Test:

Talkative, obscene, announced the intention of going on a world tour.

E.C.T. a. Interval preceding e.e.g: 2 years, 6 months, 25 days.
b. No. shocks and other particulars 6 shocks from 14-26.3.1947.
During 1943 12 shocks in private nursing home.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, with a classical medium-low voltage alpha rhythm at 10 - 11 c/sec. arising occipitally and blocking normally.

Hyperventilation caused no change.

There was some slower activity at 4 - 6 c/sec. of low voltage confined to the left hemisphere only. It may have been due to movement artifact, for it disappeared towards the end of the recording. A repeat would be necessary for certainly about this.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	20	occ	40	C	3		Rarely kept eyes closed for long.
Beta								
Theta	5	15	left hemisphere	med				
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
D	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8085 (b) N.I.P.R. [illegible].63	67	M	B	RH	20.10.49	11.10a.m.	B.7, T.10.15

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1932

Clinical History: 30.8.1933, 14.6.1938, 7.1.1949 (current).

Mental symptoms dated back about a year before first admission. During first two admissions was acutely depressed and expressed ideas of sin, unworthiness and ruin. During current admission manic, depressed, mixed and relatively normal phases have occurred.

State at Test:

Talkative and euphoric.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The record was abnormal due to excessive post-central slow activity at 6 - 7 c/sec. and of medium voltage. There was a persistent medium voltage alpha rhythm at 8 - 9 c/sec. which showed little blocking response. It appears to have two foci, one parieto-occipital (8 - 9 c/sec.), the other more frontal (9 c/sec.). There was considerable low voltage generalised fast activity at 16 - 18 c/sec. also present, this often [illegible] bilaterally. The occipital areas [illegible] than the anterior regions, [illegible] difficult to distinguish from [illegible] activity.

[illegible] provocation [illegible].

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	20	par-occ	76	P	1		9 c/s.sometimes fr.
Beta	17	5	gen	?70	Greater in occ.			
Theta	6.5	20	post-cent	65	Difficult to disting.from alpha.			
Delta								
"Choppy"								

Hyperventilation

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **Involutional melancholia (artificially induced)**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at [illegible]

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4876** (b) N.I.P.R. 259	**57**	**F**	**E**		**27.10.49**	**10.30 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **c.1929**

Admissions to Mental Hospitals: **14.10.1949**

Clinical History: **Depression commenced after gynaecological operation, which was followed by cessation of menses. Depression increased in severity after the death of her husband in 1944. Aggression and persecution ideas became prominent shortly before admission to Weskoppies. On admission to Weskoppies she was depressed with persecutory ideas.**

Course: The depression has become milder and persecutory ideas have left her.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. b. No. shocks and other particulars) **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle): **The E.E.G. was abnormal. There was a low voltage alpha rhythm at 8-9 sec of occipital origin, this being suppressed on the left.**

There was an abnormal focus over the left temporal lobe, where a sporadic discharge at 6 - 8 c/sec occurred, often associated with random sharp waves and near spikes.

There was also some underlying low voltage diffuse fast activity at 14 - 20 c/sec of a generalised nature.

Hyperventilation augmented the left-sided slow activity and evoked several focal spikes from the same region.

The abnormal focus indicates a source of irritation in the region of the left temporal lobe.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**8.5**	**13**	**par-occ**	**rare**	**M**	**0**		
Beta	**16**	**5**	**gen**	consid				
Theta	**6.5**	**15**	**gen.inbursts**	consid				Focal 6.8 c/s.
Delta								
"Choppy"								

Hyperventilation **Yes (AC.M-C).Low voltage alpha.Paroxysmal.Sharp waves and near spikes.**

Theta F.6-8, amp. increased to 35, left temporal.Some focal sharp waves over left temporal lobe,near spikes.Some actual random spikes - 40 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

NOTE: Some 8 c/s. discharge in left par.temp.in bursts mixed with 6 and 7 c/s.,30 microvolt waves. Abnormal focus.

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or TH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.H.7377	43	M	E		27.10.49	11.30a.m.	B.7,T.10.30
(b) N.I.P.R. 260							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1920

Admissions to Mental Hospitals: 31.1.1927, 12.2.1929, 12.3.1936, 10.5.1944, 17.8.1944 (current).

Clinical History:

Was not hospitalised in 1920 for his psychotic attack. At Weskoppies:- First admission: manic and depressive phases with intervals of relative normality. Second admission: predominantly depressed. Third admission: predominantly hypomanic. Fourth admission: manic. Current admission: manic on admission, latterly predominantly hypomanic but with brief depressive and normal phases.

State at Test:

Talkative, playful and aggressive by turns, mildly erotic.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal but flat.
There was a rare alpha rhythm at 8 - 10 c/sec. of very low voltage, often disturbed by generalised low voltage fast activity at 16 - 26 c/sec.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	5	per-occ	rare	M	0		
Beta	21	8	gen	med				
Theta								
Delta								
"Choppy"	Very flat record.							

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.7377** (b) N.I.P.R. **260.51**	**35**	**M**	**E**		**19.4.51**	**11 a.m.**	**B.7, T.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Restless, talkative, alternately aggressive and playful.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits showing a low voltage occipital alpha rhythm at 8 - 9 c/sec. blocking slightly and often disturbed by low voltage posterior theta rhythms at 5 - 7 c/sec. Occipital low voltage fast activity at 15 and 25 c/sec. was also present, the latter also occurring strongly in frontal regions.
Poor hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**8.5**	**20**	**occ**	**24**	**M**	**2**		
Beta	**20**	**15**	**occ**	**consid**				**25 c/sec. also frontal.**
Theta	**6**	**10**	**post**	**consid**				
Delta								
"Choppy"	**Rather low voltage alpha often disturbed by theta.**							

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - manic.

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.5987 (b) N.I.P.R. 261	78	M	E		20.7.49	12 noon	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Unknown.

Admissions to Mental Hospitals: 10.4.1937.

Clinical History:

No previous history available except that the admission documents show that he landed in goal for some offence and to have been euhporic and megalomanic there. At Weskoppies he has been restless, interfering, decorative, garrulous with flight of ideas, euphoric and megalomanic. Memory and orientation intact.

State at Test:

Euphoric, played the mouth organ, made a monacle of tinfoil, was restless and called himself Piet Retief, King of the Kaffirs.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal.

There was a low voltage persistent alpha rhythm at 10 - 11 c/sec. of parieto-occipital origin, this showing no blocking response. Occasional 20 - 22 c/sec. low voltage activity was associated with the alpha rhythm, this being at the second harmonic.

Poor hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	15.	par-occ	77	P			
Beta	21	7	par-occ	rare				assoc.with alpha often mixed
Theta								
Delta								
"Choppy"	Mixed alpha and beta.							

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - manic**

(b) Symbolic

Predominant Phase	State at Test
M	**M2**

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.S.5987** (b) N.I.P.R. **261.R1**	**30**	**M**	**E**		**19.4.51**	**2.30 p.m**	~~1~~ **1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Restless, decorative, euphoric and megalomanic.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with low voltage parieto-occipital alpha rhythm at 10 - 11 c/sec. showing little blocking response and often disturbed by low voltage occipital fast activity at 20 - 22 c/sec. Analysis revealed diffuse low voltage 5 c/sec. and 15 - 18 c/sec. also present.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	15	par[illegible]	70	P	1		
Beta	10.5	7.5	gen.	sought after				
Theta	5	5	diffuse	rare				Masked. 20-22 occ. Masked.
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - Circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**Ml**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4883** (b) N.I.P.R. **272**	**41**	**F**	**B**		**17.11.49**	**3.10 p.m.**	**12 noon**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1929**

Admissions to Mental Hospitals: **30.10.1949**

Clinical History: **At age 21 after birth of second child she had a psychotic attack. Current attack commenced 12 days before her admission to Weskoppies: she was restless, violent and slept poorly. On admission she was depressed. Since admission: predominantly elated but lapses into depression readily. Talkative when interviewed but selfabsorbed and inhibited in the ward.**

State at Test: **Talkative, euphoric, with midl flight of ideas.**

E.C.T. a. Interval preceding e.e.g.) **Nil**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal.

There was a regular alpha rhythm at 10 - 11 c/sec which blocked fully and arose occipitally, the rhythms sometimes being associated with harmonically related frequencies at 5 c/sec. Some low voltage beta at 14 - 16 c/sec was also seen occipitally.

Occasional frontal bursts at 8 - 9 c/sec of medium voltage was observed, these being slightly augmented by hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**45.5**	**fr.occ.**	**62**	**C**	**3**		**8,9 in runs rare.**
Beta	**14.5**	**5**	**occ**	**rare**				
Theta	**5**	**25**						**Rare alpha sub-harmonic always assoc. alpha and occ.**
Delta								
"Choppy"								

Hyperventilation **Alpha F.8, amp. 30 frontal.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania.**

(b) Symbolic

Predominant Phase	State at Test
M	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
+	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4896** (b) N.I.P.R. **322**	**56**	~~M~~ **F**	**E**	~~Th~~	**26.1.1950**	**9.30a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1927.**

Clinical History: **1931, 1933, 1942, 1945, 1948 and 12.1.1950 (current).**

In all her psychotic attacks she has been restless, talkative, and predominantly euphoric but at times angry, and with mild persecutory ideas.

State at Test:

Euphoric, talkative, paranoidal.

E.C.T. a. Interval preceding e.e.g. **1 year, 1 month, 23 days.**
b. No. shocks and other particulars **3 shocks from 1-3.12.48.**
9 shocks during Jan.1948, 5 in 1946.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality (probably abnormal in light of flicker responses), there being a rare, irregular alpha rhythm at 8 - 10 c/sec. of low voltage and occipital origin. The record was dominated by low voltage irregular fast activity at 16 - 18 and 20 - 24 c/sec, this often appearing in short outbursts. Rare 6 - 7 c/sec. post-central theta activity was also observed.

Hyperventilation = little change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9~~	~~15~~	~~occ~~	~~15~~				
Beta					M	?	1-2	
Theta	~~19.5~~	~~15~~	~~gen~~	~~50~~				**Often in bursts.**
Delta	~~6.5~~	~~15~~	~~post-cent~~	~~rare~~				
"Choppy"								

~~Irreg. low-voltage record. Paroxysmal mixed alpha, beta and thet~~
Hyperventilation Slow, fast, disorganised (AC.M-C).

Hyperventilation produces little change

Normality ~~Normal~~ Questionably Normal **?** Abnormal **(flicker response)**

DIAGNOSIS

(a) Verbal M.D.P. - circular.

(b) Symbolic

Predominant Phase	State at Test
M (D)	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race		E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.S.4901				RH		10.15a.m.	
(b) N.I.P.R. 323	58	F	E	LH	20.1.50		7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1948.

Admissions to Mental Hospitals: 7.12.1948.

Clinical History:

Onset of psychosis shortly before admission. At Weskoppies: Episodes of excitement in which she is restless, talkative and paranoidal and in which sudden alternations between elation and tearful depression occur. The former mood predominates.

In Mint explosion at Pretoria in 1945 - was unconscious but displayed no head injury.

State at Test:

Within normal limits. There is some emotional lability present but insufficient to rate as M1 - D1.

E.C.T. a. Interval preceding e.e.g. 11 months, 25 days.
b. No. shocks and other particulars 11 shocks from 3-31.1.1949.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits. There was a very rare irregular occipital alpha rhythm at 10 - 11 c/sec, this blocking normally. It was considerably disturbed by irregular low voltage generalised fast activity at 16 - 20 c/sec, and also occasionally by short low voltage bursts of generalised 6 - 7 c/sec. rhythms.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	15	occ	12	C	3		Irregular.
Beta	18	10	gen	7 50	Consid.irreg.l.v.f.activity.			
Theta	6.5	20	gen		Rare bursts.			
Delta								

"Choppy" Irregular record, due to mixture of alpha, beta and theta.

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS **M.D.P. - circular**

PSYCHOLOGICAL PATTERN at Test

(a) Verbal

(b) Symbolic

Predominant Phase (D)	State at Test

Mood	Motility	Psychic Tempo

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies 323 R.1	39	F	E		7.6.61	12 noon	b.f. 10.30
(b) N.I.P.R.							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals:

Clinical History:

State at Test: **Normal. Very slight emotional labality as before - within normal limits.**

E.S.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Murray-Scott) **was questionable due to excessive low voltage fast activity at 14 - 30 c/sec. this causing considerable irregularity in appearance. Rare low voltage alpha rhythms at 9 - 12 c/sec. were observed, also of an irregular nature, with 10 c/sec. dominant. Rare diffuse theta rhythms at 4 - 7 c/sec. were also present.**

Hyperventilation caused little change.

