PRESIDENT'S ADDRESS,

DELIVERED AT THE OPENING OF

THE SECTION OF MEDICINE,

*At the Annual Meeting of the British Medical Association,
in Plymouth, August 1871.*By CHARLES BARHAM, M.D. Cantab., Truro.
President of the Section.

THE DISEASES OF CORNISH MINERS.

I OCCUPY this chair, gentlemen, with great reluctance. In any case I should have felt painfully my incompetence to its duties; and I should have declined accepting this, as I have declined other similar offices at this meeting, if proposed to me at the time when such appointments are usually made, on the ground of the uncertainty which hangs over the fulfilment of all distant engagements when one has "fallen into the sere and yellow leaf."

"Vitæ summa brevis spem me vetat inchoare longam."

But my incompetency is brought home to me with double force by my knowledge and your knowledge that this Section was to have been presided over by Professor Acland, than whom no member of our profession is more highly qualified to fill the post with honour to himself and advantage to the purposes of the Section, whether by position, acquirements, or zeal in our common cause. We may imagine, too, that he would have experienced some special satisfaction in heading your advance in this locality—in his native county, where his name is associated with all that is most worthy of honour in the character of the English gentleman. Some of you have seen the noble statue of his father, Sir Thomas Dyke Acland, at Exeter, a tribute of universal respect. His accomplished sons, emulous of his excellence, have distinguished themselves in the Church, the Senate, and the Schools, by the same elevation of public spirit and equal ability. Had Dr. Acland been here, we should have been inclined to exemplify towards himself the line inscribed beneath the statue of his father:—

"Præsentī tibi maturos largimur honores."

That father is gone to rest within a few days only; and if anything is a source of satisfaction to me in acting, inefficiently as I must act, as the son's substitute here, it is that I may be saving him from public duties which he would willingly avoid. Of the causes of his withdrawal from our Association, I will say nothing, and I know very little; but we shall all deeply regret their effects. One of them is my presidency over this important Section. When the post became vacant, almost at the eleventh hour, I could not, as a member of nearly forty years' standing, give an absolute refusal to the request of the Committee of Council that I would fill it, although I regarded that request as a sort of observance of the fifth commandment—a mark of respect for seniority. I will repay it by due parental consideration for the fastness of the rising generation, and limit my discourse by the twenty-minutes sand-glass, "with a leaning to mercy." Under the circumstances, I am sure you will favour me with an extra measure of the indulgence accorded to those who "have greatness thrust upon them"; and I am further relieved by the reflection that, although I alone am bound to trouble you with an address, the business of the Section will hardly suffer from my defects, as it will be mainly conducted by Vice-Presidents who have your fullest confidence—Dr. Quain and Dr. Smart.

Had he occupied the place destined for him, Dr. Acland would probably have addressed you on the past, or present, or future of medicine, or all together; and he would have done so with his wonted talent, and with the authority with which he is invested as the head of the medical school of our greatest University. Any such attempt would ill befit a remote country doctor. Perhaps I may employ a few minutes of your time less unprofitably by inviting your attention to some topics of medical interest more or less specially belonging to these western parts, and consequently presenting some features of novelty to our distant visitors. It has, indeed, seemed to me that as, when we look into a local museum, we hope to find, not a futile attempt to imitate by shreds and patches a metropolitan collection, but full and characteristic series of specimens representing the peculiarities of the surrounding districts, so this Association, in successively visiting the seats of particular industries or localities marked by distinctive climatic or other physical conditions, may fairly expect that, whatever else may be brought under consideration, the knowledge and experience of the resident members of the profession in regard to matters of special and local character with which they are daily conversant, shall to some extent be utilised

for the benefit or entertainment of those who have left their homes to see or to hear something new. On this principle of the exhibition of "local productions", the Presidents of the Association and of the Sections are annually chosen; and on this principle I will try to present you with a sketch, in very broad outline, of the most marked diseases and causes of death of the Cornish miner; and I will slightly allude to two other local topics; and, in accordance with the dictum of Horace—

*"Segnius irritant animos demissa per aures
Quàm quæ sunt oculis subjecta fidelibus—"*

