

## IBM Rebuilds Europe: The Curious Case of the Transnational Typewriter

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This is a PREPRINT DRAFT. To cite, quote, or distribute please use the final version published in *Enterprise and Society* in the final issue of 2015 or the first issue of 2016.

**Length:** Approx. 12,500 words (including endnotes but excluding bibliography and abstract).

### Abstract:

In the decade after the Second World War IBM rebuilt its European operations as integrated, wholly owned subsidiaries of its World Trade Corporation, chartered in 1949. Long before the European common market eliminated trade barriers, IBM created its own internal networks of trade, allocating the production of different components and products between its new subsidiaries. Their exchange relationships were managed centrally to ensure that no European subsidiary was a consistent net importer. At the heart of this system were eight national electric typewriter plants, each assembling parts produced by other European countries. IBM promoted these transnational typewriters as symbols of a new and peaceful Europe and its leader, Thomas J. Watson, Sr., was an enthusiastic supporter of early European moves toward economic integration. We argue that IBM's humble typewriter and its innovative system of distributed manufacturing laid the groundwork for its later domination of the European computer business and provided a model for the development of transnational European institutions.

An icon of the American century IBM ranked among the world's largest and most successful companies for decade after decade. At the peak of its strategic power, in the 1970s, it dominated rapidly expanding global markets for computing hardware, software, and services. IBM was technologically innovative, well managed, cosmopolitan, and reliable. Politically progressive but institutionally and financially conservative, a blue-chip stock safe for widows and orphans, it provided the model of modern American corporation for its competitors and its high technology peers.

IBM was a classic American brand, like Ford, Levis, or Coca Cola. Yet it was never just an American company. The "I" stood, after all, for International. Its logo was displayed like a flag on prominent buildings across the major cities of the free world. Echoing the famous boast of the British Empire, the title of a 1974 book proclaimed that "The Sun Never Sets on IBM." IBM's iconic Americanism was, in keeping with the political internationalism of the Cold War era, a reflection of its confident and successful engagement with the world overseas. This meant finding ways for its foreign operations to be at once American and indigenous, turning both its products and its employees into transnational hybrids. If the firm was truly an empire then its models were the polyglot Austro-Hungarian or Ottoman Empires, in which subject nations enjoyed considerable local autonomy in matters of culture and talented provincial leaders were able to rise to positions of imperial authority. IBM was among the first and most successful of a new breed of multinational enterprises, driving and profiting from the gradual reintegration of the global economy over the second half of the twentieth century to create what Geoffrey Jones calls the second global economy.<sup>1</sup>

In Europe IBM began to lay the groundwork for this immediately after the Second World War, years before European governments themselves began to dismantle trade barriers and create the institutions that grew into today's European Union. We focus here on the early part of this story, the rebirth of IBM's European operations in the aftermath of war. While our

approach is influenced by recent work on the international history of computing we focus here on the role of one of IBM's less celebrated products, the electric typewriter, in building the institutional, political, and cultural strengths it would later deploy to marginalize its competitors within the computer industry.<sup>2</sup> Historians such as Lars Heide, James W. Cortada, and Steven W. Usselman have already shown that IBM laid the foundation for its success in the computer era during the preceding decades with its punched card machine business.<sup>3</sup> Here we extend this insight in several ways, to encompass other products, new markets, and the intersecting influences of political factors such as trade barriers and the Marshall Plan.

These developments during the immediate postwar decade remade IBM as the exemplar of a new kind of multinational enterprise. Like other major US corporations such as General Electric and General Motors IBM had established a European presence early in the twentieth century through a mish-mash of joint ventures, licensing agreements, distributors, and subsidiaries. After the war IBM built on the framework of the Marshall Plan to replace this with an integrated network of national subsidiaries offering an almost standard set of products. These were controlled, and usually wholly owned, by the US-based World Trade Corporation but managerial decision making and production were deliberately distributed across subsidiaries with a new pan-European management team installed in Paris. Although IBM itself has been very widely studied, the literature on the World Trade Corporation is sparse.<sup>4</sup> We are able to ground several aspects of its history in archival sources for the first time.<sup>5</sup>

IBM's unique manufacturing system made the corporation an integral part of European reconstruction during the early-1950s. The key innovation was IBM's distributed manufacturing of electric typewriter parts in several European countries in order to exchange these component parts across borders to create export and minimize duties. IBM's World Trade Corporation was not, in this early period, about free trade. Instead the visible hand of

management shuffled resources and components between national subsidiaries to appease local governments and avoid the tariffs and political price attached to imported goods. The typewriters themselves became transnational artifacts, assembled using parts from eight countries. IBM's business and politics connected with the Marshall Planners' ideas and integrated European economies. With the bold interchange plan, IBM proved itself an exemplary corporate citizen *avant la lettre*, both of the United States and of most major nation states in Europe.<sup>6</sup>

While many big US corporations invested in Europe and employed local citizens as managers, especially after the Marshall Plan started, IBM's investment was exceptional in embracing European integration by engineering its own networks of interdependence among European nations. Its manufacturing networks became a form of infrastructure, something historians have increasingly recognized as a crucial underpinning for Europe's economic and political integration.<sup>7</sup> Making all this work was far from easy, requiring conflict-solving negotiations, increased communication and centralization of control. Analyzing IBM's postwar re-organization in Europe supports Mira Wilkins's conclusion that the US multinational companies in particular contributed to European integration because they shared many advantages in developing European-wide operations.<sup>8</sup> IBM pooled its American and European experiences and resources to create a distinctively European manufacturing system. Thomas Watson Jr., the firm's leader during the 1960s, later wrote that the integrated European system of production IBM created around the typewriter was "a kind of common market ten years before the real one existed."<sup>9</sup> The boast highlights IBM's success in building networks of international trade and collaboration, but hides much of what was most novel about the firm's structural innovations. As we shall show, they made sense only in a Europe without a common market, full of borders, tariffs, and protectionist sentiment.

### **World Peace and World Trade**

To say that the 1930s were a challenging time for American businesses would be a understatement. Yet IBM had weathered the early years of the Depression well, thanks to its business model of leasing rather than selling its products. The establishment of the Social Security Administration brought with it huge government orders for the firm's punched card systems, so that by the mid-1930s it was again expanding rapidly. As it ballooned IBM remained a family firm, dominated by its leader, Thomas J. Watson. This salesman extraordinaire was hired to manage the fledgling Computing Tabulating Recording Company in 1914. A decade later he renamed the company International Business Machines, a name capturing his ambitions for the still obscure firm.<sup>10</sup> IBM's ever growing columns of employees waved banners, sang proudly from the IBM Songbook (particularly its anthem, "Ever Onward"), shaved their faces, and dressed in dark suits with white shirts.<sup>11</sup>

During the 1930s Watson prioritized rapid international expansion. He would arrive to ceremonially open a new outpost, like a monarch visiting an obscure colonial possession. Employees would cheer as Watson received the blessing of local dignitaries. A handful of large European countries had significant and well established IBM outposts, but in many cases this was a symbolic act of planting IBM's flag on another corner of the globe.<sup>12</sup> This also carried a serious political purpose. Nationalism and political extremism were driving apart some of the firm's most important markets. Trade could bring the world together, and IBM would spread the universal values of rationality and capitalism. IBM's products promised to bring efficiency and progress, but war was neither efficient nor businesslike.

Perhaps the greatest salesman of his generation, Watson pitched peace to a troubled world as chair (1937-39) of the International Chamber of Commerce (ICC), a sort of businessmen's league of nations. This belief in the pacifying influence of globalized business

strikes us as a forerunner of the canard that two countries with branches of McDonalds will never fight each other.<sup>13</sup> He did his best to ensure that IBM salesmen would never be required to kill each other or destroy each other's factories. Watson was never a fascist sympathizer, unlike some of his fellow American business leaders, but like many in the 1930s he had a fondness for crowds, rallies, and public adoration. At a meeting in Berlin in 1937, Adolf Hitler promised him there would be no war.<sup>14</sup> Watson's slogan of "World Peace through World Trade" was apparently vindicated.

Events, alas, proceeded otherwise. Europeans worked industriously to reduce much of the continent to rubble and all of its major economies to penury. IBM machines, old and new, were used on both sides in the war but the firm had lost control of its little empire of subsidiaries and joint ventures across Europe. This was most apparent in Germany, where IBM had acquired a controlling stake in its formerly independent agent, Dehomag, after the Mark collapsed during the 1920s. Its charismatic leader, Willy Heindinger, retained considerable autonomy, which only increased as public evidence of nationalism and development of German self-sufficiency became a mandatory part of business conduct during the Nazi era. After 1933 IBM was unable to repatriate Dehomag's profits, and when America finally entered the war Heindinger took full control as the "custodian" of an "enemy company."<sup>15</sup> The regime's reliance on Dehomag products became a source of embarrassment to IBM, and Dehomag's push to supply machines to occupied territories beyond German borders later helped critics to paint IBM itself as a participant in the Nazi holocaust.<sup>16</sup>

When peace returned in 1945 neither the state of IBM's facilities in Europe nor the finances of its former customers gave much hope for a rapid recovery. A 1946 IBM report summarized its ambivalence towards Europe as a market: the potential market for its products was substantial, as was their potential contribution to Europe's economic recovery, but

limited supply of currencies and government restrictions seriously complicated cross-border shipments and trade.<sup>17</sup>

IBM's rapid wartime expansion, fed by government contracts, gave it the resources to try again in Europe. The first American multinationals to make major new investments in postwar Europe were oil companies, a potential source of new orders.<sup>18</sup> Recovery started with locating IBM machines and personnel and regaining legal control of IBM companies. James G. "Jimmie" Johnston, general manager of IBM world manufacturing, was dispatched to Europe from the middle of 1946 to February of 1947 to help resume local production.<sup>19</sup>

### **The World Trade Corporation**

Unshaken by the failure of his previous foray into international relations, Watson became a fervent supporter of the United Nations, established in 1945, and of strengthening America's engagement with the world.<sup>20</sup> In July 1948 Watson sailed back to Europe.<sup>21</sup> The trip marked the start of IBM's transformation into a truly global manufacturing corporation, providing a glorious final act for Watson's career. By the time he bequeathed International Business Machines to his sons in 1956 it had finally earned the grand title he chose more than three decades earlier.

