

that the use of the finger-nail in dividing and drawing aside the tissues will generally enable an operator to avoid the difficulties which have hitherto been described as attaching to the operation from hæmorrhage.

A good deal has been written also in relation to the number and nature of the tubes to be introduced into the wound for the purpose of giving exit to the urine. I have never used one, and believe that they are wholly unnecessary—useless for the purpose named, and injurious as local irritants. After the first twenty-four hours I have placed the patient on either side alternately every six hours, to facilitate the outflow of the urine, and to prevent excoriation of the skin by thus frequently changing the direction of the current.

Finally, I think I am quite justified in believing that unless the operator has had a large experience of lithotomy—and there are not many of whom this can be affirmed—the high operation would generally be a safer proceeding than crushing for a calculus which is hard and much above an ounce in weight.

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LARGE URINARY CALCULUS: THE HIGH OPERATION.

By PROFESSOR HUMPHRY, F.R.S.

THERE is in the pathological museum of the University of Cambridge, to which it has lately been transferred from the library of Trinity College, a lithic acid calculus, which is larger than any of those mentioned by Sir Henry Thompson in last week's LANCET. It is, I believe, the largest of that composition known to have been taken from the human bladder. It is spheroidal, slightly oval, and flattened, its circumference measuring in one direction 15 in., and the other $13\frac{1}{2}$ in. The analysis given by Professor Cumming in the Cambridge Philosophical Transactions, vol. i., p. 347, is as follows:—"The nucleus is lithic; to this succeeds a considerable portion of the oxalate of lime variety; this is followed by layers of the triple crystals, covered by a thick coating of lithic, which is occasionally broken by a layer of the triple crystals, and the external surface is principally composed of the fusible calculus. Its present weight after being sawn is 32 oz. 7 dr.; the specific gravity 1.756, which after being two days in water became 1.768." He further adds that "it is more than nine-tenths lithic acid." The density of the calculus, and the small proportion of phosphates contained in it, indicate it to have been of slow formation and attended with little irritation of the bladder; and this is corroborated by the account given by Dr. Heberden in the forty-sixth volume of the Philosophical Transactions, from which it appears that the stone was taken from the wife of Thomas R—, a locksmith in Bury, after her death, by Mr. Gutteridge, a surgeon of Norwich, and was presented to Trinity College, Cambridge, by Mr. Samuel Batteley, who was M.P. for Bury, and had possession of it soon after the woman's death. "She had felt much less pain than might have been expected from so large a stone; and might probably have lived much longer with it if she had not thought herself well enough to attempt a journey on horseback, for while she was riding she was suddenly seized with violent pains that obliged her to be taken off the horse immediately, after which she could never make water unless the stone was first moved, and she continued in great agonies till she died. This happened in the reign of Charles II., who, being then at Newmarket, had the stone brought to him, some part of which was chipped off from one of its ends to show the King that it consisted of various coats formed one over another, as animal stones usually do." "This monstrous stone weighs 33 ounces 3 drachms and 36 grains, Troy weight. There appears to have been at least an ounce broken off on the occasion before related, not to mention what it must have lost by mere wear in fourscore years." Heberden had heard of calculi in Paris of equal weight, and of one "mentioned by Dr. Lister in his journey to Paris, which he says was taken from a monk A.D. 1690, and weighs 51 ounces"; but no further account is given of these, and nothing is said of their composition.

I am glad to find that Petersen's method of raising the bladder by distending the rectum with an indiarubber bag filled with fluid, as practised by Sir Henry Thompson, is

giving an impulse to the high operation of lithotomy; for it has always appeared to me that it is the operation best suited for the removal of large stones, and I have been surprised that it has not been more frequently practised. In the case of a lad on whom I performed it in 1848¹ I found no difficulty in reaching the bladder with the knife and the fingers, although the viscus was not distended, simply taking care to keep close to the ossa pubis after the linea alba had been cut through and the attachments of the recti muscles had been divided; and no ill consequences followed the infiltration of urine, which must have taken place to some extent. The lad quickly recovered, and four years afterwards, there being a recurrence of symptoms, I removed by the lateral operation three phosphatic calculi, one of which was adherent to the forepart of the bladder, where the incision had been made into it in 1848. The patient soon recovered, and was quite well a year subsequently. Some of the papillomatous and other growths in the bladder, which cannot be removed through a perineal incision, might be extirpated if the bladder were opened above the symphysis pubis.

REMARKS ON

THE CIRCULATION OF THE BLOOD.

MECHANISM OF THE ESTABLISHMENT OF VASCULAR CONGESTION: AN EXPERIMENTAL RESEARCH, DEDICATED TO STUDENTS OF MEDICINE.

By T. WHARTON JONES, F.R.C.S., F.R.S.

(Concluded from p. 108.)

FROM what has been said, it appears that the general blush of vascular fulness of the eye and side of the head in a dog or rabbit after section of the sympathetic nerve in the neck, and of the posterior extremity of the frog after section of the ischiatic nerve, is quite different in nature from the circumscribed deep-red vascular congestion (stasis sanguinis) which has here been spoken of. In the former case, the arterial walls having become paralysed by the section of their vaso-constrictor nerves, the blood, freely entering, distends their calibre, and flows in full force into the capillaries and venous radicles, distending the calibre of these vessels also, and causing a general blush of redness of all the parts under the influence of the divided nerve. In the latter case, the vascularity with intense circumscribed redness of the part is owing, not to an increased afflux of blood, but to a retarded flow in the small vessels, permitting of retention and stasis of blood in them by accumulation and aggregation of the red corpuscles. Such, it is to be observed, is the real nature of the circumscribed patch of congestion in the sclerotica and conjunctiva, which is excited by injury of the adjacent part of the cornea referred to in my article on Cohnheim's alleged emigration of white corpuscles from the vessels into the corneal substance.²

It remains now to make some remarks on blood-pressure, as directly manifested in nature, and not through the medium of hæmodynamometers, sphygmographs, and other curious instruments. By the blood flowing in the vessels under the influence of the propelling force of the heart's systole, distending pressure is exerted on the walls of the vessels from within, whilst, on the other hand, constricting pressure is exerted on the streams of blood by the muscular contractions of the walls of the vessels. In the case of the veins of the bat's wing, the constricting pressure on the blood by the rhythmical contractions of the walls of these vessels supported by valves, operates in aid of the propelling force of the heart's systole, as does also, indeed, the constricting pressure on the blood by the tonic muscular contraction of the walls of veins generally, backed by valves, though in a less degree; whereas, in the case of arteries, the vaso-parietal constricting pressure on the streams of blood operates as a controlling and even resisting force. Nay, we have seen that the calibre of a small artery may become constricted to closure by the tonic contraction of its muscular wall under vaso-motor nervous influence. In such a case of vaso-parietal pressure the stream of blood is not only arrested but is actually regurgitated in opposition to the propelling

¹ Provincial Medical and Surgical Transactions, vol. xviii.

² See article Phlyctenular Ophthalmia and Keratitis in my Ophthalmic Medicine and Surgery.