dosing through the day, but was easily roused. He answered questions intelligently, although very sluggishly. The chest was free from signs of disease, but the abdomen was strongly suspected to be the seat of tuberculous deposits.

An inordinate thirst had been noticed by his parents six months since, but the health did not seriously give way until two months ago. Previous to the present complaint, the lad had enjoyed excellent health.

For nine days he partook of the common diet of the house, and had six pints of milk, acidulated with a weak dilution of phosphoric acid, as a beverage. A pill, containing one-third of a grain of opium and two grains of sulphate of iron, was administered three times a day.

The condition of the urine under this regimen was as follows:—Average daily discharge, 160 oz.; range of density, 1033-1043; daily excretion of sugar, 5380 grains (11¼ oz.). His weight was 48 lbs. During these nine days, he improved somewhat in strength, and became more lively.

On April 18th, ordinary bread was replaced by bran cakes; and the medicine and milk were continued. Four days of this fare reduced the average daily flow of urine to 95 oz.; its range of density, to 1036-1038; the daily excretion of sugar, to 3150 grains (6 3-5 oz.).

On the 22nd of April, cabbage was ordered for dinner, instead of potatoes—milk and medicine as before. For two days he got on very well on this diet; and the urine fell to 60 oz., and the sugar to 1550 grains (3¼ oz.). The tongue also became moist; the thirst declined; and the belly grew decidedly softer and less protuberant. On the third and fourth days, however, the appetite vanished entirely; he could not touch his meat or the bran cakes, and he lost a pound in weight. The urine fell to 40 oz., and then to 30 oz.; and the sugar to 1220 grains (2½ oz.).

Seeing the boy unable to eat, Dr. Wilkinson ordered him an onion with breakfast and dinner, in lieu of cabbage. This change had the desired result. The appetite returned, and he could now eat his bran cakes with relish. The opium was increased to two grains a day.

This treatment was continued for eleven days, during which he made doubtful progress. He increased in weight to 52 lbs.; but the urine and its saccharine impregnation increased, and the tongue became redder. The exact results were:—Average disharge of urine, 72 oz.; range of density, 1035-1040; daily excretion of sugar, 2090 grains (4⅛ oz.)

On the 7th of May, the onions were withdrawn, and he was put on the previous diet of bran cakes and cabbage, with flesh-meat. The appetite fell away immediately; he could not eat his bran cakes. In a day or two, however, having now the run of the wards, he began to satisfy his intense craving for bread by begging some from the other patients. In five days he grew much worse; he was scarcely able to leave his bed; and his weight sank to 50 lbs. The urine rose to 110 oz., and the sugar to 3430 grains (7 1-7 oz.).

After the discovery of his delinquencies, he was more narrowly watched, and strictly limited to his prescribed diet; but he could not eat the bran cakes, nor indeed his meat; so that, although the state of the urine forthwith improved (its quantity being reduced to 22 oz., with a specific gravity of 1021, and daily secretion of sugar of only 230 grains, under half an ounce), yet his general condition was most deplorable. In this dilemma, Bouchardat's gluten bread was tried, and with happy effect. The opium was also pushed on to five grains a day.

The boy remained in the Infirmary ten days after this change, and made rapid progress. He ate his food with relish. He became much less ventricose, and his weight advanced to 57 lbs. On the day of his departure, he was so improved in strength that he was able to walk home, a distance of four miles. The state of the urine was as follows:—Average discharge, 44 oz.; range of density, 1032-1038; daily excretion of sugar, 1120 grains (2½ oz.).

This case exemplifies in a remarkable manner the difficulties and the advantages of the dietetic treatment. When amylaceous food was allowed, the proper diabetic symptoms made progress; when these were withdrawn, the desire for food and the power of taking it vanished. Between Scylla and Charybdis the physician had to steer. Was the patient to be permitted to die of the diabetes, or were the disease and his life to be starved out together? Bouchardat's bread seemed in this instance favourably to solve the problem; it preserved the appetite for meat; and, from its scanty proportion of starch, it did not produce any aggravation of the proper diabetic symptoms.

[*To be continued.*]

Reviews and Notices.

