

IBM's UNSUNG FOUNDING HISTORY.

An outline of the 26 years
prior to the creation of the
Computing-Tabulating-Recording Co
(C-T-R) in June 1911

CHARLES RANLETT FLINT

1850 – 1934

**Father of Trusts, Master of Consolidations,
and Creator of C-T-R, which became IBM in 1924.**

Although IBM has a heritage many in the Data Processing Industry envy, very few in IBM in the 21st century have ever heard of Charles Ranlett Flint. This is probably due to little emphasis being placed on the Company's founding story down the years.

Through his considerable experience in organising 'Industrial Consolidations' and other financial accomplishments, he became known as 'The Father of Trusts' in the USA, always acting with diplomacy and integrity. His squeaky clean persona gave people confidence to trust his business judgements. Right up to his death he was held in very high esteem both within the old Computing-Tabulating-Recording Co. (C-T-R) and in the early years of IBM. He was no maverick entrepreneur but one who was involved in C-T-R's fortnightly Executive and Finance Committee meetings for some eight years.

Of all Flint's consolidations, C-T-R was the only 'multiple industry' grouping. The three principal companies manufactured three different product lines, but all were of the same scale, using similarly sized components such as bearings, chains, dials, gear wheels and trains, levers, racks, and springs etc. Thus rationalisation brought better economy of scale and freedom to cross-fertilise ideas and patents by combining design elements across the board. Each of the three companies contributed one key word to the new name i.e. the Computing Scale Co. of America, Herman Hollerith's Tabulating Machine Co, and the International Time Recording Co,

Clearly, Flint's business acumen, foresight and contacts got C-T-R off to the best possible start in 1911. It became the most successful of his twenty four company consolidations. In 1914 he engaged Thomas J Watson as General Manager, (the ideal business marriage.) who universally changed the name from C-T-R to International Business Machines in 1924.

It should be noted that Flint had previously had a hand in the consolidation of the 'International Time Recording Co.' (ITR) in 1900, which joined together four companies, bringing their respective patents under one ownership, and later acquiring three more companies. Flint had also been seeking to help the Computing Scale Co. of America get a larger slice of the weighing machine market with their brilliant Computing Scale dial with advice regarding their business set up and strategy. Finally his approaches to Herman Hollerith regarding the future of his 'Tabulating Machine Co.' could not have

been better timed. Hollerith was tired of the machinations of the United States Census Bureau, and having health worries as well, the rewards he would receive solved many of his problems.

Flint was no straight faced, hard nosed business man, he liked his pleasures, which were principally country sports, aviation and yachting. With his various yachts, and one in particular called "Gracie" he had great success in many races and gained a lot of respect with the yachting fraternity of the time. He was in short a very likeable character who could always be trusted, and never let people down. In his later life time he was always regarded and credited as being the father of IBM, and in his death the obituaries to him reinforced this fact with glowing testimonials.

So the true Father of IBM is Charles Ranlett Flint, not Tom Watson, though Watson did an excellent job leading the company for forty two years. IBM is undeniably the direct result of Flint's inspirational creation, marrying the right businesses together, and then engaging the right leader at the right point in time.

THE COMPUTING SCALE CO. OF AMERICA & THE DAYTON MONEYWEIGHT SCALE CO.

1885: The brilliantly simple 'Computing Scale' that allowed costs to be instantly married to the weight to give the exact price, was invented and patented by Julius E Pitrat. This is the same year that Willard Bundy registered his patents for his time recording device.

1889: The manufacture of weighing machines with the Computing Scale began in Dayton, Ohio.

1891: The Computing Scale Company was incorporated as the world's first computing scale company by Samuel M Hastings President, Orange O Ozias Secretary and General Manager, and Edward Canby Treasurer, in Dayton, after they had acquired the Pitrat patents.

1893: Samuel M Hastings and Walter K Mills appointed Sales Agents for the company in four Midwestern States, this led to a National Sales Organisation.

1899: The Moneyweight Scale Co. came into being as the 'Selling Agent' for the Computing Scale Company in the USA and Canada. Later the name was changed to the Dayton Moneyweight Scale Company, and the 'Dayton' label became so prominent it became the brand name.

