disappears rapidly from almost every tissue in the body, it should accumulate in such large quantities in the liver.

d. Other wasting diseases besides phthisis—such, for instance, as cancer,* simple ulcer of the stomach,† and chronic dysentery‡—are likewise often attended by fatty enlargement of the liver.

It appears, then, that fatty liver is met with under two opposite conditions: one, in which there is an increased supply of material capable of being converted into oil, and where fat often accumulates in all the tissues of the body; the other, in which there is a rapid absorption of fat from all the tissues, with consequent emaciation. Its mode of production in the former case is sufficiently obvious; in the latter, the blood becomes loaded with oily matters derived from the patient's own tissues, and this oily matter is separated from the blood in its passage through the liver. The impaired absorption of oxygen in phthisis, interfering with the proper metamorphosis of the oil, accounts for fatty liver being more common in pulmonary than in other wasting diseases; and the greater frequency of fatty liver in women may be accounted for by women having in general a larger quantity of fat to be absorbed.

III. *Simple hypertrophy*.—By this is understood an enlargement of the liver due to an increased size of the lobules and an increased size or number of secreting cells, without any alteration of structure. The enlargement of the liver is uniform and rarely great; and, as might be expected, it is not attended with any prominent symptom. The condition is comparatively rare, and has still to be studied. It has chiefly been observed in

a. Leukæmia; and in

b. Exceptional cases of saccharine diabetes.§

Hence, when the liver is found enlarged in either of these maladies without any obvious derangement of its functions, simple hypertrophy may be suspected. It has been suggested that the enlargement of the liver arising from protracted residence in hot climates may be of this nature; but in most cases this is probably rather due to chronic hyperæmia.

THE

RESULTS OF THE TREATMENT OF NON-BONY UNION AFTER FRACTURE OF THE HUMERUS BY THE INTRODUCTION OF IVORY PEGS THROUGH THE FRAGMENTS.

BY JOHN BIRKETT, F.R.C.S.,

SURGEON TO GUY'S HOSPITAL.

THE failure of bony union of the fragments after fracture of the shafts of the long bones is a rare occurrence. The causes which interfere to prevent union are occasionally with difficulty discovered, and the best treatment to adopt to excite the deposit of the earthy salts in the yielding tissue intervening between the fragments still remains a subject of debate.

The following cases contrast with each other in many interesting particulars. Occurring in different sexes, nearly at the same age, in the male the repair of a *simple* fracture, unattended by any complication, and treated after the ordinary methods, was arrested by the failure, in the last stage of reparation, to deposit the earthy salts of bone tissue. In the female, a *compound* fracture, complicated with a great extent of local injury of the soft parts around the fragments, and several other severe injuries, the condition of the patient and the secondary consequences of the injury may all be adduced as sufficient causes to explain the fact of non-bony union of the humerus. But, even in this case, the *compound* fracture of the lower jaw united as if under the most ordinary conditions. We may therefore, perhaps, refer the defective repair of the arm-bone to local causes entirely.

The most important constitutional and local circumstances admitted to influence the arrest of the deposit of earthy materials in the repair of long bones are as follows:—The constitutional: old age, pregnancy, lactation, syphilis, phthisis, fevers, general cachexia, and scurvy. The local: diseased conditions of the broken bone, injury of the soft tissues surrounding the bone, destruction of its nutritious artery, movement of the fragments, the interposition of muscle between them, comminution, and wide separation of the fragments.

It might be suggested that the baneful influence of the lead pigments used by the male patient in his work may have induced deterioration of his general health, but there were no traces of lead-poisoning detected. He could not be regarded as a robust nor very healthy-looking man from his facial aspect; yet his muscular system was fairly developed, and he made no complaints of ill-health. The woman, on the other hand, had given birth to a child a few weeks before she received the injury, at which moment she was suckling, and her social position was such as to lead to the deprivation of repose sufficient to recover her usual strength rapidly. Besides, the effects of the several severe injuries she had received produced an extraordinary amount of constitutional disturbance, and this might well counteract and exhaust the natural reparative processes. In her case we may fairly attribute the absence of bony union of the humerus to the great amount of local injury, which caused sloughing of the soft tissues, and an exhausting amount of suppuration. Also these conditions necessitated the frequent movement of the member, to prevent which, although a suitable splint was applied, was next to impracticable.

In the operation of connecting the fragments of bone together by means of ivory pegs, some difficulty occurred in both cases on account of the dimensions of the shaft of the humerus, which at the part injured is usually small, and in both these cases appeared to be strikingly so. The operation on the man was attended with the most satisfactory results from the moment of its performance. With the woman, on the contrary, much disappointment was occasioned by the failure of the first operation, and for some time even after the second it seemed to be doubtful whether bony consolidation would ever take place. But the successful results eventually acquired plainly demonstrate that one of the qualities of the surgeon in the practice of his art is the exercise of patience.

