Chapter 9

Science, Military Dictatorships and Constitutional Governments in Argentina[1]

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Introduction

Argentina has a long tradition of conflicts between scientific development[2] (or educational development) and authoritarian governments.[3] Between 1835 and 1852, although he was only Governor of the Buenos Aires Province and responsible for Argentinian Foreign Affairs – that is, a sort of *primus inter pares* amongst the other thirteen governors – General Juan Manuel de Rosas ruled the country with an iron fist. Among his obscurantist measures we may mention that he stopped paying salaries to the professors at the University of Buenos Aires – the salaries having to be paid exclusively through the tuition of the students, see Buchbinder (2005). The simplified image is reasonably true, that from the establishment of the constitutional republic between 1852 and 1862, education and support for science flourished. We can mention the outstanding work of President Sarmiento (1868–74), who, besides strongly backing

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[2] In this work we shall focus on natural and exact sciences, without mentioning social sciences and humanities.

[3] Anyway, in Argentina the relationship between authoritarian (in the twentieth century, usually military or with a strong military influence) governments, on the one hand, and science and technology, on the other hand, was ambiguous. The military appreciated that science is needed to develop industry and the technical potential of the nation, but they distrusted Argentinian scientists. We shall describe this ambiguity in this work.

elementary education, created, during his administration the (later named) National Meteorological Service, the National Academy of Sciences in Córdoba and, also in Córdoba, the Astronomic Observatory. In particular, the creation of the Observatory is quite symbolic, as it was first necessary to have an ambitious idea of what science means in order to create an astronomic observatory in a country of two million inhabitants which had just ended a terrible war, in which 80 per cent of the population was illiterate, then locate it in a small city of thirty thousand inhabitants, and also convince an internationally known astronomer – Benjamin Gould – to be in charge.[4] Sarmiento's approach to science has other very remarkable characteristics, such as his lecture in homage to Darwin in 1882, in which he demonstrated a stunning knowledge of science. Sarmiento was not alone; the so-called 'generation of the eighties' encouraged secular elementary education. Juan María Gutiérrez, as Rector of the University of Buenos Aires, founded the Department of Exact Sciences, which eventually became the Faculties of Exact and Natural Sciences, of Engineering and of Architecture, Design and Urbanism.[5] Following this line of thought, we may also mention the creation of the National University of La Plata in 1905, the support its Rector Joaquín B. González gave to science and many other similar developments.

There were also shadows: neither Gutiérrez nor González were successful in their efforts to create genuinely scientific universities. The difficulties, for example, that the future Nobel Prize winner Bernardo Houssay had to overcome to be appointed Professor of Physiology at the Faculty of Medicine of the University of Buenos Aires show that the prevailing culture at that University was not to hold scientific activity in high regard (Vaccarezza, 1981). There were even outbreaks of authoritarianism which provoked, for instance, a select group of secondary education teachers to create a private high school after resigning from their positions at the *Colegio Nacional de Buenos Aires*, the flagship of secondary education for upper class children (Sanguinetti, 2006). But, overall,

[4] Gould remained in Argentina for more than 13 years where he developed an amazing amount of scientific activity, especially recording stars from the southern hemisphere. He also directed the National Meteorological Bureau (the future National Meteorological Service). A glimpse of his professional activity in the USA may be seen in Galison (2005). For a more detailed analysis of Gould's life, see Bernaola (2001).

[5] The Department was created in 1865. As Halperin Donghi (1962) describes, Gutiérrez entrusted the Italian physician Paolo Mantegazza with the hiring of well-paid professors in Italy. Three Italian professors were hired in this way. It is remarkable that, in spite of the huge economic – and political – problems due to the war against Paraguay, that (for Argentina) began the same year, the authorities maintained the project of appointing the professors. It is clear that the hiring was part of a scientifically - or, at least, academically– ambitious project.

the 'liberal country' that existed between 1862 and 1930, in its elitist version until 1916 and in its mass-democratic version between 1916 and 1930, either supported scientific development or did not obstruct it.[6] And during this period, in 1918, University Reform began in Córdoba, which among other things, attempted to modernise the archaic university structures. It spread like wild-fire, not only across all the country but also across Latin America. The Reformists enthusiastically supported science, although Bernardo Houssay, who as mentioned was the most distinguished scientist contemporary with the University Reform, and several of his colleagues, opposed it.[7]

