

ENVIRONMENTAL AND HEREDITARY FACTORS IN
THE SCHIZOPHRENIAS OF OLD AGE ("LATE
PARAPHRENIA") AND THEIR BEARING ON THE
GENERAL PROBLEM OF CAUSATION IN
SCHIZOPHRENIA

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THE paraphrenias raise a number of problems common to many other disorders in the field of psychiatry, and their solution might therefore advance knowledge in a number of directions. The relationship between paraphrenic, paranoid and schizophrenic illness has long been disputed, and no view at present commands general acceptance. It has seemed to us that these controversies have often turned upon unacknowledged assumptions as to whether clinical, prognostic or genetic criteria, or all of these, were to be employed to decide the issue.

In a descriptive sense the term has been applied by continental and English authors to a condition, arising usually in the fourth or fifth decade of life, in which paranoid delusions and hallucinations are prominent, but the affective volitional and intellectual aspects of the personality remain fairly well preserved despite a chronic course. It is customarily distinguished from paranoid schizophrenia on the grounds that typically schizophrenic symptoms are absent. It is also considered distinct from paranoia, where the delusions are very well systematized and hallucinations do not occur. Yet when the later course of the illness is taken into account, many of these points of distinction fail, since, as was found by W. Mayer (1921), after a few years more than half of patients with paraphrenia do exhibit typical schizophrenic symptoms, and nearly all of a group of patients with paranoia were found by Kolle (1931) to have primary delusions, which are widely regarded as pathognomonic of schizophrenia. Kolle's studies also showed genetic affinities between paranoia and schizophrenia, since among the children typical cases of schizophrenia were six times, and among the sibs, three times as common, as in the average population, though less common than among the relatives of schizophrenics. The result has been that chronic delusional states with or without hallucinosis are now regarded by many authorities as mild forms of schizophrenia, attenuated and modified by certain constitutional features. In the American system of classification paranoia is however classified among the paranoid states, which are regarded as "reactions", schizophrenia, including the paranoid form, being specifically excluded.

The term "paranoid reactions" is widely used to cover a group of conditions, mostly of short duration but sometimes chronic, arising in circumstances of adversity, characterized by paranoid and referential ideas, often with hallucinations, but lacking the nuclear symptoms of schizophrenia. The personality is

often over-sensitive, prone to suspiciousness or otherwise abnormal. These reactions have been observed during imprisonment, among aliens and refugees, in the deaf or disfigured, during adolescence and the period of involution, in compensation cases, in folie à deux and in infections and intoxications. In some of these conditions family studies have also shown some increase over expectation in the risk for schizophrenia among relatives.

When paranoid delusions commence in old age, they are generally believed to be due to senile or arteriosclerotic changes in the brain. Yet, as the above account shows, the aetiology of paranoid psychoses is complex. In the paranoid reactions and the chronic delusional states genetic and other more general constitutional factors interact with exogenous ones to produce the mental illness and even in schizophrenia itself the studies on twins by Slater (1953) and on social factors by Hollingshead and Redlich (1953) and by Hare (1956) have focused attention on the contribution made by the environment.

In this study, "late paraphrenia" is used as a suitable descriptive term, without prejudice as to aetiology, for all cases with a paranoid symptom-complex in which signs of organic dementia or sustained confusion were absent, and in which the condition was judged from the content of the delusional and hallucinatory symptoms not to be due to a primary affective disorder. Provided these criteria were satisfied, no case showing a paranoid psychosis was excluded. In the result, cases were found to have more or less well-marked schizophrenic symptoms, and a small proportion exhibited no hallucinations. The material was studied as one group in order to see what related factors emerged as the most significant and consistent. Different varieties would be identified if this proved possible, and their aetiology studied.

Special importance was attached to follow-up of the cases to determine the rate of mortality and the incidence of cerebral disease.

In the course of these studies we became aware that many patients were solitary, eccentric, isolated and difficult individuals and that these characteristics had been very long-standing rather than imposed by an illness of recent onset. They therefore presented a particularly favourable opportunity for investigating the phenomenon that has been rather crudely called "social isolation". In addition to schizophrenia, where a failure of social communication was first suggested as a factor in causation by the researches of Faris and Dunham in Chicago (1937), the mental disorders of migrants, minority groups, the deaf and those who attempt and commit suicide have been frequently attributed in part to a social predicament of this nature. An aetiological role has been attributed to social isolation in these diverse settings largely on the strength of statistical associations elicited in the course of epidemiological research. The network of cause and effect is difficult if not impossible to disentangle in these enquiries. The essential complement to them is the detailed investigation of small groups of cases, for, until confirmation has been adduced from study of the life histories of actual patients with mental illness, the role of "social isolation" as a cause of psychiatric disorder must remain conjectural. This investigation has therefore sought to define consistencies in a group of intensively studied cases. To exclude as far as possible the likelihood that we were dealing in any consistencies defined with the effects of selective bias created by entry to hospital, or some other irrelevant contingency, the findings have been compared with those in cases with affective and organic psychosis aged 60 years or more admitted to hospital during the same periods.

The main questions we set out to investigate in the late paraphrenias were to what extent social isolation or difficulties in social communication were

peculiar to this group of old age mental disorders, what role they could have played in causation, what relationship they bore to genetic, psychological, social and organic factors, and finally, what part any of these factors could have played in the postponement of breakdown until old age, a result which would be highly desirable for schizophrenic disorders as a whole.

MATERIAL

This was obtained from two sources, but the diagnostic criteria were in each instance those described above.

(1) During the period 1951 to 1955 patients aged 60 and over admitted to Graylingwell Hospital, Chichester, were examined by one or both of the authors and allocated to various diagnostic groups (Roth, 1955). During this time 42 patients consisting of 39 women and 3 men were diagnosed as "late paraphrenia". All but 6 of these patients have been followed up for at least five years and it has also been possible to obtain detailed social and family histories for the large majority, and in the remainder, information about the circumstances in which the illness developed.

(2) The records of all patients aged 60 and over admitted to the Psychiatric Hospital, Stockholm, during the period 1931 to 1940 were examined by one of us * and as a result 57 patients of whom 48 were women and 9 men, were diagnosed as suffering from paraphrenia with onset late in life. As part of a clinical and genetic study these cases were all followed up until death or until June 1956, and in addition a family investigation was made into the incidence of psychosis amongst the relatives. Information was obtained from members of the families and from the Parish Registers, which are exceptionally complete in Sweden. Since the Psychiatric Hospital was a teaching hospital the case records were unusually complete in regard to such items as previous illness, personality, and social and domestic circumstances about which information is sometimes lacking in mental hospital records.

In both hospitals cases with paraphrenia formed about 10 per cent of all admissions aged 60 years or more. The age and sex distributions are shown in Table I. The mean age was about 70 years and women predominated, in excess of the population figures. Only 7 cases had been previously admitted to a mental hospital but in every case except one this took place after the age of 60. The duration of illness varied from a few weeks to 20 years, but in the majority symptoms had been present for less than two years and in no case was the onset before the age of 55.

TABLE I
Age and sex distribution of paraphrenic cases

Age Bracket	Graylingwell (1951-1955)			Stockholm (1931-1937)			Total BS
	M	F	BS	M	F	BS	
60-64	1	9†	10†	1	20	21	31†
65-74	0	17	17	6	20	26	43
75-	2	13	15	2	8	10	25
All ages ..	3	39	42	9	48	57	99

† One female aged 59.

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CLINICAL PICTURE

1. *The background of the illness*

(i) The *social setting* of the illness appears, as will emerge from the data to be presented, to be bound up in a number of ways with the fact that the large majority were women, of whom over half were unmarried. The sex distribution is strikingly different both from the population figures standardized for age (according to which in the Stockholm cases 21 males and 36 females instead of only 9 males and 48 females might have been expected), and from that found in schizophrenia when it occurs early in life, where the heavier incidence is among males. The predominance of the unmarried in both sexes is also greatly in excess of expectation. In Stockholm there were 36 unmarried patients, compared with the 11 that might have been admitted according to the population figures, and only 8 married patients instead of 26 expected, while at Graylingwell, although the predominance of unmarried patients was not so marked, 17 of 39 women were single and only 11 married.

A third point is that in both series over 40 per cent. of the patients were living alone, some in private houses or flats, others in rooms in lodgings or hotels. Patients with paraphrenia were far more often living alone at the time they fell ill than those with affective disorder (12 per cent.) or those with organic psychoses (16 per cent.).

It is of course possible to be living alone yet to be in close touch with relatives, friends or neighbours. But careful enquiry showed that all except 2 or possibly 3 of the Graylingwell paraphrenics who were living alone were indeed "isolated" in a social if not in an actual sense, whereas only 5 of the 26 patients with affective disorder who were living alone were isolated. It is true that in 5 of the latter the information was insufficient to allow a definite conclusion to be drawn, but over half were certainly in close or regular touch with other people and some were in daily employment, ran boarding-houses or frequently visited relatives. Among the paraphrenics only one was working and one other was in regular contact with a sibling.

As regards the 11 married women, one had lived alone in isolation since her husband's admission to a mental hospital many years previously, and another lived with an ageing taciturn man in an isolated rural cottage. In two cases the husbands shared some of the patients' delusions, so that in four instances at least the husband was a remote, ineffectual or submissive partner. Another patient had remarried shortly before her psychotic breakdown. Four of these five patients were childless, and the children of the fifth were living in a different part of the country.

In Stockholm there were insufficient data to make a comparison of the frequency of social isolation in the different groups. But if admission to hospital through the agency of the police or other authority is evidence of lack of contact with relatives, then, as Table II shows, this was much commoner among un-

TABLE II
*Mode of admission to hospital among married and widowed patients
in Stockholm*

	Affective	Organic	Paraphrenic	All Groups
Police, etc. ..	2	11	18	31
Other methods *	49	39	31	119
Total	51	50	49	150

$$\chi^2=16.53 \quad df=2 \quad P=<0.01$$

* i.e., admitted at own request or through petition by relatives or by transfer from a general hospital.

married and widowed paraphrenics than among the affective and organic groups.

Whether in their social isolation the patients were the victims of accidental circumstances or of their own life-long peculiarities of personality will be discussed at a later stage.

Although a few of the patients with paraphrenia were relatively well off, and all social classes were represented among them, some account must also be taken of the fact that (whereas nearly all had at one time been in regular employment) many were living currently on small State pensions or National Assistance in straitened or insecure circumstances. Although the social consequences of ageing are no doubt the lot of many in the aged population, we believe that these, as also the general decline in health and vigour associated with senescence, fell with special severity on this group of paraphrenics, consisting as it did predominantly of women, of the unmarried, and of those without close family or personal attachments.

(ii) *Physical health.* General health did not seem to differ from the norm for a population of similar age. Exceptionally good vigorous health was noted in several cases, and serious physical disease was uncommon, a fact which is clearly in accord with the practically normal lifespan of the Stockholm cases.

Special attention was given to the occurrence of sensory impairment and central nervous system disease of focal type. *Visual defect*, found in some 15 per cent. of cases (in about half of these of severe degree) was not more frequent than in control groups of comparable age, and seems only occasionally to have played a part in promoting persecutory ideas, as in the case of a totally blind woman aged 84, who lived in a Home, where from time to time she had attacks of noisy and abusive behaviour when she accused the staff of stealing her possessions.

At Graylingwell some *impairment of hearing* was found in as many as 40 per cent., of marked degree in about 15 per cent. In Stockholm, where probably only the more severe cases were recorded, the incidence was 16 per cent., while among patients with affective disorder, who were on average three years younger, the frequency was only 7 per cent. An even larger difference was found at Graylingwell, where 74 out of 91 affective and organic cases were considered to have normal hearing, and sight that was good for their age, whereas only 20 out of 41 paraphrenics were neither blind nor deaf in some degree. Although the assessments were made by rough methods only, and some milder cases may have been overlooked among the affective and organic cases, the differences are large enough for attention to be directed to them.

The presence of visual or hearing defect did not as a rule, greatly modify the symptomatology. Visual hallucinations were very prominent in some blind patients, and hallucinations consisting of *loud* sounds, singing and music, were common in the deaf. In several cases, hallucinosis was confined to the deaf ear, and sometimes head noises (tinnitus) seemed to provide a physical basis for the hallucinations.

As regards *focal cerebral disease*, this was seldom found, owing no doubt to our criteria by which organic psychiatric syndromes were excluded. Some evidence of cerebral disease or injury was indeed obtained on admission in eight cases (8 per cent.) but in very few of these, as will be described later, did it seem to have any bearing on the later course of the illness. The time of origin of the organic condition was usually very far removed from that of the paraphrenic psychosis. Five patients showed pyramidal signs—one a congenital weakness and deformity of a hand (she had also suffered from petit mal attacks), one

a hemiplegia dating from a head injury in childhood, and a third a hemiparesis, with an expressive dysphasia, thought to have followed fracture of the skull eight years previously. Another patient had a facial paresis attributed to "a small haemorrhage", with transient lameness, occurring 28 years previously, and the fifth stated he had had "several small (cerebral) haemorrhages" over the previous ten years (of which, however, no neurological evidence was found). In addition, two patients had coarse tremors of senile type, and finally there was a patient who had developed epileptiform fits soon after the onset of the psychosis. Three of these patients, all over 70, exhibited impairment of memory and orientation, but of fluctuating kind and not severe enough to warrant exclusion from the series. Moreover, the paraphrenic symptoms were usually quite typical. We conclude that paraphrenia occasionally arises in the presence of focal brain damage, which, however, acts not as a true precipitating factor but (if its presence is not entirely fortuitous) by increasing susceptibility to the psychosis among predisposed individuals.

