

THE NINETEEN CENTURY - INSTRUMENTS TO OBSERVE: THE CONTRIBUTION OF ITALIAN MAKERS

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Questo lavoro analizza la nascita delle prime industrie italiane che hanno costruito strumenti scientifici "meccanoottici" in particolare.

Il periodo preso in esame va dalla fine dell'ottocento alla prima metà del 900 e mette in evidenza lo sforzo che fecero alcuni costruttori italiani (e tra di essi Ignazio Porro) per dare alla loro produzione artigianale una dimensione industriale capace di competere con le maggiori case costruttrici europee.

The purpose of this report is to draw a picture till now anything but exhaustive, referring to some of the instruments makers who worked in Italy at the end of the 19th century.

This is an interesting period because, for the first time in Italy, industries were established whose dimension and efficiency were almost comparable with the European ones; besides these firms will be the only important ones in Italy in the course of the following century.

I'm referring particularly to Filotecnica Salmoiraghi, to Tecnomasio and to Officine Galileo.

Towards the end of the 19th century for many, good instrument makers the moment of the great leap had come. Some of these "mechanicians" who, up to that time, had made single pieces meant for few or only buyers (usually the Astronomic Observatories) had the opportunity to become design engineers responsible of both the production and management of their manufactured articles made on an industrial scale.

This happened to Poggiali in Florence who, inheriting his friends 'experience and relying on other fellows' help (like Donati, an astronomer in Arceteri and an industrialist named Vegni), started the Galileo workshops production. The same can be said about Dell'Acqua in Milan who, together with Duroni, Longoni and the industrialist Cabella, established the firm "Tecnomasio".

In a way the same happened to Ignazio Porro who, after making for years various attempts in different fields, was able at last to establish in Milan the Società Filotecnica which later on will have the firm name Filotecnica Salmoiraghi because of the entry of the industrialist engineer Angelo Salmoiraghi.

Other good mechanical engineers tried to establish other firms even though of smaller dimension like Spàno and Mileto Co. in Naples (surveyor's cross, levels and theodolites makers), Koristka brothers in Milan (microscopes, telescopes makers), Ramperti and Restelli Co. also in Milan (lenses, prisms and glasses manufacturers), Pelle and Wolf Co. in Florence, Allemano in Turin.

Others preferred a handicraft management even though their items were sold to many Institutes and Astronomical Observatories. Cavnato for example worked both for the Observatory in Padova where he was employed and for the Observatory in Parma and Catania.

The Italian home market had always depended on French, German and English precision instruments makers: all the Italian astronomical observatories would apply to the well-known Dollond, Ramsden, Fraunhofer, Canivet who were considered the most famous instruments makers of that time and their reputation lasted up to the end of the 19th century: actually the European production included prestigious firms names.

In Germany Mertz's optical workshop was keeping up the tradition left by Fraunhofer; Steinheil's workshop went on successfully following the way led by its old founder and so did the Repsold brothers in Hambourg, sons of the famous Repsold, contemporary with Bessel (right in these workshops for example in 1880 the 38 cm. wide Pulkowa's equatorial was under construction).

Starke in Vienna, Pistor, Martins and Bamberg in Berlin went on with a tradition by then consolidated.

May be the only old and prestigious workshop which didn't succeed very much was Ertel: this firm which was celebrated at the time of its founder, had lost its previous importance after the transfer of title (Dietz Co.).

In France the glass manufacturing workshops were particularly advanced: Feil, Brunner Brothers, Eichens, Martin and Henry Brothers.

In England the tradition of making small or large dimension scientific instruments was carried on by the Simms near Woolwich, by the Cookes in York, by Dalmeyer in London and by Grubb in Dublin.

Therefore there was an extraordinary liveliness, even in the United States where Alan Clark's industry, specialized in the manufacturing of very large dimension lenses, was growing stronger and stronger.

Why in Italy was there a completely different situation?

One of the answers was the peculiar political situation in this country which was divided in to many small states. In addition to that its development and teaching policy being very poor, the establishment of new industries was not stimulated because these firms would hardly find a brisk market for their development.

Moreover the accuracy and the quality of the mechanical parts needed the experience and means that our workers didn't have. Glass, which had to be of high quality, needed skill not only on the melting stage but about all on the following processing stage, that is the cutting and the beveling.

From this point of view Campani's and Davini's optics schools as well as those run by accuracy engineers were of little use.

In the field of the accuracy mechanics the study of another very important sector concerning the time-telling instruments and, more generally speaking, the time-pieces industry, would make us better understand the situation in Italy at that time.

Since Europe was strongly involved in the conquest of new territories, navigation instruments (like chronometers, sextants, etc.) or measuring instruments (like theodolites, barometers, thermometers, etc.) were vital to get supremacy both on land and sea.

Italy couldn't take part in this policy because other problems had to be solved soon, the unification of the country in the first place. The unification of Italy in 1860 required the solution of an important and practical problem: after having drawn all over again the political map of Italy, the geographical one had to be drawn again as well.