1901: C R Flint recommended that the Computing Scale Company of America be incorporated to embrace the assets and businesses of the existing Computing Scale Co, the Dayton Moneyweight Scale Co and the Detroit Automatic Scale Co.

1909: October, the entire factory, stock and equipment were destroyed by fire, but the energy with which the company recovered in immediately resuming business made the calamity just an incident in its progress.

1911: Under the inspiration of C R Flint, the consolidation of the Computing Scale Co. of America into C-T-R was completed. The participating companies adjusted quite quickly to the new organisation, and although C R Flint only stayed on for a month to oversee the transition, he quickly appointed a rather reluctant George E Fairchild to act as President.

1912: G E Fairchild handed over the Presidency to Frank N Kondolf.

1914: C R Flint appointed Thomas J Watson as General Manager of C-T-R.

1915: T J Watson superseded F N Kondolf as President. It is a well known fact that Watson warmed most to the products of the Tabulating Machine Co, with their high revenues, then to the Time Recorder division whose revenues could always be depended upon, but with the Scale Division he showed least interest. This part of the business did not prosper as the other two did.

1920: Samuel Hastings appointed President of the Dayton Division of C-T-R.

Other products such as Coffee Mills, Food Mincers and Meat Slicers and other commercial food machines began to be added to the product line.

1924: The name IBM superseded C-T-R, and began to appear alongside the Dayton label. Samuel Hastings also became a Director of IBM.

1935: T J Watson ultimately sold the whole 'Dayton Division' of IBM to the Hobart Manufacturing Co. for shares in their stock, the business then quickly prospered and became very profitable.

INTERNATIONAL TIME RECORDING CO. (ITR)

Like the Computing Scale Co, ITR has roots that also go back to 1885. Unlike the Computing Scale Co, ITR was initially the consolidation of four companies in 1900, with three more joining later. The original, the Bundy Manufacturing Co., was the very first time recording company in the world. It was incorporated in 1889, the name Bundy became synonymous with time recorders, much as Hoover did with vacuum cleaners.

Considering the advances made in horology and mechanical engineering in the 19th century, time recorders seem now to have been a long time coming and an overdue logical development. It really was an invention just waiting and wanting to happen.

Willard Bundy, a clock maker and jeweller in Auburn, New York, invented and patented his 'Watchman's Time Recorder' system in 1885 in the USA, and then in England in 1888 (IBM's oldest ancestral datum point in the UK). He used keys with a personnel number set on the edge of the key's blade in type face, to trigger the time block and the key's number to be stamped together on a paper roll, but it took his brother Harlow Bundy to make a business out of it.

Others too started to apply their minds to different designs using cards that were just pushed into a slot and a paddle pushed down to activate the printing mechanism as with the Rochester pattern, or a large detented wheel, where the employee swung the radial arm to a hole adjacent to their personnel number and pressed a sprung loaded plunger into the hole causing the printing mechanism to record the time on a paper covered drum against their number. A large machine but the quickest to use in practice, it was invented by John and Alexander Dey, of the Dey Time Register Co, its limiting factor was it could only accommodate a maximum of 200 workers, so after 200 another machine would be required.

Some early designs got off to a rather shaky start, but with further development they came good. The overwhelming case for them was obvious, they simplified administration and record keeping and greatly improved time keeping, so almost sold themselves. Some of the very early Dey Time Registers went on to give over 30 years of reliable service, proving the value of a simple design and proper development.

In the late 1890s, there was such competition for sales of time recorders in the USA market place from a number of burgeoning companies that C R Flint advised the Bundy Company of the benefits of consolidating a number of them into one company, and so ITR was born. Later more companies were

absorbed, and the real benefits of permutating designs and patents brought better economies of scale and a more rational range.

So from 1900 right up to 1911, ITR gained such a good reputation and capitalised on its international markets to become more secure, helped by additional European and other markets opening up. Even after IBM was born out of C-T-R, ITR continued in the UK as a brand name right up to 1982. It operated as a parallel company to IBM from 1924 to 1963. Many of the products could be had with either ITR or IBM logos on the dials (an example of badge engineering).