Disorganised fast type, frequencies into Davis range of "choppy" activity.

Summary of Features relevant for statistical purposes

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Resting								
Alpha	10.5 21.6	8 12	occ gen	rare consid		1	1	Very irregular. Some poss.muscle,but certainly not all aug.by eye closure (18-20
Beta								
Theta	6.5	8	diffuse	? 20				
Delta								
"Choppy"	Disorganised fast type, frequencies into Davis range of "choppy" activity.							

Hyperventilation

No change except perhaps slight increase in theta at 4 c/sec.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - Depressed

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or ~~RH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.S.4897 (b) N.I.P.R. 324	44	F	B		6.1.50	11.10a.m.	B.7.T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: ~~1949~~ 1949.

Admissions to Mental Hospitals: 17.1.1950.

Clinical History:

No previous attack. Double Halstead and thyroidectomy operation preceded mental illness.

On admission to Weskoppies was restless and agitated. Since admission has presented feeding difficulties, has exhibited psychomotor retardation, states that she is tired of life, that is why she took an overdose of sleeping tablets. Her expression is usually one of deep misery and she is at times mutistic.

State at Test:

Acutely depressed, very retarded and inaccessible, and questioning elicits only occasional unintelligible muttered replies.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to excessive low voltage generalised fast activity at 28 - 36 c/sec. Almost no alpha was apparent, but for one burst of ½ sec. duration during hyperventilation, this being at 10 c/sec. and occipital origin. No other changes occurred.

There was also considerable low voltage generalised slow activity at 4 - 5 c/sec, and rare low voltage generalised short bursts at 20 c/sec.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	? 10	V/V	occ	.01	M	? 0		
Beta	32	10	gen	75+				Also rare bursts of 20 c/sec.
Theta	4.5	10	cent & post-cent	25				
Delta								
"Choppy"	Low voltage predominantly fast record. Slow, fast, disorganised (Ac.M-c).							

Hyperventilation

Poor. No change, except half second run of l.v. occ. alpha 10 c/sec.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	**D2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4299** (b) N.I.P.R. **343**	**57**	**F**	**b**		**3.2.1950**	**10 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1942.**

Admissions to Mental Hospitals: **24.1.1950.**

Clinical History:

There was a slowly increasing depression for 8 years before admission to Weskoppies and towards the end delusions and auditory hallucinations were in evidence.

At Weskoppies she has been retarded and depressed and at times tearful.

State at Test:

Depressed, inhibited, hypochondriacal and apprehensive.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Little co-operation made a satisfactory recording difficult. The e.e.g. appeared to be normal, with a low voltage irregular alpha rhythm at 8-10 c/sec. of occipital origin, this often disturbed by underlying lower voltage generalised fast activity at 18-19 c/sec. Some 11-12 c/sec. activity of low voltage appeared on eye closure.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	20	occ	1	M	3		11-12 after eye closure
Beta	18.5	10	p.occ&gen	? 70				
Theta								
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality (**Apparently** Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. 344 F.E.2842	47	F	E	RH	9.2.1950	11.5a.m	B.7,T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1920

Clinical History: 25.6.1920, 2 others of which no particulars available, and 8.10.1951 (current).

Depressive and manic phases with intervals of relative normality, equally prominent.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. with low voltage occipital alpha rhythm at 8 - 10 c/sec. showing a normal blocking response.

Alpha activity augmented somewhat by hyperventilation. No other change.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	15	occ.	40	C	3		
Beta								
Theta								
Delta								
"Choppy"								
Hyperventilation								

Alpha par. occ. amp. increased from 15 to 20.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4494** (b) N.I.P.R. **345**	**62**	**F**	**E**		**9.2.50**	**11.35a.m.**	**B.7,L.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1919.**

Admissions to Mental Hospitals: **23.9.1943 and 11.10.1945 (current).**

Clinical History:

Details of attack at age 31 not available. During her two periods in the mental hospital she has been subject to depressive attacks which have been mild or moderately severe.

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to excessive low voltage generalised fast activity at 22 - 25 c/sec., this being present almost continuously.

Otherwise there was a medium-high voltage alpha rhythm at 10 - 11 c/sec. of occipital origin, this showing a normal blocking response.

Hyperventilation augmented the alpha activity only.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**40**	**occ**	**47**	**C**	**3**		
Beta	**23.5**	**15**	**gen**	**95**				**Very clear eyes open.**
Theta								
Delta								
"Choppy"								

Hyperventilation

Amp increased from 40 to 50 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4494** (b) N.I.P.R. **345.R1**	**63**	**F**	**E**	**12.4.61**		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.e.g. within normal limits, with a medium voltage occipital alpha rhythm at 10 - 11 c/sec blocking normally. Considerable low voltage diffuse fast activity at 15 and 22 - 25 c/sec. was also present, this being strong occipitally. Rare low voltage 7 c/sec. of a diffuse nature was also observed.

Hyperventilation caused some alpha augmentation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Amp	Location	%	Time	Type	Responsive 3V	Responsive M	Remarks
Alpha	10.5 / 10.25	40 / diffuse	(p) occ / diffuse	50 / consid					F.15 amp.12. F.22-25 amp.10, diffuse but strong occ.
Beta	19.25 / 7	diffuse / 5	diffuse	consid / rare					
Theta									
Delta									
"Choppy"									

Hyperventilation **Some Alpha augmentation.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	O

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4494**	**63**	**F**	**E**	**12.4.51**		
(b) N.I.P.R. **345.R1**						

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.e.g. within normal limits, with a medium voltage occipital alpha rhythm at 10 - 11 c/sec blocking normally. Considerable low voltage diffuse fast activity at 15 and 22 - 25 c/sec. was also present, this being strong occipitally. Rare low voltage 7 c/sec. of a diffuse nature was also observed.

Hyperventilation caused some alpha augmentation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Amp	Location	% Time	Type	Responsive 3V	Responsive M	Remarks
Alpha	10.5	40	(p) occ	55				
Beta	19.25	diffuse II	diffuse	consid				F.15 amp.12. F.22-25 amp.10, diffuse but strong occ.
Theta	7	5	diffuse	rare				
Delta								
"Choppy"								

Hyperventilation **Some Alpha augmentation.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - manic**

(b) Symbolic

Predominant Phase	State at Test
M	**M1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
◆	◆	◆

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.2815** (b) N.I.P.R. **365**	**75**	**F**	**E**		**23.2.50**	**10 a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1931 or before.**

Admissions to Mental Hospitals: **31.7.1931.**

Clinical History:

Continuously hypomanic since admission - garrulous, distractible, elated or irritible, interfering, mildly paranoidal.

State at Test:

As above.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal.
There was a regular medium-high voltage alpha rhythm of parieto-occipital origin at 10 - 11 c/sec, with rare 9 c/sec. activity appearing parieto-temporally. The alpha rhythms appeared strongly frontally. Blocking response was slight. There was considerable amplitude modulation. Hyperventilation = little change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Amp	Amp-fron-cen-tal	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	35	50	78	P			9 c/sec alpha amp.20, par-temp.very rare. 10,11 c/sec. amp.50, par-occ.78%. Alpha strong fr.& par.temp.- considerable beating.
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation **Percentage time alpha increased.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - manic

(b) Symbolic

Predominant Phase	State at Test
M	M1

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.2815 (b) N.I.P.R. 365 R.1	76	F	E		10.5.51		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative, over-active and euphoric.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g. with high voltage parieto-occipital alpha rhythm at 10 - 11 c/sec., with some 9 c/sec. also present. Low voltage occipital fast activity at 18 - 22 c/sec. detected.

Hyperventilation caused a short appearance of medium voltage parieto-temporo-occipital 6 c/sec. activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	70	par-occ	30	C	2		left beating after rt.
Beta	20	8	occ	7				10 c/s of par. origin
Theta								
Delta								
"Choppy"								

Hyperventilation

Poor. Par.temp.occ. runs of 20 microvolts 6 c/sec. activity disturbing alpha rhythms.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating

(b) Symbolic

Predominant Phase	State at Test
M (D)	Dl (Ml)

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
- +	-	- +

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3734 (b) N.I.P.R. 366	76	F	E	RH	23.2.50	11.15a.m	B.7, F.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Mild attacks over several years before that for which certified in 1930.

Admissions to Mental Hospitals: 1930, 1935, and current on 3. 6. 1937.

Clinical History:

During first admission at Weskoppies the mental picture was one of agitated depression.

During second admission it was one of hypomania with manic exacerbations in which she was delusional.

On the occasion of her third admission she was elated, talkative and voiced grandiose as well as persecutory delusions.

Since then she has been predominantly hypomanic and manic but occasional mild depression has been in evidence. Normal phases have occurred but have become less frequent with the passage of time and mixed phases have appeared.

State at Test:

Predominantly depressed and retarded. There are transitory episodes of talkativeness with silly laughter.

E.C.T. a. Interval preceding e.e.g. b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting E.E.G. was of questionable normality, there being a rare, low voltage irregular parieto-occipital alpha rhythm at 8 - 10 c/sec, this showing a partial blocking response. It was considerably disturbed by slightly lower voltage parieto-occipital faster activity at 12 - 15 c/sec, also by low voltage generalised fast rhythms at 17 - 18 c/sec, and occasional runs of parieto-occipital 6 - 7 c/sec activity, also of low voltage. Alpha frequencies often appeared strongest frontally.

Hyperventilation augmented the 8 - 10 c/sec rhythms considerably.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.4	10	fr,par,occ	35	C	2		9-10 frontal as well as occ. 12-13 slightly lower voltage.
Beta	16	7.5	gen	consid				
Theta	6.5	10	par-occ	rare				
Delta								
"Choppy"	Alpha low voltage disturbed irregular.							
Hyperventilation	Alpha fr. 8 and 9 only, amp.increased from 10 to 18, duration 2'.							

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.A.2864 (b) N.I.P.R. 387	60	F	B		25.2.50	11.5 a.m	8.7.27 to 10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1924
First: 10/ /1924. Current: 2.7.27.

Clinical History:

On admission: depressed and inhibited. During earlier part of her hospitalisation (second admission) she was hypochondriacal and complained of accusing and reproving voices. Episodes of agitation in which she has been violent and destructive have interrupted the dominant picture of retarded depression.

State at Test:

Retarded, inaccessible, depressed.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.
Report (A.C. Mundy-Castle)

The E.E.G. was normal, with a high voltage occipital alpha rhythm at 9 - 10 c/sec showing a normal blocking response. Underlying generalised medium-low voltage fast activity at 16 and 22 - 26 c/sec was also observed, this sometimes causing a slight disturbance of alpha purity. Hyperventilation caused no significant changes.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	70	(par)occ gen	65	c	3		
Beta	20	25		consid		1		Increased with eyes open beta at 22-26 amp.10 at 16 amp.20.
Theta								
Delta								
"Choppy"								

Hyperventilation Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - ~~XXXXXXXXXX~~ circular

(b) Symbolic

Predominant Phase	State at Test
D (M)	D2 M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	+

Registered No. (a) Weskoppies F.E.3631 (b) N.I.P.R. 369	Age	Sex	Race	RH or ~~RH~~	E.E.G. Date	E.E.G. Time	Time of last meal
	51	F	E		23.2.50	12.30p.m.	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA:

Onset: 1930.

Admissions to Mental Hospitals: 28.2.1938.

Clinical History:

Particulars of first attack in England 1930 not available.

At Weskoppies, depressed, retarded and inhibited for the greater period of her detention, but there have been occasional manic episodes during which she has been restless, noisy, destructive and resistive and has shown flight of ideas. Mixed phases also occur.

State at Test: Depressed and retarded but talks rapidly to herself.

Cardiazol treatment: (a) 7 years, 6 months, 6 days, before e.e.g.

(b) 20 treatments from 8.5.1942 to 17.7.1942.

~~E.C.T.: a. Interval preceding e.e.g.~~
~~b. No. shocks and other particulars~~

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits.

There was a very rare occipital alpha rhythm at 11-12 c/sec, this only appearing for a short period after eye closure at medium-low voltage.