THE REPARATIVE PROCESS IN HUMAN TENDONS, after Subcutaneous Division for the Cure of Deformities; with an Account of the Appearances presented in Fifteen *Post Mortem* Examinations in the Human Subject; also a Series of Experiments on Rabbits, and a *Résumé* of the English and Foreign Literature of the Subject. Illustrated by Seven Lithograph Plates and a Series of Woodcuts. By WILLIAM ADAMS, F.R.C.S.; Surgeon to the Royal Orthopædic and Great Northern Hospitals; Lecturer on Surgery at the Grosvenor Place School of Medicine, etc. Pp. 175. London: Churchill. 1860.

MR. ADAMS has for some time been engaged in the careful investigation of the process by which tendons become reunited after division. On this point there has been a difference of opinion; some surgeons—Mr. Tamplin, for instance—holding that the new tissue which is formed between the ends of the tendon is gradually contracted, so as to form a *linear cicatrix;* others, especially the author of the present work, maintaining that there is a true reformation of tissue, which remains and performs the office of tendon.

The results to which Mr. Adams has been led by his carefully made observations and experiments will be clearly understood from the following extracts from his work.

"1. Tendon is one of the few structures of the body, such as bone, cellular-tissue, nerve-tissue, and blood-vessels, capable of reproduction or regeneration, and the newly formed tissue, acquires, within a few months of its formation, the structural characters of the old tendon so perfectly as to be, under the microscope, with difficulty distinguishable from it, but it does not acquire (at least it has not up to three years, the latest period to which these observations extend) through its substance the uniformly opaque, pearly lustre of old tendon; in the mass it retains a greyish, translucent appearance, streaked only with opaque fibres at a late period, so that the recent section affords an easy method of distinguishing the new from the old tendon.

"2. When a tendon has been divided subcutaneously, for the cure of club foot, and its cut extremities are separated and held apart during the active period of the reparative process,—*i.e.*, the first two or three weeks (as by mechanical extension employed with variable rapidity in different cases, according to the activity of the reparative process), new tendon is formed, of variable length according to the extent of the separation, for the purpose of reuniting the divided extremities of the old tendon. The greatest length of perfectly formed new tendon thus obtained, and equal in bulk and thickness to the tendon it served to unite, which I have seen in the human being, is two inches and a quarter, and this was in the tendo Achillis of a girl, aged 9 years, a year and a-half after the tendon had been divided by Mr. Curling. It is probable that when the tendo Achillis has been divided in children for the cure of deformities, such as congenital varus, the length of new tendon is generally from half an inch to an inch, and in adults from one to two inches.

"3. The process, by which new tendon is formed for the purpose of reuniting the separated extremities of a tendon divided by a subcutaneous section, is essentially similar in animals and in man. The perfection of the process is in direct proportion to the absence of extravasated blood and inflammatory exudation; and the sheath of the tendon, when consisting of loose-textured areolar tissue, as in the tendo Achillis, and other tendons surrounded by soft tissues, is of importance: first, in preserving a connexion between the divided extremities of the tendon; secondly, in furnishing the matrix in which the nucleated blastematous, or proper reparative, material is effused; and, thirdly, in giving definition and form to the newly developed tendinous tissue.

"4. The ultimate perfection of the reparative process by the regeneration of tendinous structure, and the elongation of a shortened muscle by the insertion of a portion of new tendon into its length, equal in strength to the old tendon, and closely resembling it in its microscopic characters, is marred only by the adhesion of the deep surface of the new tendon, to a greater or less extent with the neighbouring fibro-cellular tissue. These adhesions may limit the free play of the tendon, but will not

interfere with sufficient motion being obtained. In cases of relapsed deformity, however, in which the operation of tenotomy may be repeated, these adhesions will, in many cases, prevent sufficient separation of the divided extremities of the tendon being obtained. Therefore, if much separation be required, a second operation is generally unsatisfactory in its result, and beyond a second operation, very little advantage can ever be obtained from operative treatment. Hence the necessity of the closest attention to the treatment after the first operation, and the explanation of the complete failure after repeated operations for the cure of deformities.