I will, as far as I can, place the great facts before your eyes at least graphically, if my words fail in descriptive power. Those facts shall be also illustrated from the mining districts of Durham and Northumberland, where our last meeting was held, and where the condition of the miner is probably the least unfavourable in this country; and from those of Staffordshire, where it is in some respects worse, in some better, than in Cornwall. I may premise that the great masses of evidence on these matters are contained in the Reports of two Royal Commissions. The first, on the "Employment of Children in Mines", was obtained by Lord Ashley, now Earl of Shaftesbury, and, when issued in 1842, startled the country by its revelations about the collieries; abominations, in regard to the work done by women and children, at once stamped out by public indignation. In this inquiry, Cornwall and the mining districts of Devon were entrusted to me. The second Commission was presided over by Lord Kinnaird. The Report was only issued in 1864. The medical evidence on this occasion was much enriched, and derived greatly increased precision, through the direct examination of a large number of miners by Dr. Peacock and Mr. Bankart; and the statistics of the subject were elaborated with his accustomed skill by Dr. Farr. Dr. Taylor, Mr. Angus Smith, Dr. Bernays, and other men of authority, also contributed the aid of accurate science to the estimation of the impurities of the air in which the miner works. Besides these sources of information, unfortunately buried in blue-books, much has been done by private investigation; and particularly I feel bound to mention Mr. Blee, of Truro, as one of the first to work out the proportionate longevity of the mining and non-mining population of the same districts, and as having just now brought down his inquiry to the latest possible date, and furnished me with his main results.

You will, I think, get over the ground most rapidly by first seeing what a Cornish mine is—the miner's place of work. The form of this results from the geological conditions of the metalliferous veins. These have a general direction from east to west for those producing tin and copper—by far the most important—and from north to south for lead. They are more or less inclined from the perpendicular. Here is the great source of the difference between these mines and collieries: as places of labour; the latter being excavations of beds of generally horizontal direction. The one is a vertical fissure through the earth's crust, filled with metallic wealth; the other, a deposit of the vegetation of eras long bygone, or, if you please, a concentration of the sunbeams of the early ages of the world, ready to be diffused again for the cheering of our winters with light and heat. In both alike, the raising the material to the surface is a process of money-grubbing, and the expenditure in it of human life and health has been too often but lightly regarded. In a double sense,

"Effodiuntur opes, irritamenta malorum."

Governed, then, by the above physical conditions, the Cornish mine consists essentially of horizontal galleries (or levels) run along the course of the vein for its excavation. These levels are opened at intervals, usually of sixty feet, through the depth of the workings, and access is given to them by shafts, either carried down on the course of the veins, or, more commonly, so as to intersect them. A gallery is also usually carried horizontally to the surface, as deep as may be in the mine, for the readier discharge of water. As the mine becomes deeper, separate shafts are made for the machinery, and shorter ones are also carried from level to level. The miner usually removes the vein from below upwards, and the aid of blasting is constantly called for. The air becomes impure from the breathing of the miners, from the burning of the candles, and from the explosion of gunpowder; and no means hitherto employed are adequate to more than a very partial correction of the evil, in those more advanced parts or ends of the workings especially, where the miner is often necessarily employed. The above causes also raise the temperature; but its elevation is still more due to that of the earth itself, which increases with the depth about two degrees in every hundred feet, so that it often reaches to ninety degrees, and in one instance has even reached a hundred and twenty-three degrees. Other mines, or parts of mines, chiefly the shallower, are cold and draughty, and almost all are more or less wet, rendering heat or cold more sensibly felt.

The Cornish miner usually works eight hours in the twenty-four, by day and night in a regular rotation, besides going to and from his place of work in the mine—a heavy addition to his labour, where he has to ascend a thousand feet or more by ladders, the universal mode thirty years ago, but now superseded by machinery in about a dozen of the most important mines.

This is a very imperfect sketch; but it is sufficient to show you that the Cornish miner works without sunlight, in a very impure air, in a thick cloud of smoke, and in a very hot place. His posture is also often constrained, and his labour wearisome; the immediate result being commonly a loss of five or six pounds during his work, and great prostration, with weak and irregular cardiac action at the close of it.

Underground labour is usually commenced at an early age, whilst the frame is still plastic, and when nutrition should be well maintained. Of 464 miners examined by Dr. Peacock, 40 (or 8.6 per cent.) began working underground from seven to nine, 185 (39.8 per cent.) from ten to thirteen, and 115 (24.7 per cent.) from fourteen to fifteen. These ratios for the respective ages are quite as high as those returned to me for a much larger number thirty years ago.

