

Inasmuch as the cysticercus, if it remains alive, after a short residence destroys the eye, the indication is to extract it. To accomplish this Prof. Gräfe employs his periphæric linear cut, and after iridectomy and extraction of the lens, endeavours to cause its exit by means of a eurette carefully introduced into the vitreous by a succession of gentle efforts.

Prof. Arlt operates by an incision in the sclerótica from before backwards between the inferior and external, or inferior and internal, in the direction of one of the great meridians of the eye. When the parasite happens to be lying in front of the equator under the retina, the latter would appear to be much the preferable operation, inasmuch as the patient's power of accommodation is in no wise interfered with.

The writer of this notice, while attending Prof. Arlt's clinic at Vienna, had an opportunity of observing three cases of cysticercus, two of which have been above detailed in the masterly description of Prof. Becker. In all three cases Prof. Arlt attempted to extract it, and in two of them was successful in so doing; in the third the animal was lying free in the vitreous, and he relinquished the attempt in finding that it would be impossible to seize it without violence to the tunics of the eyeball and considerable loss of that humour.

Hoping that by the above extracts we have succeeded in giving to our readers a fair idea of the contents of Prof. Jæger's Atlas and Dr. Mauthner's Text Book, we conclude by cordially recommending them to the attention and perusal of all interested in ophthalmic surgery, believing them well worthy of their careful study.

W. F. N.

ART. XX.—*Injuries and Diseases of the Knee-joint, and their treatment by Amputation and Excision contrasted.* The Jacksonian Prize Essay of the Royal College of Surgeons of England for 1865. By WILLIAM PAUL SWAIN, F. R. C. S., Surgeon to the Royal Albert Hospital, Devonport. 8vo. pp. xii. 252. London: John Churchill & Sons, 1869.

In the year 1860 the subject for the Jacksonian prize essay of the Royal College of Surgeons was announced in almost the same language as in 1865. The prize in the former year was contended for by the late Mr. Price, with what melancholy result we all know. Price's was the only essay sent in, and yet was rejected; the disappointment fell heavily upon the author, whose health was already undermined, and he died of phthisis three or four years later at the early age of 32. His work, posthumously published under the editorial supervision of his friend and colleague Mr. Henry Smith, amply vindicated his fame, and is now deservedly looked upon as classical. Under these circumstances the subject of "The diseased conditions of the knee-joint which require amputation of the limb, and those conditions which are favourable for excision of the joint," was again proposed in 1865, and on this occasion the prize was awarded to Mr. Swain, whose essay forms the neat volume the title of which stands at the head of this article. Mr. Swain's essay was originally published in the *British Medical Journal* for 1866, from the pages of which it is now reprinted with some additions; and it thus comes before the profession for

examination and criticism as one of the excellent series of "Jacksonian prize essays." The body of the work, which is appropriately dedicated to Sir Wm. Fergusson, is divided into ten chapters, the last quarter of the volume being occupied by an appendix giving in more or less detail 104 cases, most of which had not hitherto been made public.

The first chapter is devoted to the "General anatomy of the knee-joint," and describes successively the bones which enter into that articulation and their centres of ossification and growth, the muscles and tendons, ligaments, cartilages, synovial membrane, and vascular and nervous supply of the joint. The author agrees with Barwell in believing that the synovial membrane is not prolonged over the articular cartilage, and that it is, therefore, more properly described as a tube than as a closed sac.