The Military Incursion into National Politics

From 1930 onwards the situation became more confused. That year, a military *coup d'état* led by José Félix Uriburu, a general with fascist tendencies, overthrew President Hipólito Yrigoyen, and the long period of constitutional governments, which had begun in 1862, was interrupted. Uriburu's quasi-fascist project was unsuccessful: reluctantly, he was forced to call a general election and a new period of constitutional governments began. This new period was based on this first election, which outlawed the 'yrigoyenists' and, in addition, the period was marked by electoral fraud.[8]

The first President of this new period was also a professional military man, Agustín P. Justo (1932–38), who had collaborated with the military coup. At the same time, the Catholic Church recovered part of the influence

[6] In fact, the second option, that the ruling class did not obstruct scientific development, is closer to the truth. This is in the sense that the ruling class did not actively harm it: except for a minority of members of the elite, including firstly the already mentioned people (and particularly Sarmiento, the politician and statesman who most supported science in the nineteenth century, and perhaps most in all our history), the ruling class of that time showed more indifference towards science than actual support for it.

[7] The relatively modest success of the Argentinian reformists in transforming the universities into scientific centres of excellence requires a detailed analysis beyond the scope of this work. Hurtado (2010) carefully describes the (also failed) attempts of Houssay and his colleagues, around the 1940s, to create private universities with a scientific orientation in order to solve the problem of low scientific activity in public universities.

[8] The triumphant group, among the sectors who had supported Uriburu's *coup d'état*, favoured the elitist republic from before 1916; this regression was impossible without electoral fraud.

it had lost during the elitist republic.[9] Justo's administration was a right-wing administration, whose legitimacy was questioned by many citizens. Significantly, Justo does not fit the traditional image that the intellectuals adopted some years later of uncouth and ignorant coup-prone military men: Justo was an engineer besides being a military man and was quite cultivated. Perhaps an indication of his and his collaborators' intellectual capacity is the skill with which Argentina managed to reduce the worst effects of the 1930 world crisis (faster than many other countries).[10]

General Enrique Mosconi was another very capable and learned man and also an engineer, who was fired from his position as Director of YPF[11] as soon as Uriburu took power, and would never have thought of participating in a plot against a constitutional government. On the other hand, the 'father' of the Argentinian iron and steel industry, General Manuel Savio, was a right-wing nationalist who participated in Uriburu's coup. In a sense, the Argentinian iron and steel industry was born 'in a state of sin', because of Savio's influence. Savio was representative of the strong nationalist right-wing group in the Argentinian Armed Forces who, during the period (1930–83) in which the Armed Forces exerted an immense power in Argentina, be it directly or by pressure on civilian governments, could never solve a crucial problem:[12] for those nationalists, the

[9] Given the low legitimacy of the new administration, it needed the Catholic Church's support, which in the elitist republic had not been necessary. The relationship between the Church and General Justo's administration (and the subsequent administrations until 1943) is described in Zanatta (1996), who also describes the process of 're-Christianization' of the Argentinian Army, which until then had been rather liberal (in the nineteenth-century meaning of this word).

[10] For instance, Hernández Andreu (1987) points out that 'the Argentinean growth rate was higher than the Canadian and American ones during the 1930s'.

[11] *Yacimientos Petrolíferos Fiscales* (YPF) was a State-owned firm that competed against the powerful foreign oil companies. Mosconi transformed YPF in the 1920s into an important company. Until its privatisation in the 1990s YPF symbolised Argentinean nationalism in opposition to the big international oil firms, for the left as well as for the nationalist right.

[12] The power of the Armed Forces, which reached its zenith during the last dictatorship (1976–83), began to dissolve after the defeat in the Falkland (Malvinas) war against Great Britain (1982), which forced them to call a general election. The winner was Raúl Alfonsín who, as soon as he was inaugurated as President, ordered that the members of the military *Juntas* during the dictatorship be judged. With ups and downs, the military's power began to decrease significantly, until it practically disappeared during Carlos Menem's and Néstor Kirchner's administrations. In fact, symbolically the disappearance of military power in Argentina may be represented by the replacement of all members of the general staff on 25 May 2003, when Kirchner, elected with a scarce 20 per cent of the votes, was inaugurated. Furthermore, during a ceremony, before the eyes of the President, the Army Chief of Staff removed the portraits of former military dictators Jorge Rafael Videla and Reynaldo Bignone on 24 March 2004.

