doctor". He grapples with grave medical errors which to ordinary observers seem to have been corrected long ago. Unhappy mortals who are being killed "by bleeding *coup sur coup*, by antimony, by starvation", beg for his protection; and, like a certain ancient knight who lived but to redress the wrongs of the helpless and unprotected, the champion of "restorative medicine", bearing "life-giving oil" for the "renewal of life", rushes valiantly forth, and instantly restores them by "life-supplying food, warmth, moisture, etc."

As to the scientific questions, I would remark—

1. That I must still hold the opinion, that "when our bowels act a little more than usual; when we pass four pints of urine instead of two in the twenty-four hours; when we perspire freely; if we apply a turpentine stupe or a mustard poultice to our sound and healthy skin,"—we *do not* "necessarily become ill". Such actions are merely increased healthy actions, and take place in perfect health.

2. The author of the *Renewal of Life* should define what he means by life. To say that we "supply life by food, warmth, moisture, etc.," and to speak of the "life-giving" properties of cod-liver oil, seem to me incorrect expressions. Instead of "supply" and "life-giving", I conclude Dr. Chambers means simply "support" and "life-supporting". The terms "vital", "more vital", "less vital", "general life", "local life", all need explanation.

3. It is a misapprehension to suppose that I regarded "augmented general or local life" as necessarily associated with "augmented bulk"; nor would I maintain that there was "*more vitality* in a jelly-fish than in a sprat, in a mushroom than in a flea"; but, to take the same striking examples the author of the *Renewal of Life* has selected for discussion, I would maintain that in a living growing mushroom there is a far greater amount of matter in a *living state* than exists in the last named insect.

4. Dr. Chambers says: "Disease is a deficiency of action." I answered: "Disease may consist of an *excess of action*, or there may be *deficient action*." Dr. Chambers rejoins by saying that I uphold the "*converse proposition*" to his!

It is certain that a cancerous growth lives much faster than the normal tissue from which it has proceeded; so does pus. In a given weight of these morbid products, there would be a far greater amount of matter in a *living active state* than in an equal weight of growing cuticle, for example. In the case of cancer and pus, a much greater quantity of inanimate pabulum would be converted into living matter within a given time, than in the normal tissue. Hence, it seems to me, the *vital processes* are *more actively* carried on in these morbid structures than in healthy cuticle. In disease there may be excess, and there may be deficiency, of action; and I submit that Dr. Chambers has not shown that disease is in all cases a NEGATION, a DEFICIENCY of action, or PARTIAL DEATH.

GREAT EASTERN RAILWAY (NEW METROPOLITAN STATION AND BRANCHES) BILL. The Ophthalmic Hospital lies close to the proposed site of the station, and the governors, medical officers, and subscribers in their petition presented by the Earl of Shaftesbury, pressed very earnestly that the bill should be thrown out.

Illustrations OF HOSPITAL PRACTICE: METROPOLITAN AND PROVINCIAL.

CHESTER GENERAL INFIRMARY.

OBSERVATIONS ON THE EFFECTS OF LEAD UPON OPERATIVES.

By ROBERT H. POWELL, M.D. Lond., Physician to the
Infirmary, etc.

THE neighbourhood of lead works and mines to this hospital affords occasional opportunities for observing the pernicious effects of saturnine emanations on the human system. Those who have inspected the preparation of white and red lead, may well feel surprised that the health of the workmen and women is not more generally impaired, and severe disease speedily induced. That it is so in several instances, however, those who are called upon to treat the ailments of the sick poor of this locality are well aware.

The deleterious influence of the salts and oxides of lead presents itself at the hospital mostly in the form of muscular paralysis. The familiar affection, painters' colic, has not been so frequently noticed as one might expect. Perhaps this may be accounted for by the fact that the respiratory organs constitute the main channel of contamination. The house-surgeon, Dr. Fyfe, informs me that he has met with six or eight cases of lead-colic attacking persons engaged at the lead-works. In most of these cases, previous or present palsy was experienced; and in all the blue line on the gums was well marked. He found that purgatives, opiates, sulphuric acid, and iodide of potassium, in succession, were appropriate remedies.

The workrooms in which the manufacture of white lead is completed are every where pervaded with fine particles of lead-compounds, which must necessarily be inhaled in more or less quantity. A visitor is struck with the resemblance there presented to the quarters of the "dusty miller"; whose jocund look and hale complexion, however, sadly contrast with the wan appearance of the lead-operative. It is to be hoped that the inventive bent of our day may eventually devise some more effectual safeguard to the health of those engaged in such employment, than the imperfect contrivances at present adopted. Meantime, we have to apply ourselves to overcome as far as possible the disease thereby induced, and to trace its precise seat and pathological results.

There is now a man under treatment in this hospital for partial palsy of the upper and lower extremities, who had been engaged for two years at the lead manufactory. He states that his general health has been good until a year and a half ago, when he first suffered from lead-colic, or, in familiar terms, had been "lead-ed". He complains of no special disorder, save this local weakness of arms and legs, commencing five weeks ago. The man is aged 28 years, of slight build and well formed; presents a pallid aspect. The gums are universally marked with the characteristic blue line. No disturbance of the digestive organs is complained of; the appetite being good, and the bowels acting well. Urine normal. Progression was much retarded; but the man can stand and bear upon the lower extremities. The sensibility is increased in the lower limbs. He complained of nocturnal restlessness, sleeping only three or four hours, and then waking up with painful "startings" in the lower limbs, which are much wasted. His pulse, save being rather feeble, is otherwise unaf-

fect. The skin is cool. He is using the iodide of potassium, with a dose of Dover's powder at bedtime. The renal secretion is increased; and he says he feels much improvement in his power of moving his legs, though only in the hospital ten days; and it may be hoped he will be speedily restored to health and strength.*