The consideration of the "morbid conditions of the knee-joint" is commenced in Chapter Second, the author describing in succession, acute, subacute, and chronic synovitis, gelatiniform degeneration, rheumatic synovitis, suppuration in the joint, and acute and chronic inflammation of the cartilages. Under the name of *gelatiniform degeneration*, the author describes what is ordinarily called serofulous or strumous synovitis, but which he justly observes is often present when there is no evidence of any constitutional affection whatever. It is, moreover, almost never met with except in the knee, thereby differing from those forms of synovitis which are habitually connected with the strumous diathesis. This gelatiniform degeneration is usually found among adults. "The swelling, which is the first symptom, is of a peculiar character. It does not convey the sense of fluctuation to the touch, which the ordinary effusions of synovial inflammation do; it is a swelling rather of a doughy, semi-elastic character. Nor does it assume the same form. It is more general and uniform; the bulging of serous effusion is absent, and the whole joint assumes a regular globular shape." Repeated attacks of chronic synovitis, by causing the formation of successive layers of organized lymph, may give rise to a difficulty in the diagnosis, which can, however, usually be made by inquiring into the history of the case, and by remembering that the gelatiniform degeneration, unlike chronic synovitis, is attended by "a constant, dull, heavy, gnawing pain." Even in the advanced stages of pulpy degeneration, the joint retains considerable mobility. These cases almost invariably end in suppuration of the joint and destruction of the articular cartilages, requiring operative interference.

"It is almost certain," says Mr. Swain, "that disease never commences in the articular cartilage." The cartilages become secondarily affected, the disease originating in the synovial membranes or in the bone.

The researches of Virchow, Goodsir, Redfern, and Barwell, as to the inflammatory changes which take place in cartilage, are briefly referred to, and the ulceration of cartilage is divided (following Barwell) into the inflammatory and degenerative varieties, two forms of degeneration being recognized, viz., the fatty and the granular. "The pain and starting of the limb which accompany ulcerations of the cartilage of the knee-joint were at one time referred to the cartilage itself, but are now understood to arise from the exposure of the bony structure by the removal of the cartilage. . . . We may be pretty sure that simple degeneration or ulceration of cartilage will in itself give little or no indication of its presence. When active symptoms show themselves, extensive mischief has already been done in the joint." Severe symptoms supervene more rapidly when

the disease has begun in the bone, than when the synovial membrane is first affected.

The author treats in the third chapter of the diseased conditions of the bones forming the knee-joint, and the tissues surrounding it. Diffuse inflammation of the spongy structure of the bone (acute sub-periosteal abscess) is first referred to, and the occasional occurrence of spontaneous separation of the lower epiphysis of the femur, in this affection, mentioned on the authority of Dr. Klose. "In chronic inflammation there is increased vascularity not of the bone itself, but of the membrane lining the cancelli. On making a section of a bone thus affected, the entire surface presents a uniform dark purple hue, or, it may be, a mottled appearance." As the disease goes on, the effusion of serum is succeeded by suppuration, and finally the lining membrane of the cancelli begins to granulate, the cancelli themselves being absorbed till finally the articular extremity consists of a granular mass surrounded by the external shell of bone. What is often called tuberculous disease of the articular extremities of bone is, according to our author, merely chronic osteitis. "I have never seen," he says, "a case of pure tuberculous deposit in a joint-head; and I believe that the 'gelatinous material' which Price describes as 'in every respect analogous to pulmonary tubercle,' is nothing more than the granulations filling the cancelli which I have before described."

Under the heading of *Tumours involving the Articular Extremities*, a caution is given as to operations for the removal of exostoses or of cartilaginous growths. These tumours often cause repeated attacks of synovitis, leaving the synovial membrane thickened and dilated, so that in any attempt at removal of the growth, "the joint is very likely to be laid open, and serious mischief ensue." Medullary cancer, or cystic growths, are occasionally met with in the articular extremities of both femur and tibia.

The fourth chapter is devoted to wounds, injuries, and deformities of the knee-joint, and contains many judicious directions as to the general management of these conditions. Free incisions into the joint (as recommended by Mr. Gay) are advised in case of suppuration occurring, together with the continuous application of ice. An attempt should always be made to obtain a cure by ankylosis, though in many cases the destruction of parts will be so great as to require either excision or amputation.

In the fifth chapter the author takes up the subject of excision of the knee-joint, and the ensuing pages are chiefly devoted to statistics. The following table, which we reproduce, embraces only cases operated on by British surgeons, and deals, we believe, with larger figures than any that has yet been published:—

	No. of cases.	Recoveries.	Deaths.	Amputation.	Recoveries.	Deaths.
Recorded in Price's book up to 1865	316	240	76	39	30	9
Collected by Dr. MacCormac	74	49	25	11	7	4
Tabulated by Mr. Swain	82	67	15	4	4	0
Total	472	356	116	54	41	13

The mortality of the operation in the hands of British surgeons would, according to these figures, appear to be about 24½ per cent. Mr. Swain compares these results with those derived from the statistics of Dr. Hodges and of Mr. Heyfelder, and attributes the greater success of the operation as shown by his own tables, to the superior skill of his countrymen.

