A CENSUS OF PSYCHIATRIC CASES IN TWO CONTRASTING COMMUNITIES

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INTRODUCTION

DURING recent years members of the Medical Research Council Pneumoconiosis Research Unit have carried out a number of studies of the prevalence and incidence of common diseases in two populations in South Wales and attempted to relate differences in morbidity to known differences in social and environmental factors (Cochrane and Miall, 1956). The communities studied are the Rhondda Fach, a mining valley with a population in 1951 of 19,722 (aged over 15 years) living in a contiguous series of eight small towns, and a number of parishes in the Vale of Glamorgan, approximately ten miles from the Rhondda Fach, in which the population of 4,621 (aged over 15 years) is spread over a relatively large agricultural area. These will be referred to as the Rhondda and the Vale. They were originally chosen to provide a complete mining community (in which the prevalence of diseases of the lungs in miners and ex-miners could be estimated) and a contrasting, predominantly rural, population respectively.

It was found in successive investigations that random sampling of these populations provided valuable information about the epidemiology not only of diseases of the chest (Cochrane *et al.*, 1952, 1955, 1956) but also of coronary heart disease (Thomas, Cotes and Higgins, 1956), hypertension (Miall and Oldham, 1955) and rheumatoid arthritis (Miall, 1955).

Through the co-operation of the Pneumoconiosis Research Unit the opportunity was presented to extend these epidemiological studies to measure certain indices of psychiatric morbidity in the two areas during a period of five and a half years. Where differences of "ascertained prevalence" of psychiatric disorders were observed, an attempt was made to relate these findings to sociological differences between the populations at risk, as a first step towards establishing the degree to which socio-environmental factors contribute to the recognition and treatment (if not to the aetiology) of certain manifestations of mental illness. It is necessary therefore to summarize their respective social features.

SIMILARITIES AND CONTRASTS IN THE COMMUNITIES

The Rhondda and the Vale are not far apart. Both lie in the county of Glamorgan. Information was not obtained about the relative incomes per head, but it was found that overcrowding (persons/rooms) was not significantly different in the two areas. Their inhabitants are of mixed descent, and all speak English; only a few members of either community also speak Welsh, and these

https://doi.org/10.1192/bjp.104.434.72 Published online by Cambridge University Press

are of the older generation. The two populations are served by the same two mental hospitals and four psychiatric out-patient clinics. None of the four hospitals providing psychiatric treatment lay within the two areas but all were within easy reach. For most individuals there was a clinic or mental hospital within a 15-mile journey, and for many within a shorter distance.

In addition to the original criterion of the presence of coal-mining in one and its absence from the other area, the communities differed in the following respects:

(i) *Density of population.* The larger Rhondda population is concentrated in a relatively much smaller area. The Vale has a very low population density. As a result, the appearance of the Rhondda is predominantly industrial (even the adjacent hills being surmounted by slag-tips) whereas the Vale presents an unspoilt rural landscape.

(ii) *Occupational distributions.* The Pneumoconiosis Unit's survey in 1953 showed that the Rhondda has a greater homogeneity in male occupations, 70 per cent. of the male population over 15 being miners or ex-miners* while the major industry in the Vale, farming, claims only 36 per cent. of the men over 15. Comparison of the two populations in terms of social class (using the Registrar General's five-fold classification by occupations) shows a relatively greater representation of the upper occupational classes in the Vale. The percentage distribution of men over 15 in the Vale is: Classes I and II (professional) 10 per cent.; Class III (skilled) 71 per cent.; Class IV (partly skilled) 12 per cent.; Class V (unskilled) 7 per cent. The distribution in the Rhondda is: Classes I and II—8 per cent.; Class III—52 per cent.; Class IV—28 per cent.; Class V—12 per cent.

(iii) *Public transport.* The small towns which comprise the Rhondda are strung along a single main road which runs down from the head of the valley, leading to the city of Cardiff; bus services are frequent and easy of access. The scattered farms and small villages of the Vale are served by relatively infrequent and less readily accessible country bus services.

(iv) *Changes in population.* The Vale has been farmed for many centuries; its Royal Borough of Cowbridge (population 1,000) has a charter dating from the 13th century. In contrast, until the discovery of its coal fields a little over a hundred years ago, the Rhondda was a bleak valley inhabited only by a few shepherds and their flocks; as each new pit was dug it attracted workmen from Ireland, North Wales, Somerset and the Midlands. The peak population increase was reached in the first decades of the present century. During the depression of the nineteen-thirties many emigrated from the Rhondda. During and since the second World War improved conditions in the mines and the provision of alternative light industry have arrested the flow of emigration. In the Vale there are numerous instances of relatively prosperous incomers buying residential property, or farms, within the last twenty years. The size of these population shifts has not been established.

