STORY OF THE ALFA ROMEO FACTORY AND PLANTS: PART 2 ALFA ROMEO UNDER A KHAKI UNIFORM

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The first part of this attempt to revisit the industrial history of Alfa Romeo (see KB 112) finished on a dramatic stage: Alfa Romeo was on the verge of closure, and only a miraculous move lead to the removal of Managing Director Orazi, entrusted to arrange the liquidation of the company, and his replacement with a high profile manager, Ugo Gobbato, now in charge to restructure Alfa Romeo and upgrade its capacity to successfully meet the needs of Mussolini's regime for advanced mechanical industries able to provide military supplies for the then forthcoming wars.

This chapter will focus on the years 1933 to 1945, a shorter period than covered by chapter one (1906-1933), and Ugo Gobbato will without doubt be the key character of the whole period, the end of the war coinciding – no coincidence indeed – with his death. Some further famous and/or controversial figures will also appear, such as Jano and Ricart. Mussolini will also never be far away.

This is also the most paradoxical part of Alfa Romeo's history: at the same time, it was the brightest time for the ultimate in Alfa's cars: the 8C2900 is rated as world's best pre-war sports car, certainly a high point in the production of Alfa Romeo, yet at no other stage of the company life has car production been so marginal with respect to the overall activity of the factory. Roughly 35 2.9s were produced over 5 years and, overall, car production accounted for a maximum of 5% of the total activity in the late 30s. Cars were already not central in our focus for the first chapter, but they will be even less so in this second one.

Beside the brightness of the refined cars and their racing success, the khaki overalls that Alfa Romeo was compelled to wear during the war years to ensure their survival also meant sad times – fascist politics, bombings, being ruled by the SS from September 1943 and eventually finding itself on the wrong side of a horrible war – and difficult times for all those who were involved. This means also that we have to deal with sensitive topics, like the involvement of the company and its management with the fascist regime and the Nazis. Industrial choices, closely linked to political goals, industrial relations, Fascist corporatism and a look into Italy's war machine are also on the program. Yet, this is certainly the moment when Alfa Romeo consolidated its industrial size: under Nicola Romeo, the company experienced a kind of external growth: first building new facilities for shell production, then mainly buying out railway stock production companies far from Alfa's initial core business. Development led by Gobbato, instead, will remain Alfa Romeo's backbone, after the war, for resuming a civilian automobile production at an industrial scale.

As for the first chapter, no arrogance here: we don't aim at judging, but at shedding some light on what happened 60-70 years ago with as much historical rigor as we can afford. The exercise is also more risky as we don't have much scientific research as a guide, such as Bigazzi's book for the early period. Instead, we have some interesting, unpublished documents like several Boards of Directors reports and letters, completed with thematic studies on Italian industry under fascism and some colourful and important testimonies written by some key people like Giampaolo Garcea and Giuseppe Busso.

1933: Hesitations on Alfa Romeo's future

We shall first come back to the last events described in the previous chapter: constitution of IRI (Istituto per la Ricostruzione Industriale – state holding), appointment of Corrado Orazi and, two months later, his replacement by Ugo Gobbato. We feel the need to stress that, just like the switch from Darracq to A.L.F.A. in 1909-1910, Alfa Romeo's takeover as a state holding and subsequent switch to aero engines and lorry production was all but sudden, as was the attempt to reorganize it more rationally. The history from Banca Italiana di Sconto's bankrupt in late 1921 to the eventual creation of IRI is a twelve years one reported in previous chapter, a compelled public involvement in order to save strategic industries from closing. Through all those years, the economical conditions of Alfa Romeo kept being heavily compromised by debts inherited from Romeo's management, as well as organizational flaws of similar origins. The rules under which loans were allowed to Alfa Romeo, as well as the financial and industrial goals were plain ones: Alfa should have earned profits allowing paying back the loans. Yet the international prestige and importance of Alfa in the Milan area saved the company, and loans were converted into capital shares.

Alfa Romeo was reacting to the market and had no choice but to sell cars - or other suitable products - on the market. As the car market was very sensitive to the economic situation especially on the high end of the market where Alfa was, the decision to get into the aero engine sector – with airline companies and the Air Force (Regia Aeronautica) as customers - commercial vehicles – with industries and public transport companies as customers for respectively lorries and busses was aimed as being less dependent on the the economic situation affecting the capacity of wealthy individuals to afford expensive cars. As Mussolini had decided to revaluate the currency exchange rate to 90 lira for one British Pound in 1926, the export market, the only one that would have been able to absorb upscale car production, had contracted dramatically.

From 1929, Managing Director Prospero Gianferrari tried to actuate a salvation program along the same lines as what Gobbato later did. Gianferrari was probably not such a high profile organization manager, nor did he have the means later granted to Gobbato, but Gianferrari's enthusiastic commitment to Alfa was recognized. On the industrial side, he invested into modernizing alloy foundries and tried to improve the workshop organization[1], but only to a rather limited extent. Gianferrari was also responsible for having decided, and this proved vital for the company's survival, to buy trucks and Diesel engines licenses to add industrial vehicles to the touring cars production, as already evocated in chapter one. Moreover, he separated for first time the car and aero divisions. It was also under Gianferrari's management that Alfa came back to the racing scene with dedicated cars such as the 8C2300 and the Tipo A Monoposto. Even the exceptional Tipo B (P3) was designed and built under Gianferrari's management. All those achievements were recognized to Gianferrari's initiative in the IRI Board of Directors report dated August 11th 1932 in a mix of statements about the industrial health (compared to other industries heavily struck by the 1929 stock market crash) and its strategic relevance for the country. But at the same time, the financial difficulties were also raised, caused mostly by the interests on older debts. The financial needs for the forthcoming activities were also relevant: the aeronautical and commercial vehicle activities needed completion of the investments, and Alfa Romeo needed cash even just to proceed in its program. While the IRI agreed a further loan of 10 million liras, it also decided that "La Motomeccanica", a company producing land tractors, and "La

[1] A task entrusted to Ing. Alfredo Bruché, technical director of the working shops since 1926, who had previously been responsible for developing the Jupiter aero engine, and left Alfa for Isotta Fraschini in 1934.

Colombo", a producer of small aero engines– two companies also owned by IRI - would both be incorporated into Alfa Romeo[2]. It may be useful to stress here that the whole process of financing Alfa Romeo, since the early 20s, consisted in a repeated "patching up" rather than a solid investment scheme that would come only from the decision to hire Gobbato and reorganize completely the company. Yet, in April 1933, IRI reconsidered the 1932 accounts and drastically turned a virtual profit of 3 millions into heavy losses: the nominal profit was cancelled, and moreover a first, provisory devaluation of the machines and stock was considered for 9 millions, with a further need of covering 20 millions of credits toward customers or other expenditures probably impossible to get back. The supply of marine engines for fishing boats in the Atlantic Ocean seems to have raised important concerns. As a consequence of the collapse of the previous commercial organization, many commercial subsidiaries also owed large amounts to the mother company, and would most probably be unable to pay back. A proposition for reducing the capital from 100 millions to circa 30 was then made; such a reduction was still underestimated. At that stage, it's also interesting to note that "*the weight of the company management [was] excessive for Gianferrari*" and two Vice-Directors were nominated, including no other than Vittorio Jano.

It's even more amazing to consider that those were the conditions of the company when the racing department issued such a remarkable car as the Tipo B. This also explains the reason for the weird decision of withdrawing them from the racing scene, and leaving the Scuderia Ferrari alone as standard bearer. For the first half of 1932, the racing activities unrecovered costs accounted for Lit. 130 000, with a forecast that, since the Tipo B was so successful, the final cost, if any, would be reduced to a very little amount, since winning races earned higher starting and prize money as well as higher suppliers contributions (tyre, oil, fuel,…). It's even considered that the Tipo B being such a competitive machine, the eventual loss would be more than compensated by the value of the remaining cars at the end of the season, unlike the less successful experience, in 1931, with the Tipo A.

The shade of Fiat's hand

According to Borgeson,[3] Giovanni Agnelli himself wrote to the Director of IRI on September 22 1933 that Alfa Romeo should either be plainly closed down and written off, or be absorbed by Fiat-owned OM (Officine Meccaniche, cars and trucks manufacturer in Brescia). The IRI Director and the Finance Minister, albeit aware of the financial emergency, wrote a joint letter to Mussolini rejecting the idea of closure[4]. This didn't prevent former OM executive manager Corrado Orazi from being nominated as Director of Alfa Romeo in October[5] with the clear opinion that Alfa Romeo should be closed down.

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[2] Actually, it's documented that Alfa Romeo built aero engines after Colombo designs, but it seems that the merge with Motomeccanica was never completed, as this company kept its own factory and resumed activity, still under IRI ownership, after the war until 1958. The merging with Officine Colombo would instead become fully effective in April, 1935

[3] *Alfa Romeo Tradition*, p.99 ; we didn't see copy of the quoted letters. In his conference in 1995, Bigazzi stated he had never seen that letter in the archives and doubted of its existence. According to him, it would not have been in Agnelli's style to write such explicit requests.