This whole chapter strikes us as rather unsatisfactory; indeed the author himself considers the statistics of the operation "most unreliable."

We almost wish that our author had omitted all reference to figures, for after all, the recommendation of excision over amputation consists in the fact that the former operation preserves a limb which the latter sacrifices, and not in a fractional difference in the resulting mortality; we shall, however, revert to this subject in another place.

The "modes of performing the operation of excision of the knee-joint; and the after-treatment," are presented in Chapter Sixth. The old-fashioned H incision, so highly commended by Butcher and Price, is condemned, and the horse-shoe or U incision described as in every way preferable. The important points to be observed are to place the lateral branches of the incision fairly behind the condyles, so as to insure free drainage; to which we may add, that if the U incision be used, its transverse branch and curves should be low enough to allow ready exposure of the articulating surface of the tibia. The operation by a simple transverse incision across the joint (the first use of which is by Mr. H. Smith, attributed to Sir William Fergusson), is stated by Mr. Swain to have been previously used by Mr. Kempe, of Exeter. He does not seem to be aware that this plan was originally suggested by Park, in his celebrated letter to Mr. Percival Pott. This method has the advantage over the U incision of making a much smaller wound, and can be readily extended into the H incision, if necessary, by adding short longitudinal cuts. In the use of the saw care must be taken not to strip off the periosteum above the line of section, and to preserve the natural obliquity of the femur. An equal amount must be removed from each condyle, and the saw must be applied perpendicularly to the axis of the femoral shaft, not to that of the patient's body. Fergusson's lion forceps are praised, but Butcher's saw is rather slightly referred to as "neither so firm, nor so entirely at the command of the operator" as the ordinary broad-bladed saw which the author prefers. For our own part, we look upon Butcher's saw as a most valuable instrument; the facility which it affords for dividing the bone from below upwards, and thus avoiding all risk to the popliteal vessels, amply compensates for any want of stiffness, which deficiency is after all more fanciful than real, for by proper adjustment the saw can be made firm enough for all practical purposes. For the after-treatment of excision cases, Mr. Swain recommends the splint known as Price's (a modification of the ordinary McIntyre's splint), or the suspension rod and Gooch's splint, as advised by Dr. P. H. Watson, either of which our author considers better than the box-splint of Mr. Butcher. The splint being adjusted, the patient is to be placed in bed upon a water-pillow, with the leg suspended by a "Salter's swing." The use of the water-pillow Mr. Swain deems very important. "By it the pelvis is, as it were, swung, and the patient can move about with the greatest freedom, without a single jar being communicated to the limb." To obviate the bowing outwards of the joint, which sometimes occurs after the operation, Mr. Swain has devised a "trass-pad," which, taking its fixed point from a bar attached to the inner side of the splint, passes over the joint, and presses the limb inwards and a little downwards."

In Chapter Seventh the author considers the "diseased conditions in which the operation of excision of the knee-joint is admissible." In deciding upon the propriety of excision, there are three points to be specially considered; these are (1) the extent and character of the disease, (2) the

constitutional condition of the patient, and (3) the patient's age. With regard to the state of the affected joint, it may be said in general terms, that the operation is not justifiable, so long as the soft tissues of the articulation are alone involved. Excision has occasionally, but very rarely, succeeded in cases of acute suppurative of the joint, and our author agrees with Mr. Holmes, that for such cases amputation is usually a preferable operation. When the cartilages and bones are involved, the patient suffering from the peculiar starting pains characteristic of this condition, our author considers excision to be particularly applicable. Though these cases may sometimes get well without operation, the time required for a cure by ankylosis is a matter for serious consideration. In illustration of this point a case is quoted from Hilton, where a not very brilliant cure was obtained after no less than ten years' treatment.