It can be said that the established ITR brand in the UK made IBM's entry on to the UK business stage in 1924 much easier and a less costly exercise than would otherwise have been the case, particularly in 1958 when IBM UK Ltd was born. But as will be seen from the IBM Time Line, C-T-R and later IBM inherited a totally different trading set-up in the UK to that in the USA.

In 1958, IBM sold its USA Time Recording Business to the Simplex Time Recorder Co, and in 1963 IBM UK Ltd. also sold its UK Time Recording Business to a management buy-out team, who ultimately sold the entire ITR business, time recording clocks and the prestigious Master and Slave Clock systems to Blick Industries Ltd of Swindon in 1982. Incidentally, in the 1920s Blick made a typewriter with a small cylinder shaped type head, that inspired IBM's famous golf ball typing head.

The ITR Family Tree shows the overall development of ITR both in the UK and the USA.

Note: on the actual chart the last line is split and shouldn't be!

HERMAN HOLLERITH

1860–1929

The Forgotten Giant of Data Processing and his **TABULATING MACHINE CO.**

This bold subtitle is truly justified by the fact that though we may look back a hundred years to Hollerith's machines and regard them as crude and inefficient, they are nonetheless undisputedly the genesis of IBM and the whole Data Processing Industry today.

Hollerith was a genius whose inventive mind was evident right from his teenage years. At the age of 19 he was lecturing in Mechanical Engineering at the Massachusetts' Institute of Technology, teaching students far older than himself. He joined the US Census Bureau that same year, 1879, in a consultative capacity. Here he found them still struggling with the 1870 census, having no prospect at all of finishing it before the next one would be taken in 1880. He concurred with a Congress Commission's findings that the 1870 census was so statistically flawed as to be unreliable and discredited. He resolved very quickly that the 1880 Census would of necessity have to be dealt with very differently, with the data being handled in a totally different way. However at this point he had yet to develop a way of handling and sorting this vast amount of data.

In 1880 Dr John S Billings, a US Army surgeon in Washington, suggested census data be recorded on cards. Even if Hollerith was aware of this, he had to take it much further and find the best way of handling and sorting the data on them. It is said he took inspiration from the way Jacquard Looms were controlled by a series of linked cards with holes in them that could be read by the loom to enable it to accurately replicate patterns. Also continuous punched tape as used by the US Telegraph System was explored, but cards won because they could sort out and separate categories far more easily than tape.

The next question was what size should the punched cards be? For convenience he worked on the size of the Dollar note, and found he could get enough columns of information on it to satisfy the Census Bureau's requirements, and so the Punch Card was born. After testing a variety of cards, one stood out that became the industry standard for the next eighty years. He quickly developed Punches, Tabulators and Sorters which worked so well together that none outpaced the others, a testimony to the continuity

of his designs. The fact that the cards grew from 34 column cards at the start, to 45 in 1912 and 80 in 1928, demonstrates the continuous development.

The Census Bureau did consider other devices and, after tests, found Hollerith's machines to be at least twice as quick and far more reliable than any of the others submitted, and so the contract was won. Besides the Census Bureau work Hollerith developed a successful Air Brake system for rail cars for which he was unable to get financial backing, and also a Rail Road Ticketing and Freight Control Systems for which he did find financial support.

In spite of having a notorious temper and falling out with some of his closest colleagues, he did nonetheless work with and through people. Whilst his 'people skills' would now be considered a limiting factor, he did achieve much in negotiations with the help of his colleagues and his wife Lou. When people stood their ground, he respected them.

In 1904 he sold the manufacturing and marketing rights for the UK and the British Empire to a British syndicate called The Tabulator Ltd, who in 1907 adopted the name The British Tabulating Machine Co. to be more closely identified with Hollerith's parent company. This independent company, although paying royalties to Hollerith, and then to C-T-R and later IBM, became in effect IBM's manufacturing arm in the UK up to 1949. There was always a good close working relationship between BTM, ITR and IBM in the UK, and it was not unknown for IBM field engineers to help out BTM.