Accompanied by one of his sons and by his top managers, Watson spent more than two months on a corporate version of the old grand tour, taking in France, Switzerland, Italy, Great Britain, the Netherlands and Belgium. They viewed war damage, met local politicians, and investigated market conditions. The fighting was over but Europe was far from tranquil. The Cold War was in its dangerous, unfamiliar early stages. Churchill had warned of an "iron curtain" partitioning the continent back in 1946, the same year that George Kennan's famous "long telegram" from Moscow proclaimed that the key challenge of the new era was containing the spread of Soviet communism without "general military conflict." Europe was

by now unmistakably divided, but the exact dividing line and its stability was still fuzzy. This was the year of the Berlin Airlift, as an alliance of Western nations successfully fought a Soviet attempt to establish control over the whole city. A civil war raged in Greece between communist and pro-Western factions while a communist coup cemented Soviet domination of Czechoslovakia. Within the United States an atmosphere of crisis mounted, as public opinion swung towards more vigorous actions to limit Soviet influence on the rest of Europe. One result was approval by Congress of the previously controversial 'European Recovery Program', the Marshall Plan, to support the economic redevelopment of Western Europe.<sup>22</sup>

The geopolitical drama was of direct and material interest to Watson. After the war many of IBM's subsidiaries in Central and Eastern Europe had begun their redevelopment, just as in countries on the other side of the eventual dividing line. But the remaining IBM companies were now subject to increasing state control. Several IBM managers in the region were jailed and by 1949 none had reasons for optimism.<sup>23</sup> The Czech coup was particularly shaking to Watson, as business had previously been recovering well there. Containing the spread of communism would safeguard IBM's access to some of the world's largest potential markets.

IBM publically announced its World Trade Corporation a year later, in 1949, but it is clear that this trip laid the groundwork.<sup>24</sup> Its creation has sometimes been explained in terms of dynastic transition, as Watson split his empire between his sons Thomas Watson Jr. and Arthur K. "Dick" Watson.<sup>25</sup> Watson Sr. had indeed made his plans clear to both sons, and already had Dick by his side during the 1948 trip.<sup>26</sup> But we do not believe that this gives the whole story.

The reorganization created a new relationship among IBM's national organizations. IBM's earlier European operations had developed erratically. Some subsidiaries had evolved



from distribution or licensing agreements and thus were jointly owned. In the United Kingdom, for example, a licensing agreement for tabulating machines signed in 1907 predated the formation of IBM itself. In the economically difficult early and mid-1930s key host governments had pushed IBM subsidiaries to increase local manufacturing.<sup>27</sup> IBM also built factories in the four largest countries to get behind tariff barriers and protect its interests in Europe.<sup>28</sup> As we saw in the case of Dehomag self-sufficient national subsidiaries could create considerable problems for IBM.

The end of the war gave Watson a chance to sweep away these messy relationships, creating new subsidiaries that were uniformly structured and, if at all possible, wholly owned by a new IBM unit, the World Trade Corporation. This encompassed not just the European operations but all IBM units outside the United States, even IBM Canada.

Thus, for example, Watson began to negotiate the end of IBM's licensing agreement with British Tabulating Machines, dissolving the relationship in 1949. The new IBM UK subsidiary offered an opportunity for the firm to market its products throughout the British Commonwealth where, with the exception of Canada, it had previously received only a 25% royalty on whatever BTM could sell.<sup>29</sup> Pulling this off required corporate diplomacy at the highest levels over several years, beginning with discussions held with Harold Wilson, industry minister in Clement Attlee's Labour government, during the 1948 trip.<sup>30</sup> Although the deal was a top priority for IBM, negotiations proceeded slowly.<sup>31</sup> Wilson thought that Britain's scientists and inventors held the key to its economic future, establishing the National Research Development Corporation in 1949 to commercialize new technologies.<sup>32</sup> He was loath to see IBM supplant its British licensee without extracting significant concessions, for example in the location of IBM's planned factory. IBM had controlled since 1929 a large factory at Hammersmith in London producing time equipment, which was not covered by the BTM licensing deal. IBM World Trade purchased this in 1949 for its new

subsidiary.<sup>33</sup> The British government, however, had other preferences – pointing IBM to Scotland.<sup>34</sup>

A final agreement was not reached until Watson returned to Europe in the summer of 1950. IBM UK would have 40 per cent British ownership. This was the biggest ownership concession agreed for any of the new European subsidiaries, but the UK held the strongest hand as its existing license was still in force. Wilson was further mollified with an agreement that IBM UK would rent a manufacturing plant in Greenock, Scotland “to be built by the Government.” In the end, however, IBM won approval to build and own the plant itself.<sup>35</sup> IBM UK started operation in 1951.

When IBM World Trade began operation in October 1949 it was staffed with a multinational team of executives. Johnston was appointed Vice President in charge of manufacturing. A young man named Frances Ritz was promoted to be his assistant.<sup>36</sup> IBM World Trade was headquartered in Manhattan, but Johnston and Ritz set up their office in Paris, where IBM built a European management group initially comprising fifteen people.<sup>37</sup> Their arrival, and their plans for Europe, were transmitted around the IBM empire on what the firm’s newsletter called “the most extensive telephone broadcast ever made.”<sup>38</sup> Together they mobilized IBM’s European manufacturing experts, with Ritz overseeing the rebuilding and opening of IBM factories in several countries.<sup>39</sup>

While Europeans like to mock Americans for their cultural insularity and ignorance of the broader world, the truth is that heavy and largely unrestricted immigration during the late nineteenth and early twentieth centuries gave firms such as IBM a diverse pool from which to draw executives. Born a Scot, Johnston had been with IBM since 1916, becoming the first European born man to rise to such a high level in its management. He spent most of that time in the US, but had coordinated European production as a manufacturing consultant from

1935-39.<sup>40</sup> Heading the postwar manufacturing expansion was Johnston's last contribution to IBM before retiring in 1954.<sup>41</sup>

In contrast Francis Urban Ritz was born in 1918 in Binghamton, NY, not far from IBM's main punched card facilities in Endicott.<sup>42</sup> Although he spent his formative years in the United States he was no stranger to European culture. Both of his grandfathers had emigrated from Germany.<sup>43</sup> Binghamton was a local cultural and manufacturing hub, attracting immigrants to its "Valley of Opportunity". His neighbors were born in locations as varied as Czechoslovakia, Denmark, Italy, Romania, Syria and Wales.<sup>44</sup> Ritz's provincial America meant people with different backgrounds, many of them European, communicating and working together.

His father worked at the Endicott-Johnson Shoe Company operating an edge trimmer machine.<sup>45</sup> Endicott-Johnson was a key model for Thomas Watson Sr.'s model in building IBM's paternalist system of welfare capitalism.<sup>46</sup> Francis chose the other dominant local business and was hired by IBM at the age of 18 in 1937. Following completion of the basic one-month IBM training course, Francis Ritz spent four years completing an IBM-sponsored two-nights-per-week course in tool making engineering at the high school in Endicott.<sup>47</sup> Working through several jobs and departments, Ritz was promoted to a managerial position in 1942 and transferred to IBM's new facility in Poughkeepsie, NY, where he helped to expand IBM's manufacturing for the war effort. From 1944 to 1945, Ritz served as a US Navy pilot.

He was almost 30 years old in September 1948, when he first travelled to Europe on IBM's behalf as a "technical engineer," visiting France, Germany, Netherlands, Belgium and England, and making "a survey of manufacturing possibilities in Spain."<sup>48</sup> He then spent the

first part of 1949 at IBM headquarters planning for a new continent-wide manufacturing system and communicating with his European colleagues.

### **IBM's Electric Typewriter**

The armistice documents of 1945 were typed on IBM's electric typewriter – a product for which Watson Sr. had high hopes.<sup>49</sup> As a consummate salesman he was aware of the benefits of making his products into symbols of the new postwar order. He later had a brace of white typewriters presented to the Pope, and a few years later when Dwight D. Eisenhower returned to Europe as the first Supreme Commander of NATO forces an electric typewriter was waiting for him.<sup>50</sup>

The electric typewriter was neither IBM's first product nor its most lucrative. Watson had taken advantage of the Depression to acquire this technology by purchasing the Electromatic Typewriter Company of Rochester, New York in 1933. IBM's first "Electric Typewriter" model was launched two years later, but it was an expensive, niche product. When preparing for peace in 1943 Watson had emphasized the development of low-priced electric typewriters as IBM's main product aimed at small businesses. While historians have focused on high-end electronic products as IBM's key product initiatives of the immediate postwar period, we should not forget that the firm's revenues from electric typewriters grew fivefold in the first decade of peace.<sup>51</sup>

Electric typewriters had shown promise in the European market before the war, making them the obvious tool with which to rebuild IBM's European operations on a broader and sounder basis than before. In Europe firms were typically smaller and cash was scarce. Considered as typewriters the new electric models were rather expensive – perhaps three times more than a manual model. But compared to punched card machines they were casual purchases. An electric typewriter could be purchased outright for about what it cost to lease

one of the cheaper pieces of punched card equipment for one month and, unlike the punched card machine, would be quite usable without other IBM products.



*Caption for image 1: IBM marketed electric typewriters as easy to use machines that made typing light and increased productivity. This 1952 advertisement for the IBM Model A, announced in the late 1940s, aligned the gentleness of the typewriter with the femininity of flowers and manicured hands.*

IBM's model rested on its legendary sales team establishing relationships with businesses and gradually supplying them with greater volumes of equipment, making

typewriters and their associated service contracts a beachhead within thousands of new customer organizations. They were sold to businesses large and small, schools, and local government offices.<sup>52</sup>

### **The Interchange Plan**

The creation of the World Trade Corporation, and its many national subsidiaries, was tied to the development of a new manufacturing strategy known within IBM as the “interchange plan.” Both were formulated during Watson’s 1948 tour.

