In the cases of the tangle-tent, sponge-tent, and India-rubber bag, the extent of the part to be dilated is immaterial, because the same, or nearly the same, force is exerted at every point of the tent or bag, whether a small or a large portion, or the whole surface of the tent or bag, be opposed to the constriction or resistance.

3. *The Sponge-Tent.*—The sponge-tent acts in the same manner as the tangle-tent, but its power is very much less. It was not tested in the metallic apparatus or clamp, but with the India-rubber band wrapped around it at an ascertained tension. By this means it was found to exert a force in expanding equal to from 20 lbs. to 30 lbs. on the square inch.

4. *The India-rubber Bag.*—In order to test this, good specimens were obtained in the ordinary shops. It was easy, by the use of a manometer, to find exactly what pressure they exerted or withstood when distended by the ordinary barrel or otherwise shaped India-rubber syringe, supplied along with them. They were found at the highest to exert a pressure equal to from 15 lbs. to 25 lbs. on the square inch. The pressure was found to be greatest when they were fully and equably distended; afterwards, becoming deformed and thinned in parts, previously to ultimately bursting, the pressure became considerably lessened.

II.—THE AMOUNT OF EXPANSION PRODUCED.

1. *The Bougie.*—By the use of this instrument, an amount of expansion is produced which is susceptible of exact measurement. The size of an aperture or passage being ascertained by transmitting easily through it as large a bougie as will pass, a larger bougie is then urged through it with some expenditure of force, and the difference between the diameters of the round stems of the two bougies is a measure of the amount of dilatation effected. In ordinary practice, the amount of dilatation effected at one sitting is not considerable: it amounts to from .02 to .04 inch in the diameter of the part dilated; but, by prolonging the sitting and using a succession of instruments, or using one large instrument very long and perseveringly, a greater amount of dilatation may be effected: .02 or 1-50th of an inch is the average difference between the diameters of two successive bougies in the ordinary male urethral series, and these may be used in gynecology, or, by trivial changes, adapted for gynecological purposes. The series, as procured in such a well known surgical cutler's shop as Mr. Young's, runs thus: 7 = .16, 8 = .18, 9 = .20, 10 = .22, 11 = .23, 12 = .24, 13 = .26, 14 = .28, 15 = .30, 16 = .32, 17 = .34, 18 = .36, 19 = .38 inch. I cannot conceive why this regularity of the series is broken at 11, nor have I been able to find out. If there be any reason, it is surgical, for the series tested is the ordinary surgical series. The whole series, if successfully used, produces a dilatation of about a quarter of an inch.

2. *The Tangle-Tent.*—The expansion of a tent of this kind when it is subjected to no pressure is considerable. A tent whose stem has about one-fifth of an inch in diameter expands to about half an inch in diameter, and other sizes expand in a like proportion; but this amount of expansion is not a good measurement of what this tent can do by mere mechanical force, for, in proportion as the resistance to be overcome by the expansion increases, so does the amount of actual expansion decrease. A tangle-tent raising by expansion a weight of 300 lbs., enlarges to a degree which in medical practice would be regarded as almost nothing. In one of the experiments made, it was found that a tangle-tent of .36 inch in diameter, expanding with a force of nearly 166 lbs. per square inch, increased its diameter only from .36 to .43, or about 1-14th of an inch. The same tent, under a pressure of nearly 500 lbs. on the square inch, enlarged only from .406 to .43, or 1-40th of an inch. To fully appreciate the insignificance of this enlargement, it is necessary to remember the length of time—at least many hours—consumed in producing this amount of dilatation. The minute dilatation effected at a sitting by a bougie one degree larger than its predecessor used at a former sitting, is produced almost instantaneously.

3. *The Sponge-Tent.*—The amount of expansion of a sponge-tent, when not under any constraint, is greater than that of the tangle-tent. A small sponge-tent of one-third of an inch in diameter will expand to a little more than an inch, more than trebling its diameter; but it is very compressible; and a reference to the experiments, in the Appendix, shows that the expansion, even under slight compression, is very small indeed.