One short burst of parieto-occipital medium-low voltage 16 - ~~18~~ 18 c/sec was also seen.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive M	V	M
Alpha	~~11.5~~ 17	~~25~~ 20	~~occ~~ occ -	one short burst.				
Beta								
Theta								
Delta								
"Choppy"								

Remarks: ~~but very~~ very rare - ? M - usually blocked

Responds only to eye closure.

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M D	M2 D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+	+

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.D.8221 (b) N.I.P.R. 398	58	M	A		23.3.56	9 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **About 1940.**

Admissions to Mental Hospitals: **One in Bloemfontein Mental Hospital, particulars unknown. 10.3.1956 (current).**

Clinical History:

For the past 10 years he has fluctuated between phases of excitement in which he becomes aggressive and of depression, the former being predominant. Seen by me 3 times in a month and once in a depressive phase at the Psychiatric Out-patients Department, Pretoria Hospital prior to admission at Weskoppies. At Weskoppies he has been restless, talkative, with flight of ideas, elated, self-opinionated and megalomanic but has also voiced hypochondriacal and persecutory ideas.

State at Test:

Garrulous, exalted, but with transient moments of depression and hypochondriasis.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, with a medium voltage occipital alpha rhythm at 8 - 10 c/sec. showing a normal blocking response. A certain degree of underlying generalised 16 - 20 c/sec. low voltage fast activity was also present, this often being harmonically related to the alpha rhythms. No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	30	occ	85	C	3		Sometimes in gen.burst
Beta	18	10	gen	rare				Often harmonically related to alpha.
Theta								
Delta								
"Choppy"								

Hyperventilation **Nil.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	**M2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.8220** (b) N.I.P.R. **389**	**40**	**M**	**E**		**23.3.50**	**9.45a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1949.**

Admissions to Mental Hospitals: **4.3.1950.**

Clinical History:

He was at Northfield Nursing Home during Aug.-Sept. 1949 in a manical state and then escaped.
At Weskoppies he has been restless, noisy, talkative, alternately aggressive and euphoric with rapidly changing grandiose ideas.
Trauma to region of left eye a year ago: this probably explains why the left pupil is smaller than the right and is irregular in outline.

State at Test:

Talkative, playful and aggressive by turns, and expresses grandiose ideas of protean content .

E.C.T. a. Interval preceding e.e.g. **Nil.**
b. No. shocks and other particulars **28 insulin comas at Northfield.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal, with a medium-high voltage parieto-occipital alpha rhythm at 10 c/sec. showing a normal blocking response. A very rare 11 c/sec. rhythm was also seen.
Otherwise there was some underlying generalised 22-24 c/sec. low voltage activity, this appearing clearer with eyes opened and greater frontally. Rare 30 c/sec. frontal rhythms were also seen.
Rare alpha variants at 5 c/sec. were seen occipitally.
Hyperventilation evoked 1 run of medium-low voltage frontal 4 c/sec. activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**45**	**(par)-occ**	**95**	**C**	**2**		
Beta	**26**	**15**	**gen.fmnt+**	consid				
Theta	**5**	**40**	**occ.left + short runs**		d.v.s.			
Delta								
"Choppy"								

Hyperventilation

Alpha F.10 av.amp. 50, frontal and occ.
Theta F. 4 av.amp. 20, frontal one run.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

Involutional melancholia

(a) Verbal

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or III	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies 400 **M.V.B.839**	60	M	E		23.3.1950	10.20a.m.	7 a.m.
(b) N.I.P.R.							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **About 1945.**

Admissions to Mental Hospitals: **28.6.1947, 28.7.1947 (voluntary boarder) and 28.12.1950 (voluntary boarder - current).**

Clinical History:

His mental picture has been one of fairly mild retarded depression with occasional exacerbations.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. **)Nil.**
b. No. shocks and other particulars **)**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal.
There was a medium-high voltage stable, regular alpha rhythm at 8 - 9 c/sec. of occipital origin showing a normal block.
Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	50	(p) occ	95	C	3	-	but rapid return due to vacant stare. V.regular alpha.
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **N.V.B.839** (b) N.I.P.R. **400.R1**	**61**	**M**	**E**		**XXX 15.3.51**	**4.15p.m**	**12 noon**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Mildly inhibited and complained feeling off-colour.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal showing a regular occipital alpha rhythm at 8 - 9 c/sec. blocking normally. Rare 4 c/sec. slow alpha variant rhythms were also observed. Hyperventilation : no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**8.5**	**50**	**occ**	**90**	**C**	**3**		**At times nearly monorhythmic with slight variations around 8 c/sec**
Beta								
Theta	**4**	**30**	**occ**	**rare**	**alpha V.s.**			
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.A.4910 (b) N.I.P.R. 407	37	F	A		30.3.50	9.45a.m.	7.0a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Late 1949.

Admissions to Mental Hospitals: 8.3.1950(current).

Clinical History:

There is a history of mild depressive episodes for some years. The present severe depression commenced 3 months prior to admission to Weskoppies. She attempted suicide four times during this period. Her ninth child was born on 16.12.1949.

At Weskoppies she has been tearful and profoundly depressed; has expressed ideas of sin and unworthiness and also persecutory ideas. There was one attempt at self-mutilation.

State at Test:

Depressed, inhibited and expresses delusions of depressed type.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal. There was a medium voltage occipital alpha rhythm at 10 - 12 c/sec. showing a normal blocking response and occasionally disturbed by low voltage 14 - 16 c/sec. occipital activity. Rare frontal rhythms at 8 c/sec. of low voltage were also seen.

Hyperventilation caused no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.25	32.5	fr.occ	49	C	3		fr - F.8,amp.10, occ.F.10,11,12, amp.40.
Beta	14.5	8	occ	rare				
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2 D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
- +	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.7436 (b) N.I.P.R. 420	55	M	E		6.4.50	9.15 a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1921

Admissions to Mental Hospitals: Several. First in 1921, current 8.1.1945. Particulars of other admissions not available.

Clinical History:

Throughout his psychotic history he has been subject to manic and depressed phases which merge into each other, and also mixed phases.

State at Test:

Fluctuates between being subdued and sad on the one hand and euphoric, erotic and megalomanic on the other. (On trip over, talkative, noisy and shouting at passers-by.

E.C.T. a. Interval preceding e.e.g. 4 years, 11 months, 20 days.
b. No. shocks and other particulars 10 shocks from 4.5.1945 to 16.5.1945.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was presumably, though doubtfully, normal, in view of the lack of any true alpha activity. The E.E.G. was flat, with low voltage 19 - 21 c/sec. occipital activity apparent on increased amplification together with rhythms at 13 - 14 c/sec. appearing occipitally with eyes opened. Closure evoked low voltage responses at 4 - 26 F/S, with considerable 2nd and 3rd harmonic activity apparent.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	13	20	occ	-	M			No true alpha apparent
Beta	17	12	occ	40			3	Rare 8 c/s.gen.burst
Theta								13-14 c/s.occur only with eyes
Delta								open.
"Choppy"	Flat.	Lack of true alpha activity.						

Hyperventilation

No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal

(b) Symbolic M.D.P. - circular

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ −	+	+

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. M.E.7436 420 R1	56	M	E		19.4.51	9.30 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals:

Clinical History:

State at Test:

Abrupt changes from marked mania to marked depression. He is decorative and talkative and in the manic periods is exalted, playful, and aggressive by turns (e.g. claiming to be Jesus Christ and later telling what he intends doing to Jesus Christ, while in depressive periods he weeps copiously, expresses ideas of sin and unworthiness and handcuffs himself.

E.C.T. a. Interval preceding e.e.g. Nil.
b. No. shocks and other particulars,

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to excessive generalised fast activity at 14 - 30 c/s of medium low voltage, this sometimes appearing in burst form. Little alpha activity was seen, some 10 c/sec of low voltage occipitally, and a rare medium voltage frontal rhythm at 9 c/sec. Hyperventilation augmented the fast activity in addition to a low voltage alpha spectrum at 9 - 12 c/sec. Rare low voltage diffuse 5 - 7 c/sec activity was seen.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.3	45	fr, occ.	rare	M			
Beta	22	20	gen. ~~scat bursts~~ exc.					2 - 12-18 blocked by v.s.
Theta	6	10	diffuse	rare				
Delta								
"Choppy"								

Hyperventilation

Alpha F.9-12, amp.10, occ. Beta 14-30, amp.25, generalised.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - circular.**

(b) Symbolic

Predominant Phase	State at Test
D (M)	D2 M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
- +	-	-

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4751** (b) N.I.P.R. **424**	**57**	**F**	**E**		**13.4.60**	**10a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1932.**

Admissions to Mental Hospitals: **1932, 23.6.1948 (current).**

Clinical History:

In addition to symptomsia evidence during her periods of ~~mxxtion~~ detention at Weskoppies there have been suicidal attempts, she is alleged to have become depressed quite suddenly 48 hours before her current admission to Weskoppies. Since then has been predominantly depressed, inhibited, voicing delusions of depressed type, butthere have been transitions to mixed phases in which her mood fluctuates rapidly between elation and depression.

State at Test:

(In view of possible neurological condition suggested by e.e.g. flicker response, a comprehensive neurological examination was conducted on 27.5.1950 but with negative results).

Depressed, inhibited and delusional, but occasbnal unexpected laughter.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting E.E.G. was normal, showing a medium voltage regular monorhythmic parieto-occipital alpha component at 10 c/sec. with occasional slight frequency variation of 0.5 cycles. There was a full blocking response. Hyperventilation revealed no change.

Subsequent spatialanalaysis of the resting E.E.G revealed the existence of low voltage fast rhythms at 30 - 32 c/sec. arising from the frontal and prefrontal regions, and although these could be due to muscle artifact, this seems unlikely in view of the flicker response. The possibility of a basal abnormality should be considered in view of the specific frontal and prefrontal projection of evoked spike activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10**	**30**	**par-occ**	**60**	**C**	**3**		**Prob.monorhythmic**
Beta	**31**	**10**	**pre-front**	**rare**				
Theta								
Delta								
"Choppy"	**Epileptic.**		**Flicker evoked paroxysmal prolonged epileptic spiked outbursts.**					

Hyperventilation

No change.

Normality Normal **(Resting).** ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular.**

(b) Symbolic

Predominant Phase	State at Test
D (M)	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.H.4761 (b) N.I.P.R. 424 Rl.	58	F	H		12.4.51		

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Mildly elated and talkative.

E.E.G. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting e.e.g. was normal, although a frontal rhythm at 10-11 c/sec.corresponding to the occipital alpha frequencies was unusual. The latter were of medium voltage and blocked normally. The former blocking only slightly. Considerable low voltage diffuse fast activity at 14-20 c/sec.was also present.

Poor hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10.5	40	par-occ	48	C	2		Strong or exclusive ly frontal. Partially
Beta	16.75	10	par-occ	consid		2 Aug.by eye closure.		& occ.nearly fully blocked by v.s.
Theta								
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - alternating.

(b) Symbolic

Predominant Phase	State at Test
D (M)	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.2950 (b) N.I.P.R. 425	43	F	E	~~HH~~	13.4.50	11.50a.m.	~~B.7,T.10.30~~

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1932

21.8.1932

Clinical History:

Admitted to Weskoppies with history of two weeks of marked depression with resistiveness and faultiness of habits.

Course: manic and depressive phases with intervals of relative normality, the depressive phases being more intense and prolonged.

Tumor of head - developed after onset of mental illness.

State at Test:

Expression sad. She is inhibited and rather uncommunicative.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to excessive medium-low voltage fast activity at 14 - 16 c/sec. of occipital origin, and evidently related to the alpha rhythm at 12 - 13 c/sec., of similar waveform, voltage and origin.
All blocked partially to visual stimuli.

Hyperventilation evoked no significant changes.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	12.5	25	occ	? 20	C		2) Often extending frontally	
Beta	15	25	occ	60			2) slightly.	
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular.**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~IH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.3103	66	F	E		13.4.50	11.20a.m	B.7,T.10.30
(b) N.I.P.R. 426							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: ~~1930~~ 1933.

Admissions to Mental Hospitals:

Admitted Weskoppies 27.8.1933

Clinical History:

She has depressed phases in which she is tearful, agitated, hypochondriacal and resistive and in which she has on occasion expressed ideas of unworthiness. Very often emotional lability is in evidence during predominantly depressed phases, when she becomes euphoric, over-sociable, and interfering, with a tendency to laugh frequently. Purely manic phases of similar content have dominated the mental picture during the latter part of her detantion at Weskoppies. She is blind.

