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The Patient's Spouse

By NORMAN KREITMAN

Over the last few decades, social psychiatry has demonstrated correlations between mental illness and certain broad social categories. At the same time clinical, genetic and psychological studies have continued their traditional interest in the illness of the individual. The divergence of these two approaches has left relatively unmapped a large area which is of considerable psychiatric interest; despite much descriptive work, very little has been clearly established (outside genetics) concerning mental illness in the small, closely-integrated group, of which the prime example in our culture is the family. Our understanding of how personal and social factors jointly contribute to mental ill-health might well be furthered by studies in this field.

However, as Post and Wardle (1962) point out in their recent review, "family psychiatry" has so far made little progress. They comment on the need to isolate discrete questions, which in turn implies that for research purposes, current concepts of family interaction must be radically simplified, and that the components of the family complex must first be studied in isolation. For these reasons, among others, in the present investigation attention is confined to the patient and his spouse.

There is evidence that the spouses of mental patients have a higher than expected incidence of mental illness (Penrose, 1944; Slater and Woodside, 1951; Gregory, 1959; Kreitman, 1962; Ryle and Hamilton, 1962). One proposed explanation is that individuals predisposed to mental ill-health tend to marry each other. Homogamy, or assortative mating, has been demonstrated in the normal population for many physical, psychological and cultural characteristics. In 1945, Burgess could refer to approximately 100 such studies; in 1950, Roff reviewed a number of these in detail, concluding that the general tendency for spouses to resemble each other is established beyond doubt. Unfortunately very little is known about concordance on variables of immediate psychiatric relevance, nor about the general aspects of assortative mating in married couples where one partner is mentally ill.

This study aims to describe some of the characteristics of the spouses of mental patients, to compare the correlations found in such marriages with those of normal couples, and to enquire how far the assortative mating theory is applicable.

Method

The patients and controls used in this study were obtained in the following way.

(*a*) In 1958 an investigation (quite unrelated to the present one) was carried out in Crawley New Town for which comparable groups of patients and normals were required. The patient group consisted of 100 consecutive new attendances at the local psychiatric clinic, who were under 60 years of age and who were immigrants to the town.* None declined to co-operate. The control group was obtained by knocking on the doors of houses ten numbers up from the patients' houses, or if no reply was obtained, at the houses on one or other side, returning if necessary. Whoever answered the door was taken as the subject, though towards the end of the survey a special effort was made to obtain men. Subjects who were over 60, or who were not New Town immigrants, were again excluded, as was one subject discovered to have been an in-patient at another hospital. One hundred and nine visits to eligible subjects were made, of whom 9 refused to co-operate: the remaining 100 thus represent a coverage of 92 per cent.

* It is estimated that at least 95 per cent. of the population of Crawley New Town are immigrants, who have come to the area with firms that employ them.

These two groups were found on analysis to be strictly comparable with respect to (*a*) age, (*b*) sex, (*c*) social class, (*d*) father's social class, (*e*) age of leaving school, (*f*) type of school attended, (*g*) district of current residence, (*h*) district of previous residence, (*i*) number of siblings, and (*j*) number of children. Further details will be given elsewhere (Sainsbury and Collins, 1963).

(*b*) For present purposes, these original groups were re-defined; to the original criteria were now added (*i*) that the subjects were currently married and cohabiting with their spouses, (*ii*) that they were still (1960) resident in the Crawley area and could be readily traced. Two patients found to have died since 1958 also had to be excluded. These stipulations reduced the groups to 75 patients (31 men and 44 women) and 95 controls (32 men and 63 women): the discrepancy was principally due to there being 17 fewer married patients than controls.

These subjects were initially considered in four groups, namely male and female patients and male and female controls. Analyses were made to determine any differences between each patient and same-sex control group with respect to (*a*) age, (*b*) social class, (*c*) father's social class, (*d*) number of children, (*e*) school leaving age. None were found. It was also found that the male and female controls did not differ significantly from each other on any of the variables listed above.

(*c*) In each group each subject *and spouse* were sent by post the Cornell Medical Index, the Maudsley Personality Inventory and a request for details of their ages and duration of marriage. A covering letter, which explained the general nature of the enquiry, stressed the importance of both members of the marriage co-operating. A series of reminders were dispatched when necessary, culminating in a visit by a social worker.

The Responders

(*d*) Satisfactorily completed schedules from the subjects and their spouses were received from 80·6 per cent. of all those approached: a further 3·5 per cent. returned incomplete forms and were not pressed further. Details of the response rates for each sub-group, which range from 71·0 per cent. to 87·5 per cent. are shown in Table I which also details other characteristics of the responders. It will be noted that the duration of marriage is approximately the same for each group.

One disadvantage of postal enquiries is the difficulty of determining whether those who respond are representative of their group. Although this could not be decided on the most crucial points, a fortunate circumstance of the present investigation was that a good deal was known about the subjects before the forms were sent out. It seems improbable that any important bias characterized the volunteers, since the response rates for the four sub-groups do not differ significantly, whichever two or whatever combination of groups are compared, but as a check the response rates by age, social class, educational status and number of children were calculated for each sub-group. Comparison again failed to show any differences which reached a ·05 per cent. level of significance.

It is possible for samples from a number of homogeneous groups each to represent their own group within permissible limits of error, yet still to differ from each other: the responders in each category therefore were directly compared on all the variables shown in Table I. Calculation showed no differences between patient and same-sex control groups. As before, the two control groups were also found to be similar with respect to these variables: they were therefore pooled at this point to provide a single control sample (N=79 pairs) for all subsequent comparisons.