Armed Forces should be powerful, so that Argentina could be in a position to face Brazil (and/or Chile), according to the theories of conflict studied at the time.[13] In order to have powerful Armed Forces, Argentina should be technologically developed and industrialised. Technological development was obviously related to scientific development. The unsolvable problem for the military was that many scientists (not all, of course) were 'dangerous leftists' or, at least, did not trust the Armed Forces.[14]

So, on the one hand, some sectors of the Armed Forces wanted to incorporate cientifically and technologically trained people to their industrialist project and, on the other hand, suspected many of these people of communism or something similar. Unlike Mosconi, who until he died in 1940 was not particularly appreciated by the governments originating in the 1930 coup, Savio got along very comfortably, not only during the fraudulent conservative governments that survived until the following *coup d'état* in 1943, but also during the 1943–46 military government; the latter was originally much more authoritarian and right-wing than the previous one, and within which some of its members embraced a strong fascist ideology. Indeed, except for the fact that the situation was tragic, the subsequent repression of university students and faculty by the military authorities, including the imprisonment of many of them, would seem to be an exaggerated caricature of military–clerical hatred of science.[15] Recall that shortly after coming to power, the military authorities changed the name of the National Secondary School of Buenos Aires (*Colegio Nacional de Buenos Aires*) to Saint Charles University School (inspired by the name the school had during colonial times) and appointed Juan Sepich, a priest, as principal (Sanguinetti, 2006).[16]

[13] Nationalist military men were extremely concerned about Argentinian military power in the context of a military government (1943–46) and the Second World War (in which Argentina was neutral until the last moment possible). This concern is reflected in the fact that, in 1945, 43.3 per cent of the national budget was set aside for the Armed Forces (Potash, 1981).

[14] This contradiction refers to mathematics and natural sciences, and their corresponding technologies. In this work we shall not analyse how military men considered social sciences and humanities.

[15] As already mentioned, from 1930 onwards the Catholic Church began to recover the influence it had held until the liberalism of the 1880s generation; part of the (successful) strategy of the Church in this regard was to increase its influence amongst the Armed Forces.

[16] This change of name was short-lived.

It is important to draw a line between the relationship of the Armed Forces with science and technology before and after 1930, that is, before and after their irruption as a protagonist of Argentinian politics until 1983. There was not a sudden change: on the one hand, after 1930 the Armed Forces followed – or tried to follow – policies that were not too different from prior ones; on the other hand, their process of ideologisation, involving a special mysticism and 're-Christianization', had begun before 1930.[17] What happened in 1930 was a qualitative and quantitative change to the influence of the military in national politics. In previous years, its not inconsiderable influence was expressed in the traditional way of constitutional democratic countries (for example, the opinions of important officers, articles in periodicals and newspapers, and so on). From 1930 on, the military either had the right of veto or overthrew governments which did not accept their right of veto. They began to have a power and a responsibility that they had not had before, and their relationship with technologists and scientists, and their interest in science and technology, became a direct part of national policies.

Armed Forces, Science and Technology

The interest of the military in science and technology existed from Argentina's beginnings as an independent country. In fact, after the May 1810 Revolution and the replacement of the Spanish Viceroy with a new government not appointed by Spain (the First *Junta*), in September, 1810, the *Junta* created a School of Mathematics and Manuel Belgrano, one of its members, delivered a significant speech, in which he said that a young officer would find in this institution '… all the tools provided by mathematical science applied to the lethal, although necessary, art of war' (Babini, 1986). Anyway, the period until the definitive constitution of the Argentinian State in 1862 was very unstable, so that it is worth observing that, for the Armed Forces, it was only from this year that any discussion about national projects, tacit or explicit, was possible.

The period 1850–1950 is described very well by Ortiz (1992): originally, the military and civilian higher education were not divided, but they increasingly separated, due, for instance, to the creation of the Technical Higher School of

[17] Perhaps one can establish, as the beginning of this process, the speech delivered in Lima by the great poet (turned into a right-wing nationalist) Leopoldo Lugones in December 1924, for the centenary of a battle which secured independence from Spain of its South American colonies. Here, he uttered the unfortunate sentence: 'The hour of the sword, for the good of the world, has again arrived' (Lugones, 1979).

the Army. Some important military men of great intellectual capacity (Justo, Mosconi) had become engineers studying at the universities, but eventually the officers obtained their technical training in military institutions, and this phenomenon contributed to the separation of military men from civilians. As their influence on Argentinian politics increased after 1930, many of them beganto think of themselves as a kind of aristocratic elite and this feeling permeated their relationship with science and technology. It cannot be ruled out that this trend had been combined with the German influence in the Army (much less in the Navy, which had been influenced by Britain) and with the influence of the Catholic Church, so as to create a contradictory situation between the pro-industry wishes of the military and the mistrust *vis-à-vis* scientists and technologists.