2. *Precipitating events*

Hitherto we have considered some general characteristics of the group, and have concluded that female sex, the unmarried state, "isolation" and deafness are probably significant factors, and that for these reasons economic and social insecurity and the normal age-specific changes such as failure of eyesight and general health, though neither more severe or frequent than expected, are likely to cause greater handicaps than in the general population of similar age. But nearly one-quarter of the cases were neither unmarried, childless, living alone nor deaf. We therefore thought it might be profitable to estimate the frequency of traumatic events that could be dated accurately and were related in time to the onset of illness such as bereavements, acute illnesses, quarrels and domestic upheavals. We find that traumatic events of this kind which may have played a part in setting the psychosis in action are relatively infrequent. In Stockholm, where a comparison was made between the affective and paraphrenic groups, no precipitation at all could be found in three-quarters of the paraphrenic patients, whereas only 39 per cent. of affectives were apparently entirely endogenous. The fact that in 25 per cent. of paraphrenics some event was uncovered does not of course mean that in every case it was in actuality causally connected with the psychosis; the figure is a maximal estimate and some traumas apparently associated with the onset of illness may have been fortuitous.

Among the 42 Graylingwell cases, acute physical illnesses or operations were rare. Rather more common were disturbances affecting the balance and regularity of domestic life; three patients fell ill in the months following the marriage of a son or daughter, one after a second marriage at the age of 64. Bereavement *per se* did not seem to be important since only once did the psychosis follow the death of a husband, in the form of paranoid accusations about the will. In Stockholm, also, after the loss of a spouse, it appeared to be the upheaval of domestic life, particularly the necessity to move to new surroundings, that was connected with the beginning of the psychosis. In a few cases, however, the loss of a favourite child through death ushered in a period of mourning after which the paranoid illness developed. Of all types of event, only bereavement was relatively more common (33 per cent.) among cases where none of the factors discussed earlier, such as isolation, existed. Thus, while family ties were relatively few, where they did exist, their disruption may have been an important factor leading to the illness.

3. *Duration of illness before admission, mode of onset and development*

In affective disorder the duration is usually a matter of months, whereas senile psychosis comes on insidiously over two or more years. Among paraphrenics the duration falls on average in between these two extremes, but with very wide variations of a few weeks to many years. In about 15 per cent. the time of onset could not be decided, owing as a rule not to lack of information but to the gradual evolution of a personality disorder that could not be distinguished sharply from illness. Another feature of such cases was the absence of hallucinations, so that they form a relatively distinct subgroup, which is described separately below.

In the remainder the descriptions obtained of the duration and development of the illness seem to depend more on the extent of the witnesses' knowledge of the patient than on important differences in symptomatology. Unavoidable contact with other people, such as exists for married patients and for those living with their families, powerful emotional ("affect-laden") responses, such as anger or panic, and the early occurrence of hallucinations all tend to bring about early admission to hospital.

When there are no witnesses living in the house or in close touch, the first signs that something is wrong are likely to be interpreted as a change in personality taking place over a period of months, or sometimes longer, and manifested in increasing quarrelsomeness or in unprovoked abuse of those living near. Oddities in speech, appearance or in other aspects of behaviour are noticed. The patient may seclude herself, refuse callers, break off contact with tradesmen and at night may be seen wandering outside, or heard moving about the house, talking, laughing or crying out. Admission finally takes place when obvious self-neglect, assaultive behaviour, a suicidal attempt, or repeated baseless complaints to the authorities force some action.

Among patients who are socially more integrated, and about whose illness more details are known, florid hallucinatory states are generally found to have occurred early and were often the first indubitable psychotic symptoms, after the appearance of which admission to hospital took place within a few months and in some cases within weeks or even days. In less than one-fifth of all cases hallucinations are altogether absent and the illness then usually develops gradually over a period of one or more years. When hallucinations occur the pre-hallucinatory phase varies considerably in duration. There may be a period of weeks or months during which the patient is irritable, suspicious and dejected with poor sleep, culminating in the development of ideas of reference immediately before the outbreak of hallucinations. Occasionally this phase may last with fluctuations for several years during which there are ill-defined complaints of tiredness, weakness, loss of weight and sleep and the doctor may be visited frequently because of nervousness, indigestion or vague pains. Character traits of bad temper, hypochondria or suspiciousness are likely to come to the fore.

4. *Clinical picture*

To what extent do patients with "late paraphrenia" show the disorders of thought, affect and volition characteristic of schizophrenia? How are the symptoms modified by age? Can paranoid reactions be identified? Or are the cases mainly composed of paranoid depressions and organic states, as Fish (1960) maintains in his study of senile paranoid psychoses?

Primary affective disorders, many of them with prominent paranoid symptoms, have been carefully excluded from this material. A few cases that

seem to correspond to the "suspicious (*argwöhnische*) depressives" of Leonhard (1957) have however been included, since follow-up has shown that the paranoid-hallucinatory symptoms tend increasingly to dominate the picture with the passage of time. Moreover, the depression, which is always attributed by the patients to the incessant, unjust persecution, does not seem to be the primary disorder, and is at times overshadowed by anger or fear. Eventually the mood becomes shallow or even euphoric. We believe therefore that these cases fall within the paranoid rather than the affective group of illnesses.

Organic states with a history of increasing suspiciousness and forgetfulness, and later with ideas of being robbed, are of course quite common. But all cases showing unequivocal mental symptoms of organic deterioration on admission have been excluded by our criteria, and follow-up has shown that our paraphrenics have survived on average about five times as long as organic groups with dementia, their life expectation being in fact almost normal. Since neither somatic disease nor physical signs of cerebral disease are particularly common, considering the age, the role of organic deterioration in late paraphrenia appears to be confined, in the large majority of cases, to the mental and physical effects of normal age-specific processes.

Many typically schizophrenic symptoms occur, including *primary delusions*, which are often closely linked to hallucinatory experiences. For example, a patient suddenly accuses a man who has never shown the slightest interest in her of interfering with her at night, or of actually entering her bed; or a certain person whose voice is heard uttering threats, is believed to be intent on committing murder. The delusions may be more or less systematized and fantastic. They are usually persecutory, but also erotic, hypochondriacal or grandiose, in order of frequency, with varied combinations, but tend to be relatively restricted, e.g., to those in daily contact, to the house, room, bed or person of the patient.

In 28 per cent. of the Stockholm cases and in a similar proportion at Graylingwell *feelings of mental or physical influence* were found. Patients feel drugged, hypnotized, have their thoughts read, their minds and bodies "worked upon" by rays, machines or electricity, complain that they are spied upon, can get no privacy in thought or act. Catatonic stupor is rare but unpredictable behaviour may occur in connection with auditory hallucinations.

Hallucinations in clear consciousness are frequent and obtrusive. Auditory hallucinations occur in three-quarters of the cases. They consist of threatening, accusing, commanding or cajoling voices, jeering commentaries, screams, shouts for help, obscene words and songs, music, loud bangs, rappings, shots or explosions. "Messages" are received from a distance and acted upon. The thoughts are repeated aloud. God, spirits, distant or deceased relatives, or most often, jealous, hostile neighbours are held responsible.

Hallucinoses is often more disturbing at night, particularly in aged patients, and accounts of men, boys or animals seen or felt to enter the bedroom through the walls are characteristic. In other cases intruders are spied on the roof, faces appear on the ceiling, or famous personages pass by outside. Bad smells, fumes, the stench of rotting corpses, poisoned food, electric feelings or vibrations in the perineum or abdomen, are all commonly met with. Patients say the body is being cut or stabbed, the "backbone split in two". These experiences form, as a rule, a very conspicuous part of the paranoid beliefs and in some cases they wax and wane in a conspicuous manner, behaviour being correspondingly very disturbed or almost normal.

Incoherence of talk, even neologisms, occur but are unusual except in cases of long duration. The patients are generally lucid, but verbosity, circumstan-

tiality or irrelevance are found in some 30 per cent. of cases, and might be put down to senile deterioration, but for their persistence unchanged over many years.

Considering that all these phenomena occur in clear consciousness they have a veritable schizophrenic quality. When they are accentuated at night, an element of diminished awareness may be postulated, but even so, they are remembered, elaborated and acted upon later with total lack of insight. *Memory* is generally surprisingly well preserved. Disorientation, if present, rarely amounts to more than uncertainties about the date of the month or the name of the hospital, and absurd ideas about great age and misidentifications of people (when not due to visual defects) are unusual or parts of the patient's delusional system. In 9 cases, however, 7 of whom were over 70, disturbances of both memory and orientation, while not severe, were more prominent than in the remainder. The outcome in these cases is described later.

Finally, while *affective changes* of the gross kind seen in hebephrenic deterioration and catatonic withdrawal do not occur, some emotional blunting, mild incongruity or euphoria is quite common in cases that have lasted any length of time. In the earlier cases the emotional responses are congruous and consist of fear, anger or depression, occasionally excitement. Compared with manic-depressive psychosis, the mood even when depression is prominent is much more variable, often with rapid changes, and schizophrenic features soon become evident, while retardation and self-accusations are rare. Clearly the affective changes are much more akin to those of schizophrenia than of affective disorder.

LATE COURSE OF THE ILLNESS

Prognosis is poor. In the Graylingwell cases only one lasting recovery is known and only 4 of the 24 cases ascertained to be alive after five years were out of hospital. Of 6 patients who were discharged and are so far untraced, only one was considered to be well at the time of last contact which varied from a few months to three years after admission. Of the 14 deaths only 2 took place after discharge and neither of these patients had recovered mentally. A similar state of affairs was found in Stockholm. Although more patients were discharged under supervision, about half the remaining life-span was spent in mental hospitals or similar institutions, so that 57 individuals spent a combined total of nearly 600 years in hospital.

Temporary remission occurred either spontaneously, with E.C.T., or with tranquillizing drugs (which appeared to be of value in disturbed cases) in about a quarter of cases treated at Graylingwell and sometimes lasted for several months. But in half of all cases hospitalization was uninterrupted for at least five years or until death. Twelve cases out of the 43 received full courses of E.C.T. and of these 7 improved and were discharged; the remainder were not. Five cases were readmitted within a year and again discharged after E.C.T. and 3 out of 4 patients were sent home after a third admission. Follow-up letters have shown, however, that only one patient has remained well, after moving from an isolated rural cottage to her daughter's home in another part of the country. The small number of patients considered suitable for E.C.T. and the poor response to it is further evidence that a primary affective disorder was not in question.

The *clinical changes* that occur with the passage of time are the same as those seen in schizophrenia, and also reported after follow-up in a high proportion of cases of paraphrenia not commencing in senescence (Mayer, 1921).

Affective blunting or incongruity appear or become more conspicuous, and some patients, especially the deaf, become mute or incoherent and inaccessible. In about one-quarter of cases marked fluctuations in behaviour continue for years, coinciding with episodes of hallucinatory activity and quiescence, and during their more disturbed spells, patients are abusive and hostile, or preoccupied, withdrawn and negativistic. This picture is indistinguishable from that seen in chronic schizophrenics. Nevertheless, pronounced deterioration of intellect, personality and habits is not usual and many patients remain clean, tidy and generally well-conducted. Sometimes, after years the illness apparently becomes "burnt out", leaving residual defects, in a way entirely comparable to schizophrenia, since insight is not gained, and the previous beliefs, though no longer expressed, are regarded by the patient as real experiences.

As age advances, memory tends to fail in a proportion of cases, especially for such matters as length of time spent in hospital, and episodes of disorientation may occur for which a physical cause may or may not be found. In the latter case, they are usually associated with an exacerbation of other symptoms. About 21 per cent. of cases eventually develop features suggestive of senile dementia or focal signs of cerebral disease. (a) *Focal cerebral disease*. First we shall describe the outcome in those 8 cases in whom, it will be recalled, evidence of cerebral damage was already present on admission. Four cases from Stockholm were found to have survived for periods ranging from six months to 19 years. None of these developed further neurological signs, nor did organic psychiatric symptoms supervene. Only in one case was death attributed to "cerebral thrombosis" (and cancer of the pancreas) but no fresh neurological signs were described.* The patient with epilepsy died within six months (from a macrocytic anaemia) but the psychosis had lasted for as long as 8 years. Of the 4 Graylingwell cases, 2 have died, one, with the congenital monoplegia, from a coronary occlusion soon after admission, the other the patient with dysphasia, after 4 years with signs of an acute cerebral accident. This patient had developed an unequivocal organic psychiatric picture, the only one of these cases to do so. Two patients are still living, neurologically unchanged, the one with hemiplegia since childhood showing markedly deteriorated memory after five years (at the age of 91 however), the other, with a senile tremor, considerably improved mentally and fit to be discharged to a geriatric unit after eight years. We conclude from the follow-up that there is little evidence of cerebral disease of a progressive kind in these cases, except in the one instance, and that the presence of the organic condition was either wholly fortuitous or else as previously suggested merely served to increase vulnerability to the mental illness in some unexplained way.

There remain 8 additional cases in whom signs of cerebrovascular disease, or seizures possibly due to this, arose later in the illness, sometimes very shortly before death. Organic psychiatric symptoms appeared in 6, usually after the appearance of focal signs. Of 4 Graylingwell patients 2 are still living, one without showing organic mental symptoms. The remaining 6 patients survived for a mean duration of 5 years after admission (1-16 years) but after the advent of organic disease seldom for more than 2 years. Previous to this, the duration of the psychosis was over 4 years in 4 cases (in 2 cases, over 10 years). From these observations, we conclude that cerebrovascular disease sufficiently advanced to affect brain function is unlikely to have existed at the

* Owing to the certified cause of death, this case is added to the 8 described below when the final estimate is made of the number of cases developing signs of cerebrovascular disease after admission.

time of onset of the paraphrenic illness in more than at the most 5 cases, a figure that includes the patient with dysphasia, referred to in the previous paragraph, whose psychosis had existed for several years prior to admission.

