

unequalled advantages of ornament, strength, durability and economy, while they, at the same time afford a larger amount of useful interior space in a given size, (an important point in a densely crowded city), and are tolerably secure against danger from fire, lightning, or an unequal settling of the foundation. The parts are fastened together much more firmly than any mortar or cement has ever proved in practice, capable of joining stone or brick.

Different methods of joining the parts are adopted by builders. One very desirable plan is to join the whole firmly, so that it is in effect a unit, but as this has induced timidity in some, in consequence of the great range such a front would take, should it be loosened from the side walls, and fall outwards. A gentleman in New York invented and patented a very simple and admirable means, by which the front falls, *one story at the time and always inward*, upon the burning ruins, instead of upon the street.

Iron buildings are always built by contract. The cost of such iron structures, or in fact of any other varies so greatly that it may appear idle to attempt to estimate the comparative expense. Calculating from the actual contract prices of a number, however, the following is a rough approximation. City lots are generally 25 feet wide on the street; a front of this width, 5 story high, would cost in Montreal as follows :

| | |
|--|------|
| Wood (forbidden by law) | \$— |
| Brick (face brick) | 2500 |
| Brown stone (a kind of sand stone)..... | 3500 |
| White marble..... | 4000 |
| Granite | 4000 |
| Iron (elegant style) from \$ 3000 to ... | 5000 |

In this article attention has been confined to the fronts alone. The construction of absolutely fire-proof buildings require brick and iron floors, etc., which it is unnecessary now to enter upon, but which may or may not be used in what are termed iron buildings.

PROGRESS OF GEOLOGY.

(Continued from page 74.)

In the last year, Mr. Barrande has most ably compared the North American Taconic group of Emmons* with his own primordial Silurian fauna of Bohemia, and other parts of Europe; and although that sound palæontologist, Mr. James Hall, has not hitherto quite coincided with Mr. Barrande in some details,† it is quite evident that the primordial fauna occurs in many parts of North

America. And as the true order of succession has been ascertained, we now know that the Taconic group is of the same age as the lower Wisconsin beds described by Dale Owen, with their Paradoxides, Dikelocephalus, &c., as well as of the lower portion of the Quebec rocks, with their Conocephalus, Axionellus, &c., described by Logan and Billings. Of the crystalline schists of Massachusetts, containing the noble specimen of Paradoxides described by W. B. Rogers, and of the Vermont beds, with their Oleni, it follows that the Primordial Silurian Zone of Barrande (the lower Lingula flags of Britain) is largely represented in North America, however it may occupy an inverted position in some cases, and in others be altered into crystalline rocks.

In determining this question due regard has been had to the great convulsions, inversions, and breaks, to which these ancient rocks of North America have been subjected, as described by Professors Henry D. and W. B. Rogers.

In an able review of this subject, Mr. T. Sterry Hunt thus expresses himself:—"We regard the whole Quebec group, with its underlying primordial shales, as the greatly developed representatives of the Potsdam and Calciferous groups (with part of that of the Chazy), and the true base of the Silurian system." "The Quebec group with its underlying shales," this author adds (and he expresses the opinion of Sir W. E. Logan), "is no other than the Taconic system of Emmons;" which is thus, by these authors, as well as Mr. James Hall, shown to be the natural base of the Silurian rocks in America, as Barrande and De Verneuil have proved it to be on the continent of Europe.

In our own country a valuable enlargement of our acquaintance with the relations of the primordial zone to the overlying members of the Silurian rocks has been made through the personal examination of Mr. Salter, aided by the independent discoveries of organic remains by MM. Homfray and Ashe, of Tremadoc.

It has thus been ascertained, that the lower member only of the deposit, which has been hitherto merged under the name of Lingula flags, can be considered the equivalent of the primordial zone of Bohemia. In North Wales that zone has hitherto been mainly characterized by Lingula and the crustaceans Olenus and Paradoxides. Certain additions having been made to these fossils, Mr. Slater finds that of the whole there are five genera peculiar to the lower zone, and seven which pass upwards from it into the next overlying band or the Tremadoc slate. But the overlying Tremadoc slate, hitherto also grouped with the Lingula flags, is, through its numerous fossils (many of them of recent discovery), demonstrated to constitute a true lower member of the Llandeilo formation. For, among the trilobites, the well known Llandeilo forms of Asaphus and Ogygia range upwards from the very base of these slates. Again, seven or eight other genera of trilobites, which appear here for the first time, are associated with genera of mollusks, and encrinites which have lived through the whole Silurian series. Such for example are the genera Calymene, Illænus, among crustaceans; the Lingula, Orthis, Bellerophon, Conularia, among mollusks; together with encrinites, corals, and that telling Silurian zoophyte,

* The Silurian classification was proposed by me in 1835, and in the following year, 1836, Dr. Emmons suggested that his black shale rocks, which he called Taconic, were older than any I described.

† Nor are the writings of the Professors W. B. and H. D. Rogers in unison with the opinions of the authors here cited.