

## A STUDY OF PSYCHIATRIC ILLNESS IN COAL MINERS.

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IN recent years the mining industry as well as the miner himself have to an increasing extent become subjects for public discussion. In addition to problems of mechanization and industrial organization, the importance of the human element has found growing recognition, and an investigation into psychiatric disorders occurring in miners should form a useful contribution in this field.

The case material for this study consists of men employed in underground work in the mining industry who were treated at the Jordanburn Nerve Hospital, and a total of 100 cases is reviewed: 86 in-patients and 14 out-patients, 32 of whom have been under the writer's personal care. Many more miners were examined, but cases were included in this study only if they had been adequately investigated; even so, it is not easy to obtain sufficient information for a just assessment of cases when questions of attitude, morale or financial motive are involved. Two groups of psychiatric patients are inadequately represented: chronic and unco-operative psychotics are not as a rule treated at this department of the Royal Edinburgh Hospital for Mental and Nervous Disorders, and mild psychoneurotic and psychosomatic cases are as yet rarely referred to the psychiatrist by the practitioner. Halliday (1938) found that it was just these latter types of psychiatric disorder that accounted for a large percentage of disabling illness in the insured population, and that they were particularly prevalent among miners.

Diagnostically, the patients are distributed among the following syndromes: anxious-depressive psychoneurosis (30 patients); depressive psychosis (18); persistent psychoneurosis, including psychopaths (14); organic psychiatric syndrome (12); schizophrenic psychosis (11); conversion hysteria (10); physical disease accompanied by psychiatric symptoms (5).

## EARLIER INVESTIGATIONS.

In view of the dangerous nature of underground work, the question naturally arises as to whether miners are particularly prone to psychiatric breakdowns. This question can only be answered by comparing the incidence of psychiatric disorders in miners with that of other members in the insured population. Eliot Dickson (1936), a practitioner with a lifelong experience of the "morbid miner," was struck by the growing incidence of so-called neurasthenia as well as of peptic ulceration. He wondered if the explanation might not lie in the increasing mechanization of the industry, which reduced the miner to a mere shoveller of coal from the coal face on to mechanical conveyors, and he thought that the increase of neurotic illness was due to lack of mental adaptation on

the part of the miners to these new conditions. But when the Report on Incapacitating Sickness in the Insured Population of Scotland for the year July, 1933 to June, 1934 appeared, which contained for the first and, unfortunately, only time a detailed analysis of morbidity in mine workers, it became clear to him that this increasing incidence of nervous illness affected the total working population. At the same time, this Report, as well as the ones that have appeared since then, showed that there was a far higher incidence of incapacitating sickness among miners than in all the other occupational groups. For the years 1930-33 there were 405 cases per 1,000 miners, and only 190 cases per 1,000 males of the total insured population of Scotland, yielding a ratio of 2.2. Inflammatory skin conditions and incapacity due to accidents were mainly responsible for this large morbidity in miners; but if, in addition to neurasthenia and nervous debility, conditions certified as tachycardia, D.A.H., undefined debility, gastritis and peptic ulceration were included to form a psychosomatic group, it was found that the incidence of these illnesses together was almost twice that in all other male insured workers (ratio: 1.8).

This is also the opinion of Halliday (1943), who approached the subject from eight years' experience as a medical referee under the National Health Insurance Act. In his view, the most frequent syndrome was one in which hysterical symptoms occurred in a setting of anxiety. Examinations of individual miners suggested to him that there had been a chronic state of tension owing to constant stimulation of the fear mechanism. He found that important etiological factors lay in the local working conditions, the effect of accidents, conscious fears, and especially unconscious or at least unacknowledged fears, as shown by the frequent admission of anxiety dreams of "run-away hitches," "cage slipping," etc. Breakdowns seemed to occur in the presence of intercurrent sources of difficulty, e.g. personal, financial, or occupational. He thought that the illness frequently retained a characteristic of primitive emotional response in that it served a blind purpose, namely that of escaping from a dangerous working environment.