The Perón Era

General Juan Domingo Perón was elected President in 1946 in the first nonfraudulent elections since the 1930 *coup d'état*. His administration was marked by two conflicting aspects: persecution and support. On the one hand, there were persecutions, firing of faculty and scientists, repression (including his unfortunate role in a scientific–technological fiasco, in which he trusted a pseudo-scientific trickster who claimed to be able to perform nuclear fusion under controlled laboratory conditions, which turned out to be an international faux-pas after spending a lot of public money).[18] On the other hand, the period saw the creation of the National Agency for Atomic Energy (*Comisión Nacional de Energía Atómica* – CONEA) and the development of the aeronautics industry. Both in the nuclear fusion fiasco and in support for the aeronautics industry, German scientists and technologists who had emigrated to Argentina after the Second World War participated in meaningful ways: in the nuclear fusion affair the protagonist was the Austrian Ronald Richter and in the aeronautics project Kurt Tank[19] (who had influenced in the decision of bringing Richter to
Argentina). Tank developed – jointly with other émigré German engineers – the Pulqui II airplane, of which five prototypes were made, the last of them in 1959. In any event, there is a fundamental difference between Tank and Richter:

[18] The story of this fiasco is told pleasantly and carefully in Mariscotti (1985). It is very interesting to see that Perón paid more attention to German scientists and engineers than to the Argentinian scientific community.

[19] The arrival of Tank and some of his collaborators has been described for instance in Goñi (1998).

there can be no doubt regarding Tank's professional quality, regardless of any discussion on the real value of the Pulqui II models.[20] It is possible to strongly criticise the huge budget spent on Project Pulqui II but, on the other hand, that kind of undertaking potentially had additional benefits that were difficult to take into account but not negligible: training of personnel, suppliers with professional expertise that outlived their main client, spill-over of state-of-the art technology, and so on.[21] It is worth mentioning that, before Pulqui II, there was a Pulqui I project, which also took place during Perón's administration, but without much success. One of the main participants was the French engineer Emile Dewoitine, who fled France due to the fact that he collaborated actively with the Vichy Régime.[22]

Peronism Outlawed

Although some distinguished professors maintained their positions at the universities, in spite of political repression and discrimination against professors who did not join the Peronist Party, many intellectuals, scientists and professionals, leftists and rightists, suffered the interruption of their academic careers due to persecution.[23] So, it is not surprising that, after Perón's fall in 1955, due to a military *coup d'état* with civilian support in an extremely polarised society, they returned enthusiastically to the universities. Many of them contributed to the university revival between 1955 and 1966, which was considered by many people as the 'golden age' of Argentinian universities.[24] In

[20] A detailed history and discussion of Project Pulqui II may be consulted in Artopoulos (2007).

[21] Anyway, those projects in the military area almost always failed in Argentina. In particular, Pulqui II, as Artopoulos (2007) describes.

[22] In 1948 Dewoitine was sentenced (in absentia) to twenty years of hard labour (Klich, 1999).

[23] Not only the persecutions. For many professionals and intellectuals the authoritarianism of the government, the pressure on people to become members of the government party, and what could be called (in current terminology) 'cult of personality' (for example, the name of the President and of his late wife given to streets, cities, provinces; the manuals for elementary school which praised the authorities) were a sufficient reason either to distance themselves from the government or to participate in the opposition to it.

[24] Buchbinder (2005) offers a general idea of the evolution of universities in that period; Halperin Donghi (1962) analyses the University of Buenos Aires, but his account, although very detailed, does not cover the final phase of this period, subsequent to the writing of his book. As a particular example of progress in that period in one discipline, computer science, see Jacovkis (2006) and Factorovich and Jacovkis (2009).

fact, historians and journalists could remark on the curious phenomenon of a military coup in Argentina which, unlike all previous (and subsequent) coups, supported democratisation of the universities and scientific and technological development.[25] Incidentally, those concepts do not necessarily go together: Houssay's attitude *vis-à-vis* a democratic university is a clear counterexample.[26]
Moreover, during the military government (which outlawed Peronism and lasted until 1958, when constitutional President Frondizi was elected) the National Institute of Farming Technology (*Instituto Nacional de Tecnología Agropecuaria*– INTA), the National Institute of Industrial Technology (*Instituto Nacional de Tecnología Industrial* – INTI) and the National Council of Scientific and Technical Research (*Consejo Nacional de Investigaciones Científicas yTécnicas* – CONICET) were created in 1956, 1957 and 1958, respectively: these three institutions which, jointly with the National Agency for Atomic Energy (CONEA), constitute the backbone of the scientific and technological Argentinian system, were founded during a military regime.

