in this manner the flow through them arrested. I believe that this supposed effect is greatly exaggerated. The fine mud and broken up fecal matters have not usually this effect. And if the supply of water passed through the drains at the same time be great, so that the current in the sewers is increased, and the size of the sewers be sufficient, I think no such effect would follow. Indeed, if obstruction did occur, perhaps in the end it would prove of advantage, because it would compel builders and the parochial authorities to repair and widen the narrow and faulty sewers, and to build any new sewers required upon an improved and more scientific plan.

(b) *Water.* I now come to the next point, the supply of water required for the suspension and diffusion of this deodorising powder. Under this plan, impure water would offer no impediment. The most offensive and impure water loses all odour by admixture with charcoal. All that would be needed would be a large reservoir with a smooth bottom, from which the water, mixed gradually with charcoal and agitated by machinery (such, for instance, as a paddle wheel) could be emptied in quantity and at fixed intervals into the sewers. The foulest Thames water, or the Serpentine water of the parks, would suffice. I think this supply would be found sufficient; so that there would be no need to bring sea water into London according to Mr. Fuller's plan, which I believe is upon the whole very objectionable, at least so far as relates to the watering of the streets by it. From the facts before recorded on the subject of sea water, putrefaction and foul odours would be augmented, at least in the hot weather. I may add a few additional facts on this point. In a high temperature, at least so far as my experiments go (I speak of a temperature above 60°), animal matters will putrefy more readily and quickly in sea water than in fresh water. I have often noticed this result in vivaria. If a snail or a fish died in a *fresh water* vivarium, it might remain in the basin three or four days and longer, and the water did not sensibly suffer; the remaining animals escaped with impunity. In the *marine* vivarium, if a periwinkle or anemone died, in two or three days the water smelt strongly, and the remaining animals all died. This result I have frequently noticed in the same conservatory, where both vivaria were exposed to the same influences. I have also noticed a fact which, so far as *chloride of sodium* is concerned, seems to prove that a small quantity of this salt rather favours decomposition. I was preparing some of Liebig's beef tea: the temperature was tepid, and it was apparently fit to drink. In this state I thought to make it more palatable by the addition of a small quantity of salt. I added this, and the result was that it suddenly frothed up, and became very offensive; putrefaction had begun. Matters to be kept must be highly salted, and the temperature must be low, otherwise they will putrefy as readily, if not more so, than if not salted. In the instance of the Bermuda fever, to which I alluded before in my last paper, I instanced the case of the mud in which the convict hulk the "Thames" was fixed; although the water over it during the tidal rise was changed twice daily, the odour was very powerful from decomposing animal, especially faecal, and vegetable matters. Sea weed will readily putrefy under a hot sun, though saturated with sea water. I therefore cannot help thinking that the beneficial effects of sea water have been overrated. Still I think that, if undiluted with much water, it does not in itself favour the extension of some epidemic influences. As a rule, watering places, and particularly those where there is no fresh water river at hand, are healthiest; and except where cases are continually imported, or where bad water is drunk, epidemics, such as cholera, for instance, are not propagated. The coexistence, however, of a river, by the admixture of the waters of which the sea is unduly diluted, more especially if offensive sewage forms any part of this admixture, has quite an opposite effect. In such localities, some epidemics when present rapidly extend, and are very fatal. I see, then, no good result likely to be obtained by the substitution of sea for fresh water for the purpose of watering the streets.

I have said that the most impure fresh water would become purified and deodorised by the charcoal admixture. But the adoption of this plan should not be limited to the common sewers. There are *two* sources of infection *without* the sewers to which the deodorising measure should be applied. 1. The ordinary water-closets in domiciles should from time to time have charcoal thrown down into them; and whatever is inconsistent with its transmission, such as syphons or old fashioned traps, removed. If this were done, the source of annoyance in our houses from these odours would be removed. 2. We all know to our cost how offensive are mews, particularly in summer; and as before stated, during the late epidemic of cholera, it was the inhabitants of these localities who suffered most. If, in these, alternate layers of charcoal and stable refuse were interposed, the odour would in great measure disappear. I am aware, however, that John Bull could only be compelled to do this by an act of Parliament.

