

d) The Handley Page Aircraft Factory at Cricklewood:

I have a clearer recollection of visiting this site. The heating was by a low pressure hot water accelerated system, but the dope shops were served by steam. There was a large battery of cast iron "Ideal" hand fixed sectional boilers possibly numbering about twelve. Imagine the labour needed to fire these by hand.

Presumably larger steel boilers were not available at the time due to steel being needed for other war purposes. The boiler output would have been about 12 - 15 million B.T.U's per hour, so that again for that period it was a large installation.

During this war both my father and Frank served part time at night on the searchlights around London, the lights being served from portable direct current generators in conjunction with carbon arc lamps. Both claimed to have got their light on the Zeppelin (airship) which was destroyed at Cuffley.

EARLY DIRECTORS:

The directors at the beginning of the 1920's were:

Joseph Russell:	(grandfather) the founder of the firm who died in 1927.
Joseph Nelson Russell:	(father) who died in 1948 (NELSON)
Francis Stanley Russell:	(uncle) who died in 1945 (FRANK)
John Alfred Naylor:	(uncle) who died before World War II (ALF)
Herbert C. Hayes:	(of Leeds office) who died after World War II (BERT)

Before my story proceeds further, some indication of the business characters of Nelson, Frank and Alf become desirable, and so here I depart from chronological order. This is because their characters are best shown by their remarks at a Board Meeting in the early 1930's, as follows:

Site of Board Meeting:

This was in the old board room of Queens Wharf, with the power shafting running nearby below, driven by the old pulsating gas engine, both of which caused vibration and noise in the room. The gas engine had a cooling tank attached to it, with fish in the tank, but that is another story about a different Board Meeting which I record later. The Board Room contained a unique fireplace, which I remember well, and which I have recently learned was transferred from the Round House and then on to Hammersmith Borough Council. The Annual General Meeting which followed could have been at Queens Wharf but it may have been at Duke Street office. The shareholders would have then been, nearly all,

members of the Russell family, with the exception of Mr. Greenwood and Bert.

Time:

This was in the early 1930's with the depression starting to end. Although the firm made a profit and was able to declare a dividend, liquid money was short and there was not sufficient to pay an interim dividend immediately.

Those present at the Board Meeting:

Those present were:-

NELSON in a lounge suit with stiff collar and tie. A capable but unassuming man, who, after thought, was prepared to take on business risks so long as they were not too great.

FRANK in a brown lounge suit, with boots and a softer collar and tie. A capable but more jovial man, who was more prepared to take on business risks than Nelson. On the whole these risks were profitable, but they did cause some unease in later years.

ALF in a lounge suit with wing collar and bow tie. A sound mechanical man, with individual ideas and although capable he did not like taking on business risks.

HENRY (H. V. Greenwood, Secretary). An ideal man for his job and with a pen behind his ear and taking notes. A short capable man and I always will remember him for his moustache, pen and pleasant disposition and grey hair.

I was present, and probably others such as H. C. Hayes, Ernest Naylor, Jim Russell and Duncan Wallace, but it was a long time ago and I do not remember.

Discussion at Board Meeting:

The main point discussed was how to pay an interim dividend in view of the shortage of liquid cash. After various talks Frank suggested an approach to the Midland Bank for a loan. Such loans were frowned upon in those days, and his suggestion was not approved by Nelson and Alf. Alf then suggested that the shareholders should be paid their dividends at the Directors' convenience. Frank was quick on the mark and said that to ask female shareholders to attend for their dividends in such a place was out of the question.

Alf was temporarily taken aback and then said, with a smile "Frick" (he always addressed him as such) you must know that I did not mean that".

Nelson then came to the rescue and said that a proposal should be made at the Annual General Meeting to the effect that dividends should be paid "as and when convenient". At the General Meeting later Nelson's motion was put forward and passed, and I think that at

several further meetings the same words were used. Somebody once said to me: "Frank was the pacemaker and Nelson the peacemaker". This was a good combination and proved to be very true. However, I would add that Alf assisted them in giving his opinion as to whether, in some cases, the business risks were worthwhile.

The cooling tank episode does not portray the directors' characters nearly as well as the dividend story, but it is worth telling. The tank served cooling water to the old gas engine and during hot weather water was sucked up a pipeline from the Thames to the tank, so as to ensure better cooling. The engine and tank were cleaned and overhauled once yearly. On one occasion the works manager reported to the board that fish had been seen in the tank and "what should he do". Alf suggested that they could have been sucked up the pipeline. Frank said that fish eggs could have been sucked up. Nelson felt that the temperature in the tank would be high enough to kill fish. They then clambered up to the tank and saw goldfish.