Thus, while the total incidence of cases with focal cerebral disease amounts to 16 per cent. (including those cases with evidence for this on admission to hospital), the proportion in which the organic disease may be thought with some probability to have brought on the psychosis is much smaller, i.e., about 5 per cent.

(b). Turning now to consider how often symptoms of *senile dementia* appeared later in the illness, it has been necessary to rely almost entirely on the descriptive evidence available in the hospital and institutional records. Only one patient was seen personally at follow-up. The diagnosis may be difficult. Objective signs are absent in this condition and psychological tests were not carried out, and autopsy reports are not of much assistance. A pathological degree of mental change may have to be distinguished from ordinary age-specific changes, which may be difficult with patients in their eighth or ninth decade, also from subterminal confusional states, and in addition allowance has to be made for the effects of deafness and blindness, and for those symptoms of the psychosis itself, such as hallucinosis or blunting of affect, that may contribute to a state of "secondary dementia" mimicking true organic dementia. In Stockholm, 7 cases were found eventually to have developed mental symptoms difficult to distinguish from those of organic senile dementia, (i.e., 12 per cent.). There were 3 further cases about whom there was much more doubt. But the time lapse between the development of organic psychiatric symptoms and admission to hospital was long. In no case did the organic symptoms appear within the first five years, in 2 cases between 5–10 years, and in the remainder only after 10 years. In Stockholm cases developing senile change (7) or focal cerebral sign (5) after admission amount to 21 per cent. At Graylingwell, where the follow-up has been of shorter duration indications of dementia in the absence of focal cerebral signs or seizures have appeared only in one patient, now aged 75, after a very long illness.

Finally we shall consider the outcome in those 9 cases with equivocal organic psychiatric symptoms on admission. Did follow-up show that they were in fact suffering from gross progressive cerebral disease? With 2 or possibly 3 exceptions (included above), the answer is probably no. Despite their high age, 6 patients survived for more than 5 years. The quasi-organic picture can be accounted for in terms of a severe psychotic disturbance coloured by age-specific changes within the range of normal variation.

Systematic examination of the *certified causes of death* of all Stockholm cases showed that only 10 per cent were due to "cerebral haemorrhage" (and allied causes), a figure that corresponded exactly with the frequency of deaths from this cause in the general population of Stockholm aged 70 years and over. In other respects too, the causes of death corresponded with those found among the aged population.

SURVIVAL AND MORTALITY

Independently of the clinical picture, evidence that these cases as a group are distinct from the organic psychoses is provided by the long period of survival and the relatively low mortality. In the Stockholm cases the length of survival was almost normal compared with a life expectation of only one-quarter of the normal in a consecutive series of senile and arteriosclerotic patients followed up

during the same period. Two-thirds of the paraphrenics were still living after five years and about one-half after ten years, while four-fifths of the organic cases were dead after five years.

At Graylingwell the rate of mortality was very similar and was far less than that found by Roth (1955) among two organic groups investigated by him at that hospital. In Table III the mortality among the paraphrenic and organic groups at the two hospitals is compared.

TABLE III
Rate of mortality among paraphrenic and organic cases

No. of cases	Paraphrenia		Organic Psychosis	
	G.H.	STM	G.H.	STM
Follow up:	42	57	98	81
	% dead			
2 years	14	11	80	63
5 years	32	35	—	81
10 years	—	51	—	96

CLINICAL VARIETIES

Clinical varieties may be distinguished on the grounds of differences in symptomatology or in aetiology. Thus the cases might be grouped according to the presence or absence of marked affective colouring (c.f. the "affect-laden paraphrenia" of Leonhard), or of hallucinations or according to the quality of the delusions. Such methods of classification would seem, however to have only descriptive value.

The following three groups are tentatively put forward on grounds of possible differences in aetiology. But since aetiology in paraphrenia is certainly complex, these differences may well be of degree and not of kind and it is doubtful if any sharp boundaries exist between the groups.

Group 1. Abnormal personalities with paranoid psychoses; no hallucinosis

When all cases without hallucinosis (20 per cent.) were provisionally separated from the rest it was found that they had certain other features in common: (i) long-standing abnormalities of personality, of a kind that interfered with human relationships; (ii) age on admission usually high, often over 75 years; (iii) the physical stigmata, including sensory defects, associated with ageing; (iv) delusions almost confined to ideas of theft, ill-treatment or poisoning by those in everyday contact with the patient.

The onset of the psychosis in these patients is hard to date, and relatives tend to regard it as a caricature of the usual personality. We may here be seeing long-standing paranoid or other abnormal modes of reaction becoming accentuated in response to the mental, physical and social changes that accompany ageing.

Group 2. Paraphrenias arising under unusual circumstances or after prolonged isolation

In about 25 per cent. of cases the delusional ideas were "intelligible", but only to a partial extent, in the light of the actual circumstances of the patient. For example, a single and solitary woman who suffered from an epithelioma of

the lip following burns due to X-ray treatment for hirsuties and a unilateral facial paralysis, had for long been very sensitive about her appearance. For about four years she had had ideas of reference, and more recently had begun to believe she was being tormented by the other guests in her lodgings; they had "got hold of her mind in some way". After operation on her lip she left hospital but was still seclusive and reticent.

A married woman who became herself psychotic after sharing a house for some years with two psychotic tenants and a husband who also suffered from an induced psychosis, though of a milder form, was symptom-free in hospital but relapsed on three occasions after returning to the same environment. In a third case a housekeeper living alone with an elderly man developed a persecuted hallucinated state that had obvious links with the social and sexual conflicts she felt about her situation, while the remaining patients in this group were mostly single women, living isolated lives, whose paranoid ideas concerned eviction and burglary and mirrored understandable anxieties. In a few cases serious physical disease or blindness modified or dominated the clinical picture.

For most of these patients no future could be envisaged outside an institution and though a few did in fact gradually improve, only one patient for whom satisfactory arrangements could be made eventually made a lasting recovery. In the remaining cases the illness pursued a progressive and chronic course unaffected by environmental circumstances. Moreover schizophrenic symptoms such as ideas of influence and affective incongruity were not lacking and schizoid traits in the premorbid personality were relatively common. Situational factors are therefore not adequate causes of the illness nor do they suffice to explain its chronicity. We are clearly not dealing with "paranoid reactions" in the sense of potentially reversible responses to adversity. And the distinction from the mainly endogenous paraphrenias described in the next section is a relative one.

Group 3. Mainly endogenous paraphrenias

The bulk of the cases, at least 55 per cent., fall into this group. External stresses are absent, or if present seem to have little bearing on the delusions, which are systematized and fantastic in varying degrees. Further subdivision is unwarranted in the present state of knowledge, but the group contains five women showing very marked schizophrenic features after psychoses of long duration. There are also 5 or 6 patients (15 per cent.) with a markedly depressed mood, but as already mentioned the scope of the paranoid symptoms and the later development of bizarre or erotic delusions and persistent auditory hallucinations confirmed that the illness was a paranoid one.

Inherited predisposition is probably relatively important in this group, since three of the patients had psychotic sibs. But deafness, which occurred in nearly 50 per cent., ageing and social isolation may provide the specific stresses that cause the illness to become manifest.

The subdivision into these three groups is tentative and it has been suggested mainly with a view to facilitating further enquiry into aetiological factors. The common features linking the three groups are the frequency in all of the premorbid abnormalities of personality to be described below, the commonness of social isolation due to social, psychological, physical or accidental factors and the chronic and inveterate nature of the illness. The distinction is most clear between the first and the remaining two groups in that in the former the illness appears to grow insensibly from the premorbid abnormalities of personality without the sharp, step-like change that had so often occurred at some stage in cases belonging to Groups 2 and 3. This distinction is underlined by the absence

in all cases of Group 1 of hallucinations as well as other features generally regarded as characteristic of schizophrenia. The course of events in Group 1 therefore exhibits many features of an abnormality of "development" as distinct from the disease "process" (in Jaspers' sense of these terms) manifest in Groups 2 and 3. However after the illness has been in progress for a number of years, these distinctions become somewhat blurred and it may well be that the differences between all three groups are of a quantitative rather than a qualitative kind.

PREDISPOSITION AND ENVIRONMENT

The question of predisposition is of major importance. Of the aetiological factors so far identified—lack of close ties, situational stress, deafness—none are specific; they occur in many people most of whom never fall ill. Evidently only a proportion of people are vulnerable. This vulnerability may be due either to the presence of a major gene causing mental illness (manifestation of which is delayed until late in life) or to deviating personality characteristics such as eccentricity which may be due to a major gene, but more probably arise from complex factors, both inherited and environmental, of a kind that interact to produce different types of temperament and body build. The evidence for monohybrid inheritance is discussed later. In eccentric individuals, sufficiently adverse circumstances may precipitate an overt mental disorder which presents in caricature the features of the premorbid personality. We have observed this sequence of events in Group 1 of the clinical varieties referred to above.

(i) *Personality and body build*

As regards body build it is of interest that pyknic habitus was uncommon (as opposed to its frequent occurrence among the affective groups). Cycloid character traits also were conspicuously absent, and there is therefore no support for the idea that the presence of a "manic-depressive diathesis" is one of the factors that tend to postpone the onset of paranoid illness until late life, as has been suggested for "paranoia" by Kollé (1931).

In both series of cases the personality traits found were predominantly of paranoid and schizoid type (jealousy, suspiciousness, arrogance, egocentricity, emotional coldness, extreme solitariness) in 45 per cent. and another third were described as explosive or sensitive, or belonged to minority religious sects. In Stockholm 6 of the 9 males were known to be solitary, homosexual, criminal or vagrant and 2 were alcoholic. Compared with the affective groups both sexes were often narrow, quarrelsome, religious, suspicious or sensitive, unsociable and cold-hearted, and less often kind, thoughtful, affectionate, sociable, even-tempered, nervous, worrying or dependent. Brief sketches of the personalities give, however, a better picture than a list of traits. Examples are given from each of the three clinical groups mentioned above.

Group 1. The personalities of all the patients in this group were very abnormal and the psychotic symptoms appeared to caricature long-standing traits. The following two cases are taken from the Graylingwell material, where of the eight cases, four were over 80 and only two under 70 years of age. Sight or hearing, often both, were severely defective in six. The first case is that of a single woman of 87 who had trained as an art student but never been employed. She had been gay, charming and sociable, but shallow, egocentric and supercilious. She had never had any love affairs and though she had many acquaintances, had made no friends. For 30 years while they lived together, she had never

kept her sister company in the evenings, but always ate meals out; never done any housework or cooking, never knit, sewed, or gone to the cinema or theatre. Her only interests were Christian Science literature and meetings. Admission to hospital was arranged because of the emergence over a period of two months of paranoid ideas, centring on the sister. For one year previously this patient had shown some deterioration in memory and in habits, also in sight and hearing, but had been sufficiently integrated mentally to act energetically, and appropriately considering her delusions, by visiting her solicitor on several occasions in order to change her will. She was found to be correctly orientated. Four years later she is still alive and expressing bizarre delusions of a persecutory and grandiose kind, but is clean in her personal hygiene.

The second case is that of a single woman, aged 82, who had worked successfully as a school teacher and later as a film scenario writer. She had been once engaged, late in life. Usually pleasant to meet and talk with, courageous and energetic, she was very difficult if annoyed or frustrated in any way, wilful, a mischief-maker, prejudiced against doctors, and later in life, suspicious. After the death of a brother she lived alone with a collection of animals. Was summarized by a niece as a "hopeless crank, tiresome, eccentric, and prone to violent rages". The illness was of insidious onset. For some years before admission she had lived alone in sordid conditions, accusing now this person now that of ill-treating her, stealing her money and poisoning her food. She was disposed to wander and gave vent to outbursts of rage when attempts were made to restrain her. Yet she was found to have a fair memory and to be correctly orientated, despite being almost blind and very deaf. She died after 2½ years, shortly after having a "stroke". At autopsy the main findings were atheroma of the major cerebral arteries and renal arteriosclerosis (the brain was hardened uncut and the report is not yet available).

Group 2. Here the personalities were less eccentric and abnormalities were hinted at rather than described in full-blooded terms. In one case a woman whose character was eulogized by her husband (who suffered from folie à deux) was said by a nephew to have "always seemed queer and not quite normal". She suffered from asthma and hypertension and had been confined for long periods to her house which she shared with her husband and with two psychotic tenants who lived on the floor above. After some years of this situation, she began to seal the doors and windows to keep out "poisonous fumes" and believed that she was being hypnotized by one of her psychotic neighbours.