There is another somewhat similar, but more severe, case in the hospital now under my care, that of a man who had been engaged for many years at the lead-mines in North Wales. He has paralysis of motion of the lower extremities, but the sensibility is increased. He speaks slowly, but is intelligent. His pupils, especially the left, are rather sluggish on the approach of a lighted taper. He has no blue line on the gums. He complains of constriction of the abdominal muscles, and is obliged to attend speedily to the desire to evacuate the contents of the bladder and bowels. The presence of lead in the system was made manifest by the reaction of the urine with the sulphuret of potassium test. The man is progressing favourably under the use of purgatives, iodide of potassium, and strychnia, with occasional friction to the lower extremities, and the application of galvanism and acupuncture.

A much graver form of lead contamination came under my notice in the out-department a short time past. A stout woman, aged 35 years, applied for relief from general debility and oppressive breathing and pain in her side. She had been engaged in the lead-works for many—I believe over twenty—years. Her health failed her of late, and she became much troubled with dyspnoea—in part, probably, from spasm of the respiratory muscles. Her aspect was anxious; the conjunctiva pearly white; and the skin slightly tinged yellow. Her pulse was frequent, small, and feeble; bowels constipated, with occasional abdominal griping; urine turbid; appetite indifferent; tongue pale and flabby. In fact, her general state was that of modified anæmia. The woman suffered from palpitation; and there was a well marked systolic *bruit* audible over the base of the heart, and to the right of the sternum. Severe paroxysms of angina were occasionally experienced. This poor woman has been treated for the present more with reference to her immediate sufferings, than with the view of removing, as in the preceding cases, the saturnine contamination from the body, which has evidently been deeply impressed with the baneful effects of lead compounds.

Anatomical research has revealed no characteristic or special change in those who have died from saturnine influence; but the above, and other cases which I might cite, pretty clearly indicate the nervous system to be the primary seat of disorder, whether evinced through lesion of the sympathetic or cerebro-spinal division of that system. We may suppose that the metal or some of its compounds permeates the nervous tissues, interfering with the due performance of their functions, and selecting certain functions in preference to others, for reasons which we can only surmise. M. Piorry suggests that perhaps lead, being an indifferent conductor of electricity, opposes the free transmission and play of its analogue, the nervous fluid or influence. However this may be, the disturbance of nervous function is chiefly manifested through the muscular system, and in the form of paralysis of motion, whether attacking the voluntary or involuntary muscles. Neuralgic affections are, however, not uncommonly observed, though not usually so prominently witnessed in these cases as a lesion of motor function. The flexor muscles of the extremities, being the more powerful, longer resist the saturnine action than do the extensors, which first give way under its influence. No doubt, ultimately, the blood becomes im-

poverished, and the muscular nutrition is defective. This condition is very apparent when the muscles of the forearm lose power in the so-called wrist-drop.

The precise nature of the disease consequent upon the saturnine contamination it may be difficult to determine; but, as far as one may infer this from the symptoms and course of the affection, it may, I think, be deemed non-inflammatory, and essentially one of defective innervation. I have not met with any epileptiform seizures in connexion with lead-taint, although their having been elsewhere observed further goes to show nervous lesion to be at the root of the disorder. But we require more precise and closer attention to be given to the subject, and the aid of modern appliances, before we can with any certainty determine the intricate questions arising in connexion with this and allied morbid phenomena. Meantime, I trust that these fragmentary remarks may not prove without interest or utility.

Original Communications.

ON A CASE OF DISEASED RIGHT HEART; AND ON "CARDIAC APNŒA."

By JOHN K. SPENDER, Esq., Surgeon to the Eastern Dispensary, Bath.

IN the number of the BRITISH MEDICAL JOURNAL for November 15th, 1862, there appeared a practically useful paper, by Dr. Stephen Monckton, on Incompetence of the Right Heart. Some years ago, I laid upon the table of the (then) Bath Pathological Society a specimen of diseased heart, which illustrated a common cause of apnœa in children, and the symptoms arising from which during life derive new interest when collated with other varieties of cardiac difficulty.

CASE. A female child, about 11 years old, in rather poor circumstances, and of lymphatic temperament, came first under my care on account of difficulty of breathing and palpitation of the heart. The essential point in her history was that, four years previously, she had had whooping-cough in a severe and protracted form. The cough left her tardily, and when at last it did go away, she found herself unable to move about in the agile manner natural to a child, and unable to play at school or to run upstairs. Disordered function probably soon passed into organic lesion; and when I saw the patient, there was abundant physical evidence of dilatation of the heart, with hypertrophy of at least some of its chambers.

But the heart-disease was merely the sequel of pathological changes in the air-tubes and lungs. What those changes are, and how they are brought about, have been aptly described in a clinical lecture delivered by the late Dr. Todd, when I was a student at King's College Hospital. Referring to a case not unlike the one I am now relating, he remarked that "After the cough has lasted for some time, changes occur affecting the lungs and general appearance of the patient. The countenance becomes full and bloated, and the capillaries distended, especially of the conjunctivæ, which look watery and swollen; and some of these minute vessels often burst, giving rise to some chemosis. All these changes result from the circulation in the capillaries being retarded, in consequence of the violence of the cough. The pulmonary circulation becomes similarly affected; the secretion of the bronchial tubes is altered; the lungs become congested and cedematous, and more or less crepitation is heard in different parts of those organs. Percussion elicits a duller note than usual, as the obstructed

* This case was discharged "cured" since the above report was written.