were short periods of mild pyrexia, with much longer intervals of apyrexia.

The chart on p. 841 shows the progress of the blood condition during the different stages of treatment, from which it will be seen that during seventeen days under arsenic no improvement occurred; that directly bone marrow was adopted a remarkable diminution in the leucocytes followed, and was maintained after the arsenic was discontinued, and that in the second attack a similar diminution occurred under bone marrow without the aid of arsenic. It seems, therefore, that in this case, at any rate, bone marrow proved itself a valuable therapeutic agent, and probably, had the patient continued its use, the second attack would have been averted, much in the same way as myxoedema is controlled by continued thyroid feeding.

Most textbooks state that there is no means of checking developed leucocythæmia, that arsenic is the most valuable drug in its treatment, and that iron is useless. The impression I received from watching this and one other case was that iron did help the patient, while in this case arsenic was undoubtedly responsible for the peripheral neuritis. The marked bronzing of the skin is interesting in view of the condition of the suprarenals as found *post mortem*.

A NEW METHOD OF DIVIDING BONE IN SURGICAL OPERATIONS.

By THOS. H. MORTON, M.D., C.M.ABERD.,

District Surgeon, Manchester, Sheffield, and Lincolnshire Railway.

FROM time immemorial the saw has been the surgeon's sheet anchor in all operations requiring severance of bone, and it might be deemed an act of temerity to impugn the capabilities of this time-honoured instrument; but for many years I have doubted if the surface of living bone divided by a saw was in the most favourable state for the subsequent healing process, whether stumps or resections. With an ordinary amputation, major or minor, under satisfactory conditions—say, healthy patient, sound tissues, good apposition of flaps, safe occlusions of vessels, and antiseptic dressing—the surgeon does not feel much anxiety as to the result except in regard to those tissues, bone cartilage, and tendon which have a lower vitality. Necrosis of the sawn end of a stump, formerly common, is still not infrequent, and the dead parts extruded after some weeks of tedious suppuration. This terminal section invariably includes the whole circumference of the bone, showing the clean, groove-like sawn surface on the distal side, and irregular spicula, with semi-rounded points, on the other, indicating the softening and absorbent nature of natural separation. The question arises, Would an irregular-grained surface, as in simple fractured bone or a bone cleanly crushed through, provided there were no loose fragments, be a better medium for attachment to surrounding live soft parts and less liable to necrosis? Before answering affirmatively, it might be well to inquire what evidence there is for this assumption. Primarily the saw action is destructive in its course, the vital material in contact with teeth effecting separation of the bone is utterly killed; that is, the *débris* or bone dust, and which needs free irrigation, or it will act as a foreign body. The surface of bone on either side track of saw is minutely lacerated or corrugated; the lacunæ and canals are impacted with sawdust, even when well sponged.

The periosteum generally divided by the operator's knife perhaps escapes the saw, but the medulla is naturally torn freely. Possibly also heat generated by rapid saw movement may have a prejudicial effect. That the vitality is not always lost near the surface subject to attrition or only slightly impaired must be admitted, as stumps do heal satisfactorily and superficial suppuration may and does occur without necrosis. Recently surgeons have employed the chisel and gouge for resections with very good results. It is a modification of this principle—the wedge as a cutter to all bones when practicable—that the instrument I am about to describe is constructed. Before doing so, we might consider the shortcomings of the ordinary chisel, also bone forceps or pliers; the latter is simply an approximation of two chisel edges with or without a little shear movement. When attempting

to divide a long bone, the chisel fails first, owing to imperfect support of the side opposite cutting edge; secondly, the hard resisting nature of bone is in excess of ordinary muscular hand power; if a mallet is used there is danger of irregular fracture and splintering up of edge, although cancellous structure of some bones can be readily and evenly divided, and when using a narrow chisel or gouge the separation of fragments is effected with more precision.

Bone pliers in general use are fairly well adapted for nipping off projecting spicula or digital phalanges, the bone being equally supported on both sides, yet a longitudinal or lateral fracture is sometimes noticed with brittle bones, metacarpal for example. From these remarks, it may be conceded that an instrument dividing bone without undue laceration or disintegration of structure, absence of fracture, or uneven splitting the terminal surface, is what we require and is at present a desideratum.