THE BRITISH TABULATING MACHINE CO. (BTM)

In 1904 a syndicate, known as 'The Tabulator Ltd', was formed by Mr Robert P Porter and Mr Raleigh B Philpotts for the purpose of funding the wherewithal to exploit the use of Herman Hollerith's punch card machines in England and, with the exception of Canada, the British Empire, later the Commonwealth, and Europe. The momentum for this came from firms like Vickers of Sheffield and others who showed interest and were willing to take these new machines on trial. This paved the way for tabulating machines to be hired to the British Government for use in the 1911 Census.

This very tentative acceptance of a 'new technology' would only be replicated in the Business World when computers became a commercial proposition in the 1950s, and here market acceptance was very much helped by punch cards continuing to be used for input, output, programming and operating system information.

Not being au fait with the intricacies of Hollerith's designs, it was a big surprise to find no means existed for handling English currency except by the use of fractions. The machine's counters had been designed to cater for most fractions but not 1/12ths, so that it was pence that presented the main problem to begin with. An interim solution to this issue was identified and cards were printed, and through the capable hands of C A Everard Greene and a youngster called Goodison, the system quickly justified itself and the benefits became obvious. In those now far off days, 4 farthings or 2 halfpennies equalled 1 penny, 12 pennies equalled a shilling and twenty shillings equalled a pound, all very simple, and did enable those generations to embrace the duodecimal system more easily when required.

In 1907 'The Tabulator' became the British Tabulating Machine Co, in imitation of Hollerith's US company, and continued right up to 1959. Plants were established at Letchworth, Hertfordshire, and later Castlereagh in Ulster, and were in effect IBM's manufacturing base in the UK for almost half a century. For the royalties, IBM shared all their new designs and patents.

Early rental sales were not easy, and even then Luddite attitudes frustrated a deal with the Woolwich Arsenal. The 1911 UK Census was an essential and hard won contract. Hollerith by now had severed all connection with the US

Census Bureau, and so BTM had to go it alone and redevelop machines for this purpose. After some teething problems the contract was completed in two years. From here growth exceeded expectations and when John Powers' launched his machines in direct competition in the UK in 1914, BTM felt so confident with full order books, they rightly saw no reason to be worried.

During the First World War BTM flourished, but the optimism of the 1920s faded in the 1930s with the Wall Street crash and the great depression. Consequently royalties due to IBM could not be paid for a year or two, and though IBM sought to mitigate the situation and help BTM, there was a real feeling in BTM that the level of royalties expected were now unsustainably high, and a millstone around the company's neck restricting their own product development.

In the Second World War the Government Code and Cypher School at Bletchley Park used a large number of BTM Machines in their work, requiring a staff of over 9,000 by 1945. There were many other war time installations that gave BTM openings and as soon as one secret project was finished another started. Unlike IBM, BTM perpetuated the use of Hollerith's name on all its machines, and as a company it was generally referred to as 'The Hollerith'. During the War IBM employees in the USA sent food and other parcels to their colleagues in BTM to help mitigate the shortages endured here.

With relaxed controls after the War, returning to a peace time routine was a testing time. In theory BTM's increased capacity should have been just right to meet post war expansion, but ensuring this happened was quite another thing. Here the old contentions with IBM surfaced again; BTM paying royalties they felt were disproportionately high, and IBM's contention that BTM were not being effective enough in the market place. Add to this the high Dollar premium imposed by the post war Labour Government, and something had to give. And it did, in October 1949, when BTM in effect 'bought out' from IBM. To see what happened to BTM, see the IBM Time Line.

Note: Swap top left and bottom right illustrations around.

C-T-R AND IBM IN THE UK.