The ill effects of the conditions under which this underground labour is carried on are marked by the general sallowness of the class, especially as contrasted with the healthy ruddiness of the women and children belonging to it; by sparseness of frame, as compared with the other workmen around; and by a certain worn and weary look, often giving the appearance of more than the real age. A pretty correct notion of the deteriorated condition of the miner, short of his being quite unequal to underground work, may be derived from the following table, given by Dr. Peacock, which shows the state of 464 boys and men found at work.

TABLE I.—Table showing the State of the Miners found at Work.

Ages.	Number examined.	Healthy.	Pale.	Worn.	Decidedly delicate looking.	Complaining of various symptoms of indisposition*
Under 21 ..	117	42	36	2	32	5
21 to 40	233	35.8 p. c. 112	80=68.3 p. c. 45	14	37=31.6 p. c. 45	17
41 to 63	114	48.06 p. c. 43	171=73.3 p. c. 8	1	62=26.6 p. c. 33	29
		37.7 p. c.	52=45.6 p. c.		62=54.3 p. c.	
	464	197	89	17	110	51
		42.4 p. c.	303=65.3 p. c.		161=34.6 p. c.	

It will be seen that one-third at least of the whole number were distinctly unhealthy.

If I had time for it, there would be no particular advantage in treating on this occasion of the ordinary disorders caused by exposure to wet and cold, or its alternation with excessive heat, which miners are always subject to from time to time. Rheumatic, catarrhal, and inflammatory affections are, of course, frequent; but they can hardly be called peculiar to the class. Dyspepsia is more so; it is often suffered from early in the miner's working life, and doubtless contributes largely to the deterioration of constitutional vigour, from which those diseases to which his death is attributed in the register derive their force, if not their origin. Another disorder, which he calls "slow fever", is distinctly traceable to his occupation, and is interesting in itself; but it is not so extensively prevalent, or so fatal, as to justify my dwelling on it here. The following statement of the results of Dr. Peacock's examination of eighty-three miners disabled by sickness will furnish a fair average of the proportionate prevalence of various forms of disorder in the class.

TABLE II.—Cases of Disease among the Miners examined in July and August, 1862.

	Cases.
Dyspepsia, or organic disease of stomach	3
Rheumatism	1
Slow fever	2
Convalescence from fever or inflammation of the lungs	1
Diseases of respiratory organs—	
Miner's asthma	41
Abscess in the pleura opening through the lungs	1
Consumption	12
Mesenteric disease	1

* Dyspeptic and rheumatic symptoms, cough, expectoration, difficulty of breathing, palpitation, etc., with more or less marked general appearance of debility or indisposition.

Affections of the heart, etc.—

Palpitation	4
Diseases of heart	5
Diseases of nervous system; paralysis—	
Hemiplegia and paraplegia (1 from injury)	6
Kidney-disease and dropsy	2
Disease of skin	2
Effects of injury (not otherwise classed)	2
Total	83

I will proceed to point out the great facts which stand in high relief on the face of the tables of mortality—the terrible sacrifice of life entailed by underground labour in the Cornish mines; and the one paramount disease, designated "consumption" in those tables, by which that sacrifice is caused. The former sad tale could not be more strikingly told than in the subjoined numerical comparison of the death-rate among miners and non-miners.

TABLE III.—Annual Death-Rate per Cent. (1) of Miners; (2) of Males, exclusive of Miners, in Seven Cornish Districts.

Ages.	In the Five Years 1849-53.			In the Three Years 1860-62.		
	Miners.	Males (exclusive of miners).	Difference in the death-rate of miners and non-miners.	Miners	Males (exclusive of miners).	Difference in the death-rate of miners and non-miners.
15 and upwards.	1.797	1.854	.057	1.938	1.785	.153
15	.890	.712	.178	.944	.750	.194
25	.896	.884	.012	.957	.832	.125
35	1.430	.999	.431	1.512	1.068	.504
45	3.531	1.476	1.875	2.074	1.250	1.724
55	6.317	2.412	3.905	6.321	1.996	4.325
65 to 75	11.123	5.861	5.262	11.051	5.331	5.720

It will be seen that while, up to the age of thirty-five, the difference is not very great, it increases very rapidly afterwards, till, from forty-five to sixty-five, the proportion of deaths among the mining class is nearly threefold that in the other. The following table shows the second great fact—the class of diseases by which the excessive death-rate of the Cornish miners is chiefly produced.

Out of 10,000 deaths (from all causes) of males above fifteen, there were registered as deaths from consumption—

TABLE IV.