Description of Instrument.—The cutting surface consists essentially of two opposing blades, slightly wedge-shaped from edge to back, the edge being moderately deeply serrated, indentations one-eighth of an inch or less uniformly alternating, the projections fitting digitations opposite, the whole looking like a set of shark teeth; each are spear-pointed, having a cutting edge on both sides extending to the base of each tooth. The cutting blades are continuous with two lever handles similar to common bone forceps, but with the important addition of a closing screw turned by hand; this approximates forcibly the serrated blade edges. Division of bone is effected first by penetration of the spear-tooth points. Pressure continued brings the edge of each tooth in contact with the bone structure, which is thus divided in segments successively, obviating the tendency to fracture. The instrument has a slight shear or curvilinear movement, which rather assists the process of separation. Modifications of this instrument are contemplated, such as variation in size of the teeth suited to different bones, also wedge-shaped, forked, indented cutting edge, with another to meet it worked by screw, winch handle, or lever. The material of all cutters must be of specially hard, tough steel and unbreakable. For cylindrical large bones it might be desirable to have the posterior cutting part made semi-lunar or concave, and the anterior convex fitting when in apposition, thus reducing the chance of fracturing the outer edge by lateral thrust during division, a mechanical obstacle apparent in cutting any tubes of brittle material. The living bone, often extremely hard, has cohesion and a certain amount of tenacity with elasticity, and would stand the strain while the dividing points were cutting their way as before described. The chisel shown is on this dentated principle, and can be made of any size. It will supplement if not supersede the ordinary bone chisel or osteotome with plane edge. It might be possible to divide a femur effectually by a well-directed blow on the handle end if a suitable unresisting support was close up on the other side.

The serrated bone forceps has been tried on various animal bone, and cuts evenly. Being made entirely of steel nickel plated, it can be easily kept aseptic when using the chisel. The mallet might also be metal, as less power is needed, and in striking a quicker impact is gained than by wood.

I am indebted to Messrs. Parramore and Sons, of Sheffield,

for carrying out my suggestions and constructing such well-finished working models, and I hope the adoption of this method may prove practically useful. If experience upholds the theory of construction, the instruments will doubtless be serviceable in cases hitherto unsatisfactory.

The instruments were shown at a meeting of the Sheffield Medico-Chirurgical Society, February 28th, 1895, and are now manufactured by Messrs. Arnold and Sons, 31, West Smithfield, London, E.C.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

DIABETIC COMA FOLLOWING INFLUENZA.

ON February 29th, 1896, I saw Mrs. H., aged 42. She was almost completely comatose. I had attended her for a normal confinement in December, 1893. She continued in good health till the beginning of 1895, when she had influenza, but only an ordinary attack, and complained of no symptoms which would lead one to suppose she was suffering from diabetes mellitus. Until about eight weeks before my visit she enjoyed fairly good health. She then suffered from a second attack of influenza, which never made her keep her bed, and was accompanied by the usual symptoms; she never complained of great thirst or polyuria, soon recovered, and I did not see her again till February 29th, 1896, when I obtained the following facts from the husband: During the previous six weeks she had suffered from great thirst, drinking at least one gallon of fluid in the day; the appetite was not altered in the same way, in fact she took about her usual quantity of food; she had lost flesh extremely fast, and complained of great lassitude. She passed large quantities of urine.

The character of the breathing reminded me forcibly of opium poisoning, but when compared closely the dyspnoea was too laboured and not peaceful enough. The lips were red, and there were no signs of cyanosis; the pupils acted very sluggishly to light, but were of normal size. When asked to put out the tongue she did so, but could not answer any question; the tongue was exceedingly dry, hard, and brown, and felt like a piece of dry leather. She was extremely emaciated, and the skin was harsh and dry. The temperature was subnormal, and the pulse small, frequent, and feeble. She lay still, except that sometimes the head was moved from side to side and occasionally she muttered incoherently. The urine obtained by the use of the catheter had the characteristics of diabetic urine; the specific gravity was 1025; it contained a small amount of albumen, and gave well-marked sugar reactions and also the acetone reaction with perchloride of iron. The stupor, which commenced between midnight and 1 A.M. of February 29th, gradually deepened into coma, which was fully established on March 1st, when she was evidently sinking fast. Death took place at 10.30 P.M., about forty-six hours after the commencement of the stupor.