As we already saw, the creation of the new World Trade subsidiaries required difficult negotiations with national governments and local partners. IBM’s 1946 report had acknowledged serious challenges in the postwar environment. The past twenty years had seen one setback after another for international trade. The 1930s were marked by virulent nationalism in many countries, the erection of trade barriers, and a succession of currency crises that pushed many countries off the Gold Standard. Events from 1939 to 1945 had done little to improve trust and strengthen ties between the continent’s largest economies. IBM later admitted, “France would give German-made typewriters a chilly reception.”<sup>53</sup>

New governments taking control of countries that were variously ruined, occupied, hugely indebted, partitioned, or humiliated were eager to rebuild their shattered economies. Exports were an attractive way of stimulating redevelopment. Imports were much less attractive. They consumed precious reserves of foreign currency and were depicted politically as blows against struggling national producers. Most countries continued to require import permits. Postwar unemployment still threatened to create support for communist parties, and no government wanted to be seen as undermining local industry.

Ritz explained later that national officials had a common condition for allowing IBM to expand its presence: exports should exceed imports.<sup>54</sup> Yet countries could not ramp up

exports unless their neighbors and trading partners were willing and able to import their goods. Partially due to import restrictions IBM's electric typewriter sales outside the United States decreased by almost twenty per cent from 1948 to 1949 as demand could not be fulfilled.<sup>55</sup>

The solution was for the new World Trade Corporation to build up its own manufacturing capabilities. IBM supplied the entire United States, a larger economy and larger land mass than the whole of Western Europe, from its plants in upstate New York. From the point of view of efficiency and logistics, a single centrally located European manufacturing plant could have supplied a particular product, such as electric typewriters, for the entire European market. This was indeed the system of production that IBM ultimately adopted, the importance of which has been recognized by historians as a significant contributor to its success.<sup>56</sup>

Unfortunately it relied on preconditions of free trade and currency conversion that did not exist in 1948. Europe's post-War wages were much lower than those of the United States, which made a strong economic case for local production of typewriters, a labor-intensive good with a potentially huge but price-sensitive customer base. Unfortunately for IBM the political and economic reality of Europe in the immediate postwar years bore little resemblance to the classical economic picture of natural advantages maximized by free trade to the good of all.<sup>57</sup> Relocating production to Europe would, in itself, only marginally improved the problems caused by tariffs, import permits, currency shortages, and protectionist politics. Typewriters produced by IBM World Trade in Paris were still imports for its Italian or German subsidiaries, just as if they had been produced in Endicott, New York. Setting up a complete typewriter plant and supply chain in each national market would solve the problem of trade barriers, but sacrifice all economies of scale. Even the larger

European markets were still depressed, and the firm would not realistically have been able to justify the investment to operate in smaller countries such as the Netherlands or Finland.

IBM's internal newspaper credited Watson with having researched the economics of interdependency to discover that "International trade is a two-way street."<sup>58</sup> Yet IBM could not force countries to accept its imports or a philosophy of free trade. Instead it had to reimagine its typewriters within a divided Europe of protectionist regimes, weighting their components so that the typewriter was, in aggregate, as close as possible to being neither an import nor an export.

The interchange plan found an ingenious middle ground between domestic production and importation of typewriters. The idea was for each of World Trade's new European subsidiaries to contribute components to every typewriter sold in Europe. In every country, custom duties on finished goods, such as machines, were much higher than duties on parts. IBM therefore shipped only parts across borders.<sup>59</sup> Final assembly took place in national plants, branding the typewriters themselves as domestic goods. This was not in itself a novel idea. Local assembly is a classic response to high tariffs on finished goods. Indeed, shipping parts across the Atlantic for assembly was an established part of IBM's manufacturing heritage in Europe. IBM's earliest European factories in Germany (1924, and even earlier), France (1925), and Italy (1935) did not initially manufacture entire machines.<sup>60</sup>

The new twist was IBM's recognition that trade could be balanced within each individual typewriter. Its electric typewriters were complex mechanisms, each containing 2,200 parts. Design and development work took place in the United States, with only the keyboard symbols and layout customized for national markets. IBM's European managers were asked to identify specific parts that could be manufactured efficiently in their countries, either by an IBM factory or by a specialist subcontractor. For example, IBM France's



exports of typewriter components would precisely counterbalance its imports if it assembled and sold one quarter of the IBM typewriters in Europe but supplied, by value, one quarter of the components used in IBM's other European typewriters factories. In practice, as we discuss below, things were complicated by the flow of other goods and parts between subsidiaries.<sup>61</sup> Balancing the imports and exports of each subsidiary bolstered their political positions, minimized tariffs, and stabilized their previous reserves of foreign currency.

This system would also foster interdependence among the various national firms, since producing a single batch of typewriters involved reliance on and interaction with colleagues in many other parts of Europe. Europe's fragmented cultural and political environment pushed IBM to further international solidarity in various ways in postwar years, from parts interchange to organizing international meetings, assignments abroad and publishing its new magazine. These programs would expedite the realization of IBM's international plans but also bring Europeans together.

The strategic benefits to IBM of leaving its subsidiaries incapable of independent production might also have appealed to Watson. Independent local subsidiaries were at risk of appropriation, as IBM's wartime experience had made clear. Distributing production, while retaining centralized control over product design, would make it easier for IBM World Trade to deal with the interruption of supplies from any one country.

Watson Sr. accepted the interchange plan as the basis for production in the new World Trade Corporation during the many meetings of his 1948 European tour. One such meeting was a "Managers Meeting" in late September 1948 in Paris, "for the first time after the war," as highlighted in IBM Finland's travel log. Watson Sr. and Arthur Watson attended, along with Johnston and IBM managers of 15 countries, all with their wives.<sup>62</sup> It is not clear how much Watson personally contributed to the concept and how much was provided by

others such as Johnston. Contemporary sources attributed the idea to Watson, but given the cult of personality he had built up within the firm one would not expect otherwise. Various claims were made later by others, but the question of invention is neither resolvable nor particularly important.<sup>63</sup> The system had from the start been planned with the prior approval of European governments.

Johnston knew of Francis Ritz through his management roles in IBM manufacturing from 1939.<sup>64</sup> He chose Ritz, aged 29, to develop and realize the new plan. Hence, Ritz began drafting the manufacturing expansion while IBM's top management stayed in Europe. Francis Ritz's transfer to the IBM World Trade division helps us date the inauguration of the interchange plan. He started preparing the system in September 1948 and managed its implementation over the next six years.<sup>65</sup> World trade was not free trade, and the visible hand of Ritz often reached out from Paris to shuffle components around Europe to keep the master plan functioning smoothly. For IBM, achieving cooperation and integration on the European scale meant centralizing planning and control.

### **Implementing the Interchange System**

IBM's ramping up of European production capabilities in 1948–49 benefited from and supported the Marshall Plan, which aimed to limit the spread of communism by expanding manufacturing and export in most of Western Europe.<sup>66</sup> Its new World Trade Corporation was exceptionally well situated to simultaneously form productive relationships with both the US government and with the eight most important Western European nations initially chosen for interchange and major export roles. Each built an electric typewriter production line. IBM's three major pre-war factories, in France, Western Germany and Italy, added typewriter parts to their range. New production facilities for manufacturing electric

typewriter components were established in Belgium, Great Britain,<sup>67</sup> the Netherlands, Sweden, and Switzerland.<sup>68</sup>

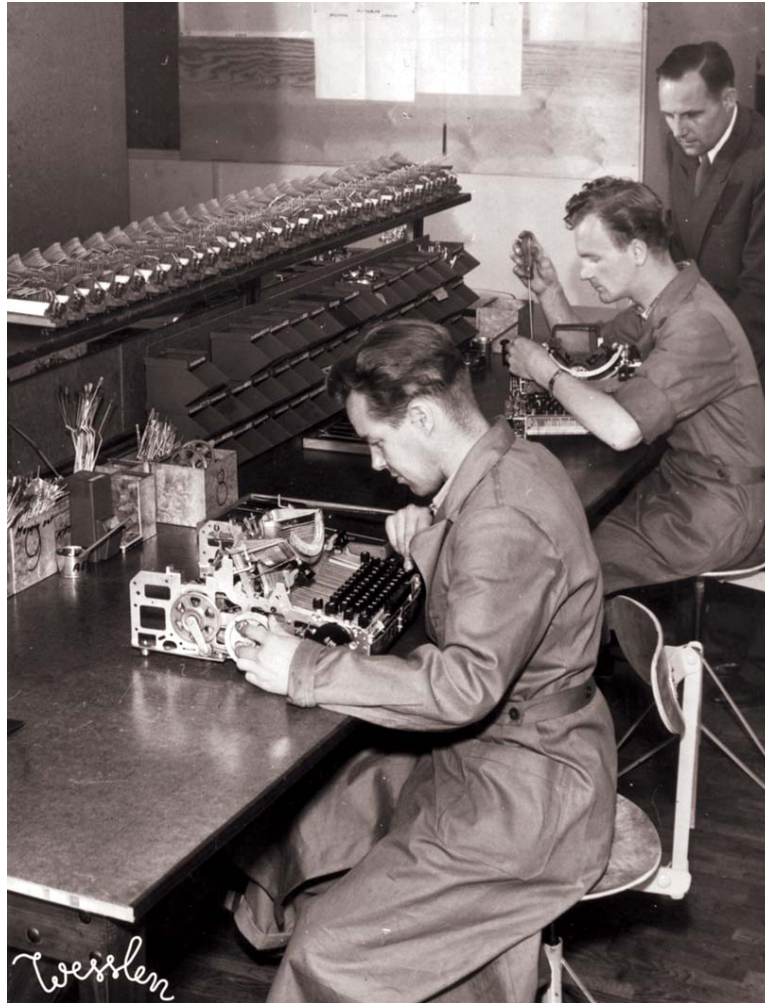
IBM Canada had a special supporting role in the system: “If the program got slightly out of balance in any country, Canada could take up the slack — since Canada assembles but does not manufacture parts for electric typewriters.”<sup>69</sup> To balance its imports therefore, any of the eight European organizations could export parts to IBM Canada. This made Canada alone a net importer of parts, but political and economic conditions made this more tolerable and it could always export elsewhere in North or South America if needed. This interchange plan helps to explain the inclusion of Canada in the domain of World Trade, since from a logistical viewpoint it might fit more naturally as an extension of IBM’s domestic operations.