#### THE RELATION OF UNDERGROUND CONDITIONS TO PSYCHIATRIC ILLNESS.

In the present investigation, 58 of 100 miners blamed the conditions of underground work for their breakdowns, and in 41 cases a medical man had initially agreed with this view. But in the light of further investigations and later events, only 28 cases remain in which the main etiological factor was closely connected with work underground. In keeping with current psychiatric thought, these special strains and stresses played a much larger aetiological role with hysterical and anxious-depressive cases than in other types of breakdown. In the first group comprising 40 men, at least 20 showed clearly and conclusively that occupational factors were predominantly important, but this could only be said with conviction of 5 among 55 patients with organic psychiatric, schizophrenic, melancholic, and persistent psychoneurotic illness. In a large proportion of cases it was possible to form an estimate of the man's attitude to coalmining, and it was found that of 55 patients in the "mainly endogenous" group, 32 had been reasonably happy at their work, whereas

among the 40 patients suffering from hysterical or anxious-depressive illness only 9 were contented in their jobs, and 25 frankly disliked coalmining; 26 patients in this group had shown excessive emotional reaction to the dangers of underground work even before they fell ill. It seems justifiable to conclude that although coalminers suffer from the usual types of psychiatric illness with the same etiological structure as is found among the population in general, in addition there occur breakdowns which are more specifically caused by occupational risks.

#### ACCIDENTS.

Accidents are responsible for a large share of incapacity in coalminers, and it is therefore not surprising that they precipitated the psychiatric illness in one-third of our cases. A few of these patients were found to be suffering from organic nervous diseases in no way connected with an injury, while in a number of cases of head trauma organic mental sequelae had ensued. For the rest, the role of injury in the production of psychiatric symptoms was just as difficult to determine as in cases of post-traumatic illness in other occupations. Certain aspects of this problem seemed to have a special significance in miners, and the return to a dangerous environment was without doubt the leading factor in the production of neurotic symptoms in many instances, at the same time detailed case studies reveal that other factors are at least of subsidiary significance. This point may be illustrated by quoting the case of a patient who suffered from a depressive illness following a head injury:

CASE I.—Aged 37. His mother had at one time suffered from a mild depressive illness with anxiety attacks, and a brother was killed in a pit accident. After a normal childhood he had been working underground regularly and without nervous symptoms, though always disliking the conditions. Three years before admission, he had a severe attack of cerebrospinal fever from which he recovered without sequelae, and eighteen months later he met with an accident at work. He fell on his face when trying to jump clear of some derailing "hutches" (carriages). He was unconscious for a few minutes without retrograde amnesia, and in addition to lacerations of his face, he sustained a fracture of tarsal bones; X-rays of the skull were negative, and there were no headaches. When he returned to work some four months later he felt that he had lost his previous vitality and interest in hobbies. After a few months he began to feel frightened in dangerous parts of the pit and when working with the hutches; so he made up his mind to quit the mines as soon after the war as possible, and began to work overtime and on Sundays in order to save sufficient money to start in a greengrocer's business. A few weeks before admission he became unduly pre-occupied with his daughter's moral character, and at the same time he developed bouts of depression with severe headaches, attacks of crying, loss of appetite, weight, and libido; finally, he made two attempts at gassing himself.

When first seen he was still moderately depressed as well as retarded, and in poor physical condition. He showed no deterioration of intellectual faculties or personality, and made an excellent recovery in two months of routine hospital treatment. He returned to his previous work and reported symptom-free six months later.

This man's dislike of "the pit," even before his accident, is fairly typical of a large majority of patients with post-traumatic psychiatric illness. Excluding cases with organic sequelae, only 5 patients out of 23 gave evidence of liking their work, and of only 9 could it be said that their emotional reactions

to the incidents of a miner's life had been within normal limits. These patients frequently related how for years they had been struggling against a rising tide of fear, until an actual breakdown was precipitated by an accident.