4. *The India-rubber Bag.*—The expansion produced by the India-rubber bag is practically unlimited on the side of great extent. Small bags are not available, or have at least not yet been introduced into practice. But, beginning with the smallest bag in ordinary use, about the thickness of a finger, further expansion is practically unlimited, because any bag can be easily withdrawn and another of larger size immediately substituted for it. This is not true of the other methods of dilatation, if the important and danger-bringing element of time be kept in view in considering the matter practically. This mode of expand-

ing is greatly different from that of the sponge or tangle-tent, for it maintains its full power until the complete regular expansion of the bag is arrived at. It does not, like them, expand to a slight degree with moderate or great force, and then become weak; for, by keeping up the repletion of the bag, it may be made to maintain the same force from the first moment of application to the last degree of regular expansion.

III.—THE AMOUNT OF TIME EXPENDED IN PRODUCING THE EXPANSION.

This element in the production of expansion is one of the most important for the consideration of the practitioner. He may wish speed for its own sake, or he may find it essential with a view to avoid the risk of the supervention of inflammation.

1. *The Bougie.*—No time is lost in bringing the full power of this appliance into action.

2. *The Tangle-Tent.*—Even when under no constraint whatever, this dilating agent expands slowly. Before its small dimensions have doubled, twelve hours will have elapsed. When there is considerable mechanical resistance to the expansion, it is, compared with this, to a very slight degree in amount, and very slowly produced. Particulars under this head will be found in the Appendix of Experiments.

3. *The Sponge-Tent.*—Almost no time is lost in bringing out the full power of this agent. Sometimes time is lost in the melting of the lard and wax with which such tents are smeared; but when the fluids get access to the sponge, it is scarcely so much as a matter of minutes to produce full expansion when the sponge is unconstrained; but under pressure its power of expansion is small, and the amount also very small.

4. *The India-rubber Bag.*—No time is lost in bringing into action full power of this method, and its power continues till the full expansion of the bag.

[To be continued.]

CASE OF WOUND OF INTESTINE: RECOVERY.

By HENRY DODD, Esq., Rollington, Yorkshire.

T. R., aged 24, labourer, stout built, tall, and well-proportioned, received a wound in the abdomen on the right side, two inches and a half from the umbilicus, and on a parallel line with it. He was stabbed with a knife, its blade being three inches long, and extremely sharp to the very point. From the appearance of the wound, which was three inches long and gaping, I should say that the instrument had passed downwards, and then had been torn upwards and outwards. I found the man in a semi-conscious state, nearly an hour after he had received the injury. The loss of blood had been great. The omentum was protruding; also a portion of the ileum, the latter being punctured. The wound in the gut was longitudinal, and half an inch long, and from the aperture was exuding a thin dark-coloured fluid. I at once, after examining the wound carefully, applied a stitch (glover's) with the thread saturated in a weak solution of carbolic acid. I returned it with the omentum to the cavity of the abdomen, closed up the external wound of the parietes by ligature, also saturated with solution of carbolic acid, and over all placed a pad of carbolised lint, with a bandage extending from the pelvis to the extremity of the sternum. I gave every three hours an ounce of a mixture composed of a grain of tartrated antimony in eight ounces of water, and a grain of opium in pill every four hours.

Twelve hours afterwards peritonitis set in, when I increased the dose of opium to two grains three times a day, and continued the mixture of antimony.

On the fourth day I examined the wound, and found it looking remarkably healthy, and healing by the first intention, and the peritoneal symptoms somewhat abating. I lessened the dose of opium to one grain every four hours. His diet up to this time had been barley-water, with a little milk; no solid food whatever.

On the seventh day the bowels acted, and he passed a dark viscid stool, and again complained of considerable pain.

I continued the opium till the tenth day, on the evening of which day the bowels again acted, this time without any pain whatever; I therefore only gave him half a grain of opium at bed-time, combined with two grains of calomel. Next morning the bowels again acted, and he expressed himself free from pain.

The patient at this time was very much reduced, from the treatment adopted. I then ordered beef-tea, and the milk diet was continued.

On the fourteenth day he was able to leave his bed; from that time gradually but slowly recovered, and I considered him convalescent on the twenty-eighth day.