

John Stern, a consultant on the faculty of the not-for-profit Aesthetic Realism Foundation in New York City, and a graduate of Columbia University, has had a lifelong interest in architecture, history, geology, cities, and transportation. He was a senior planner for the Tri-State Regional Planning Commission in New York, and is an Honorary Director of the Shore Line Trolley Museum in Connecticut. His extensive photographs of streetcar systems in dozens of American and Canadian cities during the late 1940s, '50s, and '60s comprise a major portion of the Sprague Library's collection.

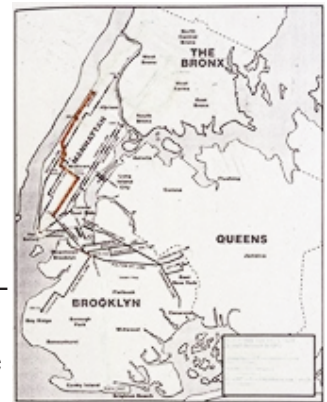
Mr. Stern resides in New York City with his wife, Faith, who is also a consultant of Aesthetic Realism, the education founded by the American poet and critic Eli Siegel (1902-1978). His public talks include seminars on Fiorello LaGuardia and Robert Moses, and "The Brooklyn Bridge: A Study in Greatness," written with consultant and art historian Carrie Wilson, which was presented at the bridge's 120th anniversary celebration in 2003, and the 125th anniversary in 2008. The paper printed here was given at the Aesthetic Realism Foundation, 141 Greene Street in NYC on October 23rd and at the Queens Public Library in Flushing in 2006.

# *The New York Subway: A Century*

By John Stern

THURSDAY, OCTOBER 27, 1904 was a gala day in the City of New York. Six hundred guests assembled inside flag-bedecked City Hall listened to speeches extolling the brand-new subway, New York's first. After the last speech, Mayor George B. McClellan spoke, saying, "Now I, as Mayor, in the name of the people, declare the subway open."<sup>1</sup>

He and other dignitaries proceeded down into City Hall station for the inaugural ride up the East Side to Grand Central Terminal, then across 42nd Street to Times Square, and up Broadway to West 145th Street: 9 miles in all (shown by the red lines on the map). It was a momentous event in the 280-year history of the metropolis.



Illus. 1: Map of First Line

The New York subway was not the world's first, nor is it the busiest; subway systems in Moscow, Mexico City, Seoul, and Tokyo carry more passengers overall, and many systems, including these, carry more passengers per mile.<sup>2</sup> Nevertheless, New York's is probably the best known because the city it serves is so famous across the globe. Our subway is part of popular culture: Duke Ellington and Billy Strayhorn named that unforgettable jazz composition after the subway that took people to Harlem: "Take the A Train." For "On the Town," the musical by Leonard Bernstein, lyricists Betty Comden and Adolph Green wrote: "The Bronx is up and the Battery's down/The people ride in a hole in the ground."

The subway has been the subject of paintings and prints by John Sloan, Isac Friedlander, Fritz Eichenberg, and these two by Reginald Marsh; and films such as "The Taking of Pelham 1-2-3" and "The French Connection."



Illus. 2 : Painting of People in Subway  
by Reginald Marsh



Illus. 3: Etching of Passengers in the Subway  
by Reginald Marsh

Why do the subways of New York, so everyday and utilitarian, stir our imaginations, even as we may complain about them? I have always cared for the subways; thought there was something beautiful about them. Through my study of Aesthetic Realism, and of this principle, "All beauty is a making one of opposites, and the making one of opposites is what we are going after in ourselves," I came to see why. The subways affect people because of the way they put together such opposites as rest and motion, surface and depth, personal and impersonal, the ordinary and the wonderful, dark and light, as they carry 4.9 million people every work day.<sup>3</sup>

## I. Rest and Motion Are Fundamental

Opposites central in every mode of transportation are rest and motion. In the subway we can be at rest, seated and reading or talking with someone, while being speedily carried to our destination at up to 45 mp. Underground, the motion seems swifter because the tunnel walls flash by close to the windows. Above ground, the motion seems slower, because the buildings we pass are more distant. In both instances we are at rest, while moving, and the effect can be very pleasing.