[4] *Ibidem*. Note that the usual understanding is quite opposite, with Mussolini opposing the Finance Ministry and some IRI directors, his personal intervention ordering Alfa Romeo to be kept alive. Duccio Bigazzi refers to a memorandum by Milan's Prefect dated November 25 1933 to tell the story this way in *Management Strategies in the Italian car industry 1906-1945: Fiat and Alfa Romeo*.

[5] A handwritten note on a document states October 15th., other sources imply it would be either on Oct. 1st or Nov. 1st. His nomination was for sure decided at an IRI meeting that took place on October 5th.

While there's no doubt that Mussolini personally played a role in supporting Alfa Romeo, he was also pressed to do so from several sides. Not only did the other industry managers oppose a further concentration of mechanical facilities into Agnelli's hand, seen as already too powerful in the sector, but both the social consequences in the Milan area and the national pride were also called as reasons for rejecting Fiat's intentions. The local Fascist authorities, as well as Alfa Romeo workers and Fascist trade unions strongly disliked Orazi for the same reasons, and were worried that the 1200 unemployed caused by a closure would be an unsustainable burden for the local social assistance structures.

Orazi, in the context, was seen as a Fiat man both for his professional origins and his plans following Agnelli's recommendations. But a small event caused further complaints about his management. It had been announced under the previous management that Tipo B monopostos would be available for sale, even to foreign drivers, and some of them had already expressed intention to buy one, in some case even with a deposit. The French subsidiary in Paris had accepted such orders from French drivers, seemingly including Lehoux, Moll and Sommer. Orazi decided to deny the sale of Tipo Bs to foreign drivers under the pretext that foreign car manufacturers would be allowed to copy the car and thus compete against Alfas. The decision caused the publication of a vitriolic article in "L'Auto" on Dec. 2nd 1933 criticizing Alfa and the Italian Government for letting the drivers down. At his turn, the Paris representative wrote to the Fascist Party secretary complaining with angry tones that such a situation put him in the impossibility to continue representing Alfa in France, and the letter was further forwarded to Finance Ministry on the Duce's behalf: what a fuss about a small article in the French press!

The very same fact caused another letter to be written personally[6] to Mussolini by a Milanese fascist attorney, *Avvocato* Cottini. This letter mentions that the rumours reported to Mussolini that Alfa Romeo hosted communist activities were untrue, and that the orders for more than 30 Monopostos from foreign customers had been disregarded, including one from Lord Howe who had already sent to the Portello a cheque for Lit. 150 000[7] as payment for a Tipo B. Even if the figures of Alfa's financial needs in Gianferrari's reports were underestimated, this compares interestingly with the accounts exposed above. The letters goes on, rating as clueless the idea that copying the Tipo B would allow Alfa's competitors to be competitive for the … 1935 season (we know how the story went!). Cottini concludes that such a move would damage Alfa's interests at Fiat's advantage, that Orazi doesn't hide the guidelines he received "*from others*" and that his replacement by "*a plainly honest person*" is the unique solution.

Ugo Gobbato, a high profile manager

Mussolini's direct involvement in the choice of Gobbato as Managing Director is not documented, but he may have previously made a strong impression on the Duce: back in 1923, as the new Prime Minister, he had inspected Fiat's innovative factory the Lingotto guided by Gobbato, in charge of the organization of the new factory. After having accomplished the job, Gobbato was sent first to modernize NSU in Neckarsulm, bought by Fiat in 1929, during a year. Gobbato spoke fluently German. Then in 1930 Gobbato went to Spain, where he first met Wifredo Ricart in the process of organizing Fiat España. The next year, he was chosen for a titanic task: the construction of a huge ball-bearing factory in

[6] The letter is dated Nov 30, thus according to Borgeson the very day of Orazi resignation. If the dates are accurate, the letter reached Mussolini when the issue was already settled.

[7] The official price tag for a 8C2300 short chassis was then 91 000 liras. A "Berlina Alfa" bodied 6C1750 GT was listed at 54 500.

USSR, on behalf of Fiat-owned RIV, chosen by Moscow's authorities. This took him two exhausting years, where language problems summed to lack of technical culture by his Soviet partners, erratic political decisions and, on the personal side, quasi-starvation for him and his family. When he came back in Italy mid 1933, he had achieved the task, and the Soviet personnel had even kept fond memories of him, as testified by Satta and Hruska and a few others visiting the Moscow plant after the war. But it had cost Gobbato so much energy that he had turned down all the job proposals presented by Fiat in the following months, as he was even not sure he would ever recover from such a difficult experience. Yet, the challenge, his patriotic fibre, and the promise of full support, both political and financial, helped him to accept.

In search of partnerships: Officine Reggiane, Citroen and Isotta Fraschini

Even before Gobbato could dedicate himself to the industrial reshaping of Alfa Romeo, although financial support was granted, the need of external partners, in order to keep as low as possible the need for fresh capital, was a priority. As soon as February 1934, Gobbato was entrusted by IRI's management to open discussions with other important mechanical industries in the hope to identify partnerships where Alfa Romeo's shortcomings in tooling, etc. could be overcome. In such a way, IRI could be dispensed with investments and/or Alfa could optimize the use of its underemployed existing plants.

The first, inconclusive talks were with the Officine Meccaniche Italiane, located in Reggio Emilia, later better known as "Reggiane" for having built advanced fighters during WWII and, after the war, bus bodies[8]. From a letter from their President dated February 26 1934, it seems that in this case, the Officine Reggiane was more in a position for begging than Alfa, and that Gobbato's intention was rather to go his own way, as he saw no foreseeable cooperation possible.

Much more advanced, and also more interesting, were the discussions about assembling at Alfa Romeo the then new, in 1934, Citroen Traction Avant 7CV. In conclusion of previous talks started as soon as January 10, André Citroen wrote to Ugo Gobbato on March 3rd 1934 that his company would be glad to sign a contract for building Citroens at Portello under the name Alfa Romeo-Citroen. Remember that, back in 1924, Nicola Romeo had sold to Citroen a piece of land located south of the Portello works: the agreement would have included Alfa renting those facilities, since no Citroen activity would have made sense if Alfa took care of assembling and commercializing Citroens in Italy. In exchange, Citroen would as well have sold Alfa Romeo products in France and other countries, including touring, sports and race cars. The aforementioned "La Motomeccanica", partially merged with Alfa from 1932 under IRI's orders, was producing among others a small land tractor called Balilla. The wheeled version (1400cc; 10HP) was issued in 1931, and another version, slightly more powerful (1600cc; 15HP) on tracks was presented in 1933. Citroen would also have sold those tractors, which were already sold (at least) in France under the Alfa Romeo name[9].

[8] See also KB 104 for examples of trolleybusses on Alfa chassis.

[9] According to A.T.Anselmi, Motomeccanica eventually took over « commercial departments » of Alfa, i.e. the compressed air activities, indeed a mere representation of the US Ingersoll-Rand. We may also remember that Motomeccanica is the very same company, then called "Motoaratrice", that Nicola Romeo unsuccessfully tried to buy in 1918 for the Tytan tractors contract –see Chap 1.

While financial and timing issues related to the contract proposals could have found satisfactory solutions, the discussions came to some length, and eventually aborted late May as the Italians wanted the cars to be marketed under the sole name "Alfa Romeo", like for the trucks and busses, while Citroen insisted that, except for eventual sales to the Italian Government, they would be identified as Alfa-Citroen. On May 6th, Ugo Gobbato sends to Dott. Menichella, Director of IRI, a handwritten letter where he expressed astonishment that, for such futile reasons, Alfa Romeo would be prevented from finalizing an agreement that would open an opportunity to get out of "*two years of wasted time*" and tie an agreement that would "*help the independence of our company*". "*The small cars so much needed in Italy and the colonies […] are missing in Alfa's range, would helpfully allow filling industrial capacities thus profitability, and are impossible to develop in-house in less than two years*". "*We have now to dedicate ourselves to the upgrade of the already old touring model and design a new sports, upmarket model necessary for keeping high the marque tradition*" He then makes several proposals for the way the name Citroen could appear on the cars. It seems indeed that nationalistic questions caused the deal to fail: this can be seen as an example of how, for Alfa, being under government ownership was both a blessing, preventing closure just a few months before, and a burden for other aspects. This might be the right place to remember that one year later, Jano designed and built in 3 examples of the small 4C1500 prototype (see KB 37), most probably as a consequence of the failure of the negotiations with Citroen.

In another letter, Gobbato, interestingly, reports some comments on the Traction after he tested a car in May: the car is rated as well-built, comfortable and roomy, but objected that, on steep twisty roads, the engine lacked torque and power caused by too tall gearing, needing thus, in Gobbato's view, shorter final drive and a 4th speed. Moreover, in the same situation, he rated the steering stiffness "*absolutely unacceptable*", wondering whether it was an intrinsic feature of front wheel drive or just a faulty adjustment of the tested car.