CASE 2.—Aged 50, an underground miner all his life, had as a sideline engaged in various business enterprises with a view to keeping his sons out of the mines. As a young man he saw a fellow worker killed under particularly harrowing circumstances; for the following six weeks he was unable to work or sleep because he was haunted by this man's voice.

For seven years before the onset of acute symptoms he had been working as overman in a mine where he regarded the roof as unsafe and the safety arrangements not in accordance with Government regulations. There were frequent accidents, which caused the patient to be in a constant state of fear and tension, especially as one of his sons was working at his side. He had nightmares of accidents, frequently jumping out of bed with a shout, and his family were so accustomed to these occurrences that they would jokingly remark, "That's father getting killed again." In the two years preceding the patient's illness he had several narrow escapes from falling stones, and an accident in which another man was seriously injured reminded him of his earlier experience. Finally, he himself met with an accident in which he was momentarily knocked out by a falling stone. Owing to copious bleeding he considered himself seriously injured, whereas in reality he had only sustained a trivial scalp wound. However, during the year which preceded his admission to hospital he was unable to return to work on account of various strange sensations in his head and neck, as well as attacks of anxiety and depression.

Though the majority of patients in whom symptoms arose following injuries received compensation pay, less than half of them were suffering from a "compensation neurosis." All patients, except one in this group, had disliked their work, and with many there had been litigation over compensation claims following earlier accidents. All the usual features occurring in compensation neuroses of other occupations were found, but the following case may be quoted to illustrate some of the special points which arise when a mining accident is followed by post-traumatic hysteria and litigation over compensation pay.

CASE 3.—Aged 26, had been excessively shy and a bad scholar. One year previous to admission he sustained burns, small flesh wounds, and concussion while firing explosive charges at the coalface; his companion was found with him unconscious, and died a few days later with subdural and cerebral haemorrhages. The patient soon recovered physically, but remained completely amnesic for the accident, and a year later he still had an extensive amnesia covering most of his earlier life. He had remained emotionally labile, with headaches, sleep-walking, and fugue states. In view of the wide amnesia, the presence of pseudo-dementia, as well as the patient's emotional attitude, occurring in a man of well-retained personality and without evidence of neurological lesions, the condition was regarded as essentially hysterical by several neuro-psychiatrists.

There was a good deal of litigation over the patient's compensation claim, as the employers contended that the patient and his dead colleague had been guilty of "serious and wilful misconduct," because after lighting the fuses leading to the explosive charges they had failed to take cover. The onus of proof lay with the employers, and they had a good case, all indirect evidence pointing to negligence on the part of the workmen; but the only direct evidence could have been given by our patient, who had lost his memory and whose mentality was impaired; the Court found against the employers and awarded full compensation pay. The impression that this man's psychiatric condition was a hysterical (purposive) prolongation of an originally organic mental state was strengthened by the fact that after three years, during which period further evidence accumulated of the hysterical nature of his intellectual disturbance, the patient returned to his work at a time when he was forced to get married in order to legitimize a child.

## ACUTE FRIGHT.

A number of miners dated their illness from an emotional shock. Transitory nervous symptoms following narrow escapes or accidents happening to fellow workers undoubtedly are very common; but when these disturbances continue and develop into a psychiatric illness, there usually is evidence either for a hysterical (purposive) maintenance of symptoms, or of reactivation of neurotic manifestations dating from childhood and presumably involving the deeper layers of the personality.

CASE 4.—Aged 41, gave up his work on account of indigestion, feelings of faintness, sleeplessness, and mild phobic symptoms. During X-ray investigation of his stomach he was asked by the radiologist whether he had recently experienced a fright, and he recalled a shock which he had suffered a few weeks before the onset of symptoms, when he narrowly escaped a serious accident. A "cage" which he was about to enter began to descend prematurely owing to negligence on the part of the operator, and it took the patient about an hour to compose himself sufficiently to resume work.

