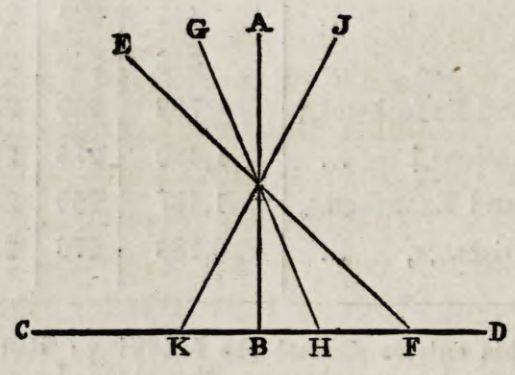
III.—THE SACRUM—ITS VARIATIONS, AND THE INFLUENCE BY IT EXERTED ON THE SOFT PARTS AS DETERMINING THEIR VARIATIONS.

By JAMES ST CLAIR GRAY, M.D., C.M., F.F.P. & S.G., *Assistant to the Professor of Physiology, Glasgow University.*

ANY one who has had occasion frequently to examine digitally per vaginam, or frequently to introduce the vaginal speculum, must have been struck by the fact, that in relation to the various bony prominences in the vicinity, the external meatus was by no means constant in situation; and that the general direction of the vaginal cavity varied exceedingly, so that a line drawn from the centre of the external meatus to a central point in the upper portion of the cavity formed, with the long axis of the body, or a line drawn parallel thereto, an angle, varying in different cases over several degrees. This may, perhaps, be most clearly and satisfactorily demonstrated by introducing into the vagina an ordinary glass speculum, when it will be found that the direction in which the external portion of the instrument points—supposing the patient in the erect posture—is in one class of cases downwards and forwards, in another class the direction is nearly downwards, while in a third class the direction is downwards and backwards;—in all, a possible variation of nearly 30°. Diagrammatically, this may be illustrated thus: Suppose the line A B represents



the long axis of the body, and C D a line at right angles thereto, the first class of cases would be represented by the line E F, the second by the line G H, and the third by the line J K.

In the *British Medical Journal* for June 22, 1861, my father, in a letter concerning laceration of the perinæum, pointed out the fact that there was great diversity in the position, length, and relation to the pubis and coccyx of the perinæum, and he classified these diversities as follows:— When the perinæum was long, and its anterior margin near the pubis, he termed it *pubical;* when shorter and almost equidistant from the pubis and coccyx, *axial;* and when nearer the coccyx, *coccygeal.*

This classification I would now adopt to the subject in hand, terming that variation of vaginal axis represented by the line E F as pubical, G H as axial, and K J as coccygeal.

It is also curious to note that, in most cases in which the vaginal axis thus varies, the corresponding variation in the perinæum occurs.

My attention was first directed to these variations while attending cases of midwifery in connection with the Lying-in Hospitals, and since then, both in obstetric practice and in the study of the anatomy of the parts concerned, as occasion supplied, I have endeavoured to arrive at the cause of these variations, and the influence they exercise upon parturition; and in the following remarks I have endeavoured, in a form as condensed as possible, to state the result of the observations made, and the deductions which, from premises thus obtained, I consider myself warranted in drawing.

Recognizing, then, as the starting point, the two facts, that neither was the orifice of the vagina constant in its position relative to the pubis and coccyx, nor the direction of its cavity invariable, I first turned my attention to the sacrum, as I there expected to receive some clue to the cause of the variations referred to. Nor was I disappointed. In the excellent collection of Pelves belonging to Professor Allen Thomson, I had abundant proof afforded me, in the first instance, that the sacrum was not constant in form, the variations being specially noticeable as regards the curve presented by that surface which bounds posteriorly the pelvic cavity; thus some sacra presented very considerable

curvature; others were as flat as a board; while between these extremes all gradations presented themselves; and, as a consequence, the antero posterior diameter of the outlet —that is, the distance from the subpubic arch to the tip of the coccyx varied from $3\frac{1}{2}$ to 7 inches. Observing, then, the relation of the soft structure in the various female subjects which presented themselves in the anatomical laboratory, as well as by careful digital examination in obstetric cases, I ascertained that, whenever the sacrum was flat, the axis of the pelvic cavity was coccygeal; when the curve was moderate, the pelvic axis was axial; and when the curve was exaggerated, the pelvic axis was pubical. By this means, I therefore ascertained that the variation in the form and relations of the soft parts, and of the cavity, were always (at least in my experience) co-related, if not dependent upon variations in hard structures, and having ascertained this, I turned my attention to the influence which these variations must exercise upon parturition. Taking into consideration, then, the resistance afforded in each case to the expulsive forces, it occurred to me that, theoretically at least, the coccygeal variety of conformation would oppose less resistance to the passage of the child's head than either of the other two forms, and that, as the pubical variety was approximated, so must the opposition to the expulsive forces be increased, and so in practice do I find it to be the case. Whenever the curvature of the sacrum is great, the case is more tedious than in other cases in which approximation is made to the perfectly flat sacrum. There being, in reality, a definite proportion between the curvature of the sacrum, *cæteris paribus*, and the duration of the labour. But this is not all, as I find there is also a definite ratio between the curvature of the sacrum and the concomitant modification of the soft parts and rupture of the perinæum, or a tendency thereto. Thus, in cases of the coccygeal variety, laying aside, of course, all irregular circumstances, such as excessive friability of the parts, rupture of the perinæum rarely occurs, even if the case be left to nature, and is always preventible by *retraction of the perinæum. Support here does harm.*

In the axial variety, moderate attention to the support of the perinæum will universally prevent rupture, while in the case of the pubical variety, support is almost indispensable in order to avoid laceration. As a matter of observation, I may also add, that vaginismus more commonly occurs in the coccygeal than in any other variety of pelvic conformation.

IV.—CLINICAL SURGICAL REPORT FOR THE YEAR 1873, WITH REMARKS ON THE STATISTICS OF AMPUTATION.

By GEORGE BUCHANAN, A.M., M.D., *Surgeon and Lecturer on Clinical Surgery, Glasgow Royal Infirmary, &c.*

THE portion of the Infirmary set apart for the reception of patients under my charge, consists of three Wards, viz.:—Ward 16, which contains 18 beds for chronic male patients; Ward 24, which contains 15 beds for male accident cases; and Ward 25, which has 18 beds for females. Children under 5 years of age are admitted among the females, and boys over that age are put into the male ward. Thus, there is placed under my sole care a small hospital containing 51 beds, for all kinds of surgical cases. In charge of this department there is my own House Surgeon; also a Clinical Clerk in each ward, whose duty it is to record in a separate journal the more interesting, and all the operative cases; and a staff of dressers, who generally number one to every three beds. In this way a very thorough supervision of every patient is secured.

During the year ending the 31st December, 1873, there were admitted to residence in

Casualty Ward 24 ...	Cases 117 ...	Cured 102 ...	Died 14
Chronic Ward 16 ...	" 131 ...	" 126 ...	" 5
Female Ward 25 ...	" 87 ...	" 84 ...	" 3
Total, ...	335 ...	312 ...	22

Besides these, a large number of out patients were admitted whose wounds were attended to, and then they went home; coming at intervals for treatment.