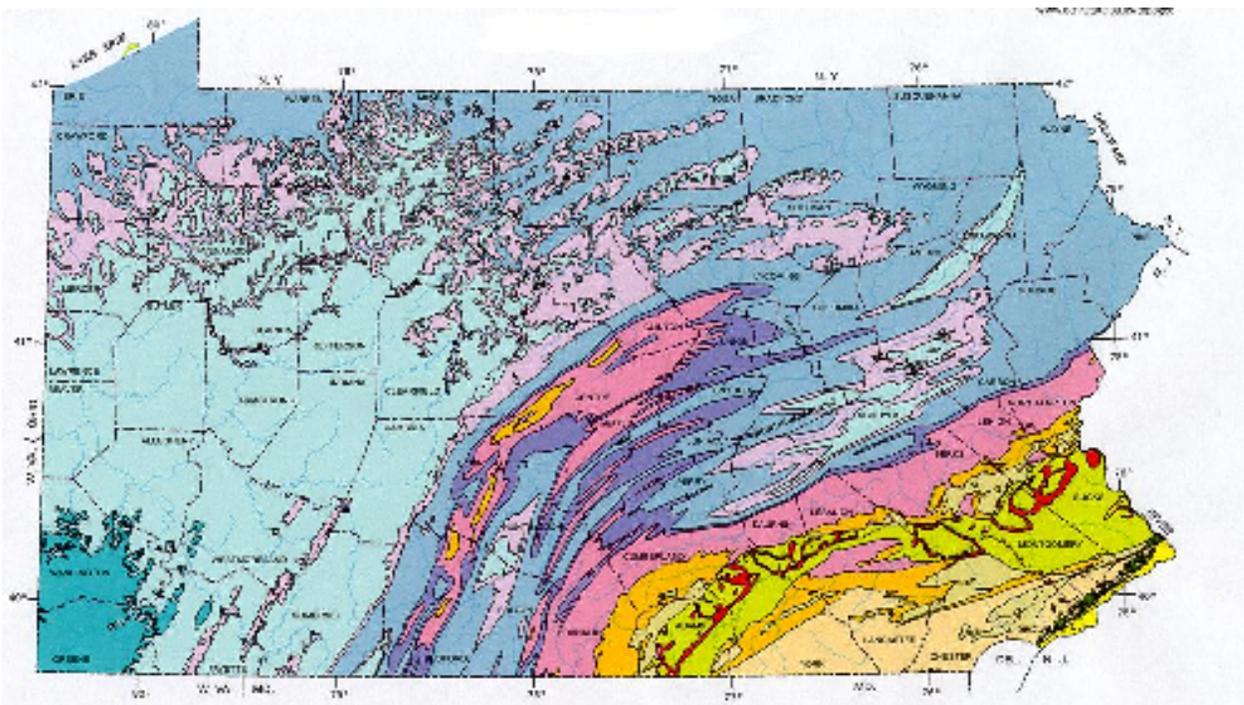


## CHAPTER II

### QUALITY AND CHARACTERISTICS

### OF HUMMELSTOWN BROWNSTONE

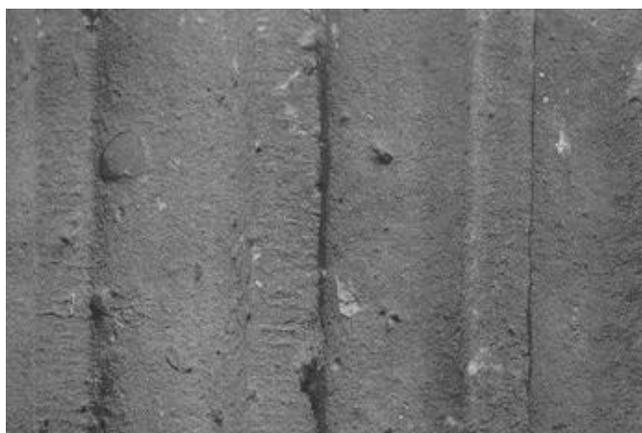
From 245 million to 208 million years ago during the Triassic geological period, vast beds of rock were being formed. Near the end of this period, the only Triassic formation of Eastern North America was deposited in downfaulted troughs, parallel to the Appalachians, from Nova Scotia to North Carolina. Where oceans and waters had been, upheaval created marshes and fens where dinosaurs roamed and cycads grew. Sand and silt collected in huge basins and time, with the assistance of pressure, began the relentless work of compressing these grains into rock. Brownstone is a product of this time.