Another instance of rest and motion as one occurs when a local train and an express briefly run side by side between stations. We are aware of people abreast of us in the other train, and aware too that that both trains seem to be at rest relative to each other, while it is clear both are moving too.

Every person is a drama of rest and motion. I tried to solve the questions of my life by acting unmoved by things, restrained, dignified-some might call it stodgy. Meanwhile, I loved trains! I remember when I was 16 spending the summer exploring New York's subway and elevated lines, traveling for the first time to neighborhoods across the city. I found it very satisfying to stand in the Grand Central subway station during rush hour, watching throngs of passengers leaving and entering local and express trains. The subway was telling me-and I love Mr. Siegel for enabling me to see this-that reality can be both energetically on the move and organized, multitudinously diverse and sensible.

In most people's lives, rest and motion often fight: one can feel stuck or lethargic, and later nervous or restless. When a train is running well, there is a regularity of motion: it goes and stops for the same purpose, and that is a guide to how we hope to be: We want to feel our rest and activity don't fight with each other; we move and we pause for the same purpose-to reach our station.

## II. The History of the Subways

The history of rapid transit in New York is one of opposites too, including the fight between private and public, between the drive for personal profit and the having of good will for the public, which Eli Siegel showed has been going on these years with increasing intensity, not only in America but throughout the world. "The present economic way of the world," he explained in 1970, "has had ill will with it always, and that contempt basic in ill will."<sup>4</sup> And, he wrote later, "There will be no economic recovery in the world until economics itself, the making of money, the having of jobs, becomes ethical; is based on good will rather than the ill will which has been predominant for centuries."<sup>5</sup>



Illus. 4: Map of Elevated Lines



Illus. 5: Street Congestion

The first successful rapid transit in New York was affected by this warfare between good will and ill will. The elevated railroads



Illus. 6: Two Elevated Trains at Franklin Square.

were built in the 1870s and 80s (see red lines on map) by private companies to provide swift public transportation above the ever-increasing street congestion in the growing cities of New York and Brooklyn. By 1881 wooden railroad cars hauled by small steam locomotives were running above Second, Third, Sixth, and Ninth Avenues in Manhattan. Because they provided rapid transportation to the employment centers in Lower Manhattan, the els facilitated the residential development of the East and West Sides above 59th Street—a growth that continues today. During the 1880s five elevated lines were built in Brooklyn, which encouraged residential construction in Bushwick, Bedford-Stuyvesant, Williamsburg, Ridgewood Park Slope, and Sunset Park. By 1900 the Els were carrying 850,000 people a day.<sup>6</sup>

I remember in a lecture he gave in 1970 on New York City, Mr. Siegel said, "When wild land gets real estate on it—like a fort or houses—there's poetic roughness and form." Thus, with the coming of the els, rough, unused land in upper Manhattan and Brooklyn was given orderly shape as streets were laid out and dwellings were built, block by block.



Illus. 7: Elevated Train on Sixth Avenue

### III. A Subway Is Needed

For two decades the elevated lines effectively filled the need for rapid transit to serve the growing city. But the els were noisy and darkened the streets above which they ran—as this photograph by Berenice Abbott



Illus. 8: Shadows Under Elevated

shows—and they were becoming dangerously overcrowded as the population grew. As the 19th century ended, many people were advocating construction of a subway—efforts bitterly opposed by the private elevated and street railway companies, who saw their profits derived from overcrowding threatened. They often showed contempt for the riding public, who had to endure discomfort, indignity, indifference by management—and even danger—every day.

In 1894 the state legislature passed a rapid transit act, which empowered the city to build underground routes and lease them to private companies. Construction began in 1900, and the Interborough Rapid Transit Company (the IRT) was established in 1902 to build the new lines (paid for by city funds) and operate them, while keeping the profits. This was at a time when public transportation was regarded strictly as a profit-making private enterprise—unlike other basic services such as fire, police, education, water supply, and sanitation, which the city provided to its inhabitants. Limits to the debt the city could manage forced it to accept this public/private financing

to get the subway built. Yet many voices even then strongly advocated municipal ownership and operation of the subway.