During Frondizi's administration, from 1958 until his overthrow by a military coup in 1962, the government clearly backed scientific and technological development, in spite of rapid disillusionment amongst many intellectuals who supported him. This disillusionment was due essentially to his Congress' bill authorising private universities to offer legal degrees and to him signing contracts with American oil firms that were completely opposed to his ideas, and which were exposed in an influential book written four years earlier (Frondizi, 1954). In fact, the ideology of President Frondizi can be called 'developmentalism', which meant, among other things, the belief that scientific and technological development was fundamental to turn Argentina, as Frondizi wished, into a capitalist developed country. In that sense, there was not so much

[25] On the one hand, the coup was supported by right-wing scientists such as Houssay; on the other hand, left-wing students ('Reformists') had suffered Perón's persecutions and had –after the coup– much influence in the universities. The military government rewarded both groups.

[26] The poor political relationship between Houssay and the reformist students may be observed, for instance, in the debate in the Council of the Faculty of Medicine of the University of Buenos Aires between Houssay who, as member of the Council had proposed restrictions on the number of students who could be admitted to the Faculty, and the members representing the students, who were opposed to the restriction (Cibotti, 1996). And Houssay's distrust in the 'politicization' of the University is clearly seen in his first speech as a member of the Argentinian Academy of Arts in 1939. In this speech he says of the late academician Ángel Gallardo '[h]e was one of the few men who ruled it [the University of Buenos Aires] who has not been contaminated by the so-called university politics, which often is a fight of egoisms trying to dominate' (Houssay, 1939).

difference between Frondizi and the progressive scientists and university people(the 'Reformists') who had a strong influence in several public universities, especially in the University of Buenos Aires. Here, they controlled its Faculty of Exact and Natural Sciences, which was transformed into an internationally recognised research centre. In any event, Frondizi needed to hold onto power under difficult circumstances. On the one hand, he confronted the Peronists, because he did not achieve what he had promised them in a secret agreement that permitted the Peronists to vote for him, thus guaranteeing his triumph in the 1958 elections. He also had to face right-wing politicians and the Armed Forces, because that same secret agreement was considered a betrayal of the anti-Peronist spirit. Frondizi's tactic was to try to obtain more and more support from the Armed Forces and the Catholic Church. The Church was not particularly interested in scientific and technological progress; its ambition was to control education, to create Catholic universities and to avoid the implementation of projects based on 'subversive' ideas, such as divorce.[27]

As on many occasions in Argentinian history, the military who overthrew Frondizi were, in some sense, a deeply contradictory group. Frondizi had guaranteed support for any scientific and technological advances, including science and technology with military purposes. When Frondizi was overthrown, the Armed Forces controlled the government despite the existence of a civilian President (José María Guido) and they did not yet dare to overthrow the authorities of the public universities. That said, antiscientific measures were taken, such as the dismissal, in the prestigious National Institute of Microbiology, of its director Ignacio Pirosky and of some of his collaborators. Pirosky was a distinguished scientist and his dismissal also revealed a certain anti-Semitic bias. It is equally worth mentioning that, due to the repressive atmosphere created at the Institute, the future Nobel Prize winner César Milstein resigned from his position there and returned to Great Britain, where he continued his brilliant career until his death (Hurtado, 2010).

[27] Although many non-confessional private universities currently exist in Argentina, in the beginning the main beneficiary of Frondizi's policy regarding private universities was the Catholic Church, which was, besides, the institution most interested in this policy. The Church mobilised many people in support of private universities (Ghio, 2008).

The Definitive Break Up between Sectors of the Scientific Community and the Armed Forces

The new military regime, with its civilian President, lasted until 1963, when Arturo Illia was elected President (with Peronism outlawed) and relations between the universities, the scientists and the government improved, in spite of the fact that student demonstrations demanding an increase in the educational budget contributed to weakening the government. In 1966 a new coup overthrew Illia and the military appointed General Juan Carlos Onganía as President. That coup, against a President who always respected freedoms and the rule of law, during whose government the economy grew annually by seven per cent, and who was gradually legalising the Peronist Party, shows a grave and deep distrust of democracy in Argentinian society at that time. That distrust was useful to Catholic fundamentalism and to the groups that would nowadays be called neoliberal, to impose their ideologies over several years. In fact, Illia was overthrown almost without opposition. One of the few opposing voices came from the University of Buenos Aires where its Rector issued a strong condemnation of the coup.