Spain was the only large Western European country not to be included in IBM’s interchange plan. Francis Ritz had studied Spain as a manufacturing country in late 1948, but Spain was not offered aid through the Marshall Plan as the United States government did not support Franco until the early 1950s.<sup>70</sup> This apparently influenced IBM’s parallel decision to defer investment.<sup>71</sup>

IBM used its pan-European typewriter as a very public symbol of its commitment to the revival and reintegration of Western Europe. In January 1951, the first electric typewriter assembled in the United Kingdom was shown in a London hotel to important customer representatives. These members of the upper classes were carefully pictured for the global IBM magazine with Johnston, whose own British origin made him a symbol of the opportunity IBM could provide to employees of its new subsidiary.<sup>72</sup>

It was Ritz who crisscrossed Europe month after month putting in place the many mechanisms and agreements needed to support such an unlikely machine. For example, shortly after the London launch Ritz was an instructor at the first Electric Typewriter

Assembling Course in Europe, with participants from six European countries. The course took place in Amsterdam where another assembly line was by then in full operation. Later in 1951, Ritz assisted when IBM Belgium organized a typewriter assembly line in Brussels. Next, the magazine reported that assembly was underway in Sweden.<sup>73</sup>



*Figure 2: In this 1951 picture, Sven-Birger Granhagen, Georg Bursell and Leif Sahlstrand focus on keyboard assembly in IBM's Stockholm plant. Picture from: "IBM Svenska ABs historia" (IBM Sweden's history, in Swedish), <http://www-05.ibm.com/se/ibm/sweden/history/1951.html> (Accessed 10.1.2012)*

By the end of 1951 these assembly lines were running well, mostly in temporary facilities, though later reports suggested that the first machines would have relied in large part on American parts, with a switch to European components over the next year.<sup>74</sup> IBM's manufacturing managers concentrated on increasing component production capacity and building permanent factories. In July 1952, IBM World Trade officially opened a new factory in Amsterdam, dedicated primarily to electric typewriters. Ceremonies were attended by more than 1,200 guests and covered extensively in the media.<sup>75</sup> IBM expanded production by starting electric typewriter assembly in existing factories in France and in West Germany in 1953.<sup>76</sup> In 1954, IBM World Trade opened and dedicated three new factories: an electric typewriter parts plant in Zurich, the promised factory in Greenock, Scotland, and a new factory in Stockholm.<sup>77</sup>

As Mira Wilkins noted, American firms “were outsiders, and so had no special affiliation with any particular European country.”<sup>78</sup> Decisions on the allocation of production were made by the IBM World Trade board. IBM management had some flexibility to reshuffle production towards the most efficient subsidiaries, creating a degree of competition in its internal market: “Holland has the lowest cost of typewriter (sic.) and can handle a great deal of export.”<sup>79</sup> Therefore, IBM gave Amsterdam more production.

Ritz was careful to present the unwieldy production system as economically efficient rather than purely driven by politics. Its publicity materials quoted him as attributing decisions to national competencies. Thus “Sweden was admirably qualified to make spring-steel parts”, and “Switzerland was unexcelled in making small precision parts.” In Sweden, an air-craft instrument maker began production of spring-steel parts, and “in Holland a clockmaker joined the program.”<sup>80</sup>

Despite these appeals to economic rationality, decentralising manufacturing made quality assurance much harder. Ritz had already emphasized quality in his first European assembly course for IBM in Amsterdam in 1951.<sup>81</sup> He foresaw that obtaining uniform and high quality in parts would be difficult with so many subcontractors in several countries. In 1953, severe problems with quality were reported from Sweden and Germany. These quality issues coincided with a new European sales campaign for IBM typewriters and further production expansion. According to Ulrich Steinhilper, who began selling typewriters from office to office in West-Germany's Stuttgart area, the quality of the machines delivered in early 1953 was abysmal.<sup>82</sup> The machines broke down in a few days and Steinhilper had to take them to IBM's typewriter repair shop. German IBM management wanted to solve the problem internally, avoiding communication with IBM World Trade in Paris and New York. Steinhilper challenged this traditional autonomy by going directly to international management when faced with the dilatory response of his German superiors. With international assistance the German factory was able to turn things around.<sup>83</sup> Steinhilper eventually joined World Trade's international management but is best remembered for coining the term "word processing" to give the humble typewriters and dictating machines he was responsible for selling rhetorical equality with the products of the company's "data processing" division.<sup>84</sup>

The quality issue was the most serious problem in building the interchange manufacturing system. Creating and securing an adequate flow of information, another kind of linkage, from the national subsidiaries to IBM's European management in Paris required extra effort and circulation of managers.

### **Broadening Integration**

IBM's public relations drive focused exclusively on typewriters, perhaps because they were more familiar and could be sold to a much broader range of organizations than IBM's punched card products. The typewriter was indeed unique in having itself been turned into a transnational artifact explicitly to balance trade flows. However our evidence suggests that the distribution of typewriter production was from the beginning used to balance the flow of other IBM products and parts between national subsidiaries. By 1960 typewriters still accounted for only ten per cent of IBM's revenues.<sup>85</sup> Punched-card systems remained its biggest business, but their complexity and specialized nature made it hard to diversify their production beyond the largest European markets, France and West Germany, where they dominated national production. Both IBM Germany's Boeblingen plant, established in 1949,<sup>86</sup> and IBM France's Essonnes plant only shipped their thousandth electric typewriters in 1954, hitting this symbolic milestone after their smaller neighbors.<sup>87</sup> IBM began to diversify assembly locations and component product for its punched card products after proving the workability of the interchange plan with its typewriters. According to one claim, production of IBM's 421 tabulator model, a core part of any punched card machine installation in this era, was eventually extended from existing facilities in France and Germany to plants in Amsterdam, Sindelfingen and Milan.<sup>88</sup>

In contrast, punched cards themselves accounted for about 10 per cent of IBM's global revenue, and required a relatively small investment to produce within a domestic market. By 1953, IBM World Trade had established punched-card plants in 14 European countries.<sup>89</sup> This spread IBM's manufacturing investments beyond even the reach of the Marshall Plan, to Spain, which had been excluded, and to Finland, which had declined participation from fear of the Soviet reaction.<sup>90</sup> Exports of cards could be balanced against imports of typewriters. Finns had been eager to buy typewriters. By 1952 IBM Finland had accumulated a queue of

130 orders for typewriters but, thanks to a dearth of foreign currency and import permits, it could deliver only three machines. The effect on its revenues was dramatic.<sup>91</sup> This posed a major problem for IBM Sweden, which had counted on typewriter exports to Finland to balance its own component imports and satisfy its political promises.<sup>92</sup>

Swedes and Finns attempted to resolve this problem on a bilateral basis, but ultimately lacked the authority to act independently within this centrally planned system. IBM Sweden had suggested that better power frames be manufactured in Finland. Under the interchange system these were made in England, but the manager of the IBM electric typewriter assembly factory in Sweden confided in a Finnish colleague that the British components were substandard.<sup>93</sup> Procuring frames from Finland rather than England this would help IBM Finland acquire its permits to import typewriters assembled in Sweden.

That never happened, but the Swedes did act unilaterally to substitute domestically produced power frames and earned a rebuke from IBM management in Paris. Paris subsequently monitored IBM Sweden more closely than before, but it also focused its own resources on the quality problem.<sup>94</sup> Ritz was back in Stockholm later in 1953, as the factory there celebrated its one thousandth IBM Electric typewriter.<sup>95</sup> He used the occasion to assist with the problem of parts quality.

Instead IBM Finland was saved by the output of the new punched card factory, and by another niche that World Trade management found for Finland in its planned economy by 1955: “the Finnish part is to produce carbon paper (ink) ribbon which is an appropriate product for a country focused on exporting paper.”<sup>96</sup> This national dimension was foregrounded in a popular magazine *Valitut palat*, the Finnish edition of *Reader’s Digest*,<sup>97</sup> which speculated that “the day will not be far away when people everywhere in Europe use ink ribbons ‘Made in Finland.’”<sup>98</sup> Thanks to the interchange system IBM Finland could now



obtain its typewriters from whichever national subsidiary was purchasing its cards and ribbons. “Not long ago Finland wanted typewriters. Normally it would have bought them from Sweden, but was short of Swedish currency. It had a surplus of Italian lire, so placed the order in Milan instead. Dozens of such incidents could be cited to show how the program has given European trade a new flexibility.”<sup>99</sup>

Similar expansion by integration occurred in other countries and across other product lines.<sup>100</sup> According to information received by a new electric typewriter salesman in Western Germany in 1953, parts were produced “in about thirteen different European countries.”<sup>101</sup> Some products were made in five or six factories.<sup>102</sup> In an attempt to duplicate its success in Europe, IBM World Trade launched an interchange system for typewriter manufacture in five South American countries in 1956.<sup>103</sup>

By the autumn of 1955, the interchange system was considered bedded down..Francis Ritz helped to launch a world-wide publicity drive for IBM’s unique, cross-border European manufacturing system. He and his family then sailed back to the United States after six years in Europe.<sup>104</sup> He retired as an IBM as a vice president in 1977.<sup>105</sup>

### **IBM’s Public Diplomacy**

IBM promoted its interchange plan within Europe, as a contribution to shared prosperity and as proof that, under American leadership, Western Europeans could put aside their old hatreds to meet the challenge of communism. This message was disseminated internally and externally. *IBM World Trade News* was launched in 1949, along with the World Trade Corporation itself. Its expressed purpose went beyond that of a typical corporate newsletter and into political and cultural dimensions, “to aid in promoting international understanding and in eliminating international barriers.”<sup>106</sup> Thus the magazine was published

in several languages. Over the years it consistently promoted the interchange plan, and IBM's European operations, as a steps towards global harmony.