State at Test:

Restless, over-friendly, over-affectionate and erotic.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was of questionable normality, there being little evidence of any alpha activity other than rare appearances of a low voltage irregular 8 c/sec. rhythm of occipital origin, ~~and~~ the main rhythma being at 5 - 7 c/sec. of parieto-occipital origin, and also of low voltage and ill-defined form. Some low voltage frontal activity at 14 - 16 c/sec. was also often seen.

Hyperventilation was impossible.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8	10	occ	v.rare	M			? alpha.
Beta	16	10	frontal	consid				
Theta	6	10	par-occ	med				
Delta								
"Choppy"	?	Low voltage. Irregular.			Poor alpha.			

Hyperventilation

Nil.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

Diagnosis

(a) Verbal M.D.F. - circular

(b) Symbolic

Predominant Phase	State at Test.
M (D)	U

PSYCHOLOGICAL PATTERN AND ...

Mood	Motility	Psychic Temp...
O	U	U

REGISTERED NO. a. Weskoppies b. N.I.P.R.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time.	Time of last meal.
F.E.3103 426 R.1	67	F	E		7.6.61	10 a.m.	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Within normal limits. Calm, not talkative, slightly affectionate and erotic but not to an extent warranting assessment as Ml.

E.C.T. a. Interval preceding e.e.g. } Nil.
b. No. shocks and other particulars. }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle). The e.e.g. was abnormal due to excessive diffuse medium voltage theta activity at 6-7 c/sec, this largely masking the complex alpha activity at 8-10 and 11 c/sec. (low voltage). Considerable low voltage fast diffuse activity at 14-17 c/sec. added further to the general picture of irregular disorganisation. Rare appearances of 4 c/sec. activity were also apparent.

Hyperventilation produced little change.

Summary of Features relevant for statistical purposes.

Resting.

	Frequency	Av. Amp.	location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	10	occ	rare				
Beta	19.7	10	diffuse	consid		2c dominant		
Theta	5.6	30	diffuse - central	origin consid. - excessive strong frontally.				
"Chop-py".	Yes: slow and fast		type plus	poor alpha.				

Hyperventilation.

Little change, possibly more thets.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal.

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.B.8229	66	M	A		27.4.50	9.55 a.m.	7 a.m.
(b) N.I.P.R. 444							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Some years before admission to Weskoppies in 1950.

Admissions to Mental Hospitals: 6. 4. 1950

Clinical History: Depression became severe 3 months prior to admission to Weskoppies, and during this time she made 3 suicidal attempts. At Weskoppies, he has been a state of intense retarded depression and has given evidence of delusions of depressed type.
(E.C.T. administered after E.E.G. resulted in complete recovery).

State at Test:

Depressed, retarded and speaks of suicide.

E.C.T. a. Interval preceding E.E.G. } Nil.
b. No. shocks and other particulars }

B. E.E.G. DATA,
Report (A.C. Mundy-Castle)

The E.E.G. was within normal limits. There was a low voltage occipital alpha rhythm at 8 - 10 c/sec. showing a normal blocking response. Rare 7 c/sec. low voltage rhythms were also seen disturbing the alpha, whilst rare short runs of frontal low voltage 6 c/sec. activity were observed. % time alpha = 52.
Hyperventilation augmented rhythms at 7 - 10 c/sec. slightly.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	10	occ	52	C	2		Poorly defined.
Beta								
Theta	6.5	10	fr.occ	rare				Disturbers of alpha, very rare, short.
Delta								
"Choppy"								

Hyperventilation

Rhythms at 7 and 10 augmented slightly.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	C

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
C	C	C

Registered No.	Age	Sex	Race	Now RH born	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.T. 41 (b) N.I.P.R. 445	30	F	E	LH	27.4.50	10.30a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: Mild symptoms over past few years. First severe symptoms Oct. 1949.

Admissions to Mental Hospitals:

22. 4. 1950.

Clinical History:

History from patient and her husband indicates that over the past few years there have been mild depressive episodes lasting a few days only. During October, 1949, she became more severely depressed and on 14. 4. 1950 was admitted to Voortrekkerhoogte Military Hospital in a state of acute depression. At interviews with me on 14th and 21st April she wept and spoke in a whisper. It was reported that she refused nourishment. Admitted to Weskoppies on 22. 4. 1950 and on the 24th she commenced to improve rapidly and on 26th was normally cheerful.

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g.) Nil.
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal EEG. with a medium voltage parieto-occipital alpha rhythm at 9 - 10.5 c/sec. showing a full blocking response. Rare low voltage occipital 16 c/sec. activity was sometimes seen underlying the alpha rhythms.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.8	35	(par)occ	73	C	3		
Beta	16	10	occ	rare.	Underlying alpha.			
Theta								
Delta								
"Chopp"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **Involutional melancholia**

(b) Symbolic

Predominant Phase	State at Test
D	D?

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	-	-

Registered No.	Age	Sex	Race	RH or ~~IH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4956 (b) N.I.P.R. 455	54	F	E		4.5.50	10.5 a.m	7 a.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **January, 1950.**
3.5.1950

Clinical History:

Suicidal attempt before admission.
At Weskoppies acutely depressed and so inhibited as to be almost inaccessible.

State at Test:

Slightly more accessible than usual.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting EEG. was within normal limits, showing a low voltage occipital alpha rhythm at 9 - 10 c/sec., with only partial blocking response. It was disturbed by occipital lower voltage 18 - 20 c/sec. activity, and occasional runs at 12 - 14 c/sec. Very low voltage generalised 28 c/sec. activity was also sometimes apparent.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~2.5~~	~~16~~	~~occ~~	~~63~~	~~P~~	1		
Beta	~~16~~ 20	~~6~~ 6	occ,gen	med				12-14 c/sec.,amp.8, 18-20 c/sec. amp.5, both occ. 28 c/sec. amp.5 gen.,~~rarely~~ rarely apparent ~~masked by alpha~~.
Theta								
Delta								
"Choppy"								

Hyperventilation **Low voltage record. Mixture of alpha and beta.**

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test
M	**Ml**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **FVB.135** (b) N.I.P.R. **486**	**50**	**F**	**E**		**3.5.50**	**11.10a.m.**	**B.7,L.10.30.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1909.**

Admissions to Mental Hospitals: **6.11.1911, 3.1.1914, 20.6.1917 and 3.5.1931 (current).**

Clinical History:

The history of her mental illness has been one of recurrent attacks of mania of hypomania. Symptoms: restless, noisy, erotic, euphoric, decorative, talkative with flight of ideas, and mildly grandiose notions.

State at Test:

Talkative, somewhat hilarious, boastful and exhibiting mild flight of ideas.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle) **The e.e.g. was abnormal due to recurrent generalised runs of medium voltage theta activity at 4 - 7 c/sec with 5 - 6 c/sec. rhythms predominant. These were usually considerably greater on the right, particularly the parietal area.**

The alpha rhythms were at 9 - 11 c/sec, medium voltage and of occipital origin. They showed little blocking response, and were clearer on the left due to contralateral theta masking effect.

Hyperventilation augmented theta activity. There would appear to be the possibility of a somewhat diffuse or deep right-sided disturbance.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**30**	**occ**	**35**	**P**	**1**		**often masked by theta on right.**
Beta								
Theta	**5.5**	**35**	**gen. sup.d.r.par.**	**20**				
Delta								
"Choppy"								

Hyperventilation **Paroxysmal slow activity.**

More theta at 50 microvolts.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - recurrent mania

(b) Symbolic

Predominant Phase	State at Test
M	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~IH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies N.E.8239 (b) N.I.P.R. 467	64	M	E		11.6.50	2.20 p.m	~~1~~ noon

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1947

Observation case 25.12.47. Reclassified as ordinary case 13.2.1948. Current admission 3.5.1950.

Clinical History:

During the earlier part of his first and throughout the current period of detention - restless, talkative with flight of ideas, exalted and voiced delusions chiefly of a grandiose but also of a persecutory type.

State at Test:

Over-active, talkative, euphoric and expressing grandiose delusions chiefly with a religious colouring.

E.C.T. a. Interval preceding e.e.g. : 2 years, 1 month.
b. No. shocks and other particulars : 6 shocks, Feb. 1948,
5 shocks, April 1948.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle): The E.E.G. was of questionable normality due to the repeated appearance of recurrent runs of generalised medium-high voltage delta and theta activity at 1.5 - 6 c/sec, the delta sometimes greater frontally. These bursts were very similar to slee, waves, hence questionable rather than abnormal classification. Patient denied sleep or sleepiness. The runs never appeared with eyes open. The alpha rhythm was of medium-high voltage at 8-9 c/sec., showing a somewhat unusual response to eye opening in that activity at 9-11 c/sec. of lower voltage was invariably present, also from the parieto-occipital areas. There was thus only a partial blocking response. No changes occurred with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9.3~~	~~33.8~~	par-occ	78	P	1		
Beta								
Theta								
Delta	~~5~~	~~20~~	par-occ	med	Assoc.with 8			
"Choppy"	~~2~~	~~50~~	~~gen.front~~*		2) Runs.Appeared with eye.			

Hyperventilation: No change. closure.

Normality: ~~Normal~~ Questionably Normal ~~Abnormal~~

* Alpha at 9-11 c/sec., amp.15-20, par.occ., with eyes open. Alpha at 8-9 c/sec., amp.50, par.occ. constituted the normal alpha rhythm. Alpha diminished but quickened during eyes open.

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.B.4861 (b) N.I.P.R. 495	54	F	A		25.6.50	11.30a.m.	~~2.7.1.10.30~~

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: Before 1947

Clinical History: 11.1.1947, 10.8.1948, 13.7.1949 current).

During first two admissions predominantly maniacal. One mixed phase recorded.

Current admission: acutely maniacal on admission but later predominantly depressed. Usually no intervals of normality between manic and depressed phases.

State at Test:

Within normal limits - perhaps slightly subdued and inhibited but not sufficiently so to classify as D1.

E.C.T. a. Interval preceding e.e.g. 9 days.

b. No. shocks and other particulars Last course 12-16.6.1950 - 4 shocks. 20 shocks earlier in 1950, 21 in 1949, 3 in 1948 and 5 in 1947.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal. There was an irregular occipital alpha rhythm at 8 - 10 c/sec of medium-low voltage, this disturbed by considerable occipital 7 c/sec activity, and numerous diffuse and irregular bursts at 4 - 6 c/sec of relatively high voltage. Blocking response was normal.

Hyperventilation augmented the 4 - 7 c/sec activity, together with several generalised irregular 2 - 3 c/sec high voltage bursts.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	20	occ	35	C	2		
Beta								
Theta	6	32.5	occ	consid		0		F.4,5 & 6, amp.45, runs. 7 lower amp. 20.
Delta								
"Choppy"	Irregular.							

Hyperventilation

Poor. Theta 4-7, amp.50, diffuse and irregular. Delta 2-3, amp.70, recurrent.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
D M	M

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
◆	◆	◆

Registered No.		Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies	F.E.1722	23	F	E		11.6.30	12.10p.m.	8.7.7.10.30
(b) N.I.P.R.	496							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1922.

Admissions to Mental Hospitals:

24.10.1928.

Clinical History:

Admitted to Weskoppies at age 26 with a history of 2 months' mental illness. On admission, depressed and agitated Since then there have been manic, depressed and mixed phases, usually running into each other but occasionally separated by brief phases of relative normality.

Slight secondary senile mental deterioration present.

Fractured base of skull 20.1.1930.

State at Test:

Talkative, euphoric, obstreperous and uncooperative with the test.

E.C.T. a. Interval preceding e.e.g. 8 months.

b. No. shocks and other particulars 3 shots from 7-12.12.1929.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was normal.

There was a medium low-voltage occipital alpha rhythm at 9 c/sec. with an occasional 10 c/sec. rhythm also apparent. These blocked fully to eye opening. No other rhythms were observed.

No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	30	occ	7	C	3		9 predominant. Eyes often ope
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

All.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal

M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
D (M)	Ml

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or Tr	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. F.H.2964 497	75	F	B		25.5.50	12.25 p.m.	7.7, 7.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admission several years prior to admission in 1932.

Clinical History: 1.4.1932

For some years prior to admission to Weskoppies episodes of excitement alternating with depression are reported. At Weskoppies the mental picture has been predominantly one of agitated depression with persecution delusions, interspersed with episodes of excitement with grandiose delusions. Physically there is contracture of the left hand.