In any general plan, however, which should be adopted, it is expedient that the sewage matter now deodorised should be diverted from the Thames and carried out of town. But I think it is one of the advantages accruing from the employment of charcoal, that, once deodorised, there is no need of conveying it to such great distances from London. A distant removal has its advantages as affording larger space for operations, but then the tunnelling of the main sewers to such a locality is peculiarly expensive. If the deodorising process be effected in the sewers, a Montfaucon in London, even as near as that in Paris, would cease to be so great a nuisance; and the air being no longer tainted by vile odours, and not capable of being wafted back on the town, all disadvantages of proximity would cease. How near this proximity should be is then, after all, resolved into a matter of convenience to the public.

To *agriculturists*, the advantage of such a ready made manure at the very doors of every large town would be infinite. Human manure is inferior to none, and equal to guano, and could be procured at a price considerably less. To the *inhabitants of towns*, a comparatively pure atmosphere, a less frequent recurrence of pestilence, and a more benignant type of disease would, under God's blessing, be the well earned reward.

ILLUSTRATIONS OF THE PATHOLOGY OF CANCER.

By J. ZACHARIAH LAURENCE, Esq., F.R.C.S.

PART III.

THE RELATION OF CANCER TO TUBERCLE.

HANNOVER states that, in 338 *post mortem* examinations in the Friedrich's Hospital in Copenhagen, cancer was found combined with tubercle only three times. In 104 necropsies of cancer, Walshe observed only seven instances of tubercle. Paget gives a well marked case. Lebert relates an interesting illustration. A woman, aged 62 years, died with all the symptoms of advanced phthisis. At the autopsy, crude and softened tubercles and vomicae were found in the apices of the lungs; the peritoneum contained many partly cancerous, partly tuberculous infiltrations. The liver also contained cancerous masses, mingled with deposits of tubercle. Dr. Carl Martius of Erlangen has accurately recorded twelve necropsies of tuberculosis of the lungs, combined with cancer in other organs of the body.* Up to the time of publication of my essay on Cancer, I had observed two cases of the coexistence of cancer and tubercle; neither of these cases were, however, very satisfactory ones; one was carcinoma of the right auricle of the heart—a dissection-room case; the second a case of colloid (on the nature of which disease opinions are still divided) of the peritoneum. In both of these genuine crude tubercles were found in

* Die Combinationsverhältnisse des Krebses und der Tuberculose, von Dr. Carl Martius. Erlangen: 1853.

the lungs. But I am now able to produce a very conclusive case at point.

CASE. Obed O., aged 77, consulted me in September 1854, for a swelling of his right cheek, that had existed about four months before I saw him. The right malar region was considerably swollen, felt doughy, was dingy red and glossy; it was very tender, and he experienced remitting pains in the part, of a pricking and shooting character. He had five decayed teeth in front of the upper jaw, and had lost all his other teeth long before. The vision of the right eye was unimpaired. In his right nostril was an ordinary mucous polypus, which had existed for some years; this I removed. He knew not how to account for his malady. None of his relations ever had cancer, but there appeared to be a tuberculous tendency in the family. He had lost flesh; his appetite had forsaken him; his complexion was dull and earthy.

The further progress of the case may be told in a few words. The tumour increased, but never reached any considerable size, nor gave him much pain. The right eye was attacked by a chronic inflammation, and was slightly protruded; and he at last became nearly blind of this eye. He lost his sense of taste; "everything tasted alike to him". The nostril bled occasionally, often to a degree sufficient to require medical attention. His sense of smell, too, became impaired. But it was in his general health that the most marked changes occurred. He wasted to a "living skeleton", sinking with it to a degree of debility not often witnessed. He died the latter end of February 1855, about eight months from the first commencement of his disease.

POST MORTEM EXAMINATION. *Brain.*—Normal. *Antrum.*—Filled with a growth which reached to the very bottom of that cavity, and had completely destroyed its anterior wall and the floor of the orbit. The tumour was of the medullary species; the cut surface was firm, yellowish white, not hemorrhagic. On pressing it, a good deal of thick, white, turbid juice, exuded in small drops. I found this growth composed exclusively of cancer-cells—without exception, the most perfect specimens I have ever seen. Some were circular; others lengthened out; others again of an extreme length, and narrowed. A great many contained two or more, often a large number, of nucleolated nuclei—excellent examples of endogenous cell-formation. Exudation corpuscles and fat globules were also abundant. *Lungs.*—Upper halves of both firmly consolidated by quantities of crude yellowish grey tubercles. A few small vomices. No cancerous deposits. The microscopic characters of the tuberculous matter were well marked. *Heart.*—Some indurations at the edge of the mitral valve, and in the line of attachment of one of the segments of the aortic valve. Bicuspid and pulmonary valves normal. No hypertrophy nor dilatation; muscular substance firm. *Liver.*—Portal system congested. Contained a small earthy nodule. *Kidneys.*—Left one of a deep venous hue, with a small cyst in its substance. Right one healthy. *Spleen.*—Normal. *Intestines.*—Not opened; much narrowed in calibre.