(v) *Ascribed characteristics of the two populations.* In addition to the above more or less objectively demonstrable differences, the populations were regarded by the consensus of local opinion (in which they themselves shared) as exhibiting quite markedly contrasting social traits. People from the mining valley were described as being "rougher", more prone to drunkenness, to violence, to petty crime and to immorality, more talkative and more belligerent than those from the Vale, given to extremes of left-wing politics on the one hand and of chapel-

* Men are only defined as "ex-miners" if they have been employed atleast six months in work involving underground activities.

https://doi.org/10.1192/bjp.104.434.72 Published online by Cambridge University Press

dominated puritanism on the other. They were known to have enjoyed relative prosperity in the last fifteen years, but this was generally said only to have increased their consumption of alcohol, and with it their emotional instability. In contrast, the farmers and other country dwellers in the Vale were regarded as relatively placid, stolid people, slow-moving and law-abiding, who might have their share of idiosyncrasies but were accustomed to keep themselves to themselves and to avoid the public display of emotions.

Although these two antitheses have been simplified to the point of caricature, they do represent patterns of behaviour ascribed to these two communities by local verbal tradition. In short, the Rhondda was said to exhibit many of the attributes of social life in an industrial slum, whereas the Vale appeared to be an unexceptional rural community. Since the former presented a picture of relatively greater "social disorganization" (Faris and Dunham, 1939) or of *anomie* (Durkheim, 1930) it was expected that rates for crime, suicide and psychiatric illness would, as postulated by these authors, be higher in the Rhondda community than in the Vale. As will be seen, not all of these expectations were fulfilled.

Aim and Methods of Present Study

An attempt has been made to ascertain the numbers of presenting cases of mental disorder in the two communities by counting all persons admitted to mental hospital, all those seen at psychiatric out-patient clinics, all cases of suicide and attempted suicide, and also the totals of certain indictable offences (sexual offences and cases of bodily assault) occurring in the two populations in the 5½-year period from 1 January, 1951 to 30 June, 1956. The number of patients in mental hospital at the end of this period was also determined. The age and sex distributions of each population and also certain details of male occupational histories were available from the Pneumoconiosis Research Unit. It was thus possible to establish psychiatric sickness rates for both men and women in relation to these two communities and also, within the larger Rhondda community, to compare the rates shown by miners and ex-miners with those in the remainder of the male population.

The study is based almost entirely on documentary evidence. For the counts of psychiatric in-patients and out-patients, and indictable offences, the study shows how many cases came to be formally recorded during the period under review. For cases of suicide and attempted suicide, evidence was also sought from general practitioners. No attempt was made to interview patients, nor to ascertain a "true count" of psychiatric cases in the populations.

Search was made of the records of all mental and general hospitals serving the area in order to complete the following counts:

(a) *Patients in mental hospital on 15 July, 1956.* (All other counts were of cases during the 5½-year period under review.)

(b) *Patients admitted as in-patients to mental hospital, psychiatric unit or observation ward in the 5½-year period.* To avoid overlooking patients who had sought private psychiatric treatment outside the area, inquiries were made at ten private hospitals, yielding in all two extra cases. General practitioners were also consulted about possible private mental hospital patients.

No attempt was made to assess the number of psychiatric cases (except for attempted suicides) in the general hospital population because of diagnostic difficulties.

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(c) *Persons seen by psychiatrists in out-patient consultation in the 5½-year period* (including those seen in private consultation).

(d) *Cases of suicide.* As recorded in the records of the Regional Medical Officer of Health in the 5½-year period. Death certificates were scrutinized to confirm possible instances of suicide where an open verdict had been made.

(e) *Cases of attempted suicide in the 5½-year period.* The eighteen G.P.s and consultants who cover the area were consulted as well as the case records of the ten local general and cottage hospitals, paying particular attention to cases of laceration, asphyxia or poisoning: only those in which definite evidence of suicidal action was found were included.

(f) *Persons charged with specified offences in the 5½-year period* (crimes of violence and certain sexual offences believed on *a priori* grounds to be frequently associated with mental disorder) were obtained by our being given access to the record system at the headquarters of the County Constabulary. Only crimes committed within the specified areas of this study by members of the population were recorded.