The third major attempt to seize a partnership aimed at reducing the necessary investments at Alfa was another trial to create with Isotta Fraschini a corporation which could accept and fulfil orders for aero engines from the Ministry of Aviation. While technically such a project would have made sense, it came to a dead end when considering the separate accounting of costs, including financial ones, transfers of material, etc., so that the only possibility would have been a full merger of the two companies. As this was seen by Gianni Caproni, the new owner of Isotta, as a way to buy out Alfa for as little money as possible[10] (just like the previous similar attempt in 1927 – see chapter 1), the IRI Director concluded " *that Alfa Romeo goes ahead alone and, for that IRI agrees to finance it to allow the needed production*"[11].

In October the IRI wrote to the Ministry of Aviation agreeing the investments in new tooling needed to fulfil orders for hundreds of Alfa 125 RC aero engines pending on the effective signature of such orders. This is the exact illustration of how Alfa Romeo was indeed financed by its public ownership: agreements between IRI and Ministries acting as customers caused the former to pre-finance the investments needed. This scheme worked well for the development of aero engine, bus and truck production, but left little if anything for car production, let alone racing car development.

[10] Bigazzi, *Il Portello*, p. 610. Handwritten notes by Menichella refers to « *unheard pretensions from Isotta* »
[11] Anselmi also quotes attempts to cooperate with Piaggio. We found no document on this.

Reorganizing Portello

It was an emergency situation that Gobbato soon discovered after entering into his new job. With experienced eyes in all sectors of a company organization, he wrote a personal memorandum on June 28 1934 summarizing a dramatic diagnostic: "*low quality machinery*", "*irrational layout*", "*unnecessary material movement*", "*non-existent cost accounting*". The workforce, when Gobbato stepped in, had been reduced from 2700 in 1932 to something between 1000 and 1500 according to sources. The company was seemingly in a complete stall, with ageing models of cars, difficult to sell abroad with the currency change fees, and a planned production of trucks and aero engines still needing the completion of the necessary tooling, plus the needs for the raw material. And, as we just saw, the Ministry of Aviation who would have preferred entrusting a new aggregate, made of Isotta and Alfa rather than waiting that, and if, Alfa would be able to fulfil the orders.

Yet the financial backing from IRI allowed modernizing the machines. The "refreshed" accounting at the end of 1933 (remember that the cleaning up accounts ended with a nominal loss as high as 93 million for 1933, meaning the capital was reduced from 100 to 10 million, later increased again to 30) recognized a global value of 21 million for the assets: land and buildings for 10.5, machines and equipment for 8, and 2.5 for the dedicated tools (moulds, stamps,…). The constructed area part was then all south of Viale Renato Serra, a street yet to be opened, while only a little was erected north of the new avenue: test benches in the open air, and a wooden lunch room for the workers. Romeo's former shop in via Alberti/via Lauria (see chap 1 on KB112) was still the property of Alfa, used as remote storage. Most of the buildings were those described in chapter one, with only a few ones erected under Gianferrari in 1929-1930. The situation would be corrected from 1936, when the northern area was enlarged by buying a piece of land from the Milan council, where further facilities would then be erected.

The 8 million liras of machines and equipment included a total of 1150 pieces of "outdated machinery". Compared with the 3035 machines present in 1919 – those being really antiquated even at the time[12], three quarters of which were already dismantled in late 1919 – it's a huge diminution, yet compared to the 1929 situation of 772, this could give an idea of what Gianferrari achieved. For the year 1934, a total of 253 new machines of all kinds (from special lathes to ovens, including gear-cutting machines, etc) were acquired, i.e. one quarter of the existing number.

Gobbato's reorganization didn't make everyone happy, indeed, as had Gallo's attempt back in 1926. Since that year, following Merosi's resignation, Vittorio Jano had become the only manager responsible for all technical sectors, from racing to touring cars and including aero engines. He was even assistant general manager during Gianferrari's last months, and it seems that he felt sick about Gobbato's hiring, having thought he would have himself been called up for the task. As early as April 4th 1934, Gobbato issued his first directives for the new executive staff reorganization, and that caused a further loss for Jano, as Giustino Cattaneo, a famous engineer who had been chief engineer at Isotta Fraschini and had thus created many of those fine cars, was hired by Gobbato[13]. He was entrusted with the responsibility for aero engines, propellers and trucks. That left Jano at the head of the sole Car division, maybe the most prestigious, but also the lesser of all in the new orientation of Alfa

[12] According to Garcea's testimony in Alfa Romeo notizie, many of those belt-driven machines, instead of being moved away, were buried into the ground near the main entrance of the 30s.

[13] Incidentally Cattaneo was of the same Venetian origins as Gobbato. On several occasions, Gobbato hired people from his native area, who attended the same schools as he did himself.

Romeo. The following table, comparing the industrial vehicles sales to the automobile ones, show Jano's declining importance during those years.

Alfa Romeo production[14]		
	Cars	Industrial vehicles
1934	699	0
1935	91	211
1936	10	671
1937	270	851
1938	542	729
1939	372	562

While the 1934 car was the 6C2300 A, basically a rebored and updated 6C1500-1750, the 1935 ones should have been more modern, all-independent-sprung 6C2300Bs and 8C2900s. From the 6C2300A to the B version, however, the technological step also meant a 20% increase of price, from 41 500 to 53 000 liras for an in-house bodied Berlina. In the meanwhile, racing successes didn't keep the previous pace and the activity itself had been handed over to the Scuderia Ferrari, another loss of responsibility for Jano.

Jano's case, the most dramatic, was not alone. Many other people felt their former prerogatives spoiled by Gobbato's intentions of rationalizing. Alfa's pride, as a leading and prestigious company[15] also meant that tradition was strong and, among the drawbacks, a concurrence between technical offices and working shops was never completely settled, the latter tending to work independently. The same was going on with the whole organization, including the accountability of wages and materials. In Gianferrari's report it was already possible to understand that not all accounting were easy to compile nor even accurate. The situation reported to Gobbato by an IRI expert mid 1935 gives indeed the impression of free hands everywhere. Huge corrections were necessary on the stock evaluations because the same pieces were accounted for several times, both as a set and individually, for example, when the sets were delivered incomplete – yet fully accounted, then completed, and the single parts were accounted a second time. Gobbato then issued, in July that year, new strict rules. An example may help give an idea of the extent of disorganization. A guard reported a supposed attempt of theft when he found a lot of 34 ball bearings on a scrap pile. It turned out that, according to the technical offices, that very type of bearing corresponded to six different uses, with five reference numbers. It was to be found in three production supplies and, in the spare parts stock, in two distinct places with different catalogue references. But since no bearing was missing from any stock, it eventually appeared that they were coming from the acquisition office, as they had been lying for such a long time in the arrivals store that they had begun to rust. That model of bearing was acquired from three different suppliers, all at different prices…

[14] Data elaborated from Bigazzi, *Management strategies…*, op. cit. and Fusi, *Tutte le vetture dal 1910.* Although Bigazzi based his counts on Alfa archive documents, we can't help noticing that, with zero industrial vehicles in 1933 and 1934 his data can't include Alfa Tipo 40, 50, 80 and 85 trucks and busses, built from 1931 to 1934 in at least 150 examples overall (Cf. M. Condolo, *Camion Alfa-Romeo*, 2003).

[15] Oral testimonies collected by Bigazzi contain several recalls of how belonging to Alfa Romeo was considered, still in the thirties, as a pride: even a prominent Comunist Resistant, Cino Moscatelli, told Bigazzi "*I always wore the Alfa badge… we were proud to work at Alfa. We did feel that Isotta Fraschini made fine, luxury cars, but they were built for ladies. On the race track, with real racing cars, no one could beat the Alfa Romeos*"

On tour at Portello in 1935 with Giampaolo Garcea

Fortunately, we have a first hand testimony allowing us to have some idea of how the Portello factory was organized in August 1935. Giampaolo Garcea, freshly graduated Engineer thanks to an Alfa-Romeo backed grant, was immediately hired to assist Amleto Bossi at the Experimental Department, and tells, in an old Alfa Notizie, his recollection of his first day at Alfa. The main entrance was not yet the one on the southern side, via Gattamelata, near the Direction building. In 1935 the entrance was still on Via Traiano, just between the original ALFA and the Trento hall (see KB112 p72). On the right of the entrance, the ALFA[16] and Trieste halls outside looks had not changed from the WWI era, and hosted the mechanical shops. Inside, hopefully, the belt driven machines had (mostly, not yet all in 1935) been replaced with more modern ones, with built-in electro motors for their drive. In both those halls were being machined parts for the Alfa 125 aero engine, derived from the Bristol Pegasus. New halls, built in the early 30s, were located in front of the Direction offices, i.e. on the left from the main entrance, not far from the 1918-built forge hall. Both are well-lit, and the first was the place where engine parts converged for being quality controlled and "signed" with electrical pencils. In the second of those new halls took place the assembly of the engines on their huge jigs. Some "scandal" arose when it was noticed that a girl working at the quality control not only signed the "passed" code on exhaust valves, but as well wrote love message for her boyfriend working at the assembly department! During the war, these halls, converted to trucks storage, were completely destroyed by bombings and not reconstructed.