Frank, who was a keen fisherman, explained that goldfish do survive in varying temperatures provided that the change is not too abrupt. The question remained "who put the goldfish there?". It could have been local lads who, in those days, played around outside the wharf entrance. The goldfish were left in the tank and grew quite big. One can only guess as to what they lived on. Possibly the lads fed them, but it is more likely that they survived on algae which would collect in such a tank.

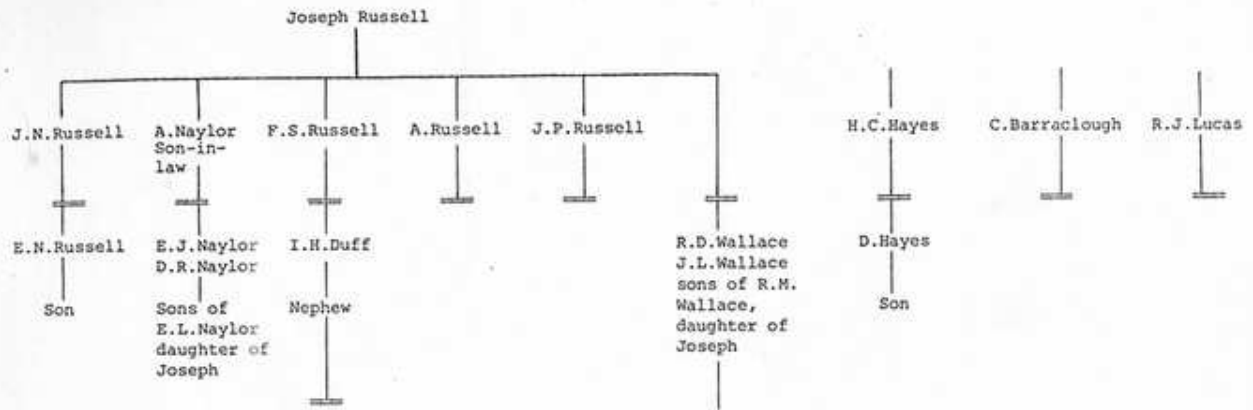
Following the death, in 1927, of the founder, Joseph, my opinion is that my father, Nelson, and my uncle, Frank, and including Bert Hayes, were the main persons responsible for the successful continuation of the firm, with help from others.

For future reference, however, I am giving a "Directors Business Tree" so as to identify all from 1910 - 1948 and especially to those who may be unaware of the Russell family connections.

Before I continue this matter, I wish to record the following:

- a) Bert Hayes (Leeds director) had four sons, and the eldest, Denis Hayes, became a director. Denis and I were good friends and enjoyed work together as well as some holidays. Two others were killed in World War II and the other carried on his own business in an Artist's shop in York. I cannot remember the projected careers of the two who were killed. The intention may have been for one or the other eventually to enter the firm, and I believe that was the case.
- b) It is with many regrets that I am unable to include my sister's son, Donald Tweddle, Nelson's eldest grandson. He entered the firm before World War II, was a member of the Honourable Artillery Company and was therefore one of the first to be called to arms. He went through the evacuation from Dunkirk and was later killed in Burma. He might easily have been made a director.

Now, coming back to the "Tree" I would stress that this covers up to 1948 only. I have therefore omitted my cousin, David Russell, son of J. P. Russell, and others.



THE FIRM'S DIRECTORS  
between 1910 & 1948

NOTES:

The secretaries were:

- H. V. Greenwood
- J. P. Russell
- H. Richards
- R. Duff (assistant secretary and brother-in-law  
of F. S. Russell)

I. H. Duff, D. R. Naylor and R. J. Lucas were elected directors in 1948. They are therefore only just in this recorded period. Previously they had all served with the firm.

#### APPRENTICESHIP:

From the age of 13 my hobby was anything to do with electricity, and which could now be described as electronics. My first wish would, therefore, to have been an electrical engineer rather than a mechanical one, although the latter would have been the next best thing. My father wanted me to be the latter because he wished me to enter the firm.

My main education was at the City of London School, on the modern side as opposed to the classical and science sides. On this side only the fringe of higher mathematics was taught, so that rather late in the day I was given special tuition in this subject, so that I could then proceed to the City and Guilds Institute to try for a B.Sc. Although I was quite normal at ordinary mathematics I never grasped the higher ones, and was useless at them, in addition to hating them. I therefore failed to pass the entrance examination for the City and Guilds, and in my career as a heating and ventilating engineer I did not find that higher mathematics would have been of help.