State at Test:

Talkative, somewhat restless and intermittently rather noisy and abusive.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The resting E.E.G. was normal, but eyes were never closed - no activity was seen. The finding is therefore inconclusive. Patient most unco-operative.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha								
Beta								
Theta		NIL.						
Delta								
"Choppy"								

Hyperventilation ?

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

(Flicker response abnormal).

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
D (M)	**M2**

PSYCHOLOGICAL PATTERN AT E.E.G.

Mood	Motility	Psychic Temp.
+	+	+

REGISTERED NO.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time.	Time of last meal.
a. Weskoppies **F.E.2904** b. N.I.P.R. **497 R.1**	**76**	**F**	**E**		**7.6.51**	**9.30 a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Talkative, almost continuously noisy, delusional, very unco-operative and moving continuously.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars. }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle).

The e.e.g. was probably within normal limits although unco-operative behaviour and excessive movement obviated a comprehensive recording. Alpha appeared to be at 10-12 c/sec. and of low voltage, although eyes were open most of the time. Low voltage beta activity at 18-27 c/sec. was present but may have been muscular. Rare 5 c/sec. activity of low voltage was detected.

Summary of Features relevant for statistical purposes.

Resting.	Frequency	Av.Amp.	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**11**	**5**	**occ**	**v.rare**	**M**	**-**		**(but eyes open**
Beta	**? 22.5**	**5**	**diffuse**		**? muscle.**			**(most of time**
Theta	**5**	**10**	**?**					
"Chop-py".								

Hyperventilation.

Nil.

Normality { **Probably** Normal — Questionably Normal — Abnormal.

MS.

DIAGNOSIS

(a) Verbal **Involutional melancholia.**

(b) Symbolic

Predominant Phase	State at Test
D	D2

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Temp.
-	-	-

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.T.35 (b) N.I.P.R. 504	69	M	A		1.6.60	2.10p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1957.**

Clinical History: **23.6.1950.**

Becoming increasingly depressed over the 13 years preceding admission to Weskoppies. At Weskoppies he has been depressed, has slept poorly, has required coaxing with his meals and has made frequent references to the parlous state of his health (no objective basis) and impending death. He exaggerates his insomnia. He has shivering attacks, apparently of psychogenic nature, to harmonise with his hypochondriacal ideas. Memory and orientation intact.

State at Test:

Depressed, inhibited, with depressive delusions of similar content to that noted above.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.e.g. was questionable in view of the lack of any observed, measurable activity. Hyperventilation evoked no alteration.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha					**A**	**O**		
Beta								
Theta	**NO OBSERVABLE**				**MEASURABLE ACTIVITY**			
Delta								
"Choppy"								

Hyperventilation

NO OBSERVABLE MEASURABLE ACTIVITY

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal

(b) Symbolic M.D.P. - circular.

Predominant Phase	State at Test

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	-	-

Registered No. (a) Weskoppies 4930 (b) N.I.P.R. F.s. 505	Age 46	Sex F	Race C	RH or HH	E.E.G. Date 1.6.1950	E.E.G. Time 2.45p.m.	Time of last meal 1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1944.

Clinical History: 8.7.1944, 17.7.1946, 30.5.1950 (current).

History has been one of recurrent resistive stupor in which she refuses her meals and for the most part looks depressed and often becomes tearful, but on occasion giggles and smiles. The purely depressive state tends to pass into the next state without any interval.

State at Test:

Depressed and inaccessible, but with occasional smiling and giggling.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars) Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to excessive diffuse and occipital low voltage fast activity at 16-24 c/sec., some of this being superimposed on the rare, disturbed low voltage occipital alpha rhythms at 9 - 10 c/sec. in the form of a 1:2 ratio. Blocking of alpha was slight, but sufficient for identification in contradistinction to the other occipital activity at 11 - 13 c/sec., also of low voltage.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	11	S	occ	rare	M	1		F=9.5 if blocking criterion accepted
Beta	19.3	S	gen-occ	? 60		1 slight incr. with eyes open.		
Theta								
Delta								
"Choppy"								

Hyperventilation ? ?

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M (D)	M1 (D1)

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+ -	+ -	+

Registered No.		Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies	F.B.4936	30	F	E		15.6.50	9.50 a.m.	7 a.m.
(b) N.I.P.R. 522								

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1941
8.6.1950

Clinical History:

She states that at age 21 she was treated for meningitis at Charing Cross Hospital but the symptoms described suggest a manic attack. After that the history of severe mood swings between elation and depression. In one depressive episode she attempted suicide. Since admission to Weskoppies there has been marked instability of mood manifesting itself by rapid passage from elated through mixed to depressed stages, the manic episodes being somewhat more prominent

State at Test:

Elated, talkative with flight of ideas but with an episode of hypochondriacal prostration and during flicker momentary weeping

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } Nil.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was abnormal due to the occurrence of a single generalised larval spike-wave complex at ½ sec. and 150 mv. Otherwise there was a high voltage occipital alpha rhythm at 9-10 c/sec. blocking normally, associated with continuous low voltage fast alpha variant rhythms at 18-20 c/sec. and occasional slow alpha variants at 4.5 - 5 c/sec. of medium voltage. 1 burst of medium-high voltage generalised 3 c/sec. delta activity also occurred.

Hyperventilation = no change.
The record thus had a somewhat epileptic appearance.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	65	occ	85	C	3		
Beta	19	10	occ		∝ v.f. 1			
Theta	4.75	40	occ	rare	∝ v.s. 1			
Delta	3	60	gen - 1 burst only.					
"Choppy"	Epileptic: 1 larval, ½ sec. spike and wave occurred. Gen. 150 microvolts. Also paroxysmal features and alpha variants.							
Hyperventilation	No change.							

Normality Normal Questionably Normal Abnormal

DIAGNOSIS

(a) Verbal

(b) Symbolic **M.D.P. - circular.**

Predominant Phase	State at Test
M (D)	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
O	O	O

Registered No.	Age	Sex	Race	RH or RH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies (b) N.I.P.R. **F.E.4902 527**	**27**	**F**	~~Eth~~		**22.6.50**	**11.30a.m.**	**B.7,T.10.30**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1950.**

Clinical History: **13.2.1950.**

In an acutely maniacal state for two or three weeks before admission. On admission to Weskoppies was restless, noisy, resistive, destructive, alternately aggressive and erotic, talkative with flight of ideas.

Course: These symptoms maximum persisted but were interrupted by sudden swings into depression.

State at Test:

Within normal limits. Cheerful and slightly talkative but insufficiently so to classify as Hl.

E.C.T. a. Interval preceding e.e.g. **3 months, 5 days.**

b. No. shocks and other particulars **~~23 shocks from 24.2.1950 to~~ 17.3.1950.**

Course of 60 insulin comas(without seizures) completed 13.6.1950.

B. E.E.G. DATA.

Report. (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to excessive low voltage diffuse and occipital fast activity at 18 - 24 c/sec, this sometimes apparent in short generalised bursts.

There was a very rare low voltage complex alpha rhythm with frequencies at 9 p/s c/sec. No blocking response.

Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**8**	**occ**	**rare**	**M**			
Beta	**21**	**6.5**	**diffuse**	**50+**	**↑ alpha v.f.**			**18-20 predom.occ.Gen.bursts occ.occ.& par.**
Theta								
Delta								
"Choppy"	**Low voltage paroxysmal mixed alpha and beta. temp. amp.10.**							

Hyperventilation

No change.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	M2

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or JH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.S.8248 (b) N.I.P.R. 828	44	M	E		22.6.60	11.8am	8.7.1.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1950

Admissions to Mental Hospitals: 6.6.1950

Clinical History:

Before admission to Weskoppies: Restless, talkative with flight of ideas, megalomanic (planning to become first president of South Africa) and interfering. Period of depression is said to have interrupted this picture. Similar picture since admission. State a

State at Test:

As above.

E.C.T. a. Interval preceding e.e.g.) **Nil.**
b. No. shocks and other particulars)

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was normal, with a low voltage occipital alpha rhythm at 8 - 9 c/sec. blocking fully. No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V.	Responsive M	Remarks
Alpha	8.5	8	occ	80	C	3		
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D1

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or ~~TH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4760 (b) N.I.P.R. 642	59	F	E		13.7.50	12.5p.m.	B.7, T.10.30

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1934.

Admissions to Mental Hospitals: 7.10.1939, 27.10.1943(voluntary boarder), 6.3.1945, 1947 and 11.6.1948 (current).

Clinical History:

In her recurrent depressive attacks she has looked apprehensive, has wept and moaned, has rubbed her hands and shown other signs of emotion, has expressed hypochondriacal delusions (e.g. that her body feels broken) and has taken nourishment poorly.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. 1 year,11 months,24 days.
b. No. shocks and other particulars 6 shocks, 7-19.7.1948. Cardiazol treatment 1943.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was within normal limits. There was a medium voltage occipital alpha rhythm at 8 - 10 c/sec. blocking normally but slightly disturbed by generalised low voltage fast activity at 18 - 22 c/sec, this enhanced with eyes opened. Rare 7 c/sec. occipital rhythms were also seen.
Hyperventilation = no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	~~9~~	35	(p) occ	76	C	3		
Beta								
Theta	~~20~~	6	gen	? 50+				22 clearest eyes open.
Delta	~~6.5~~	25	occ	rare				
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4225** (b) N.I.P.R. **543**	**49**	**F**	**E**		**13.7.50**	**2.30 p.m**	**1 p.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1941.**

Admissions to Mental Hospitals: **Queenstown - 4.1.1941. Transferred to Weskoppies 4.8.1943.**

Clinical History:

Several manic, one depressed and one mixed phase recorded.

State at Test:

Normal.

E.C.T. a. Interval preceding e.e.g. : **7 days**

b. No. shocks and other particulars : **Last course 4-6/7/1950, 3 shocks. Several previous courses.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The E.E.G. was within normal limits, showing a medium-low voltage occipital alpha rhythm at 10 - 11 c/sec with occasional 9 c/sec activity also present. Blocking normal. The alpha rhythms were irregular due to underlying low voltage occipital fast activity at 14 - 16 c/sec and also rarely at 18 - 20 c/sec. Hyperventilation caused some augmentation of these fast rhythms.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10**	**35**	**occ**	**35**	**C**	**3**		**Irregular alpha, possibly due to interference by beta.**
Beta	**17**	**5**	**occ**	**? 10**				
Theta								
Delta								
"Choppy"								

Hyperventilation **? Irregular record vide remarks**

Beta rhythms at 18-20 and 14-16 c/s. augmented from 5 to 7 microvolts amplitude. Percentage time also increased.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - circular

(b) Symbolic

Predominant Phase	State at Test
M D	0

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
0	0	0

Registered No.	Age	Sex	Race	how RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8283 (b) N.I.P.R. 584	41	M	E	orig.	28.9.50	3.5. p.m.	12 noon

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1944.

23.2.1949, and 21.9.50 (current).

Clinical History:

Several psychotic episodes since the age of 35. was also at Tara Hospital between two admissions to Weskoppies. He has been subject to rapid transitions from mania to depression with mixed phases interspersed and after a long series of attacks has had normal phases lasting several months.

State at Test:

Within normal limits. Slightly garrulous and hypochondriacal but insufficiently so to classify him as M1 - D1.

E.C.T. a. Interval preceding e.e.g. 4 years, 5 days.

b. No. shocks and other particulars 5 shocks from 10-23.9.46.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal e.e.g, with a low voltage occipital alpha rhythm at 9 - 10 c/sec. blocking normally.
No change with hyperventilation.

Summary of Features relevant for statistical purposes

Resting	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9.5	18	occ	70	C	3		
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

No change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - alternating**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.8288** (b) N.I.P.R. **593**	50	M	E		12.10.50	3.30p.m.	1. p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1921.**

Admissions to Mental Hospitals: **1921, 1927, 1.10.1950 (current).**

Clinical History:

No details of 2 previous hospitalisations available except that he was depressed during one of them.
During current admission he has been garrulous, exalted, and over-active with flight of ideas.

State at Test:

Talkative with flight of ideas, and megalomanic.