Another fact worthy of attention is the different susceptibilities different organs have for the development of the two morbid states. Thus primitive cancer of the lungs is very rare, primitive tuberculosis of the lungs very common; primitive cancer of the liver is not uncommon, primitive tuberculosis of the liver is rare. And these facts may be multiplied for several other organs.

I have long been struck, when listening to the melancholy tales of cancerous patients, how often one hears that some of their relatives have died of consumption. Is there any connexion between the two diseases? Are they in any way, as it were, vicarious to one another? If they were, the great rarity of their both occurring together would be at once explained. However, the materials for answering these questions are as yet too scanty and vague to allow of any positive conclusions. All I will say is, that, of 51 cancerous patients who have fallen under my own observation, I find that no fewer than 14 (upwards of a fourth) knew of a parent, a brother, or a sister, having died of phthisis.

EXTENSIVE LACERATIONS OF FOREARM, WITH SEVERE INJURIES OF MUSCLES AND ARTERIES: DIFFUSED ANEURISM OF ULNAR ARTERY: LIGATURE: RECOVERY.

By W. THOMAS BELL, Esq., Great Grimsby.

DELIA SWABY, aged 15, a stout healthy young girl, was engaged in cleaning her father's windows; her attention was hastily attracted by some cattle passing by; she lost hold of the framework, and fell with her forearm through the window, causing extensive lacerations, dividing the radial artery, partially the flexor muscles, and puncturing the ulnar artery half an inch above the annular ligament. From these wounds profuse bleeding took place, to syncope. A druggist in the village was summoned, and very properly and judiciously applied a compress and bandage, which controlled the bleeding until my arrival. Upon exposure of the wounds, which were very extensive, the radial artery half up its course was found to be divided across, and began to bleed very freely: both ends were readily secured. There was also a short wound across the situation of the ulnar artery; but from this there was not the slightest arterial hemorrhage. The edges of the wounds were brought together by sutures and strips of plaster; a splint and bandage were applied; an opiate was administered; and the patient was ordered to keep quiet in bed. Only slight constitutional disturbance took place, which was readily checked by an opiate effervescing saline. Some small sloughs appeared at the edges of wounds, which soon separated by a poultice and nitric acid lotion. Very little pain was complained of. The ligatures came away in the poultice from the radial about the eighth day.

On the twelfth day after date of injury, my father discovered, when examining the wound, a diffuse aneurism, of about the size of a shilling, corresponding to the small wound in the integuments over the ulnar artery: from this there had been no bleeding. He applied a firm compress and strips of plaster over the sac.

Three days afterwards—i.e., on the 15th of August—I was summoned in the night, and found that during sleep the sac had given way, and free bleeding had taken place; a coagulum had formed, and bleeding had stopped before I arrived. Not considering it safe to leave, I applied a horse-shoe tourniquet until the morning. My father then administered chloroform; a free incision was made upwards and downwards through the sac; the coagulum was turned out; the fascia attached to the flexor carpi ulnaris was divided upon a director, and the bleeding vessel was exposed with a small punctured wound in it. An aneurism needle, armed with a ligature, was passed under the vessel, and a ligature placed above and below the wound; all bleeding ceased; the lips of the wound were brought together with strips of plaster, a splint and bandage applied. The patient was kept in bed, with the arm raised upon a pillow, for a fortnight; the ligatures separated in a week: the wounds healed rapidly, and the case was quite cured in five weeks from the first receipt of the injury.

NEURALGIA OF THE NECK OF THE BLADDER.

By CHARLES WILLIAM BELL, M.D., Buxton.

WHEN I took up my residence in Buxton, after I had quitted the extensive field of practice afforded by Manchester, one of my inducements to do so was the expectation of finding there abundant opportunity for prosecuting a favourite subject of study—that of nervous disorders; nor have my hopes been disappointed.

One of the two cases of pain referred to the neck of the bladder and urethra, which I am about to relate, I have only recently met with, and it is still under treatment; the other, which I commence with, occurred three years ago. Their rarity and similarity render them, I think, worth recording.