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PIERRE JAQUET-DROZ—WATCHMAKER OF GENIUS

The pioneer who had perhaps the most influence after Daniel Jean Richard in preparing the ground for the Swiss watch industry was the famous watch and automaton maker *Pierre Jaquet-Droz*, who was born at La Chaux-de-Fonds 250 years ago.

To mark this anniversary, the people of La Chaux-de-Fonds, Le Locle and the surrounding watch-manufacturing country have opened the *Jaquet-Droz Year* with great festivities on 12th June last. The memory of this genial watch mechanic and inventor is honoured in two exhibitions staged at the art museums of Le Locle and La Chaux-de-Fonds until 10th October. The latter exhibition displays the marvels of ingenuity of Pierre Jaquet-Droz and of the traditions which outlasted him in the firm of Jaquet-Droz and Leschot.

Jaquet-Droz's importance in the history of watchmaking

Pierre Jaquet-Droz was born on 28th July, 1721 from relatively well off country gentry. Contrary to Daniel Jean Richard, he was not a blacksmith turned watchmaker, but a mathematician with a passion for mechanics. He began his studies in Basle under the Bernoullis, the famed family of Basle mathematicians. Daniel Bernoulli 1st had received a commission from the government of Basle to study the German automats. Jaquet-Droz was in due course to make good use of the principles of physics and mathematics acquired with his illustrious masters in his mechanical research. He left Basle for Neuchâtel, where he studied theology for a while. However, five years after having left La Chaux-de-Fonds, which then had a population of 2,800 inhabitants, and his occupation as a horse and cattle dealer, he is found working as a watchmaker in one of the many farm workshops which had already sprouted up in the Neuchâtel Jura.

The artisans' revolution of the Jura had indeed already started at that time. It was at the beginning of the century that *Daniel Jean Richard*, a former blacksmith and cabinet maker

in Geneva, returned to his native Le Locle and created an artisan industry which was to keep the peasants of these harsh mountains busy during the long winters and thus transformed a way of life. The farm workshops getting established after the epochal enterprise of Daniel Jean Richard and lasted until 20 years ago, were the prefiguration of the workshops and factories which were to dot the whole Jura. They also had an impact on civilisation because the Jura of that day created the "watch of the commonalty" when there were only watches for the clergy and the nobility.

In the same way the pin lever watch created in the Jura two centuries later will bring watches within the reach of the working man.

The merchants of the Jura took their locally made articles to the northern markets of Montebeliard and the French Jura. They went further afield and probably went as far as Moscow to sell the new watches of the Jura. Thus it can be said that whereas "high watchmaking" originated in Geneva, which was a watchmaking town in the Middle Ages already, the industrial production of watches sprang in the Jura as the result of the initiative of one man, Daniel Jean Richard.

The climate and the skills were thus ripe in the Jura for Pierre Jaquet-Droz to realise his ingenious engineering concepts. There is much conjecture as to how and where Jaquet-Droz obtained his training. It was probably with the few watchmakers who were already established in the area. By 1750 he had constructed enough clocks and automats to establish his reputation. The nobles of Neuchâtel rode up to the outbacks and hunting grounds which the upper valleys of the Jura were to them and visited him. Monsieur de Natis, who governed the Principality of Neuchâtel for the King of Prussia, was among the first to come. He was followed by his successor, Lord Keith, a Scot in the service of Frederick II, and locally known as "Milord Maréchal". He was liberal and interested in arts and crafts, a protector of trade who knew well that the high periods of culture were always those

where industry could supply the arts and allow the artist to live.

The journey to Spain

Lord Keith realised the potential of this nascent industry, but also foresaw that it could not survive without outlets in the rich countries. Thus he encouraged Jaquet-Droz to make the journey to Spain to see the melancholy King Ferdinand VI and his Queen, who were most interested in automats and mechanics.

He left with his father-in-law and one of his craftsmen on 4th April, 1758 and arrived in Madrid on 22nd May. They carried various Jaquet-Droz clocks and automats, one of them was the famed "*Pendule du Berger*" which he sold for 2,000 pistols in Spain and which is still to be seen in the Prado. His automats created such a sensation that the Great Inquisitor was ready to throw him in the gallows when people threw themselves on their knees to worship his mechanical prodigies. He was saved from this uncomfortable situation by the intervention of the King.

Jaquet-Droz came back to La Chaux-de-Fonds a year later, when the Queen of Spain and Ferdinand VI had died in close succession, bringing back an enhanced reputation. He settled in La Chaux-de-Fonds and together with his son Henri-Louis and his adopted son Leschot created masterpieces of ingenuity and precision. Many of them are the pride and joy of the Arts Museum of Neuchâtel.

Such are *The writer*, *The musician* and *The artist*—finely constructed robots whose conceptions contained all the ideas of modern engineering, such as levers, cams, engraving machines, profile copiers, screw cutting lathes and were so much in advance of their time that when the problem of automation emerged in 1860, the situation inherited from these pioneer mechanics had been left unchanged.

Jaquet-Droz co-operated closely with his son Henri-Louis and his adopted son Leschot. Henri-Louis died in Naples a year after his father, in 1791, and the firm founded by Pierre

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Jaquet-Droz in Geneva and London was continued by Leschot and known as Jaquet-Droz and Leschot. It was a well-known name in the trade and produced many fine pieces which can be seen in collections all over the world.