E.C.T. a. Interval preceding e.c.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was abnormal due to occasional periods of domination by generalised medium voltage slow activity at 5 - 7 c/sec. An unusual fronto-parietal rhythm at 10 - 11 c/sec.of medium voltage was also often present, the true alpha frequency being at 9 - 11 c/sec. and of occipital origin, the rhythms being rare and of low voltage. Occasional diffuse/voltage 16 - 18 c/sec. rhythms were also seen. low
Poor hyperventilation = No change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	20	fr.par.occ	7	M	1		F.par, F.10-11, amp.30, occ.9-11, amp.10.
Beta	17	10	diffuse	med				
Theta	6	25	gen & occ	20				
Delta								
"Choppy"								

Hyperventilation

Poor. No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal [illegible] recurrent depression

(b) Symbolic

Predominant Phase	State at Test
"	"

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	'	-

Registered No.	Age	Sex	Race	RH or LH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies [illegible] (b) N.I.P.R. 641	34	F			26.4.49	1.1.pm	[illegible]

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: 1946

Admissions to Mental Hospitals: [illegible]

Clinical History:

[illegible] episodically depressed since 1946.
Hirsutism which affected the face and other exposed parts as well as other regions would appear to have acted as a psychogenic factor quite apart from indicating a possible endocrine aetiological factor.
At Weskoppies she was in a state of acute agitated depression, with ideas of sin, unworthiness, resistance and persecution.

State at Test:

As above.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars ; nil.

B. E.E.G. DATA.
Report (A.C. Mundy-Castle)

The record was within normal limits, there being a low voltage occipital alpha rhythm at 8 - 9 c/sec. blocking normally. Considerable low voltage diffuse theta activity at 5 - 6 c/sec. was also apparent, this clearest with eyes open. Poor hyperventilation : no change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	8.5	15	[illegible]	?	c	a	[illegible]	[illegible]
Beta								
Theta	5.c	5	diffuse	consid				Clearest with eyes open - Weske
Delta								
"Choppy"								

Hyperventilation

[illegible] change.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent depression

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.	Age	Sex	Race	RH or EH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.B.8290	47	M	A		26.10.50	12.35 pm	B.?, L.10.30
(b) N.I.P.R. 602							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1945
13.8.1945, 15.11.1946, 18.9.1947 and current 9.10.50.

Clinical History:

During all admissions in state of acute, stuporous depression. At time of current admission depressed, retarded, mute, answering questions only through the medium of writing by which he indicates the existence of delusions of persecution and unworthiness.

State at Test:

In state of depressive stupor but does give occasional brief scarcely audible replies.

E.C.T. a. Interval preceding e.e.g. 2 years, 10 months, 2 weeks.
b. No. shocks and other particulars 12.10.1947 - 2.12.1947, 11 shocks; 6.1.1947 - 20.1.1947, 7 shocks, 5.3.1946 - 20.3.1946 5 shocks.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

Normal E.E.G. with a medium voltage occipital alpha rhythm at 10 c/sec. blocking fully, also rare lower voltage 9 and 11 c/sec. occasionally apparent.

Rare parieto-temporal and occipital theta rhythms at 4 - 7 c/sec. of low voltage were also seen, these being augmented slightly by hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	10	40	occ	40	C	3		Greater left.
Beta								
Theta	6.25	15	occ. & p.temp.	rare				10 chiefly, others of low voltage
Delta								
"Choppy"								

Hyperventilation

Alpha amp. increased from 40 to 50. Theta F.5, amp. increased from 15 to 25, occipital, greater on left.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. recurrent depressive**

(b) Symbolic

Predominant Phase	State at Test
D	D3

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Temp
-	+	-

Registered No.	Age	Sex	Race	RH or [illegible]	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies M.E.8294 (b) N.I.P.R. 603	53	M	E	[illegible]	26.10.50	2.30 p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: **1941.**

Clinical History: **1941 and 18.10.1950(current). Another admission - date unknown.**

During psychotic attack treated in Bloemfontein Mental Hospital during 1944 he was in a state of acute agitated depression. During his second period of hospitalisation, for which no records are available, he is also said to have been agitated and depressed. During current admission, very depressed and agitated and almost inaccessible. He has been very resistive and has required a sedative (paraldehyde) at night, including the evening preceding e.e.g.

State at Test:

In a state of acute, agitated depression.

E.C.T. a. Interval preceding e.e.g.
b. No. shocks and other particulars } **Nil.**

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

E.E.G. normal with an occipital alpha rhythm at 8 - 10 c/sec. blocking normally. No other observable activity, but record marred by excessive muscle artifact.
No hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	9	20	occ		C	3		
Beta								
Theta								
Delta								
"Choppy"								

Hyperventilation

Nil.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal M.D.P. - recurrent manic

(b) Symbolic

Predominant Phase	State at Test
M	O

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
O	O	O

Registered No.	Age	Sex	Race	RH or	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies F.E.4817 (b) N.I.P.R. 608	23	F	E		2.11.50	2.30p.m.	1 p.m.

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset:

Admissions to Mental Hospitals: 1943.

Clinical History: 30.10.1943. Dec.1948 (transfer). 20.1.1949 (transfer). 27.3.1949 (transfer). Dec.1949 (transfer).

Her clinical history has been one of recurrent, fairly severe manic attacks.

State at Test:

Within normal limits. Somewhat excitable but insufficiently so to classify as Hl.

E.C.T. a. Interval preceding e.e.g. 1 year, 8 months, 9 days.
b. No. shocks and other particulars 5 shocks from 21-23/2/1949.

B. E.E.G. DATA.

Report (A.C. Mundy-Castle)

The e.e.g. was of questionable normality due to considerable low voltage occipital and diffuse theta activity at 4-6 c/sec. There was little alpha rhythm, this being at 12-13 c/sec. of very low voltage and showing no block. Low voltage occipital fast rhythms at 14-16 c/sec. were also present.

Hyperventilation caused some augmentation of alpha and beta activity.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive O	Responsive M	Remarks
Alpha	12.5 15	10	occ	v.rare med	M			
Beta	5	15	diffuse	consid				Sometimes in occ.runs 20 microvolts
Theta								
Delta								
"Choppy"								

Hyperventilation

Increased amount of alpha. Amplitude increased from 8 to 10. Average beta frequency increased from 15 to 17.

Normality ~~Normal~~ Questionably Normal ~~Abnormal~~

(a) Verbal **M.D.P. - recurrent mania**

(b) Symbolic

Predominant Phase	State at Test.
M	0

Mood	Motility	Psychic Tempo
0	0	0

REGISTERED NO. a. Weskoppies b. N.I.P.R.	Age	Sex	Race	RH or ~~BH~~	E.E.G. Date	E.E.G. Time.	Time of last meal.
F.2.4817 608.51	**24**	**MK F**	**E**		**21.6.51**	**11 a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: -

Admissions to Mental Hospitals: -

Clinical History: -

State at Test:

Within normal limits.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars. }

B. E.E.G. DATA.

Report (A.C. Mundy-Castle).

The e.e.g. was abnormal due to excessive medium-low voltage theta activity at 5 - 7 c/sec. of a diffuse nature, combined with considerable low voltage generalised fast activity at 14 - 26 c/sec. Rare alpha rhythms of very low voltage at 8 - 13 c/sec. were also present, dominant frequency possibly at 10 c/sec.

Hyperventilation caused no change.

The record is a perfect example of the slow and fast (B) disorganised type.

Summary of Features relevant for statistical purposes.

Resting.

	Frequency	Av. Amp.	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**5**		**v.rare**	**M**	**0**		
Beta	**20**	**8**	**gen**	**consid**		**1**		
Theta	**6**	**12**	**diffuse**	**excessive**				
"Chop-py".	**Perfect example of the slow and fast(B) disorganised type.**							

Hyperventilation.

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal.

DIAGNOSIS

(a) Verbal **M.D.P. - circular.**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M2**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or ~~LH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.T.51** (b) N.I.P.R. -	**43**	**F**	**E**		**30.3.51**	**9.40a.m**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1938.**

Admissions to Mental Hospitals: **19.3.1951 .**

Clinical History: **Two former attacks treated in Durban and Berlin. 10 days before current admission became very restless, excessively talkative with flight of ideas, and elated. It is reported that she did not sleep at all during the four nights preceding admission. At Weskoppies she remained in a similar state for three days, then had a short depressed phase, only to return to the original state.**

State at Test: **Fairly marked manic state as described above. Resistive and unco-operative at test. No ~~xxx~~ paraldehyde the night before the test but at 10.45 the night before that.**

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. ~~DATA~~ Report (A.C. Mundy-Castle) **(L. A. Hurst)**

This E.e.g. falls within normal limits. There is a moderately well developed alpha rhythm of standard location at a frequency of 10.5 c/sec. and beta activity of an average frequency of 24 c/sec. is generalised but better marked anteriorly - some of it of relatively high voltage. The record is much disturbed by artefact owing to the patient's resistiveness and she could not be induced to hyperventilate.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**25**	**per-occ**	**20**				
Beta	**24**	**15**	**gen**	**10**				
Theta								
Delta								
"Choppy"								

Hyperventilation **Unco-operative.**

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	**D2**

PSYCHOLOGICAL PATTERN at test

Mood	Motility	Psychic Tempo
-	+	-

Registered No.	Age	Sex	Race	RH or ~~HH~~	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **F.E.4993**	**42**	**F**	**E**		**14.3.51**	**9.45a.m**	**7 a.m.**
(b) N.I.P.R. **-**							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **Unknown. Some years ago.**

Admissions to Mental Hospitals: **6.3.1951.**

Clinical History:

Husband states that she has had previous attacks of depression during the past few years. Current attack of depression started three weeks before admission.
On admission she was acutely depressed and indulged in a jerking movement indicative of agitation.

State at Test:

Acutely depressed with agitation.

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report ~~(A.E. Maudsley Hospital)~~ **(L. A. HURST)**

This E.e.g. was abnormal due to the presence of theta and delpha activity in the right temporal parietal lead region. Alpha activity at 11 c/sec. wastully developed. There was some generalised fast activity of an average frequency of 24 c/sec.

Hyperventilation brought about no significant change.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**11**	**20**	**occ**	**15**				
Beta	**24**	**5**	**gen**	**3**				
Theta	**6**	**35**	**rt.partemp**	**2**				
Delta	**3**	**50**	**ditto**	**3**				
"Choppy"								

Hyperventilation

No change.

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

DIAGNOSIS

(a) Verbal **M.D.P. - recurrent depression**

(b) Symbolic

Predominant Phase	State at Test
D	**D1**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
-	-	-

Registered No.		Age	Sex	Race	RH or IH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies	**F.E.4998**	**32**	**F**	**E**		**4.4.51**	**10 a.m.**	**7 a.m.**
(b) N.I.P.R.	-							

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1940.**

Admissions to Mental Hospitals: **1.5.1940, 4.11.1950 and 19.3.1951 (current).**

Clinical History:

During all three admissions has presented a depressed picture. Prior to the current admission she is said to have been depressed, tormented about hell and to have made suicidal threats. Since admission she has been mildly depressed, inhibited and self-absorbed.

State at Test:

Mildly depressed and inhibited.

E.C.T. a. Interval preceding e.e.g. **5 months.**

b. No. shocks and other particulars **7 shocks from 19.10.50 to 4.11.1950.**

B. E.E.G. DATA.

Report (~~A.C. Murray-Castle~~) **(L. A. Hurst)**

This record is normal. A well-developed alpha rhythm (percentage time 75) at 9.5 c/sec. of occipital and parietal origin is present. There is intermittent generalised beta activity at 22 c/sec. well defined but of low voltage.

Hyperventilation results in marked augmentation of the amplitude of the beta rhythm and slight augmentation of the amplitude of the alpha rhythm.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**9.5**	**20**	**occ-par**	**75**				
Beta	**20**	**5**	**gen**	**10**				
Theta								
Delta								
"Choppy"								

Hyperventilation

Alpha rhythm is increased in amplitude to 25 microvolts. Beta rhythm is increased in amplitude to 15 microvolts.