The engines were then tested in the open air, where, on high benches, they were connected to mock propellers that cooled them in the same time as they acted as aerodynamic brake. Those test benches and cabins, roughly a dozen in 1935, were located in the northern part of the Portello, beyond the future Viale Serra, blowing air, exhaust gas and oil on over 20 metres of grassy land behind them. After the run-in, the engines were dismantled, checked, reassembled and bench tested again, but on the hydraulic bench for measuring power and consumption. On delivery, one out of every 100 was random chosen and bench run for 150 hours, after which every single part had to remain in as-new condition. A single hydraulic bench, called a "Froude brake" from the company producing such devices, was still used, in 1935, for both experimental engines and production ones. It was located on the edge of the facilities, at the northern end of "Trieste"[17], its rear end blowing 120 decibel and gases at 200km/h on the grass where Viale Serra would be later traced. No way of hearing any word there, and the only protection was to force into one's ears masticated cotton wool and communicate through signs or written notes. A 500 HP electrically driven, huge blower hung from the roof. It provided cooling air to the engine, while a shaft ran through its duct to the brake. The engine controls were near the engine itself without any separation, hence the insupportable noise. The engine behaviour was checked thanks to the gauges, but most importantly, by watching the colour of the exhaust flames, giving clues on carburetion, misfire, knocking, etc. The bench room was thus best kept almost in the dark.

[16] Garcea, in both his book *La mia Alfa* and the Alfa Notizie article refers to the Trento hall. There is however no doubt, following his geographical explanations, that he meant the original ALFA hall, since the Trento department was not contiguous to the Trieste and was located on the side opposite of where he describes it, i.e. on the left when crossing the main entrance.

[17] Garcea's description of a long access hall running between Trieste and ALFA suggests the bench could have been arranged in an angle of the presses and ovens building.

Creation of an Experimental Department and new construction at the northern end of Portello

From January 1936, Gobbato decided to split the Experimental Aero Department from Production. Amleto Bossi and his assistant Garcea were entrusted to choose their future colleagues and order all the equipment they needed to create new facilities for the new Experimental Department, named "Esperienze". The first engine for which the new department had to be ready was the double row radial AR 135 being designed by Cattaneo. Gobbato expressed his views on the Experimental Department role: "*Keep in mind that we are all blind here. You are as well, but you are the recognition team. Your task is to use your nose and tell us, when you hit an obstacle, which way we shall go to go around it*". At the same time, a new facility was under construction next to the "wind mills", the place where the new hydraulic benches for the second test on production engines had to take place. The last such room in the row was instead the new, state-of-the-art test bench for the newly created Experimental Department. The technicians in charge of the tests were now separated from the engine itself by glass walls, finally allowing them to communicate by voice. All controls were now remote and automatically operated. When Ing. Haugh, a German sent to attend the homologation runs of Alfa-built DB 601s visited it, he rated the new bench as the most advanced he had ever seen around the world, having been on tour as far away as Japan.

On the northern side of Viale Serra, further buildings and facilities would be erected in the following years, up to the beginning of the war. Larger halls for production of the parts for those aero engines, and the offices and workshops under direct dependence of the Technical Design head. On the first floor over the workshops along Viale Serra, we find the design tables and, just next to them, the shops in charge of executing the parts and prototypes for the new projects. The Experimental Auto Department would as well move on the new grounds: early 1938, the building on the corner of Via Serra/Via Traiano would spring from the ground for a most prestigious function: a place will be found, next to the "Esperienze", for the newly launched Alfa Corse, entrusted to manage Alfa's official racing activities in replacement of the Scuderia Ferrari. When Alfa Corse is officially founded, on January 1st 1938, construction workers are still busy with the concrete for the building structure: pictures taken early January show the building not yet built up to the 1st floor. Yet, the fashionably designed new facility, also there with workshops on the ground floor and design and direction offices above them, had to be completed in March. It's about at the same moment that the Via Renato Serra itself was laid out. Further north, a huge meeting and lunch room, with large collective kitchen was built with a very large, arch shaped roof in concrete, an audacious design for the times. Other facilities for the workers leisure activities were also completed toward the beginning of the war in the surrounding area, plus the professional school at the northern edge of the then built-up area.

From other sources and attentive study of the contemporary pictures, it seems that, in the south-west end of Portello, the 1917 forge hall was sided by new, high and long halls dedicated to the truck assembly line. Between this area and the Gorizia hall, we could find the steel and iron supplies storage, typical with its repetitive triangular frontages. In 1940-41, the aluminium, electron (alu-magnesium alloy) and Duralfa foundries were all reunited in the north-western area, next to an electricity plant, supplying the whole north area. Some plans, approved in 1939, to move the repair and maintenance shop in the northern area could not be completed due to the war conditions, which caused a steep increase in the cost of the materials. Further, non identified buildings also appeared in the late thirties, in the remaining space between the main halls. Those were described as provisory facilities, as Milan's

urbanization plan included new streets to be laid out, that would cut the Portello area into at last six separated parts. Accounting for those streets, the main buildings had been organized along their planned path, but since the urbanization didn't materialize, even with the 1934 "Albertini" plan, the space was filled. Eventually, only Via Serra was ever established, some of the "provisory" buildings lasted until Portello's final destruction; others didn't survive war and bombings.

"Militarizzazione"

Garcea recalls his first crossing of the Portello gates on August 21st 1935, effective work starting on September 1st. The very next day after his first visit, a Government decree call for the "militarization" of Alfa Romeo. We may not be aware of all implications of this decision, but it clearly means that the Army (actually the Air Force) gained with that a right to control and rule aspects of the company's life. Ingegnere Tonegutti, the man who welcomed Garcea, was indeed a Regia Aeronautica officer, in charge of the aeronautical production of Alfa Romeo. His offices seem to have been located in the south-western corner of the ALFA hall, where the Direction offices of A.L.F.A. were hosted in the pre-WWI era, next door to *Cavaliere* Agostini's, the Head of all mechanical workshops. The need for a young assistant to the aero test benches head makes also sense in this context.

Militarization also allowed a tighter control on the workforce (any worker could be prosecuted, for any activity affecting production, according to the military wartime laws), but, for the near future, it was also clear that the army's needs would have absolute priority. This is self-evidently what Luigi Fusi means when he writes, about the 4C1500 project, that "*it didn't go farther than the experimental stage due to a change in the company's plans*"[18]. While the archives suggest that Gobbato never dropped the idea that car production should be one leg of Alfa's activity, with a view of what a suitable range should be, from the small car (Citroen, then 4C1500) up to the image-making sports cars (8C2900, directly derived from state-of-the-art sports racing cars), through advanced middle-class ones (the 6C2300B, decidedly a step forward on the "A", with the then exceptional all-independent suspension), the program should now rotate almost exclusively around army supplies: aero engines, whose production capacity had to be drastically enhanced, trucks, and an even lesser known branch, marine engines derived from the truck diesels.

Mussolini declared war against Ethiopia on October 2nd 1935, and that caused, on November 18th, the Society of Nations to declare sanctions against Italy, affecting the supplies of raw materials and most importantly causing difficulties for importing petrol. Following a speech by Mussolini promoting the independence of Italy with respect to imports ("autarchy"), Alfa Romeo, tightly linked to the Government politics, immediately started studying the feeding of industrial vehicles with "national" alternative fuels: methane, wood-gas, electricity[19]. Alfa Romeo subsequently faced a press campaign questioning a supposed "lack of nationalism", as aero and industrial activities actually consisted of production under foreign licenses. New in-house developed trucks appeared, firstly Deutz-derived engines on Alfa designed chasses (Tipo 85, 350, 500), and later full Alfa Romeo projects (800 and 430). Gianferrari's and Gobbato's modernization of the Portello facilities also allowed, in such a context, patenting new kinds of light alloys with different features, called "Duralfa" for

[18] Fusi, *Tutte le vetture*, op. cit., p.301
[19] See KB 104 for a more comprehensive description

specific purposes, including engine parts (Duralfa 1 for con rods; Duralfa 3 for pistons; Duralfa 4 for engine blocks) and propellers (Duralfa 2).

The same issue was happening in the aero engine sector: except for the Jano designed small radial engine (the 240HP D2, produced in 600 units from 1931 to 1934), and the even smaller Colombo models (S53 85HP 4-cyl, and S63 130HP 6-cyl – 500 units in 1934), all were derived from British-licensed models, an especially problematic situation since the United Kingdom was held, with France, as the main countries responsible for the "unjust sanctions". The Bristol derived radial 9-cylinders remained anyway as Alfa Romeo's backbone in the aeronautical sector. Brilliantly developed under Bossi and Garcea's responsibility – they identified on Alfa's benches, and then communicated to Bristol, the cause of some repetitive failures, like the blower rear bearings seizing due to low intake air temperature. Now called Alfa 125, 126, 128, 129 and 131[20], they were built in 11 000 units from 1934 to 1944 and powered some flagships of the Regia Aeronautica, especially the Savoia-Marchetti 79 tri-engined bomber. The original design was already quite advanced, with nitrided steel cylinder liners, Duralumin cast blocks, 4 valves per cylinder, the exhaust ones sodium cooled, a feature 30 years later introduced on the *bialbero*. Alfa not only sorted reliability issues, but also developed supercharging optimized for different altitudes, and introduced automatic valve registration on the 129. It may be recalled here that, while the Italian Air Force appeared ill-prepared at the outbreak of WWII, Italian planes and engines earned many prestigious records and victories in competitions in the late 30s. The Alfa Romeo engines were brilliant for power, altitude and fuel economy behaviour, allowing them to seize several world altitude records (11 world and international speed, distance and altitude records from 1937 to 1939), and winning races such the Istres - Damas - Paris.