The existence of circumscribed abscess, or of limited caries, or necrosis, or even of the so-called tuberculous deposit of Price (if in small amount), does not contra-indicate excision. In the diffuse variety of the latter affection, however, amputation would be a safer operation: "If, upon making the section of the bone, large diffuse extravasations of blood be present, or if it present a dirty yellow appearance, from diffuse suppuration, the operation of excision is not admissible."

Continuing the subject of the local conditions admitting of excision, in Chapter Eighth, the author considers the operation as applied for the relief of traumatic injury and deformity. Mr. Swain makes the assertion (which he does not attempt to prove), that the shock of excision is less than that of amputation: be, however, somewhat modifies this opinion on a subsequent page, by explaining that he looks upon *hemorrhage* as a cause of *shock*. No one, we suppose, will be apt to differ from him in believing that more bleeding attends the loss of a limb than the mere loss of a joint; but, on the other hand, we think that the experience of most surgeons will confirm our own, that the shock (*par et simple*) of an amputation is no greater than, if as great as, that of a corresponding excision. We do not find anything new in this chapter as to the application of the operation under discussion in military practice; nor do we think our author justified, by any facts that he has presented, in "boldly prophesying," as he does, that when British army surgeons have occasion to excise knee-joints, they will meet with "better results than those given . . . by M. Spillmann¹ and the Surgeon-General of the American army." Greatly as we admire the skill of British surgeons, we cannot believe that it will suffice to render an operation advisable, which has been condemned by the general experience of other nations in its application to the surgery of war. In his remarks upon *excision for deformity*, we are rather surprised to observe that Mr. Swain makes no mention of the names of either Dr. Barton, of this city, or Dr. Buck, of New York.

Our author discusses in the ninth chapter "the constitutional conditions and the age admitting excision of the knee," and adds some remarks upon re-excision. "It really seems so reasonable," says Mr. Swain, "that it should be a *sine qua non* for the patient to be free from any other exhaustive visceral disease, that one is surprised to find surgeons advocating the

¹ By the way, Mr. Swain is in error in saying, as he does on page 122, that "M. Spillman has published . . . the history of thirteen cases of excision of the knee in civil practice, for gunshot injury," the fact being that only four of the thirteen were for gunshot injury, the remaining nine being for other forms of traumatic lesion.—See *Archives Générales de Médecine*, Juin, 1868.

practice of excision when visceral disease is present." With regard to age, our author would forbid the operation in children under ten and adults over forty-five. Mr. Swain's remarks as to the arrest of growth consequent upon excision are interesting and judicious: he agrees with Fergusson and Holmes in considering a shortened limb as better than a stump.

Chapter Teath is devoted to amputation of the thigh, for disease of the knee-joint: the operations recommended are those of Spence and Carden, with the use of ligatures and *non-metallic sutures*. Our author here returns to the statistics of amputation and excision, and we must say, in a very unsatisfactory manner. He reasonably observes that it is unfair to compare excisions *for all causes, with amputations for disease alone* (which are of course the most favourable cases): and yet he immediately proceeds to do what is equally unfair, viz., to compare excisions with amputations of *all parts of the thigh*. The fact is that, as we have already observed, the relative merits of the operation are not to be settled by statistics; for it is almost impossible thus to institute a just comparison. Moreover, as far as statistics show anything, they show, when fairly considered, that excision of the knee is more fatal than amputation through or immediately above the condyles. Thus Hodges' tables give two hundred and eight cases of excision *for disease* performed since 1850, with sixty deaths (a mortality of 28.84 per cent.); while Brinton's statistics of knee-joint amputation *for disease* give a mortality of only 22.58 per cent. Again, taking Mr. Swain's own figures as to the practice of the Exeter and Plymouth Hospitals, we find that the former gives one hundred and nineteen cases of thigh amputation with ten deaths (mortality of 8.40 per cent.) against thirty-one excisions with three deaths (mortality of 9.68 per cent.); while the latter gives forty amputations with three deaths (7.50 per cent.), against eight excisions with two deaths (25 per cent.).