Normality Normal ~~Questionably Normal~~ ~~Abnormal~~

DIAGNOSIS

(a) Verbal **M.D.P. - circular**

(b) Symbolic

Predominant Phase	State at Test
M (D)	**M**

PSYCHOLOGICAL PATTERN at Test

Mood	Motility	Psychic Tempo
+	+	+

Registered No.	Age	Sex	Race	RH or HH	E.E.G. Date	E.E.G. Time	Time of last meal
(a) Weskoppies **M.E.2348** (b) N.I.P.R.)	**60**	**M**	**E**	HH	**7.3.51**	**10.30a.m.**	**7 a.m.**

A. PSYCHIATRIC AND PSYCHOLOGICAL DATA.

Onset: **1941 or before.**

Admissions to Mental Hospitals: **27.7.1942, 24.10.1947 and 21.2.51 (current).**

Clinical History:

Was not hospitalised for first known attack in 1941. In 1942 he was in Valkenberg Hospital for about 2½ months: predominantly manic - over-active and delusional but with mild depressive episodes. Prior to his first admission to Weskoppies in Oct. 1947 he tried to burn the house down, threatened murder, exhibited flight of ideas, was delusional and experienced transitory hallucinations. He was discharged recovered ten days after admission. He became obviously psychotic again 2 months before the current admission: he was over-active, aggressive and delusional. At Weskoppies he has been talkative, restless and at times noisy. He has been predominantly exalted but there have been transitory depressive phases. He has fleeting grandiose delusions: one of them is that he was the Angel of Mons.

State at Test: **Over-active, talkative and delusional. Called one of the male nurses his dear brother.**

E.C.T. a. Interval preceding e.e.g. } **Nil.**
b. No. shocks and other particulars }

B. E.E.G. DATA.

Report (L. A. Hurst)

This E.e.g. is abnormal owing to the high incidence of slow activity in the theta and delta bands present in the temporal, parietal and occipital regions, more particularly the right occipito-parietal lead. The alpha rhythms at 9 and 12 c/sec. of usual origin are poorly developed an d there is some fairly clearly defined beta activity at 15 c/sec. There is no appreciable change in response to hyperventilation.

Summary of Features relevant for statistical purposes

Resting

	Frequency	Av. Amp	Location	% Time	Type	Responsive V	Responsive M	Remarks
Alpha	**10.5**	**20**	**occ/par**	**10**				
Beta	**15**	**10**	**gen**	**10**				
Theta	**6**	**35**	**)Temp-par-occ**	**50**				
Delta	**3**	**50**	**)esp.rt.**	**50**				
"Choppy"								

Hyperventilation **No change.**

Normality ~~Normal~~ ~~Questionably Normal~~ Abnormal

A P P E N D I X.

2. MANIC-DEPRESSIVE SLEEP RECORD AND LITERATURE.

Sleep Record of - 51 R.1. 6/4/1950:

(a) K complexes on stimulation - at 16-18 c/sec. long trains, 20 microvolts, blending into resting 20-26 c/sec. rhythms. Then awakened.

(b) During flicker, a gradual suppression of evoked responses, replaced by random, irregular slow waves of medium-low voltage, $\frac{1}{5}$ - $\frac{1}{2}$ sec. duration. Intermittent recurrences of evoked activity, especially after an auditory stimulus. These usually preceded by a slow wave ($\frac{1}{4}$ sec.) from parieto-temporal area, and mixed with K spindles at 18 c/sec. Some low voltage fundamental and second harmonics occasionally occurred during light sleep.

(c) Runs of 20 ,icrovolts occipital 5-6 c/sec. saw tooths, recurrent, irregular.

(d) Occasional $\frac{1}{2}$ sec. paroxysmal bursts, 40 microvolts, generalised. Good following occurred at low frequencies, with 15 c/sec. spindles occurring from parieto-temporal leads on auditory stimulation.

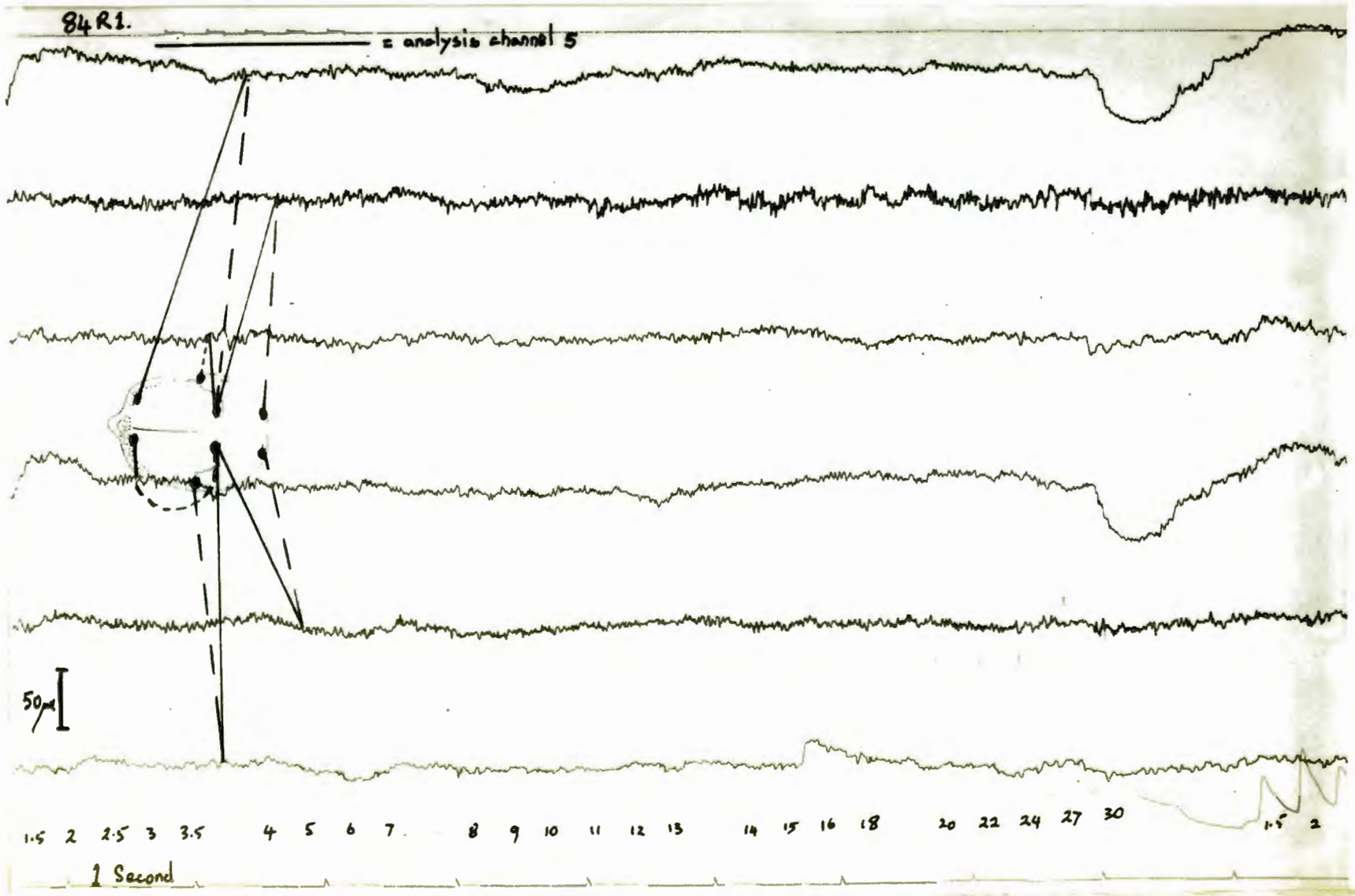
(e) No flicker - irregular delta waves at 2-4 c/sec., 30 microvolts - Awake. Amplitudes greater.

Rogelio Diaz-Guerrero, J. S. Gottlieb and J. R. Knott.
The Sleep of Patients with Manic-Depressive Psychosis, Depressive Type.

"The six subjects of this study each had manic-depressive psychosis, depressive type, each was under 40, none had had previous sedatives and none had been subjected to drastic therapy such as ECT. Each spent two successive nights in the experimental chamber. The electroencephalogram was run during both nights but recordings were taken only during the second. Records were analysed according to the following correlations: low voltage, dosing to very light sleep; spindles, moderate sleep; spindles plus random, deep sleep; random, deep sleep. The left occipital area EEG was analysed and compared to three sets of data obtained on normal controls. There was considerable variability among patients in actual duration of sleep, period elapsing between retiring and going to sleep, and in percentage of time spent in wakefulness and at any one particular level of sleep. A greater percentage of sleep of depressed patients was very light as compared to ~~xxx~~ controls; conversely, a smaller percentage of the patients' sleep was deep. The interval before onset of sleep was about twice as long for patients as for controls (41 and 26.3 min. respectively). When fluctuations of EEG pattern from minute to minute were analysed the patients showed a significantly higher incidence. The patients then not only had a greater proportion of light sleep but they also did not remain so constantly at any one level. Further indication of this was borne out by calculating per cent. of minutes during the night's sleep which showed two or more of the EEG sleep patterns. About half of the total minutes of sleep of patients showed at least two levels of electrocortical activity, in contrast to a quarter of total sleep of the controls showing similar fluctuations. A comparison of mean percentage of time each EEG sleep pattern appeared in sleep records shows that patients exhibited almost twice as much low voltage activity as the controls and about half as much spindles plus random (indicating deep sleep). These EEG findings imply a change in neurophysiological status of these patients from the normal."

A P P E N D I X.

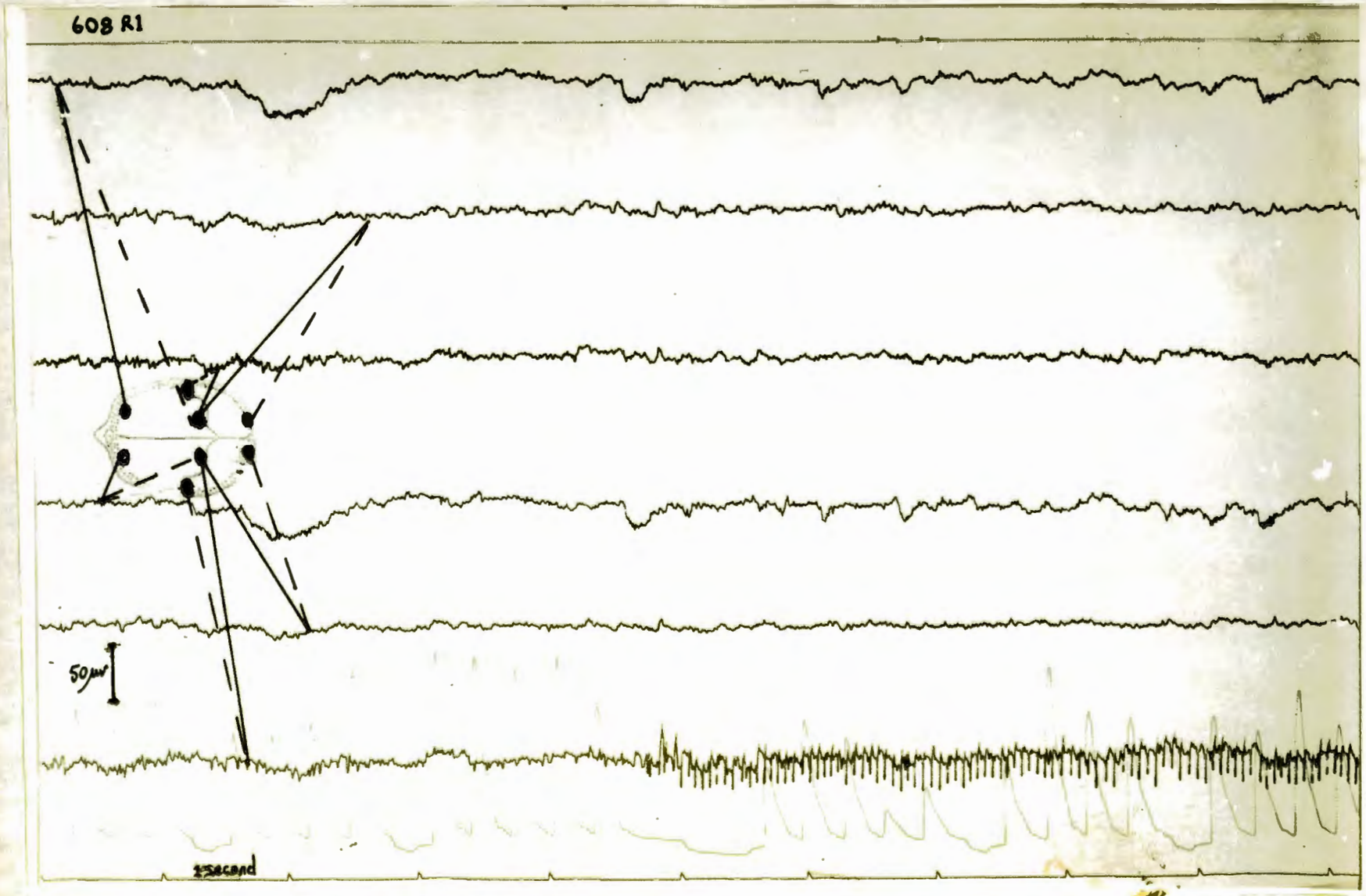
3. PHOTOSTATIC SAMPIES OF DISORGANISED E.E.G. RECORDS.



