THE DETECTION OF PSYCHOLOGICAL VULNERABILITY IN STUDENTS

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PARNELL (1951) reported that 76 men undergraduates at Oxford had lost a full term's residence on account of psychological ill health in the period of three years from 1 January, 1947 to 31 December, 1949. Psychological ill health had caused 52·5 per cent. of all prolonged absence through illness, a fact which emphasized the need for more detailed study of the causes and possibility of prevention of psychological disturbance. As an indication of minimal current prevalence of such disturbance, it may be reported that 59 Oxford students in need of psychiatric help were referred by their general practitioners to the Warneford and Park Hospitals in twelve months from 1 April, 1953 to 31 March, 1954: these figures take no account of the numbers treated elsewhere; but the evidence as a whole shows that, as found in 1951, mental upset is still the most important cause of ill health in Oxford students.

Information derived from a comparison of somatotype, electroencephalographic, psychological and psychiatric findings upon patients and healthy controls is summarized in this paper. It shows that, despite a probable bias in the controls, significant differences can be detected between the two samples. Some of these differences were sufficiently marked to form the basis for a simple heuristic method of detecting vulnerability.

THE SAMPLES

Both patient and control series consisted of 100 Oxford students speaking English as their first language and between the ages of 18 and 28 when first seen. Both series were similarly examined by somatotype, electroencephalograph and a battery of four psychological tests of which two only are relevant to the present paper. Both series, moreover, were interviewed psychiatrically; the patients frequently and extensively; the controls on one occasion only for 50–80 minutes. As the patient series contained four Americans, only the first four American controls volunteering were included.

The 100 patients were referred consecutively by general practitioners to the

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Warneford Hospital for Mental Disorders, the Park Hospital for Functional Nervous Disorders or the Park Hospital Out-patient Department, and were either under treatment at the outset of the investigation in April, 1951, or were referred between then and April, 1954. Six were replaced by the next six attenders: one because of complicating head injuries; the other five failing for clinical reasons to complete sufficient tests.

The 100 voluntary controls, all freshmen of 1953–54, came from three colleges. The proportion of the annual entry of each college volunteering was respectively 64 per cent., 30 per cent. and 29 per cent., making an overall proportion volunteering of 42·3 per cent. Of the 123 students who volunteered, the first 100 of appropriate age and with English as their native language, were chosen as the control group.

The fact that more than 40 per cent. of the total entry volunteered, implies that the majority of the controls were healthy young men, though the possibility of bias on grounds such as public-spiritedness or interest in psychology cannot be excluded.

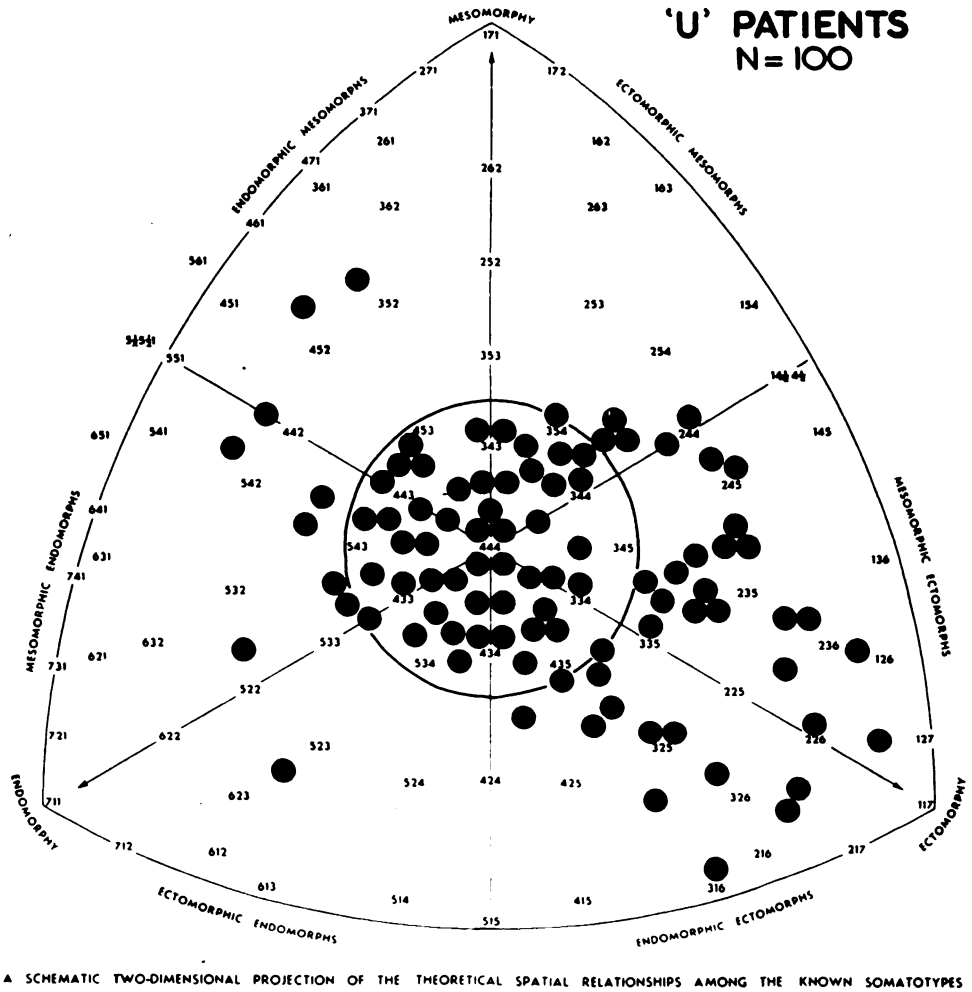


FIG. 1.—Somatotype distribution of 100 consecutive undergraduate patients referred by their general practitioner for psychiatric treatment.