	In England.	Of Cornish miners.	Difference.
15	312	247	65 less.
25	354	331	23 "
35	309	549	240 more.
45	263	1,206	943 "
55	186	1,394	1,208 "
65 to 75	85	652	567 "
Total	1,509	4,379	2,970 more.

The disease here designated consumption is not usually connected with tubercle at the ages when the mortality assigned to it is so great. It comprises the chronic forms of pleurisy, bronchitis, pneumonia, asthma, emphysema, and other chest-affections, and is characterised by slow decline, with progressive loss of breathing-power. The various structural changes have not been ascertained so precisely as might be wished, *post mortem* examinations having been rare. The miner will never die of chronic disease in hospital; and the process is abhorrent to the feelings of survivors at home, as well as very inconvenient in the cottage. The following notes of an autopsy performed by Dr. Peacock and Mr. Bankart constitute the only record of the kind presenting any fulness and accuracy of detail with which I am acquainted; and it may be regarded as a fair specimen of the complication of diseased conditions evidenced in a great many cases by symptoms and physical examination, although some of its features are exceptional.

The affection seemed to have originated in bronchitis and pneumonia, leading to collapse or consolidation of the lung; and no tubercle was found in any part of the body. The patient was a man fifty-five years of age, who had been a miner since he was thirteen or fourteen years old. He had been laid by ill for three years, though ailing for a greater length of time. The left lung was found slightly attached to the parietes by old cellular adhesions; it was voluminous, somewhat emphysematous at the edges, of a deep blue or black colour, and sparingly crepitant. The bronchial tubes contained much secretion, of a dark brown colour. The right lung was universally attached to the

parietes by strong fibro-cartilaginous adhesions. One of the ribs was carious; and an abscess had formed in the situation, containing thick yellow pus, which involved the pleura, but not the lung itself. The substance of the lung was of the same colour as the left, and entirely solid, except towards the upper part, where there were several irregularly shaped cavities, which, together with the bronchial tubes, contained a similar brown material to that found in the tubes of the left lung. The bronchial glands were also very large, hard, and of a black colour. In the bronchus of the right lung, the terminal portion of that of the left, and the commencement of the trachea, the mucous membrane was deeply reddened, and studded with small yellowish coloured deposits of lymph. The trachea and larynx were large; but the mucous membrane on the epiglottis and cordæ vocales, though thickened, was free from ulceration.

To obviate all sources of fallacy, we will throw together the deaths attributed to "consumption" and those registered under "other diseases of the lungs", and compare the mortality of the Cornish miner from these causes with that of the other great mining districts and that of all occupations in all England.

Out of 10,000 males who attained the age of fifteen, there were registered as dying of all lung-diseases—

TABLE V.

In England: All occupations.	MINERS IN			
	Cornwall.	Stafford.	Durham.	South Wales.
2,866	5,596	2,655	1,958	3,037

Hence it is clear that underground work does not entail *per se* any excess of mortality from this class of diseases; and that its lamentable excess among the Cornish miners is owing to the special conditions of their labour, of which a summary view has been given. Heart-disease is a less frequent cause of death here than in England generally—much less so than in Durham. There is sufficient evidence that the mining districts of Cornwall are in themselves as healthy as almost any part of England; but the inference drawn in the Report of Lord Kinnaird's Commission, from the small number of deaths, except from lung-disease, that the miners would be peculiarly exempt from other fatal maladies, is hardly safe; a large mortality from any one cause necessarily lessening the number of those subject to perish by other causes.

Although not strictly within my subject, a cursory glance at the comparative frequency of death by accident among Cornish miners will be interesting. It is furnished by the following table.

TABLE VI.—*Death-Rate by Violence, per Cent. of Males aged 15 Years and upwards in five Years, 1849-53.*

Ages.	All England.	MINERS.		
		Cornish.	Stafford.	Durham.
15	.089	.200	.754	.243
25	.098	.211	.768	.223
35	.115	.188	.823	.333
45	.144	.237	.882	.370
55	.160	.148	.680	.375
65 to 75	.183	.209	.684	.290

I can only point to the much larger proportion of these fatal accidents at an early age—the age of carelessness—compared with the total deaths. The loss of life thus caused in Cornish mines, although considerably greater than in the community generally, appears insignificant by the side of that in the Staffordshire collieries, with which those of South Wales nearly correspond.*

It is satisfactory to me to be able to state, from the data furnished by Lord Kinnaird's Commission, and from the more recent inquiries of Mr. Blee, that there has been some progressive lessening of mortality, both from disease and from accident, in the thirty years since the date of my own report. The former amendment, which is coincident with a like change for the better among the surrounding population, may arise in great measure from freer command of the necessities of life; the latter is a good deal owing to the introduction of substitutes for ladders into many of the larger mines.