The several small states, each of them drawn by its own having disappeared, it was necessary to organize a sole state with a unified cadastre and coordinated by a sole body. It was a vital problem to be solved: either one was able to establish in a short time industries which could make geodetic instruments to meet the new requests or the Italian market would be overrun, in a short time, by foreign industries which were already heavily operating in Italy.

An economic datum of 1870 shows that out of 1.000.000 liras spent on imported instruments, Italy was able to export only an amount of 70.000 a disparity ratio of more than 1/13.

Besides the instruments matter, men had to be educated and schools had to be founded for their training and education. This consideration leads us to a more general topic, concerning the education field. Between 1861 and 1900 important scientific schools were established in Italy (the Polytechnic schools for example) while the old and glorious universities were reorganized in order to be able to train new engineers for future professions.

In the specific field of scientific instruments, the three firms already mentioned, Galileo in Florence, Tecnomasio and Filotecnica Salmoiraghi in Milan at the beginning of the new century were reliable and ready to diversify their production, being able to meet the new needs, above all those concerning the new born electric and military industry.

In the course of only 40 years of activity the gap between import and export changed from 1:13 in 1870 to 1:4,5 in 1914. Almost to seal the good results obtained, since 1865 exhibitions specialized in optical instruments made in Italy will be organized in Florence.

Unfortunately this trend will not have a progressive development so much so that nowadays none of the three firms above mentioned makes scientific instruments anymore; at the most they resell those made by other firms, the Japanese ones in particular. I'm referring about all to Filotecnica Salmoiraghi which, after its entry into IRI in 1936, little by little started to decline, losing its vitality and peculiarity of making its own instruments and committing its future activity more to the distribution rather than to the production network.

Nowadays Salmoiraghi, together with another old Milanese firm, Viganò, sells almost exclusively foreign articles.

Each of the three above mentioned firms anyhow deserves attention from the scholars of scientific instruments. A good study on this subject has already been started and also the researches made by Salt, like the reports which are being issued just these days, will serve the purpose of reconstructing the history of an Italian firm which tried to get into a difficult market, got important results but unfortunately, nowadays, has almost disappeared.

During 60 years of hard work there have been men (Ignazio Porro in particular) who, in the field of instruments manufacture, have left us important notes about the theory and the processing technique which have been applied up to now, although the shape or functional character of these instruments has changed to some extent, especially after the beginning of electronics.

Porro's scientific activity can be valued both for his theoretical and practical notes and for his attempts (unlucky though, in Turin and Paris) to found an Italian industry being capable of manufacturing scientific instruments (mostly geodetic ones).

His treatises on "celerimensura", his appeals and proposals to make the general census of the new Italian State (a sole cadastre), his geodetic work carried out for 40 years with numberless innovations (like the "anallattico" telescope and the "2clepsciclo") deserve to be just mentioned here (about the "anallattico telescope" and Porro's life in particular, see my article issued in SIF in 1987 page.495).

After reconstructing Porro's and other good instruments maker's work as well as the main firms activity (Salmoiraghi, Galileo, Tecnomasio) it's still not clear why so little has been left of all that.

SAIT researches can give important contribution to the field of astronomic instruments, a field which some of the above firms and men addressed to, Salmoiraghi in particular.

If we could have access to the scientific correspondence and about all to the one treating the scientific instruments and the opinion that the astronomers gave about them, we could understand the quality of the instruments proposed, with they were made for and what results they led to.

In the case of Salmoiraghi, for example, it would be important to know the technical and scientific estimation given about the big 27 cm. wide transit circle made by this firm at the end of 1885 and which was used by Professor Millosevich and by Tringoli for the compilation of the catalogue of 412 stars in the latitudes 49 and 54 degrees.

It's true that esteemed scientists like Bianchi and Celoria gave their opinion on this instrument and on other ones, but it's a matter of scanty sentences, moreover put in catalogues aimed at the commercial market.

The Italian makers did their best to get their instruments into the market. It's well known the polemics between Salmoiraghi (who meanwhile was also a senator) and the Italian government about the war reparations (a chapter of the Treaty of Versailles) which Germany could pay off also by supplying scientific instruments.

Salmoiraghi fought against this solution, showing the unfavorable consequences that would follow for the Italian industries which, on the contrary, on his opinion, were able to compete with their European rivals.

This initiative by itself couldn't help very much the poor work situation existing in the Italian Astronomic Observatories. As a matter of fact their backwardness had no hope of future development if compared with the other European Observatories where the research was progressing more and more: new offices were opened and the most modern and accurate instruments were planned and manufactured. At the beginning of the 19th century the Italian situation, on the contrary, was rather dull: the Observatories (about 26) were generally provided with scanty means and staff and very few as well were the vanguard researches.

The inventory work of the scientific instruments which SAIT is carrying on in all its offices will be therefore very useful to make us better understand the research level in the astronomic field as well as the history of the scientific instruments in Italy.

Praiseworthy and useful is also the work which is being carried out in many astronomic archives, like the one at Brera (in Milan) mentioned by Professor Tucci.

References

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