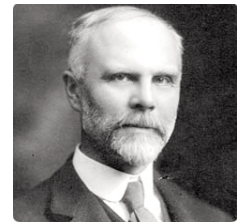


Illus. 9: August Belmont, Jr.

The persons most prominent in the construction of the first subway were August Belmont and Chief Engineer William Barclay Parsons. Belmont, an enormously wealthy and capable banker, financed the IRT's share of costs for building the original lines, and even had his own luxurious private subway car, the "Mineola," in which he entertained distinguished guests.<sup>7</sup> While he was in close and cordial relationship with the most prominent families in New York, he was also, as Clifton Hood writes, "arrogant, pompous, mean-spirited, and quick to anger."<sup>8</sup> Parsons was an experienced engineer, who saw his expertise as a means to expand America's wealth and power.



Hood describes him as "hardly an amiable or engaging man, [with] little personal warmth. But this stern, demanding patrician nonetheless drew first-rate engineers to his side, inspired their best work, and earned their lifelong loyalty."<sup>9</sup> Parsons later was a founding member of the prestigious engineering firm Parsons Brinckerhoff.



Illus. 10: William Barclay Parsons

## IV. Surface and Depth: In Subway Construction & Ourselves

The opposites of surface and depth, on top and underneath were central in the construction of the subway. As a geologist, it means everything to me to have learned from Aesthetic Realism that the structure of the earth, like the structure of our very selves, is aesthetic—a oneness of opposites. Indeed, the geology of Manhattan that the subway had to traverse is complex, ranging from hard rock a half billion years old to quicksand and other soft soils. Most of the nine-mile route was constructed by a method called "cut-and-cover": men using mostly picks and shovels, drills, and other hand tools began to dig out the right-of-way for the subway line under the street, installing a temporary wooden street surface—as this photograph shows—and shoring it up as they excavated to the proper depth; then building the tunnel; and restoring the street above. Clearly, during construction, the street surface and excavation for the tunnels were in a mobile, changing relation of depth and surface as the work progressed.



Illus. 11: Cut and Cover



Illus. 12: Cut and Cover with Temporary Street Surface.

The builders encountered a subsurface crowded with water, sewer, steam, and gas pipes, telephone and electric conduits, and even underground streams, for which no comprehensive maps existed. These utilities had to be relocated and rebuilt as construction proceeded. Much of the remainder of the route, in Murray Hill and later Washington Heights, required tunneling through hard rock, some of which was dangerous to workers because of unexpected zones of shattered and unstable rock and underground springs. As a result during construction 54 men lost their lives, out of 7,700 predominantly Irish and Italian laborers.<sup>10</sup> I have often asked myself, What did these men feel working day after day under such difficult and even hazardous conditions for four years?



Illus. 13: Underground Utilities

And we can ask: do we have anything like interior recesses and subterranean tunnels in ourselves? How much do we want other people to know what we feel, including those closest to us? I didn't like the fact that I had emotions I didn't understand going on inside me. I wanted to be calm, unperturbed—to be, as much as possible, like a quiet boulder in upstate New York. Outwardly my appearance was both imposing and blank. Inside I was churning.

In a class early in my study of Aesthetic Realism, I mentioned a dream in which I was rolling out maps and rolling them back up again, which I often did at my work as an urban and regional planner. Mr. Siegel asked me, "Do you think you are like a rolled-up map? A human being unfolds himself like a map or he can roll himself up and be concealed like a lost scroll. Do you believe you would like to hide what you are?" "Yes," I answered. I came to see there was something I wanted more than being concealed like a lost scroll, thinking I'd fooled everybody. What I really



Illus. 14: Red Cars on Elevated, Flushing Line



Illus. 15: Brighton Line at Cortelyou Road  
Photo: David Pirmann

wanted was to have the depths of myself known, be more like some of those subways in Brooklyn, Queens, and the Bronx that come out of the dark underground up into the light,<sup>11</sup> like this structure on the Flushing Line at Queens Plaza and here, on the Brighton Line, and to be in relation to other things, other people. This is what Mr. Siegel made possible, and I've had such great pleasure riding with my wife, Faith, on the various subway lines of our city, feeling I'm related to the many passengers, young and older, all going to their destinations.

