

Plundered by Harpies

AN EARLY HISTORY OF HIGH-SPEED TRADING



Museum of American Finance

By Bob Pisani

ON JANUARY 28, 1790, Representative James Jackson of Georgia rose and spoke in the then very-young House of Representatives, meeting in New York City. His purpose: to denounce high-speed traders.

“Three vessels, sir,” Rep. Jackson thundered, “have sailed within a fortnight from this port, freighted for speculation; they are intended to purchase up the State and other securities in the hands of the uninformed...”

Jackson railed against these men, calling them “rapacious wolves...preying upon the misfortunes of their fellowmen, taking an undue advantage of their necessities.”

What terrible crime did these men commit? Murder? Treason?

Hardly. Jackson and his fellow Congressmen were debating a proposal by Secretary of the Treasury Alexander Hamilton that the then-new US government should assume the old debts that the states and the Continental Congress incurred during the Revolution, a proposal that became known as the Funding Act of 1790.

Traders who had heard of the deliberations immediately chartered fast-moving boats to front-run messengers and began buying up the old debt, reasoning correctly that passage of the Act would raise the market value of the old debt, which was trading in some cases at 10% or less of its face value.

Jackson was outraged; he demanded that Congress take action to “save the distant inhabitants from being plundered by these harpies.” The “distant inhabitants” Jackson was referring to were his constituents in Georgia; although, in a sense, we are Rep. Jackson’s distant inhabitants, still praying to be saved from the harpies.

Railing against informational advantages that “speculators” possessed was a common feature of American life from the founding of the country right up to the present day. Today, many complain that “high-frequency traders” who employ mathematical algorithms have unfair advantages over those whose algorithms are not as good, or who have trading systems that are faster than theirs.

Uniformed NYSE trading floor clerks gathered around a stock ticker, ca. 1915.

From the outset, there was a deep and abiding suspicion of the broker, who, for a price, was willing to buy or sell your stock, bond or commodity. It was a suspicion that these middlemen knew something that buyers and sellers did not.

True or not, these complaints underscore a larger historical fact: any technology that increased the speed of information flow was immediately adopted by the trading community in both Europe and the United States. Traders have employed every known conveyance to trade faster and cheaper. They were among the earliest adopters of faster boats, faster stagecoaches and private horse expresses. The trading of securities was among the very first uses of the telegraph.

The adoption of these high-speed trading techniques had two characteristics: 1) they greatly reduced the price differences between markets, and 2) those who were slower to adopt bitterly complained that the new technologies offered unfair advantages to the participants.

Then, as now, the buying and selling public—and the government—were desperate to keep up. Congress established the US Postal Service in 1792 specifically for the “conveyance of information” into “every part of the Union.” By establishing low rates for the transmission of newspapers that contained market-sensitive

information, it was hoped that citizens could be quickly apprised of market-moving events and stay ahead of the “harpies.”

But speculators were far quicker than newspapers. In 1817, when a ship arrived in New York from London with news that caused a sharp rise in stocks, three speculators jumped on a stagecoach for Philadelphia to buy up stocks. Thanks to greatly improved highways, the time to travel between New York and Philadelphia had been cut to under two days, creating a lively arbitrage in stock trading between the Philadelphia Stock Exchange (founded 1790) and the early version of the New York Stock Exchange (founded 1792).