"5. The perfection of the reparative process, especially in non-congenital cases of deformity, in which more or less paralysis frequently exists, and in which the reparative powers are proportionably feeble, may be interfered with by injudicious after-treatment, especially by the too early and too rapid mechanical extension, so that an elongated, and attenuated uniting medium may be formed. And also, when tendons situated in dense fibrous sheaths of a tubular form are divided, there is great danger of complete non-union, the divided extremities of the tendon becoming adherent to the inner surface of the sheath without any direct connexion with each other. This I have shown to occur in the posterior tibial tendon, when divided immediately behind the inner malleolus. The practical rule, therefore, is never to divide a tendon as it passes through the denser portions of its sheath, and when the operation is performed near to such portions of the sheath, the extension must be conducted very slowly.

"6. There is no reason for believing that, in the treatment of deformities by tenotomy, direct approximation and reunion of the divided extremities of the tendon must be first obtained, and that the required elongation is afterwards to be procured by gradual mechanical extension of the new connecting medium, as we should stretch a piece of india-rubber, the stretching process occupying at least a month or six weeks, according to the doctrine and practice of some orthopædic authorities of the present time; but, on the contrary, all my observations lead me to consider that the required length of new tendon should be obtained during the time occupied in its formation, *i.e.*, from about two to three weeks under the ordinary conditions of health, but in paralytic cases, and also in patients of feeble health, this period may be doubled. Therefore, the object of gradual mechanical extension during this time is to *regulate the length of new tendon*, first, *by forcibly overcoming ligamentous resistance in some cases*, especially in those of long standing and of congenital origin, in which it is difficult to separate sufficiently the divided extremities of the tendon; and secondly, *by preventing a too rapid and excessive separation of the extremities of the tendon in other cases*, especially in those of non-congenital origin, in many of which the ligaments offer no resistance, and the reparative power is so feeble from partial or complete paralysis that rapid extension, separating too widely the divided extremities, would endanger their union; and also when tendons situated in or near dense tubular sheaths, as the posterior tibial, are divided, because it has been shown that in such situations, if the divided extremities be widely separated complete non-union may result in consequence of the absence of a connecting cellular sheath. Hence the mechanical extension must always in its rapidity be proportionate to the activity of the reparative process, and in the tendo Achillis, and other superficial tendons; this can be judged of by external examination and manipulation.

"7. The new tendon remains during life as a permanent tissue, and as an integral portion of the tendon, the divided extremities of which it has been formed to reunite. I see no reason for believing that the newly formed tendinous structure has any disposition to undergo a process of gradual contraction, such as we see taking place in the cicatrices of the skin after burns, to which it has been compared, and that ultimately it becomes absorbed, the muscular structure at the same time becoming elongated by the force of the contraction of the cicatrix, so as to allow of the reapproximation of the ends of the divided tendon, and the formation of a 'linear cicatrix.'

"8. The effect of this permanent elongation of the tendons of retracted or shortened muscles—*i.e.*, muscles shortened by adapted growth or adapted atrophy, is not only to correct deformities mechanically, by increasing the length of the tendons, as a carpenter would lengthen a piece of wood by the insertion of another piece of wood, and thereby allowing certain bones to be brought into their normal anatomical relations; but that, having obtained this end, its higher physiological or dynamic object is to allow of motion being gained, or, as it may happen to be, regained, in joints which were previously rendered fixed and motionless by the retraction and structural shortening of the muscles. The mechanical conditions necessary for motion are thus obtained, and if the muscles themselves, both those operated upon and their antagonists, are in sufficiently healthy condition, voluntary motion is also obtained, and is followed by an increased development of the muscular structure, so that the bellies of the muscles operated upon progressively enlarge, and in case of congenital talipes varus, the gastrocnemius and soleus muscles thus brought into use, attain in a few years a very fair proportionate size, instead of undergoing a process of progressive atrophy from disuse, as seen in cases of clubfoot which have remained unoperated upon till the period of youth or adult life. The effect of the operation in increasing the size of the calf is very conspicuous, when a case, which has been successfully operated upon at an early age, is compared with a case which has not been operated upon or subjected to other treatment: and it is thus proved that, when the possibility of muscular improvement exists, the muscular strength of the limb is very materially increased, instead of being diminished, by the operation of tenotomy; in fact that tenotomy in favourable cases must increase the power of the muscles operated upon, and also of the antagonist muscles. The extent to which muscular power is restored, with its attendant advantages, must of course depend upon, and be proportionate to the healthy condition of the muscles, and *vice versâ*; so that, in cases of complete atrophy and degeneration of the muscular structure, as in old paralytic cases the results of the permanent elongation of the tendons is purely mechanical.