When I hid, it was not for a good purpose, but to get away from a world and people I saw as messy-not worthy of getting mixed up with my feelings. Having the subway hidden beneath the ground, however, is for a very different purpose: it enables the city above and the people there to operate more efficiently.



Illus. 16: Two Original Kiosks

A wonderful thing occurred when the IRT lines in Manhattan incorporated a feature at many stops that joined surface and depth: a handsome metal and glass kiosk at street level (patterned after similar structures on the first Budapest metro)<sup>12</sup> that sheltered the steps leading to the station below. They're gone now, except for a replica at Astor Place, but these kiosks made the transition from the bright outdoors to the darker underground more graceful.



Illus. 17: Astor Place Replica of Kiosk

Surface and depth are one also in the way the underground subway lines have transformed development above ground—for example, the large apartment buildings that have been built along Broadway above 59th Street, West End Avenue, and Riverside Drive.

## V. Profit vs. Good Will

The designers of the first subway routes, while concerned primarily with their bottom line, nevertheless were forced to think about what the people who would use their system felt, including their fears traveling below the earth. For example, each train's controls were—and are—designed to be fail-safe: if a motorman becomes disabled and releases his grip on the control handle, the brakes are automatically applied, bringing the train to a stop. And in his book *Under the Sidewalks of New York*, Brian Cudahy writes that "to allay the qualms of passengers unaccustomed to riding through the darkness of underground tunnels, officials never failed to emphasize that each car was illuminated



Illus. 18: Spring Street Station  
Photo: Wayne Whitehome

by 26 electric light bulbs."<sup>13</sup> And, he continues, the construction contract provided that "all parts of the structure where exposed to public sight shall therefore be designed, constructed, and maintained with a view to the beauty of their appearance, as well as to their efficiency."<sup>14</sup> To this end, stations were imaginatively decorated with mosaic and terracotta panels appropriate to the local history of the area—like this ship at Columbus Circle—and like the beaver you can see at the Astor Place station, named after John Jacob Astor, who made millions selling beaver furs and real estate.



Illus. 19: Ship at Columbus Circle



Illus. 20: Beaver at Astor Place

Most of the original subway cars were built with frames and structural members made of steel, while their sides were wood painted a deep, rich, wine red, with orange trim;<sup>15</sup> such a train is shown here at City Hall Station, with its beautiful Guastavino tiles. However, because of concerns about the safety of wooden-sided cars running underground, the IRT gradually replaced them with the world's first all-steel railway cars—



some of which were running in the subway from opening day.



Illus. 21: Original Subway Cars at City Hall Station

Meanwhile, despite the obviously urgent need to reduce horrible overcrowding in the old tenement neighborhoods, the IRT adamantly refused to risk its huge profits<sup>17</sup> by expanding beyond its existing lines to undeveloped areas in the outer parts of the city. The IRT's recalcitrance highlighted a central question asked by a Mayor's Commission, whether "the provision of rapid transit facilities for a great city was...a function for private gain."<sup>18</sup> After five years of stonewalling, an agreement called the Dual Contracts was finally hammered out in 1913 between the city and the two private companies, the IRT and the Brooklyn Rapid Transit Company (later the BMT), to build more than a dozen new subway lines—marked in red on the map.<sup>19</sup> This unprecedented expansion of rapid transit alleviated some of the dangerous overcrowding in the Lower East Side and elsewhere, and provided the catalyst for the development of vacant lands into extensive new residential neighborhoods, where millions of people could live with dignity and comfort, and easily travel to Manhattan's employment centers. For example, this view eastward along the new Flushing line shows mostly empty space that in the next 20 years would be filled with factories, houses, and apartment buildings.