During out-patient attendance over a number of weeks no evidence for early instability could be obtained either from the patient or his wife, but he had disliked the pits all his life and had made various vain attempts at obtaining different employment. Since the early part of the war he had been suffering intermittently from gastric symptoms, first noticed during heavy lifting at his work (steel propper). On medical advice he had all his teeth extracted, and while waiting for the anaesthetic he had an attack of faintness and sweating indistinguishable from his present turns. Though he improved steadily, he felt unable to return to underground work, and finally advanced the opinion that he ought to receive compensation pay. In view of his favourable progress and the history of symptoms before the precipitating incident, the patient was advised against engaging in litigation. He discontinued out-patient attendance forthwith, but eight months later his solicitor requested a medical report to support a compensation claim.

In the following case the illness was also precipitated by a frightening experience, but here we seem to be dealing with a much more deeply seated disorder:

CASE 5.—Aged 30, labourer in a shale oil plant released from underground work two years previously. Eight years before coming under observation he was hit by a runaway hutch and sustained slight lacerations not requiring absence from work. A few months later he narrowly escaped a similar accident, and reacted with an attack of trembling, sweating, faintness, palpitations, and vomiting. Since then he has been suffering from frequent similar turns, as well as pains, weakness, and stiffness of his limbs.

The patient had preferred mining to farm work on account of the shorter hours and better pay; he had worked regularly, and before his illness had taken part in the social life of his fellow workers; his married life had always been happy. The patient's mother was a hypochondriacal woman, constantly preoccupied with her heart, and in his childhood she had kept the patient in bed for a whole year following pneumonia because he had lost the use of his legs. His schooling had been irregular on account of frequent attacks of dizziness and vomiting associated with weakness and stiffness of his legs.

The patient agreed that his present attacks strongly resembled this childhood "biliousness," but in spite of reassurance by specialists he thought that his anxiety attacks were due to heart trouble, and that the doctors "were cheated" in their view of his case. Release from underground work had not produced any improvement of his condition, which had deteriorated into a chronic anxiety neurosis with hypochondriasis.

## PERSISTENT FEAR.

A continuous state of fear and apprehension arising from working conditions underground was admitted by 41 of 100 patients, and was the emotional back-



ground in 26 of 40 miners suffering from psychoneurotic illness of recent origin. There were some men in whom chronic fear alone was the main aetiological factor, as exemplified by the following case-record, which at the same time illustrates the stresses to which some miners may be subjected for prolonged periods.

CASE 6.—Aged 26, whose father was killed in a pit accident and whose mother was a lifelong sufferer from nervous palpitations. The patient's own personality showed only mild neurotic traits; circumstances had forced him into coalmining and he had delayed going underground until the age of 19, when he was placed in a particularly difficult and dangerous job at the junction of three "roads," all of which went uphill. Almost every day trucks broke away in one or other of these tunnels and his predecessor had his leg broken three times in 5 years, as well as sustaining a fractured wrist and many minor injuries. Each morning when going out to work he was apprehensive of what might happen to him during the day, and indeed he had numerous narrow escapes, such as the following: While at his post he heard some hatches rumbling down one of the tunnels, but the only getaway was closed by stationary trucks, which were filled up to within an inch or two of the roof. He was only saved from being crushed by the oncoming trucks owing to the fact that the first of them caught on a projecting beam and derailed the others a few feet away from him.

He gradually developed sleeplessness and morning headaches with an increasing sense of strain and anxiety, as well as hatred of the pit; at night he frequently woke crying out with the idea that the "hatches were down upon him." His doctor noticed the man's shaky condition one day when he was attending him for an abscess not connected with his work and advised him to take a few weeks' rest. This was two years before admission (1936), and the patient had never been able to face up to his work again on account of various symptoms of anxiety, depression and hypochondriasis. He made a good symptomatic recovery in hospital, but several months later was still trying in vain to obtain work outside the mines.

In most cases the sequence of events leading to a breakdown was less clearcut. When the patients were first seen their reaction to mining conditions appeared to be a highly important aetiological factor, but as treatment proceeded and the illness was studied in therapeutic interviews more and more personal factors gained in significance, until the illness began to show a pattern similar to psychoneurosis found in men of nervous make-up belonging to other occupational groups.