The De Havilland Gipsy-derived, air-cooled in-line fours and sixes AR 110 and 115, designed for training, recognition and light planes, were also produced in significant numbers (500 fours and 1600 sixes), and the 115 was even developed and continued after the war. Lesser known is the Alfa Romeo production of alloy propellers, 5600 of which were produced from 1938 to 1944. They were among the most advanced for the time, as variable pitch was a very new feature that allowed engine power delivery to be optimized: even the first versions of the famous "Spitfire" fighter started their life, pre-war, with a fixed wooden propeller. Alfa Romeo also designed the natural next step in this field, the automatic pitch adjustment, a must for high performance airplanes, where the engine revs were automatically kept constant whatever the throttle position, climb rate, etc.

The warfare situation obviously eased Alfa Romeo's financial difficulty, financing being granted through IRI on the behalf of Government and Air Force. Quality and quantity of aero engine production were the absolute priorities, and Alfa had to be equipped to meet such targets in any case. Yet, even in this context, some projects, and related investments, proved to be mere losses. In the difficult 1931-33 years, millions of liras had been invested for the tooling needed for another Bristol-licensed engine, the Mercury. This was a downsized version of the Jupiter, whose shorter stroke allowed a lower drag, while being disposed for higher revs, just as the Pegasus. A total of a mere 37 Mercury were produced between August 1933 and November 1934. Another important Bristol model, the Hercules, was licensed to the Italian Air Force in 1933 and featured sleeve valves. This solution, suitable only for rather slow-revving engines such as aero ones, was another way for reducing diameter and drag. There's no trace of any production of the Hercules by Alfa, yet Garcea recalls a sleeve valve

[20] All were derived from the Bristol Pegasus, featuring the same capacity, but differed in power output mainly due to differences in supercharger sizes and speeds, including variable speed on the 131.

radial engine on Alfa Romeo's drawing boards, called Alfa 105. It probably never went beyond the studies.

The Italian commitment to the Spanish Civil War, of course on Franco's side, that broke out on July 17 1936, shortly after the Ethiopian campaign came to an end (May 1936) meant another duty –and bench test - for the Italian Air Force, thus more workload for Alfa Romeo. In the nationalistic climate, that reached a climax with the League of Nations sanctions, even racing activities were affected, as foreign drivers (especially the French ones) were banned from Italian racing teams. Scuderia Ferrari-led Alfa was included, causing the departure of famous drivers like Louis Chiron and René Dreyfus.

A new financial health

As soon as the decision to rescue Alfa Romeo was made, and Gobbato nominated as its head, a move toward reorganization and new development took place, demonstrated by the Citroen talks taking place in January 1934. The first months of that year see the reduced workforce being used to start rebuilding the factory rather than focusing on production. This causes the President of Alfa Romeo's Board of Directors, *Senator Dottore Ingegnere Marquis* Emanuele Trigona, to introduce the annual report stating that "*not only the existence of the Company has been secured, but the factory's activity is headed to a brighter future*". Yet, a prudent accounting for the year shows a 1.7 millions lira loss, including the cost of rebuilding many facilities (resulting in an increased asset value of half a million lira – details on the new tooling have been described above), so that the cause for the loss is as attributed to the lack of production during the first months of the year. The reference to a new generation of cars soon to be unveiled, being designed by a "*famous engineer*", was also stressed at the end of the report.

The 1935 fiscal year also ended with a loss of 2.3 million, the accounting being again done with unusual care – maybe the previous decade, ended with the loss of 90% of the capital, was a painful recollection… An order for 300 aero engines had materialized, and the related investments had taken place (6 million for that order alone), without being in a position to effectively deliver the products during the year. The archives for 1935 explicitly state that further aeronautical orders, logically needed for amortizing the new tooling, caused lorries and passenger car productions to slow, up to the point of stopping them completely (in contrast with the statement on the new range of cars), in order to concentrate all the available machines and workforce on the aero production. Renting some CEMSA[21] facilities was even considered, where useful machinery was available, to speed up deliveries. Dozens of millions of lira – 20 for the first half of the year - were again needed for increasing capacity, provided by the IRI under the guarantee of Government orders. At the end of June, those orders were up to 700 engines for a total of 91 million lira, an amount the Air Ministry would of course pay only when they would be actually delivered.

All that activity and the money provided by IRI eventually produced its fruits: 1936 saw the first, unquestionable profits since the mid-twenties. The 4.3 million earned that year allowed the company to absorb their previous losses and leave 300,000 lira in reserve, although the value of the out-of-date machines, no longer suited to the new production processes, was simply cancelled, for a total of about 2 million lira. It's also interesting to note that the wood-gas conversion of truck engines had been possible thanks to the acquisition of

[21] The locomotive plant in Saronno, that was part of the Romeo group until 1926, see chapter 1

the company "Soterna", owner of the patents for such devices. Truck production had been resumed at a normal pace, while we have seen already that the cars built were at the historical minimum: 5 6C2300B Pescara and 5 8C2900A, not even production cars, but only racing ones[22].

During the next few years, up to the outbreak of war, detailed data does not exist on any investments, but truck production was emphasized first, and the 6C2300Bs were also produced in a few hundred units, while aero engine production increased steadily. From the aggregate data we have, it's possible, however, to state that Gobbato's reorganization, the supply of aero engines to the Air Force and civilian airlines, together with propellers, trucks, buses and marine engines earned substantial profits. Still rather underestimated by the careful accounting of amortization and maintenance, the profits for 1937 were at 5.8 million, 5.2 in 1938 and 8.6 in 1939. This new financial health allowed Alfa Romeo to pay dividends to the shareholders (that is IRI at 99.7%) at the height of 6% for each of those years. However, since the company's capital was still at 30 million, obviously inadequate for the new situation with production capacity increased, some financial settlement was still needed with IRI, that took place only in connection with the construction of the new Pomigliano plant, with which we will deal below.

Working at Alfa Romeo in the thirties

Ugo Gobbato took his position at Alfa Romeo sometime in late 1933. Since the exact date of workforce downsizing differs from source to source, we can't know if he was responsible for the decline in employment at that time. Anyway, since his hiring granted the company a future, and his reorganization took place immediately, the workforce (for Milan only) was already back up to 2000 in 1934, over 5000 in 1935-36, 6500 in 1937, 7500 in 1941 and hit an apex at 8000 in 1943. Production workflow was being drastically improved "*to bring back the work cycles fairly consecutively and redistribute the machinery into lines so that the work processes could be done sequentially*". Not quite a true production line, but at least, for assembly of engines and trucks, something looking almost like one. Gobbato had long been a promoter of the scientific organization of work: from mid-1935, he introduced a new set of rules allowing accurate industrial accounting for analysing the costs of each individual work process. In parallel, new rules also addressed discipline in the workshops and wage calculations. We have no statistics on the wages themselves, but Gobbato reformed the calculation of the piece-related wage bonus. Daily wages were limited to exceptional cases, and a set of boards would be used to indicate the time dedicated to each operation, each batch of pieces, the working time on each machine, etc. so that all costs could be charged on the order for which they were spent.

But the former organization, as we already mentioned, left quite a lot of autonomy to the workshops. This had to change, in order to control work discipline more closely, worker movement within the factory, and bring more rigour. That meant that a specialized Time Office was created to estimate a reference time for each operation. This was of course a key point, and the "fashionable" method then was a French one called Bedaux, promoted by specialized consultants who timed the workers: the Società Italiana Bedaux was hired as a consultant at Alfa Romeo. This was intended as an "objective" method to state the bonus piece wages, as these were based on the production exceeding the standard pace. Of course, it

[22] Even the 6 12C36 GP cars can't be counted, as they consisted of existing 8C35 chasses fitted with the new 12C engine.

was strategic to have those statements entrusted to a central time office rather than to time analysts on the work floor, in order to avoid favouritism or worker bias. Every change in production type, method, or tooling would of course cause a revision to the standard times, and documents show that Gobbato claimed full freedom for revising the rates, going against the guarantees given to the worker by the 1937 law.

The attempt at line production instead of highly specialized and autonomous workshops caused a dramatic evolution in the workforce structure. While in 1926-1933, skilled workers accounted for 47% of the overall workforce at Alfa, their percentage fell to 37% of those hired in 1933-40, and 16% during the war. In comparison, helpers and machine operators rose from 10% before 1933 to 15% before the war and 36% in 1940-45.

