BRITISH MEDICAL JOURNAL:

BEING THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

EDITED BY ANDREW WYNTER, M.D.

No. XXXIII.]

LONDON: SATURDAY, AUGUST 15, 1857.

[NEW SERIES.]

Diseases OF SPECIAL OCCUPATIONS.

No. V.

THE LEAD-MINERS OF DERBYSHIRE: AND THEIR DISEASES.

By WILLIAM WEBB, M.D., M.R.C.S.Eng., Fellow of the Royal Medical and Chirurgical Society of London, Wirksworth, Derbyshire.

THE Derbyshire miner is indeed subjected to many hardships and numberless privations, unknown to persons engaged in work above ground; he is exposed to a great variety of accidents, and obliged oftentimes to labour for hours in a constrained and stooping posture, in an atmosphere very deficient in oxygen, and highly charged with carbonic acid and other unwholesome gases—his *groove clothes*, at the same time, frequently sticking to the skin from wet, and his whole body drenched in moisture. Yet he is not the fragile, puny, and delicate creature, which a consideration of his daily circumstances, occupation, and habits, might suggest; but a moderately hale, robust, and vigorous individual. This is probably owing in part to the custom observed, I believe, throughout the mineral field of this county, of employing the men only six or eight hours at a *shift*, and to their taking, except under certain circumstances, only one *shift* in the twenty-four hours. Much is likewise due to the men in this matter; for when unoccupied in mineral concerns, which they must generally be for six or eight hours *per diem*, they for the most part engage themselves in out-door labour and employment. Many miners have small plots of ground, where they keep a cow or cows, the attention to which affords them most wholesome occupation, and, I feel sure, is considered by them as a sort of recreation after their severe underground exertion. At Middleton, a village one mile from Wirksworth, the land is all divided into small plots, each one being about enough to keep a cow. The men in this place are principally miners, and most of them owners of property. Notwithstanding these advantages, which the Derbyshire miner undoubtedly possesses, over all other men of the same class and occupation that I know of, he can generally be pointed out by his pallid face, which strikingly contrasts with the florid and healthy visage of the agricultural labourer; this pallor being due to the deprivation during a fourth part of his existence of the necessary supply of oxygen to thoroughly decarbonise the blood.

In this neighbourhood there are two or three classes of working miners, viz.:

1. Those who work at the mines of proprietors.
2. Those who work at their own mines.
3. Those who work at both. (Some miners, after working six hours in a proprietors' mine, will likewise take a *shift* at their own.)

With all the apparent insalubrity of the occupation in which he is engaged, statistics are opposed to the assertion that the life of the miner is shortened and his health impaired by it; indeed, my own experience, and the opinions of other medical men with whom I have conversed on this subject, justify me in stating that these persons are rather remarkable for their health and longevity. In support of this, I may mention that the registrar of this district (who has held his office since the Registration Act came into operation) informs me, that he rarely registers the death of a miner who has died under the age of sixty.

There must be something peculiar to account for all this in the habits of the men. One great means of preserving health I have mentioned, viz., out-door occupation; a second, I am convinced, may be found in the cleanly habits of the miner, and in the care and attention he receives at the hands of his wife and friends, who constantly turn night into day to suit his periods of work; and we may recognise a third in the dwelling-places, which are oftentimes exceedingly neat cottages in lofty and exposed situations. Once a year, most of the miners' wives have a round at whitewashing, etc., till they make the abode to which their husbands return after their weary toil a pattern of everything that can promote and preserve health.

The occupation of the miner is at best very speculative, and most uncertain in its returns. He is sometimes paid by the amount of work, and sometimes by the *shift*; but much more frequently by the proportion of lead-ore which he is enabled to get. Hence, in some instances, a miner can scarcely realise a subsistence; whilst in others, with ordinary care, he may speedily amass a tolerable competency.

I am told that, as a body, the miners were formerly much addicted to intemperance; but now, as far as I know, they are a very steady, industrious, and provident race of men. I say provident, because, besides being moderately prudent, sick clubs (many supported entirely by working men) abound in this district; and few miners there are who do not belong to one or other of these societies, which not only afford them a good weekly allowance in the event of sickness or accident disabling them from work, but provide them, at a reasonable cost, with a qualified medical attendant. Hence the application by these persons for parochial relief is a most infrequent occurrence.

The mineral district of South Derbyshire is remarkably picturesque and highly salubrious; it consists principally of hill and dale, and of natural scenery which, for grandeur and beauty, it would be difficult if not impossible to surpass. Of this latter, the beautiful drive leading from Cromford to Grange Mill, called *Via Gellia*, with which many of our associates must be familiar, affords a good and striking example.