"9. When recontraction of the foot takes place, and the deformity returns at a distant period after tenotomy, this does not depend upon absorption of the new material, or new tendinous tissue formed previously to unite the divided extremities of the old tendon; but upon the structural alterations taking place in the muscular tissue, either of an active character as in spasmodic cases, or of a passive character as in paralytic cases, and those produced by position, etc., in which the muscles, by a process of *adapted atrophy*, simply adapt themselves to the altered mechanical relations of the parts with which they are connected."

Besides giving the account of his own observations and opinions, the author has collected the remarks of various British and foreign surgeons regarding the reparation of tendons, and has thus made the work a most complete monograph on the subject; if completeness may be said to be wanting to inquiries so ably carried out as those in which Mr. Adams has been engaged.

FURTHER OBSERVATIONS IN SEVERAL PARTS OF SURGERY. By BENJAMIN TRAVERS, Fellow of the Royal College of Surgeons of England; Consulting Surgeon to the Economic Life Assurance Society; and formerly Resident Assistant-Surgeon at St. Thomas's Hospital. To which is appended an Original Memoir on the Nature and Treatment of some Unusual Forms of Eye-Disease. By the late BENJAMIN TRAVERS, F.R.S., one of Her Majesty's Serjeant-Surgeons. Dated 1828. Pp. 205. London: Longman and Co. 1860.

THIS volume consists of a series of essays on various surgical subjects, on which Mr. TRAVERS has enjoyed the opportunities of making observations, and regarding which he now sets forth his opinions for the benefit of the profession. The work is a continuation of one of a similar kind which was published by the author several years ago.

In his Introduction, Mr. Travers expresses his opinion that the refinements in pathological anatomy which have been carried out in the present age are not calculated to further the progress of medicine and surgery. He believes that "there is now-a-days an evil tendency or desire to bring men's thoughts down to the dreary level of a material proof, which is subversive of that method of theoretic reasoning founded upon a close and prolonged observation of morbid processes as they go on during life." But, granting that the microscope and the test-tube are apparently in advance of or at variance with our remedial means, we believe that the therapeutic reasoning to be derived from their indications has yet to be worked out—that it *will* be worked out; and that, therefore, no investigations into morbid structure are to be despised.

Mr. Travers also deprecates the tendency to operative interference in cases where it can be of no use, or must end in actions destructive to life. While we would agree with him in condemning such procedures, we cannot think, as he apparently does, that, as a rule, the tendency of modern surgeons is towards their performance, or that too great regard is paid to local manifestations of disease, to the neglect of the injury which the system has suffered. Nor can we at all agree with him when he says that

"There are some operations which should be wholly condemned as a class; such are a large proportion of the rhinoplastic performances, many of the jaw or face cases, and all those large and useless dissections made with an avowed purpose of removing deformity after a burn."

On the administration of medicines, Mr. Travers has some remarks worthy of attention. He objects to methods which "exhibit a tendency to teaze the system," and often do more harm than good: such as mercury and iodine. He advocates the giving of one medicine at a time, in small doses, spread over a considerable period.

The next essay consists of Observations on Unusual Forms of Injury occurring at the Hip-joint; being a memoir read before the Royal Medical and Chirurgical Society, on February 15th, 1854. Of the cases here related, one was, in Mr. Travers's opinion, partial dislocation of the head of the femur: the others relate to real or supposed fractures of the cervix, and to certain changes in the head of the bone.

A case of Dislocation of the Left Thigh Bone into the Sciatic Notch, which was reduced by extension upon the heel *in perinæo*, forms the subject of another essay.

Mr. Travers republishes some observations on the Nature and Treatment of Boil and Carbuncle, which originally appeared in the *Lancet* for 1857. He argues in favour of the application of caustic potass in preference to excisions; and advises attention to the secretions, and the judicious employment of a tonic plan of treatment, medicinal as well as hygienic.