Thus, to summarize the sampling methods employed:

1. The original samples comprised a sequence of screened out-patients matched with controls (neighbours). These did not differ on a wide number of variables.

2. These were re-defined for the present enquiry; the populations remained homogeneous, and in particular each pair of same-sex groups, and the two control sub-groups, did

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TABLE I

Characteristics of Final Samples (Responders)

	Females		Males	
	Patients (N=36)	Controls (N=51)	Patients (N=22)	Controls (N=28)
Response rates (per cent. of original subjects)	81·8	80·9	71·0	87·5
Age—$\overline{M}\pm$S.E.	38·5±1·4	37·6±1·4	40·5±1·3	40·3±1·6
Duration of marriage—$\overline{M}\pm$S.E. ..	14·0±1·0	13·4±1·1	14·5±1·1	14·4±1·5
Per cent. by Social Class:				
I and II	25	16	27	25
III	58	67	59	61
IV and V	17	17	14	14
Per cent. by Father's Social Class:				
1 and 2	19	18	18	14
3	55	49	59	46
4 and 5	17	27	23	18
Not known	8	6		21
Per cent. by School-leaving Age: ..				
Below 15	83	76	59	64
15 and over	17	22	41	36
Siblings: $\overline{M}$	4·5	3·8	2·8	3·5
Per cent. distribution:				
0 and 1	25	43	27	36
2	8	8	23	21
3	11	23	23	11
4 and over	55	25	27	32
Per cent. by number of children:				
0	22	8	4	18
1	31	22	27	25
2	31	30	50	36
3 and over	17	25	18	21
Per cent. by diagnosis:				
Psychoses: manic-depressive ..	22		23	
other	6		0	
Neurotic depression	39		23	
Other neuroses: Psychopathy ..	33		54	

not differ significantly (·05 per cent.) on five major variables.

3. A postal enquiry elicited replies in approximately 85 per cent. of subjects and their spouses, with no significant differences in response between any same-sex sub-groups or between the two control sub-groups, even when broken down into a number of specific response rates.

4. On direct comparison, the responding subjects in each group were found not to differ significantly on the variables previously employed, and each sub-group had a similar average duration of marriage.

5. In view of their similarity, the two control sub-groups were combined to form a single control group.

Validity of the Instruments

The Maudsley Personality Inventory (Eysenck, 1959) yields two scores related to extraversion (E scale) and neuroticism (N

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scale), which are largely independent. "Neuroticism" is conceived as a fairly stable personality factor, although scores on this scale do fluctuate to a minor degree with variations in clinical state (Knowles, 1960).

The Cornell Medical Index is a check-list of 185 symptoms covering many areas of physical and mental function serially represented by letters A to R. Scores on sections A to L indicate physical health, M to R mental health. The Index has been tested in this country (Culpan, Davies and Oppenheim, 1960) and found to be "an uncommonly good discriminator, as pencil-and-paper tests go". Different critical scores ("cut-off levels") can be used when distinguishing patients and normal subjects according to the relative importance of avoiding the misclassification of one or other group. Usually it is also possible to determine a level which ensures minimum overall misclassification, and it is in this manner that the Index has been employed here. Unlike the M.P.I., the C.M.I. is claimed to be sensitive to fluctuations in mental state (Brodman *et al.*, 1956).

The N scale of the M.P.I., and the A–L, M–R and total scores of the C.M.I. all purport to distinguish patients from normal subjects. The first question to arise was whether they succeeded in doing so in the present context. The relevant data are given in Table II and show that satisfactory differentiation was achieved by each instrument.*

It may be noted in passing that the normal subjects scored higher than those quoted by Culpan *et al.* (1960), suggesting that these authors had access to a screened population. Their neurotic patients, on the other hand, tended to have higher scores than those now reported, probably because the former were seen at a more acute stage of their illness and were also diagnostically more homogeneous. Hence the patient and control groups used here, though well differentiated, might yet be less distinct than would ideally be desirable.

* Some doubt may arise over the borderline t value of the C.M.I. A–L section for female subjects. The scale was retained as the low value was due to a few exceptionally low-scoring patients: thus the χ^2 value (at the dividing level indicated in the Table, and after correction for continuity) was 4·74, $p < .05$.

Results

For each variable, the first comparison between the spouses of the patients and of the controls is made on means and distributions, in order that the spouses can be characterized as groups. The second comparison is on some index of interspouse correlation to estimate how closely the partners match on their positions within their respective categories.

Table III shows the means on each scale for the patients' spouses. They consistently fall between the values obtained by the (same-sex) patients and controls. The magnitude of the differences from the control subjects is rather greater for females than males.

Most of the differences do not reach statistically significant levels, but even allowing for positive intercorrelations between many of the scales, the consistency of the pattern makes it improbable that the findings are due to chance.

Nevertheless, the differences tend to be small. A possible reason for this was thought to be the degree of overlap between the patient and control groups previously mentioned, perhaps attributable to there being among the patients individuals whose illnesses were minimal and for whom referral was the outcome of social rather than clinical factors, while the converse might be true for the controls. Accordingly the data were re-classified on a psychometric basis. Thus the male patients and male controls were re-grouped according to whether they fell above or below a certain critical score, each scale being treated separately; the levels chosen were those already found to effect optional differentiation between patient and control groups.* The same procedure was then used to re-classify the female patients and controls.