The lead mines in this neighbourhood have been worked from a period of great antiquity. Three pigs of lead, found seventy or eighty years since in old mine-hillocks, upon which are some Roman inscriptions, have been deposited in the British Museum; and there can be no reasonable doubt that these mines continued to be worked during the Saxon period.

The ventilation of the mines is such as to permit the miner to pursue his calling with comparative comfort. I believe, however, that there is room for improvement in this respect, which, if effected, would contribute to the advantage of all parties concerned in working these stores of wealth. Explosions from fire-damp (light carburetted hydrogen) are very rare in the Derbyshire lead mines. I have, however, heard of two explosions from this inflammable gas happening within the last three years, but, happily, neither was attended with loss of life or personal injury. The "*Whites' Founder*"—a mine on the north side of Wirksworth—was the scene of both these occurrences. My esteemed friend and partner, Mr. Cantrell, who has paid great attention to the working of mines, and is a large mineral proprietor, has informed me that explosions from fire-damp have likewise taken place at the "*Bullace Tree Mine*", near Cromford; and that such explosions occur when the men are working in the *shale*, and not in the *lime-stone*.

DISEASES OF THE LEAD-MINERS.

I shall not attempt a classification of the maladies under which miners suffer, but shall refer in a brief manner to those diseases most observed by myself, and to the treatment which I have found most effectual.

Perhaps the most common affection which the medical attendant is required to treat is due to the deficient oxygenation of the blood, and may be called general prostration of the system, or debility. A man will present himself at the surgery, fresh from the mine, looking as pale as death, complaining of difficulty and oppression in breathing, want of

proper action of the bowels, cephalalgia, aches and pains across the loins, with a pulse slow and feeble; and giving, as a part of his history, that he has been working in a *windless* place (*i. e.*, in an ill ventilated part of the mine, and one loaded with noxious vapours). The treatment for such persons is abstinence from work for a week or two, and iron in some form. I generally prefer the tincture of the sesquichloride in infusion of quassia, or the ammonio-citrate in water or the same vehicle. The miner should at the same time take a liberal diet; should be cautioned against working in those parts of the mine in which his candle will not burn; and recommended to take some quick lime with him in future, and in this way to absorb and render inert the carbonic acid which everywhere abounds as a product of respiration and combustion.

In some cases, besides the general prostration and other symptoms of lead-poisoning, I have observed the characteristic deposit of sulphuret of lead on the edges of the gums. Under such circumstances, sulphuric acid in full doses, with the black draught of ordinary use, are the best remedies, and, with their employment, the patient is soon restored to his accustomed health. Cases of this kind have been observed, in which the subjects were working only amongst *galena* or the ordinary sulphide of lead, clearly proving that lead in this form may be so absorbed as to poison the system; and, although I have never seen a case of paralysis or dropped hand in miners that I could trace to poisoning by *galena*, I have repeatedly observed the characteristic blue line, witnessed the concomitant symptoms, and even had occasion to treat several cases of colic in men who were getting no other form of lead besides *galena*.*

There is a notion prevailing among the miners and smelters of this district, that persons engaged in their occupations who take plenty of fat bacon, butter, or indeed fatty matter of any kind, enjoy a remarkable immunity from lead-poisoning. I am unable to bring any very strong or conclusive testimony in support of this point, or to advance any satisfactory opinion as to the *modus operandi* of these substances. I nevertheless think that some credence may be given to the general report, as, at a large smelting establishment in this district, whilst the men, I am told, suffer periodically from the milder forms of lead-poisoning, they are considered to save themselves, by taking plenty of fatty material, from the more severe and less tractable maladies. I may mention that some smelters have continued to follow their employment, with periodical intermission, for upwards of forty years, by observing this simple precaution, which, as far as I know, is the only one observed in this neighbourhood. Dr. Watson mentions that "a physician near Breda informed Sir George Baker that the village in which he lived contained a great number of potters, among whom he did not notice a single case of lead colic in the course of fifteen years; and he attributed their immunity to their having lived very much on butter and bacon, and other fat kinds of food." (*Principles and Practice of Physic*, vol. ii, p. 478.)