In all the above counts only persons over the age of 15 at the time of treatment or occurrence were included.

The County Council records of ascertained mental defectives were examined but were not used in this study as they were declared to be far from complete. Only a few mental defectives actually admitted to mental hospitals have thus been included in our figures: those in special Mental Deficiency institutions have not been included.

Results

(*i*) Comparison of Findings in the Two Populations

To allow for age and sex differences between the two communities, the Rhondda figures, which relate to a population over four times larger than the other, have been corrected by standardizing them to the Vale figures in each 5-year age-sex group. The standardized figures can then be compared with actual totals for the Vale to give a comparison between rates in the two areas. In the following account standardized figures for the Rhondda are used unless otherwise specifically stated.

The results for all counts are shown in Table I: the figures refer to persons and not events except that for admissions in the 5½-year period events are given as well to permit comparison with the Registrar General's figures.* χ^2 statistical tests were used.

(a) *All Psychiatric Cases Identified During the 5½-year Period*

The term "psychiatric case" is used to include all persons who were seen by a psychiatrist as out-patients, or were admitted to mental hospital, or attempted or committed suicide. These totals do not include crimes, mental defectives outside mental hospital care, or those who remained inside a mental hospital throughout the 5½-year period.

Total psychiatric cases shown in Table I are proportionately more numerous in the Rhondda; the differences for the total cases, and for men only, are both

* For example, an admission three times during the period is counted once under "persons" and thrice under "events" in Table I. If the same person also attended an out-patient clinic, under our count of "all psychiatric cases" the total history is still recorded as one case.

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TABLE I

Census Totals for the Various Counts

		Rhondda	Standardized Rhondda	Vale	P
In-patients	M	52	12·8	3	Significant <0·01
15 July, 1956	F	39	8·9	9	Not significant
Admissions	M	87	20·9	13	Not significant
1951-56 (Persons)	F	83	18·7	33	Significant <0·01
Admissions	M	100	24·0	13	Significant <0·05
1951-56 (Events)	F	99	22·4	34	Significant <0·05
Out-patients	M	119	28·4	7	Significant <0·001
1951-56	F	150	33·6	21	Significant <0·05
Attempted suicide	M	16	3·9	1	—
1951-56	F	36	8·2	5	Not significant
Suicide	M	14	3·4	4	—
1951-56	F	7	1·6	—	—
Crimes	M	37	8·5	10	Not significant
1951-56	F	2	—	—	—
All psychiatric	M	190	45·5	22	Significant <0·001
cases 1951-56	F	224	50·6	44	Not significant

statistically significant ($p<0·001$). The difference between the totals for women is not significant.

As the figures refer to persons irrespective of the number or type of counts under which they are recorded, an estimate of the rate of appearance of new psychiatric cases in each population was possible. Expressed as the average number of cases per annum per thousand of the population over 15 the rates are as follows; the figures are not standardized:

Rhondda: 3·81 (men, 3·67; women, 3·96, giving a male/female ratio of 0·93).
Vale: 2·60 (men, 1·76; women, 3·42, giving a male/female ratio of 0·51).

These rates, considered as a measure of new psychiatric cases, will be too large as some persons would already have been in touch with psychiatric services before 1951: but the small number of duplications within the 5½-year period suggests that this may be a minor error.

(b) *Patients in Mental Hospital on 15 July, 1956*

Male patients from the Rhondda (standardized) were 4·26 times more numerous than those from the Vale ($P<0·01$). No such statistically significant difference was shown where women were concerned, the figures being equal. These figures reflect the small proportion of men to women patients in the Vale (0·33) and the large ratio in the Rhondda (1·33). The male/female ratio for mental hospital patients in England and Wales as a whole was 0·74 in 1951 (R.G.O. 1955, Table M5, p. 134). All three men from the Vale were schizophrenics and so were 32 out of 52 men from the Rhondda. In women patients, schizophrenia was diagnosed in three out of nine cases from the Vale and in 23 out of 39 cases from the Rhondda.