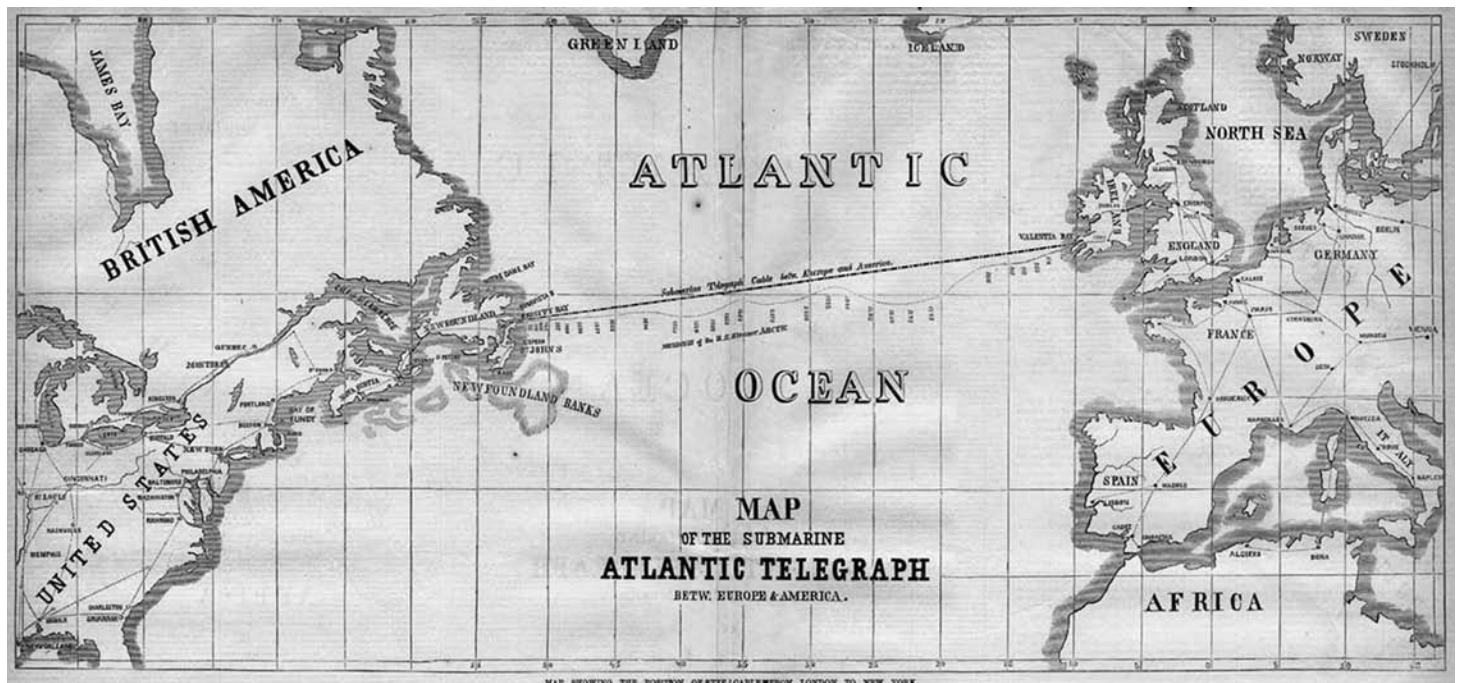
When the stagecoach broke down, they hired their own coach and arrived in Philadelphia before the broken coach arrived with the news. They immediately bought stock, and when the mail arrived the prices jumped in value. Those left out insinuated that the speculators had paid the stagecoach driver to delay the mail.

Traders quickly set up networks of speedy “private expresses” along the newly-created networks of turnpikes and expanded postal roads, from New York to New Orleans. By 1825, Postmaster General John McLean, outraged by speculation in the cotton market, attempted to convince Congress to shut down these high-speed trading networks and set up a government system that

conveyed newspapers at the same speed as letters to thwart speculators. “On all the principles of fair dealing,” McLean wrote, “the holder of property should be apprised of if its value before he parts with it...To purchase an article at one-half or two-thirds of its value, which is known to the buyer, but carefully concealed from the seller, is in opposition both to the principles of law and sound morality.”

So serious was the government’s attempt to shut down high-speed couriers that the US Post Office operated a high-speed horse express from 1836 to 1839 linking New York and New Orleans that transmitted news reports to journalists on lightweight tissue paper rather than far more costly newspapers.

Traders, ever desperate for a trading edge, soon cut the time gap dramatically—they cut out the horse and stagecoach! In the late 1830s, Philadelphia broker William C. Bridges operated a private signal station between New York and Philadelphia which disseminated stock market news to him and his backers (and to no one else). The signals were transmitted through an “optical telegraph,” which consisted of a series of boards on a pole, mounted on hills that could be seen by a telescope. Reports indicated that it could transmit stock information from New York to Philadelphia in anywhere from 10



Map showing the location of the transatlantic cable between New York and London.

to 30 minutes. In the 1830s that was high-speed trading!

Not surprisingly, there were complaints from New York speculators not part of the scheme, who had up to this time enjoyed a substantial trading advantage. The locals in Philadelphia were not happy either. When the system was shut down after the arrival of the telegraph in 1846, a local newspaper account recounted that “many mysterious movements in the Philadelphia stock and produce market were laid at the door of the speculators who worked the telegraph. No doubt the speculators paid them well.”