CASE I.—J. H—, aged twenty-nine, was admitted an in-patient at Guy's Hospital in July, 1861. A painter by trade, he had lived "pretty freely." He did not appear strong, but had generally enjoyed good health. About two months before admission he fell from a height of about twenty feet; and came to the surgery in consequence of having fractured the left humerus at about the middle and the lower third. The fragments were adjusted in the usual manner, and maintained *in situ* by means of the ordinary splints. He came at intervals, and was carefully attended by the dresser as an out-patient; but at the expiration of two months from the injury bony union had not taken place. In this condition he was admitted. There did not appear to be any indications, either from the state of the patient's general health or of the parts which had been injured, to explain the absence of bony deposit. A splint of leather was carefully made to fit the arm, and to maintain the fragments in a state of perfect repose. Tonics, stimuli, and full diet were given; but after the lapse of about two months and a half the fragments were still ununited by bone.

On the 15th of October I exposed the ends of the fragments by making a vertical incision along the outside of the biceps muscle. I then cut away some fibro-cartilaginous tissue from their divided ends, drilled two holes obliquely, and inserted ivory pegs therein. The fracture had been rather oblique, so that with slight overlapping the pegs retained the fragments in close apposition. This operation was performed about five months after the bone was broken. A splint was adapted to the inside of the arm, and the wound dressed with moist lint. Not the least constitutional disturbance ensued; the wound healed favourably over the ends of the pegs, which had been cut off short—about a quarter of an inch from the humerus; and on the 11th of January, 1862, he left the hospital. At this date (nearly three months since the operation) there was a considerable amount of ossific union, and he was permitted to use the member, as he had done before leaving, with a splint around it for the sake of avoiding injury.

In October, 1862, he had acquired complete use of the member, and during the summer had been following his ordinary occupation. The arm, he said, felt a little weaker than the other, and now and then was slightly painful.

This man has since frequently visited the hospital. The last time was in June, 1866. Then the pegs still remained in

* See case of cancer of the larynx, by Mr. C. Heath, "Pathological Transactions," vol. xiii., p. 28; and case of extensive cancerous ulceration of groin, by Dr. Budd, "Diseases of Liver," p. 299.

† Case by Mr. R. Robinson, "Path. Trans.," vol. iv., p. 133; and by Mr. H. Thompson, *id.*, vol. vi., p. 156.

‡ Case by Dr. Bright, in "Hospital Reports," vol. i., p. 117.

§ See Frerichs' "Diseases of Liver," Syd. Soc. Transl., vol. ii., p. 210. According to Budd, the liver in diabetes is often unusually small, and the lobules shrunken, from the quantity of oil being below the normal standard. ("Diseases of Liver," 3rd ed., p. 310.)

the bone. The usefulness of the arm was quite equal to that of the other, but at the site of the fracture there still remained a slight bony irregularity.

Briefly, then, there was absence of bony union after five months of the ordinary local and constitutional treatment, and bony deposit was excited by the operation in about two months and a half.

CASE 2.—Mrs. F—, aged twenty-eight, was admitted into Guy's Hospital on June 9th, 1863, on account of injuries inflicted by the passage of a heavy four-wheeled waggon over her. Besides contusions over the body generally, the special injuries were *compound* fracture of the lower jaw and *compound* fracture of the left humerus, about its centre. There was a long wound in the middle of the inner side of the arm, through which the lower fragment of the humerus projected. The bone was not comminuted, and the irregular ends of the fragments were capable of being accurately fitted together, and might have been firmly maintained in apposition by means of a peg or wire suture, an operation which I regretted afterwards that I had not immediately performed. Moist lint was laid on the wound, splints were applied, and the arm kept in the most favourable position. The fragments of the lower jaw were adjusted by means of a wire twisted around the teeth. The patient had enjoyed good health. She was suckling a baby, ten weeks old, but she was in a state of healthy nutrition.

Excessive constitutional disturbance was excited by the injuries. She was obliged to give up suckling the infant, and she suffered much with the contusions about the left clavicle and same side of the neck. Not the slightest attempt at repair took place in the wound of the arm, around which erysipelatous inflammation appeared on the fourth day, and extended to the neck and face. Appropriate remedies were administered, consisting of stimulants, ferruginous tonics, and all the food she could take, and in about a week it had subsided altogether. The soft tissues of the arm in the neighbourhood of the fracture were, however, the seat of widespread inflammation and suppuration, and at one time there seemed to be but slight hopes of saving the member. Nevertheless, by degrees, the wound assumed a healthy aspect, sloughs came away, and in spite of drawbacks from a troublesome cough, diarrhoea, and suppuration about the injured jaw-bone, there was complete cicatrization in October. At this date there was no attempt at ossific union of the humerus, although rather more than four months had passed away since the injury. The lower jaw had united and become quite strong in about the usual time.