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Somatotype Bias Amongst the Volunteers

Somatotype evidence will now be presented from a comparison of both patients and controls with 405 students derived from a pilot health service from 1947–50 and similarly typed to show that a bias among the controls did exist towards physiques similar to those of patients.

Method

Sheldon's photoscopic method of somatotyping was compared with results reached independently by means of physical anthropometry before the final

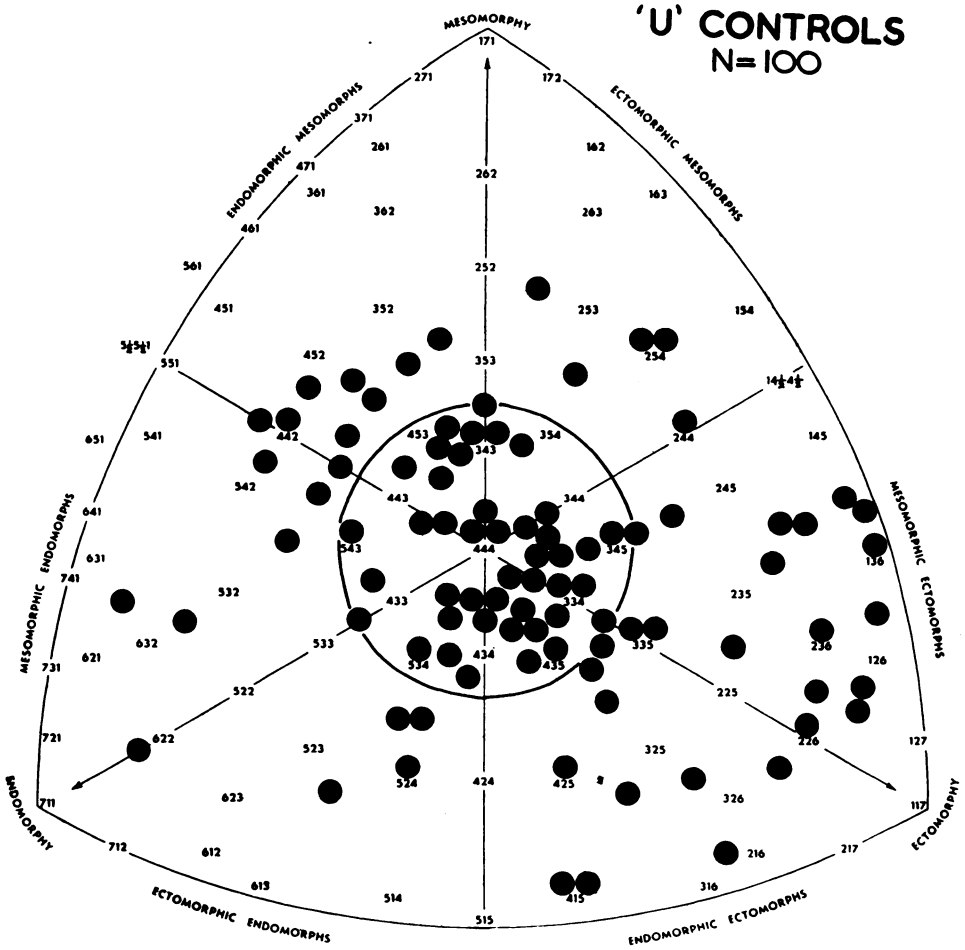


FIG. 2.—Somatotype distribution of 100 volunteer controls.

3-figure index of physiques was decided upon. The objective figure derived from physical anthropometry ensured the procedure greater internal consistency (Parnell, 1954).

The orthodox 3-dimensional somatotype chart devised by Sheldon is divided into six main sectors of dominance which, together with the central 444's, gives 13 main somatotype groups (see Fig. 1). Concise notation is used

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to describe the regions, e.g. 453, 343, for central endomorphic mesomorphs, and mesomorphs with shared secondary dominance. Peripheral types of similar dominance are noted as P453, 343, the prefix "P" preventing confusion with central types. The notation for other sectors of dominance follows suit.

Samples

Figures 1 and 2 depict the somatotype distribution of patients and controls. The application of these comparative distributions to the delineation of the vulnerability scale will be described later.