CASE 7.—Aged 35, gave a year's history of mild hypochondriacal preoccupations following a minor operation. A month before his first attendance he began to suffer from short depressive episodes, phobias, as well as feelings of unreality and lack of contact with other people, which amounted to a mild state of depersonalization. Both the patient and his wife made much of his unhappy position in the mines, where he had been working since the age of fifteen, originally in order to help his widowed mother and the younger members of his family, and then owing to the impossibility of obtaining alternative employment. At first he was frightened by the conditions underground and had frequent anxiety dreams relating to his work, but later on he thought that he had grown accustomed to the dangerous aspects of his employment. He was, however, very resentful of the discipline enforced in the mine, always hoping for a possibility of leaving the pits in order to become his own "gaffer," and he regretted having missed the opportunity of entering more congenial employment in the early part of the war before the Essential Works Order as applied to coal mining came into force.

The patient had lost his father early in childhood, several of his siblings showed neurotic traits, and he had as a boy suffered from fainting turns, nocturnal enuresis, sleep-walking, and various morbid fears, e.g. of finding himself blind when returning from a dark room. Later on he had to overcome sexual difficulties, and had

remained of a morose, hypochondriacal, and easily worried disposition. From the wealth of psycho-pathological material offered by this intelligent and co-operative patient mention may be made of a dream which recurred frequently during his illness and which at first seemed to be related to the mine: he is walking through an underground passage on rotten boards with water underneath them; he is frightened, and has the feeling that he will meet his death in a similar situation. The patient later on recalled that he had had the same dream in his childhood, and that it was connected with a childhood memory of being dared to cross the faulty wooden cover of a disused pit shaft in the woods near his home.

After admission to hospital the patient made little progress until he confessed a sexual digression while drunk about a month before the onset of his first symptoms. His feelings of guilt on this account were so severe and he felt so humiliated that he had not been able to discuss this experience in spite of repeated probings during numerous therapeutic interviews. Improvement began immediately after full discussion of this matter, and the patient was finally able to resume his work underground; a few slight relapses could be dealt with during out-patient attendances.

Apart from illustrating the danger of attributing too much aetiological importance to attitudes and motives connected with working conditions, this case shows in combination several findings encountered in a large majority of miners with recent psychoneurotic illness: a neurotic personality based on constitution and early environment; neurotic manifestations in childhood; chronic fear and unhappiness in the mines; and finally some precipitating event, which may or may not be connected with underground conditions. The resulting psychoneurotic breakdown often resembles in its structure and symptoms an earlier childhood neurosis, much as can be demonstrated in cases of psychoneurosis among the general population.

#### PERSISTENT PSYCHONEUROSIS IN MINERS.

When miners suffer from a persistent psychoneurosis, the course and symptomatology of their illness appears to be but little influenced by circumstances connected with underground work; they continue at their job for years in spite of neurotic symptoms, though the following case shows that this adjustment can become temporarily upset by additional factors:

CASE 8.—Aged 43, an underground miner since the age of 14, suffered from a chronic phobic-obsessive psychoneurosis, and had been twice previously incapacitated for a few weeks on account of exacerbations of his symptoms with a mild depressive mood disorder.

Without going into the details of this patient's earlier history, it can be said that he had suffered from his present symptoms continuously though with fluctuating intensity since the age of 21. Apart from mild obsessive-compulsive tendencies, these symptoms consisted of obsessional fears of losing his reason, of killing himself, of injuring others, of knocking at the doors of strange houses, etc., and of phobic sensations in the street as well as indoors. It was interesting to note that the panicky feeling of "as if there was not enough space" was no worse 400 ft. underground than in a small room of the patient's home. The claustrophobic symptoms, which were the first manifestation of his illness and which appeared at a time of psycho-sexual difficulties, arose acutely one day while the patient was travelling in a crowded train, and not in association with his work in the pit.