Watson himself remained the company's most powerful ambassador. During the European tour in 1950, Watson Sr., his wife and IBM executives spent four months visiting IBM organizations and leaders across Western Europe. Having chosen Paris as IBM's European headquarters Watson was made a "Grand Officer of the Legion of Honor" by the French foreign minister Robert Schuman. Schuman had recently presented his plan for a union of European coal and steel industries centred on Franco-German coordination.<sup>107</sup> IBM's magazine informed the world that Watson had told Schuman that "...you can count on me to do everything to help you carry out your plans."<sup>108</sup> Corporate self-aggrandizement aside, it does not seem fanciful to think that the two saw parallels in their plans for European integration, both intended to build broader cultural and economic ties through the coordination of industrial production. In Rome Watson Sr. was received by the Pope, another leader whose authority transcended national borders.

While in Europe, Watson Sr. feted the firm's most successful salesmen at three first three meetings of the IBM Hundred Percent Club meetings ever held there. Watson Sr. was already 76 years old in 1950 but made several more trips to Europe accompanied by his son Arthur to every important meeting and conference. He was visibly weakening for some years before his death in 1956 but he invested a great deal of his remaining time circulating in Europe and strengthening IBM World Trade's capacities.

IBM World Trade made a particular push to promote its message to a broader audience in 1955, when it hired John Drury Ratcliff (1903–73), a successful American science writer and freelance magazine writer.<sup>109</sup> His article on the interchange system, based largely on conversations with Ritz and predictably titled "World Peace through World

Trade,” was published in *Kiwanis Magazine* in the summer of 1955.<sup>110</sup> It claimed that the system’s contributions to international understanding, cooperation and goodwill (“a small but perhaps significant step toward a more unified Europe”) were more important than the thousand jobs it allegedly supported.<sup>111</sup> Interdependence fostered understanding, as “[w]ith workers in each country dependent upon workers in seven others, an international esprit de corps began to grow.”<sup>112</sup> The American and international magazine group Reader’s Digest, for which Ratcliff wrote regularly, republished the article, titled “Eight Countries Build a Typewriter” later the same year.<sup>113</sup> *IBM World Trade News* boasted that the Reader’s Digest story was published in seventeen languages with a world circulation of eighteen million copies.<sup>114</sup>

These 1955 articles did not mention the Marshall Plan or any other role for the United States. As Jacqueline McGlade has emphasized, the Marshall Plan was heavily contested in US business circles.<sup>115</sup> In that debate, Thomas Watson Sr. publicly committed IBM to defend the Marshall Plan and America’s international engagements. IBM presented itself as a model for other US multinationals and firms, not least because these corporations were its customers and their growth overseas would benefit IBM before long too.

This story resonates with the claims of Michael Hogan that American support was instrumental in creating processes towards a more integrated European economy.<sup>116</sup> One cannot, of course, credit Watson and Ritz with the creation of the European Union. Yet had there been no Marshall Plan, IBM would not have invested in Europe as early and widely as it did and thus would not have provided this powerful demonstration of the tangible potential of European cooperation across national borders. IBM’s choice of technology was powerful too: practically everyone knew electric typewriters, unlike computers and punched card machines, not least from IBM’s many advertisements in popular magazines. This publicity advertised both brand awareness and European integration, at a crucial time in the broader

economic unification of Western Europe. After some setbacks the six countries of the existing coal and steel union resumed negotiations on the creation of a broader common market in May 1955 leading to the Treaty of Rome in 1957.<sup>117</sup> This established the European Economic Community, and remains the founding document of today's much expanded and deepened European Union. Over the years to come internal tariffs were eliminated and external tariffs harmonized.

To the extent to which the manufacturing interchange plan supported steps towards a true common European market one might say that it carried the seeds of its own destruction. Watson Sr. regarded the interchange plan a clever solution for difficult times. His biographers appositely characterized the interchange plan as a "triumph of shrewd idealism."<sup>118</sup> By the late 1950s, IBM was reorganizing its manufacturing in anticipation of increased European integration. A new production system was suggested in late 1956, its implementation commenced in 1957 and it was planned to be mostly in place by 1960.

This "Product-by-Plant Program" rationalized IBM's production system by consolidating production of each product in a single location, relying on the planned dismantling of trade barriers against in finished goods within the new European Economic Community and the allied European Free Trade Area.<sup>119</sup> This system of assigning particular products to national subsidiaries remained in place for decades thereafter.<sup>120</sup> It permitted the reintegration of research and development with production, as World Trade subsidiaries began to design products as well as manufacture them.

IBM's decentralization of typewriter production peaked around 1958, when World Trade operated seventeen plants outside the United States.<sup>121</sup> Over the next decade, European production was consolidated from ten facilities to just two plants, in Amsterdam and West Berlin. In 1968, Prince Bernhard of the Netherlands opened a new plant which had more than

1,300 employees. This met increasing demand for IBM's Selectric (or "golf ball") typewriter, which had been manufactured in the Netherlands since 1961.<sup>122</sup> By 1983, when IBM introduced its personal computer to Europe, the plant had produced 2.5 million typewriters.<sup>123</sup> More than 90 percent of Dutch production was exported, the combination of low wages and excellent transport infrastructure making this an excellent manufacturing base.<sup>124</sup> West Berlin enjoyed no comparable logistical advantage, and we suspect that this plant was situated for political reasons, to support the enclave's sleepy and heavily subsidized economy. Its vulnerable location may explain IBM World Trade's departure from the new policy giving each plant a unique product. Outside of Europe, the IBM World Trade plant in Mexico gradually expanded to consolidate production for the Latin American and Asian markets.<sup>125</sup>

### **Conclusions**

IBM's interchange system operated for less than a decade in Europe, primarily for typewriters and punched card machines. As IBM exported its first computer to Europe only in 1955, and began selling them in large numbers only during the 1960s, well after the system was dismantled, it might be tempting to dismiss it as a historical curiosity of little relevance to the firm's electronic triumphs.<sup>126</sup> Indeed IBM's competitors in the computer business skipped over this stage, moving straight to the development of plants to serve the newly open Western European market.

We believe that the head start IBM achieved with this system was vital to its later success. Its ingenious reshuffling of production to overcome trade barriers provided the company with more than a dozen subsidiaries, each with its own manufacturing capabilities and sales networks. IBM's commitment to local manufacturing employment and the generation of exports won its subsidiaries popular and political support. IBM was always

American, but to Europeans it was not purely American. This had real benefits. In the decades to come, IBM's national operations were able to present themselves, when the political need arose, as patriotically rooted in the local economy and full of pride in the accomplishment of their countryfolk. Eda Kranakis showed that several European governments generated a formal European IT policy from the late 1960s onwards largely as a defensive reaction to IBM World Trade's dominance.<sup>127</sup> Yet IBM World Trade was, and had been since its foundation, a major European manufacturer, making concerted action against it legally and politically problematic.

This story likewise challenges historians to think more carefully about the assumption that postwar globalization of European trade can be reduced to "Americanization" even when driven by an American corporation. IBM's interchange plan was a creative modification and hybridization of US technology and management in postwar Europe.<sup>128</sup> The process was driven in part by a strategic desire to save European capitalism, and thus to further the firm's long-term business, but IBM's investment would have been hard to justify on any short-term measure of return. It invested a great deal in building up its new subsidiaries, but the interchange system forced accumulated profits to remain abroad since the whole point was to prevent national subsidiaries from being net importers of foreign goods or exporters of capital. IBM also paid a price in operational efficiency and, initially at least, in product quality by moving so many parts around Europe to balance trade flows. During the 1950s its European productivity sank further than ever below IBM's domestic plants.<sup>129</sup> Watson Sr. valued growth and the extension of the firm's infrastructure into new markets over profit.

We might see something faintly ridiculous about the idea of a "typewriter made in eight countries" using parts sourced from each partner. Yet this arrangement prefigured many landmark European projects to come – from European Science Foundation grant programs offered only to researchers collaborating across many countries to the era when Airbus had

two chief executives and was required to assemble its planes from sections provided by its national partner firms according to a quota system. For IBM, as for these later projects, transnational collaboration and the development of a continental marketplace were goals worth pursuing even if politics and economic nationalism meant that the reality would look more than a little awkward. Bringing European citizens together with a common purpose had its own value in a world where neighbors had so recently been exhorted to kill each other. IBM did this with its exchanges and sales meetings and in the new European layer of World Trade management based in Paris. Later on, the European Commission's Erasmus programs facilitated millions of student exchanges with a similar aim of creating a pan-European elite.

IBM's competitors, especially the essentially national European computer companies, faced increasing difficulties in competing with the European-wide resources and international relations that IBM had created.<sup>130</sup> IBM had the resources and confidence to set up its interchange system, at a time when trade barriers prevented more obvious approaches to serving the overall European market through the export of goods from a single plant. This set a hurdle that its American and European competitors did not attempt to clear. Under Watson's command, IBM used the seemingly non-strategic electric typewriter business to open new markets and to lay the foundation for an integrated pan-European business.

Let us finish where we began, with Thomas J. Watson Sr. and his quixotic dream of world peace through world trade. He can be a hard figure to relate to, even for his own biographers, a superlative salesman whose favorite product was himself. Watson was an autocrat with a weakness for pomp and an enduring need to ingratiate himself with the politically powerful. He was certainly no match for Adolf Hitler as a negotiating partner, and has come to symbolize the blinkered naivety of an international business elite who assumed that bourgeois appeals to shared interests could contain the Nazis' demented rage. As novelist J.G. Ballard once noted, Hitler remained perpetually vivid in the public imagination, whereas

his contemporaries, such as Neville Chamberlain and, we would add, Watson soon came to “seem pathetically fusty figures, with their frock coats and wing collars, closer to the world of Edison, Carnegie and the hansom cab.”<sup>131</sup> After Watson died his own son threw away the company song book and shifted decision making to a network of committees, rejecting aspects of Watson’s approach that appeared outmoded in the postwar world.