I have no time for comment on the great facts I have stated; and my audience can need none. Their application to civic life, where

* The plans and sections of Cornish mines, and the comparative ratios of mortality from various causes at different ages in the several districts, were very clearly shown by coloured diagrams, which we cannot reproduce.

similar agents of disease and death are at work in mitigated intensity, is transparent.

It was my wish and intention to say something about the prevalent diseases of Plymouth from 1727 to 1752, as they are described by that excellent example of the old physician, Dr. Huxham, who has placed them on record, month by month, together with a minute meteorological register, during the whole of that period. But I must content myself with remarking that the prevalence of intermittent fevers at that time—they have been nearly extinct here during the present century—may be attributed in great part to the former marshiness of a very large tract, now in the centre of the town; an evil influence probably intensified by an unprecedented term of thirteen years in succession, with rainfall much below the average.

I cannot conclude without endeavouring, in the fewest possible words, to point out to you a new weapon against disease and delicacy of the chest, in the climate of the Isles of Scilly. Placed in the midst of a warm sea, frost of any severity is quite unknown, and the summer-heat is never intense.* The extreme range of the thermometer is from 75 deg. to 28 deg. In short, the climate is by far the most equable in the British Isles. The rainfall is much less than on the mainland. The vegetation is almost tropical; the aloe, said to flower in England once in a century, may be seen blooming every summer, and the mesembryanthemum dazzles everywhere. To reside there is to have the benefit of a sea voyage, in a genial air, without the chance of being drowned.

CLINICAL MEMORANDA.

WASP-STINGS.

A FEW days ago, I had a hasty summons to see a lady who was said to be nearly suffocated, having been stung by a wasp in her mouth. I arrived within an hour of the occurrence. Her whole face was very much swollen, and the eyes nearly closed; the neck and the upper part of the chest and the arms were swollen, and dotted over with a red rash. Her breathing was very short and hurried; but she could swallow without much difficulty. The tongue and inside of the mouth were also swollen, so that I could not examine the throat; but I could see the mark of the sting in the centre of the inside of the upper lip. The accident occurred in drinking wine at luncheon; and I was told that the symptoms commenced almost immediately afterwards, and were at their height within half an hour, when she was cold and faint, and the breathing worse than on my arrival. Ammonia and oil had been applied to the sting, and had taken away all the pain; and the treatment now was to constantly foment the face with hot water, the vapour being also inhaled through a sponge over the mouth. This had a marked effect in reducing the swelling of the face; and on leaving it off for a few minutes, it evidently began to increase. I saw my patient again in the evening; all the urgent symptoms had subsided, but there still remained considerable swelling of the face, much of which had not subsided even on the following day. By a strange coincidence, the next day, I was shown a leg very much swollen from the foot to the knee, and quite hard and very hot, from a wasp-sting in the calf of the leg. As such accidents must be common at this season, they must affect some persons more severely than others, or such cases, as I have mentioned, would be more frequently met with.

Mells, Frome, August 19th, 1871.

GEORGE TERRY.

IRON IN SCARLATINA.

I NOTE in the JOURNAL of August 12th some remarks by Dr. Russell Aldridge on the use of iron in scarlatina; and as I happen to have had not a little experience in that ailment, am glad to be able to confirm his views relative to its treatment. Having repeatedly seen the best results from the use of iron in small-pox, I determined to see its effects in scarlatina; and during the past few years have had reason to place it as a well-proved remedy, particularly in those cases in which the throat-affection was a prominent symptom. I usually employ the perchloride with chlorate of potash and the solution of the acetate of ammonia, to help, with warm baths, in promoting diaphoresis. If deglutition be difficult, and the little patients very averse to being dosed, I generally use a stronger solution of the medicine as an application to the fauces, believing that it does good not only locally, but generally. The too frequent accompaniments of this disease—glandular, ophthalmic, renal, and other mischiefs, have been most certainly modified, or altogether prevented, by a somewhat early administration of quinine.

Bingley, August 17th, 1871.

JAMES CROCKER, M.R.C.S.E.

* The rainfall at Plymouth from 1727 to 1752, and the climate of Scilly, were shown by coloured diagrams.