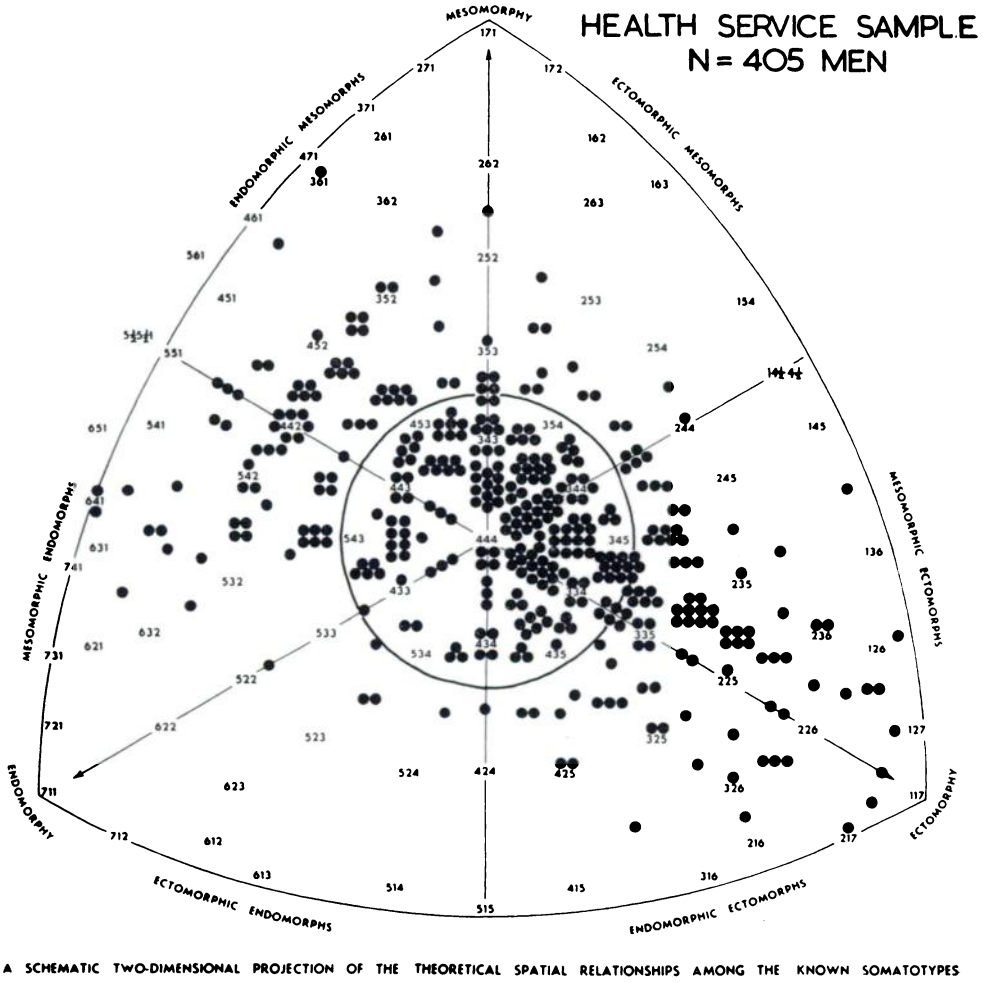


FIG. 3.—Somatotype distribution of 405 men attending a pilot health service 1947–1950.

The bias in body build of the controls can be measured against the distribution of the 405 pilot health service students (see Fig. 3). This health service sample is considered a more satisfactory standard of the normal distribution of physiques of Oxford students for three reasons; first, it was larger, secondly the volunteer rate (70 per cent.) was higher, and thirdly, a check carried out by

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Tanner (1952) on a large part of the sample, revealed that athletic physiques were fairly represented.

The comparative frequency of the volunteers and patients compared in the somatotype groups with the health service sample is shown in Table I.

TABLE I

Comparative Prevalence Ratios of Undergraduate Psychiatric Patients, Psychological Volunteer Testees and Health Service Attenders by Somatotype Groups

		Nos. and Percentages				Prevalence Ratio			Significant at 5 per cent. level*		
		1		2	3	1	2	3			
Central		S.H.S.		Vol.	Pts.	S.H.S.	Vol.	Pts.	D1–2	D1–3	D2–3
		n	%	n=%	n=%						
534	433	10	2·5	6	8	100	243	324		*	
543	443	22	5·4	4	10	100	74	184			
453	343	49	12·1	8	9	100	66	74			
354	344	45	11·1	3	8	100	27	72	*		
345	334	56	13·8	12	4	100	87	29		*	*
435	434	23	5·7	9	9	100	158	158			
444		4	1·0	3	5	100	300	501			
Central Subtotal		209	51·6	45	53	100	87	103			
Peripheral											
534	433	5	1·2	6	1	100	483	84			
543	443	45	11·1	8	7	100	72	63			
453	343	38	9·4	6	2	100	64	21		*	
354	344	18	4·4	6	5	100	135	113			
345	334	63	15·6	19	20	100	122	129			
435	434	27	6·7	10	12	100	150	180			
Peripheral Subtotal		196	48·4	55	47	100	113	97			
Central and Peripheral											
534	433	15	3·7	12	9	100	324	243	*		
543	443	67	16·6	12	17	100	72	103			
453	343	87	21·5	14	11	100	65	51	*	*	
354	344	63	15·6	9	13	100	58	84	*		
345	334	119	29·4	31	24	100	105	82			
435	434	50	12·4	19	21	100	154	170		*	
444		4	1·0	3	5	100	300	501			
Total		405	100·2	100	100						

The actual frequency is divided by the expected frequency based on the health service sample and the quotient multiplied by 100 to give a comparative ratio. A ratio of 100 is therefore recorded where the frequency of a given group of somatotypes is identical with that in the health service sample; ratios above or below will be found where the prevalence in the patients or controls series is higher or lower respectively (see Figs. 4 and 5).

Findings

These findings demonstrate not only which physical types mainly avoided and which succumbed to psychological breakdown, but also which type of student was especially interested in taking part in the experiment.

