A TEST OF THE ACCURACY OF CLINICAL MEASUREMENTS OF THE LENGTH OF THE LEGS.

BY THOMAS DWIGHT, M.D.,
Parkman Professor of Anatomy at Harvard University.

To take accurate measurements on the living with a tape-measure is admittedly difficult. What is worse is the uncertainty as to how great an error is likely to occur even when considerable care is exercised. This doubt is annoying in surgery and in medico-legal medicine. The fact that the legs, which most frequently come into question, are often of different lengths, complicates the matter. It is to be understood that I am speaking of clinical, not of anthropological measurements. As for obvious reasons it is not practicable, even *post mortem*, to institute a series of tests of the accuracy of measurements by disarticulating the legs and remeasuring them, we have to resort to some roundabout method.

In my researches in the dissecting-room of which the results were given in the Shattuck Lecture,¹ I measured before dissection the length of the legs in two ways. First, from the top of the great trochanter to the ground, and, second, from the anterior superior spine of the ilium to the internal malleolus. The former may seem the best guide to the length of the leg but it presents such great difficulties in execution that I consider the other more trustworthy and have relied on it alone in the following tests. It may not be amiss to mention a point of technique in finding the starting-point. If one feels without method for the prominence supposed to be caused by the anterior superior spine of the ilium, it is very easy to mistake for it a part of the crest. The finger should be laid on the crest and carried forward till it has rounded the superior spine. As soon as this is passed, by pressing upward the finger easily recognizes a definite point.

After dissection I measured the greatest possible length of the femur and the length of the tibia, including the malleolus, but not the spine. The test which I now make public is to compare the differences between the combined lengths of both bones with the differences obtained before dissection. Let it be remembered that we are not now discussing the difference between the legs but are trying to determine the accuracy of the measurements made in the flesh. If we find, for instance, that the distance from the spine of the ilium to the inner malleolus is the same on both sides, and then after dissection find that the combined length of the right femur and tibia precisely equals that of the left ones, the presumption is strong that the original measurements were very accurate. The difference between the results I have called the error. Thus, if the first measurements show that the right leg is six millimetres longer than the left, and the bones show that it is only two millimetres longer, the error is four millimetres. If the first measurement shows that the right leg is six millimetres the longer, and the bones show that the left is the longer by two millimetres, I have added the differences together and called the error eight millimetres. I am not at all sure that in this last point the method is the proper one; but I have adopted it because, by making the error appear as large as it possibly can, it is the severest test of the accuracy of the original measurements.

I have applied this test to 73 bodies with the results shown in the following table:

Error, in mm.	Times.
0	8
1	10
2	12
3	3
4	7
5	11
6	2
7	3
8	6
9	7
10	1
11	2
13	1
18	1
	73

The average error was almost half-way between four and five millimetres; but a better judgment is formed by analyzing the table. Thus it appears that 30 times (that is in 41 per cent. of the cases) the error was either absolutely *nil*, or less than three millimetres, which in such coarse work may be called a negligible quantity. Only four times did the error exceed one centimetre. In the worst case, in which the error was 18 millimetres, the original measurement made the left leg one millimetre the longer, while the left bones were the longer by 19 millimetres. I cannot help thinking that by a blunder .1 was put in place of 1. in recording the original measurements; but, be that as it may, this method shows a greater accuracy in measurements made with a tape-measure before dissection than 1, at least, was prepared for.

Clinical Department.

A CASE OF CASTRATION FOR HYPERTROPHIED PROSTATE.¹

BY M. F. GAVIN, M.D.

This operation is still *sub judice*, and the history of this case, recently operated upon, may be of interest to the profession.

C. G., sixty-nine years old, a widower, entered Boston City Hospital, May 5, 1894, with the following history: Frequent and scalding micturition for five years, occasional pain over pubes, never any retention or dribbling. Examination by rectum showed a large, dense, symmetrically enlarged, smooth prostate, size of a large orange, occluding to considerable degree the rectum, the finger-tip reaching with difficulty the upper edge. The catheter was passed easily until the prostate was reached, which was surmounted with difficulty. The residual urine was five ounces, was acid and contained pus, some bladder cells, a trace of albumin, and very few renal elements. In five days the patient was discharged with directions to return to the hospital for catheterization weekly.

For four months the patient followed this treatment, but the symptoms increased rapidly, and constantly recurring pain made more frequent catheterization necessary, and he was taught the use of the catheter with poor success, the prostatic urethra being too difficult for the patient to pass the catheter through. He finally came to hospital with absolute retention which had existed for twenty-four hours, with great pain, distressing tenesmus, coated tongue, tremulousness, and prostration.

¹ This paper will appear in the Boston City Hospital Reports, Sixth Series.

¹ Boston Medical and Surgical Journal, 1894, vol. cxxxi, p. 73.