B-1: Geological Map of Pennsylvania – The red and green coloration indicates the Jurassic and Triassic formations of Pennsylvania that were formed approximately 140 to 250 million years ago. The red coloration more specifically identifies the red sandstone, shale and conglomerate deposits of that time.

As a variety of sandstone, brownstone is composed from consolidated sand bound together by an interstitial cement of iron oxide. It is this iron oxide which gives brownstone its characteristic color; however, when inclusions of other elements such as feldspar, aluminum, magnesium, etc. occur in the stone it can have a gray, blue, pink or purple hue. All of these tints were quarried at the Hummelstown pits. Interestingly, the mica imbedded in the brownstone quarried at Portland, Connecticut, appears to be unique to that area and gives it a distinctive glitter that is not found in Hummelstown stone. Due to its sedimentary formation, brownstone has a more or less rounded grain, although at times it can be quite angular. When the grain of the stone is rounded and the interstitial cement is not too cohesive it does not tend to cleave or fracture in a given direction as does diamond for example. This stone is commonly called freestone because it can be worked freely in every direction, a characteristic that made it popular with stone cutters and masons. Hummelstown brownstone is a freestone.

A less desirable and durable brownstone is conglomerate which contains fine grained stones as well as individual grains that can be several inches in diameter which



B-2: Detail – Corinthian Column, Old Dauphin County Courthouse showing conglomerate inclusions

occasionally fall out under severe weathering conditions leaving the surface pock-marked. Although Hummelstown had its share of conglomerate, as the detail of this column from the old Dauphin County Courthouse indicates, it was not used to any extent due to the abundance of

top quality stone available.

The following analysis of Hummelstown brownstone was made at the Pennsylvania State College and appeared in the 1903 and 1933 issues of the United States Geological Survey Magazines.<sup>1</sup> It should be noted that when silica is the primary bonding agent, the stone can be remarkably durable and weather as well as some granites. The silica content of this stone is high.

	<u>Blue</u>	<u>Brown</u>
SiO <sub>2</sub>	90.30	88.96
Al <sub>2</sub> O <sub>3</sub>	4.35	4.74
FO <sub>2</sub> O <sub>3</sub>	1.09	2.19
FeO	.74	-----
MgO	.17	.44
CaO	.95	.86
Na <sub>4</sub> O	.19	.24
K <sub>2</sub> O	1.30	1.31
H <sub>2</sub> O	.61	.37

Experiments made with the government testing machine at Watertown, Massachusetts in 1882 and 1883 calculated the tons/sq. in. crushing load of various stones. Montgomery County blue marble was 700, Indiana limestone was 500, 840 for Hummelstown brownstone, and 260-1,000 for Ohio yellow sandstone.<sup>2</sup> George P. Merrill, in his classic study Stones For Building and Decorating, reported that in 1875, the Q. A. Gilmore Company found the crushing strength of the stone to be 12,810 to 13,600 lbs./sq. in. which was similar to that quarried by its competitors in Portland, Connecticut, as well as Medina and Albion, New York. This far outstripped the crushing capacity of the stone quarried at Beria, Ohio, and East Longmeadow, Massachusetts, two

<sup>1</sup> United States Geological Survey, "Bulletin 840," 1933, pp. 72 – 73.

<sup>2</sup> Stone, "Hummelstown Brownstone," (New York: Frank A. Lent Publisher, 1907), p. 403, Hummelstown Brownstone Manuscript Group, Hummelstown Area Historical Society.

other competitors in the brownstone business.<sup>3</sup> In 1912 Heinrich Ries in his book Building Stones and Clay Products listed the crushing strength of Hummelstown brownstone at 14,750 lbs./sq. in. which exceeded all other companies on the list except those in Medina and Warsaw, New York.<sup>4</sup>

From the first stone quarried by the Bersts in the late 18<sup>th</sup> Century to the demise of the company in 1929, five pits were created at this location. Numbered in the order in which they were opened they had different characteristics of coloration and hardness. Quarries number one and number three running in an east and west direction produced a similar stone and eventually became joined in one long trench. The present water-filled state of these pits is deceiving, for they are much larger than they appear. By 1907 they were 1,324 feet long, 180 feet wide and 160 feet deep. The stone from this pit had a