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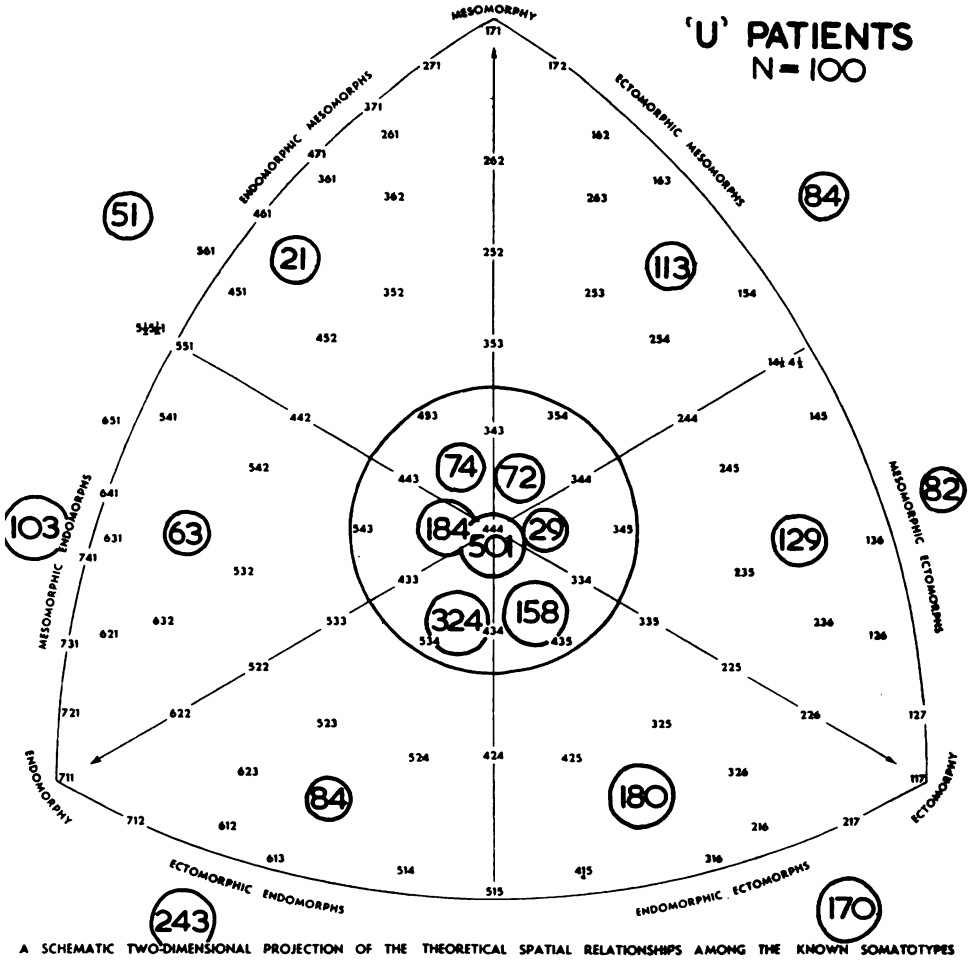


FIG. 4.—Comparative ratios of somatotype prevalence among the patients. The expected ratio would be 100 in the health service sample.

Mesopenes of all types (C.P. 435, 434, 534, 433) were found significantly more often among the patients

$$\left(\frac{\text{Diff. in proportion}}{\text{S.E. Diff.}}=2\cdot8\right)$$

than among the health service sample; they also volunteered significantly more often for control testing

$$\left(\frac{\text{Diff. in proportion}}{\text{S.E. Diff.}}=3\cdot1\right).$$

Mesomorphs on the other hand (C.P. 453, 343, 354 and 344), if central and peripheral ones are taken together, not only appeared significantly less often as patients

$$\left(\frac{\text{Diff. in proportion}}{\text{S.E. Diff.}}=2\cdot7\right),$$

but they also volunteered significantly less often as controls

$$\left(\frac{\text{Diff. in proportion}}{\text{S.E. Diff.}}=2\cdot9\right).$$

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In contradistinction, however, endomorphic mesomorphs (a region, incidentally, where medical students congregate (Parnell, 1953)), had less than average interest in the experiment and only a small casualty rate, while central ectomorphic mesomorphs, who co-operated least well in the experiment, nevertheless showed relatively greater liability to breakdown.

Table I also reveals the need to distinguish between central and peripheral types of the same dominance. Taking ectomorphic endomorphs (534m 433)

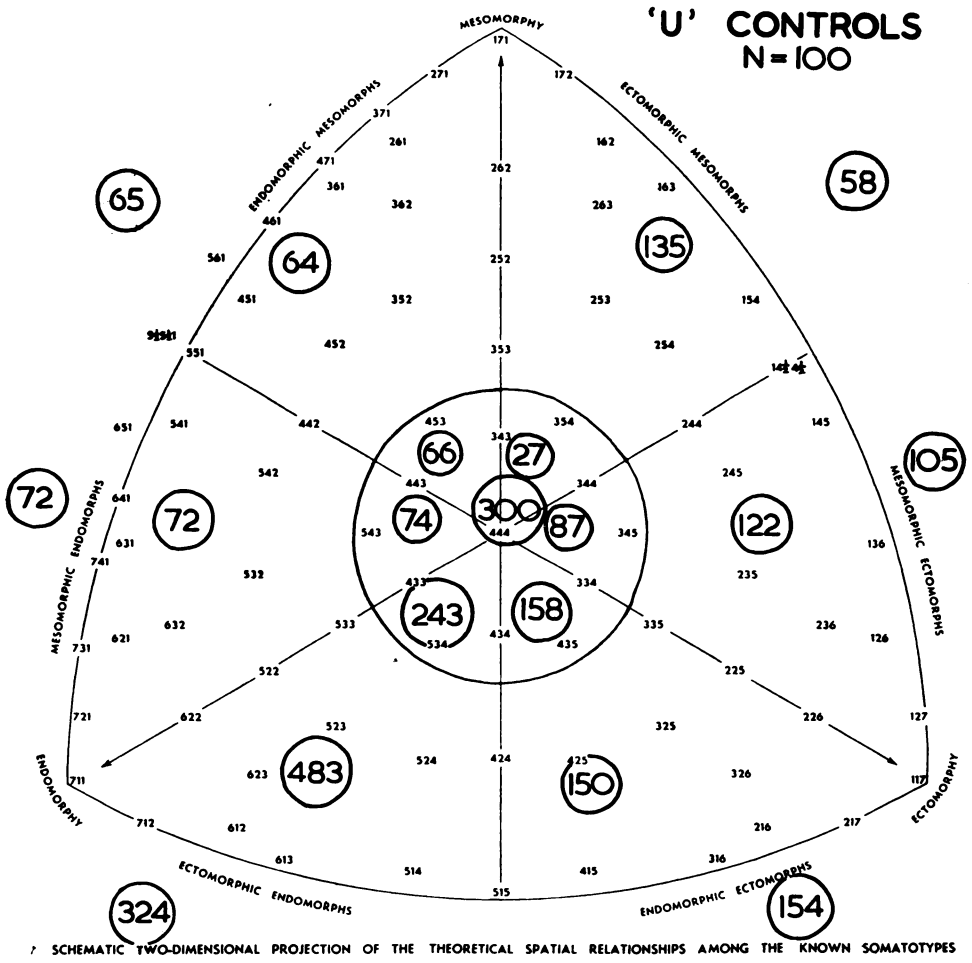


FIG. 5.—Comparative somatotype prevalence among the volunteer controls.