Isolation was however the most common form of stress in this group. The patients were women and they were all either unmarried or widowed at the time of falling ill. The psychosis featured ideas of eviction or robbery, sometimes with erotic elements. Three cases may be cited briefly. A widow, aged 74, had made a serious suicidal attempt nine years after the death of her husband, and later developed a paranoid psychosis with very vivid auditory hallucinations. She had been a capable woman of pleasant, even temperament, who had contracted a childless marriage to a man twenty years older than herself. Up to the time of marriage she had been a strict Baptist, but afterwards had adhered to many different religious sects, which she always abandoned after a short time. A feature of her married life was that she and her husband had never settled anywhere but had continually moved home from one town to another. Another patient was aged 79, having lived alone since the death of her husband and her only son some ten years previously. She had always been very correct, prim, Victorian, and conversant with medical folklore and fallacious theories about

causation of illness. Admission to hospital took place after she was found wandering in the road in a nightgown, looking for imaginary men who, she believed, were constantly entering her house at night, tormenting her and stealing her food, furniture and keys. A third patient, aged 72, was cheerful and friendly but touchy, had a horror of hospitals, was obstinate and self-willed and very independent, and ultra-conservative in her attitude to modern conveniences. She lived in a cottage with oil lamps and stoves and gradually became a solitary recluse, but was visited regularly once a year by a half-sister. In her illness she heard the voice of a brother from Australia, and believed that her half-sister was stealing her money and persecuting her.

TABLE IV
Number of single and widowed women living alone

				(1) Stockholm patients					
				Affective disorder			Paraphrenia		
				S	W	T	S	W	T
Alone	..	..	..	2	5	7	16	3	19
Not alone	..	..	..	12	15	27	15	5	20
Total	..	..	..	14	20	34	31	8	39
				$\chi=6.258$	$df=1$	$P=<0.02>0.01$			
				(2) Graylingwell patients					
				Affective disorder			Paraphrenia		
				S	W	T	S	W	T
Alone	..	..	..	16	10	26	10	8	18
Not alone	..	..	..	37	41	78	7	3	10
Total	..	..	..	53	51	104*	17	11	28
				$\chi=>12.0$	$df=1$	$P=<0.01$			

* 5 cases excluded, not known.

Group 3. In this group also good and bad traits often co-existed in the same patient, but environmental conditions were relatively favourable. The patients differed from those in Group 1, in that the illness was much more sharply defined from the previous personality, and sometimes arose without any premonition. Thus a twice-married woman of 65 had been gay, cheerful, lively and talkative when young, dressed well and liked going out, and was also a competent housewife, but had no communal interest whatever and never made real friends. A year after her second marriage at the age of 64 she suddenly complained that the spirits of her deceased relatives were following her and threatening to murder her. A single woman of 83, living with a sister, was strong-willed, independent, energetic, versatile and capable, also kind and fond of children and with a sense of humour; she was never moody or over-anxious. But she belonged to a religious sect called The Brides of Christ, and led a life regulated by its principles by which marriage and sexual intercourse were forbidden absolutely. Six weeks before admission she began to believe that the child living in the upstairs flat was being tortured and calling to her for help, and rapidly built up an elaborate delusional system in which the child became her adopted son. Descriptions of other patients read: "jealous", "stubborn and headstrong", "took violent dislikes to people", "erratic and impulsive, and very obstinate", "never made friends, dictatorial,

very sensitive, imaginative, sulky, with narrow interests". A spinster aged 78 was "very domineering, independent, active, tactless, particular and precise, a perfect lady, but with a vicarious interest in sex". This patient was living in lodgings as a paying guest. The first symptom of illness noticed was that she would come downstairs only half-dressed, "to show off her figure". Later she developed a belief that men entered her bed at night and that she was having syphilis injected into her eyes by the landlady.

On the whole the personalities in Group 2 were more normal than in the other groups.

In both the Graylingwell and Stockholm cases there was evidence of psycho-sexual abnormality. In addition to the large proportion of unmarried patients, those who had married often did so late in life, or were frigid, had few children, were very jealous of their husbands, or cold and unloving mothers and sometimes took a violent dislike to their step-children.

The general conclusions were drawn that abnormalities of personality were present in a large proportion of the patients and were probably related both to the frequent failure to marry, the low fertility and the social isolation, as well as to the actual psychosis.

(ii) *Personality factors related to failure to marry and "isolation"*

The question arises, are the abnormal and stressful social circumstances which many paraphrenics experience accidental, or do they reflect a primary anomaly of personality? Such circumstances may arise from causes over which a person has no control, or they may be self-created, brought about wholly or in part by his own temperamental peculiarities. Of the factors already discussed deafness and physical illness, which render communication difficult, are probably unrelated to the personality. On the other hand "social isolation" might well be mainly due to personal eccentricity. The detailed case histories which suggested that for many patients isolation was the preferred mode of existence or else brought about by their "difficult" behaviour, made this a likely explanation. Some had for years deliberately avoided any close relationships. Others through the tolerance and sense of responsibility shown by a relative had escaped total isolation—yet had fallen ill.

TABLE V
"Social isolation" among single and widowed women

			Graylingwell patients			Paraphrenia		
			Affective disorder					
			S	W	T	S	W	T
"Isolated"	..	..	3	3	6	9	6	15
Not	..	..	50	48	98	8	5	13
Total	..	..	53	51	104*	17	11	28
			$\chi^2 = >12.0$		df=1	$P = <0.01$		

* 5 cases excluded, not known.

In order to test further this hypothesis that a primary personality disorder was one cause of isolation in paraphrenic patients the social histories of a group of *unmarried* women admitted to Graylingwell Hospital when aged 60 or over, suffering from affective and organic psychoses, were examined to determine the frequency of traits such as explosive temper, awkwardness in human relationships, egocentricity, or extreme independence, which could have accounted to

some extent for their failure to marry. Single people are known to form a high proportion of those admitted to mental hospital in old age and we wished to obtain some estimate of the frequency of "isolating" personality traits and of actual isolation among elderly unmarried patients in general. The records showed that of 55 patients about half showed such traits. But they were found far less frequently among the married or widowed. Therefore while personality factors of this kind may well be associated with failure to marry, and perhaps with falling ill, they are evidently not peculiar to paraphrenics. The second question, the frequency of isolation among these "difficult" unmarried patients with affective or organic psychoses, also found a definite answer. Taking "isolation" to be present when a patient was living alone or in a lodging-house or hotel where she had not taken root, was not working and was not in close or regular touch with a relative or friend, it was found that 6 and possibly 9 of the 17 unmarried paraphrenic patients (35-50 per cent.), but only one or possibly two (about 7 per cent.) of the patients with other conditions were isolated. A similar difference between patients with paraphrenia and with affective disorder was found among *widows*. Hence the oddities of personality probably related to the unmarried state of many paraphrenic patients do not wholly explain their "isolation".

It is quite likely that important differences in personality of qualitative kind and with a closer bearing on the risk of social isolation may have existed but were not brought to light by our crude methods of assessment. Be this as it may, as far as the present analysis goes, the poverty of human contact suffered by our paraphrenic patients is only partly explained by inherent personality traits and further reasons for their isolation have to be sought.

The role of deafness which was observed to recur frequently at an early stage of our studies clearly called for investigation. It was found in 41 per cent. (7 of 17 cases) of unmarried paraphrenics, but in only 3 (11 per cent.) of the 27 patients with abnormal personalities who did not suffer from paraphrenia. Deafness was also more frequent among widowed paraphrenics, since 4 out of 10 were severely deaf, and it seems very unlikely that such a severe degree of deafness was overlooked in the other group where hearing defect was noted in only 3 out of 54 cases. The added factor of deafness had probably played some part in deciding that temperamental difficulties would result in isolation in one group of unmarried patients, the paraphrenics, but not in the other. The role of other contributory factors was suggested by the finding that several extremely "difficult" patients had succeeded in avoiding isolation having been tolerated at home over many years by close relatives. Did the paraphrenics have fewer relatives on average than the other groups?

TABLE VI

Position of patients in own sibship

Graylingwell	Affective	Paraphrenic	Both Groups
Eldest	44	3	47
Youngest	19	14	33
Intermediate	66	12	78
Total	129*	29†	158

$$\chi^2=17.05 \quad df=2 \quad P=<.01$$

* Excluding 13 not known, and 3 only children.

† Excluding 9 not known and 1 only child.

TABLE VII

(a) Living sibs: all women patients

Graylingwell G.H. Stockholm STM.		Affective disorder			Paraphrenia		
		G.H.	STM.	T	G.H.	STM.	T
With sibs	.. ..	72	22	94	25	31	56
Without sibs	.. ..	14	5	19	10	16	26
Totals	.. ..	86	27	113*	35	47	82
Mean Ages	.. ..			70.91			70.49

$$\chi^2 = 5.938 \quad df = 1 \quad P = < .02 > .01.$$

* Omitting age-group 60-64.

(b) Living children: married and widowed woman

Graylingwell G.H. Stockholm STM.		Affective Disorder			Paraphrenia		
		G.H.	STM.	T	G.H.	STM.	T
With children	.. ..	63	41	104	12	11	23
Without children	.. ..	24	6	30	10	6	16
Totals	.. ..	87*	47	134*	22	17	39

$$\chi^2 = 5.374 \quad df = 1 \quad P = < 0.05 > 0.02.$$

* 3 cases excluded, not known.

(a) Living sibs. Both at Graylingwell and in Stockholm paraphrenics had fewer surviving sibs than patients with affective disorder, who, after excluding those under 65, were found to have a similar mean age (Table VIIa). Nearly one-third of all women paraphrenics had no sibs living and the average number per patient was fewer (1.7) than among the affectives (average 2.2), only 17 per cent. of whom were without sibs. Of those patients with abnormal personalities, but without paraphrenia, referred to above (whose mean age was found to be about 1 year higher than that of the paraphrenics) only 11 per cent. had no surviving sibs and the average number of sibs per patient was 2.4. That the existence of surviving sibs did protect these affective and organic cases from risk of isolation is shown by the fact that nearly half were living with their sisters.

When the matter of sibs was being looked into, an interesting and unexpected finding came to light. It has an obvious bearing on the likelihood of having sibs still living and may go some way towards explaining the difference between the two groups in respect of isolation. Of the 39 Graylingwell paraphrenics 14 had occupied the youngest position in their own sibship, the position of 9 was unknown, and only 3 were eldest, whereas among 129 affectives, 19 were the youngest, 44 the eldest and in 13 their position was not known. In Stockholm these peculiarities of place in sibship were not observed, but the discrepancy may be due to several factors operating in Sweden in the 19th century, such as the comparatively high rate of infant and child mortality, the frequent presence of half and step-sibs and the common custom of "boarding out". These would all tend to obscure the possible effects of order of birth. (See Table VI).

(b). In view of these findings it was thought worth while also to make a count of *living children* among ever-married patients, with the following results. (Table VIIb). At Graylingwell, paraphrenics had on average 1.0 living children

compared with an average of 2·0 living children among affectives. Among ever-married patients 45 per cent. of paraphrenics had no living children compared with 32 per cent. in the other group. In Stockholm the same differences were noted; ever-married paraphrenics were childless in 33 per cent. of cases, with an average of 1·5 children, affectives in only 12 per cent., with an average of 2·0 children. In this case, since the difference is due to the lower fertility of paraphrenics, personality defects may be thought of as acting indirectly, by tending to cause postponement of marriage till late in life and in other ways also to restrict the size of families. In any case here is still one more factor decided in early life yet impairing the chances of avoiding isolation and desolation in senescence.

In deciding whether an individual is forced into isolation in old age or not, the positive qualities of the personality, the capacity for warmth and ease in human contact, for giving and evoking affection may be quite as important, if not more so, than the negative attributes for which we have in the present context been comparing paraphrenics and controls. The description of personality traits already given points to there indeed being a difference in respect of just these attributes of premorbid personality between those who developed paraphrenia and those with affective disorder. There is one objective finding which confirms this view and underlines the importance of longstanding personality defects in deciding the isolation of paraphrenics. In the Stockholm material over one-quarter of the women had had illegitimate children but only two married the fathers, whereas among the patients with affective disorder the much smaller numbers with illegitimate children legitimized their union almost without exception. This reflects in a striking manner the differences in the affective life and personal adjustment of paraphrenic and affective cases some half a century before breakdown in old age. But the original hypothesis that isolation was a consequence of personality defects requires modification, since unrelated intrinsic factors—deafness, fewer surviving sibs, smaller families and fewer children who survived had clearly made a substantial contribution.

(iii) *Heredity*

In a review of the literature Strömgren (1938) found the risk of developing schizophrenia among the sibs of schizophrenics to be 6–12 per cent. while Kallmann (1956) reported the risk among the children to be 10–22 per cent. In this material the corresponding risk among sibs and children was much lower. Only one case, of a sib with an untreated paranoid illness beginning in middle age, was found at Graylingwell, although some of the six relatives reported to have been mentally ill with unknown conditions may have suffered from schizophrenia. In Stockholm where the investigation was very complete, the risk among sibs and children combined was only $3\cdot4 \pm 1\cdot2$ per cent. (Kay, 1959). These findings make it unlikely that precisely the same hereditary factors operate both in schizophrenia and “late paraphrenia”.

But there were 8 additional cases (3 from Stockholm and 5 from Graylingwell) where a parent or sib had developed a paranoid illness late in life (i.e., after the generally employed “risk-period” of 20–50 years of age). Three of these were treated in mental hospitals and showed the characteristic picture of late paraphrenia. The existence of these 8 cases among the relatives of 99 patients may be compared with an incidence of only 2 similar cases among the families of over 200 patients with affective disorder. Schultz (1930) also found a rather high risk (6 per cent.) of “senile persecution mania” among the sibs of a group of patients suffering from senile psychoses with paranoid colouring, although

the risk for schizophrenia proper was only 1·7 per cent. among the sibs and children combined. Paranoid or schizoid psychopathy were also more common among the relatives in our paraphrenic group, while depressive psychoses were rare.