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(c) *Admissions to Mental Hospital (1 January, 1951 to 30 June, 1956)*

There is again a difference in the totals (persons) for men, there being 1·60 times more admissions in the Rhondda, although the difference is not statistically significant (P=0·1). This difference is reversed in favour of the Vale in the case of female admissions and is significant (P<0·01). The figure for *events* gives approximately the same results, but the difference in the case of men patients is now significant (P<0·05) and the significance level for women is reduced to 0·05. The ratio of male cases (events) to female cases is equal in the Rhondda (ratio 1·01) but again in the Vale the women greatly outnumber the men (ratio 0·38). The corresponding figure in 1951 for Wales is 0·75 and for England and Wales as a whole is 0·70 (R.G.O. 1955, Table M.10, p. 144).

In respect of diagnoses, rates for schizophrenic and organic and senile psychoses are similar in the two populations for both sexes. Differences are most apparent in men with affective psychoses, who occur much more frequently in the Rhondda (actual numbers Rhondda 25, Vale 1); for women the position is reversed, the Vale contributing a higher rate of cases both of affective psychoses (actual numbers, Rhondda 29, Vale 10) and of psychoneurotic and psychopathic disorders (actual numbers, Rhondda 14, Vale 7).

(d) *Psychiatric Out-patients (1 January, 1951 to 30 June, 1956)*

General practitioners in both areas referred many patients to psychiatric consultation at out-patient clinics. The totals in Table I refer to persons having at least one interview with a psychiatrist. Large and statistically significant differences were found between the totals for the two communities. Rhondda men patients outnumber those of the Vale by 4·05 times (P<0·001) while Rhondda women outnumber the Vale by 1·60 times (P<0·05). In both communities (but especially in the Vale) women patients outnumber the men, the male/female ratios being 0·87 for the Rhondda and 0·34 for the Vale. There are no comparable national figures.

When diagnoses are analysed, men from the Rhondda greatly exceed those from the Vale on all counts. The Vale yields no men with schizophrenia or affective psychosis and only five cases of psychoneurosis or psychopathy, whereas the Rhondda shows 11 schizophrenics, 16 affective disorders and 62 cases of psychoneurosis or psychopathy. In the women this discrepancy is reversed for schizophrenia (actual numbers: Rhondda 6, Vale 3); it is present but less marked for affective psychoses (actual numbers: Rhondda 31, Vale 6) but it is again very marked for cases of psychoneurosis and psychopathy (actual numbers: Rhondda 81, Vale 5).

(e) *Attempted Suicide (1 January, 1951 to 30 June, 1956)*

The figures show differences similar to those of out-patients. Men patients from the Rhondda outnumber those from the Vale by 3·87 times (a statistical test was not applied to the actual figures of 16 and 1). The difference in female cases was smaller, the Rhondda standardized total being 1·63 times the greater, which is not significant (P<0·1—actual figures 36 and 5). As in the count of out-patients, women outnumber the men in both communities, the male/female ratio being 0·48 for the Rhondda and 0·21 for the Vale.

(f) *Suicide (1 January, 1951 to 30 June, 1956)*

There is a negligible difference between the suicide totals for the men. Seven cases occurred among females in the Rhondda, and none in the Vale:

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the figures are too small for tests of significance. As previous studies have shown, the preponderance of females over males in cases of attempted suicide becomes reversed in cases of suicide.

(g) *Specified Crimes (1 January, 1951 to 30 June, 1956)*

Only two women (both from the Rhondda) figure in these counts. Contrary to expectation the figures for men show no statistically significant difference between the two populations.

(*ii*) Analysis of Rhondda Male Cases by Occupation

The number of male cases from the Rhondda population were large enough to warrant some further analysis. It was possible in all but 8 of these 189 cases to determine whether the individuals concerned were miners, ex-miners or non-miners.

The figures shown in Table II represent men in the Rhondda over 15 years of age who consulted psychiatric services or committed or attempted suicide during the period under review. These figures refer to persons, not events: they give a close approximation to the rate of appearance of new psychiatric cases in the populations studied.

Table II

Rhondda Male Psychiatric Patients by Occupation

	Psychiatric Patients	Total Population	Average Rate Per 1,000 of Population Over 15
Miners and ex-miners	86	6,513	2·37
Non-miners (including 8 never worked) ..	95	2,917	5·98
Not known	8	—	—

The group of non-miners yields proportionately more than twice as many psychiatric cases as the group of miners and ex-miners—a difference which is statistically very significant ($P<0·001$).

When figures for the separate indices are analysed (Table III) this difference is repeated at the same level of significance for every count except those of suicides and attempted suicides. There is no significant difference in the frequency of attempted suicides in the two groups: in the case of suicide there is a reversal, the rate being over twice as high in the group of miners and ex-miners.

