

Architecture

That Was No Lady In Hoopskirts

By ADA LOUISE HUXTABLE

IT COULD almost be called a hotbed of preservation around Astor Place and Lafayette and East Fourth Streets—with the Old Merchants' House finally being restored under the tender loving care of architect Joe Roberto and the Decorators' Club with some long overdue grants, Joe Papp's New York Shakespeare Public Festival Theater setting cultural, architectural and urban standards in the old Astor Library, and Cooper Union now embarking on the renovation of its 114-year old Foundation Building.

The Cooper Union for the Advancement of Science and Art was established, built and nurtured by Peter Cooper, a self-made man and distinguished 19th-century New Yorker whose own lack of education inspired him to the task of creating a "free school" for young people of limited means and "good moral character." This radical aim aroused some public distrust, particularly when it became known that "persons of every race and creed, including Jews, Roman Catholics and even Negroes were to share its benefits."

The building is therefore a New York milestone in many ways. Architecturally, it was a solid, conservatively stylish brownstone (Continued on Page 25)

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structure in the "Roman" taste, built from 1853 to 1858, incorporating a remarkable technological advance that led ultimately to the steel-framed skyscraper — the rolled iron beam. It is now a registered national historic landmark.

Historically, Lincoln made his pivotal "Right is might" speech in the Cooper Union Great Hall, then the largest in the city, which incorporated a primitive air conditioning system of fan-forced air. He was introduced as "Mr. Abraham Lincoln of Illinois, of whom some of you have doubtless heard."

Educationally, the school offered not only free tuition, but evening sessions "available to the working classes," and courses for women. In this century it has become notable as an excellent school of architecture and engineering. (It would be kinder to say nothing of the abysmally banal engineering building added in 1960.)

The original structure became a kind of rabbit warren of partitions and patchwork, still revealing those arched brick ceilings springing from the wrought iron beams, and a forest of cast iron columns with foliated capitals. Now, under the direction of John Hejduk, head of the Department of Architecture, the building is being gutted and refitted, much as Boston's venerable City Hall has been treated, with outstanding success, for a new, 20th-century life. A \$15-million fund-raising campaign is expected to pay for this job, for another building remodeling, and for the endowment of five professorships.

The Great Hall and its columns will be kept and refurbished as will other distinguishing features. The round elevator shaft that Cooper insisted on building in even be-

fore the elevator was in common use, and which later had a square cab installed, will finally have its round elevator. The exterior will be respectfully cleaned and restored.

Cornerstone laying ceremonies in 1853, after construction had begun, were marked by "a most republican absence of parade." As *The New York Times* reported the occasion, Mayor Westervelt proceeded to "use the trowel as delicately as he would lift a pea on his silver fork. Mr. Cooper handled the implement with as bold and workmanlike a hand as though he had been brought up to the business; Messrs. Petersen [the architect] and Wood [the builder] were quite at home."

According to an account written for the Cooper Union Centennial by Esmond Shaw, called "Peter Cooper and the Wrought Iron Beam," for years the only reference that could be found to the designer of the building at Cooper Union was the sentence, "The architect was one Petersen."

Fred A. Petersen was a native of Prussia and one of the founders of the American Institute of Architects. Like many of his contemporaries today, he gave an estimate for the building that doubled; his original figure of \$350,000 swelled to over \$634,000 by completion.

There were problems. The structure was on one of the few sand pockets in Manhattan and foundations were troublesome and had to be rebuilt later when another story was added. Construction took place during a period of inflationary building costs. Peter Cooper, an extremely astute businessman who made his fortune in glue (an interesting byproduct was Jello) and iron, managed to come out of the depression

of 1857 better off than ever, and gladly footed the bills. Cooper Union was his baby, his darling, and his monument, and he tended to its affairs almost daily from its beginnings when he was 68 to his death at 92.

The building was originally five stories and flat-topped, with plans for a roof garden. The additional story and irregular, skylit roofline were added later. The effect was elegant, with arched windows and front loggia, in the popular "Italianate" manner of the mid-19th century. It is still elegant, even with over a century of deterioration, and it will be a proper New York gem on restoration.