As we described it in the first part, Alfa Romeo being the standard bearer for the regime, officials also claimed Alfa to be a fervently fascist place, with an exceptionally strong fascist trade union (80% of the workers compared to an average of 15% in Milan), and an equally high number of party members, up to a claimed 1000 workers in 1933. Those are obviously largely exaggerated figures, but still their presence and strength not only put a heavy pressure on the other workers, but was also an obstacle for Gobbato's rationalization. The most active fascists were not the most skilled workers, yet got easier promotions to higher functions, and thus tended to lower productivity. Gobbato tried to reduce their presence, but achieved little if anything. Such a tight control on the other hand prevented any social conflict at the factory, which was significantly lower than at Fiat, for instance. The only moment of tension had taken place when rumours of closure were spread, under Orazi. Other demonstrations of discontent, noticeable but limited in their extent, were swiftly repressed. This was true until September 1943, when Italy deposed Mussolini and control of the country was taken over by the Germans. During the war, work conditions worsened drastically, and archives reveal that in 1941 about 25% of the workers were usually forced to work 72 hours a week or more.

Another priority for Gobbato was the professional school. He had already organized such schools elsewhere, including in the USSR, during his career, and together with the reorganization of the work itself, he tried to adjust the workers skill to the demands of the new tasks. The school was founded in the thirties, being ruled directly by the Director General's secretary from January 1938, an indication of the high attention Gobbato paid to it, and could be attended by 400 people. There were two distinct sections; one was the practical training of engineers and technicians, the other was the school for apprentices. Engineers could attend a six month course specialized training for the department they would join; technicians were offered one year to become, among others, head of a production line. Workers apprentices instead would attend two years of preparatory classes and a qualifying one. Half-yearly programs were also organized for specific purposes, such as to upgrade from specialized worker to engine tuner, etc.

Both practical and theoretical classes were organized, with quarterly examinations that included "moral and fascist culture" among other general content. During the war, Gobbato expanded his goal to accurately assess the skills needed for each productive task. Padre Agostino Gemelli, a Franciscan monk who pioneered applied psychology in Italy, was associated from January 1943 with the Alfa Romeo effort to identify and select the "psychotechnic" aptitudes of the candidates by scientific measurements, in relation to an advanced scheme of job evaluation. This should have taken place in the wider context of standardization of worker qualifications, carried out by the national office, ENIOS, of which Gobbato was a leading member. But actually war conditions prevented the initiation of such plans, since the bombing of August 13, 1943, crushed the school building.

The fascist organization of society at the time also included framing the workers' leisure time through a national organisation called OND-PF (Organizzazione Nazionale Dopolavoro-Partito fascista), which had an Alfa Romeo branch. For this organization, new premises were constructed in the northern area of the factory, next to the school, and inaugurated in 1941, that included a huge hall also used as dining room, a library, conference rooms, etc. The Alfa Romeo-OND also organized the distribution of Christmas gifts, many sport activities and competitions, music bands, etc. Before the construction of the northern part of Portello, indeed, a large part of the yard was dedicated to sports fields.

Summarizing Gobbato's solid conservative and paternalist ideas on the relationship company to workforce, we can quote a 1942 circular from him: "*the worker must learn that his labour does not simply give him the right to his wage packet but should ensure his own and his family's well being and provide a foothold for his children […] so that they eventually could replace the parent at work and, with confidence, themselves found a new family which would, in turn, depend upon Alfa for its livelihood.*"

The new technical guard arises

We have seen previously that Gobbato's arrival frustrated Jano's ambition to become General Director himself, took away his former oversight of the aero and industrial vehicles departments, and left him at the head of car design. Gobbato certainly didn't play down the importance of cars for Alfa Romeo, but the crisis situation, and acceleration of Government orders for aero engines, actually left Jano responsible for little in the new Alfa situation. While designing fine, fast, sophisticated and expensive production cars, his reputation became dramatically challenged on the racing scene. From the moment German teams entered GP racing, little laurels were left for Alfa Romeo or anyone else.

Before judging Jano's competence on that basis, it is fair to stress that little was ever done to help him in his task during those years. The IRI financing scheme for Alfa Romeo implied only pre-financing of the aero engine orders and the tooling and material they needed, but at no moment did we come across any trace of a subsidy for racing activity, unlike what happened in Germany. Alfa Romeo had to design, test and build racing cars from its own general budget, receiving little more than telegrams from Mussolini *ordering* them to win. Since the company, just coming out of the crisis, was busy at reorganization, then coping with the burden of new work, no means were left for Jano to produce new cars. Old models had proven competitive for several seasons, as it had been for decades. But the German teams continuously boosted the technical evolution of their cars, and new models now had to be designed every year. Jano had been designing, since 1934, an independent sprung 12 cylinder.

In the meantime, Bazzi at Ferrari had designed and built a "monster", the Bimotore, to try filling the gap. Actually, the new car, still with a straight-eight (albeit re-bored to 3.8 litre) appeared only for the last race of the season, the Italian GP. The V12 came out in May of the next year at Tripoli. The reason for such a delay, and for some anger by Jano, was that no one was available at the Experimental Department to draw the detailed plans, nor to machine the parts, since everyone was involved with aero engines. The Tipo C was certainly a competent car, albeit the V12 showed no dramatic improvement on the 8C. Anyway, it may be useful, for assessing Jano's efforts, to consider that his cars would have been more of a challenge to the Germans if they had appeared one year before, as planned; the actual Alfas were outperformed with respect to power output, but they would have been in line with the

competition of the previous year, and the Tipo C handling was, instead, a strong point. For his last work at Alfa, the 1937 12C37, Jano had been expressly promised, upon his insistence, that the staff and material for designing and building the new cars would have been made available in time. Again, that didn't happen, and the car wasn't completed until August. It proved unfit, with a good engine but tricky handling, and Jano didn't get a second chance[23].

Jano has been recently criticized in Busso's memoirs as "*not a high profile designer*", and it is probably unfair to him, as his later work for Lancia and Ferrari showed. Yet, the reason for such a low evaluation is probably that Busso, under Ricart's influence, realized quite soon his own lack of a theoretical background. Jano was of the old school, indeed not being a university-trained engineer, and Gobbato became probably convinced that his theoretical weakness would mean his time had gone as well. Jano had a lot of experience, a very good memory, and kept informed on what was going on among Alfa's competitors. In that, Busso may not be completely wrong: Jano could interpret and use new concepts created by others, but was not that good at inventing groundbreaking solutions himself. Experts today reach the conclusion that there's no evidence Jano knew what he was doing when he designed the split shaft for the Tipo B transmission: he seems to have missed the understanding of the Tipo A's good road holding and then transferred this misunderstanding onto the Tipo B. The transition from cart-sprung, flexible chassis construction to a rigid chassis with independent suspension in the mid-30s possibly gave him new issues he needed some time to handle. The sudden rise in horsepower per cubic inch achieved with new technology by the German teams was beyond his reach at the time. But he was certainly not the squeezed lemon described when hold for responsible of the Alfa defeat in GP.

Giustino Cattaneo, already mentioned above, took over as head of the aeronautical division in early 1934. His main work there was the design of the double row, 18-cyl. Alfa 135, an assembly of two radial-nines similar to the AR126s. As soon as he finished the design of that engine, he left Alfa to found his own engineering company called CABI-Cattaneo. It seems he was too independent-minded for the Alfa Romeo environment. His engine was certainly an impressive one; yet, maybe in part because he was no longer there to follow its development, it took 4 years of work on the test benches to address all the reliability problems that arose. According to Garcea, these went from the cam ring (on a radial, there's no shaft but a ring) breaking after 10 hours, to bearing troubles including collapse of the rocker supports on the heads. Incidentally, Garcea gives full credit to another non-certificated technician, Amleto Bossi, for having solved one after another of all those serious issues. In the end, the engine would have received its homologation after 150 running hours, including the severe requirements of the pilots for in-flight tests, where the 135 replaced the central engine on a SM82 tri-motor. The Germans, after they seized Alfa in September 1943, took away some units and fitted them on a FW 200 Condor with excellent results. The Reichlin test bench was poorly designed for this application, stressing the engines so much that no double-row engine, BMW or Pratt&Whitney from shot down US planes, ever lasted more than 4-5 hours, due to poor cooling; however, the Alfa 135 ran for an unheard of 29 hours before an exhaust pipe overheated. The Germans then ordered a production of 500 per month. Overall, 150 were ever built, and none were fitted to any significant aircraft.

Considering the thoughts on Jano, it may look even odder that his first successor was another "Perito Industriale", a non-university educated engineer (i.e., trained at a technical school). But this one, Bruno Trevisan, was both a childhood friend of Gobbato, and an officer of the Regia Aeronautica. After having worked a while with Jano, he was entrusted with development of the 12C37 into the 1938 312 – basically the same car, with the handling

[23] See KB 96 for a comprehensive study on that car.

issues either sorted out or hidden by the lower power of the engine. His next task was to develop a new range of cars, a 12 cylinder 3.5 litre, S10, and a V8 2.2, the S11. Neither went into production, due to the war, but the prototypes survived until shortly after it. Trevisan upgraded the 6C2300B into the 6C2500 in 1939.