as an example, it may be seen that they volunteered more frequently than all other groups, the peripheral ones if anything more often than the central ones; but it was the central ones who most frequently became patients. If as a further example mesomorphic ectomorphs are considered, they showed near average disposition to volunteer, but while the comparative ratio for patients at the periphery is rather above expectation, that for central types (C 345, 334) is very low. This highly stable "eastern-central" area on the somatotype map is one of the most densely populated regions in the university sample (Parnell, 1953) though, incidentally, it is one with comparatively poor academic record (Parnell, 1954b).

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In general summary it may be said that the volunteer controls appeared to be closer in physique to the patients than to the health service sample. The assumption is therefore permissible that the differences found below between the patients and controls would tend to be enhanced among the more divergent physiques of the University at large.

Factors Differentiating Patients and Controls

Medical and personal histories, recorded at psychiatric interview, will next be examined to discover factors differentiating patients from controls. Electroencephalographic and psychological test results will be studied subsequently and the best differentiating information gathered together to develop scales of vulnerability.

Medical and Personal History

(*a*) Insignificant Factors

As already mentioned the age range was the same for patients and controls and one may add that the age distribution was also similar.

Table II lists the percentage prevalence of factors which failed to show significant difference between 100 student patients and 100 controls.

Table II

The Percentage Frequency of Factors Failing to Differentiate Between 100 Student Patients and 100 Controls

	Patients (Per cent.)	Controls (Per cent.)
Father's Occupation:		
Professional	18	26
Scholastic	10	10
Business Director	29	21
Managerial, foreman, etc.	27	32
Traders, miners, labourers, etc.	16	11
Schools Attended:		
State-aided day only	49	51
Private day	10	9
Boarding	41	40
University Status:		
Scholar	29	21
Exhibitioner	5	8
Commoner with F.E.T.S., State, County or other Grant	38	43
Commoner without State Grant	11	9
Post-graduate or graduate elsewhere	17	19
Financial Security of Subject:		
Number who worried about money, were in debt, or admitted difficulty in making ends meet	4	4
National Service and War Service:		
Completed	56	49
Deferred	28	36
Unfit	13	10
Others not liable	3	5

From Table II it may further be seen that no significant difference was encountered in social class judged from the father's occupation, type of school attended, university status, financial aid, financial security or national service.

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Social inferiority, therefore, financial stress, the unsettling effect of national service, or, alternatively, the immaturity of those who have not yet done it, create no significant danger of psychological breakdown. This is not to say that none of these factors ever contribute to distress: it means merely that by themselves they cannot be considered important causes of breakdown.

Religious Interests

A waning interest in religion has been cited as a cause of breakdown. The actual proportion of patients now agnostic, undecided or otherwise deviated in religious affiliation from that of their upbringing, was just significantly greater than the proportion of controls (see Table III). But because the controls were seen only shortly after arrival at university the difference could be explained by longer opportunity for change in Oxford's iconoclastic atmosphere, an hypothesis confirmed in Table IV by the figures of change in religious interest according to the year of residence.

TABLE III

Religious Interests

Interest	Patients	Controls
Agnostic now	25	14
Undecided now	7	10
Others who changed from religion of upbringing	17	10
Total changing	49	34

TABLE IV

Changes in Religious Interest According to Year of Residence

	Patients			Controls		
	Number	No. Having Changed	Per cent.	Number	No. Having Changed	Per cent.
1st year	19	6	32	100	34	34
2nd year	26	11	42	—	—	—
3rd year or later years	47	24	51	—	—	—
Post-graduate	8	8	100	—	—	—

(*b*) SIGNIFICANT FACTORS IN THE HISTORY

Faculties

The percentage distribution of students according to faculty is given in Table V, to which the distribution has been added for the whole University, taken from the 1953 Calendar. There is a suggestion that men reading "Literae Humaniores" had a greater tendency to breakdown; the tendency is slight and the test of significance

$$\left(\frac{\text{Diff. in proportion}}{\text{S.E. Diff.}} = 1{\cdot}8\right)$$

reveals that it approaches, but does not reach the 5 per cent. level. Similar remarks apply to Geography. The least liability was found among student lawyers and linguists. Modern historians contributed a significantly small number of patients, but they contributed a similar small proportion to the control series too. The conclusion is reached that choice of faculty is not an important factor in breakdown.

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TABLE V

Percentage Distribution of Students According to Faculty

Faculties	Patients n=100	Controls n=100	O.U. 1953 n=1603
Lit. Humaniores	15	7	9
Geography	6	3	3
Modern Languages	8	15	13
Jurisprudence	6	10	10
Theology	5	4	3
Medicine	5	8	4
Modern History	8	9	19

Faculties showing no difference of distribution have been omitted.