A T Y P E :

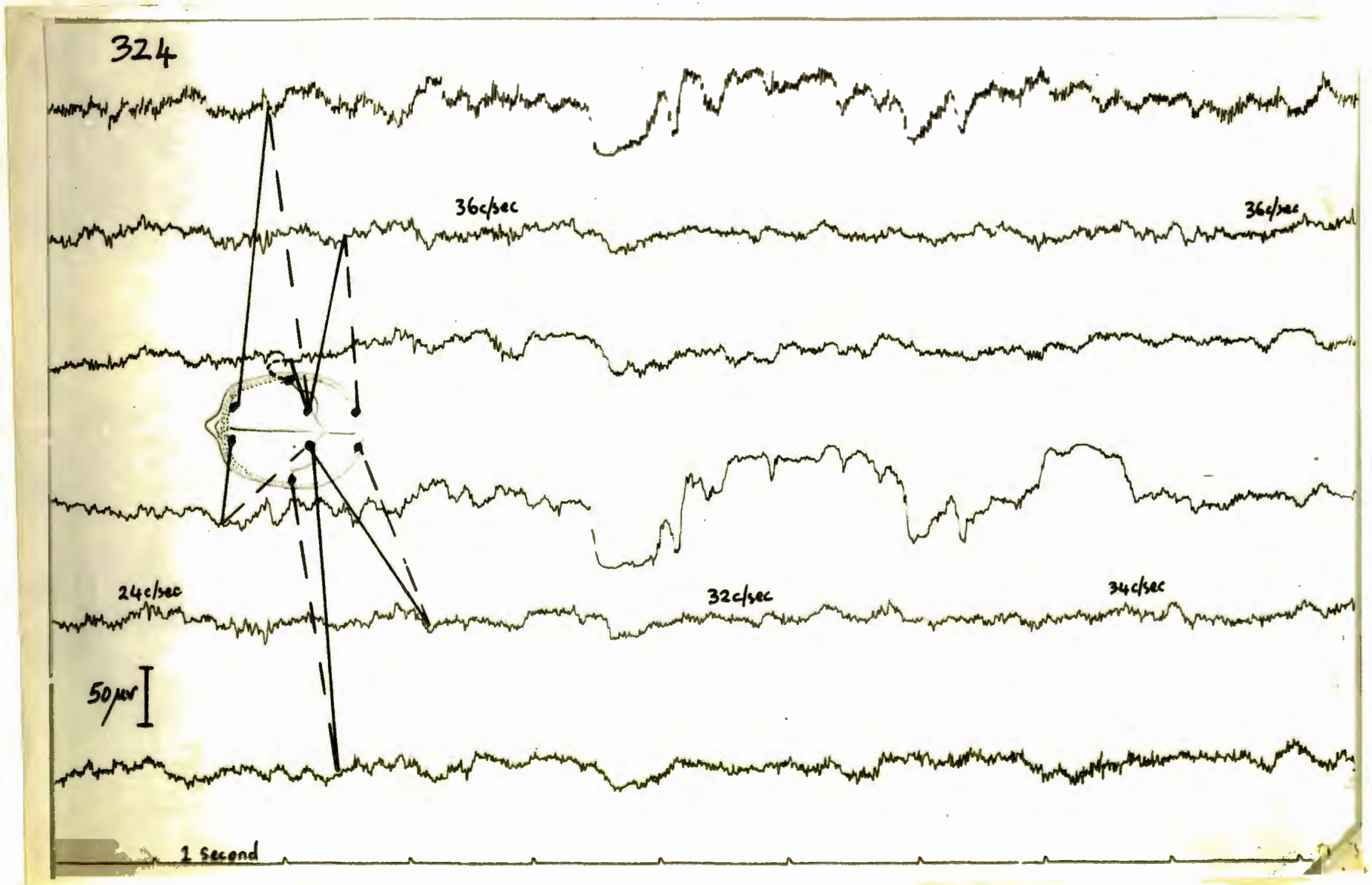
low voltage rare alpha activity, disturbed by relatively low voltage fast rhythms (14-30 c/sec.).

(NOTE: Components of frequency spectrum individually marked).

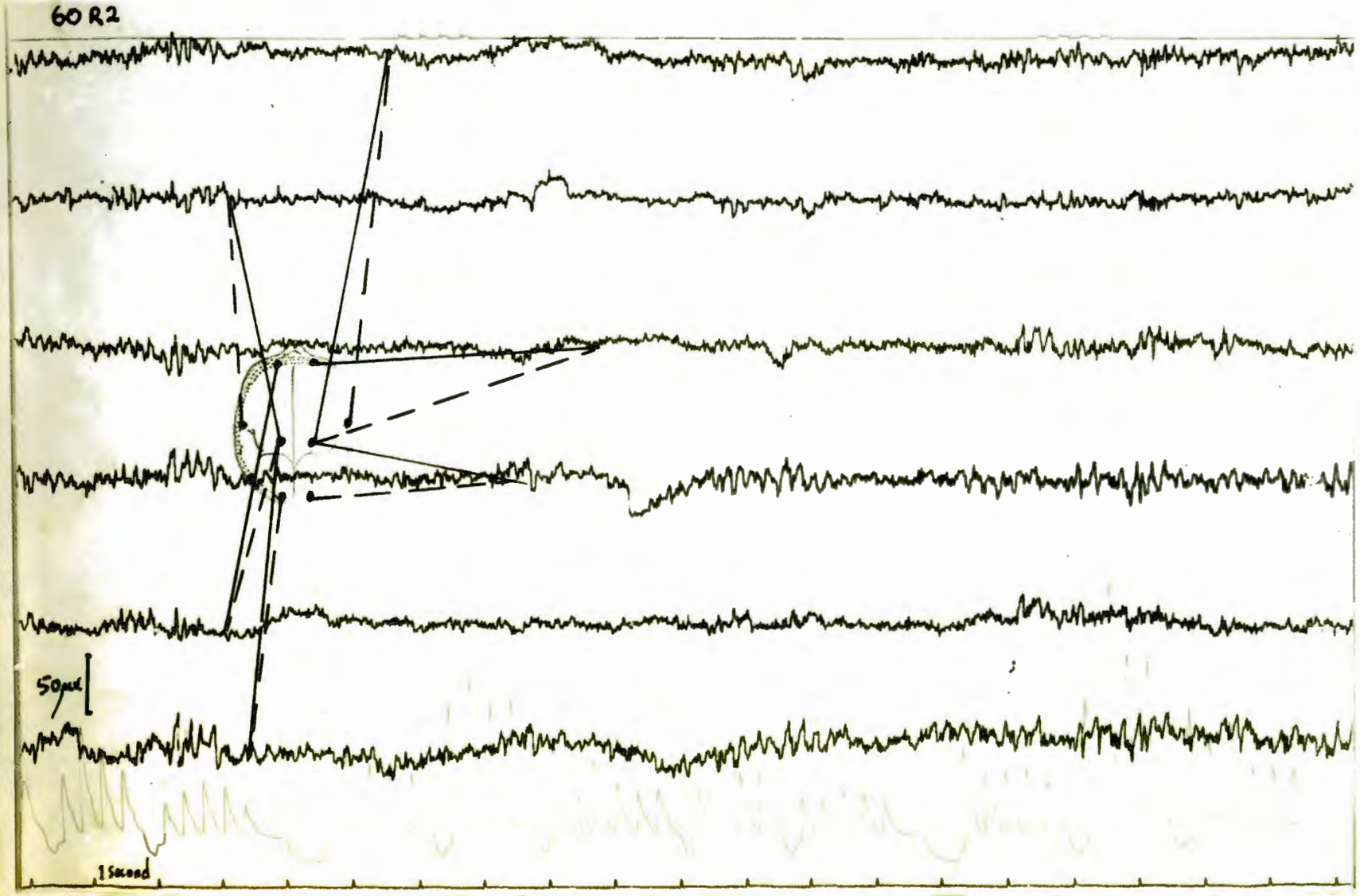


A TYPE:

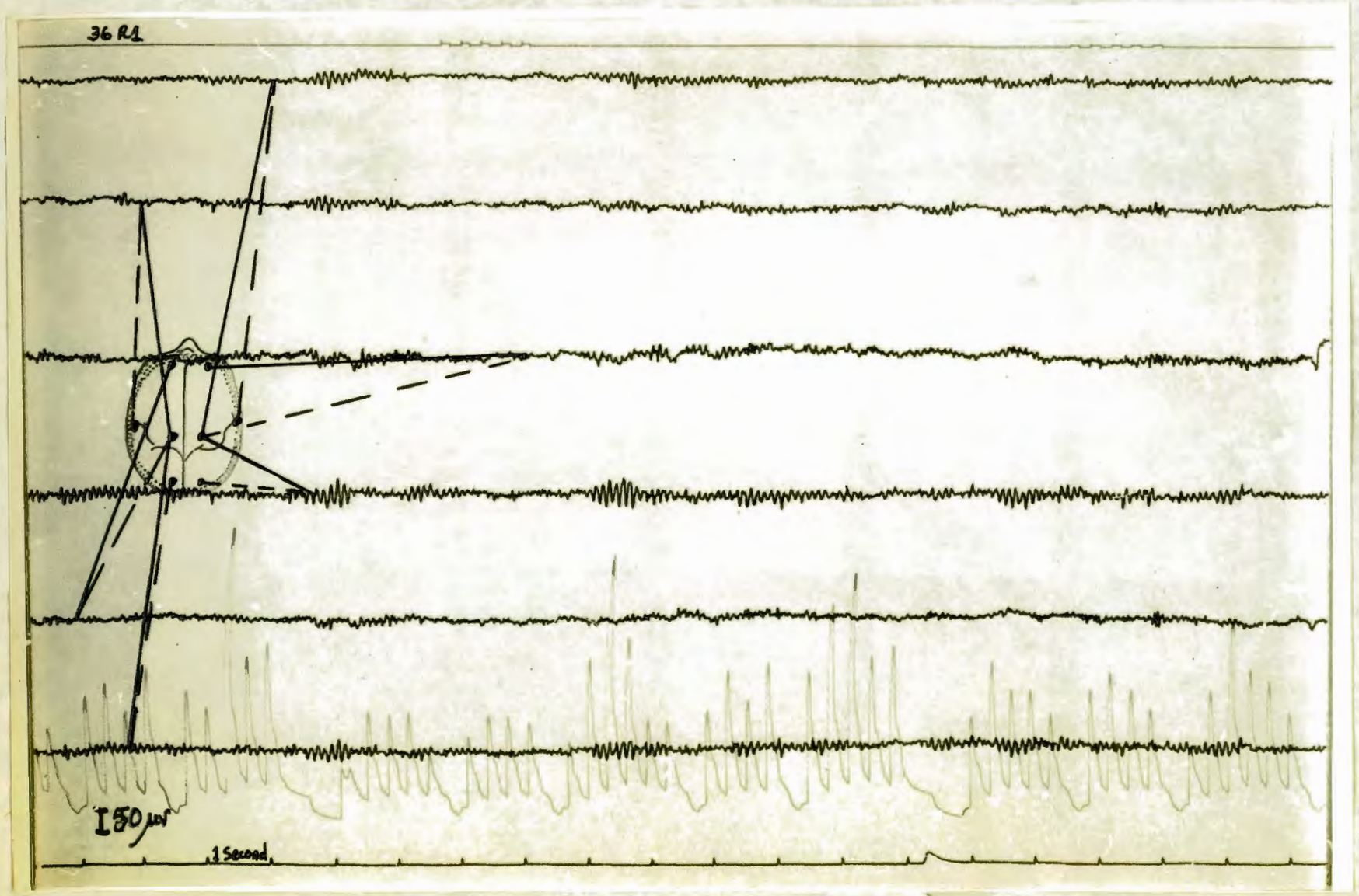
flat variant.



A TYPE : Davis variant - fast activity of predominantly higher frequency than in standard A type (over 30 c/sec.).



B TYPE : excessive diffuse theta activity of medium voltage combined with typical A type characteristics.



D TYPE : excessive fast activity but with a well developed alpha rhythm.