But the part of the story that interests architecture buffs most is the tale of Peter Cooper's famous iron beams. It is necessary first to remember the obvious—that buildings were either constructed of heavy and costly stone or flammable wood at that time. Fire, weight and expense were still unsolved problems. Cast iron had been tried and was found to have structural faults; it weakened progressively and collapsed in high heat or through manufacturing flaws. Wrought iron had the advantage of greater strength and the fact that it

gave warning of failure by bending. But nobody had devised a practical, economical system for using it.

Involved in iron manufacture, Peter Cooper was determined to produce the appropriate beams. It meant building machinery large enough to roll floor-spanning beams in one piece, which required considerable plant investment and provision of major sources of fuel and transportation. It took two years and \$150,000 to develop the rolling mill that could make the necessary seven-inch deep beams. In 1854, Cooper was able to roll such beams 20-feet long, as single structural members. The I-beam, basic to all building today, was born.

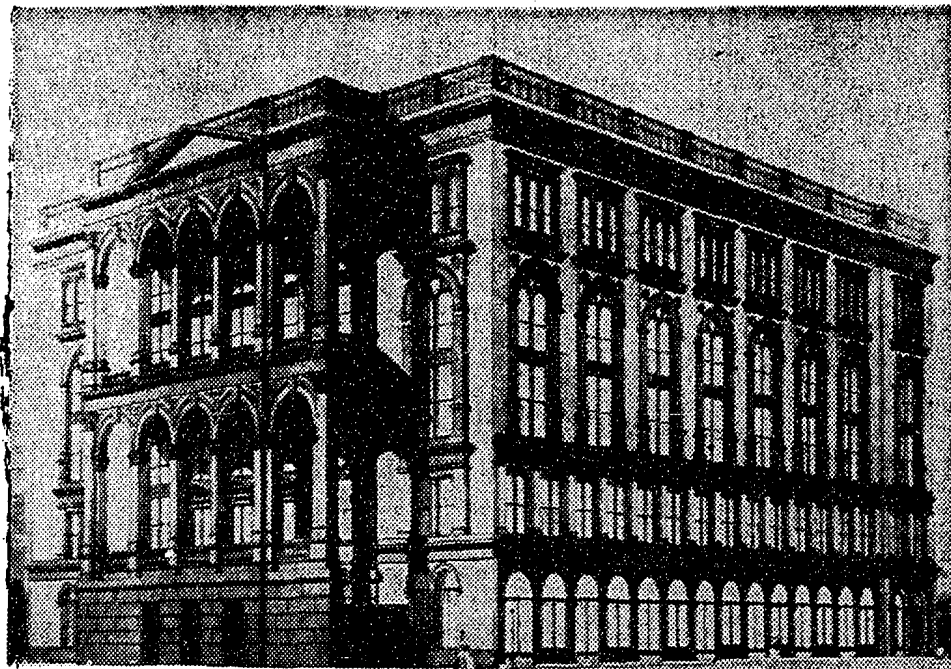
But these beams were not used immediately in the ongoing construction of Cooper Union. Harper Brothers, the publishers, had lost their printing plant in a disastrous fire, and the first of Cooper's beams went to Harper's new plant, in an innovative fireproof design. Next, the U.S. Government bought the new beams for an extension of the New York Assay Office and other Federal structures. The profits on these deals went to the Cooper Union

job. Finally, in 1854 and 1855, the beams were rolled for the school, and construction was completed in 1858.

The brownstone-brick facade consists of bearing walls from 18 to 24 inches thick. Esmond Shaw's monograph tells us that seven-inch deck section beams span the bearing walls and are three feet nine inches on center, bulb-shaped at the top, with flanges on the bottom. Segmental brick arches rest on the flanges. Concrete was poured over the arches.

As Abram S. Hewitt, son-in-law of Peter Cooper and Mayor of New York, wrote about the meaning of this structural innovation: "I need say nothing of the enormous extension of fireproof construction in this country. So far as the final culmination in the iron frame for buildings, the United States is entitled to the credit of the achievement." Read steel frame for the modern skyscraper.

And so that was no lady in hoopskirts at the corner of Third Avenue and 8th Street. It was a building in which progress became history, and style became art, and it is finally getting its due.



Drawing of Cooper Union at time of construction, 1853-58

A proper New York gem