Previous Personal and Family History of Psychological Disturbance

Significantly more patients had suffered at an earlier period from psychological illness, but 80 per cent. had no previous experience of this kind (see Table VI). If a knowledge of previous upsets were to be obtained by Student Health Officers when a student starts his university course, this information could succeed in directing supervisory attention to only one fifth of those likely to need it. Likewise, evidence of mental disorder in the family history is significantly more common in the families of patients, but its comparatively infrequent

TABLE VI

	Patients (Per cent.)	Controls (Per cent.)
Previous Psychological Illness:		
None	80	98
Out-patients only	13	2
Mental hospital	7	0
Psychological Illness among Relatives:		
Nil known	61	81
Some relative afflicted	39	19
Direct	17	10
Collateral	15	7
Both direct and collateral	7	2
Parental Circumstances:		
Harmony now or when both parents were alive:		
Good harmony	52	71
Slight disharmony	19	12
Disharmony	20	9
Broken home:		
Separation by arrangement, legal separation or divorce	8	7
Mother died at birth of son	1	1
Relations of Subject with Family:		
Mildly disturbed:		
With father	26	9
With mother	30	4
With siblings	9	2
With family as whole	26	9
More severely disturbed:		
With father	16	2
With mother	11	3
With siblings	4	4
With family as whole	18	5
Total disturbed:		
With father	42	11
With mother	41	7
With siblings	13	6
With family as whole	44	14

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occurrence renders it by itself almost useless for prediction. Moreover, bias may have been produced as a result of information supplied by parents of patients; for parents of controls were not interviewed.

Parental Circumstances

In assessing the significance of this factor, it must be understood that the information was derived from the subjects themselves; it is therefore possible that patients were more forthcoming than controls in admitting disharmony.

Although disharmony between the parents was admitted significantly more often among patients than among controls, over half the patients came from homes where no evidence of disharmony could be detected, and twenty-one controls had not broken down despite the presence of disharmony. "Broken homes" are sometimes thought to be equally damaging, but the incidence of homes broken by death, separation and divorce was not greater among patients than among controls, suggesting that continuing disharmony, or possibly the patient's idea that such disharmony exists, may matter more than an actual break.

Relations Between Subject and Family

Assessment of this was based on description of relationships afforded by patients and controls and, occasionally, in the case of patients, by their relatives. Greater knowledge of the patients, together with knowledge gained in some cases from analytical exploration of intimate personal affairs may therefore have biassed these figures. Moreover, the controls may have glossed over or repressed knowledge of disturbance.

The point of importance here, however, is that over 50 per cent. of the patients had reasonably serene relations with their parents and in less than 20 per cent. of the cases was there any severe disturbance. This factor has, therefore, only limited value in the assessment of vulnerability.

EEG Findings

Thirty-two per cent. of the 72 patients with EEG recordings gave "abnormal" records, i.e. they showed considerable theta activity at 4–7 c/s, delta waves at 1–3½ c/s, or an epileptic pattern of a well recognized form either at rest or on overbreathing. A small amount of bitemporal theta activity was accepted as within normal limits. By the same standards, 42 per cent. of controls were classed "abnormal". This difference is not significant statistically although it will no doubt be noted as departing in the "wrong" direction. Moreover, 12 per cent. of controls showed an epileptic pattern, none, however, giving a clinical history of epileptic attacks; and it is interesting here to record that in the student health service series of over 500 Oxford undergraduates only about half 1 per cent. suffered from clinically diagnosed grand mal or petit mal epilepsy. An additional finding of special interest was that as high a proportion as 19 per cent. of peripheral ectomorphs showed epileptic patterns in their EEG, whereas only 4·5 per cent. of endomorphs showed this characteristic.

It can be concluded that electroencephalography by itself is valueless in distinguishing students psychologically vulnerable from those who are not.

Tests of Intelligence and Honours Class Results

A.H.5 is a closed, time-limited test of high grade intelligence devised by Dr. Alice Heim (1947) of the M.R.C. Unit in Applied Psychology at Cambridge,

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and divided into two parts, each occupying 20 minutes, Part I testing verbal and arithmetical reasoning, Part II with its visual bias, mainly non-verbal reasoning. The five grades A to E comprise descending levels of ability. The total score is obtained by direct addition of scores in each part.

TABLE VII

A.H.5 Test. Percentage Distribution of Test Grades Obtained by Patients and Controls

Grade	Patients (90)			Controls (100)		
	Part I	Part II	Total	Part I	Part II	Total
A	10	10	11	12	9	14
B	22	19	18	22	27	19
C	41	28	31	36	38	40
D	18	29	28	19	16	15
E	9	14	12	11	10	12

There is no significant difference in the three upper grades A–C; the difference between patients (40 per cent.) and controls (27 per cent.) placed in the lower two grades D–E on the total scores, although suggestive, is just below the 5 per cent. level of statistical significance. However, the difference in Part II at grades D–E between patients (43 per cent.) and controls (26 per cent.) appears significant. This is in line with the usual finding that a high proportion of patients with neurotic, psychotic and organic disorders show discrepancies between verbal and non-verbal ability.

The honours class results of these patients who have taken their final examinations are compared in Table VIII with figures for the University as a whole, taken from the University Calendar, 1953. No significant difference was found.

TABLE VIII

Honours Class Results

	Patients		O.U. 1953	
	No.	Per cent.	No.	Per cent.
1st Class Honours	7	12	121	9
2nd Class Honours	30	52	731	55
3rd Class Honours	18	31	411	31
4th Class Honours	3	5	70	5

The data from intelligence tests and examination class results appear to dispose, at least as far as Oxford is concerned, of two notions frequently advanced as common causes of breakdown. The first is that biological maladjustment is associated with extremely high or supernormal intelligence. The second is that failure in mental health arises from men with intelligence within the lower ranges encountered at the University being unable to survive the stress of academic demands and competition. Although some slight support might be claimed for this latter view from Part II of the intelligence test, it is not a significant factor in the test as a whole, there is a well accepted alternative explanation and, therefore, no reason to regard it as one of the commoner causes of breakdown.

