

shape of upright arched gateways. I may mention that fifteen miles to the westward, at the foot of this same range, I found two hillocks of quartz only twenty yards apart, with the strata dipping at exactly the same angle of  $40^\circ$  to S.S.W., and therefore apparently quite conformable; but on close inspection the ends of the beds on the inner side of one hillock were seen to be arched in such a manner, as to show that they had been doubled on themselves, with the axis-plane inclined at an angle of  $40^\circ$ .

A wide undulatory district of slate and sandstone extends southward of the main range; but on the coast, Captain Sullivan again found two east and west quartz ranges: one of these is transversely intersected by a creek (near Port FitzRoy), and two good sections, a hundred feet in height, are exposed. These are given in the following diagram on account of the complexity of the curvatures,



almost resembling those produced by the mingling together of two viscid fluids; and because in crossing the country any one would be apt to think that the dome-formed hills had been produced by single impulses from below, whereas we now see that perpendicularly beneath one dome, another may lie hidden in the solid rock\*.

I will not take up the time of the Society by giving any further details on the geology of these islands; nor would the foregoing account have been worth communicating, had it not been for the interest which is justly taken in ancient fossils coming from a very distant quarter of the world.

2. *Description of Eight Species of BRACHIOPODOUS SHELLS from the PALÆOZOIC ROCKS of the FALKLAND ISLANDS.* By JOHN MORRIS, Esq., F.G.S., and DANIEL SHARPE, Esq., F.G.S.

PLATES X., XI.

1. *CHONETES FALKLANDICA*, sp. n. Pl. X. fig. 4.—Transversely semi-oval; upper valve convex, with a slight mesial depression; lower valve rather concave; surface covered with fine bifurcating rays

\* It is singular in how many points the old quartz-rock of Anglesea, as described by Professor Henslow in his admirable paper in the Cambridge Phil. Trans. (vol. i. p. 359), agrees with that of the Falkland Islands. The quartz of Anglesea is granulo-crystalline, and contains white earthy spots and a little mica; it passes insensibly into an overlying chloritic schist, and this again into clay-slate. The strata have been in a pasty condition, and have been singularly curved: they strike in the same direction with the laminae of the overlying slates, but their average inclination is less.

crossed by a few concentric lines of growth. Hinge area linear, of the breadth of the shell; hinge line furnished with fine spines.

Width  $\frac{3}{4}$  of an inch, length  $\frac{1}{2}$  an inch.

This shell so closely resembles some of the forms of the *Chonetes sarcinulata* (*Leptæna lata*, Sil. Syst.) of the Ludlow rocks, that, if found in England, it might probably have been mistaken for a variety of that species; it is however somewhat flatter, more square and rather larger. The spines on the hinge line are not well preserved in the specimens examined, but traces of them may be distinctly seen. The *C. Falklandica* may be considered as belonging to the same group as *C. sordida*, *C. Hardrensis*, *C. Buchiana*, all of which are closely-allied species to the *C. sarcinulata*.

2. *ORTHIS SULIVANI*, *sp. n.* Pl. X. fig. 1.—Semi-ovate; ventral valve nearly flat, dorsal valve gibbose; surface covered with fine sharp bifurcating striæ, increasing towards the margin to about 150, crossed by 3 or 4 concentric lines. Hinge line nearly as wide as the shell, hinge area broad and triangular. Interior of both valves striated for about  $\frac{1}{2}$  of an inch round the edge, producing a fringed appearance in the cast.

Width  $1\frac{1}{2}$  inch, length  $1\frac{1}{4}$  inch.

There is a slight resemblance between this species and the *Atrypa reticularis* of the Silurian System; it is however a true *Orthis* and has a finer striation than that shell; in the latter genus it is most nearly related to an *Orthis* common to the Coniston, &c. beds of the Silurian formation, about to be described and figured by Professor Sedgwick.

This species has been dedicated to Captain Sullivan, who was employed in the survey of the Falkland Islands, and who materially contributed towards the enlargement of the geological collection from them.

3. *ORTHIS TENUIS*, *sp. n.* Pl. XI. fig. 4.—Nearly semicircular; both valves flat and covered with fine bifurcating striæ, increasing to about 200 at the margin, and crossed by a few concentric lines. Hinge area of the width of the shell, linear. The cast is scarcely thicker than a sheet of paper and faintly marked by the striæ.