Illus. 23: Flushing Line Just Before Opening (1917)

The results of this subway expansion were dramatic. Between 1910 and 1940 population densities decreased markedly in the older districts, while the number of residents grew from 300% to 500% in northern Manhattan, the northern and eastern Bronx, in western Queens, and the south half of Brooklyn.<sup>20</sup>

In the early 1920s, Mayor John F. Hylan strongly advocated building an independent subway system to be owned and operated by the city. He rightly argued that subways should be "planned, built, and operated to accommodate the transportation needs of the people...and not solely for the financial advantage of the operating companies or their officials."<sup>21</sup>

I was thrilled to read about Hylan's passionate advocacy of municipal ownership and operation. Under his leadership, the city started building the Independent subway system, which had brightly tiled stations, fewer local stops, and long express runs—one, from 59th Street to 125th Street, is 3.25 miles.<sup>22</sup>

The new Independent system included the Queens line, which served then-modestly developed areas along Queens Boulevard and made possible the dense development there today.

Then, in 1940, after years of agonizing negotiations, New York City purchased all the routes of the IRT and BMT, paying \$336 million in municipal bonds.<sup>23</sup> At last the entire network of subways was owned and operated by and for all the people of the City of New York.

Meanwhile, despite the obviously urgent need to reduce horrible overcrowding in the old tenement neighborhoods, the IRT adamantly refused to risk its huge profits<sup>17</sup> by expanding beyond its existing lines to undeveloped areas in the outer parts of the city. The IRT's recalcitrance highlighted a central question asked by a Mayor's Commission, whether "the provision of rapid transit facilities for a great city was...a function for private gain."<sup>18</sup> After five years of stonewalling, an agreement called the Dual Contracts was finally



Illus. 22: Map of Dual Contracts



Illus. 24: Mayor Hylan

## VI. One and Many: The Subways Are Both

In Eli Siegel's landmark Fifteen Questions, "Is Beauty the Making One of Opposites?," he asks:

Is there in every work of art something which shows reality as one and also something which shows reality as many and diverse?-must every work of art have a simultaneous presence of oneness and manyness, unity and variety? <sup>24</sup>

Since 1940 the operations of the three once separate subway systems and the buses, and transfer opportunities between them-including through the introduction of MetroCard-have become more and more integrated, which has made for a more efficient relation of the opposites of one and many. Just as each of us is one person, trying to make useful sense of the many people and situations we meet every day, so over the years the many separate segments of the public transportation networks in New York City have increasingly become a single system working for one purpose: efficiently carrying millions of individuals to their destinations every day.



Illus. 25: Michael J. Quill

And there is the Transport Workers Union, 34,000 individual men and women all working to operate and maintain a unified transit system that knits together the city's diverse neighborhoods and provides a common thread in the lives of its 8 million inhabitants.

When Michael J. Quill founded the Transport Workers Union in 1934, working conditions were abysmal. Wages were paltry, hours exhaustingly long, and the private companies who then owned the lines routinely fired anyone who joined a union. Quill was instrumental in changing this, enabling transit workers to get better conditions and live with dignity and security. These are the motormen and women, conductors, token booth clerks, the persons who, often in dangerous conditions under the earth, work faithfully maintaining the tracks and cars and stations. In my freshman year at Columbia University, 1949, our labor studies instructor asked Mr. Quill to address our class, and I'll never forget him asking, with his unforgettable brogue: "Why should a change clerk who stands all day not get a decent wage?"

The great work Mike Quill began continues. Each time the union negotiated a new contract, it made modest but steady gains. During negotiations in December 2005 for a new contract, the union refused to undermine its valuable pensions, and its members struck. The ethical meaning of the strike is explained by Ellen Reiss, Class Chairman of Aesthetic Realism: "Unions, with all their mistakes, have fought for people's being able to live more as they deserve and get more of the fruits of their labor." <sup>25</sup> That is what the union finally achieved when, a year after the strike, an arbitration panel awarded TWU members the three-year raises they had originally negotiated for.