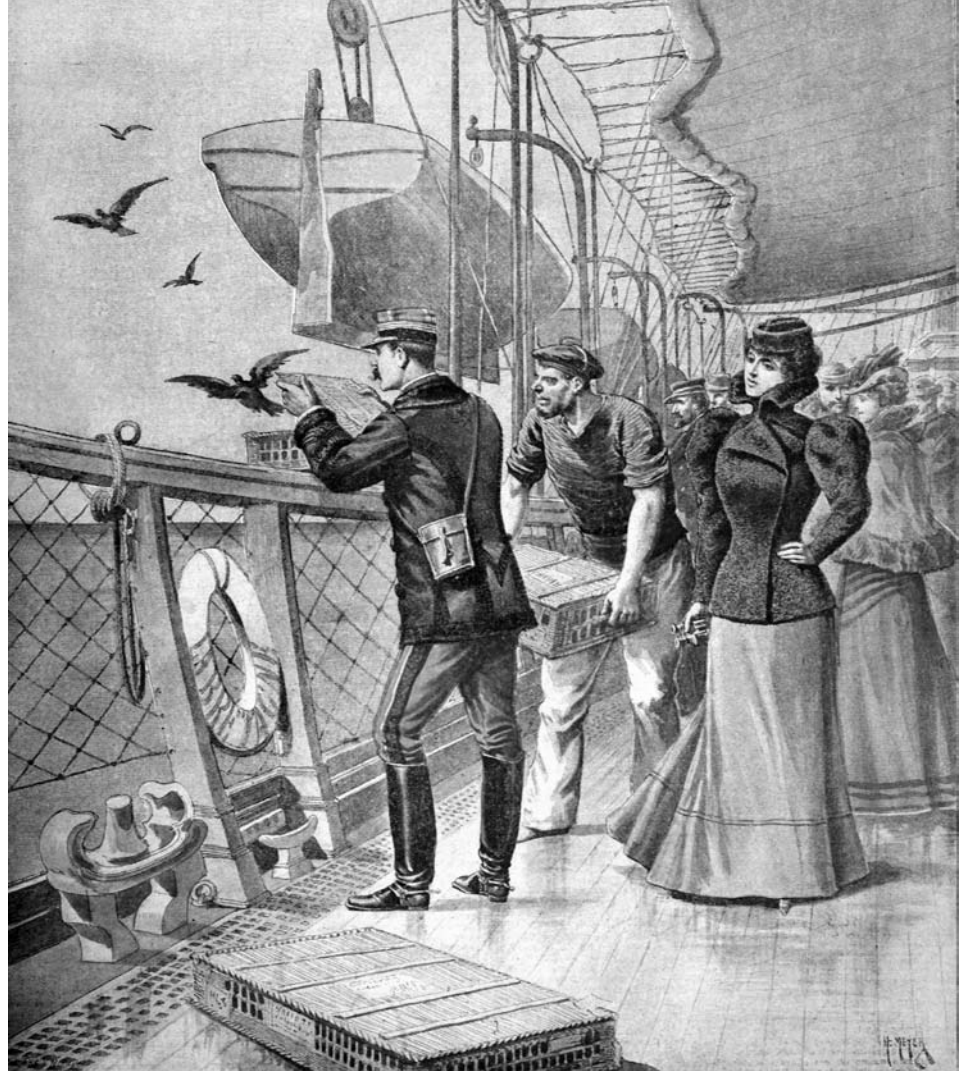
No doubt. Unfortunately, the “organized” trading community did little to foster transparency. In the early days of its existence, the NYSE (then known as the New York Stock and Exchange Board) barred the public from listening in on its trading sessions (sessions would not be open to the public until 1869). Competing traders (curb traders, who literally operated outside) who wanted to trade off the NYSE’s trades were furious that they could not get proximity to the exchange. In 1837, the NYSE discovered that the curb traders had drilled a hole in the brick wall of its building in order to eavesdrop on the trading.

Just as the public was debating how to outwit high-speed horses, a new technology came on the scene that would transform trading into a truly high-speed endeavor: the telegraph, which came into use after 1844.

It was the greatest invention of its age. Newspapers took time to get out and for the most part operated only at fixed intervals. But the telegraph operated at all hours and could be used for private communications.

It was a high-speed trader’s dream come true. The first customers were stock brokers and lottery speculators. On March 3, 1846, the *New York Herald* reported that “certain parties in New York and Philadelphia were employing the telegraph for speculating in stocks.”

Predictably, there was great indignation at the use of the telegraph to transmit “secret intelligence.” Several early inventors of the telegraph were persuaded to abandon their endeavors when warned that they could be prosecuted for circulating information in advance of the mail. The principal inventor of the telegraph, Samuel F.B. Morse, was in favor of a hybrid public/private takeover of the



Communications experiment using carrier pigeons, 1898.

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entire telegraph business specifically to guard against speculative abuse.

It was all for naught. Congress ultimately declined to take over the telegraph system, partly because competition for market-moving information and the limited wires space then available was intense. That competition emerged not only among traders but among their biggest competitor: the press.