Tables IV and V show the results for the spouses of the subjects re-grouped in this way. The differences between the low and high-scoring groups is clearly reflected by their spouses, the husbands or wives of high-scoring individuals themselves scoring substantially higher than the spouses of the low-scoring

* The levels used for the C.M.I. are quoted in Table II. For the M.P.I. the critical scores for the N and E scales were respectively 17/18 and 23/24 for men, and 25/26 and 22/23 for women.

TABLE II

Differentiation of Patient and Control Groups

	Patients (N=22)	Controls (N=79)	t Value	p<	Optimal "Cut-off" and Misclassification
MALE SUBJECTS					
M.P.I.: N scale:					
$\bar{M}$ ..	23·5	12·6	4·45	·001	
S.D. ..	11·1	10·2			
E scale:					
$\bar{M}$ ..	22·4	25·2	1·36	NS	
S.D. ..	8·4	9·0			
C.M.I.: A–L:					
$\bar{M}$ ..	14·9	11·4			At 10/11=36%
$\bar{M}$ log* ..	115·8	101·3	2·78	·001	
S.D. log ..	19·5	27·8			
M–R:					
$\bar{M}$	9·5	4·5			At 4/5=29%
$\bar{M}$ log ..	91·3	53·2	4·28	·001	
S.D. log ..	34·8	43·8			
Total:					
$\bar{M}$	24·4	15·9			At 18/19=34%
$\bar{M}$ log ..	135·6	112·5	4·18	·001	
S.D. ..	19·9	31·5			
FEMALE SUBJECTS					
M.P.I.: N scale:					
$\bar{M}$	29·3	17·7	4·81	·001	
S.D. ..	12·3	11·2			
E scale:					
$\bar{M}$	20·7	24·4	4·54	·001	
S.D. ..	10·8	8·9			
C.M.I.: A–L:					
$\bar{M}$	23·3	16·3			At 14/15=41%
$\bar{M}$ log ..	127·9	115·7	1·79	·10<p<·05	
S.D. log ..	36·7	27·2			
C.M.I.: M–R:					
$\bar{M}$	18·7	7·6			At 7/8=31%
$\bar{M}$ log ..	123·2	75·5	5·29	·001	
S.D. log ..	25·0	43·9			
Total:					
$\bar{M}$	42·0	23·9			At 22/23=32%
$\bar{M}$ log ..	156·3	130·5	4·58	·001	
S.D. log ..	27·7	28·7			

* The transformation used for all C.M.I. scores was log (X+1)100. All parametric statistics for these scales are calculated on data so transformed.

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TABLE III

Means of Patients, Patients' Spouses and Controls

	Females			Males		
	Female Patients	Wives of Male Patients	Control Wives	Male Patients	Husbands of Female Patients	Control Husbands
N=	(36)	(22)	(79)	(22)	(36)	(79)
M.P.I.:						
N scale	29·3	19·3	17·7	23·5	14·4	12·6
E scale ..	20·7	23·1	24·4	22·4	22·6	25·2
C.M.I.:						
A–L	23·3	17·1	16·3	14·9	11·5	11·4
M–R	18·7	9·3	7·6	9·5	5·4	4·5
Total	42·0	26·4	23·9	24·4	16·9	15·9

TABLE IV

Mean Scores of Wives of Male Subjects by Psychometric Classification

	M.P.I.				C.M.I.					
	N Scale		E Scale		A–L		M–R		Total	
	N	M	*N*	M	*N*	M	*N*	M	*N*	M
Wives of low-scoring males	*63*	14·7	*43*	24·7	*53*	12·8	*56*	6·3	*61*	21·5
Wives of high-scoring males ..	*38*	23·6	*58*	23·7	*118*	20·6	*45*	10·1	*40*	28·9
t		4·44		—		3·68		4·16		2·84
p<		·001				·001		·001		·01

TABLE V

Mean Scores of Husbands of Female Subjects by Psychometric Classification

	M.P.I.				C.M.I.					
	N Scale		E Scale		A–L		M–R		Total	
	N	M	*N*	M	*N*	M	*N*	M	*N*	M
Husbands of low-scoring females ..	*69*	10·6	*56*	23·7	*54*	9·0	*54*	3·3	*54*	11·9
Husbands of high-scoring females ..	*46*	17·1	*59*	25·1	*61*	13·6	*61*	6·1	*61*	20·0
t		3·30		—		3·29		3·26		4·38
p<		·01				·01		·01		·001

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group. All these differences are significant at the ·01 level of probability or beyond. Again, the differences tend to be greater between the wives of the male "probands" than between the husbands of the females.

Husband-Wife Correlations

The correlations between husbands and wives in the various groups were next examined: the results are shown in Table VI which gives for each variable the interspouse correlations for male patients and their wives, female patients and their husbands, all patients and their spouses and for the control pairs. (Preliminary tests were carried out to determine homogeneity of variance between the two latter groups.*) For these it can be seen that all the values are positive, except for the E scale which has near-zero levels; otherwise, all but one reach significant levels of probability.

TABLE VI

Husband-Wife Correlations (Pearson r)

	Male Patients and Wives	Female Patients and Husbands	All Patients and Spouses	Control Pairs
(N=) ..	(22)	(36)	(58)	(79)
M.P.I.:				
N Scale	·43*	·47†	·45†	·36†
E Scale	−·24	·00	−·09	·02
C.M.I.:				
A–L ..	·11	·35*	·26*	·41†
M–R ..	·27	·22	·24	·38†
Total ..	·22	·37*	·31*	·45†

* $p<·05$.
† $p<·01$.