We conclude therefore that in late paraphrenia some predisposition to mental illness due to heredity does exist. But the observed risks among relatives are difficult to reconcile with any *simple* monogenic mode of inheritance. We are inclined to favour a multifactorial hypothesis, which has the advantage of allowing ample scope for the operation of environmental and other exogenous factors, which we believe to be important. Further, the high incidence personality deviations would accord most readily with such a theory. Further consideration is given to these matters below.

DISCUSSION

(1) *What contribution does organic cerebral degeneration play in late paraphrenia?*

All classificatory systems in psychiatry have serious shortcomings which are inevitable at the present stage of development of knowledge. The weakness of the Kraepelinian system, which forms the basis of most classifications, is that it is based upon two principles. According to one, mental disorders are divided on the basis of certain psychological symptoms and signs into "organic" and "functional" categories; according to the other, division into the same two categories depends on the presence or absence of structural disease, whether cerebral or somatic. This dual system leads to ambiguities which deserve careful analysis. For example, where "neurasthenic", depressive or manic symptoms develop in close association with some infective illness such as influenza, it is customary to regard the mental disturbance as symptomatic: the chronic paranoid psychoses of epileptics are called epileptic psychoses, those of alcoholics and drug addicts, toxic psychoses, and so on.

Some important considerations are overlooked when this nomenclature is employed. Thus if knowledge of the associated organic factor had been withheld, differential diagnosis of these conditions from "functional" depressive, manic and schizophrenic illnesses would have been impossible in many cases. The closeness with which these "organic" psychoses may resemble schizophrenic illness has been recently illustrated in a particularly clear and cogent manner by the revelation that many chronic amphetamine addicts are mistaken for schizophrenics. Three of seven cases seen within the last 2½ years at our clinic had been previously given deep insulin coma therapy and one of the three had had a prefrontal leucotomy carried out at a famous psychiatric university clinic (Beamish and Kiloh, 1960).

In the past, attempts have been made to accommodate such facts within the theory that those who responded to organic disease with "functional" symptoms of this nature were genetically predisposed to do so. The schizophrenic-like psychoses of epileptics, alcoholics and drug addicts were, in other words, due to a coexistence of two phenomena, epilepsy or addiction on the one hand, and on the other the constitutional predisposition peculiar to schizophrenics. Genetic studies by Slater and Beard in epilepsy (1959), by Benedetti in alcoholic hallucinosis (1952) and clinical investigations into amphetamine psychoses by Connell (1958) and others, have made such simple theories untenable. Although such "functional" syndromes in the setting of cerebral or metabolic disease are relatively uncommon, recent observations have shown that their relevance for

the functional group of mental disorders is indubitable and that they may have an important bearing upon aetiological problems in this field.

Among the mental disorders of the aged the dual system of classification has led to particular difficulties. Here we are most prone to encounter depressive psychoses after an attack of pneumonia, manic episodes after surgical operations, paranoid disorders with or without physical illness in old people with a mild memory defect or any one of these syndromes in patients with peripheral and retinal arteriosclerosis, or perhaps hypertension and a mild cerebrovascular accident some years previously.

Such common associations have led to most of these diseases of whatever kind being regarded as essentially organic in aetiology when they have begun after the age of 65 years, although the specific psychiatric manifestations of cerebral disease may be absent. That some degree of real overlap exists between functional and organic psychoses in senescence, as at all ages (*vide supra*), is not in question. But this overlap, together with the fact that senile and arteriosclerotic change will be a relatively common finding in any group of old people after long periods of observation, has tended to perpetuate the view that cerebral disease has a ubiquitous aetiological role in old age mental disorder.

Recent follow-up and neuro-pathological studies have made such views untenable. In the first place Roth and Morrissey (1952) showed that there were striking differences in the rate of mortality between paraphrenic and organic groups of cases. The present study, on a different material and from two separate sources, has amply confirmed this earlier work. After two years and five years the rate of mortality was respectively only 12 per cent. and 34 per cent. among the paraphrenics, with good agreement in the two series, compared with a mortality of 63 per cent. and 81 per cent. in the organic cases collected from the Stockholm records. At Graylingwell the rate in this group was still higher, i.e., 80 per cent. after two years (Roth, 1955). After ten years half the Stockholm paraphrenics were still alive whereas nearly all the organic cases had died. The size of these differences seems to exclude organic cerebral disease of the kind found in the organic dementias as a major factor in late paraphrenia, but does not entirely contravert the view that early or mild degrees of cerebral change may be responsible.

This argument, as well as the objection that the organic cases are an older group, is met by comparison of the actual length of survival with the mean expectation of life for a group of comparable age and sex in the Stockholm population. Among paraphrenics the period of survival was almost normal, among organic cases it was only one-quarter as long.

Yet despite this long survival, it is probable that some contribution is in fact made by cerebral disease. This follows from the existence of those few cases, about 5 per cent., that exhibited somatic signs of cerebral disease in connection with the onset of the psychosis or within a space of three or four years, and *prima facie* from the eventual appearance of cerebrovascular or presumptive senile change in 21 per cent. of cases in the Stockholm series. That paranoid symptoms and organic changes often coexist is apparent from the frequency of paranoid colouring in those old age psychoses that are clearly of organic origin. But the contribution is probably small. The figure of 21 per cent. is in all probability far too high an estimate of the importance of cerebral damage as a causative factor, for the following two reasons. In the first place, evidence of senile change did not appear until at least five years, and in the majority of cases not until 10 years or more, after admission. The picture then was often indistinguishable from that of "secondary dementia", a condition well known to

occur in chronic mental illness after prolonged institutionalization, accentuated in this instance by the effects of normal age-specific mental changes, most of the patients being by then in their eighties, and frequently by deafness.

Secondly, reference may be made to the work of Corsellis (1960) who made a systematic examination of the brains of groups of patients dying in a mental hospital. Corsellis found that the frequency of gross cerebral lesions was significantly higher in those diagnostic groups where the mean interval between admission to hospital and death was less than five years. These were the groups of senile and arteriosclerotic psychoses and a group showing features of both of these conditions. For example the incidence of gross cerebral vascular change was 48 per cent., of cerebral atrophy, 42 per cent. Among Corsellis' groups with a diagnosis of functional psychosis (affective, schizophrenic and paranoid), among whom the mean age of onset was well before the senium and, as was the case among our paraphrenics, the period of hospitalization was of long duration, gross cerebrovascular lesions were found at autopsy in the much lower but still considerable proportion of 15 per cent., and cerebral atrophy in 16 per cent. The incidence of such lesions increased with age in both the functional and organic groups, but the difference between the groups remained consistent at all ages and the incidence found among the former may provisionally be taken, according to Corsellis (1960), to represent the expectation in the normal population. It is not very surprising therefore that amongst the paraphrenics, whose mean age at death was over 75 years, clinical signs of cerebrovascular disease or of senile mental change should have appeared in some 21 per cent. of cases.

Hence when allowance has been made for the normal hazards of growing old, the only cases in which we can be reasonably certain that organic factors have played some part in causation are the 5 per cent. of patients in whom neurological signs appeared about the time of the beginning of the illness or within one or two years. It is of interest however that in most of those with neurological signs at onset, organic psychiatric features were completely lacking. We have here a counterpart of those schizophreniform psychoses of earlier life in which, despite an organic aetiological basis in the form of dextroamphetamine intoxication, alcoholism or epilepsy, the psychological characteristics of cerebral disease are absent or minimal. It is just possible that cerebral changes have an aetiological significance that extends beyond the 5 per cent. of paraphrenic cases already mentioned. Although the 21 per cent. of cases who, after many years of observation, exhibit senile or arteriosclerotic changes, represent little if any excess over normal risk of cerebral degeneration in this age group, we cannot exclude the possibility that in a group of susceptible personalities such changes contribute to the disease process. In other words, whereas normal cerebral degeneration might never bring the patient under psychiatric care, in the case of a schizoid personality, the result might be a paraphrenic illness which is usually an imperative cause for admission to hospital. Any such cerebral degenerative changes must have a quite different qualitative character or be of a quite different order of subtlety from those active in the senile and arteriosclerotic psychoses proper. It is not possible otherwise to account for the gross discrepancy in life expectation between the two groups of cases, for the paraphrenic group appears to enjoy a normal life-span. But some of the possibilities discussed here are clearly matters for further enquiry.

(2) *Do the paraphrenias of late life constitute a homogeneous clinical group?*

There was considerable variation in such factors as the prominence or absence of severe environmental stresses, premorbid personality defects, and of

deafness, so that the material lends itself at first sight to subdivision in a number of ways. At Graylingwell, out of 42 patients, there were, for example, ten patients, all females, in whom the illness had arisen in a particularly abnormal environmental setting; this had coloured the content of the delusions and hallucinations in an easily understood manner (Group 2). Eight of these cases had lived alone for a very long period, but only one was deaf. In a second group of 24 patients, delusions of a much more bizarre character were present and these were far less clearly intelligible in terms of the environmental stress endured by the patient. Serious adversity had been less often experienced by these patients and only eight had been living alone, but as many as 11 were deaf. This group included six patients in whom a very marked depressive colouring was present in the early phase of the illness. These cases certainly deserve special mention in that a temporary response to E.C.T. was usually obtained and although the paranoid delusions and hallucinations eventually became the predominant features of the illness, the prognosis for discharge from hospital and subsequent survival in the community was relatively good. There were also 5 females in whom the presence of symptoms generally associated with schizophrenia in early life was the outstanding feature. Three of these were the only cases in the material in whom the illness had been of very long duration. They were in their late seventies or eighties, but the illness had probably commenced 20 years earlier. Four showed a marked incoherence of thought and speech, one patient being in addition deaf and inaccessible. Another patient showed a stupor of catatonic type. All these cases were regarded as mainly endogenous paraphrenias.

The points of similarity between patients are however far more impressive than the differences. In all the condition was dominated by delusions and hallucinations of an essentially similar character and pursued a chronic course. Examples of suspicious, hostile, arrogant, eccentric or extremely solitary personalities were found in each. Moreover, although there was a certain amount of variation with respect to the type of exogenous factor that had contributed to the illness, it was clear that most of these exogenous factors had tended to undermine adjustment in a similar way and in the many cases in which several of these factors co-existed, they had acted in an additive fashion. The unmarried state, few surviving sibs, few children, scarce and infrequent social contacts owing to circumstances, personality difficulties or both, deafness and infirmity, all have a great deal in common in the adverse effects that they produce.

There is one group of eight patients which, in the light of observations to date, seems to be more distinct from the rest of the material than any other group which can be tentatively created on descriptive grounds. In these cases the differentiation between the overall behaviour disturbances characteristic of personality and those which arise as the result of illness seem to merge insensibly with one another. These are lifelong paranoid personalities whose history shows them to have become increasingly embroiled in conflicts and antagonism with those in their environment. They are often described by their relatives as "not ill but exaggeratedly themselves" and "I always expected this (meaning hospital admission) to happen". It is of some interest that an independent objectively definable feature characterizes all these patients; in no patient of this group were hallucinations present. However, in the light of the progress of these cases, the description of paranoid reaction in the sense of a potentially reversible response to vicissitudes by over-sensitive or suspicious personalities, would hardly be accurate. In many of their basic personality features, the frequency of social

isolation and of deafness, and the progressive course and inveterate nature of the illness there are important common features of the remaining cases. While for research purposes these cases deserve some independent consideration, it is doubtful whether they deserve at present a nosological status wholly apart from the paraphrenias of late life. We are saying in effect that we are unable to draw any hard and fast distinction between the paranoid reactions and paranoid schizophrenias of old age.

(3) *Can the paraphrenias of late life be legitimately classed with the schizophrenias?*

Even if the small sub-group of eight cases discussed above is regarded as akin to the paranoid reactions described by Kretchmer (1927) under the heading of "*Sensitive Beziehungswahn*" this question has still to be raised in connection with the greater part of the material. It has to be remembered also that not all workers would accept the paranoid reactions of early life as wholly distinct from schizophrenia and irrelevant for the aetiological problems of this disorder. The common features linking all the groups of cases described in this paper have already been discussed.

It seems to us that the diagnosis of schizophrenia must be based on an operational definition which incorporates all those symptoms and signs which, according to the general consensus of opinion, constitute the "primary" or "process" features of the condition. As the aetiological basis of the condition is unknown, it seems illogical to apply aetiological criteria, as is done when cases which follow some psychological stress or even a physical illness are excluded from the schizophrenias. So far as is known, cases precipitated in this manner do not, when symptoms of process type are present, behave any differently in their pattern of outcome from the general run of schizophrenics. Again, while genetic studies have proved themselves valuable research tools, it is unwise in the present state of knowledge to separate a group from the schizophrenias on the basis of genetic findings alone. The attempt to differentiate groups of cases of more or less favourable prognosis within the schizophrenias, constitutes an important line of enquiry. But prognostic criteria, since they can only be effectively applied *post factum* in the individual case, must clearly play a role of secondary importance in the diagnosis of schizophrenia. Nor should we assume at the present stage of development in knowledge that any real hard and fast dividing line separates groups of cases of good and bad prognosis.

If the kinship of a group of cases with the schizophrenias must be decided, as we believe, by the presence or absence of the primary or process symptoms of schizophrenia, the main group of the paraphrenic cases we have studied, with their ideas of influence, primary delusions, hallucinations in clear consciousness and oddities and at times incongruity of affect, must be regarded as schizophrenic. Any aetiological factors identified may be reasonably assumed to have a certain amount of relevance for problems of aetiology among the schizophrenias as a whole.