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The Establishment of a Vulnerability Scale

(*a*) The Minnesota Multiphasic Personality Inventory. Description and Methodology

According to Hathaway and McKinley (1943), authors of the M.M.P.I. Manual, this is a psychometric instrument designed to provide scores on the more important deviations of personality. The test material consists of 550 intimate personal statements, each printed on a separate card, which the subject is asked to sort into three categories indicating that he considers each statement either true or false about himself, or he cannot say.

From the sorting, nine characteristics of personality named after symptom complexes are objectively scored. Standard scores are used around a mean of 50 with one standard deviation equal to ten points, and a score of 70 (i.e. the mean+2 S.D.) is taken as a convenient criterion of abnormality. The nine characteristics have here been neglected: a score of 70 or more obtained on any one scale being employed to define abnormality.

Findings

Among 100 controls 33 per cent. were classified by this standard as abnormal. Among 93 patients 28 per cent. were classified as "normal". The total misclassification of 31 per cent. is higher than can usefully serve to discriminate the sick from the healthy.

(*b*) M.M.P.I. Combined with Somatotype

In an attempt to improve the discrimination, the scores were noted which distinguished best between patients and controls in separate areas of the somatotype chart. These areas are illustrated in Fig. 6: where for each zone the optimum score separating patients and controls has been entered. It would be unwise on the available data to attach too much importance to the precise levels and exact ranges of somatotype implied, but trends suggest for example that peripheral mesomorphic ectomorphs and mesomorphic endomorphs may score more than 70 and even as high as 80 without becoming patients, whereas among mesopenic ectomorphs scores as low as 65 are common among patients. As an indication of the improvement in discrimination between patients and controls brought about by using the relevant optimum M.M.P.I. score for each somatotype, only 19 per cent. of patients would be thought normal, only 18 per cent. of normals would be suspect patients. The total of 19 per cent. misclassified is significantly less than when the M.M.P.I. is used alone (31 per cent.).

Since a complete university intake of 700 students at Birmingham has been somatotyped in one week as part of the routine health assessment on entry, and since the M.M.P.I. may be taken as a written group examination occupying from 30 to 90 minutes and scored by clerks, there is no technical reason why these procedures should not be combined for screening new entrants. They cannot be claimed as highly efficient, but it should be remembered that among the patients considered, a certain proportion did not perform the M.M.P.I. until near full recovery; while among controls one or two seemed vulnerable and may have volunteered because they felt in need of help. Thus an upper limit with perhaps 10 per cent. misclassified might reasonably be expected on the present data.

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(*c*) PSYCHIATRIC INTERVIEW

Object

To reduce misclassification further, ratings derived from a short psychiatric interview may be used. While it is impractical for all university entrants to be interviewed, it might be more feasible to interview those suspected vulnerable by the combination of M.M.P.I. and somatotype.

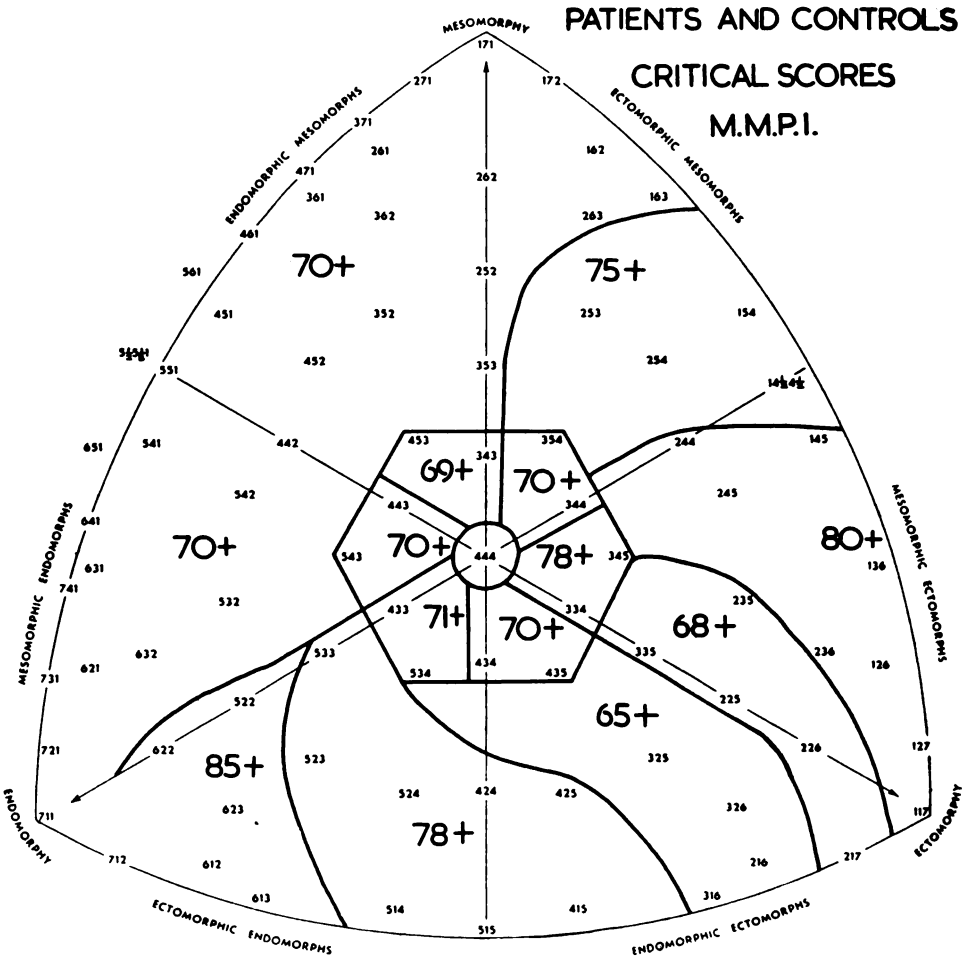


FIG. 6.—M.M.P.I. Best discriminating scores between patients and controls according to somatotype.