Four years before coming under observation, this miner developed "occupational dermatitis," and was given work as a bricklayer underground away from the dust of the coal face; there were, however, frequent recurrences of his skin condition associated with troublesome itching. This interfered seriously with the patient's sleep, and was thought to have precipitated an exacerbation of his neurotic symptoms as well as a mild depression, for which he attended as an out-patient. After a few months he readjusted once more and returned to underground work.

A good work record and lack of causal nexus between neurotic symptoms and underground conditions, as exemplified in the last case, are fairly typical features of the chronic psychoneurotic group of miners; this is in keeping with a psycho-pathological view which regards chronic psychoneurosis as a deep-seated disorder the symptoms of which are symbolic, and not reactive to the patient's situation in reality. It may be relevant to this point that a fair number of chronic neurotic patients are seen at this hospital who have been coalminers in the past, but who changed their work on account of nervous or vague physical symptoms; while some benefited temporarily from the change, in others the course of their illness remained unchanged.

#### WARTIME CONDITIONS.

The impact of the late war on the coalmining industry not only produced a host of social and economic problems which have been widely discussed, but there have also been psychological repercussions on the individual miner. In the absence of published morbidity statistics for the war years, only tentative conclusions can be drawn regarding the significance of the relative as well as absolute increase in the number of miners admitted to the Jordanburn Nerve Hospital. While in the years between 1933 and 1941 3-7 per cent. of male in-patients were miners, the figures for 1942 were 9.5, for 1943, 13.0, for 1944, 14.0, and for the first half of 1945, 12.0 per cent. This trend seems parallel to a rise of absenteeism among underground workers; according to Redmayne (1945) the rate was about 8 per cent. in 1926, 9.65 per cent. in December, 1941, 10.79 per cent. in 1942, 13.40 per cent. in 1943, and 14.40 per cent. in 1944; in Scotland the figure was about 12 per cent. early in 1945, but since then higher figures have been quoted in the press. Redmayne thinks that at present between one-half and two-thirds of absenteeism is voluntary, i.e. not certified as due to illness.

It is outside the scope of this paper to discuss possible sociological and economic reasons underlying this trend, but it appears highly probable that when morbidity statistics become available, psycho-somatic factors will be found to have played their part in the rise of absenteeism during these last years. As far as the psychological aspects of coalmining in wartime are concerned, it can be stated that it did not become a more dangerous occupation: the pre-war trend towards improvement in the accident rate and death rate from accidents per man shift worked as well as per persons employed has continued (Redmayne, 1945). In contrast to other industries, the duration of each shift has remained unaltered, and in Scotland at least, the number of shifts worked per week has not increased materially. Some patients worked excessively by putting in extra shifts on Sundays as well as during the week, but frequently this type of overwork, could be regarded as a symptom of a developing psychiatric disorder (e.g. unreasonable fear of financial difficulties) rather than as its cause. On the other hand, several consecutive years of uninterrupted work with only very occasional holidays appear to have been an unwonted experience for most patients, and in the presence of a wartime diet the occurrence of genuine industrial fatigue must be kept in mind.



It is probably not mere coincidence that there has been an increase in the number of miners seen at this hospital since 1942, the first year in which the Essential Works Order as applied to the mining industry (December, 1941) was in operation. Many men who had been unhappy in the mines had failed to find alternative employment before the war, and the Essential Works Order came into force at the moment when for the first time in their lives these miners would have been able to change over into more congenial and better paid work in the armament industry. Release became possible on medical grounds only, and especially in the out-patient clinic a number of men with previous neurotic tendencies were seen suffering from anxious and hysterical symptoms; with them the purposive motive of their illness, medical release from the pits, was only thinly disguised.