(4) *Are the genetic factors shown to contribute to the causation of schizophrenia in early life present in the paraphrenias?*

The aetiological factors for which there is most conclusive evidence, as derived from twin studies and other genetic investigations, are the genetic ones. It is not implied that these are the only factors, but that they make an important contribution seems undeniable in the light of the findings of Kallmann, Feingold and Bondy (1951), Slater (1953) and others. The question arises whether the paraphrenias are genetically uniform with the schizophrenias of early life. It

has been shown that this is not the case. If a period of risk similar to that generally employed in genetic investigation into schizophrenia is used as a basis for calculation, the morbid risk for schizophrenia among the first-degree relations of paraphrenics, though somewhat increased, does not differ to a significant extent from that of the population at large. We deal therefore with a group of individuals in whom the genetic loading for schizophrenic illness proper is relatively small. On the other hand, there were six families (if second-degree relatives are included) with more than one secondary case of schizophrenia, and eight instances of secondary cases with late-developing paranoid psychosis similar to that in the *propositae*, where the explanation that the psychosis arose entirely through the effects of a similarly adverse environment appears highly improbable. Some genetic contribution to causation is therefore likely.

The available data are insufficient to justify an attempt to define precisely the mode of inheritance. A crucial question is the homogeneity of the material. Does it consist of a mixture of exogenous and mainly endogenous cases, clinically indistinguishable? An admixture of this kind has been suggested to account for the low morbidity among relatives in the affective disorders of late onset (Stenstedt, 1959; Kay, 1960) and the same question has been raised for schizophrenia itself (see later). Our own argument that there are exogenous causes of schizophrenia is quite compatible with this hypothesis. But certain features of the illness suggest that the hereditary loading is more evenly spread. These are the frequency of pre-morbid personality deviations and the colouring they lend to the clinical picture, and the apparently close interdependence and interaction of all causal factors—long-standing social difficulties such as social isolation, physical defect such as deafness, previous personality pattern and precipitating stresses—in the evolution of the disorder. The amount of susceptibility to breakdown as reflected by personality deficiencies and degree of environmental stress shows considerable quantitative variation, and these factors appear to some extent to be inversely correlated with one another. Moreover, we have a number of distinct factors—constitutional, social, psychological and organic—in varying combinations, but probably acting additively to produce an essentially similar phenomenon. If this is the true situation, then taken together with the very low morbidity risk for mental illness among the relatives, it is more suggestive of the effects of polygenes than of the specific monohybrid type of inheritance often held to underlie schizophrenia. We need to know much more about the frequency and nature of abnormal traits of personality among the relatives of schizophrenics, paraphrenics and in control groups.

(5) *What is the nature of the relationship between social isolation and paraphrenic illness?*

The question that arises is whether the social isolation of the paraphrenic patient before illness is a cause of his ultimate breakdown or whether both isolation and the mental illness which develops in late life are expressions of some common factor, perhaps a lifelong anomaly of personality, determined by constitutional factors. An almost identical question has been asked in relation to a great many psychiatric disorders. Thus Durkheim's classical studies of the incidence of suicide, some 60 years ago, led him to conclude that this varied inversely with the degree of social cohesion in the community. Wherever ties arising from beliefs, aspirations and activities held or practised in common with the social group were weakened, the chances of suicide were adversely affected. Investigating suicide in London, Sainsbury (1955) was able to show that variation of suicide rate in the different boroughs followed a pattern which

Durkheim might have predicted. There were significant correlations between suicide rate and indices of social isolation, social disorganization and social mobility within the boroughs; some of the highest rates had been registered in Chelsea, Hampstead and St. Marylebone where material adversity was uncommon. Predominantly working-class boroughs such as Stepney, Poplar and Bethnal Green, where a relatively high degree of social cohesion prevailed, had a low suicide rate. Sainsbury was inclined to attribute a causal role to isolation in relation to suicide and the weight of evidence certainly favoured this view. But the extent to which differences in the suicide rate flow from the tendency of those who are mentally ill and potentially suicidal to drift into those areas where they can lead an anonymous existence freed from social ties and responsibilities, has yet to receive adequate investigation.

The findings in certain other areas where this question has been raised call for a systematic enquiry to disentangle the network of cause and effect. Thus it has been known for some time that immigrants have a relatively high incidence of mental disorder, as reflected by admission to hospital (Malzberg and Lee, 1956). Yet Ødegaard (1932, 1953, 1959) has adduced a large amount of evidence in favour of the view that this arises from the fact that those with abnormal personalities and in whom there is a high risk of psychotic breakdown are especially prone to migrate. He has also assembled data showing that the high incidence of mental disorder among those who fail to marry and those who work in certain occupations may be attributed to a process of social selection, rather than to any ill-effects exerted by loneliness and isolation. Those with deviant personalities fail in the competition for spouses and occupations and are also especially prone to become psychotic. In other words it is the social failure of those predisposed to become mentally ill that tends to isolate them, rather than the isolation which engenders mental illness.

A similar controversy has been in progress in relation to the other social factors in the causation of schizophrenia. In their classical survey of first admission rates to mental hospital in different parts of Chicago, Faris and Dunham (1939) discovered that a disproportionately large number of schizophrenics not only belonged to the lowest social class, but came from the central lodging house areas of the city or its "hobohemia" where social cohesion was minimal. (Mental disorder in old age and delinquency showed a similar distribution). Once again, opinions have differed as to whether this could be a cause of schizophrenic illness, an effect, or both. The work of Hollingshead and Redlich (1953) has shown that a disproportionately large contribution to the number of schizophrenics under treatment was made by the lowest social classes, whereas the upper classes contributed less than their expected number of schizophrenics. In further studies (1954, 1958) they examined the possibility that this was due to a downward social drift of schizophrenics who had been demoted to unskilled jobs on account of the incompetence that was caused by the disease. Morrison (1959) found that the fathers of schizophrenics were a representative sample of the normal population as far as occupation was concerned, suggesting that drift had in fact occurred. Moreover, Hare (1956) was able to confirm some of the findings of Faris and Dunham in a study of mental health in Bristol, and concluded that schizophrenics were to be found in social seclusion largely because they segregated themselves and severed their social ties after their illness had begun to undermine their social adjustment. On the other hand, he also concluded that to a lesser extent their isolation had been enforced by circumstances which their own actions had done nothing to produce.

The essential complement to statistical studies of the kind we have been discussing is the detailed investigation of individual cases of disorders in which social stresses, such as isolation, are suspected to operate. It seems unlikely at first sight that mental disorders appearing for the first time in old age can be partly attributable to lifelong personality defects which have also served to create social difficulties for the individual. Yet the findings suggest that this constitutes a large part of the explanation. Approximately half of the personalities were hostile and suspicious, hard and arrogant, shy, solitary or eccentric in the extreme, the incidence of some such abnormal personalities being significantly higher than among the control groups. There are two particularly good examples that illustrate the way in which such individuals may segregate themselves rather than become isolated by accident or force of circumstance. The first is the contrasting behaviour of paraphrenic and affective women following illegitimate pregnancies. The second example is provided by the fact that adherence to minority religious groups was relatively common among the paranoid cases, far more rare in the affective groups.

These findings therefore lend a certain amount of support for the views of Ødegaard in that the unmarried state appears more as one reflection of the abnormal personality of paraphrenics than as a cause of it or of the illness that follows. One may also suspect that the isolation of such individuals may be self-created and that deliberate choice, rather than chance had possibly decided that few children should be born to them. Indeed clinical experience teaches that attempts to break down the isolation of such individuals are prone to meet with singularly little success. One has in fact to ask whether these individuals could have remained sociably viable until late life if circumstances had forced them into close association with other people, or whether their immunity from frank breakdown until senescence may not have owed something to their success in keeping social contacts at arm's length. Further studies may help to shed light on this important question. However, even if the most extreme interpretation possible is placed on the available facts, not all the factors making for seclusion can be considered to be self-created. It was through no exercise of personal choice that they had so often been youngest children with few surviving siblings in old age, nor could their frequent deafness have been conditioned by their anomalies of personality.

It would seem therefore that the isolation in which so many of our patients were found had been fashioned by the additive effect of many different factors. It is not possible to decide the relative importance of these with any degree of precision, but the oddities of personality found in so many patients loom largest in the picture and probably made the largest single contribution. We have raised the possibility that, far from being a cause, the solitary and eccentric ways of these patients may have been the defensive and self-protective responses of individuals poorly equipped for emotional relationships. On the other hand, having formed few friendships in early life, their social assets must have depreciated at a far steeper rate than would be the case in the general run of people. An attitude of determined and aggressive independence which helps to render the individual socially viable in early life might well contribute to make adjustment and integration impossible in old age. Hence, although isolation may initially have been an expression of the special needs and preferences of schizoid personalities, it is likely to have turned secondarily into a cause and by its cumulative effect over the years, steadily eroded the patient's resources for adjustment in late life.

The fact that in some cases breakdown finally occurs at about the time

that a number of extraneous influences have begun to drive the patients further into isolation, lends some confirmation to this view (we are referring here to the death of relations, progress of deafness, the advent of physical infirmity). It must be remembered also that personality is only one of the factors in the situation. In most of the cases severe anomalies of personality were present. But a few patients in Group 2 appeared to be relatively normal personalities in whom an unusually intense aggregation of extraneous influences had enforced isolation. In others still, a situation intermediate between these two extremes emerged in that environmental and physical handicaps of moderate severity were associated with a premorbid personality and peculiarities that were not particularly severe. The conclusion that emerges is that the theory propounded by Faris and Dunham (1939) that isolation and lack of social communication were causes of schizophrenia is an oversimplification when applied to the paraphrenias of the aged. Their segregation often results from lifelong personality traits which are a long-drawn-out prelude of, and intimately related to, their psychotic breakdowns in senescence. But to a small extent at any rate they are victims of circumstance, and isolation would appear to this extent to be a cause of paraphrenic illness. To a greater extent, as far as the present data are concerned, it is merely a consequence of personality anomalies that also portend a schizophrenia in late life.

(6) *What is the bearing of these findings upon aetiological theories in relation to schizophrenia?*

It is held by many workers that schizophrenia is a condition determined by specific genes whose manifestation may be influenced, though only within rather narrow limits, by environmental factors. Sharp differences in the incidence of the condition in different social classes have recently been clearly demonstrated, but the significance of these findings is far from clear and the view that they reflect an environmental factor in the causation of schizophrenia has certainly not won general acceptance. In paraphrenia we appear to have a very different situation as far as aetiology is concerned. Genetic factors play some part, but are less important and it seems unlikely that they are of the specific simple monohybrid kind postulated for schizophrenia. The prominence of environmental, physical and exogenous factors, the varying combinations in which they are found, the additive fashion in which personality deviation and environmental stress interact to create ill-effects, suggest a disorder of multi-factorial aetiology. The hereditary basis of such a condition is also likely to be multi-factorial, that is, polygenic. And in the predisposed personalities of paraphrenics we are probably dealing with extreme deviations of temperament and character, rather than any rare and specific constitution.

One possible way of reconciling these facts is to conclude that the constellation of symptoms called schizophrenia has different causes in early and late life and that the environmental factors and sensory deprivation identified as causal agents in paraphrenia are irrelevant to theories about the aetiology of schizophrenia before the age of sixty. This formulation would be cogent but for the fact that on closer examination the present evidence relating to the causation of schizophrenia shows some interesting parallels with the situation described in this paper in late paraphrenia.

Recent investigations tend to suggest that even in the group of cases in which schizophrenic symptoms occur in the absence of organic disease, genetic factors are not only insufficient, but perhaps not always necessary causes of the illness. Thus Rosenthal's examination of Slater's material (1953) has revealed

that in the families of identical twins, where only one twin was schizophrenic, the genetic loading with schizophrenia is extremely low, while in the families of concordant twins it is very high. He suggested that there may be two aetiological distinct types of schizophrenia, the one caused by genetic and the other by environmental factors. The evidence from this line of investigation alone does not point altogether in one direction, for in a similar study some years ago, Luxemburger (1939) registered a quite opposite finding. Further studies of twin material will be necessary to decide the issue. However, some allowance is made for the evidence pointing to a difference in social class incidence and for the role of social isolation, the view that the causes of schizophrenia cover a broad spectrum ranging from the predominantly genetic at one extreme, to the predominantly exogenous and environmental at the other seems a reasonable and cogent one. The genetic studies of Kollé (1931) among the relatives of patients with "paranoia" and of paranoid psychopaths are perhaps relevant in this context.

These facts relating to aetiology make it necessary to consider other possibilities for the mode of inheritance for schizophrenia than those which have hitherto been accepted by most workers in this field. The theory of simple dominance and of simple recessivity both have their adherents, but it would be generally agreed that neither adequately explains all the family data relating to schizophrenia. In fact, the theory that schizophrenia has a simple, monohybrid, genetic basis has had to be buttressed by a number of *ad hoc* hypotheses such as "inhibition of manifestation", the action of "genetic modifiers" and a partial recessivity so as to fit the data with the theoretical requirements of Mendelian ratios. Some of these genetic hypotheses involve the notion of an effect by polygenes on such characteristics as age of onset, degree of affective colouring, the course run by the disease and other features. All such hypotheses are elaborate and not wholly satisfactory. In the light of the new evidence about environmental factors, the simpler alternative that the predisposition to schizophrenic illness may be a graded character depending on quantitative variation, merits more consideration than it has received. The argument against this view, that the schizophrenic illness itself presents as a step-like "all-or-none" phenomenon, is not conclusive, since threshold effects may be involved. Moreover, disputed borderline cases, formes frustes and psychopathic paranoid and schizoid personalities are not uncommon, and form a link between the normal and the indubitably abnormal. In three common psychiatric conditions—the subcultural variety of mental defect (Fraser Roberts, 1950), obsessional neurosis (Rüdin 1953) and epilepsy (Harvald 1951)—inheritance has been shown to be, probably, multi-factorial, and in each of these conditions environmental or other exogenous factors are certainly important. On the other hand those mental abnormalities known without doubt to be due to major genes are rare and very much less influenced by external factors. Methods for identifying a predisposition to schizophrenia, by means of biochemical, physiological or possibly psychometric tests, in the same way as intelligence is revealed by mental testing and subclinical epilepsy by the EEG, no longer appear hopelessly remote in the light of recent advances. When such methods become practicable we may find that the predisposition to schizophrenia and its latent forms, which are at present accounted for by heterozygosity or by inhibition of manifestation, are possibly graded characteristics even though manifest schizophrenic illness may show all the features of a pathological phenomenon.