The Guinness Book of Records indicates that the first *wrist watch* was made by Jaquet-Droz and Leschot in 1790.

The origin of the self-winding watch is rather obscure. German watch-makers are believed to have built isolated models in the early eighteenth century. The first self-winding watches of which there are definite records were made by the Swiss Abraham-Louis Breguet, somewhere between 1750 and 1760. The latter's self-winding devices were called "*pedometers*" and were powered by the vertical movements of walking. Jaquet-Droz made a few pedometer watches as from about 1780, but centred his production on the items which had made his reputation, namely singing-bird boxes, puppets, sumptuous watches and Neuchâtel clocks. The wrist watch made in 1790 was an isolated specimen. Wrist watches only became popular after the First World War.

Branching off to London

The major market for the articles of the firm Jaquet-Droz was England, and indirectly the Near and Far East. This is why a branch was opened in London in 1783 under the direction of Henry Maillardet, one of Jaquet-Droz's best craftsmen. The watches were exported to the Far East, particularly China through the East India Company. London at that time was the centre of the watchmaking industry.

Pierre Jaquet-Droz was an intellectual turned inventor and craftsman. He was opened to the enlightened ideas

of the 18th century, remaining all the while attached to the teaching of the church. The church authorities of Neuchâtel of his day were rigorously Calvinistic and anti-liberal, as Jean-Jacques Rousseau had the opportunity to discover for himself.

When Jaquet-Droz's friend, the pastor Fernand Olivier Petitpierre, proclaimed from his pulpit in the church of Les Ponts-de-Martel that the fires of Hell were not eternal because the love of God would one day redeem the worst sinners, the pastors of Neuchâtel denounced him as a heretic, and summoned him to recant his ideas. As he refused he was banished from his church in the midst of considerable controversy. He left for London, where he taught theology. Although his views were accepted by the two enemies, Rousseau and Voltaire, by the Governor of the Principality of Neuchâtel, Lord Keith and by the State Council, the assembly of pastors had their way. Jaquet-Droz supported him to the extent of organising a demonstration in the church of La Chaux-de-Fonds.

Jaquet-Droz, Daniel Jean Richard, Abraham Louis-Perrelet, these are some of the great names in the history of the Swiss watch industry. The industrial organisation of this vital source of prosperity sprang from the country workshops which their genius helped to create. Little did they know that their pioneering work would one day promote Switzerland to the world leadership in the field of watchmaking, and produce, as it did last year, 46 per cent of all the watches made in the world.

Jaquet-Droz watches today

There are *Jaquet-Droz watches* marketed all over the world today. However, they are not related in any way to the firm founded by Pierre Jaquet-Droz, his son and Leschot. *Jaquet-Droz* is the actual trade mark of the watches manufactured by a group of 150 small firms who have joined forces in one single trading organisation, the *Société Anonyme de Fabricants d'Horlogerie*. This large-scale co-operation was prompted by the need of collective bargaining with the main supplier of movement components of the industry, *Ebauches S.A.*

The small watch firm—say, the factory with 30 workers producing a few thousand watches a year—found that it was being treated as a second class customer by *Ebauches S.A.* and getting its components with delayed deliveries and at higher costs than the competing big firms. For *Ebauches S.A.*, it was commercially more expedient to satisfy the large customers first, plants like Lenco and Omega, which would place orders for millions of components. They could necessarily be served at lower prices than the individual firms asking for small job lots.

These small firms therefore decided to concert their buying (and later their marketing, testing, research and their more onerous investments) and became *Ebauches*' biggest customer. All the watches made by the independent companies of the *Société Anonyme de Fabricants d'Horlogerie* are sold abroad with the stamp *Jaquet-Droz*. It was as good a trade name as any other and certainly a good service to the memory of a great genius of horological history.

(PMB)

COMMENT

HOW SHOULD TEACHING BE UNDERSTOOD

It may be an exaggeration to talk of a "crisis" in the Swiss universities. Nevertheless these holidays come as a cooling-off period after a number of incidents which have hardly helped to improve the relations between teaching staff and students at Geneva, Lausanne and Zurich Universities. The worst cases happened in Zurich.

The president of the Federal Institute of Technology, Professor Hauri, was practically stormed in his office on 24th June by 80 architecture students requiring immediate changes in the teaching programme and demanding explanations as to why the contract of six lecturers who had been experimentally hired for a year to teach architecture from a new angle had not been renewed. A month later a psychiatry lecturer, Mr. Rothschild, who was found guilty of lending political and moral overtones to his teachings, was given notice of the end of his teaching contract at the end of the summer semester. The official motive given was that he had behaved in an undignified way by taking part in a street theatre show. This caused agitation in the university, made worse by the closure of the main building while an "Anti-Capitalist Week" was in full swing.

Ironically enough, Mr. Rothschild was presiding at the sittings of this symposium of dissent, which was held in the *Auditorium Maximum*. The rectorate allowed this event to take place after having received promises from the revolutionary students that they would not interfere with the normal running of the university and regular lectures.

The university was closed as a result of various complaints. It appears that right-wing students had torn down the flags and streamers in the *Auditorium Maximum* and this, alleged the organisers of the anti-capitalist conference, was used as a pretext by the authorities.

In Geneva, there were demonstrations by architecture students against the appointment of two professors and