The case seems interesting from its rapid course and termination and its quick onset after an attack of influenza.

Horsley Woodhouse.

E. S. R. CADMAN, M.B., C.M.

INJURY OF THE OPTIC NERVE.

IN the report of the meeting of the Birmingham and Midland Counties Branch of the British Medical Association, appearing in the *BRITISH MEDICAL JOURNAL* of February 29th, a case, shown by Mr. Priestley Smith, of the above injury is described. The following case, which came under my notice when House-Surgeon at the Birmingham and Midland Eye Hospital, seems very similar.

A boy, aged 10, attended the out-patient department on November 4th, 1893. His friends said that at the end of the previous September he had been struck by a pea rod on the inner side of the right upper lid; the rod was said to have gone in some distance. The lids were swelled for a day or two after the accident, but when he was able to open the eye the sight was quite gone. There was a small indurated scar where the rod had wounded the lid; there was no pain, and

the eye appeared uninjured. There was no light perception, and except that the disc appeared somewhat paler than that of the other eye the fundus was normal.

He came again on September 1st, 1894, when the disc was extremely atrophic, but there was very slight diminution in the size of the retinal vessels, if any. Light perception was entirely absent.

The pea rod in all probability damaged the optic nerve near the optic foramen in much the same way as the brass rod in Mr. Smith's case without injuring the orbital structures to any serious extent.

Leicester.

R. WALLACE HENRY, M.D.

TRAUMATIC FACIAL PARALYSIS TREATED BY CONSTANT CURRENT: RECOVERY.

AN infant delivered by forceps showed complete left-sided facial palsy. For the first week nothing was done, as I expected the usual spontaneous cure in a week or so. At the end of the week the skin and muscles were rubbed and pinched systematically. This was continued for three weeks, but with very little benefit. The galvanic current was applied, with the positive electrode over the motor points of Ziemssen for the different muscles supplied by the facial nerve. The current was interrupted slowly. A marked improvement followed the first two applications, and in eight days the left side of the face showed complete return of power. The galvanic current appeared to act as a direct cure. Wilson says such cases are sometimes permanent.

Fulham Road, S.W.

A. INNES, M.B.

REPORTS

MEDICAL & SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF GREAT BRITAIN, IRELAND, AND THE COLONIES.

ROYAL FREE HOSPITAL.

CASE OF RHEUMATIC FEVER, WITH PROLONGED HIGH TEMPERATURE, ENDING THREE WEEKS LATER IN CHOREA, VIOLENT DELIRIUM, HIGH TEMPERATURE, AND PERICARDITIS; DEATH; POST-MORTEM EXAMINATION.

(Under the care of Dr. SAMUEL WEST.)

A. F., aged 21, was admitted on December 21st, complaining of pain in the joints. She had been ailing for nearly seven weeks but the joint pains appeared about three weeks ago, and after a fortnight became so bad that she had to remain in bed. She felt feverish and sweated a good deal.

There was nothing of importance in her family or previous history except an account of an attack of rheumatism at the age of 12 years.

On admission she appeared to be suffering from a severe attack of rheumatic fever. There was a good deal of swelling in her joints, and the temperature was 103.8°; but she felt very ill and ached all over, in the muscles as well as in the joints. There was nothing in her heart except that it was a little dilated, and there was a faint, systolic, blowing murmur, both at the apex and at the base. She was put upon salicylic acid and improved greatly, but the temperature did not fall properly, and the patient looked much more ill than was usual, and was somewhat dusky in complexion, yet nothing could be found to account for these symptoms. The temperature is interesting; being nearly 104° on admission, it fell soon after to between 100° and 101°, and remained at about that level for three days. It then rose again, and ranged between 102° and 103° for the next three or four days, subsequently falling again until it ranged a little above and below 100°; but it never became normal, and even on January 11th, that is, three weeks after admission, was still at the level mentioned, namely, between 100° and 101° at its maximum.

On January 11th the patient complained of a great deal of frontal headache, but the temperature did not vary. No cause for this elevation of temperature could be found. The whole body was very carefully examined to discover one, but without success. On the night of January 13th, without any apparent cause, the patient became somewhat delirious and complained of pain in the abdomen. At 3 P.M. on January