Genetic factors are probably more important in the causation of schizophrenia in early life than in old age while the reverse is probably true for the

environmental factors in causation. But in the light of the above discussion the differences may well be quantitative rather than qualitative. Further, if the kinship of late paraphrenia and the schizophrenias is accepted, the differences in incidence according to social class in the latter and the isolation in which many schizophrenics are found to live, are unlikely to be wholly due to drift down the social scale or to some bias in the selection of cases. To some extent adverse social circumstances are likely to prove causes (as well as consequences) of schizophrenic breakdown in earlier life, although their contribution will probably be less important here than in the late paraphrenias.

SUMMARY

1. A clinical follow-up and genetic study has been made of 99 patients aged 60 years and over (with a mean age of about 70) suffering from "late paraphrenia". The patients consist of two groups, one from the Psychiatric Hospital, Stockholm (1931–1940) and the other from Graylingwell Hospital, Chichester, Sussex (1951–1955). Patients with affective and organic disorders of similar age and admitted during the same periods are used for comparison. Both paraphrenic groups show the same characteristics which may be summarized as follows:

(i) Females predominate over males in the ratio of about 7:1, i.e., significantly in excess of expectation. In both sexes unmarried patients are significantly more, and married patients less common than in the general population of similar age. Fertility among ever-married patients is low.

(ii) An examination of the background of the illness shows that significantly more paraphrenics were living alone at the time of falling ill than those with affective disorder. This appears to have been due to several factors, i.e., the frequency of the unmarried state and the low fertility among the paraphrenics, who also had fewer surviving sibs.

(iii) Of those living alone, many more patients with paraphrenia than with affective disorder were socially "isolated". Three factors seem to be responsible: (1) deafness (2) abnormalities of personality (3) few surviving relatives. Deafness of some degree was found in 40 per cent. of the Graylingwell paraphrenics and of severe degree in some 15 per cent. of all cases, with a much lower incidence among the other groups. Personality traits among paraphrenics and affectives also differed markedly. Among the former they were commonly of paranoid-schizoid type and contributed substantially to failure to marry, social isolation and probably to the development of the psychosis itself. But factors unconnected with the personality, such as absence of relatives, played some part in deciding whether isolation did or did not occur.

(iv) Except in one subgroup, referred to below, the clinical picture is remarkably uniform and is characterized by the presence of many schizophrenia-like disorders of thought, mood and volition, by relatively good preservation of formal intellect, personality and memory, and by conspicuous hallucinations. In about 20 per cent. of the Graylingwell cases hallucinosis was entirely absent and the illness appeared to represent a caricaturing of deviating personality traits of long standing; these cases may perhaps be regarded as "paranoid reactions" to the physical and social consequences of growing old. But exogenous factors (deafness, isolation) or personality attributes are always to a greater or lesser extent in evidence, and it is doubtful if any clear lines of

demarcation between groups of cases really exist. At this stage therefore it seems far more profitable to treat the "late paraphrenias" as a whole.

(v) An inherited predisposition to late paraphrenia must be postulated, but this is likely to be of lesser degree than in schizophrenia occurring early in life. The mode of inheritance is probably multifactorial.

(vi) A pathological degree of cerebral degeneration is probably related to the onset of psychosis in not more than 5 per cent. of cases. Normal age-specific mental changes may have been responsible in a further proportion of cases for a caricaturing of previous abnormalities of personality and to this extent have contributed to the development of the psychosis.

(vii) The course of the illness tends to be chronic and the changes of schizophrenic type usually become more prominent, but sometimes a "burnt out" state with residual defects is seen. Occasionally the illness merges after many years into a state difficult to distinguish from that of senile dementia (12 per cent.). Signs of focal cerebral disease, including isolated seizures, eventually appear in a further 9 per cent. The mean life span is only very slightly shorter than normal, a fact which distinguishes late paraphrenia sharply from senile and arteriosclerotic psychoses where life expectation is less than one-quarter of the normal.

2. The clinical homogeneity of the group, its relationship to schizophrenia, the influence of genetic and organic factors, and the roles of social isolation, lack of relatives, deafness, and abnormalities of the personality are discussed.

3. It is concluded that late paraphrenia has to be regarded as the mode of manifestation of schizophrenia in old age. The aetiological factors identified in late paraphrenia are therefore likely to have some relevance for the problem of causation of schizophrenia itself. It is considered that the setting of social isolation in which a high proportion of paraphrenic cases are found is due to some extent to a self-segregation of personalities for whom social contact and communication are difficult or stressful. But the evidence suggests that isolation must be attributed to some extent to accidental factors such as deafness, position in sibship or scantiness of surviving relations. The accumulating effects of such factors may account for final breakdown in old age. At younger ages also, the onset of schizophrenia is likely sometimes to be due to isolation, and not merely a cause of it. The findings perhaps also have some bearing on the general problem of social isolation in relation to mental illness.

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APPENDIX

In the following case-histories, the psychological tests used, with the method of scoring, were those described by Hopkins and Roth (1953). The scores given are "test quotients", where "100" represents the average score among affective groups aged 60 years and over.

The first case is that of a highly intelligent woman with life-long personality difficulties. At the time of admission she had become very deaf.

CASE 1. Widow, aged 77. Admitted to Graylingwell Hospital 27.3.52–21.6.52 (V.P.). Had recently accused son-in-law of stealing her insurance policy and threatened to call in the police. *Mental state*—Circumstantial, suspicious, with paranoid allegations about daughter and son-in-law, had brought all private papers with her "to prevent theft". *Physically*—Very deaf, well-nourished. B.P. 160/80. Para-oesophageal diaphragmatic hernia (X-ray). *Psychological testing*—All tests above range for senile psychosis (test quotients: vocabulary 112, matrices 114, digit span 101, information 108). *Course*—Treated with "modified insulin". Depressed at times, lacked energy. Discharged to Nursing Home.

Family History—(Informant, daughter). F. d. 78, lay preacher and printer. M. d. 78. Patient 9/9 sibs, only survivor; 7 lived to be over 70. One S. alcoholic, d. young. One S. senile psychosis?

Past History—Brought up in very poor family. Won scholarships to school and University (latter not taken up for economic reasons). As child, rejected by fellow pupils on account of class differences. Elementary school teacher. Married aged 23 (1897), but husband left home 1913 and died 1922. Frequent quarrels. Two children, daughter (informant), aged 45, son aged 44. Both married, intelligent and mentally normal. *Physical health*—Good. *Personality*—Had always felt dissatisfied, aggrieved and inferior to others because of her impecunious background. Had felt unwanted as a child (was youngest of 9 sibs). Daughter described her as highly-strung, independent to a fault, very religious in a puritanical way but rather a "canting Christian", egocentric, possessive, jealous of all her family and interfering in her children's affairs; very sensitive and hating to meet people, but when shielded from contacts would complain that daughter was ashamed of her; very thorough and conscientious, faddy, particular and meticulous in the home, and parsimonious.

Onset of Present Condition—Onset indefinite. At daughter's wedding in 1939 had made a hysterical scene, telling son-in-law that he was taking her "most cherished possession". After this, lived first with daughter for "three months' hell", and then in her son's house, but quarrelled with both and afterwards lived for a time on her own in "solitary isolation". Then returned to daughter, staying in a room on her own, doing everything for herself, and never speaking to her son-in-law.

The illness was not sharply demarcated from the personality. Some three years previously, she had become more depressed and had had outbursts of weeping and self-pity when she said she had "lived too long". She visited numerous doctors, and thought she had various illnesses. She complained of losing things, said they had been stolen and finally accused son-in-law of stealing her insurance policy.

Follow up—After discharge was unable to settle anywhere. After a few days, invariably began to make a flood of complaints, e.g., that the food was tampered with, or her belongings being stolen, and on one occasion informed the police. At her son's house, she complained that she had caught V.D. from the lavatory seat and had telephoned the Medical Officer of Health. She was readmitted on 14.1.53 (C.P.). She was emotional, not consistently depressed, gave a good account of recent events, and memory and orientation were fairly good. Physically, there were obesity and signs of peripheral arteriosclerosis. B.P. was 190/100. Mentally, she was garrulous, complained of wrongful detention, was "the victim of a plot" and lacked altogether any insight. She showed obsessional attention to cleanliness and believed that she was contaminated. Psychological re-testing (19.6.53) showed little change (vocabulary 102, matrices 115, information 104). Vision was excellent in both eyes. After nine months, affect was noted to be incongruous, although at times she was agitated and depressed; said that her clothes were torn at night and that harmful substances were put into them. Memory was good and habits clean. A few months later, she was mute and resistive, refusing all food, refusing to leave her bed and incontinent. She died (19.10.54) within a few days of a seizure with localized convulsions. Autopsy showed diffuse suppurative bronchitis, chronic cystitis and senile changes with early atheroma of coronary arteries and aorta and moderate granular contraction of both kidneys.

Comment—This case belongs to Group 1, i.e., a paranoid psychosis without hallucinations developing in a markedly abnormal personality. She showed a life-long difficulty with human relationships, which began in her childhood, and later resulted in disruption of her marriage. Finally, this made it impossible for her children to continue to offer her a home. She escaped isolation, up to a point, entirely through the tolerance of others, but even so was undoubtedly isolated in an emotional sense and was a painful burden to all those who tried to help her. Hospital admission, however, became necessary only in old age, when with the advent of age-specific mental changes and deafness, her grievances and accusations became increasingly absurd and uninhibited. She eventually became negativistic and inaccessible and death was

probably hastened by her refusal to take food. Because of the almost terminal occurrence of seizures, the case is included among those developing cerebro-vascular signs but their connection with the psychosis is doubtful. It was only during the last 9 months of life, at the age of 79, that deterioration of habits occurred, but this coincided with marked physical decline. The brain appeared normal but was hardened uncut.

The following case showed markedly asocial personality traits, and was socially isolated. Some improvement occurred in hospital.

CASE 2. Unmarried woman, aged 75. Admitted to Graylingwell Hospital 26.7.52. C.P. In-patient. Certificate stated that she was hallucinated, complained that the neighbours were dropping bombs outside her door and filling the house with deadly smoke. Rambling and disconnected in conversation. According to the police, patient was constantly writing letters (all nonsensical), accusing the neighbours, alleging the house had been broken into and things stolen. Also inventing malicious gossip. There was evidence that paranoid delusions had been present for 2½ years. *Mental state*—Garrulous, circumstantial. Schizophrenic thought disorder. Inclined to tears. Talked of persecution by landlord and neighbours, describing gunpowder explosions, rappings on door at night and pollution of the drains. Correctly orientated, memory fair. *Physically*—Thin, kyphotic. Heart enlarged, B.P. 200/110. *Psychological testing*—(15.9.52). Vocabulary 106, matrices 90, memory 104; no deterioration. *Course*—Patient believed she was the victim of persecution instigated by her landlord, who wanted to get rid of her so that he could sell the house. 1951, abdominal aneurysm diagnosed. Osteo-arthritis R. hip. 1953, hypochondriacal with many aches and pains, paranoid delusions remaining. Mood placid and cheerful, and behaviour sociable. Engaged in occupational therapy, helping in ward. Can carry on rational conversation. 1954, obese, B.P. 180/105. Considered to be "fit for discharge when suitable accommodation can be found". Reliable worker. Vision with glasses, R.V. 6/12, L.V. 6/9. Early R. cataract. Fundi normal except for arteriosclerosis. 1955, complaining of pain in hips, knees, abdomen. Barium meal showed functioning gastro-enterostomy without obstruction but with small hiatus hernia. Hypochondriasis now the only psychiatric abnormality. Patient later developed signs of avitaminosis, with dysphagia. Subsequently she did not change mentally but required treatment for hypochromic anaemia, cardiac failure and for a leaking abdominal aneurysm.

Family History—(Informants, niece and sister-in-law). F. d. 52, tuberculosis. M. d. 52, heart failure. Patient 6/6 siblings. All dead at the time of admission. One S. odd and religious.

Past History—Normal childhood. Village school till 14. Bright. Domestic service, including housekeeping all her life. Sex—"let down once, never worried again". Lived for 25 years in former employer's house. *Physical health*—Hypertensive with enlarged heart, and generalized osteo-arthritis. Hysterectomy. Gastro-enterostomy and several laparotomies 1939. *Personality*—"The odd one out". Trouble-maker and bad mixer. No friends or interests, and did not get on with family. Self-centred. Good at her work, clean and tidy.

Comment—This case belongs to Group 2, owing to the obvious connection between the content of her delusions and her position as an isolated, single woman, living alone. It is clear that personality traits contributed to her isolation, and it is likely that constitutional factors interacted with environmental ones to bring about the paranoid illness. It is of interest that her mental state improved very considerably during her stay in hospital, where she became quite well-integrated. The parts, if any, played by avitaminosis and physical illness are of minor importance, and the courses of the mental and physical conditions ran independently. At the most, avitaminosis amounted to one extrinsic factor.