A further group of patients under observation were wartime miners who had failed to adjust. These were temporarily released from the Forces under the condition of working in the mining industry, as well as "Bevin Boys." All but a few in this group of patients disliked their new occupation intensely; they had all of them been of unstable make-up, and broke down either on account of the strenuous nature or of the dangerous circumstances of their new calling. The following case illustrates how a genuine psychoneurotic illness can arise under these conditions:

CASE 9.—Aged 19, was referred by his doctor 5 months after being conscripted to the mines. His mother had had a brief "nervous breakdown" following an emotional upset, and the patient himself had shown undue fear of the dark as well as a tendency towards gastric symptoms during childhood and adolescence. At the age of sixteen he spent several months in hospital with a left-sided chorea which had developed after he had been hit on the left side of his face by another boy. He felt anxious and cried easily at that time, and since then has continued to have slight recurrences of his choreiform movements at each anniversary of the assault. Hoping to get into the Navy, he withheld this illness during his medical examination and was graded I. He was very disappointed at being drafted into the mines.

At the time of his first attendance he complained of headaches, poor sleep, and loss of appetite. He had, however, gained a good deal of weight at his job, which consisted in carrying wood, and apart from a mild tremor could not be regarded as ill at that time. He was encouraged to carry on and seemed to respond quite well during two months of regular attendance. He had a great dread of having to work at the coalface, where he considered the roof to be dangerous, and continued to be severely upset by occasional small accidents occurring in the pit. Finally, he was ordered to the coalface, which caused a sharp increase in his symptoms and, objectively, his tremor became more severe, he developed a coated tongue, and began to look ill and depressed.

He was recommended for a safe job underground, where he worked practically symptom-free for several weeks, until he was declared "redundant" by the manager, and allowed to return to his old job on a grocer's van. Follow-up by the psychiatric social worker some six months later confirmed that he had remained well; but he was apprehensive and resentful about his impending call up into the Navy.

#### CONCLUSIONS.

As a result of the present study certain conclusions appear permissible. In more than half of miners suffering from a psychiatric illness occupational factors were absent or unimportant from the point of view of aetiology, and

apart from cases arising under the artificial conditions of wartime control and compulsion, only few men broke down on account of the unpleasant and dangerous nature of underground work alone; in fact, on closer investigation deeply seated personality problems eclipsed in importance the occupational factor. More significance should be attached to the finding that almost 60 per cent. of patients blamed their work for their illness when they first came for treatment, indicating a basic readiness of accepting their occupation as an unhealthy one, and 40 per cent. frankly disliked being coalminers, on account of the general conditions of work rather than of its dangerous nature.

Clearly these observations made on psychologically ill men cannot be applied to miners as a group without complementary field studies among the normal mining population. Recently H.M. Chief Mines Medical Officer (Fisher, 1944) pointed out that only investigators who are working in the mine itself and who are in constant close contact with the miner should make pronouncements on mining questions, but even authors who fulfil those conditions are seen to draw conflicting pictures. Redmayne (1945) stresses the great improvements made in recent years, and deprecates the view that the conditions under which the coalminer works underground are not only unpleasant, but highly dangerous and unhealthy. In contrast, Eliot Dickson (1936) describes vividly the gruelling conditions of work at the coalface combined with its monotonous and mechanical nature, with only one short interruption for the "piece." Coombes (1944), while admitting modern improvements, gives a most gloomy and pessimistic account, which has a depressing effect on the reader, and which is in line with the picture of mining conditions emerging from some of the case histories quoted in this paper: admittedly, a picture seen through the eyes of morbidly sensitive individuals. Though there are the stabilizing factors of a corporative spirit and, especially in the face of danger, of a fine sense of comradeship among miners, it is difficult to eradicate the general impression of an atmosphere of disgruntled resentment and restiveness, which must surely provide a favourable culture medium for neurotic reactions. This is particularly apparent in psychiatric cases falling under the Workmen's Compensation Act, where "the miner's bitterness never seems against the staff or the work which has crippled him, but to be intensified against the colliery company, or more distantly, the insurance company" (Coombes).

Preventive medicine has played an increasingly active part in the development of a modern mining industry, and recently the Mines Medical Service has been established. While the improvements in safety arrangements and the checking of the recognized occupational diseases have given more security and hopefulness to the miner, an investigation into the psychological aspects of coalmining might be equally worth while, as it should lead to adjustments likely to improve the general outlook of the miner, and at the same time to attract the badly needed recruits.

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