From the creation of C-T-R in June 1911, there is no evidence that business was immediately conducted in the UK under this new name. No letter headings or other documents to suggest C-T-R even existed or was a burgeoning force in the business world have come to light so far. This was in large measure due to the semi independent BTM Co, already successfully manufacturing and marketing Hollerith's Punch Card equipment, and ITR, a well established and respected company in the Time Recording business, so that there were no immediate issues to deal with. This just left the products of the Computing Scale Co. under the Dayton label with no obvious UK outlet. In 1911 the patents of the Computing Scale Co would have run 26 years and so other scale manufacturers would have started to embrace the Computing Scales in the UK.

It seems from photographs of ITR's business premises in the UK that the Dayton product line sat comfortably along side those of ITR, presenting the Dayton Division with a ready made business and distribution network that was up and running for instant trading, until having their own dedicated premises at 49, Farringdon Street, London. Exactly when the weighing machines etc. started to be promoted here is now sadly lost unless an appropriate old copy of 'The Early Bird' (ITR's newspaper) , or some other documents, come to light. This was the first such Company UK newspaper which started on the 4th October 1919.

Interestingly a photograph of the Paris Office in the 1930s has the name of Hollerith emblazoned above a window on the first floor, showing that IBM there were themselves marketing the products of BTM who made punch card equipment under license to IBM. Whether or not this was to mitigate the much higher freight costs of punch card machines from the USA, or to use up spare capacity in the UK is a matter of conjecture. At the very least this shows that IBM had become more than passive licensees in the world wide market place. It is safe to assume that in the UK, if IBM saw an opening for

the BTM's punch card machines, they ensured that BTM knew about it and followed it up.

ITR's factory and office address was :- International Works, Beaver Lane, London, W6, that is in the Hammersmith suburb, and IBM's first UK Head Office was at 112, Strand, Central London, before moving to 8, Berkeley Square, Piccadilly, London.

In the early 1930s IBM / ITR introduced their 'Automatically Supervised Electric Time System', where an electrically wound master clock with an anchor escapement and metre long pendulum, drove as many slave clocks as were required in that building, in one minute increments on the minute. This system became a common feature in the UK's public buildings in the 1930s. In the USA these master clock movement was even fitted out in period long-cases for domestic use.

The next hugely successful product to be embraced by IBM in the 1930s was the electric typewriter. These were regarded as the very best typewriters made, and many typing speed records were set on these machines. The development of this led ultimately to the famous 'Golf Ball' (single typing element) electric typewriters of the 1970s

The 1939 -1945, World War 2 period was one in which IBM's punch card equipment manufactured by BTM came to the fore in the code breaking work at Bletchley Park and elsewhere.

After the War the increased capacity BTM now had, became a challenge in matching it to peace time uses. Other difficulties arose in the post War period with the high Dollar premium exacerbated by the post War Labour Government, so that by 1949 something had to give, and it did, when BTM effectively bought out from IBM, relieving them of royalty payments also. Machines like the 405, Alphabetic Accounting Machine and the 601, Multiplying Punch sold well.

In 1951, IBM UK Ltd became the parent company, no longer riding on the back of ITR as the UK flagship company, and with the advent of electronic computers the company took off, principally because IBM could supply computers off the shelf, saving considerable time over most of its competitors, who through lack of capitalisation could only supply bespoke machines.

By 1961 most of the punch card machine business was with BTM, allowing IBM to focus on its Electronic Computers and Office Products.

In the 1960s IBM created the first true family of computers, System 360. It took the world by storm, offering customers degrees of continuity and flexibility hitherto unknown in the computer world. It was not only financially successful, but its range of abilities allowed it to be used to design the optimum Operating Codes etc, Printed Circuit layouts and even the

Draughting itself of its successor, System 370. It was a venture that took IBM to the limits, but it made IBM the World leader in the computer industry.

Similarly the 1980s heralded the birth of the Personal Computer, and here IBM led the way by taking the PC from an electronic curiosity to a very useful and usable tool for all sorts of business applications.

Its 'desk-top' abilities quickly enabled PCs with a printer to replace typewriters, even the golf ball ones, enabling possible low cost publishing.

The one fly in the design was in using other manufacturers' components, which left the flood gates wide open for all sorts of clones etc. So using these same components IBM's prices were instantly undercut. These reduced profit margins were the eventual cause of IBM relinquishing this section of the market place.