Gioacchino Colombo had been Jano's assistant from the P2 times back in 1924 and, by 1937, was finding himself cramped under Jano's direction, so he was sent, in May 1937, to Modena at the Scuderia Ferrari and entrusted with the design of a 1500 single seater that would become the glorious 158 Alfetta. It seems that he had been putting ideas on paper for such a project from as early as late 1935. Yet the 158 didn't come out right the first time, and the chassis needed to be redesigned and strengthened before the first race in 1938. After Jano's departure, Colombo was in charge of the 1938 GP cars for the newly created Alfa Corse, i.e. the 308 (revised Tipo C) and 316 (a 16 cylinder made from two 158s in a single crankcase) in addition to the 158 that proved the only successful machine out of the three.

But the new man in the company, the one who gained Gobbato's trust, was a Spaniard who flew in the civil war in 1936 (Barcelona was then the centre of Republican resistance, ruled by anarchists, while he had strong right-wing sympathies - nominated honorary Captain by Franco) and was first given a job of consultant, designing a multipurpose (even aeronautical!) V6, diesel, two-stroke engine. From 1938, Wifredo Ricart had been, albeit initially in an unofficial way, responsible for the whole technical sector at Alfa, his position not being made official until 1940. Ricart was possibly the opposite of Jano: excellent theoretical knowledge, very forward-thinking, but without practical experience, at least for racing cars. This probably earned him Gobbato's esteem, because of the similarity in their approaches. He has been made a fool of, especially by Enzo Ferrari, in an unfair way. Ricart was undoubtedly a more advanced mind in automobile technique, and the power output of his creations was a significant improvement over Jano's. To achieve that, he broke the nationalist Italian rules by hiring Englishman Harry Ricardo as a consultant for the new generation of racing engines. He also introduced solutions such as the De Dion rear axle, albeit a poorly designed one, coupled with double wishbones at the front, a feature that remained for years as part of Alfa's DNA. Or, furthermore, the three-leading shoe drum brakes that remained superior to disks until the early sixties. Yet, it is a fact that none of his creations ever came close to production. He was rated by Satta and Garcea as not being in the real world and his projects as megalomaniac. Satta is quoted as having had vitriolic comments on the AR 1101 aero engine[24], as not only did he find the project exceeding Alfa's capacities, but spotted many faults in the design on which Ricart insisted. Satta was convinced they would be discovered as soon as the engine was tested for reliability – that never happened. He was seen as building *castles in the air*. Ricart was opposed by all the old guard, including Sanesi, for instance, who rated Ricart's proposal for a post-war production car (the Gazzella, see KB 80) as "*unfit for production*" and "*it compares to a production car as a locomotive compares to a bicycle*"[25]. The racing cars designed by Ricart proved powerful but handled very poorly, and that caused a big deal of mistrust between the testers and himself. Ricart was convinced there was a conspiracy against him, and he might not have been completely wrong. It is indeed possible that experienced people spotted the ingenuous features but didn't tell. Or maybe those who criticized weren't listened to…

[24] A water cooled radial 28 cylinders. See KB 113 p. 104 for some detail about that engine. Busso remained proud of that engine, and very respectful toward Ricart, though he is pitiless for Jano and Colombo.

[25] It included, a.o., a preselective gearbox with hidraulic pistons engaging the gears in the same way as the current « Selespeed ».

The late 1930s were also the years when the post-war team, the men who established Alfa Romeo as an industrial auto maker, started working for Alfa. Satta was hired in 1938, preceded by Garcea in 1935, and followed in 1939 by Giuseppe Busso, another engineer who had cut his first professional teeth at Fiat. Ivo Colucci, the man responsible for the chassis design, i.e. the one who first designed the monocoque for the 1900, had been hired in 1935 and worked in the body design office. After a short period at the Cantieri Riuniti dell'Adriatico, he was sent to the new Pomigliano factory. There, he worked under a little known engineer, but a fertile designer: Raimondo Gatti. Head of aircraft design at Pomigliano, he worked on advanced designs for aircrafts. Busso worked with him on an unconventional fighter. The engine, Ricart's 28 cylinder, would have been fitted in the fuselage behind the pilot. It would have driven, through angled shafts, counter-rotating propellers in each wing, allowing for very small nacelles, thus reducing drag. This design followed a 1938 proposal from Aeronautica Umbra, called "Fighter Bellomo" from the name of the designer. The exact links between Aeronautica Umbra and Alfa in Pomigliano are unknown, but from Busso's accounts, Gobbato approved the construction of a prototype, and it seems that at least a mock fuselage was built in Naples. Gatti fled the San Martino plant after the bombings to continue working with the experimental team in the northern mountains at Orta, where he designed domestic appliances, window frames, etc., for the difficult post-war recovery, as well as a bi-cylindrical microcar called the Marameo.

Doubling Portello: the San Martino plant in Pomigliano

In 1938, the Government called for a new factory to be built in southern Italy, aimed at enhancing the country's capacity for aircraft production. The joint proposal from Alfa Romeo and the Cantieri Riuniti dell'Adriatico, another IRI-owned company specializing in ship and aircraft construction located in Monfalcone, near Trieste, was accepted for a huge plant, including a landing strip over an area covering 300 hectares. It would also include an engine production plant but mostly the production facilities for metal airframes and the necessary facilities for producing on the spot the needed light alloys, duralumin, electron and Duralfa. The planned total workforce was 5000 workers for the airframes, 2600 for the engine plant and 1000 office employees and technicians. Actually, it would amount to around 4000, down to 2000 after the May 1943 bombing.

The first stone of this major project was laid by Mussolini in person on April 1st 1939. The work proceeded steadily and engine production could partially start in late 1940, with the hope that the first engines would be test-ran in March 1941. As the workforce had to come from quite far away, the program included construction of 500 houses for the staff as well as a farm, cattle shed, etc. for their supplies. In December 1940, the first 24 families were installed. The first engines produced at the San Martino plant were the light in-line 4 and 6 cyl. AR 110 and 115, started at 60 units per month reaching a cruising rate of 130. As the license was bought from Daimler Benz for the construction of the DB 601 (the engine powering the Messerschmitt 109 fighter and the Heinkel 111 bombers), Italy having no suitable liquid cooled aero engine, it was then decided that Portello would concentrate on air-cooled radials and Pomigliano on those V12s. Initially designated as Alfa 150, it was then named RA 1000 RC41 (RA for Regia Aeronautica – the designation came from the Air Force as it held the licensing rights). The effective orders in December 1940 occupied the entire production capacity for the whole of 1941. At the end of 1940, the Air Ministry already owed 270 million lira to Alfa.

Back in 1939, the initial estimate of the investment needed for the new plant was 200 millions lira, provided by the IRI, and, because of this decision, Alfa Romeo's capital was raised from 30 to 240 millions. As the war began and the construction works were still proceeding, the availability and price of materials, machinery and tooling became a big concern. A further loan was granted to Alfa in 1941 for 200 million, but the eventual cost of San Martino, estimated in 1944, were up to 670 million. Shortages of machines, materials and electricity, and frequent air attack alerts did not allow the production to proceed as planned.

The total number of aero engines produced in Pomigliano was only 945, while the contract with the Air Force stipulated repayment of the investments in 1500 engines at the rate of 100 per month, plus the cost of airframes and related alloy. None of those amounts were ever paid to Alfa, which caused serious problems starting in late 1943, and a letter dated September 8, 1944, states that the Air Ministry was 450 million in debt to Alfa just for the San Martino investments, plus another 824 million as payment for all the destruction caused by bombing.

Engine production had been proceeding slower than expected, but it was worse for the alloy and airframes sections. As early as April 1940, Gobbato had warned the Ministry that starting production of advanced aircraft in a brand new factory, crowded with unskilled workers, would require making a choice: either start construction immediately using an existing airframe pattern under license and supply them for training, as it was impossible to guarantee perfect quality for combat purposes, or start building immediately an advanced prototype model, starting slowly and progressively, as both the product and the production methods would need to be sorted out. No completed aircraft should be expected before March or April 1942. The second solution was chosen, and collaboration with Ing. Zappata of the CRDA aimed at implementing in parallel the production of the new CANT Z 1018 twin-engined bomber both at Monfalcone and Pomigliano. Since this was taking too much time, the Germans used the already built facilities for repairing their own front line aircraft, such as the Ju 88. The Italian Air Force repeatedly changed its mind: it ordered Fiat G50 fighters to be built, the order then cancelled in favour of the bimotor fighter IMAM Ro58[26], then replaced by a program for repairing RE 2001 fighters, then back to the CANT Z1018 project. This aircraft should have used the eventually sorted out AR 135s, and an order for 300 units was signed. At the armistice in September 1943, 10 pre-production and 5 production units had been completed, seemingly at Monfalcone, not at Pomigliano, and a few saw operational service. The repeated requests from Gobbato and Zappata for the provision of the necessary tons of raw metal and other essential equipment had produced precious little results.

On May 30th 1943, the San Martino factory suffered a heavy Allied bombing that destroyed most of the plant and caused many victims. A previously decided plan for spreading the facilities to safer places was actuated. The engine assembly and repair shop was moved to Marigliano, a few km. east of Pomigliano, and the engine and laminated parts production was installed in the San Rocco caves. There was also much unrest among workers, for the poor working conditions, scarce food, and insufficient wages. In September 1943, the retreating Germans sabotaged the remaining facilities, except in the caves where, luckily, the Allied troops arrived in time to prevent most of the damage.

