

ligaments on the dorsal side of the articular ridges would help in the extension of the arms again.

It has already been mentioned that the trivial arms are larger and better developed than those of the bivium; but in both cases a variable number of the lower joints (Pl. III. figs. 6-13) are considerably larger than those which follow them (figs. 14, 15), and the passage from one to the other is usually somewhat sudden. On the trivial arms there are generally from 8 to 10 of these large, massive joints; but on the bivium there are only about seven, six, or even less. The difference between the two is very well shown in the small specimen represented in Pl. IV. The shape of these lower arm-joints is rather variable. They may be roughly oblong as is the case with the first two or three, or their edges may be more oblique so as to give them a truncated wedge-like form. The more wedge-shaped these joints are owing to the obliquity of their terminal faces, the greater is the inequality in the size of the muscle-plates on the two sides of the median groove. This inequality is visible in the joints represented in Pl. III. figs. 10 to 12, though it is sometimes still more distinct. The pinnule-socket of such a joint is on the thickened upper edge of the higher muscle-plate. The general character of these lower arm-joints is much less regular and symmetrical than is the case in other Crinoids, so that many of them are more or less of a monstrous nature. In some few cases, indeed, the joint is smaller than usual and triangular, not extending completely across the arm, so that the joints above and below it come into contact with one another. This is shown in various parts of both figures on Pl. I.; and it is comparable to the condition of other parts of the same specimen, viz., the way in which the first brachials may partly rest on the second radials, or the axillaries on the first radials, as has been already described.

Sometimes again, a first brachial becomes unusually large, as is shown on two of the bivial arms in Pl. I. fig. 1. The inner one of the two bears a small, triangular, second brachial, and consequently comes into contact with a similarly large, third brachial along its outer edge; but the outer edge of the other second brachial sends a long process forward by the side of the next three joints, which are much smaller than their fellows of the adjacent arm.

Other irregularities of growth appear in the same individual, but they are by no means so marked in that shown in Pl. II. This, moreover, shows very well the rather sudden diminution in the size of the arm-joints which lose their tubercles and gradually become laterally compressed, so that their medio-dorsal edge is tolerably sharp. This form of joint is figured in Pl. III. figs. 14, 15, and Pl. Vc. fig. 2. The longest arms seem to have about eighteen of them, raising the total number of brachials to between twenty-five and thirty.

The larger, outer sides of all the brachials bear the pinnules (Pls. II., Va., Vb.). That of the first brachial is comparatively small, and is attached close to the distal edge of the joint; the next pinnule is invisible in all the specimens, but those of the third