B-3: Steps – First Lutheran Church, Carlisle

definite purple cast or hue and was referred to by the workmen as purple brownstone. It was one of the hardest stones quarried at this location yet it retained the desirable quality of ease of carving, as a freestone should. Because of its hardness it was often used in

places where stress and wear were of primary importance such as foundations, steps,

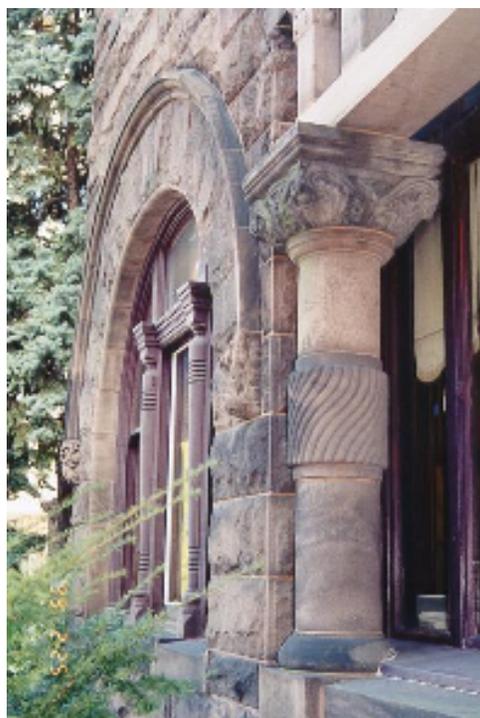
<sup>3</sup> George P. Merrill, Stones For Building and Decorating, (New York: John Wiley and Sons, 1903), pp. 504 – 507.

<sup>4</sup> Heinrich Ries, Building Stones and Clay Products: A Handbook For Architects, (New York: John Wiley and Sons, 1912).



B-4: Entrance – First Baptist Church, Reading

as sharp as the day they were set in place. Sometimes this same stone was used solely as a subtle contrasting architectural detail when used in combination with the stone from quarry number four as in the arch above the entrance to the First Baptist Church in Reading. One thing is certain however, this combination of purple brownstone with the deep, rich chocolate brown color of the stone from quarry number four is common in buildings constructed of Hummelstown brownstone almost to the point of being an identifying hallmark for the source of the stone. Time and time again this feature is to be found in buildings constructed of Hummelstown brownstone.



B-5: Detail – Heurich Mansion, Washington D. C.

Quarry number two, the second smallest of the pits, was immediately to the west

lintels, sills, jambs, flags, etc. The steps at the front of the First Lutheran Church in Carlisle are a fine example of the durability of the purple brownstone, for the edges of each step, despite almost a century of wear, appear to be

of quarries one and three and yielded a pink tinted brownstone that was equally as hard as that from quarries one and three. One of the outstanding residences constructed of this stone is the Heurich Mansion erected for Washington, D. C. brewer, Christian Heurich. Recently the former home of the headquarters of the Historical Society of Washington, D. C., this grand house with its balcony crowned portico and bold turret is an excellent example of the use of pink brownstone and the bravura art of the Hummelstown stonecutters.

Quarry number five lay to the east, northeast of quarries one and three. Its stone was of a blue cast, and it was so hard that little of it was quarried. Consequently, it was by far the smallest pit. It has since been obliterated by residential development encroaching upon the quarries.

Unquestionably the most popular of Hummelstown's brownstones was that from quarry number four which was situated just to the west of quarry number two. Considering that this quarry was opened in late spring of 1888 and is yet the most gigantic of the pits, gives some indication of the remarkable amount of stone that was removed and processed during the last forty-one years of the company's existence. By 1907 the main opening of this quarry was 420 feet long, 240 feet wide, and 200 feet deep. At the demise of the business in 1927 the chasm almost tripled in length and width. Its stone was:

evenly bedded, the courses varying from 3 to 10 feet in thickness, the joints regular and from 4 to 40 feet apart, so that sound blocks of any practicable size can be readily obtained.<sup>5</sup>

This stone is to be found throughout the Commonwealth of Pennsylvania, and many

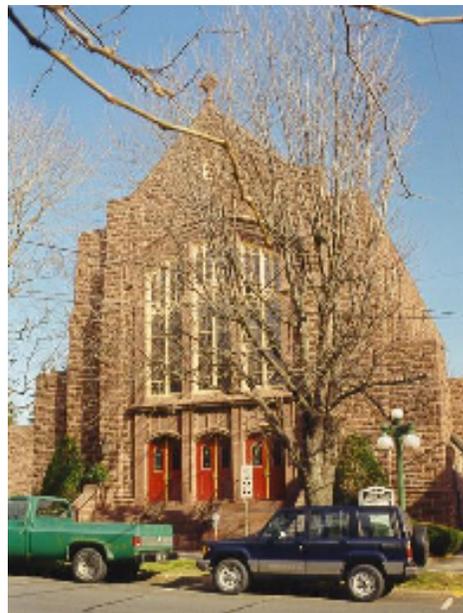
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<sup>5</sup> Ibid. p. 403

surrounding states. Two examples of this stone are the brownstone trim on the Broughal Middle School in Bethlehem and St. Matthew's Lutheran Church in Bloomsburg.