We may add that the adoption of Mr. Swain's advice (which we entirely approve) to reserve excision for those patients who are in the prime of life and unaffected by visceral disease, and to employ amputations for the others, will not tend to make the operations more comparable as to their statistical results. The true question, we take it, as to excision of the knee-joint is this: Are the prospective benefits of the operation sufficient to warrant the surgeon in exposing his patient (in a suitable case) to the additional risk of excision over those of amputation? And this question we are prepared, unhesitatingly, to answer in the affirmative. The surgeon's first effort (where any operation at all is required) should be to save both life and limb by a resort to excision, and it is only when the local or general condition of the patient will not allow the preservation of the limb by the graver operation of excision, that an amputation should be thought of. Knee-joint excision is too valuable an operation to need to be bolstered up by an attempt to prove it in itself less fatal than amputation; but though more fatal, its dangers are not so much greater but that it is in proper cases in every way to be preferred.

We have thus gone hurriedly over Mr. Swain's book, and endeavoured to give our readers a sketch of its general scope and design. It is, on the whole, a good book, though not so good, we think, as it might have been; nor, with all respect to the judgment of the Jacksonian Committee of the Royal College of Surgeons, as good as its rejected predecessor, the work of the Invented Priece. We cannot see that Mr. Swain has added a great deal to what was already known concerning the subject of his essay,

but his book is nevertheless useful, as presenting in a form convenient for reference what has been said by others, as well as the results of his own experience.

As a literary effort the work cannot be considered as remarkable, the style being rather common place and occasionally somewhat obscure. The book is well printed, and the wood-cuts (thirty six in number) are usually satisfactory. Though we confess to a feeling of disappointment after the perusal of this volume (perhaps we expected too much on account of its being the Jacksonian prize essay)—we do not wish to appear to undervalue Mr. Swain's work, which we hereby cordially commend to the attention of American surgeons.

J. A., Jr.

- ART. XXI.—1. *On the Physical Basis of Life.* By T. H. HUXLEY, LL. D., F. R. S. 12mo. pp. 35. New Haven, Conn.: C. C. Chatfield, 1870.
2. *As Regards Protoplasm in Relation to Prof. Huxley's Essay on the Physical Basis of Life.* By JAMES HUTCHISON STIRLING, F. R. C. S., LL. D. Edin. 12mo. pp. 68. Edinburgh and London, 1869.
3. *Protoplasm; or, Life, Matter, and Mind.* By LIONEL S. BEALE, M. B., F. R. S., etc. Second edition, much enlarged, with coloured illustrations, 12mo. pp. 158. London: J. Churchill & Sons, 1870.
4. *How to Work with the Microscope.* By Dr. BEALE. Fourth edition. pp. 308 to 339. London, 1868.

THE first three books at the head of this list should be read together, or rather continuously, in the order of publication. We are quite sure that such perusal, if careful, will reward the reader, by a thorough acquaintance of the history, nature, and properties of protoplasm, such as can be derived from no single one of the three; though we are not so sure that he will know as much more of the real nature of "life" as he might be led to expect from their titles, or the reputation of their authors.

Prof. Huxley's essay, or lecture, was the "glove" thrown to the literary and scientific world, which Dr. Beale and Mr. Stirling have hastened to pick up, though it seems to us that Mr. Huxley has not, in every instance, been properly interpreted by either of these gentlemen. We do not think that either Dr. Beale or Mr. Stirling has sufficiently remembered the character of the audience or the nature of the occasion which called forth Prof. Huxley's essay. The former, as we understand, was promiscuous, and the latter, one of a series of Sunday evening addresses upon non-religious topics. As such, it contains statements which are general and as inaccurate as such statements often erroneously are, when intended for popular appreciation, and should not, therefore, be subjected to the most rigid scientific criticism, unless they are rearranged for scientific readers. Perhaps, had this been the case, certain palpable flaws in the argument of Prof. Huxley would not have occurred.

Prof. Huxley's object is to show, 1st, that there is one kind of matter common to all living beings, which is "protoplasm," the scientific name for the physical basis of life; 2d, that all the phenomena exhibited by protoplasm are simply its physical properties, just as the phenomena exhibited by water in its various states are properties; they are not to be considered