One month later, on 29 June 1966, what was symbolically the most important event of the relationship between the Armed Forces and science and technology in Argentina in the twentieth century took place. This was the so-called Night of the Long Sticks, when the Federal Police, under the orders of an Army general, entered the Faculty of Exact and Natural Sciences at the University of Buenos Aires, beat students, graduates and professors gathered there and detained them for several hours. Although this aggression was incomparably less grave than the repression unleashed by the military in 1976, which also concerned university people and scientists (there were no dead in 1966, only some who were bruised), it has been engraved in the collective memory as a potent symbol of military brutality and of the complete incomprehension and mistrust of the military *vis-à-vis* what science means.[28] As a consequence, around 1,300 professors and teaching assistants of the University of Buenos Aires resigned. Some of them abandoned their scientific activities, others emigrated abroad (mainly to Chile and Venezuela) and others took refuge in the National Council of Scientific and

[28] On the same day the Federal Police burst into the Faculty of Architecture and Urbanism at the University of Buenos Aires and, besides using violence against professors, graduates and students, destroyed mock-ups of buildings prepared by the students. Very significantly, this event shows the feeling of the new military government towards intellectual activities.

Technical Research (CONICET), where they were tolerated by the authorities because they had no direct contact with students.[29]

CONICET was not a refuge for everybody. Despite the fact that Houssay continued being its President, due to his personal and scientific prestige as well as his right-wing ideology, CONICET ruled that any researchers who wished to be admitted to the institution would need to be authorised by the Secretariat of Intelligence of the State (*Secretaría de Inteligencia de Estado* – SIDE). This was an efficient method to exclude people with 'suspicious' ideologies.[30] In fact, in 1970, under Houssay's presidency and one year before his death, the Board of CONICET proposed to the military authorities of the country that they appoint Carlos Alberto Sacheri as Scientific Secretary. Dr Sacheri was the president of the group The Argentinean Catholic City, which published an anti-Semitic, anti-liberal, anti-communist and anti-French Revolution journal.[31] Houssay voted against the appointment because the candidate had no scientific background, but he considered that nonetheless Sacheri had 'a good record and favorable conditions'.

In the non-university scientific and technological institutions (INTI, INTA, CONEA and others) the ideological filter of SIDE also existed, but was seldom used during Onganía's administration. In the military mindset the communist devil materialised in the public universities. It is interesting to observe that there were sectors of the Armed Forces, who clearly recognised the importance of science and technology, who were extremely worried because of the crisis originating in the Night of the Long Sticks (they were also worried when Frondizi was overthrown) and who considered that the exodus of scientists endangered national defence. They were evidently a small minority, and in spite of their pressure and of the enormous public impact of the Night of the Long Sticks (heightened because among those beaten was a distinguished American mathematics professor, Warren Ambrose, who sent a letter to the *New York*

[29] The poor relations between many groups of students and the Armed Forces have a long tradition in Argentina, even before the 1930 *coup d'état*. Halperin Donghi (1962) describes an 'extraordinary fuss' in a lecture at the Faculty of Law of the University of Buenos Aires in 1927, where subjects related to national defence were discussed. More than 150 officers had attended the lecture, as well as the Rector of the University and the Minister of War (the future President Justo). And the 'troublemakers' were students of law, not future scientists. That is, the military mistrusted students before they mistrusted scientists.

[30] The corresponding resolution was passed by the Board of Directors of the CONICET at the end of 1967 (Hurtado, 2010).

[31] Editorial. *Ciencia Nueva*, 5, 1970, p. 4.

Times),[32] Onganía did nothing to prevent the exodus of scientists. Although they could not influence the government, those sectors tried to save what could be saved: scientist Marcelino Cereijido (Cereijido, 1990) tells how after the 1966 assault on the University (after which Cereijido was dismissed from his position by the new Rector), he was called by Brigadier Bosch, President of the Board of Scientific and Experimental Research of the Armed Forces. Bosch was not only extremely worried about the potential loss of scientists due to resignations and dismissals, but also offered Cereijido a position. Bosch fully understood Cereijido's explanations of his research on biological membranes and made very precise and accurate comments on the importance of scientific development in the country and, above all, on its concrete applications. Next, Bosch accompanied Cereijido to see the Director of the Institute of Scientific and Technical Research of the Armed Forces, Rear Admiral Milia, who also had very firm ideas about the applications of science for development and national security, and secured a position for Cereijido. According to Cereijido, around one hundred scientists were protected in similar ways by Bosch and Milia.