A No. 9 Coudé catheter was passed with difficulty, and several ounces of cloudy urine withdrawn. Its specific gravity was 1.010, reaction alkaline and no albumin was present. Catheterization had to be performed every four hours, day and night, because of the irritable condition of the bladder, which was quieted by morphia. Pain was still a prominent symptom, and the patient was unable to pass water at all. This condition continued for nearly three weeks, when the urine was still cloudy, acid, 1.012, albumin a trace, and pus was found in the sediment. Castration was performed, and about eight hours after operation the patient had the first voluntary micturition for three weeks. Sixteen hours after the operation catheterization was needed. Voluntary micturition continued during the next day, and a second catheterization was demanded about forty hours after operation. From this time on no catheter was needed, morphia was omitted, and voluntary micturition, unattended by pain, continued. There was no more tenesmus or discomfort. At the end of a week the sutures were removed from the incisions, the wounds healing firmly. The prostate was then diminished markedly in size and consistency. The patient's nervous symptoms were quieter and disposition much more cheerful.

During the second week the patient was up and about the ward in clothes, passing his water during the day about every three or four hours, and three or four times a night. The force of the stream was increased. The character of the urine was unchanged except that there was a little less pus. The urine chart then showed a polyuria, as much as 120 ounces being passed in twenty-four hours, the average being about 98 drachms. Three weeks after the operation the prostate was diminished one-half, and in five weeks was only one-fifth of the size before operation. The patient was then discharged. The urine was then 70 ounces in twenty-four hours, acid, albumin a trace, pus much less in quantity, residual urine three ounces.

The patient reports from time to time at the hospital. He is grateful and enthusiastic, free from pain or discomfort, passes water every four hours during the day and two or three times at night. The residual amount is two to three ounces and is clear, specific gravity 1.010 to 1.014, albumin trace. Patient has gained thirty pounds since leaving the hospital. Prostate is now about one-sixth of the size before the operation.

This case has considerable interest in many ways; it goes to show that permanent benefit does follow the operation of castration for hypertrophy of the prostate. When contrasted with the many other operations that have been suggested, it has much to commend its use. It is rather repulsive to the average man to think of the loss of his testicles, but when we consider that this operation is only called for late in life, when the activity of those organs, to say the least, is on the wane, it must lose much of the repulsiveness that has been urged against this operation. The operation is a simple one and does not entail much risk to life. Of course it is only for a certain class of cases that this operation is called for—persons unable to follow out a systematic course of palliative treatment; where the passage of a catheter is attended with the loss of blood or great pain; where obliged to work and exposed to the changes in the weather, and where the liquor habit prevails.

The subject of this operation had tried the palliative

treatment faithfully without any gain; in fact, he was losing flesh and strength. He was told of the different operations—perineal drainage, suprapubic cystotomy, prostatectomy, and castration—but was willing to allow us to use our better judgment. When we think of the suffering that follows hypertrophy of the prostate and how difficult it is to reach even to afford relief, living with a disorganized condition of the bladder and later the kidneys, any remedy ought to be gladly welcomed by the surgeon. I have been greatly impressed with this case and the result that followed the operation.

The suffering of a woman with advanced ovarian cystoma is no greater than that of a man with an enlarged prostate and its consequences, and if ovariectomy is done to relieve the one, why not castration for the latter?

Reports of Societies.

SURGICAL SECTION OF THE SUFFOLK DISTRICT MEDICAL SOCIETY.

CHARLES L. SCUDDER, M.D., SECRETARY.

REGULAR Meeting, Wednesday, March 6, 1895
DR. M. H. RICHARDSON in the chair.

DR. ROSWELL PARK, of Buffalo, read a paper on

THE ACUTE INFECTIOUS PROCESSES IN BONE.¹

DR. J. C. WARREN: I am very much pleased that Dr. Park selected this subject for discussion this evening. I feel that the disease has not been understood by the general practitioner, and not only by the general practitioner, but a large number of surgeons have not and perhaps do not now appreciate the important bearing of this process on bone disease. Many of these cases, in fact the majority of them, are spoken of as necrosis, as if necrosis were a disease and not a sequel of disease, the process itself going unrecognized. The reason the general practitioner does not recognize the disease is because the teaching has been inadequate; and many of these bone affections have consequently been classified, as Dr. Park has already told you, with a number of acute types of disease. Many of them were fatal in their nature as bone typhoid, acute rheumatism, etc. They often run a rapidly fatal course, and I have no doubt many cases reported as blood-poisoning, typhoid fever, etc., were cases of acute osteomyelitis not recognized. On the other hand, the surgeon has not recognized the disease because he has not seen it in its early stages. I think it is remarkable to find how in a long hospital experience one comes to a realizing sense of the fact that one sees so few examples of acute osteomyelitis in its early stages, and the reason is because the doctors do not send the cases into the hospital for treatment. It is just as it was a few years ago in appendicitis. The hospital did not get these cases. It may be that we have an epidemic of appendicitis here, a larger number of cases than elsewhere; but this winter in the Massachusetts Hospital during my term of service there were something like forty cases of appendicitis in the hospital at one time. The general practitioner has begun to recognize the disease, and to send it promptly to the surgeon for treatment; and so I hope it will be eventually with acute osteomyelitis. If we can by

¹ See page 425 of the Journal.