In Case 3, affective symptoms were very prominent and there was an excellent initial response to E.C.T., so that schizophrenic features that in retrospect were obvious, tended to be brushed aside.

CASE 3. Married woman, aged 61. Admitted to Graylingwell 1.12.54–3.2.55. Eighteen months ago, when daughter married and left home, patient began to think there was jealous talk among the neighbours, that two people had a house to themselves. Became afraid of being turned out of house. Three months ago, had a fall and was confined to house for 3 weeks, and because of this was unable to help with daughter's baby, although previously had done so. Six weeks ago, sat up in bed listening to voices, could hear neighbours talking about her through wall. Became frightened of electricity, thought neighbours could kill her with a ray. On 3 weeks' holiday was symptom-free, but on return symptoms immediately recurred. Admitted after a few days of acute terror. *Mental state*—Talk hesitant but coherent. Mood very apprehensive, also depressed but apparently not deeply so. Described persecution by neighbours by means of a ray which followed her from room to room, played on her when she sat on W.C. and gave her a "red glow". Neighbours could see into her room and knew what she ate. Voices told her she had not fed her husband properly. *Physically*—B.P. 220/110. Wt. 7 st. Asthenic build. *Course*—Recovered after 6 E.C.T. Memory of events was vague, and these were described as "all silly". A diagnosis of "depression with paranoid features" was entertained.

Family History—(Informant, husband). F. d. 49. Farm worker. M., no information. Patient 3/3 sibs. Brother and sister alive and well. Four younger half-sibs. No history of family illness known.

Past History—Childhood unhappy. Mother left home because father was cohabiting with another woman whom he later married. This woman said to have been brutal to the 3 children, and patient was placed under institutional care by the N.S.P.C.C. at the age of 8. Her two sibs were sent elsewhere. From the age of 14, she worked in domestic service and in factories. Married aged 25. Happy but sexually frigid. Husband 6 years younger. Wanted children but finally had to adopt a child—now aged 23. *Physical health*—Hypertensive. Menopause about 50, following period of menorrhagia, and curettage. *Personality*—Even-tempered, but highly-strung and worrying. Good-natured and kind. Poor mixer, very reserved, no outside interests. Some obsessional traits. A little suspicious. Methodist. *Home*—Living in Council house, husband on night-shift. *Previous Mental Illness*—Some years ago, had a period with much nervous dyspepsia. 3 years ago, became very nervous and suffered from indigestion and anorexia at a time when daughter was being courted by a married man.

Follow up—Re-admitted 14.2.55—28.6.55 (V.P.). Two weeks' recurrence of auditory hallucinations, the voices of neighbours saying she ought to be "locked up", that she ill-treated husband and stole money. No insight. Depressed and agitated with poor appetite. *Physically*—B.P. 240/140. Wt. 6 st. 8 lb. Improved greatly, in all respects, after 6 E.C.T. Urinary infection treated. Relapsed after 3 weeks. Found to be anaemic (Hb 70 per cent.) and to have occult blood in stools. Improved on iron but developed ideas of unworthiness, that other patients said she smelled. Improved, with limited insight, after 8 E.C.T. and discharged.

Re-admitted 27.9.55—18.1.56 (V.P.). Few months' elapse with similar ideas of persecution by neighbours who were threatening to shoot her. Correctly orientated, agitated and depressed. No insight at all. Wt. 6 st. 3 lb. B.P. 210/120. After 7 E.C.T. improved but had no insight into persecution. After few weeks was again hallucinated at night. After 4 further E.C.T. remained "well".

Re-admitted 8.3.56—14.3.56. On this occasion, presented herself voluntarily for "legal advice" on account of persecution by neighbours. B.P. 220/140. Heard voices saying she was mad and also that sister was mad; that husband was the "father of their adopted child". Voices followed her everywhere day and night. Sleep disturbed but appetite excellent. No insight whatever, refused treatment and discharged herself. Later history unknown.

Comment—This patient showed marked depressive features at the onset of the illness, and recovered after E.C.T., apparently with insight. The later course is, however marked by, the prominence of hallucinations and persecutory delusions, and by a decreasing response to E.C.T. In retrospect it is clear that even at the first admission schizophrenic symptoms were evident, although these had tended to be overlooked or explained away after the initial recovery. As regards aetiology, this is a case in which none of the usual factors, such as isolation, deafness, gross personality deviations nor heredity can be clearly demonstrated. However, there was probably some contribution by several of these factors. The family history is incompletely known. Early childhood experiences were very adverse, and the personality anxious and restricted. The illness developed during a period of strain when the existence of a housing shortage may have given rise to gossip and jealousy among the neighbours, and when the husband was away at night and the daughter had left home. In addition, there was a deterioration in physical health. But such a severe, chronic, paranoid-hallucinatory psychosis can hardly be supposed to have arisen without some predisposition, and a hint of this may be seen in the asthenic bodily habitus and narrow, reserved and somewhat suspicious personality of this patient.

CASE 4. Married woman, aged 65. Admitted to Graylingwell Hospital 23.10.54. In-patient. (C.P.). The certificate stated that patient complained of 3 spirits following her everywhere. One, that of her sister, was determined to murder her. Refused to go home as she was in fear of her life. Engaged spirits in conversation and called them by name. According to husband, had not been to bed for 2 nights because of constant conversation with spirits. Duration, 3 days. *Mental state*—As above. Constantly hallucinated by voices of spirits of dead relatives threatening her instant end. Replied to voices during interview. *Physically*—Pyknic, obese (11 st. 3 lb.). B.P. 180/95. Old fracture L. wrist with deformity. Deaf, difficult to make contact with.

Family History—(Informants, daughter and husband). No information about parents. Patient 4/4 sibs, only survivor. One S. d. 2 years ago. Sibs "quarrelled whenever they met". In particular, patient had quarrelled with her eldest sister.

Past History—Childhood spent in happy surroundings. Probationer in fever hospital. Married Captain in Hussars. Widowed 18 years ago. Two children, son killed 1939, daughter married. Remarried July, 1953. *Personality*—Gay, cheerful, lively, talkative, dressed well and liked going out. Competent housewife and cook. No communal activities, or real friends.

Health—Deaf since childhood.

Course and follow up—After 9 ECT was still deluded and hallucinated. 1955, wt. 8 st. 11 lb. Constantly hallucinated. Frequently tried to abscond. Deafness interfered greatly with contact. Believed husband had had her illegally detained so that he could meet other woman. Visited at night by ghosts who talked to her. Solitary but clean in habits and occupied herself usefully. 1956, still hallucinated and kept awake by yells and screams. Believed medical staff could watch her through the ceiling. 1957, fatuously smiling, hallucinated, almost totally

deaf. Wt. 10 st. Largactil 50 mg. t.d.s. 1959, still frequently hallucinated and expressing a variety of persecutory delusions.

Comment—There was an abrupt onset with auditory hallucinations in a woman who had been deaf since childhood. No premonitory symptoms were described and the patient is certainly likely to have been in normal health at the time of her remarriage 15 months previously. Yet despite the acute onset and prompt treatment the illness ran a chronic course, with eventual flattening of affect, though without gross deterioration. There is no evidence of specific predisposition (the family history is incomplete) but the personality was superficial and egocentric and, perhaps owing partly to the severe deafness, the capacity to form friendly relationships was impaired. Earlier disagreements within her family evidently provided the basis for much of the content of the psychosis. Some weight must also be attached to the late second marriage, since this presumably changed her mode of life and posed new problems of adjustment. A paranoid psychosis beginning soon after a marriage contracted very late in life has been seen occasionally in other cases.

In the following case a florid paraphrenic illness, beginning with depression, developed after the sudden death of a son.

CASE 5. Widow, aged 65. Admitted at own request to psychiatric hospital in Stockholm, 19.9.32. Well until son's accidental death 1 year previously, when she became very depressed. At Christmas, 1931, felt something strange in stomach "like electricity", which kept her awake at night and gave her no peace. Also had trouble with micturition and with giddiness. Said it was other people who "worked in her", perhaps some neighbours who did not like her. Later thought it was chiefly two people who persecuted her. 17.9.32, had a short attack with unconsciousness and blueness of the face, lasting a few minutes. Talked loudly to herself (hallucinated?). *Mental state*—Since summer had felt "persecuted by everybody"; indoors by two men in next flat, and outside by cars and by people staring at her. Neighbours and passers-by slandered her, and in some way caused her stomach to be upset. In hospital, a strange method of counting was employed, which she did not understand. *Physically*—Good general condition. *Course*—Occupied, but did not converse spontaneously. Complained that all sorts of people stood outside and denounced her; that they lay under her bed and disturbed her at night. Occasionally was irritable and querulous. Transferred to another mental hospital 8.12.32. Hospital diagnosis "Insania Presenilis".

Family History—F. d. 70, alcoholic. M. d. 81. Patient 3/6 siblings. One S. had 2 "strokes". no psychosis.

Past History—Married aged 20 to a bricklayer, alcoholic, died in 1900. 5 children, all living, except a son who died in January, 1931. After husband's death, patient worked very hard to keep the home going for the 3 youngest children, the others going to a Children's Home. One son criminal psychopath, one son alcoholic. One daughter treated twice with E.C.T. for manic-depressive psychosis, one daughter very nervous, one daughter admitted to mental hospital on 11 occasions, diagnosis either psychopathic personality with psychotic episodes, or schizophrenia. *Physical health*—Good. *Personality*—Sulky and withdrawn, cold and resentful, often beat the children.

Follow up—Remained in hospital until death 13 years later. Throughout auditorily hallucinated and persecuted. Complained of being forced to watch films of naked men and women having sexual intercourse; heard vulgar words, was violently raped, etc. Completely without insight. In 1935, showed rather poor orientation for time and place, but not to a gross degree. In 1938, showed gross delusions about identities, and a year later said she had given birth to a child in the night; later still that her bed was full of small children, spoke of a little boy inside her left arm, and prepared sandwiches for him. Thought disorder prominent, but at times she was able to reply coherently. Died after sustaining fracture of an arm, aged nearly 79, cause of death being arteriosclerosis, marasmus and pneumonia. Post-mortem: "diffuse cerebral atrophy of senile type with small gyri and broad sulci" (weight of brain 1,200 gm). No gross local changes found on section. Mild, universal arteriosclerosis.

Comment. The description of the post-mortem appearance of the brain can be accounted for by the advanced age of this patient, and in the absence of microscopic evidence, cannot be considered to be definitely indicative of pathological cerebral atrophy. Moreover, the illness had lasted 14 years at the time of death, and this length of survival is rarely if ever seen in cases of senile dementia. The illness may be attributed to the impact of the son's sudden death in a woman of schizoid personality, who was predisposed to mental illness. That some specific predisposition to mental illness existed is suggested by the fact that two daughters had suffered from a psychosis, one probably schizophrenia.

The last case shows an insidious onset before the sudden appearance without precipitating cause, of a florid persecutory-hallucinated state.

CASE 6. Married woman, aged 60. Admitted at husband's request to psychiatric hospital in Stockholm, 10.10.37. In recent years she had been quiet and brooding; had at times laughed aloud without explanation. On 2.8.37 became obviously ill, had visual hallucinations and hid her belongings. On the day before admission, refused to let her husband into the house, and

when door was broken in by Authorized Officer, tried to strangle him. Found to have a carving knife in her bed.

Mental state—Deluded that her husband was “strange” and wanted to injure her; had hidden her belongings to prevent them being stolen. Thought food smelled of snuff and contained worms; that tapwater made blue marks appear on her hands, so that she dared not wash. People were engaged in directing rays on to her, which she felt in her whole body. She had heard people running round her cottage and banging on doors. In hospital, heard whisperings questioning her about friends and relations. Foreign thoughts were put into her head. Her mood was indifferent, and affect was impaired, and her replies were brief and uninformative. *Physically*—Leptosomatic build, very thin, marked kyphosis. *Course*—After some improvement, discharged home on trial but soon returned and was eventually transferred, unimproved, to a Home for Old People (January, 1938). Hospital diagnosis “*Insaniam Presenilis (paranoid)*”.

Family History—F. d. 70, stroke. M. d. 75, said to have been psychotic towards end of her life. Patient 5/6 siblings.

Past History—Married twice (1) aged 30 (2) aged 38. First husband died after 5 years, said to have been very quiet and withdrawn. Related to patient. 2 children, of whom one died young. Son was a psychotically disturbed mental defective who was treated in a mental hospital for over 30 years. Second marriage was unhappy and childless. *Personality*—Peculiar, cold, insensitive to others’ feelings but over-sensitive herself, uneven in mood; always jealous. Had some musical talent. Not previously treated. Took son’s illness very hard.

Follow up. For 5 years she attended to herself well, was accessible, and well-orientated. Occupied herself by playing piano. For the last 3 years of life, her physical state was unsatisfactory, although no definite diagnosis was made. Throughout, she was slovenly, unoccupied and bad tempered, swearing and spitting. There was, however, no evidence of gross dementia or of focal C.N.S. disease. Death in January 1945, when nearly 69, was attributed to chronic myocarditis.

Comment. Unfortunately the nature of the mother’s illness could not be ascertained, but the husband, who was related to the patient, was schizoid, and the only son psychotic, as well as mentally subnormal, so that a hereditary predisposition can be strongly suspected. The personality showed both paranoid and schizoid traits, and the second marriage was unhappy and unfruitful. Predisposition seems to be the only identifiable factor in this case.