The early 1800s saw the birth of the modern newspaper industry, and much of the purpose of those early papers was to get financial news out more quickly. James Gordon Bennett Sr., who in 1835 founded the *New York Herald*, one of the country’s first “penny” newspapers, emphasized that the emerging press would break the information monopoly of the few: “Speculators should not have the advantage of earlier news than the public at large,” he proclaimed.

Suddenly, newspapers had boats. And optical telegraphs. The *Journal of Commerce*, founded in 1827 to cater to the

financial community, kept deepwater boats to meet ships arriving from abroad. An optical telegraph system similar to the private one operating between Philadelphia and New York operated between Sandy Hook, New Jersey, and New York City to inform the editors when ships were arriving.

The *Journal of Commerce* and its rival, *The Courier and Enquirer*, even established rival pony expresses that ran between New York and Philadelphia, and, later, to Washington. Even the pigeons were dragged into the competition: one group of penny newspaper owners paid \$2,000 for a fleet of carrier pigeons to send news between Philadelphia, Washington and Baltimore.

Traders, however, had plenty of help, for a price. One news entrepreneur, Daniel C. Craig, made a fortune selling information on European news to traders. Using a combination of pigeons and express couriers, he got news from European steamers which had just sailed into Halifax harbor in Nova Scotia to Boston before anyone

else. The information was then sent to New York via telegraph.

Craig was so effective in gathering information ahead of others he was later hired by the newly-formed New York Associated Press. The press was apoplectic about traders and the agents who supplied them with information. There was particular anger directed against telegraph operators who were believed to have close relationships with traders; editorials railed against the telegraph's potential for falling "in the hands of bad men."

Receiving information first was so valuable that some speculators, at times in cahoots with telegraph operators, were willing to cut the telegraph wire after the news had been received! Because telegraph operators were among the first to receive tradable news, some operators cut out the speculators altogether and went into business for themselves. This continued for decades: when the Civil War broke out, several Western Union employees made a fortune in the gold markets by leveraging their advance knowledge of war news.

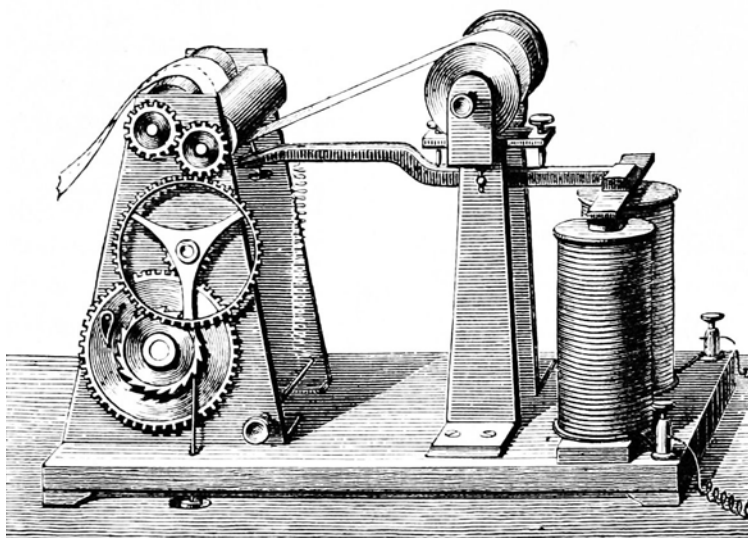
Forty years later, the telegraph was still a stock speculators' realm. In 1887 the president of Western Union said 87% of the company's revenue came from stock and commodity speculators, and from racetrack gamblers.

Getting a faster boat across the Atlantic was even more lucrative for traders. In the middle of the 19th century, it took eight days to cross the Atlantic, and any person who could get important news across the ocean more quickly could profit from it. In one extreme example, when it became known in New York City in 1865 that the South had lost the war, financier Jim Fisk chartered several ships that were faster than the mail ships then in use and sailed them to London with orders to his brokers to sell short Confederate bonds. When the news became known in London that the South had lost, the price of the bonds went to zero, and Fisk of course made a fortune.

Just as the telegraph had been eagerly adopted by stock traders in the United States, stock trading and other commercial uses were among the first uses of the

transatlantic cable. The first successful cable came into use in 1866 between New York and London and greatly reduced the information advantages that some traders had previously enjoyed; brokers could now telegraph an order to London and receive confirmation within five minutes. Price differences between securities soon began to narrow.