Immediately after school I was apprenticed to the firm for three years, during which I went to the Regent Street Polytechnic for evening classes twice a week for two years. My weekly rate of pay was about fifteen shillings during the first year and rising to twenty-five shillings (now £1.25) in the third year. This was insufficient to pay my travelling expenses, even at the early morning workmen's rate of those days. My father dealt with this, however, and gave me pocket money which I used to buy materials for my hobby.

When working on outside jobs and in the workshops at Queens Wharf the hours were long, from 8 o'clock on site in the morning to 6 o'clock in the evening. On two days per week, due to evening classes, I did not arrive home much before midnight.

Saturday mornings were a working period, so that, all in all, apprenticeship was a strenuous period. It was a relief, however, when, on working in the office, the hours were reduced to 9.00am to 5.30pm. From this I realised that the workmen on muscular labour worked as hard, or even harder, as the bosses and office staff did on mental work.

My three year apprenticeship can be divided up under the following headings, and commencing in 1920:

1. Outside work as a workman on heating apparatus for various buildings in London.
2. Inside workman on mechanical apparatus at Queens Wharf and including staff work in the office there.
3. Staff work at the London office at Duke Street on heating and ventilating apparatus.
4. Staff work at Leeds office in Aire Street on heating and ventilating apparatus.

My recollections are as follows.

### Outside Work:

On this work I heard the workmen's point of view about their employers, which was generally favourable and relations were good. I learned how to use the tools, these being hand tools as there was little mechanised equipment then. The hardest work was in screwing 4" - 6" dia. steel pipes and for this about three persons hand operated the dies and bore their full weight on them. For these pipe sizes cast iron socket and spigot piping with caulked joints was sometimes used because it was cheaper and did not have to be screwed.

Oxy-acetylene welding for pipe junctions was in use. Acetylene was produced on the site by portable generators with a small gas holder attached to collect the gas after it had been made by dripping water onto carbide. I do not remember how oxygen was provided but possibly bottled oxygen was then available.

I also do not remember how pressure was given to the acetylene. Prefabrication of special pipe manifolds etc., was not done "off site" but was measured and prepared on the site itself. The bending of steel pipework was also done on the site. Small portable forges were used, about 3'0" dia. x 3'0" high with a hand driven blower bellows in the base. The tray on the top contained solid fuel and it was a craftsman's job to obtain a neat looking bend by taking the pipe out of the incandescent fuel, cooling it with water and then returning it for reheating. These forges were also used for boiling up water in billy-cans for canfuls of tea.

Radiators were of heavy cast iron sectional type with right and left hand screwed nipples. These were purchased from either the Beeston Boiler Company or the National Radiator Company (later Ideal Boilers and Radiators). Nelson and Frank preferred to purchase from the former because the firm had helped Sir Louis Pearson when he set up business, and they obtained preferential treatment from him. The first radiators were of "decorated type" but I do not remember fixing any of these, although some still exist. These were followed by the "plain type" which were used a lot in this period. These were followed shortly afterwards by the "Classic" and "Neo-Classic" types by the National Radiator Company and the "Royal" and "New Royal" types by the Beeston Company.

Many materials were delivered from Queens Wharf storage to the sites by means of a motor driven lorry, with, I think, a Napier engine. Later this lorry was fitted with an overhead runway, terminating in lifting tackle for loading and unloading. I feel that this was the first lorry to be so fitted, and remember, on one occasion, the weight to be unloaded was such that the back went down and the engine in the front was tilted upwards.

I remember that at times an odd bit of material was wanted on a site, such as a tee piece, elbow, valve etc., and I was sent to pick it up. The storekeeper, Hussey, was a remarkable man and could usually find something in his store to meet the demand. The foregoing notes are given only to indicate some idea of what was done at that time, and I therefore follow with some memories of actual "outside jobs".

THE STOCK EXCHANGE, LONDON:

This was Nelson's job, with Victor Bunn as foreman. I was careful to make sure that I was accompanied by a "top hatted" door keeper when I crossed the Exchange Floor to reach the boiler room. In his absence I could easily have been "debaggged" as was then the custom if strangers were seen by the brokers.