* F ratios were computed for the men and for the women in the combined patients and the control groups for each variable. All were non-significant for the males, and were similarly non-significant for the two M.P.I. scales and the total C.M.I. scale for the females. For females, the variance on the A–L section of the C.M.I. was significantly greater in the patient sample than in the controls, while for the M–R section the converse obtained. These points should be borne in mind in interpreting Table VI, but make little difference to the overall pattern.

There are no significant differences between the correlations obtained in each (major) group, that is to say, patients and their spouses show approximately the same degree of concordance for neuroticism, for physical health and for mental health, as do normal pairs. The implications of these findings will be discussed later.

Broadly similar results emerge when the subjects are classified on a psychometric basis as in the previous section.*

EFFECTS OF DURATION OF MARRIAGE

A problem frequently met when interspouse correlations are reported is that of deciding whether the association has arisen by mutual selection of the partners at the time of marriage (assortative mating in the strict sense), or derives from subsequent interaction between the couple. If mutual selection alone were responsible for the concordance, then positive correlations should be demonstrable at the time of the marriage or soon after, and thereafter remain stable. If interaction were the sole mechanism then the initial correlations should be zero and then increase with time. To elucidate this question the data for both means and correlations have been considered with regard to length of marriage.

Each group of subjects was split into "short" and "long" durations of marriage at a dividing point of 12 years, the median of the entire sample. Table VII shows the means of the wives of male patients and control wives: it is most easily read by considering first the long duration marriages. Relative to the controls, the patients' wives are more introverted, more neurotic and have more symptoms, as already noted in Table III for the whole group. For the shorter marriage duration, however, these relationships do not hold; indeed, the opposite is true: the patients' wives are less introverted, have fewer symptoms and are no more neurotic than

* Regression coefficients were used since division into high and low-scoring groups on each variable resulted in bisected distributions. Nearly all the coefficients were positive, the exceptions again being with the E scale, and of approximately the same order in both patient and control pairs. This supports, incidentally, the suggestion that the differences in variances noted in the previous footnote are of minor importance.

the controls. Thus, with increasing duration of marriage—if the cross-sectional method is accepted as trustworthy—the patients' wives *become* more introverted, remain equally neurotic and develop more symptoms, while the controls do not change on introversion, become less neurotic, and although with time they develop more symptoms they do so to a lesser degree than the patients' wives. The numbers are too small for the differences between these changes to reach statistical significance except for the M–R scale ($p < \cdot 001$).

The corresponding data for male subjects, i.e. the husbands of female patients and control husbands, are given in Table VIII. On the whole the pattern is less clear-cut. For the longer duration the husbands of the patients differ from the controls in the abnormal direction on all scales, as previously found in Table III. For the M.P.I. scales and M–R of the C.M.I., however, similar differences appear at the shorter duration also, and the trends over time are in similar directions in the two groups.

A simple division into shorter and longer durations of marriage enables one to say little about the consistency or linearity of any trends in the marriages of patients or controls. The "progress" of both groups is illustrated in Figures 1 and 2, where a tripartite division of marriage duration is used. Each group (male patients, female patients and controls) were split into approximate thirds with respect to length of marriage: the spouses of the first and second groups were then combined using weighted averages to balance sex-specific differences. The control group values represent the average scores of both partners.

It emerges that the patients' spouses remain more introverted than the controls at all durations of marriage. For neuroticism the gap between groups widens with the passage of time (Fig. 1). Again, for physical symptoms the two groups remain at similar levels throughout, while for mental symptoms the initial discrepancy becomes increasingly pronounced. The same progressive divergence is clearly demonstrated by the curves for total C.M.I. scores (Fig. 2).

Strictly speaking, the assortative mating theory depends not on the mean values for spouses but upon positive intercorrelations between married pairs. The correlation coefficients at different stages of marriage were therefore examined next, along the lines employed for the consideration of averages.

TABLE VII

Mean Scores of Patients' Wives and Control Wives by Duration of Marriage

	M.P.I.				C.M.I.						*N*	
	E Scale		N Scale		A–L		M–R		Total			
	Patients' Wives	Control	Patients' Wives	Control	Patients' Wives	Control	Patients' Wives	Control	Patients' Wives	Control		
Short marriages (up to 12 years) ..	27·1	24·6	19·1	19·3	11·2	14·4	6·9	8·4	18·1	22·8	*8*	*40*
Long marriages (13 years+)	20·9	24·2	19·1	16·0	20·5	18·2	10·6	6·8	31·1	25·1	*14*	*39*

TABLE VIII

Mean Scores of Patients' Husbands and Control Husbands by Duration of Marriage

	M.P.I.				C.M.I.						*N*	
	E Scale		N Scale		A–L		M–R		Total			
	Patients' Husbands	Control	Patients' Husbands	Control	Patients' Husbands	Control	Patients' Husbands	Control	Patients' Husbands	Control		
Short duration (up to 12 years) ..	22·8	26·9	16·2	13·3	9·6	10·2	5·4	4·7	15·0	14·9	*17*	*40*
Long duration (13 years+)	22·4	23·5	12·7	11·9	13·2	12·7	5·5	4·3	18·7	17·0	*14*	*39*