Analogously, when in 1974 President María Estela Martínez de Perón (Perón's widow) dismissed the authorities of the University of Buenos Aires and replaced them with an extraordinarily reactionary and obscurantist group, I was a witness to how Commodore Vélez, in charge of an area of research at the National Institute of Water Science and Technology (currently the National Institute of Water), protected and offered positions to around thirty scientists who had been fired from the University. Unfortunately, the general political climate was extremely disagreeable and many scientists, in any event, eventually abandoned science or Argentina.[33]

The only successful and relevant military effort at tolerance, and even support, for the scientific and technological community in Argentina happened at the National Agency for Atomic Energy (CONEA), where, as an almost isolated phenomenon in modern Argentinian history, an environment that was practically constant from the last years of Perón's administration onwards

[32] Professor Ambrose's letter, dated 31 August 1966, was published on 11 September. The international impact of the assault against the universities is indicated by the articles that appeared in the *New York Times* in the days following the Night of the Long Sticks.

[33] This protection of scientists against ideological discrimination lasted until 1976. The dictatorship installed that year mercilessly enforced its discriminatory measures; several scientists and technologists working in public institutions (not only universities) were kidnapped and murdered (or disappeared) and many others were dismissed.

could be observed.[34] Anyway, during the first years of its existence, there was strong opposition by many physicists to the considerable amount of money put aside for CONEA. Those physicists thought that it would be much more useful to use this money for laboratories in national universities. In this regard, after Perón's fall, the prestigious physicist Enrique Gaviola proposed that the CONEA be closed and its buildings, equipment and personnel be transferred to the universities (Hurtado, 2010); Mario Bunge (2009) commented that he was one of the opposing physicists, which, in his case, included a great mistrust *visà-vis* the Navy, under which, tacitly, CONEA operated (technically it was not the case, but in practice almost all its Presidents, until 1983, were Navy officers).[35]

After a turbulent period, in which an urban guerrilla movement emerged, the military government, with General Lanusse as President, had to call a general election in which no political party was outlawed, and in 1973 an extremely unsettled time began, in which the Peronist right prevailed over the revolutionary Peronist sector in 1974.[36] As already mentioned, the leftist authorities of the universities were replaced by rightist ones; many professors and teaching assistants were dismissed.[37] Moreover, a Dean of the Faculty of Philosophy, the priest Raúl Sánchez Abelenda, exorcised his Faculty to chase away evil spirits. With these extremely reactionary attitudes, the military had nothing to do: the government had been elected in transparent elections and the protagonists were all civilians, under the extremely strong influence of the Catholic Church. In Argentina, the Church has always played a main role in the attack against free thinking and science.[38]

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[34] Probably the most successful fruit of the military support for CONEA is the construction of the particle accelerator TANDAR between 1975 and 1986, described by Hurtado in his book mentioned previously and in Hurtado and Vara (2007). That was a 'big science' project which, although begun and finished during constitutional governments, was carried on essentially during the 1976–83 military dictatorship, which backed the project both politically and economically.

[35] Personal correspondence with Mario Bunge, December 2009. He comments on this also in the foreword to Bernaola (2001).

[36] The turbulent period 1973–74 of 'revolutionary' university did not seriously address the scientific and technological problems of the country, probably because, on the one hand, it did not have enough time and, on the other hand, it had to face the political fight against the right; further analysis is beyond the scope of this work.

[37] In fact, when the military overthrew President María Estela Martínez de Perón in 1976, few professors in the University of Buenos Aires were fired, because the 'dirty work' had been completed beforehand.

[38] When the University Reform began in Córdoba in 1918, the rallying cry was 'No to the priests!'(see, for instance, Bruera, 2009).

The Dictatorship 1976–1983

In 1976 Perón's widow was overthrown; the last military coup in Argentina started the bloodiest dictatorship of the twentieth century in Argentina. Curiously, many of the scientists who had to flee from Argentina went to Brazil, where the government was also a military dictatorship, but where they could comfortably continue their scientific and academic careers. It is worth noting how much the ways in which the Argentinian Armed Forces tried to impose their ideology had changed by this time: during the 1943–46 military government they changed the lyrics of tangos, when written in slang, so that they become more 'respectable'; during the 1966–73 military government they detained unmarried couples caught in hotel rooms rented by the hour because they were regarded as immoral; during the 1976–83 military government they unleashed indiscriminate repression and thousands of people disappeared. The ideological influence of fundamentalist Catholic fascism in the Armed Forces is discussed, for instance, in Finchelstein (2010). Here, it is interesting to flag the special role played by CONEA. On the one hand, during this dictatorship (as well as during the others) some scientific institutions, mainly CONEA, were strongly supported and their scientists and technologists could work without too much political interference; on the other hand, for instance in CONEA, some scientists 'disappeared' and its President, Admiral Castro Madero, did nothing to save them.[39] CONEA and related institutions, on the one hand, enjoyed a stability and the existence of an environment that are striking in a context which, generally speaking, was so harmful to scientific and technological development. On the other hand, modern mathematics was considered 'subversive'.[40] It is possible that this protection of scientists and technologists working in CONEA is related to secret militaristic wishes: that to have an important war industry, and therefore powerful Armed Forces, modern science and technology are necessary. The cost of having modern 'ecological niches' in some areas, completely isolated from the general state of development of the country, tends to be high. The archetypical example is North Korea, which has the atomic bomb and simultaneously suffers frightening famines. We think that a similar situation in Argentina would be politically unfeasible.