B-6: Detail – Brughal Middle School, Bethlehem



B-7: St. Matthew's Lutheran Church, Bloomsburg

One of the more unusual displays of the various colors of stone quarried at the Hummelstown pits can be seen in Pottsville in the façade of St. John the Baptist Roman Catholic Church. At a distance the coloration appears mottled, but as one gets closer the various hues of brown, blue, purple and pink brownstone become evident.

Since many of the original entrepreneurs in the company were Philadelphians and the product was shipped via the Philadelphia and Reading Railroad, it is not surprising that large quantities of the stone were marketed in that city. Consequently, the Waltons opened an office in Philadelphia on Library Street in the area now known as Society Hill. At the turn of the century this same



B-8: Entrance – St. John the Baptist R.C. Church, Pottsville

location was dotted with small businesses and light industry. In an effort to secure a bid for supplying brownstone for the proposed building of a sanitarium in Norristown, the Waltons submitted the following letter, which is perhaps the best testament to be found regarding the quality and durability of the stone.

Philadelphia  
February 25, 1878

To the Commissioners  
For buildings the Hospital for the Insane  
at Norristown, Pennsylvania

Gentlemen:

We have the great pleasure of presenting to you a certificate signed by the Architects and Builders of Philadelphia which bears testimony of the quality and durability of the Stone from the Quarries of the Pennsylvania Brown Free Stone Company known as Hummelstown Brown Stone which are most favorably known and used in this market. The undersigned Architects and Master Stone Cutters and Builders of the city of Philadelphia do hereby certify that Hummelstown Brown Stone from the quarries of the Pennsylvania Brown Free Stone Company in Dauphin County, Pennsylvania is one of the best and most durable Brown Stones or Sand Stones Known in this country.

Collins and Autenrieth  
Addison Hutton  
Geo. W. Hewitt  
Frank Furness  
John McArthur, Jr.

Atkinson & Myhlertz  
Muller & Killen  
Wm. Struthers & Son  
Philip Dougherty  
Hugh Copland  
Chas. D. Supplee  
George Diemer  
A. A. Catanach  
William Armstrong  
William Gray<sup>6</sup>

The bias of Muller and Killen, Philip Dougherty, and William Armstrong is understandable in that they were minor stockholders in the company. Nevertheless, the

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<sup>6</sup>“copy of Letter of Architects to Commissioners in charge of building State Hospital,” February 28, 1878, Hummelstown Brownstone Manuscript Group, Dauphin County Historical Society.

signatures of some of Philadelphia's top-flight architects who had no financial investment in the company speaks well for the product. Frank Furness trimmed his tour de force, the Pennsylvania Academy of Fine Art, with the stone; Addison Hutton used it for trim on the administration building of the State Hospital in Harrisburg as well as various

buildings for Asa

Packer at Lehigh

University; George

Hewitt clad his

Philadelphia Bourse

with it, and Collins and

Autenrieth used it for

revisions to the Library

Company of

Philadelphia. At this

point no specific

building can be

attributed to John

McArthur's use of the

stone, but it is evident

from this letter that he

was familiar with the

product. Moreover, the

firm of William Struthers and Son was one of the largest stone and masonry retailers in



B-9: Pennsylvania Academy of Fine Art, Philadelphia

the city, and records of the Pennsylvania Brown Free Stone Company indicate that Struthers bought large quantities of the stone from the mid 1860's through the 1870's.



B-10: Entrance detail – Lehigh University, Bethlehem

The fact that it competed favorably with some of the major brownstones of the day, its outstanding performance in various tests, its endorsement by eminent builders, masons, and architects at the turn of the century, and the many remaining structures that attest to its durability and beauty, rank Hummelstown brownstone as one of the finest stones of its kind.

B-11: Philadelphia Bourse, Philadelphia