## VII. Personal and Impersonal, Emotion and Logic

Some of the deep feelings had by transit workers about their jobs are presented in Transit Talk: New York's Bus and Subway Workers Tell Their Stories. Many of the interviews show the pride and good will these men and women have. For example, the author, Frank W. Snyder, writes "When [transit workers] step onto a track to fix a signal, or go to work inches away from a third rail sizzling with 600 volts of electricity, they face danger to make things safer for the rest of us." Mike Lombardi, an assistant chief mechanical officer, says: "You feel like you're doing something because there's a couple of million people out there every day depending on us." And Snyder tells about subway workers trying to rescue people who have fallen or jumped onto the track and sometimes end up trapped under a train: their arduous efforts are accompanied not only by dirt and dan-

ger, but also by heartfelt pride and gratitude when a rescue is successful.<sup>26</sup>

Mr. Siegel defined history as "shown feeling about the past." I learned that facts presented alone, without an awareness of the multitudinous emotions people have had, are incomplete. I remember a class in which he discussed an architectural guide to New York City, filled with facts and descriptions of notable buildings. He asked me what was missing, and I didn't know. He explained that the guide wasn't aware of the people who lived or worked in these buildings, or the feelings they had. "For example," he asked, "what do you think a clerk might have felt on a sunny June morning in 1883, as he rode in a horse car to work? Or a housewife early in 1861, hearing the news that Fort Sumter had been bombarded, and thinking about her husband?"

There are facts aplenty about the subways, detailed in many publications. But there are also the feelings of millions, past and present. Mr. Siegel says in the opening lines of his 1961 poem, "Local Stop, Sheridan Square":

*The subways, as usual, take emotions north and south.  
When you are in a subway, emotion goes with you.* <sup>27</sup>

Yes, the subways are constructed of impersonal matter, created by the logic of engineering, but they do carry the complex feelings of the people who ride the trains and those who faithfully maintain and operate the tracks and cars and stations.

A short poem I love, which shows sameness and difference, an individual and humanity, is Eli Siegel's "Discouraged People."<sup>28</sup>

The discouraged  
People were wedged  
So closely together in the subway  
You could have taken one discouraged person for the other.

As I've studied the subways and thought about the people who have built them, worked on them, and ridden them these hundred years, I have a large sense of wonder and admiration of what humanity can do. And I'm very glad to have shown how the eternal opposites, our opposites, as described by Aesthetic Realism, are in the creation, operation, and colorful, emotion-filled, ever so meaningful history of the great subway system of the City of New York.

## Footnotes

- 1 Brian J. Cudahy, *Under the Sidewalks of New York* (New York: Fordham University Press, 1995), p. 3
- 2 *Railway Directory* (London: Reed Business Publications, 2004), pp. 261-264, 271, 289.
- 3 *New York Times*, August 10, 2007, MTA Statistics. In addition, there are 2.3 million bus riders every work day.
- 4 Eli Siegel, *Goodbye Profit System: Update* (New York: Definition Press, 1982), p. 156
- 5 *ibid.*, p. xxxiii
- 6 Peter Derrick, *Tunneling to the Future* (New York: New York University Press, 2001), p. 32
- 7 Meyer Berger's *New York* (New York: Random House, 1960), p. 8. The "Mineola" is now at the Shore Line Trolley Museum in East Haven, CT, awaiting restoration.
- 8 Clifton Hood, *722 Miles: The Building of the Subways and How They Transformed New York* (Baltimore: The Johns Hopkins University Press, 1992), p. 73
- 9 *ibid.*, p. 78
- 10 *ibid.*, pp. 85, 90