On October 20th I made an incision on the outside of the arm down to the ends of the fragments, separated them, removed some fibro-cartilaginous tissue, and drilled two holes in the most suitable direction to maintain the fragments in apposition by means of ivory pegs. The shaft of the humerus being small, and the fracture having been oblique, the fragments were not so firmly held together as in the case of the male patient. The pegs were cut short, the wound was dressed with lint, and splints were adjusted. She suffered from the effects of the chloroform she had taken during the twenty-four hours following the operation, but otherwise she was very well. No inconvenience further than the above followed, either constitutionally or locally; and at the end of a week a gutta-percha splint was applied along the inside of the arm. On November 9th one of the pegs came away, after remaining in the bone twenty days; the other one could not be felt. The wound healed about the commencement of December; but, although the mobility of the fragments was less than before the pegging, there was not ossific union. During January the ends of the fragments were protected from injury and kept in apposition by means of a leather splint, and the patient was allowed to move the arm as much as possible; but the movements of the joints were much restrained in consequence of the long time the arm had been kept at rest. In February, four months after the operation, there being no bony union, she was discharged from the hospital, in the hope that change of air, diet, and scene might excite more reparative action.

At the end of March she was again admitted with a false joint at the site of fracture, and after careful constitutional and local treatment without advantage, I again, on the 24th of May, drilled holes in the ends of the fragments, and inserted another peg. The wound slowly healed, and she left the hospital the following August. At this time there was still mobility at the site of fracture.

During the next six months, which she passed in the provinces, a few small spiculæ of bone exfoliated through an

ulcerated opening in the cicatrix. The arm was more and more used, and ossific union became by degrees completed.

In January, 1865, the movements of the member were only slightly restrained by trifling stiffness of the elbow- and shoulder-joints; and although, by forcible examination, it was possible to demonstrate imperfect bony union, still the patient was able to use the arm for all ordinary occupations.

In March, 1866, the member was as strong, useful, and nearly as well-shaped as the uninjured one. Bony consolidation was completely established.

Green-street, Grosvenor-square, May, 1867.

ON CASES OF INJURY FROM RAILWAY ACCIDENTS;

THEIR INFLUENCE UPON THE NERVOUS SYSTEM, AND
RESULTS.

BY THOMAS BUZZARD, M.D. LOND.

(Continued from page 510.)

It is not very uncommon to hear it said, in reference to a case of alleged injury to the head, "There is no paralysis," and this in a tone which seems to imply the speaker's conviction that the brain cannot therefore have sustained any serious damage. The fact that some portion of the comparatively small *central* nervous system must be damaged ere this symptom shows itself, and that injury to the large mass of the cerebral hemispheres does not produce this condition, appears to be overlooked; yet the probability—nay, the certainty—that the delicate cineritious substance of the hemispheres is capable of being seriously injured by external violence which may not affect the central ganglia must be conceded. As evidence of such injury we must necessarily look for disturbance of the functions which the cerebral hemispheres discharge—not of those performed by the central ganglia. If, then, we find in a certain case impairment of the intellectual operations, of consciousness, or of the will, it is as reasonable to diagnose injury of the hemispheres as it is in a case of hemiplegia to point with confidence to lesion in some part of the central nervous system. It would appear that injury of this kind is no infrequent a result of the violence received in a railway accident, and that it may vary in degree and kind, from insensibility of a minute's duration to a state of mental incapacity which lasts for years, and may approach, if it does not even arrive at, insanity. These are the instances which are peculiarly apt to occasion those differences of opinion on the part of medical witnesses which have so much tended to lessen the value of medical testimony in our courts of law. The symptoms are for the most part "subjective." There is little or nothing that we can discern with absolute certainty for ourselves, and we have thus to depend very generally upon the statements of the patient himself or his sympathising friends. He may tell us that he cannot apply himself to business with his former energy; that he has constant pain in the head; that his rest is disturbed; that he cannot even write an ordinary letter as he used; that he suffers from a confusion of ideas and occasional giddiness: and we have to test his assertions partly by the consistency of the alleged symptoms, but mainly by the estimate we may form of his veracity. It is useful, therefore, I think, to trace the after progress of such patients as these, and of especial advantage to note the history of persons for whom there is either no question of compensation to embarrass the observation, or in whose cases this question has long ago been decided. It happens not unfrequently that patients exhibiting psychical phenomena of the kind described improve very rapidly when the question of compensation has been decided; and it is often argued that this circumstance furnishes decisive proof that the alleged symptoms were factitious. This is doubtless sometimes the case; but I apprehend that quite as frequently the true explanation lies in the fact that the settlement of the claim at issue leaves the patient for the first time in a condition favourable for recovery. It is a fact that mental anxiety alone is often sufficient to give rise to these phenomena, where the condition of the nervous system is favourable to their