The stock ticker, introduced in 1867, was the next great electronic technology that was immediately adopted by the trading community. Prior to its introduction, stock trades were typically done by "pad shovers"—boys who ran back



Drawing of the Morse telegraph that appeared in *Popular Science Monthly*, ca. 1872–1873.

and forth between the trading floor and the offices of brokerage firms. It was an enormous advance over the telegraph for several reasons: 1) traders no longer needed to be physically present on exchange floors; 2) it reduced transaction costs; 3) it enabled the dissemination of continuous, real time information; and 4) it cut out pesky intermediaries like telegraph operators and newspaper editors. Not surprisingly, journalists and newspaper editors began to worry that the ticker might put them out of the lucrative business of financial news.

Thomas Edison did not invent the ticker, but he made several crucial improvements, including the invention in 1873 of the quadruplex, which allowed four messages to travel simultaneously over one wire. Western Union put this excess capacity to good use: they leased the lines to private networks controlled

by Wall Street firms. The firms were connected to their branch offices by these private telegraphs in Boston and Philadelphia by 1879, and to Chicago by 1881. These private wires were faster than the "public" telegram. They were also more reliable and provided confidentiality.

And Wall Street gladly paid up, because getting access to trading data as fast as possible was, as always, crucial to profitable trading: by 1894, brokers at the Boston Stock Exchange knew of trades at the NYSE within 30 seconds.

The stock ticker also initiated a new wave of stock market speculation, this time led by working class investors who began speculating through the newly-created bucket shops, which had also hooked up to ticker machines. Professional traders, who had heretofore enjoyed an enormous information advantage, bitterly complained: "indiscriminate distribution of stock quotations to every liquor-saloon and other places has done much to interfere with business," New York broker John T. Denney said in 1889. "Any person could step in a saloon and see the quotations."

Though bucket shops were mostly scams (there was no actual transfer of stock, so "investors" were merely betting against the bucket shop operator), many paid top dollar for fast telegraph services; in 1887 the NYSE discovered that one Chicago bucket shop was getting stock quotations several minutes earlier than the "regular" ticker service, thanks to assistance from Western Union.

It went on like this, through the development of the specialist system in the 1860s, the invention of the telephone (first tested by Bell in 1876; there was a phone on the NYSE floor by 1878), pneumatic tubes shortly thereafter, the computer in the 1950s, computer-readable cards in the 1960s, the early development of electronic trading when the Nasdaq began operation in 1971 and algorithmic trading in the 1990s. It was the same argument: some were getting information ahead of others, and others were able to execute trades because they had a faster boat/horse/carriage/telegraph line/computer link/algorithm.



Man using the new “high speed” stock ticker, 1930. According to the original caption, “Western Union has ordered 10,000 [tickers] and has begun installation in brokers’ offices throughout the country. The company is spending \$4.5 million in an effort to speed up stock quotation service... to keep pace with the new era of six or eight million share trading days on the stock exchange.”

The public and government response to the traders’ “need for speed” varied, but one factor remained fairly constant: the informational advantages of any new technologies seem to have diminished over time. From the very beginning, astute observers recognized this fact.

Let’s go back to Representative Jackson and the debates in 1790 that centered on whether Congress should take action to outlaw “speculation” (men hiring fast boats). When several Congressmen objected, arguing it would be impossible to prevent such activity, and always had been, Jackson countered by saying he knew full well that there was “speculation in the funds of every nation possessed of public debt,” but this was different: these were people trading on information they had, but that others did not. This, he implied, was dishonorable, and just plain wrong.

One Representative, Elias Boudinot of New Jersey, rose and agreed that while speculation had risen to “an alarming height,” he concluded that the only measure that would be effective to stop it was “appreciating the public debt, ‘til the evidence in the hands of the creditors came to their proper value.”

Boudinot was arguing that the only way out was to recognize the value of the debt

had increased and implied that wider dissemination of information — more transparency — was the most effective disinfectant. Boudinot implicitly conceded that the first movers of any new technology (faster boats, in this case) had an initial advantage. Yet the advantages conferred were fleeting as others adopted the new technologies. That was certainly the case with the telegraph and the stock ticker.

And whatever happened to that debate about the debt and the “harpies” seeking to profit from it? The bill was passed in 1790, the US government assumed the debt of the Continental Congress and the states, and the new government issued bonds.

Immediately, a brisk trade in those bonds ensued among merchants and auctioneers, the very “harpies” Representative Jackson railed against. This business proved to be so lucrative that some began to specialize in trading those very same securities. Two years later, on May 17, 1792, 24 brokers gathered in front of a buttonwood tree on Wall Street and attempted to form a quasi-monopoly in trading that debt and what few stocks were available to trade by promising to “give preference to each other in our Negotiations.” That group became what is now known as the New York Stock Exchange. **\$**

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