While Mussolini had been deposed on July 25th 1943, the armistice was signed with the Allies on September 8th. The Germans took control of the not yet liberated parts of Italy, restoring Mussolini to power under the name of Repubblica Sociale Italiana. For Gobbato, and Alfa Romeo as a whole, the situation then became complicated, being squeezed between

[26] See chapt. one in KB 112: IMAM was the former Romeo, former OFM company in Naples.

maintaining production capacity for post-war reconstruction and at the same time supplying as little as possible to the German war machine. Alfa Romeo obstinately refused to produce sub par engines and insisted in building them at the pre-war standard of reliability, so that Alfa engines were more reliable than their German counterparts. The Luftwaffe, in 1944, had estimated that the life expectancy of a fighter plane was 10-20 hours in combat missions with poorly trained pilots, so that engines able to last 150 were not useful to them.

The Portello under bombing

Despite supply shortages, production at Portello had been increasing. From the 1234 engines produced in 1939, production was stable in 1940, and a 25% increase was registered in 1941. Maximum monthly output was in January 1943 with 160 units. Truck, bus and trolleybus construction was also proceeding, with a new model of light truck powered by a 4 cylinder, the 430, appearing in 1942. A total of 2607 trucks were produced, among them being 1382 Tipo 800RE delivered to the army before the end of the war.

In the meantime, the design team didn't forget about planning for post-war civilian production. Even studies for the racing cars continued at the beginning of the war, including the construction of the Tipo 163[27], a rear-engined sports car with Ricart's 135-degree V16 that was almost completed and hidden together with the 512s in a villa near Orta. Tests of the 512 also proceeded, including some tests at Monza and a run on the Como autostrada in December 1941, on occasion of a visit of King of Romania, who ordered an 8C2900. Trevisan's team continued the development of the S10 and S11 projects up to 1941, but with seemingly unrealistic goals. As this proved inconclusive, and the cars were positioned too high for the post-war market, Gobbato issued an order on May 31th 1941 to stop all the current projects causing some anger among the staff. Following that order, Ricart proposed a new project "1350" for a car featuring an in-line 2600cc 6 cylinder, basically a single row of the aero 28 cylinder radial, and De Dion rear suspension. Mid 1943, this project was also dropped in favour of the Gazzella, whose fate has been discussed above. It is, however, interesting to note that most prototypes survived the war, even though some of them, including the S10, S11, 163 and Gazzella were broken up soon after.

In late December 1942, after the bombing of Italian cities had started but had not yet targeted the Alfa factory, the removal of strategic documents and departments commenced. The Air Force spent 10 million, later extended to 30, to move the offices and workshops. The Design and Experimental Department was the first moved to a safe place, joined by the technical archives. They were installed at Orta, on a lake of the same name, located west of the Major Lake. Travelling from Portello to Orta, when necessary, was a dangerous adventure. A staff of 40 people, including Ricart, Satta, Busso, and Gatti, was installed in the hotel Belvedere facing the lake. A few kilometres away, in a hilly north-eastern location called Armeno, were transferred the experimental workshops, where the parts for the AR 1101 28 cylinder were built. Ing. Gatti, transferred from Naples to Armeno with his staff, as there was no space left in Orta; he recalls they were housed in a knife factory called Inuggi. They first worked on aeroplanes projects, then switched to the famous stoves and other post-war transition products. The transfer to and supply of the new locations was very difficult for both the material and the workers. The nuts and bolts production was moved to Vanzago (west of Milan, not far from Arese) and the auxiliary production together with metallurgic and chemical laboratories to Melzo, east of Milan, not far from Gorgonzola. Right in Melzo, in a

[27] See KB 80 for detailed description of the 163 and Gazzella.

cheese factory owned by an Alfa enthusiast, the 6 158 racers were hidden until the end of war, after their first hiding place in Monza was rated unsafe. Other locations around Milan included Trecate (tooling and aero parts storage), Pero (miscellanea storage), Treviglio (Spica production, a pump production company absorbed by Alfa in 1940) and Secugnano. Vacciago and Pettenasco, in Orta's surroundings, hosted tooling construction and storage facilities.

The Portello factory was seriously hit on February 14 and August 13, 1943, causing considerable damage to the production facilities. They were estimated in 1944 at 126 million lira for the first attack and another 240 for the second one. Part of the facilities was however reconstructed the same year. When, in late 1942, the Regia Aeronautica doubled its request for RA1000RC41s, a second production line was planned and installed in Vittuone, a few km south-west of Vanzago, not far from Settimo Milanese, where Autodelta installed itself 20 years later.

When the armistice was signed and the Italian Government turned their weapons against Germany, on September 8th 1943, the occupying troops took control of all strategic facilities. The organizations that had supported fascism to some extent, including the Church, now felt on the wrong side of a lost war and took their distance from the new Repubblica Sociale, and the general atmosphere in Italy became heavier, with more repression, and also a much stronger resistance movement. The new regime issued a law for the "socialization" of Italian companies, implying that workers would be involved to some extent with management. Both the resistance movement, on one hand, and Gobbato, on the other hand, opposed such a scheme in which Alfa Romeo was included. Formally, it did take place at Alfa, with the election of the workers representatives in February 1945. Of course this had no practical effect, but those circumstances allow us to have a precise estimate of the workforce at that date, including those in remote locations: 6909 workers, 641 technicians and 783 office employees.

The SS entered the Portello factory on a Sunday, Sep 12th 1943. Another plague then hit Alfa, the forced requisition of material and vehicles, rarely paid for. From then on, Gobbato and the staff tried their best to stop material as well as workers from being carried away, but the fascist activists became even more ferocious, and unknown men used to get into the factory and take away workers suspected of antifascist activities, most of them never to be seen again. While Gobbato's influence usually managed to prevent the worse decisions of the occupant to be achieved, he had to face the seizing the entire metal, steel and alloy stock for shipment to Germany. This would have meant the complete dismantling of the factory and deportation of most of the workforce. He entrusted Bonini, a test driver, to drive a 6C2500, with all the equipment he needed, to Berlin, travelling at night to avoid bombings, and to bring a letter to Albert Speer, with whom Gobbato had good relationship. Fortunately, at the cost of a three days without food, Bonini managed to meet Speer, came back unscathed and the reply letter from the Minister avoided the seizure.

In an attempt to remedy the poor productivity of the Italian armament industry, the Germans issued orders for a total reorganization. Alfa Romeo had to stop all truck production and continue building only radial engines and parts for the DB601s. From October 1943, it was ordered to concentrate the effort, jointly with Isotta Fraschini and Officine Reggiane, on the production of parts for the Junkers Jumo aero engine. A joint corporation was created, called CARIM, with Gobbato at its head, which had to transfer all the needed tooling and machine to a cave cluster near Vicenza, the *Grotte di Costozza*. The workshops were installed in the caves despite huge transportation and supply difficulties.

In July 1944, the dramatic increase of Resistance activity led to the sabotage of the Armeno workshop, where the parts were ready for the first pre-production run of 20 AR 1101

engines. The entire production was blown up, including engines, parts, machinery, and related documents. Following that episode, a secret agreement was discussed between Busso, whom the negotiation were entrusted, and Cino Moscatelli, the already quoted head of the resistant group, to avoid further damage. Clandestine hints for how to sabotage production also circulated among the engine factories, including the advice to use tincture rather than sand to cause engine bearing failures without risk of being suspected. From then on, the design team remaining in Orta didn't make sense anymore and they came back to Milan, to a former orphanage a few blocks away from Portello.

The most destructive bombing took place on October 20th, 1944, and, after that, all productive activity came to a stop at Portello. The killing of the whole staff who would be responsible later for post-war Alfa Romeo (Satta, Busso, Garcea, etc.) was a near miss as a bomb fell at the orphanage's entrance just as they were fleeing, but fortunately enough it failed to explode.

On April 25th 1945, the whole of northern Italy was overthrown by an insurrection that liberated the country, while the Allied army was still 180 km away from Milan, near Bologna. The Alfa workers participated in the uprising, fought against retreating German troops near the factory, arresting some.

As in every liberated country, a hunt for collaborators took place immediately. Many low level fascists who had been active in the factory were prosecuted, estranged and/or killed. We have seen that Gobbato was probably no fervent fascist, and instead had tried his best to save the company and the people from the Germans. Of course, this had not been publicized, while instead his exposure as manager of a company supplying the fascist armies, and standard bearer of the regime with pre-war racing had made a big impression during his 12 years in the position. He had proved himself highly efficient as a manager and an organizer, and as such could have played a capital role in the post-war restart. His appearance in fascist uniform and giving official speeches may have convinced some of his guilt, but those were times for revenge rather than for nuance and understanding. Even in such circumstances, both oral and written testimonies from Alfa workers were appreciative to Gobbato, who saw him as "*a father for them*". Gobbato was tried by a popular court on April 27th, and found not guilty. Yet he was advised to keep away for some time as it would have been safer. The next day instead, possibly driven by his sense of duty, he went to work on the morning and was shot on the walkway a few hundred meters away from Portello. The reconstruction of Alfa Romeo would have to proceed without him.