Table III

Rhondda Males by Occupation and Separate Counts

	Total Population	In-patients 1951-1956	In-patients 1956	Out-patients 1951-1956	Attempted Suicide 1951-1956	Suicide 1951-1956
Miners and ex-miners ..	6,513	31	21	56	11	12
Non-miners (including never worked) ..	2,917	53*	31	58	4	2
Not known ..	—	2	—	5	1	—

* Includes 2 who had "never worked".

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However, the age distributions of the two populations at risk were very dissimilar. Among the miners and ex-miners there were progressively more in the older age groups, while in the non-miners there were progressively less. Since there is a differential risk of exhibiting a psychiatric disability in different age groups, it is possible that the differences given in Tables II and III might be related directly to this. To throw light on this point the populations at risk and the persons included in our counts were analysed by 5-year age groups, using a critical ratio test and thus holding the factor of age constant. The differences in the age range 30–54 were still found to be statistically significant ($P<0{\cdot}01$); thus at least in this age range, which included about half the cases, differences are very unlikely to be related only to the age distribution of the persons at risk in the two populations.

In the other two age ranges the differences are in the same direction but are not large enough to be statistically significant. It appears therefore that factors other than the age distributions of the populations at risk are at work.

The difference of age-distribution of these two groups *does*, however, go far to explain the disproportionately high rate of suicides among miners and ex-miners. It is known that suicide rates for men reach a peak in late middle and old age. The average age of suicides in the mining group is 57; the ages of the two instances in non-miners are 33 and 34. The average ages of the populations at risk are 47·8 and 34·9 years respectively, with a loading of the older age-groups in favour of the miners.

An analysis of the diagnoses of men admitted to mental hospital over the 5½-year period shows that the main differences between the two groups are in the categories schizophrenia and psychoneuroses; the rate of occurrence of schizophrenia being four times greater and that of psychoneuroses nine times greater among the non-miners (actual figures: "mining" 7 schizophrenia, 4 psychoneuroses; "non-mining" 12 schizophrenia, 18 psychoneuroses). The "depressive" and "organic" groups show only small differences. Because of the small numbers and different age distribution of the populations at risk these figures can only be suggestive.

Discussion

The salient points emerging from this survey can be briefly summarized as follows: psychiatric cases were found to occur more frequently in the Rhondda than in the Vale, but whereas in the former area the sex ratio approaches equality, in the Vale cases were twice as numerous in women as in men. As compared with national figures, Rhondda men were over-represented and Vale men were under-represented among patients admitted to, or remaining in, mental hospitals.

Men from the Rhondda sought psychiatric out-patient advice four times more frequently than did men from the Vale. In both areas women out-patients outnumbered the men; this was particularly evident in the Vale. Cases of attempted suicide showed a similar distribution, but actual suicides occurred with equal frequency among men of either community. Men from the two areas were involved with equal frequency in crimes of violence.

On sub-dividing the Rhondda men into "miners and ex-miners" and "non-miners" it was found that psychiatric cases (in all counts except that for suicides) occurred more frequently in the minority group of "non-miners". This preponderance could not entirely be accounted for by the differing age-range of the two groups; but the relatively high rate of suicides in the former

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group could be so explained. In terms of diagnoses, the "non-miners" yielded more than their share of cases of schizophrenia and psychoneurosis, but equal numbers of affective disorders and organic syndromes.

Some of these findings conform to expectation. It has repeatedly been shown that admissions to mental hospitals occur more frequently from urban than from rural areas. For example, standardized rates for first admissions in New York State (Malzberg, 1940) have shown urban/rural ratios of 1·8 to 1 for men patients and 1·5 to 1 for women. Figures for admissions to mental hospitals in England and Wales in 1951 from Country Boroughs and Rural Districts show less marked differences: the ratios for men are 1·48 to 1 and for women 1·32 to 1 respectively (R.G.O. 1955, Tables M.21(a) and (b)).

In this survey the ratio of male admissions to hospital from the Rhondda to those from the Vale is 1·60 to 1, but the rate of admission of women patients is actually higher in the Vale than in the Rhondda.

Male patients from the Rhondda have accumulated in mental hospital so that they are four times more numerous than the corresponding figure from the Vale; but in spite of a much higher admission rate the women patients from the Vale have *not* accumulated in hospital to a corresponding degree. Any consideration of totals of patients remaining in hospital must be qualified by the reminder that some of these patients were admitted many years ago, from populations which may have differed in some respects from those of the present study.