What of “world peace?” The phrase itself seems ridiculously dated, heard only in the mouths of New Age cultists and the hopelessly unworldly. It was memorably used in the film *Miss Congeniality* as a running joke to capture the vapid loftiness of purpose demanded from beauty pageant contestants. Yet in the last decade of his life Watson responded to postwar conditions with great skill as a veteran businessman, integrating technology, business, and politics into a plan that served both the cause of international stability and the long-term fortunes of IBM. We never achieved world peace, but armed conflict between the nations of Western Europe quickly became unthinkable. Further European expansion of the Soviet Union’s domain was successfully blocked and it eventually dissolved itself after withdrawing peacefully from Eastern Europe. Watson would have been content with that outcome, and with the enormous expansion of global trade over the past sixty years. Today only about twenty per cent of IBM’s global workforce is in the United States. This fusty autocrat and his long-forgotten transnational typewriter did more than has been remembered to lay the groundwork for our modern world.



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<sup>1</sup> Jones, "Business Enterprises and Global Worlds," esp. 590, 595. Jones calls this the second global economy. The first wave of globalization refers to the period that began in the nineteenth century and ended in 1914 or 1929. Ibid, 587.

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<sup>2</sup> Misa, “Understanding ‘How Computing has Changed the World’”; Cortada, “Patterns and Practices in How Information Technology Spread around the World”; Schlombs, “Engineering International Expansion,” ; Cortada, “The Digital Flood.”

<sup>3</sup> Usselman, “IBM and Its Imitators,” ; Heide, “Punched Card Systems and the Early Information Explosion”; Cortada, *Before the Computer*. See also Campbell-Kelly, “ICL: Taming the R&D Beast,” 170; Yost, “Appropriation and Independence.” Haigh, “The Chromium-Plated Tabulator” addressed similar continuities in use.

<sup>4</sup> There are several studies and publications about national IBM subsidiaries. See Nerheim and Nordvik, *Ikke bara maskiner*; Vernay, *Chroniques de la Compagnie IBM France*; de Goey and Wubs, “US Multinationals in the Netherlands.” IBM research more broadly includes Pugh, *Building IBM*; Akera, “IBMs early adaptation to cold war markets.” See also Cortada, *Before the Computer*; Olegario, “IBM and the Two Thomas J. Watsons.” IBM’s role as an exemplar of welfare capitalism and corporate liberalism is explored in Haigh, “Computing the American Way.”

<sup>5</sup> Most research on IBM World Trade’s history relies exclusively on secondary sources. This is due in part to a paucity of source material from which we are not entirely immune. IBM’s European archives were never open to academic researchers and have reportedly been destroyed by a fire. We have instead drawn on board minutes from the IBM Archive in Somers, NY and on archival documents from IBM Finland, one of World Trade’s smaller national subsidiaries. IBM World Trade’s in house international journal IBM World Trade News helped us to document the firm’s propaganda efforts and to verify certain dates and details.

<sup>6</sup> For IBM’s development as a corporate citizen in the US in the 1930s, see for instance Maney, *The Maverick and his Machine*, ; Stebenne, “Thomas J. Watson and the Business-Government Relationship,” .

<sup>7</sup> Misa & Schott, “Inventing Europe”; van der Vleuten & Kaijser, eds. *Networking Europe*.

<sup>8</sup> Wilkins, “U. S. Multinationals,” .

<sup>9</sup> Watson and Petre, *Father, Son & Co.*, 175.



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<sup>10</sup> For Watson's roots, see Tedlow, *The Watson Dynasty*, 9–13.

<sup>11</sup> See Stebenne, "Thomas J. Watson and the Business-Government Relationship," .

<sup>12</sup> Heide, *Punched-Card Systems*.

<sup>13</sup> This theory apparently originates with New York Times columnist Thomas J. Friedman. "Foreign Affairs Big Mac I," December 8, 1996. Friedman wondered if there was a "tip-over point at which a country, by integrating with the global economy, opening itself up to foreign investment and empowering its consumers, permanently restricts its capacity for troublemaking and promotes gradual democratization and widening peace." His theory was falsified in 2008 with the Russian invasion of Georgia.

<sup>13</sup> Thomas J. Watson: "World Peace through World Trade," *The Rotarian* LI (November 1937): 50–51; Watson and Petre, *Father, Son & Co.*, 55. For a discussion of Watson's relationship with Nazi Germany in the 1930s, see Maney, *The Maverick and his Machine*, 201–23.

<sup>15</sup> Heide, *Punched Card Systems*, 180–92, 233–48.

<sup>16</sup> Black, *IBM and the Holocaust*. Heide points out that Dehomag appropriated rental payments on IBM owned machines leased by its subsidiaries in Belgium, France, and the Netherlands and eventually seized IBM's French subsidiary.

<sup>17</sup> Report on IBM Foreign operations, March 11, 1946. World Trade Corporation/history, 1946-1964. RG 6, World Trade Corporation. Box 1. IBM Archive.

<sup>18</sup> Vernay, *Chroniques de la Compagnie IBM France*, esp. 75; Wilkins, "U. S. Multinationals," 342–48.

<sup>19</sup> See RG 14: War History Collection, Manuscripts: Demobilization - New Goals, Box 19, IBM Archive.

<sup>20</sup> Watson and Petre, *Father, Son & Co.*, 162; Haigh, "Computing the American Way," 12–13.

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<sup>21</sup> Maney, *The Maverick and his Machine*, 283; Watson and Petre, *Father, Son & Co.*, 176–77.

<sup>22</sup> Wilkins, *The Maturing of Multinational Enterprise*, 285–91. For influential studies of the extensive literature on postwar European recovery and the Marshall Plan, see for instance Milward, *The Reconstruction of Western Europe*; Hogan, *The Marshall Plan*.

<sup>23</sup> See esp. Minutes of a Meeting of the Board of Directors of the IBM World Trade Corporation, New York, December 22, 1952, draft. RG 6, World Trade Corporation Office of the Secretary, Board of Directors, Box 4, IBM Archive (cited hereafter as IBM-Directors); Connolly, *History of Computing in Europe*, ; Paju, and Durnová, “Computing Close to the Iron Curtain.” Interestingly some Czech salesmen were still able to attend a 1949 meeting of IBM’s 100 Percent Club. “World Trade Corporation Members of 1949 100% Club.” *IBM World Trade Corp. News* 1 (October 1949): 6–9; “More Men from Various Countries Join WTC Hundred Percent Club.” *IBM World Trade Corp. News* 1 (December 1949): 6.

<sup>24</sup> “IBM World Trade Corp. Organized,” *IBM World Trade Corp. News* 1 (October 1949): 1–2.

<sup>25</sup> Maney, *The Maverick and his Machine*, 282–83. Cf. Tedlow, *The Watson Dynasty*, 69–171.

<sup>26</sup> Watson and Petre, *Father, Son & Co.*, 176–78.

<sup>27</sup> Heide, *Punched-Card Systems*, esp. 187, and ; Engelbourg, *International Business Machines*, 284. (Originally, a PhD dissertation for Columbia University, 1954.) See below also.

<sup>28</sup> Wilkins, *The Maturing of Multinational Enterprise*, 77, 498; Heide, *Punched-Card Systems*, ; Paju, “IBM Manufacturing in the Nordic Countries.”

<sup>29</sup> See and compare with Campbell-Kelly, *ICL. A Business and Technical History*, esp. 26; Yost, “Appropriation and Independence.”

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<sup>30</sup> “Thomas John Watson 1874–1956. Memorial Issue,” *Think* 22 (July, August, September 1956): 45. For the year 1948 as a start of talks with the UK government, see also Schlombs, “Productivity Machines: Transatlantic Transfers,” 83.

<sup>31</sup> Minutes of a Meeting of the Board of Directors of the IBM World Trade Corporation, New York, October 5, 1950., in IBM-Directors.

<sup>32</sup> See and compare Campbell-Kelly, *ICL. A Business and Technical History*; “ICL: Taming the R&D Beast,” 169–180. On Wilson suggesting a European IT policy, see Kranakis, “Politics, Business, and European Information Technology Policy,” 223–26.

<sup>33</sup> “IBM World Trade Corp. Organized,” *IBM World Trade Corp. News* 1 (October 1949): 1–2; Sayers, “A Summary History of IBM’s International Operations,” 135. See and compare with Campbell-Kelly, *ICL. A Business and Technical History*, esp. 149.

<sup>34</sup> See Rooth and Scott, “British Public Policy and Multinationals,” 138, on regional policy, and 142–43 on prolonged negotiations between IBM and the UK government. Cf. Maney who wrote that Watson’s rash decision on the Scotland factory site made the project preparation there lengthy. Maney, *The Maverick and his Machine*, 372–75.

<sup>35</sup> Minutes of a Meeting of the Board of Directors of the IBM World Trade Corporation, New York, October 5, 1950, in IBM-Directors. World Trade Corporation Office of the Secretary, Board of Directors, Box 4, IBM Archive. See also Sayers, “A Summary History of IBM’s International Operations,” 137, and below for Scotland.

<sup>36</sup> “IBM World Trade Corp. Organized,” *IBM World Trade Corp. News* 1 (October 1949): 1–2; Connolly, *History of Computing in Europe*, 33, E-15.

<sup>37</sup> IBM’s first general manager in Paris was Jack Brent, from IBM Canada. Maisonrouge, *Inside IBM: A Personal Story*, 71.

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<sup>38</sup> “World-wide IBM Hears Details of New Corporation on Most Extensive Telephone Broadcast Ever Made,” *IBM World Trade Corp. News* 1 (October 1949): 3; “Mr. Francis U. Ritz Made Assistant to Mr. Johnston,” *IBM World Trade Corp. News* 1 (October 1949): 4.