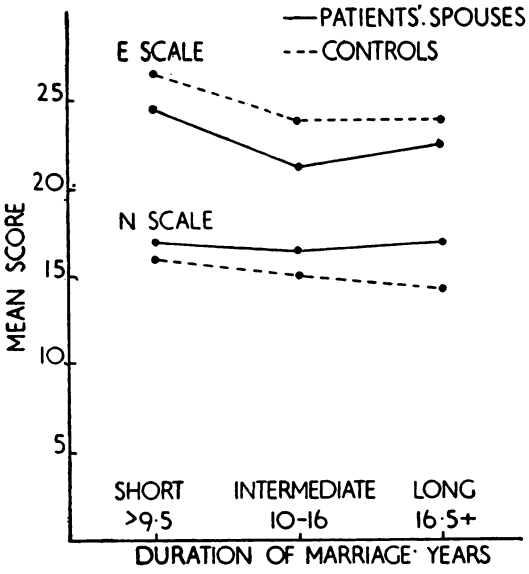

FIG. 1.—Mean M.P.I. scores of patients' spouses and controls, by duration of marriage.
N for patients' spouses: short=21, intermediate=15, long=22: for controls, short=56, intermediate=54, long=48.

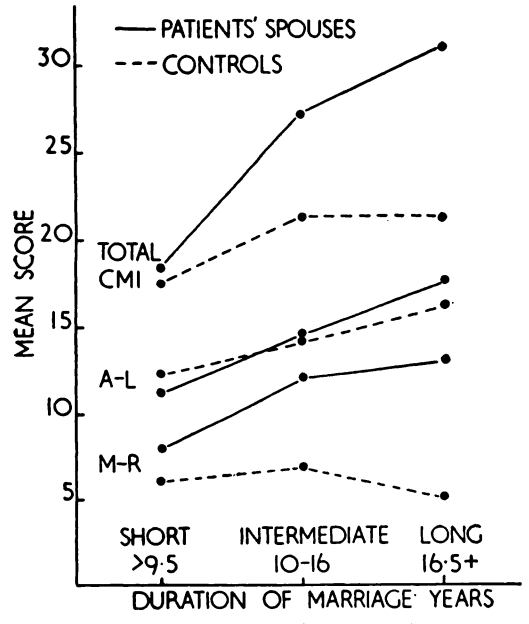

FIG. 2.—Mean C.M.I. scores for patients' spouses and controls, by duration of marriage.
N as for Figure 1.

Preliminary analysis of the variances involved showed that these had no consistent effect on the obtained correlations.*

Table IX gives the results for the M.P.I. All the values for the E scale are near-zero or negative. For the N scale both patient groups show a low initial correlation which thereafter rises, while the opposite is true of the controls. Corresponding C.M.I. values are shown in Table X. The male patients and their wives have low initial levels which then rise in two out of the three indices, and the same is true of the female patients and their husbands but with an apparent anomaly in the A–L section. Again the control pairs have high initial correlations which subsequently fall.

TABLE IX

Correlation Coefficients (Pearson) of Patient and Control Pairs, by Duration of Marriage: M.P.I.

	Male Patients and Wives	Control Pairs	Female Patients and Husbands
E Scale:			
Short duration	−·36	·08	·01
Long duration	−·02	−·08	·00
N Scale:			
Short duration	·27	·50†	·02
Long duration	·47	·37*	·61†

* $p<·05$.
† $p<·01$.
(N as for Table VI).

Some idea of the consistency of these changes with time is afforded by Figure 3, which illustrates the correlations for the M.P.I., using a triple division of marriage duration as previously, both patient groups being combined. On both the E and N scales, the control pairs *initially* correlate at highly significant levels, while the patient–spouse pairs correlate around zero. For introversion, both groups

* F ratios were calculated, for men and women separately (*a*) in each patient group against controls, (*b*) between short and longer duration of marriage, for both patients and controls. Of 120 computations, 9 gave significant ratios. Inspection showed that in these instances the greater variance was associated with a lower correlation coefficient about as often as with a higher correlation.

TABLE X

Correlation Coefficients (Pearson) of Patient and Control Pairs, by Duration of Marriage: C.M.I.

	Male Patients and Wives	Control Pairs	Female Patients and Husbands
A–L Section:			
Short duration	—·04	·49†	·61†
Long duration	—·01	·27	—·31
M–R Section:			
Short duration	·18	·59†	·11
Long duration	·31	·19	·24
Total C.M.I.:			
Short duration	—·10	·66†	·27
Long duration	·26	·19	·44

* $p<·05$.
† $p<·01$.
(N as for Table VI)

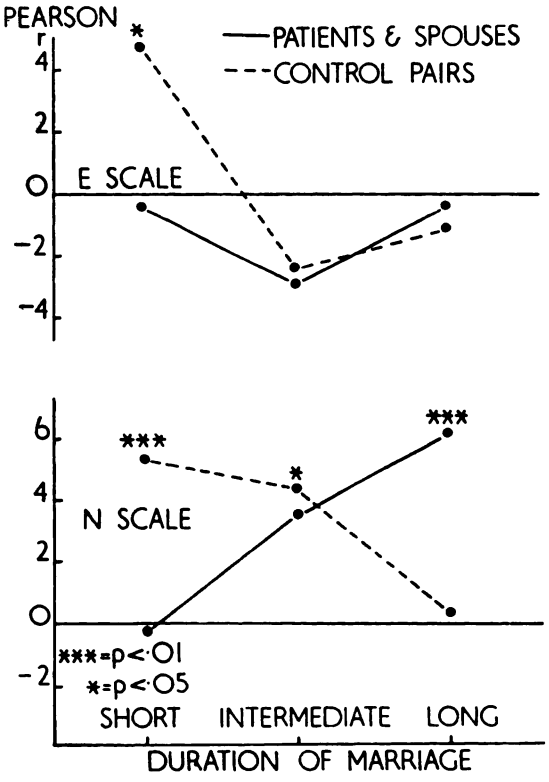

FIG. 3.—Husband-wife correlations (Pearson) on M.P.I. scales, by duration of marriage.
N pairs for patients-spouses: short=21, intermediate=15, long=22; for control couples: short=28, intermediate =27, long=24.

continue at low negative or zero levels thereafter. For neuroticism, the two groups follow strikingly different courses: the patients and their spouses correlate at progressively higher levels, while there is a converse trend among the controls.