Width  $1\frac{1}{2}$  inch, length  $\frac{1}{2}$  of an inch.

Nearly allied to the *Orthis expansa* and *O. grandis* of the Lower Silurian rocks.

4. *ORTHIS CONGINNA*, *sp. n.* Pl. X. fig. 2.—Semi-oval; both valves slightly convex, covered with very fine bifurcating striæ, increasing to about 120 at the margin, and crossed by a few concentric lines. Hinge area of the width of the shell and nearly linear.

Width 1 inch, length  $\frac{3}{4}$  of an inch.

This species is closely allied to the *Orthis tenuis*, but it is less flat and of a more rounded form.

5. *ATRYPA PALMATA*, *sp. n.* Pl. X. fig. 3.—Nearly hemispherical; the ventral valve flat or slightly concave in the middle, with the edges a little depressed, the dorsal valve highly convex; valves with 15 or 16 prominent rounded ribs, equal to the furrows between them. Hinge line less than the width of the shell and nearly straight.

Width  $\frac{3}{4}$  inch, length  $\frac{1}{4}$  of an inch.

The equal rounding of the ribs and furrows gives a peculiar wavy or palmate appearance to the surface of the shell, which is not of common occurrence, but of which we have instances in the *Atrypa hemisphærica* of our Caradoc sandstone, and in the *Orthis callactis* of Dalman. The resemblance between our species and the *A. hemisphærica* is very striking.

6. *SPIRIFER HAWKINSII*, *sp. n.* Pl. XI. fig. 1.—Shell transversely elongated; front rounded; 5 imbricated ribs on each side, the two middle ones acute, prominent, and nearly equal to the mesial ridge, which is slightly furrowed; the lateral ribs diminish in importance as they approach the edge; intervening furrows rather wider than the ridges and rounded. Hinge area of the width of the shell, broad and longitudinally striated.

Cast of the dorsal valve; beak prominent, with a deep mesial depression, only 3 ribs distinctly marked on each side towards the front of the shell; rest of the cast nearly smooth.

The cast of this species bears great resemblance to that of *S. speciosus* from the Eifel.

Width 2 inches, length nearly 1 inch.

7. *SPIRIFER ANTARCTICUS*, *sp. n.* Pl. XI. fig. 2.—Transversely fusiform, nearly equivalved, with 20 to 24 prominent, sharp, imbricated ribs; mesial ridge of the ventral valve similar in form to the ribs, but larger and more elevated; mesial furrow of the dorsal valve deep and angular. Hinge area of the width of the shell, very broad and triangular, with well-marked longitudinal lines.

Cast; ribs well-defined; beak of the dorsal valve straight and very prominent, with a deep mesial furrow and a slight furrow on each side.

Width  $3\frac{1}{4}$  inches, length  $1\frac{1}{2}$  inch; height of hinge area  $\frac{1}{2}$  of an inch.

8. *SPIRIFER ORBIGNII*, *sp. n.* Pl. XI. fig. 3.—Gibbose, nearly semi-circular; about 20 prominent, rounded, imbricated ribs; mesial ridge broad, elevated, flattened above and slightly furrowed; mesial furrow deep and rounded. Hinge area of the breadth of the shell, narrow.

Cast; ribs well-defined; beak of the dorsal valve heart-shaped, with a sharp deep mesial furrow and 2 or 3 nearly obsolete furrows on each side; ventral valve, cast of the mesial ridge traversed for the upper half of its length by a sharp slit, which divides the top of the ridge into two points.

Width  $2\frac{1}{4}$  inches, length  $1\frac{1}{2}$  inch.

The specimens examined of these three species of *Spirifer* are so imperfectly preserved, that it is impossible to obtain good specific characters; they are however very distinct from each other; but it may be stated that they also bear a general resemblance to the species of *Spirifer* described in Count Strzelecki's work on Australia, and a careful comparison might be hereafter advantageously instituted with better-preserved specimens.

The number of species collected by Mr. Darwin from the Falkland Islands is too limited to justify any close comparison with the palæozoic fauna of other portions of the globe, still however their allocation is rather interesting: of the eight species above described, all belong to the family of Brachiopoda, which appear to have constituted the chief portion of the fauna of that locality, and there is also a species of *Orbicula* (Pl. X. fig. 5), too imperfect to be described; these are associated with numerous traces of Crinoidal stems, an *Avicula*, and fragments of a *Tribolite*.