<sup>39</sup> Ratcliff, J. D. “World Peace through World Trade,” *The Kiwanis Magazine* (July 1955): 12–13; Obituary of Francis U. Ritz, *Poughkeepsie Journal*, July 22, 2010.

<sup>40</sup> See and cf. Foy, *The Sun Never Sets on IBM*, 42.

<sup>41</sup> Connolly, *History of Computing in Europe*, E-21. Johnston had a French wife. Maisonrouge, *Inside IBM: A Personal Story*, 46.

<sup>42</sup> In fact one of IBM’s predecessors, the Bundy Manufacturing Co, later part of the International Time Recording Company, was founded in Binghamton in 1889 and manufactured there.

<sup>43</sup> United States of America, Bureau of the Census. *Fifteenth Census of the United States, 1930*. Washington, D.C.: National Archives and Records Administration, 1930. T626, 2,667 rolls. Ancestry.com. *1930 United States Federal Census* [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2002. Year: 1930; Census Place: *Binghamton, Broome, New York*; Roll: 1407; Page: 18A; Enumeration District: 20; Image: 100.0.; Obituary of Francis U. Ritz, *Poughkeepsie Journal*, July 22, 2010.

<sup>44</sup> United States of America, Bureau of the Census. *Fifteenth Census of the United States, 1930*. Washington, D.C.: National Archives and Records Administration, 1930. T626, 2,667 rolls. Ancestry.com. *1930 United States Federal Census* [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2002. Year: 1930; Census Place: *Binghamton, Broome, New York*; Roll: 1407; Pages: 15A–20A; Enumeration District: 20; Images: 94.0–104.0. See also Maney, *The Maverick and his Machine*, esp. 102.

<sup>45</sup> Francis Ritz was the first of two sons to Frank Albert and Anna Louise (née Yesberger) Ritz. His father Frank was born in Rochester, NY. United States of America, Bureau of the Census. *Fifteenth Census of the United States, 1930*. Washington, D.C.: National Archives and Records

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Administration, 1930. T626, 2,667 rolls. Ancestry.com. *1930 United States Federal Census* [database on-line]. Provo, UT, USA: Ancestry.com Operations Inc, 2002. Year: 1930; Census Place: *Binghamton, Broome, New York*; Roll: 1407; Page: 18A; Enumeration District: 20; Image: 100.0.; Obituary of Francis U. Ritz, *Poughkeepsie Journal*, July 22, 2010. Francis Ritz died 91 years old in 2010.

<sup>46</sup> Maney, *The Maverick and his Machine*, 102–09, and Stebenne, “IBM’s ‘New Deal’”.

<sup>47</sup> Flad and Griffen, *Main Street to Mainframes*, 174–75.

<sup>48</sup> “Mr. Francis U. Ritz Made Assistant to Mr. Johnston,” *IBM World Trade Corp. News* 1 (October 1949): 4; Pugh, *Building IBM*, 89–90; Flad and Griffen, *Main Street to Mainframes*, .

<sup>49</sup> Sayers, “A Summary History of IBM’s International Operations,” 162.

<sup>50</sup> “Factories, Branch Offices Visited in 14,000-Mile Trip Through Twelve Countries,” *IBM World Trade News* 2 (October 1950): 2, 4-5, esp. 5; Obituary of Francis U. Ritz, *Poughkeepsie Journal*, July 22, 2010. See also Watson and Petre, *Father, Son & Co.*, 187. Thanks for the “beautiful new Executive machine” are included in Eisenhower to Watson, December 8, 1951 in the “Watson, Arthur K.” folder of Box 122 of the “Pre-Presidential Papers” collection of the Eisenhower Presidential Library, Abilene, Kansas. We are grateful to Kevin M. Bailey for locating this letter.

<sup>51</sup> Pugh, *Building IBM*, 118–21. IBM’s revenues from ETs (in US) increased fivefold in ten years from 1946. Pugh, *Building IBM*, 121. In time, this business grew to IBM’s Office Products division with many more items of office machinery.

<sup>52</sup> On the IBM typewriter business, see DeLoca and Kalow, *The Romance Division*, .

<sup>53</sup> Ratcliff, J. D. “World Peace through World Trade,” 12; Ratcliff, J. D. “Kirjoituskone kahdeksan maan yhteistyönä,” *Valitut palat* (Finnish version of *Reader’s Digest*) (October 1955): 38–41. (A typewriter by eight country co-operation, in Finnish, with an additional text attached.), 38.

<sup>54</sup> Ratcliff, J. D. “World Peace through World Trade,” 12.

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<sup>55</sup> “World-wide IBM Hears Details of New Corporation on Most Extensive Telephone Broadcast Ever Made,” *IBM World Trade Corp. News* 1 (October 1949): 3. Out of IBM’s products, the typewriter sales had suffered most. The broadcast took place October 24, 1949.

<sup>56</sup> On this “product by plant” manufacturing system, see for instance Connolly, *History of Computing in Europe*, ; Petzold, *Rechnende Maschinen*, 271–72; Kranakis, “Politics, Business, and European Information Technology Policy,” 237. Schlombs, “Engineering International Expansion,” ; Schlombs, “Productivity Machines: Transatlantic Transfers.” This system started in the late 1950s.

<sup>57</sup> Wilkins, *The Maturing of Multinational Enterprise*, 300–302, 308–311; Rooth and Scott, “British Public Policy and Multinationals,” . For useful collections, see Maier, *The Cold War in Europe*; Crafts and Toniolo, *Economic Growth in Europe*. For postwar cartel building, see Jensen-Eriksen, “Industrial Diplomacy and Economic Integration.”

<sup>58</sup> Thos. J. Watson. “World Peace through World Trade,” *Think* XV (November 1949): 3–4; Stebenne, “Thomas J. Watson and the Business-Government Relationship,” 62.

<sup>59</sup> Ratcliff, J. D. “World Peace through World Trade,” 12.

<sup>60</sup> Engelbourg, *International Business Machines*, 284. Until 1934, for instance Dehomag, the IBM subsidiary in Germany, only assembled IBM machines. Petzold, *Rechnende Maschinen*, 269.

<sup>61</sup> This manufacturing system is mentioned by many researchers into IBM, see for instance Foy, *The Sun Never Sets on IBM*, 43; Vernay, *Chroniques de la Compagnie IBM France*, 87. In contrast to most studies, it is briefly discussed by Dassbach, *Global Enterprises and the World Economy*, 308–309. For a negative view on the interchange system, see Rodgers, *Think*, 244–245.

<sup>62</sup> Of course, the manager of IBM Finland and his wife participated. “Dagbok” (Log, in Swedish and in English), from 1947 to 1958, p. 35. IBM Finland Archive.

<sup>63</sup> Contemporary descriptions mention Watson Sr. as the inventor. In his memoirs, Jacques Maisonrouge claims Ritz invented it. Ulrich Steinhilper was told in a 1953 IBM class that Arthur K.

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Watson was to thank for the system. See Ratcliff, J. D. “World Peace through World Trade,” 12; Maisonrouge, *Inside IBM: A Personal Story*, 71; Steinhilper, *Don’t Talk – Do It*, 75.

<sup>64</sup> “IBM World Trade Corp. Organized,” *IBM World Trade Corp. News* 1 (October 1949): 1–2; Connolly, *History of Computing in Europe*, 33, E-15.

<sup>65</sup> “Mr. Francis U. Ritz Made Assistant to Mr. Johnston,” *IBM World Trade Corp. News* 1 (October 1949): 4.

<sup>66</sup> For Marshall Plan, see Maier, *The Cold War in Europe*, ; Crafts and Toniolo, *Economic Growth in Europe*, .

<sup>67</sup> This was new production for the British although IBM controlled the existing plant at Hammersmith.

<sup>68</sup> “ETs for the World,” *IBM World Trade News* 7 (November 1955): 16.

<sup>69</sup> Ratcliff, J. D. “World Peace through World Trade,” 13. This Canadian section was deleted from the republished version in *Reader’s Digests*. See Ratcliff, J. D. “Eight Countries build a typewriter,” *The Reader’s Digest* (August 1955): 98–100; Ratcliff, J. D. “Åtta länder om en skrivmaskin,” *Det Bästa ur Reader’s Digest* (Oktober 1955): 85–90. (Eight countries about a typewriter, in Swedish.)

<sup>70</sup> “Mr. Francis U. Ritz Made Assistant to Mr. Johnston,” *IBM World Trade Corp. News* 1 (October 1949): 4.

<sup>71</sup> For information on Spain, see articles in Bonin and de Goey, *American firms in Europe*.

<sup>72</sup> “Many leaders attend showing of first ET assembled in Britain,” *IBM World Trade News* 3 (January 1951): 4; “At showing of first ET assembled in U.K.,” *IBM World Trade News* 3 (January 1951): 5. Ritz did not appear in these pictures.

<sup>73</sup> “Netherlands starts IBM typewriter assembly,” *IBM World Trade News* 3 (March 1951): 20; “IBM typewriter assembly line in Brussels,” *IBM World Trade News* 3 (July 1951): 19; “Electric typewriters assembled in Sweden,” *IBM World Trade News* 3 (October 1951): 8.

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<sup>74</sup> Ratcliff, J. D. “World Peace through World Trade,” 13.

<sup>75</sup> “Opening of new IBM factory in the Netherlands Hailed in Amsterdam Ceremonies,” *IBM World Trade News* 4 (August 1952): 8-9; “New factory is dedicated in Amsterdam,” *IBM World Trade News* 4 (August 1952): 3.

<sup>76</sup> France, *IBM in France*, 27; Steinhilper, *Don’t Talk – Do It*, 74–75.

<sup>77</sup> “New factory is dedicated in Scotland,” *IBM World trade news* 6 (October 1954): 3; Sayers, “A Summary History of IBM’s International Operations,” 425; Paju, “IBM Manufacturing in the Nordic Countries,” 220. Arthur Watson was now the one who travelled around the *IBM World Trade* countries in Europe, South America, and Asia, reporting back on progress with the interchange plan. “IBM World Trade Corp. holds annual meeting,” *IBM World Trade News* 5 (May 1953): 3.