Another disease common among smelters, but from which miners suffer occasionally, is the *belland* or *bellain*, which is synonymous here with "painters' colic", and is usually treated in the same way. After repeated attacks of this troublesome affection (which, when it has once appeared, usually assails the smelter for the rest of his life, unless he give up his work, and resort to some other more congenial and healthy employment), paralysis of the extensor muscles of the hand and arm sometimes takes place, and we have what is called *dropped wrist*. I have seen one case of paralysis of the lower half of the body in a smelter aged 36, which has hitherto resisted all treatment. As it took place while pursuing his occupation, and after many other affections of a less severe character, and as other conculsive signs were present, there can be no doubt that this case is an aggravated one of lead-poisoning and paralysis.

Miners suffer a good deal from irritation of the bronchi (bronchitis), caused by the introduction during their work of small particles of dust into the larger air-tubes. Sinapisms to the thorax, and stimulating expectorants, as the decoction of senega, with carbonate of ammonia and tincture of squills, are found most beneficial and satisfactory in the treatment of this malady; the miner at the same time observing perfect rest from his occupation, and thus avoiding the exciting cause of it.

Rheumatism, rheumatic fever, and heart-disease, are common diseases here, as might be expected from the damp to which the men are sometimes exposed. Colicium is the sheet-

anchor in rheumatism, and is generally given in combination with alkalies.

Besides rheumatic affections, the nature of the country, and the distance which some miners walk to their work, may have something to do with the production of heart-disease.

Fatal accidents, considering the large number of men employed, are rather rare in the Derbyshire mines. They generally are occasioned by a fall of stone or by blasting, and happen mostly to old miners, who have grown careless by long continued work. Of the less serious accidents, concussions of the brain, fractures of the ribs and extremities, injuries to the eyes from the impaction of foreign bodies, as small particles of rock, pieces of steel from the pick, etc., scalp and face wounds, are the cases I have generally met with.

In conclusion, I am induced to believe that the longevity and comparative comfort enjoyed by the miners of this neighbourhood are in a great measure due to—

1. The regular out-door occupation and exercise.
2. The small number of hours employed.
3. Personal cleanliness, and moderately steady and prudential habits.
4. Good and nutritious food, with plenty of fatty material.
5. The general situation of the dwellings, and the neatness and cleanliness observed therein.
6. The salubrity of the district.

Illustrations

OF

HOSPITAL PRACTICE:

METROPOLITAN AND PROVINCIAL.

KING'S COLLEGE HOSPITAL.

I. WOUND OF THE RECTUM, ULCERATING INTO THE BLADDER: DEATH FROM PYÆMIA.

Under the care of R. PARTRIDGE, Esq.

[From Notes supplied by C. HEATH, Esq., House-Surgeon.]

H. B., aged 30, was admitted June 27th, under the care of Mr. Partridge. It appeared he had sat down rather suddenly, while undressed at night, on the sharp broken end of the upright part of an arm-chair. This caused a good deal of pain, and shortly afterwards he passed some blood in his motion. When admitted, there was great tenderness in the abdomen, especially the left iliac region. The pain was increased by pressure. He had made water directly after the accident, but had since been unable to do so. There was no sickness. A catheter was passed, to draw off the water. This was done easily, and no obstruction was then noticed. During the day, his urine was passed naturally, but mixed with blood. He was ordered to take a grain of opium every four hours.

Next day, Mr. Partridge passed a catheter, and noticed a hitch near the posterior portion of the urethra, probably depending on laceration of the mucous membrane. No further symptoms, however, presented themselves; the urine and feces were natural; and he wished to leave the hospital, feeling quite well. He accordingly did so on July 2nd.

He was readmitted on July 22nd, stating that he had been suffering from almost incessant diarrhoea since leaving the hospital, and had at that time twenty or thirty evacuations daily. This was not attended with much pain. He also stated that wind passed from the urethra. The urine and feces usually passed at the same time. An examination *per rectum* failed to detect any communication. He was ordered tinct. catechu 5 ss, tinct. opii mx, decoct. hæmatoxyli 3iss, 6tis horis. Next day he had slept pretty well, but was much exhausted. The urine contained a dirty brownish yellow substance, which was thought to be mucus tinged with the logwood he was taking. The diarrhoea persisted. There was also dulness at the back of both lungs, and crepitus on the left side, with expectoration of rust-coloured sputa. He was much troubled with retching, but there was no vomiting. A liberal allowance of brandy was given, and ammonia was added to the draught.

On July 24th, a number of little whitish bodies were found floating in the urine, which was examined microscopically, but no clear proof was obtained of the presence of feces. The

* Some medical men are of opinion that this blue line is not characteristic of the absorption of lead.