The corresponding data for the C.M.I. are shown in Figure 4. Though too complex to interpret fully, the same salient points as previously noted are again evident. On both somatic and mental symptoms, the *initial* levels for controls are high and for patients and their spouses low or even negative. For the A–L and total C.M.I. scores the two groups then approximate and continue similarly. For mental symptoms, however, the trends are as previously noted for neuroticism—a progressive fall in concordance among the control and rise in the patient pairs. As far as can be ascertained, there is no evidence for any of the

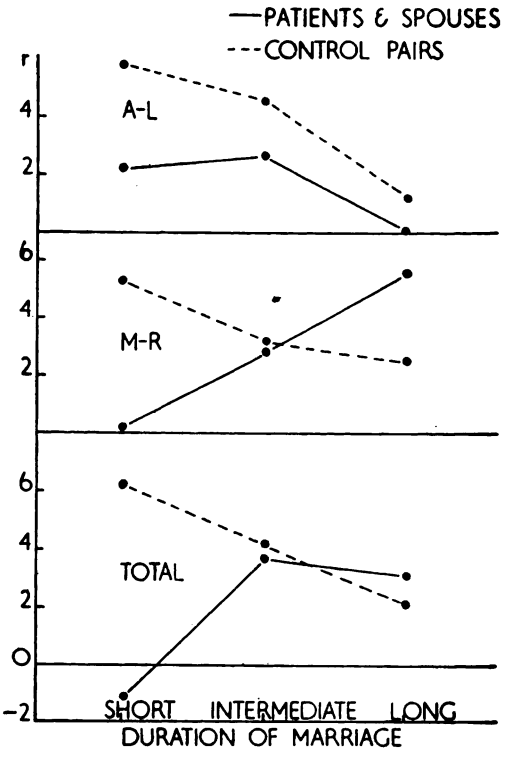

FIG. 4.—Husband-wife correlations (Pearson) on C.M.I. scales, by duration of marriage.
N pairs as for Figure 3.

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variables studied that differences in correlation coefficients are explicable principally by differences in variance.

Severity of Illness Among Spouses

It remains to attempt a translation of the psychometric data into a clinical index of illness. Criteria of "significant illness" were derived by assuming that any individual who scored above the median of the *patients'* scores on the N, M–R or total C.M.I. would be judged undoubtedly ill. Separate criteria were necessary for men and women.* It should be noted that by these standards a substantial proportion even of known patients were excluded: only 68 per cent. of male patients and 64 per cent. of female patients were classified as "significantly ill", as was about a third of the control subjects.

The male "probands", i.e. the male patients and controls, were first divided into "significantly ill" and "not significantly ill" groups, each of which was again dichotomized by the presence or absence of significant illness in their wives (by the criteria for women). The corresponding procedure was then applied to the "female probands" i.e. female patients and controls. Table XI shows the results. Concordance is much more evident (and more highly significant) when the wives are classified by the health of their husbands than when husbands are grouped by the health of their wives. The reader may have noticed the same trend emerging in other sections of the data.

The Table also shows that irrespective of the basis of initial classification, there is a significant concordance among marital illness with respect to "significant illness".

TABLE XI

"Significant Illness" in Marriage Partners

Male "Probands" (Male Patients and Controls):

	Husbands Ill	Husbands Not Ill	
Wives ill ..	22	10	$\chi^2 = 11 \cdot 10$ ($p < \cdot 001$)
Wives not ill ..	23	46	

Female "Probands" (Female Patients and Controls):

	Wives Ill	Wives Not Ill	
Husbands ill ..	24	22	$\chi^2 = 4 \cdot 73$ ($p < \cdot 05$)
Husbands not ill	22	47	

All Subjects:

	Husbands Ill	Husbands Not Ill	
Wives ill ..	52	30	$\chi^2 = 5 \cdot 21$ ($p < \cdot 05$)
Wives not ill ..	24	31	

DISCUSSION

It has been shown that on personality and health variables the patient's spouse deviates from normal subjects in the abnormal direction and that the stricter the criteria of illness applied to the patient, the greater the difference from normal of the partner. This accords with the studies reporting a higher than expected incidence of mental illness among patients' spouses. A picture thus emerges of widespread minor disturbance as a background to a high rate of major disorders.

The data concerning the effects of marriage duration on interspouse correlations are perhaps the most interesting to emerge from this study. It was found that in the early years of marriage the control couples show highly significant positive correlations on extraversion, neuroticism and both physical and mental health. Conversely, the patients and their spouses have low, zero or even negative correlations. At the intermediate duration of 10–17 years the correlations in each group are approximately the same. Thereafter the controls continue to show a fall in correlation on the N and the M–R scores. while the patients and their spouses continue to rise. Failure to consider the effects of duration of marriage, as when simply comparing normals and patient-spouse pairs of the same average marriage duration, would conceal these important differences; the values so derived would represent only an average of the opposite trends in the two groups.