<sup>78</sup> Wilkins, “U.S. Multinationals,” 347.

<sup>79</sup> Minutes, meeting of the board of directors IBM World trade corporation, New York, December 8, 1952, draft, p. 9, in IBM-Directors.

<sup>80</sup> Ratcliff, J. D. “World Peace through World Trade,” 12; Ratcliff, “Kirjoituskone kahdeksan maan yhteistyönä,” 39.

<sup>81</sup> “Netherlands starts IBM typewriter assembly,” *IBM World Trade News* 3 (March 1951): 20.

<sup>82</sup> Steinhilper wrote about an American instructor and his teachings of respecting the salesman. He did not remember the name of the American but it could have been Francis Ritz. Steinhilper, *Don’t Talk – Do It*, 70.

<sup>83</sup> Steinhilper, *Don’t Talk – Do It*, 75–81.

<sup>84</sup> Haigh, “Remembering the Office of the Future,” 7–8.

<sup>85</sup> Sheehan, Robert. “Q. What grows faster than IBM? A. IBM abroad,” *Fortune* 42 (November 1960): 166–170, 236, 241–244, esp. 242.



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<sup>86</sup> “IBM World Trade Corp. Factories in Germany,” *IBM World Trade News* 4 (July 1952): no page numbers.

<sup>87</sup> Sayers, “A Summary History of IBM’s International Operations,” 184, 205. By 1960, however, IBM France had a “commanding position” in the niche electric typewriter market. Out of roughly 110,000 typewriters sold in France annually, more than 9000 were electric typewriters and 50,000 other special typewriters were more or less competitive to IBM ETs. France, *IBM in France*, 27.

<sup>88</sup> Connolly, *History of Computing in Europe*, 50. Connolly suggests a date of 1953 for this expansion, which seems early to us. His information on punched card machine production is somewhat contradictory.

<sup>89</sup> “IBM Card Production an International Enterprise,” *IBM World Trade News* 5 (September 1, 1953): 7; Sayers, “A Summary History of IBM’s International Operations,” 463. The 14 countries with a card plant (or two) in Europe were Austria, Belgium, Denmark, Finland, France, West-Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

<sup>90</sup> Paju, and Durnová, “Computing Close to the Iron Curtain.” For Finland, see and cf. Paavonen, “Finland and the Question of West.”

<sup>91</sup> Anttila, *Big Blue Suomessa*, 36–37. The year 1952 was unprofitable for IBM Finland. “Kotimaiset tulokset vuodesta 1937 lähtien tukkuhintaindeksin mukaan (1937–1985).” (Domestic revenues and profits from 1937 according to wholesale price index, in Finnish.) IBM Finland Archive.

<sup>92</sup> Anttila, *Big Blue Suomessa*, 36–37.

<sup>93</sup> It is unknown whether the “English” producer referred to was an IBM factory either in Hammersmith or in Greenock, Scotland or a subcontractor somewhere in the UK. See also Rooth and Scott, “British Public Policy and Multinationals,” 154–155.

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<sup>94</sup> Fred Jergner to Lars Hongell (Oy IBM Ab), Stockholm, January 23, 1954. IBM Finland archive.

<sup>95</sup> “1000th Electric typewriter assembled in Sweden,” *IBM World Trade News* 5 (November 1, 1953): 14.

<sup>96</sup> Ratcliff, J. D. “Kirjoituskone kahdeksan maan yhteistyönä,” 40. See the supplementary text box written by the magazine’s Finnish editor. For instance in the original or in the Swedish version of *Reader’s Digest* there was no such supplementary text attached.

<sup>97</sup> Ala-Ketola-Tuominen, *Jokapojan amerikanperintö*, 34–35. See and cf. Paavonen, “Finland and the Question of West.”

<sup>98</sup> Ratcliff, “Kirjoituskone kahdeksan maan yhteistyönä,” 40. On IBM’s punched card production and subcontracting in Scandinavia, see and cf. Paju, “IBM Manufacturing in the Nordic Countries.” On Finland’s paper export, see Jensen-Eriksen, “Industrial Diplomacy and Economic Integration,” esp. 184.

<sup>99</sup> Ratcliff, J. D. “World Peace through World Trade,” 13.

<sup>100</sup> In Norway, for instance, import difficulties together with growing demand prompted IBM’s Oslo factory for time recorders to also assemble electric typewriters in 1956–1959. Nerheim and Nordvik, *Ikke bara maskiner*, 54–56.

<sup>101</sup> Steinhilper, *Don’t Talk – Do It*, 75.

<sup>102</sup> Memorandum to J. W. Schnackel, September 19, 1958 by Chas. F. McElwain. A. L. Williams papers, Divisions, 1070, World Trade Corp. Box 18, RG 11. IBM Archive; Maisonrouge, *Inside IBM: A Personal Story*, 132.

<sup>103</sup> “Thomas John Watson 1874–1956. Memorial Issue,” *Think* 22 (July, August, September 1956): 45.

<sup>104</sup> List of in-bound passengers on S.S. Independence, September 4–12, 1955. Year: 1955; Microfilm Serial: T715; Microfilm Roll: T715\_8634; Line: 13; Page Number: 80. Ancestry.com.

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*New York Passenger Lists, 1820-1957* [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2010. Passenger Lists of Vessels Arriving at New York, New York, 1820-1897; (National Archives Microfilm Publication M237, 675 rolls); Records of the U.S. Customs Service, Record Group 36; National Archives, Washington, D.C.

<sup>105</sup> Obituary of Francis U. Ritz, *Poughkeepsie Journal*, July 22, 2010. For Ritz's later career in IBM and involvement in charity and community work, see Larry Hertz, and Craig Wolf. "IBM Exec Francis U. Ritz Recalled as Community Leader, Visionary," *Poughkeepsie Journal*, July 23, 2010.

<sup>106</sup> "WTC Executives Present Varied Ideas at School," *IBM World Trade Corp. News*, 1 (December 1949): 5.

<sup>107</sup> Belgium, Italy, Luxembourg, and the Netherlands joined the plan. The Schuman plan was signed in April 1951, and became operational in February 1953. See Kipping, *Zwischen Kartellen und Konkurrenz*.

<sup>108</sup> "France Gives Mr. Watson Highest Honor," *IBM World Trade News* 2 (September 1950): 3; "Factories, Branch Offices Visited in 14,000-Mile Trip Through Twelve Countries," *IBM World Trade News* 2 (October 1950): 2, 4-5. See also Vernay, *Chroniques de la Compagnie IBM France*, 82-84. Both Schuman and Watson Sr. supported the United Nations. Most likely, Schuman and Watson Sr. had met previously in New York in relation to UN assemblies where Schuman had spoken on the need for a European community.

<sup>109</sup> He was featured by Jessica Mitford in "Let Us Now Appraise Famous Writers", *The Atlantic* July 1970.

<sup>110</sup> Ratcliff, J. D. "World Peace through World Trade," *The Kiwanis Magazine* (July 1955): 12-13. The Kiwanis Magazine was and is published in Chicago by Kiwanis International, an international charity.

<sup>111</sup> Ratcliff, "World Peace through World Trade," 13.

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<sup>112</sup> Ratcliff, “World Peace through World Trade,” 13; Ratcliff, “Kirjoituskone kahdeksan maan yhteistyönä,” 39–40. With regard to workers, IBM had also taken precautions that a strike in one country did not close plants in all others; each plant maintained a ninety-day supply of parts.

<sup>113</sup> Ratcliff, J. D. “Eight Countries build a typewriter”; Ratcliff, J. D. “Åtta länder om en skrivmaskin”; Ratcliff, J. D. “Kirjoituskone kahdeksan maan yhteistyönä.”

<sup>114</sup> “ETs for the World,” *IBM World Trade News* 7 (November 1955): 16.

<sup>115</sup> McGlade, “From business reform.”

<sup>116</sup> Milward, *The Reconstruction of Western Europe*; Hogan, *The Marshall Plan*. Cf. McGlade, “From business reform,” 18–25.

<sup>117</sup> Gillingham, “American Monnetism,” 22.

<sup>118</sup> Belden and Belden, *The Lengthening Shadow*, 212.

<sup>119</sup> Memorandum to J. W. Schnackel, September 19, 1958 by Chas. F. McElwain. A. L. Williams papers, Divisions, 1070, World Trade Corp. Box 18, RG 11. IBM Archive. This change was part of a larger IBM reorganization by the Watson brothers, modernizing the IBM their late father had accomplished.

<sup>120</sup> Maisonrouge, *Inside IBM: A Personal Story*, 132–134; Kranakis, “Politics, Business, and European Information Technology Policy,” 237. See Schlombs, “Engineering International Expansion;” Schlombs, “Productivity Machines: Transatlantic Transfers.

<sup>121</sup> Sayers 2006, 464 and passim.

<sup>122</sup> Sayers 2006, 323.

<sup>123</sup> Sayers 2006, 326.

<sup>124</sup> Sayers 2006, 324–325.

<sup>125</sup> Sayers 2006, 312.

<sup>126</sup> “IBM Institute of Data Processing and Computing Opens in Paris,” *IBM World Trade News* 7 (November 1955): 2.

<sup>127</sup> Kranakis, “Politics, Business, and European Information Technology Policy,” esp. 217–219.

<sup>128</sup> Zeitlin, “Introduction,” esp. 15–18. Cf. Haigh, “Computing the American Way.”

<sup>129</sup> Sheehan, Robert. “Q. What grows faster than IBM? A. IBM abroad,” *Fortune* 42 (November 1960): 166–170, 236, 241–244, esp. 167. See also Tedlow, *The Watson Dynasty*, 174.

<sup>130</sup> See for instance the British and American cases in Yost, “Appropriation and Independence.”

<sup>131</sup> Ballard, J.G.. “Alphabets of Unreason,” *New Worlds* 196 (December, 1969).