PARNELL'S STORE, VICTORIA:

This was Frank's job, with T. C. Stevens as foreman. This building no longer exists, but at the time a builders strike was on and so the firm had to do its own builders work. I was given a hammer and chisel and was told to cut a trench in an old hard concrete floor and this lasted for a week, by which time my hands were cut and bloody. On arriving home my mother said "Nelson, is this necessary?". His reply was: "Yes, it is, he will remember". I certainly remembered, and afterwards tried to avoid designing systems which involved such builders work. I do not remember much more about this job except that, thank heavens, the strike was called off.

THE DAIMLER HIRE COMPANY, KNIGHTSBRIDGE:

This was Frank's job with T. C. Stevens as supervising foreman, and as such he called in daily to see what was being done.

The installation was a straight-forward hot water heating one with offices in front and garages behind, and when he entered through the garages we all tried to knock off his bowler hat with balls of hemp etc., and I was successful.

He gave me the job of connecting up a radiator from a main below and in doing so I lifted the main so that a part of the system became air-locked and would not work. Stevens had his own back on me by means of a severe telling off. The lesson to me was thereafter to remember how air-locking can occur.

G.E.C. OSRAM WORKS, HAMMERSMITH:

This was Frank's job with T.C. Stevens as supervising foreman. To me the work was something new as heating was not involved. It consisted of vacuum pipe lines for the exhaustion of air, and lines to carry inert gases for electric light bulbs, the half watt type now having come into use. Although there was nothing special about the pipe lines I was interested to see the equipment used in the manufacture of the bulbs. It may be that I was put onto this work because of my known interest in anything electrical.

MIDLAND BANK, UXBRIDGE:

This was Nelson's job with Noakes as fitter and Wilkins as mate. This was a very small job, but Wilkins showed me an idea of his which I have always remembered, as it could have been a forerunner of electrical thermostat. He had blown a bulb in a glass tube which he filled with mercury and it was therefore similar to a glass thermometer. Electrical connections were made into the bulb and the tube so that when the mercury rose due to temperature electrical contact was made. Although this arrangement was crude, the idea was there. The year was about 1921 and the only thermostatic devices I can remember were non-electrical and operated mechanically by vapour pressure, such as steam traps and damper regulators.

#### QUEENS WHARF:

On arrival and departure all workmen had to clock in and out. It was soon discovered that it was well beyond 8.00am before I clocked in, and when I explained that even by taking the earliest workmen's train from Gerrards Cross I could not arrive on time, the rule was relaxed for me.

I enjoyed helping in the workshops, my main recollection being of assisting the fitter Tate to make dishwashing machines for Messrs. Lyons of Cadby Hall. Each was a tank about 10' x 4' x 5' deep and was fitted with water sprays etc., and pulleys were fitted so as to work from shafting at the Hall, as individual electric motor drive was then not a common method. These machines were possibly the fore-runners of present day ones.

This type of work was of much more interest than that of screwing pipes and fixing radiators on outside jobs.

I also made pipebrackets for the heating side when the more mechanical work was slack. This was uninteresting and must have been costly to the heating side, but it helped the wharf workshops to keep going when their normal work was short.

I worked with Hussey in his store and clearly remember seeing Spikins in his peaked cap at work on his large lathe. He was only about 5'3" tall and operated a lathe the faceplate of which must have been over 6'0" in diameter. I asked to be put on lathe work, but this did not mature and a bit later on I bought one of my own which I still use.

Some sheet metal air ducting was made for the use of the heating and ventilating side, but the demand was not big. When later the demand increased Leslie Wallace took the matter in hand and this side was developed with the use of more modern machinery and consequent extra output.

My wharf office time was spent in the ground floor office under the charge of Philpott, the work being on time sheets and payments to workmen and staff, all very boring, but useful knowledge.

On one occasion I told him that I was going out to buy a wireless valve, these only just having arrived on the market. His reply was "Why not get one from Hussey's store, there are plenty there". I tried to explain to him the functions of a thermionic valve but I do not think that he understood. I went across the road to Tingey's wireless components shop, one of the few at the time, and brought back one of the first "R" valves. When I showed it to him he realised the differences between thermionic and radiator valves.

The first floor over was occupied by the Secretary, H.V. Greenwood and his small staff. I remember a Mrs. Ross who helped him, and Jim Russell was either there then or came later. They dealt with the accounts etc., for the whole firm and the mechanical work was supervised from there in conjunction with the works foreman Gilbert, and later Healey. This office staff dealt with essential but unspectacular work and I do not remember any stories about them except the following.