[39] On the website http://ate-cnea.blogspot.com/2011/04/35-anos-del-golpe.html a list exists of the 14 people who disappeared in CONEA.

[40] Terán (1979) mentions that on 13 December 1978, the Buenos Aires newspaper *La Opinión* reported that the Ministry of Education had formally consulted the National Academy of Exact, Physical and Natural Sciences about the potentially subversive power of modern mathematics.

It is worth mentioning that the contradictions of the Armed Forces were not related exclusively to the scientific and technological communities. In general, the military governments in Argentina, with the exception of that of 1943–46, established economic policies which, in current parlance, we could call 'neoliberal'. But nevertheless, their nationalism led them to prevent any privatisation of public enterprise. In fact, the most neoliberal of the military governments, the 1976–83 dictatorship, not only did not privatise any enterprise, but *nationalised* a very important one: the Italian–Argentine Electric Company.

The Scientific and Technological Community in Democracy

From the democratic restoration in 1983 onwards, the Armed Forces lost their influence over the control of the scientific and technological institutes, and from the 1990s on, they lost all influence in the country. However, only in the last few years, from 2003 on, does there seem to be a state policy that supports science. During Alfonsín's administration (1983–89) and in the second part of Menem's administration (1989–99) there were competent people in charge of the then Secretariat of State for Science and Technology: Manuel Sadosky, a distinguished intellectual and founding father of computer science studies in Argentina, and Juan Carlos del Bello, respectively. Nevertheless, although all ideological discrimination disappeared for people who wanted to obtain a position in the national system of science and technology, the budget for science and technology continued to be very meagre, scientists and technologists continued to earn low salaries, scientific laboratories continued to be poorly equipped, the mean age of researchers continued to increase and a significant proportion of young (and not so young) researchers emigrated, for economic, not political, reasons.

Furthermore, the ambitious project promoted by Sadosky of making up for lost time in the area of computer science, through intensive training of human resources, was interrupted when Carlos Menem became President in 1989, and a large part of the effort was wasted.[41] During the first years of Menem's legitimate and democratic government, the same obscurantist sectors that had occupied

[41] The project consisted in the creation of the Latin American Higher School in Informatics (ESLAI), a high-level university institution which did not survive the change of government. The history of ESLAI may be consulted in Jacovkis (2004) or Aguirre (2003), for instance.

positions of power in all military dictatorships recovered positions.[42] This shows that obscurantism was deeply ingrained in civil society, and in particular in the intellectual sectors of the Peronist right. Those sectors had no influence during Alfonsín's administration, save for the fact that they conserved institutional power and limited the government's room for manoeuvre. Criticism of Alfonsín is more related to his government's indifference to science and technology than to an obscurantist policy, which by no means existed while he was the President. In some respects, given that President Menem was legitimately and democratically elected in 1989 (and re-elected in 1995), his attitude regarding science and technology, especially during his first years of government, is an alarming sign of lack of interest and incomprehension of an important part of Argentinian society regarding the importance of science and technology in a developing country.[43] And, of that phenomenon, one cannot accuse the Armed Forces.

Summing up, one can say that, in Argentina, usually the obscurantist sectors *vis-à-vis* science were also obscurantist regarding education; that the Church was the intellectual force behind them and they obtained more and more power from 1930 on. Also, that they had so much influence in the military that the Armed Forces became the armed wing of national obscurantism. But the Armed Forces had no 'monopoly' on obscurantism. Not all was darkness during military governments and not all was light during democratic governments.

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[42] For instance, Bernabé Quartino, Rector of the University of Buenos Aires between 1971 and 1973, was the President of CONICET at the beginning of Menem's administration (1990–91).
[43] As a symbolic example, which the scientific community remembers very well, the powerful Minister of Economy during several years of Menem's administration, Domingo Cavallo, contemptuously referred to a female scientist suggesting that she should go and 'wash the dishes'.

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