The progressive rise on correlations for the

* The values used for the N, M–R and total C.M.I. scales were 23, 8 and 20 for men, and 30, 20 and 38 for women.

N scale and the M–R section of the C.M.I. among patient-spouse pairs could in theory be due to sampling bias at different stages of marriage. Blacker (1958) had shown that some diagnostic categories have a higher separation and divorce rate than the general population. Such divorced pairs may represent those in which the spouse has not deviated towards the patient, i.e. has not become more neurotic, so that their omission may give a bias to the remainder. This explanation is improbable, since only 5 per cent. of the original patient sample were found to be divorced or separated. Another possibility is that a long-married neurotic only becomes a patient when the spouse reaches a certain level of intolerance, which may well be the point at which the spouse too becomes ill; the spouse not so affected may "contain" the partner within the marriage without psychiatric assistance, and a non-referral will again invalidate the representative nature of the long-marriage group of patients. This possibility cannot be tested on present data, but clinical experience suggests that although an individual may sometimes be referred because of some critical change in the spouse, this happens in too small a proportion of cases to invalidate the major findings.

Assuming then that the data are trustworthy within the limits of the small groups employed, some interpretation is required which would account for the findings respecting (*a*) mean scores, (*b*) initial correlations, (*c*) trends in correlations, and (*d*) the apparently greater effect of the spouse on wives than on husbands.

The assortative mating theory as applied to psychiatric patients may be considered first. This theory postulates mating between those constitutionally predisposed to mental illness, presumably as indicated by social background and personality traits at the time of courtship—a period incidentally, in which neurotic behaviour may be much in evidence (Davis, 1956). Since personality and neurosis are intimately linked, mutual selection of those predisposed to neurosis can be readily understood. For psychosis the explanation is less convincing, since a connection with personality is more tenuous, though possibly such a link is discerned by the intuition of an intending spouse yet hidden from the cooler appraisal of the psychiatrist. The theory is usually understood as a correlational theory, and the evidence adduced in support is usually of this kind. From the literature on *normal* populations it appears that the (Pearson) correlation coefficient for physical characteristics is in the region of ·20 to ·40: for personality variables from zero to ·45: for intelligence about ·55, though with considerable variation on different subtests: for attitudes and opinions about ·60 to ·75: and for age about ·70 to ·75. Concordances with respect to racial, religious and occupational status tend to be still higher. In one of the very few studies conducted in this country Berent (1958) found 54 per cent. concordance for social class and 71 per cent. concordance for educational status, using a four-fold classification of each. Strictly speaking, these findings can be taken to mean no more than that the husbands and wives occupy comparable rank-orders within their own distributions, that is to say, that husbands scoring high with respect to other husbands will tend to have wives similarly placed with respect to other wives. In our society marriage is an open system in the sense that a substantial proportion of the population remain single. This being so, correlations have no necessary implications for means, and the concept therefore requires to be further specified in this respect.

However, the assortative mating theory is clearly inapplicable to the patient population, though it might hold for the normal group, since the former shows no intercorrelation at short-duration marriages, while the latter does so at highly significant levels of probability. Comparison of mean values similarly shows that the patient–spouse do not differ significantly from the controls in the early stages of the marriage, but tend to do so later. Moreover, the theory has no explanation to cover the subsequent changes within the marriage for neuroticism and mental health (in either group). Thus the theory fails on many grounds.

This differs from the conclusion reached by Slater and Woodside (op. cit.) whose study is the most extensive that has yet appeared. These authors, having established that husband-wife concordance on neuroticism exists for both

patient-spouse and normal pairs (but without analysing the effect of duration of marriage) support the selection theory for two main reasons. First, they demonstrate more neurosis and psychopathy among the parents of the wives of their 100 neurotic soldiers than among those of the 100 wives of the controls. Yet the differences are small—19 as against 12—out of approximately 190 parents in each group on whom data was available. If to these are added those parents suffering from psychosis, the difference is reduced to 20 as against 17. Secondly, these authors quote the review by Richardson (1939) who concluded that in *normal* subjects there is no evidence that the resemblances between spouses with respect to temperament, attitudes or interests are affected by length of marriage. Only the first of these, temperament, is relevant here, and only two of the many studies listed by Richardson relate changes in neuroticism to duration of marriage. Hoffeditz (1934), using the Bernreuter Inventory, showed a statistically significant fall in initial correlations with time, much as reported here. Schooley (1936) using the Clark revision of the Thurstone Personality Scale, reported a small rise, but one which is well within chance limits. Of more recent studies, that by Kelly (1955) is the most extensive; on 116 couples followed for over 20 years, he found a tendency for the married individual gradually to move away from the original score of the partner, thus increasing any initial disparity. Over a large number of traits taken as a group he reports no consistent change in interspouse correlations with time; unfortunately, details for neuroticism are not given. In the most recent study by Pond, Ryle and Hamilton (1963), normal pairs showed a decline in their initial positive correlations on C.M.I. scores, demonstrable over approximately the same period as used in the present investigation (data kindly supplied by Dr. A. Ryle).

On balance then, it is reasonable to conclude from these studies that in normal pairs there are no grounds for assuming interspouse correlations for neuroticism or mental health to be stable, and that the recent work is consistent with the present evidence of a decline. The literature has little to suggest on this point for psychiatric patients and their spouses. Assortative mating could still operate in this group with respect to social class, education, religious denomination, etc., and Slater and Woodside's findings on these variables indicate that such is the case.