- 11 Almost half of "subway" route mileage today is on elevated structures, on embankments, or in below-ground open cuttings
- 12 Hood, p. 94
- 13 Cudahy, *Under the Sidewalks of New York*, p. 24
- 14 *ibid.*, p. 7
- 15 *ibid.*, p. 24
- 16 *ibid.*, p. 27
- 17 Hood, p. 123
- 18 Derrick, p. 154
- 19 These new lines included the Lexington and Seventh Avenue lines in Manhattan; Jerome Avenue, White Plains Road, and Pelham Bay routes, and an extension of the Third Avenue El in the Bronx; to Astoria, Flushing, Ridgewood, Jamaica, and Liberty Avenue in Queens; and Fourth Avenue, Sea Beach, West End, Culver, 14th Street-Canarsie, New Lots, and Nostrand Avenue lines in Brooklyn. In addition, an express track was added to some of the El lines.
- 20 Derrick, p. 247
- 21 Hood, p. 203
- 22 Cudahy, *A Century of Subways* (New York: Fordham University Press, 2003), p. 13. Of the more than 90 cities worldwide having rapid transit systems (Railway Directory, pp. 225-295), only New York has extensive four-track segments with both local and express services (ten such segments in all, accounting for one-fifth of total route mileage); all are underground except the Brighton line). Philadelphia has one such line, Broad Street. The author notes (p. 324) that London and Chicago provide local and express services on some four-track lines out-of-doors.
- 23 Derrick, p. 237
- 24 Siegel, *Is Beauty the Making One of Opposites?* New York: Terrain Gallery, 1955
- 25 *The Right of Aesthetic Realism to Be Known*, New York: Aesthetic Realism Foundation, No. 1657
- 26 Robert W. Snyder, *Transit Talk: New York's Bus and Subway Workers Tell Their Stories* (Brooklyn: The New York Transit Museum, and New Brunswick: Rutgers University Press, 1997), pp. 1-2, 13-16, 48, 156
- 27 Siegel, *Hail, American Development*, (New York: Definition Press, 1968), p. 120
- 28 Siegel, *ibid.*, p. 109

## Illustrations

- Illus. 1 Map of First Line. Peter Derrick, *Tunneling to the Future*, p. 31
- Illus. 2 Painting of People in the Subway. Aesthetic Realism Foundation Library
- Illus. 3 Etching of Passengers in the Subway. Norman Sasowsky, *The Prints of Reginald Marsh* (New York: Clarkson N. Potter, 1976), p.187
- Illus. 4 Map of Elevated Lines. *Tunneling to the Future*, p. 31
- Illus. 5 Street Congestion. New York Transit Museum
- Illus. 6 Two Elevated Trains at Franklin Square. John Grafton *New York in the 19th Century* (New York: Dover Publications, Inc., 1980), p.251
- Illus. 7 Elevated Train on Sixth Avenue. [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 8 Shadows under the Elevated. Berenice Abbott, *New York in the Thirties* (New York: Dover Publications, Inc., 1973), Plate 22
- Illus. 9 August Belmont, Jr. [www.answers.com](http://www.answers.com)
- Illus. 10 William Barclay Parsons [www.c.250.Columbia.edu](http://www.c.250.Columbia.edu)
- Illus. 11 Cut and Cover. New York Transit Museum
- Illus. 12 Cut and Cover with Temporary Street Surface. New York Transit Museum
- Illus. 13 Underground Utilities. New York Transit Museum
- Illus. 14 Red Cars on Elevated Flushing Line at Queens Plaza. Jeff Erlitz, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 15 Brighton Line at Cortelyou Road. David Pirmann, [www.nycsubway.org](http://www.nycsubway.org)

- Illus. 16 Two Original Kiosks. Benjamin Blom, New York Photographs, 1850-1950 The Amaryllis Press, Inc., and E. P. Dutton, Inc., 1982). Plate 596
- Illus. 17 Replica of Kiosk at Astor Place. Jason R. DeCesare, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 18 Spring Street Station. Wayne Whitehorne, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 19 Ship at Columbus Circle. Robbie Rosenfeld, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 20 Beaver at Astor Place. Richard Panse, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 21 Original Subway Cars at City Hall Station. Collection of Ed Levine, [www.nycsubway.org](http://www.nycsubway.org)
- Illus. 22 Map of Dual Contracts. Tunneling to the Future, p.177
- Illus. 23 Flushing line just before opening in 1917 Tunneling to the Future, following p. 154
- Illus. 24 Mayor Hylan. Clifton Hood, 722 Miles: The Building of the Subways and How They Transformed New York, plate following p.96
- Illus. 25 Michael J. Quill. Shirley Quill, Mike Quill Himself: A Memoir (Greenwich: Devin-Adair, 1985), Cover