Method

With this in mind, twenty-one traits of psychological disturbance, assessed during the psychiatric interview with patients and controls, have been selected from a longer list. All these traits, except insomnia, which was assessed either present or absent, were estimated on a 7 point scale, 7 indicating greatest severity, 1 absence of the trait.

In defining these traits, psychiatric jargon has been avoided. Nevertheless, the 21 traits appear to embrace the commoner adolescent syndromes of affective

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disturbance with anxiety or depression, obsessionalism, hysteria, inadequacy of personality and conflict with parents: together with possible prodromal signs of schizophrenia.

Findings

Table IX gives the percentage prevalence and ratios between patients and the controls series of insomnia and higher scores (5 plus) on the other 20 traits.

TABLE IX

Best Discriminating Characteristics from Clinical Interview

	Numbers Scoring High (5+) on 7 Point Scale		
	100 Patients	100 Controls	Ratios
1. Depression as judged by appearance and speech	29	0	29 : 0
2. Inability to concentrate	51	1	51 : 1
3. Easy fatiguability	22	1	22 : 1
4. Excessive demand for attention	22	1	22 : 1
5. Over dependence	35	2	17 : 1
6. Tendency to run away from difficulties	26	2	13 : 1
7. Self dramatization	39	3	13 : 1
8. Immaturity in general attitude to life	47	4	12 : 1
9. Inferiority feelings	32	3	11 : 1
10. Insomnia	41	4	10 : 1
11. Perfectionism	37	4	9 : 1
12. Narcissism	37	4	9 : 1
13. Insecurity	51	7	7 : 1
14. Distractibility	22	3	7 : 1
15. Indecisiveness	33	5	7 : 1
16. Irritability	19	3	6 : 1
17. Disturbed relationship with mother	41	7	6 : 1
18. Overanxiety	38	7	5 : 1
19. Excess preoccupation with specific topics	38	7	5 : 1
20. Excessive non-compulsive rumination of abstract topics—day dreams	25	5	5 : 1
21. Disturbed relationship with father	42	11	4 : 1

If one point is awarded for the presence at that level, of each of the 10 most discriminating traits shown above the line in Table IX, and if a total score of 2 constitutes abnormality, only 12 per cent. of both patients and controls are misclassified. These 10 traits at first sight appear to possess a discriminating power greater than that of the objective combination of somatotype and M.M.P.I. It must, however, be appreciated that much closer acquaintance was gained with the patients than could be obtained with the controls in an interview lasting one hour, and this bias may partly account for the better discrimination afforded by the psychiatric traits selected. This brief method of interview is, therefore, but tentatively propounded as a first rational step towards the development of a psychiatric scale of student vulnerability: its efficiency in the field is as yet untested.

SUMMARY

1. Mental upset continues to be the leading cause of prolonged absence and illness among Oxford students.

2. The problem has been studied at a local N.H.S. centre for acute psychiatric illness by examining 100 consecutive student patients referred by their general practitioners and 100 healthy volunteers.

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3. Examination was by somatotype, electroencephalography, clinical psychological tests and psychiatric interview.

4. A somatotypical bias among the 100 volunteers was shown by comparing them and the 100 patients with a sample of 405 pilot health service students.

(a) *Patients compared with pilot health service*

Among the patients, central endomorphs and central and peripheral endomorphic ectomorphs were significantly more common. Endomorphic mesomorphs and central mesomorphic ectomorphs, were significantly more common in the health service sample.

(b) *Volunteer controls as compared with pilot health service*

Among volunteer controls, mesopenes, particularly endomorphic ones, appeared significantly more frequently; mesomorphs attended significantly more often in the health service sample.

5. There is evidence that findings differentiating patients from controls would be likely to differentiate patients still more strongly from the University at large.

6. Differentiating factors between patients and controls of varying significance are discussed.

(a) *Social Class*

No significant difference was observed in respect of social class, financial security, national service, broken homes or religious interest changing in the first year of residence.

(b) *EEG*

No significant difference was observed in the prevalence of electroencephalographic abnormality.

(c) *Intelligence*

(i) *A.H.5 Test*. There was no significant difference in Part I (verbal) between patients and controls. In Part II a small but significant number of patients obtained lower scores (Grade D and E) than controls, but there was no significant difference in the upper three grades (A, B and C) of Part II.

(ii) *Honours Class*. Patients taking final honour schools obtained percentages of first, second, third and fourth class honours comparable with the University at large in 1953.

(iii) Neither high nor low intelligence can therefore be regarded as an important factor in producing psychological breakdown.

(d) *Previous and Family History*

Significant but possibly biassed differences between patients and controls were found in the spheres of previous psychological illness, psychological illness among relatives, disharmony between parents and disturbance of relations between the subject and members of his family. None of these differences was of a high order.

7. *The Establishment of a vulnerability scale.*

(*a*) The Minnesota Multiphasic Personality Inventory differentiated all but 31 per cent. of patients from controls, taking as abnormal a score of 70 obtained on any one scale.

(*b*) If the optimum M.M.P.I. score shown to differentiate patients from controls in separate somatotype areas is used in conjunction with the somatotype, only 19 per cent. are misclassified.

(*c*) Although the results may be biassed, if the 10 traits of psychological deviation found at psychiatric interview to differentiate most satisfactorily between patients and controls are used, misclassification is further reduced to 12 per cent.

(*d*) In practice this heuristic vulnerability scale could be used by submitting students to somatotyping and M.M.P.I. testing on entry, and those with "vulnerable" results to a 15 minute psychiatric interview designed to elicit the 10 discriminating traits.

(*e*) This procedure would occupy about 2½ hours of each student's time. It might be employed either as an aid to early diagnosis, or for routine screening after university entry.

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