In analysing rural-urban differences in hospital rates in Ontario, the authors of a careful study (Buck, Wanklin, and Hobbs, 1955) compared the severity of patients' symptoms on admission, and reached the conclusion that "the excess urban admission rate arises almost entirely from a greater urban tendency to hospitalize cases whose symptoms could be tolerated in the community". This conclusion, if it is relevant to the present findings, would suggest that the Rhondda population is more intolerant of incipient psychiatric symptoms in its men, and the Vale in its women-folk. The Vale appears readier to receive ex-hospital patients back into the community.

There is a conspicuous difference in the frequency with which men from the two communities have consulted psychiatric out-patient clinics: the Rhondda men preponderate greatly in all diagnoses. This preponderance is much greater than that for admissions to mental hospital (which can be regarded as indicating a more serious complaint than mere attendance as an out-patient) and it disappears altogether when actual cases of suicide are counted. It appears therefore that men from the Rhondda have been readier to present with the minor forms of mental disorder than have men from the Vale. The same is true of women from the two areas; women out-patients from the Rhondda were 1·6 times more numerous than those from the Vale and this preponderance was not due to cases of schizophrenia or affective disorder, but primarily to an increase in the psychoneuroses.

It appears therefore that recourse to psychiatric advice occurs more frequently in the Rhondda; and that in the Vale women seek this recourse much more readily than do the men. This may indicate that women are more dispensable in the rural community. In view of the frequency with which the coal-mining community becomes the target of unfavourable comment, it is interesting to note that it was the *non-miners* in the Rhondda who contributed more than their share to every index of psychiatric disorder except actual suicides. The relatively high rates among non-miners (which are only partly accounted for by their lower age-range) could be regarded as an instance of

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the vulnerability of the minority group in a community (Faris and Dunham, 1939); but a more likely explanation is that of adverse selection to a less favourable occupation—an explanation which has been adduced to account for high rates of psychiatric breakdown among seamen in Norway (Odegaard, 1956; Sundby, 1956). Mining is a strenuous, dangerous, but relatively well-rewarded occupation. In the Rhondda miners are the aristocrats among manual workers, so that one can expect a higher incidence of physical and emotional handicap among those who elect to take lighter and less well-paid jobs instead.

Speculation is easy, but a linking together of social pressures and psychiatric disabilities in causal terms must await fuller analyses (*i*) of the social structure and value systems of the communities (with particular reference to prevailing attitudes to mental illness), (*ii*) of the circumstances leading to the emergence of the declared cases, and to the "carrying" of undeclared illnesses in each community, and (*iii*) of the clinical features of the illnesses themselves. Towards such a study the present survey can serve only as a pointer.

Summary

1. A count was made of psychiatric cases, attempted suicides, suicides and crimes of violence occurring during a 5½ year period in two defined communities in South Wales, a mining valley and an agricultural area.

2. Cases occurred at the rate 3·8 per 1,000 of population over 15 per annum in the mining valley and 2·6 per 1,000 per annum in the agricultural area.

3. In the mining valley, admissions to mental hospital were as frequent among men as among women; suicides were twice as frequent among men. Women outnumbered men in out-patient attendances and attempted suicides.

4. In the agricultural area, women greatly outnumbered men in all psychiatric counts except suicide.

5. Crimes of violence occurred with equal frequency among men of either community.

6. On analysing the Rhondda male cases by occupation, it was found that the larger group of miners and ex-miners showed a significantly higher rate of suicide than did non-miners: this could be accounted for by their higher mean age.

7. The group of non-miners contributed a disproportionately high number to all other indices of psychiatric disorder.

8. The relation of these findings to sociological differences between the communities is discussed.

Acknowledgments

In the carrying out of this study the authors received help from many individuals and institutions in the Cardiff region. Particular thanks are due to Dr. Gilson, Director of the Pneumoconiosis Research Unit, and to Dr. Cochrane and the members of his epidemiology research team, to Dr. W. E. Thomas, Medical Officer of Health of Glamorgan, to Mr. Watkins, Chief Constable of Glamorgan, to the Matrons and staff of all the hospitals we consulted, to Drs. Morgan and Hennelly, Medical Superintendents of Bridgend and Whitchurch hospitals, and to the medical practitioners of the two areas.

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https://doi.org/10.1192/bjp.104.434.72 Published online by Cambridge University Press