Some Clinical Remarks on Hernia, which form the next chapter, will repay perusal.

Mr. Travers next publishes a Lecture, delivered some years ago, at St. Thomas's Hospital, on Hæmorrhage, and the Means to be employed for its Suppression; Remarks on the Use of the Ligature; also on some Points connected with Occurrence of Secondary Hæmorrhage from Large Arteries.

The next chapter is on a Case of Acute Tetanus following an Operation for the Radical Cure of Hydrocele by Injection, which terminated fatally in thirty hours. It is followed by some good remarks on the treatment of tetanus.

Some Remarks on M. Velpeau's Analysis of Breast-Diseases complete the contributions made by the present author. Mr. Travers has some hope that cancer may one day be cured by medicinal means. He says:

"The alkaline salts certainly seem, on some occasions, either to be corrective of or subsidiary to the supply or defect, as the case may be, of certain saline ingredients of the blood, which are clearly concerned and have to do with, the production and propagation of this complaint, and if hereafter it shall be found that cancer may be cured, or even permanently controlled by the use of medicine, this is the route which will be taken to arrive at that desirable event. It is a common error amongst the moderns to give too much attention to the progress of local changes only. This isolated contemplation of a diseased and decaying tissue belongs to a miserable solidism, which may be satisfactory to the morbid anatomist but it does not help the surgeon. The chemist appears to be the only true guide in this our darkness, and it is by no means certain that his researches may not some day establish the conditions upon which we might proceed to combat successfully the first approach of a cancerous disease." (Page 160.)

The observations on Eye-Diseases of the late Mr. Travers consist of a letter to Dr. Bauer of Hesse-Cassel, who was desirous of receiving information on the progress of the subject in this country. It is a very good epitome of the knowledge of the pathology of the eye which was possessed by British surgeons in 1828.

Although on some points we are not able to agree with Mr. Travers in his opinions, we find in his book much instruction, and attach value to it as being the result of the labours and cogitations of an observant practical surgeon.

British Medical Journal.

SATURDAY, NOVEMBER 10TH, 1860.

WASH, AND BE CLEAN.

THE Quarterly Report of the Registrar-General just issued has this significant sentence: "The weather of this quarter (ending September 30th) may be looked upon as an experiment upon the health of the people." What we have been pleased to stigmatise as the most wretched and unseasonable year within the memory of man is now nearly past; and, as far as we have yet "taken stock of it", we find that, on the score of health at least, we have sadly maligned it. Had there been no such person as a Registrar-General, and had we only to depend upon the experience of hearsay evidence, the probability is that the year 1860 would have been branded for the next generation as preeminently a sickly season. We should have been told that in this year all nature was depressed; that the flowers had no perfume, the fruit no flavour, the cattle no food, and man no enjoyment. All these charges against the year that is past are true enough; nevertheless, we put aside our feelings, banish all sentimentality, and consult the national register; and lo! we are forced to confess that we have been labouring under a delusion, as far as the public health is concerned; and the poor year stands forth as the most remarkably healthy one we have had perhaps in the century. How could we more forcibly illustrate the value of statistics? The three months of July, August, and September, usually the finest in the year, were this season miserable beyond description; their mean temperature being only 56.2°, or less by 3.3° than that of any corresponding season for eighty-nine years; that is to say, there are very few living men who have experienced so cold a period of three summer months. With this low temperature there was a very large rainfall; indeed, the abundance of the rain must be considered one of the main causes of the low state of the thermometer. For years there has been a deficiency in the rainfall; this season we have made up for it; the excess during the driest months of the year has been 2.1 inches. Nevertheless, under these wretched summer skies, death has ceased to be as busy as usual amongst us. According to the general average of the season, the rate of mortality should have been twenty per thousand; it actually was only seventeen per thousand. Thus three living beings out of every community of a thousand owe their lives to the wretched weather!

There is a very prevalent opinion that much of the diarrhœa existing in the summer months is attributable to the eating of fruit—especially unripe fruit; hence fruit is unnecessarily denied by fond mothers to little children, and the bounties of Providence are practically stigmatised as a nuisance. This summer we have been able to test the value of this universal