The alternative theory, that of mutual interaction, is more in accord with the data, especially for patients and their spouses, even if not fully borne out. The simplest form of verification would be to demonstrate increasing degrees of disturbance among the patients' spouses, as compared with controls, with increasing duration of marriage. This trend has been demonstrated here, but not to a statistically significant level, possibly because of the diagnostic heterogeneity of the patient sample and the small size of the groups. The correlation data, however, do attain statistical significance, and the different trends in the two groups support the interaction hypothesis, but on the other hand, this theory cannot account for the initially high correlations among normal pairs.

It appears then that no one construct can adequately cover all the findings in both normal and patients groups. The picture is a complex one but might be explained as follows.

After an initial "sound" choice of partner, i.e. one of comparable background and personality, and of similar mental and physical health, the normal couples continue to develop relatively independent marriage "careers", as Foote (1956) expresses it, and are aided in doing so by maintaining a reasonable number of social outlets. In consequence, the further health and personality development of the partners occurs separately, or, in statistical terms, at random, with a resulting fall from the initial high correlation. Note that a trend towards personality "polarization" between the partners would produce a similar effect.

Neurotics commence marriage with spouses who as a group have no conspicuous differences from the rest of the population, having approximately normal mean values on the admittedly crude measures of health and personality currently available. But the least disturbed neurotics do not marry the least neurotic spouses, nor do the most ill neurotics pair with the most deviant: hence the zero correlation.

It may be noted that the relative lack of neurotics in the general population is of little importance in this context. Such a deficit in the "pool" of prospective mates need influence correlations relatively little, although (within the limits previously discussed) it may lower the mean neuroticism and illness indices of those selected. According to the sociological literature, minority status *per se* has no effect on husband-wife concordance for racial, religious or educational variables. The precise determinants of mate selection by neurotics raise wide issues, but it will be recalled that a lack of correlation between partners was also found for a non-neurotic personality variable, extraversion, and it might be that the choice of spouse by the potential patient is especially dependent upon apparently superficial or trivial influences—in other words on symbolic, transference or other essentially "neurotic" factors.

Now, it is generally accepted that as time progresses the neurotic operates in a progressively shrinking social framework. This must generally involve the spouse, so that the pair are increasingly involved with each other and tend to acquire each other's characteristics, which in practice probably means that where the neurotic remains ill enough to seek treatment at some point, his spouse becomes progressively more disturbed. Hence the rising intercorrelations and the similar trend for mean values. Since for occupational reasons wives are generally more dependent on their husbands for external outlets than are husbands upon wives, and since in any case wives usually make the greater adjustment in marriage (Burgess and Wallin, 1953), the interaction effect may be expected to be manifest more by the wives, as has been shown.

A postulate central to this account is that there are differences in the amount of social activity of patients' spouses and spouses of normal subjects. This could be tested directly. Additional hypotheses may occur to the reader. There is, for example, the possibility that those who fail to make a homogamous marriage *become* neurotic, and that marriage of this kind, which sometimes leads to divorce (Terman, 1938), may alternatively lead to neurosis. On balance this theory appears to be less able to cover all the data than the one given above, but deserves consideration.

In normal subjects the psychological basis of mate selection is poorly understood. For neurotic individuals there are many clinical accounts but few attempts to test particular hypotheses. Interaction processes have similarly been frequently described, but close investigations are lacking, although such studies might well contribute to an aetiological theory of neurosis.

Independent confirmation of the findings of this investigation, with special enquiry into the social integration of the married couples, will be necessary before the explanation above can be substantiated or additional possibilities evaluated. Meanwhile, it is safe to conclude that for neuroticism and health the assortative mating hypothesis is too simple to fit all the facts, especially for the psychiatric patient and his spouse, and that interaction within such marriages deserves close attention.

Summary

1. A group of 75 patients (31 men and 44 women) and 95 controls (32 men and 63 women), known to be closely matched on age, sex, social class, father's social class, educational status and number of children, formed the basis of a postal survey in which the subjects and their spouses were asked to complete the Maudsley Personality Inventory and the Cornell Medical Index and to give certain biographical details. The overall response rate was 85 per cent. There was no evidence that the responders were atypical of their groups in any important respect. The male and female patients who replied were closely comparable with control subjects of the same sex over a range of variables.

2. The patients' spouses were more neurotic and had more physical and psychological symptoms than same-sex control subjects. This discrepancy became more marked (and more highly significant statistically) when the subjects were re-classified on a psychometric basis.

3. Correlations between spouses were usually positive at significant levels in both groups, with the exception of extraversion.

4. Length of marriage was reflected in a progressive increase in neuroticism among the patients' spouses when compared with controls, and the same was true of M–R and total C.M.I. scores. Extraversion and A–L scores showed no such trend.

5. Patients and their spouses had zero or non-significant correlations during the early years of marriage on introversion, neuroticism, physical and mental health. On all these, control subjects and their spouses showed highly significant positive correlations at the comparable period of marriage. As marriage progressed, patients and their spouses correlated increasingly highly on neuroticism and psychological health, while in normal pairs the concordance progressively fell.

6. It appeared that wives were more likely than husbands to reflect the illness of their spouses.

7. After evaluation of the data, some implications were discussed, and it was concluded that neither assortative mating nor interaction between marriage partners could alone explain all the findings. The role of each factor was reviewed, and stress laid on the relative social isolation in which patient-spouse interaction often occurs.

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