The individuals belonging to the various species of *Spirifer* were few in number; those belonging to *Orthis*, *Chonetes* and *Atrypa* appear to have been abundant or rather gregarious in character, just as we find some species of *Terebratulæ* at the present period abounding on the sand and mud-banks beneath the sea.

In their alæform character and the paucity of ribs, the species of *Spirifer* approach those obtained from the altered limestones and sandstone of Southern Australia and Van Diemen's Land; they likewise bear some resemblance to Devonian species from the Eifel, and to some forms described by M. d'Orbigny from South America.

The *Orthis*æ, of which the individuals are numerous in the Falkland Islands, have not yet been observed in Australia, and are rarely met with on the continent of South America: as regards their affinity, they bear considerable resemblance to some species of the northern regions which characterise the Lower Silurian strata, as described in the 'Silurian System' of Sir R. Murchison. Thus we cannot attempt to place the beds in the Falkland Islands which have supplied these specimens, on the level of any particular portion of the European scale of formations, but must be contented with saying that they belong to a part of the palæozoic series of which the position is still undetermined. In the intermixture, abundance and analogy of form of the species of *Orthis*, *Atrypa* and *Chonetes*, they bear a still more remarkable resemblance to the collection made by Captain Bayfield from North America.

The *Chonetes Falklandica*, as previously observed, is scarcely separable from *C. sarcinulata*, a species having a wide geographical and vertical range.

The general occurrence and extensive distribution of many species of Brachiopoda, either identical in character or analogous in form, in the palæozoic strata, has always been a subject deeply interesting to the palæontologist, and has given rise to the opinion, that a more equable temperature, a greater uniformity of physical character and surface arrangements may have been instrumental in producing this

extension in the northern regions during the palæozoic period; and the valuable researches of Mr. Darwin have also revealed to us that the existing conditions of some portions of the southern hemisphere at the same æra were favourable to the development of other species of the family Brachiopoda nearly related to those which in Northern Europe characterise the rocks of the palæozoic æra.

## EXPLANATION OF THE PLATES.

## PLATE X.

- Fig. 1. *Orthis Sulivani*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, exterior.  
 c. Ventral valve, interior.  
 d. Dorsal valve, interior.
2. *Orthis concinna*, sp. n.  
 a. Dorsal valve, exterior.  
 b. Dorsal valve, interior.
3. *Atrypa palmata*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, exterior.  
 c. Dorsal valve, interior.  
 d. Ventral valve, interior.
4. *Goniatites Falklandica*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, interior.  
 c. Ditto, ditto.
5. *Orbicula* (undetermined).

## PLATE XI.

- Fig. 1. *Spirifer Hawkinsii*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, interior.
2. *Spirifer antarcticus*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, interior.
3. *Spirifer Orbignii*, sp. n.  
 a. Dorsal valve, interior.  
 b. Ventral valve, interior.  
 c. Dorsal valve, exterior.
4. *Orthis tenuis*, sp. n.  
 a. Ventral valve, exterior.  
 b. Dorsal valve, interior.

3. *Notice on the COAL-FIELDS of ALABAMA; being an extract from a Letter to the PRESIDENT from CHARLES LYELL, Esq., F.R.S., dated Tuscaloosa, Alabama, 15th February 1846.*

SINCE my arrival in Alabama I have devoted part of my time to the investigation of the carboniferous rocks, and have obtained information respecting some coal-fields, the very existence of which in this State was unknown to me in 1844, when I compiled the Map of the Geology of the United States, published in my 'Travels.' On my way southwards, I had learnt from several persons in Georgia that the city of Mobile was supplied with bituminous coal, brought down the



1a



1b



1c



2a



2b



3a



4a



4b



5



6a



6b



7a



8a



8b

G.B. Sowerby Junr a.d. lap. del<sup>t</sup>

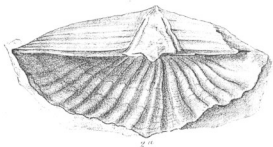
Reeve, imp.



1<sup>a</sup>



2<sup>b</sup>



2<sup>a</sup>



3<sup>c</sup>



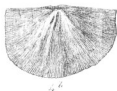
3<sup>a</sup>



3<sup>b</sup>



3<sup>d</sup>



4<sup>b</sup>



4<sup>a</sup>