The Reform of the National Technical University of Athens in 1943-44,

or the Rise and Fall of a Technocratic Utopia in Greece, from the Interwar to the 1940s

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Abstract

This paper is an account for the reform of engineering education in the National Technical University of Athens in 1943-44, during the Nazi occupation of Greece. The reform was designed regarding the post war plans for economic development and industrialization of the country, anticipating a broad social hegemony for engineers. In this context, I present the meeting of the technocratic ideology of Greek engineers with communism as a cameo to the adventurous trajectory of this sort of ideas from the interwar era to the 1940s. More specifically I will present the rise and fall of the technocratic consensus in NTUA under the leadership of Nikolaos Kitsikis, an emblematic leading figure of the Greek engineers. This consensus claimed the transcendence of political dichotomies of the time, projecting a bright future for the country that was guaranteed by the triumph of scientific objectivity and technological efficiency.

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Introduction

In September 1943, while Greece was in the third year of the Nazi occupation, Nikos Kitsikis, an emblematic figure of the Greek engineering community during the interwar period, becomes for the second time rector of the National Technical University of Athens. Two months later, in his inaugural speech before an enthusiastic audience of students[1] and professors, Kitsikis would announce the need for a radical reform in the NTUA curriculum, connecting the proposed changes to the prospect of the post war economic reconstruction and industrialization of the country. In keeping with the prevailing idea of the time, the proposed reform in NTUA was declared to be the precondition for a corresponding model of economic and technological development.

The decade between 1940 and 1950 is one of the most eventful in Modern Greek history. It begins with the participation of Greece in the World War II (1940-41). It continues with the Nazi occupation of the country (1941-44), and ends with the civil war between Left and Right (1946-49). During the Nazi occupation, the social and political equilibriums of the interwar era seemed to have been irreversibly swept aside. A flourishing liberating movement, under the leadership of the Communist Party, defined the future of the country in terms of a definitive break with the past. Technology and industrialization came to be the key issues in political conflicts between the Left and the Right.

Kitsikis opening his speech said:

"*Soon, our army of technicians, using their scientific knowledge, will fight the battle of technique to rebuild the ruins, to create a new Greece that will be capable of rising up to the boldest expectations of its children… In your songs, there is only Greece, eternal Greece and the eternal national values that will be even more secure in the new future life you will create".* Kitsikis asked the NTUA students to "…*show allegiance to the ideals of Greek youth, to strengthen even more the new ideals of humanity that will secure a better future, but most of all to achieve the unification of all children of Greece, thanks to whom no miracle is impossible*".[2]

Greece, technique, new ideas, national unity and the challenge of impossible: these were the ideological foundations in the excerpt above. On the one hand, the rector's speech was in essence a summary of the long term debates during the interwar period among engineers, economists and politicians on the economical and technological development of the country; on the other, it placed the issue of technical

studies and the claim for social hegemony of engineers within the new ideological context, in which he lately had acceded. The latish accession of Kitsikis to communism was the hidden agenda of his declarations. Engineers were actually challenged to combine their spontaneous dedication to the national and technocratic ideals - a kind of Greek 'techno-nationalism' – with the communist utopia.

This is a rather peculiar situation. The rector of NTUA, who acceded to communism, during the Nazi occupation period, proposed transformations, which, despite the serious objections of many professors about the timing, the content and the aims of changes, finally succeeded a strong consensus among the faculty and an official consolidation by the quisling Greek government.

The support of the majority of the NTUA professors –irrespectively of their political commitments– to Kitsikis' left wing technocratic utopia and the collaboration with the quisling governments for the official consolidation of the reform in NTUA are aspects that are not easily understood within the analytic frameworks and dichotomies (leftists-rightists, liberals-monarchists) that the traditional political historiography suggests.[3] Clearly, these derive from a different cultural basis, one that has been adequately brought to the foreground by the historiography of technology and by Science and Technology Studies in numerous studies. [4]

I try to build on these insights, providing my narrative about NTUA and Greek engineers. I argue that the devotion of the professors to an ideal of progress was the base, on which the technocratic consensus in respect to reforms of NTUA and the post war plans for industrialization of the country was built. Kitsikis' technocratic utopia, in the context of the extremely crucial circumstances of the time, claimed the penetration of the political boundaries between the Left and Right and it actually diminished the major antithesis of the time, conquerors and their collaborators versus Resistance.

The paper begins with an outline of the development of technocratic ideas of engineers between 1920 and 1940 in the political context of the Greek Interwar. This acts as a background for understanding and interpreting the new ideological terrain that emerged during the occupation years. It follows a picture of the situation at NTUA during the Nazi occupation, the Kitsikis' reforms and his encounter with communism. In the context of the reform, I present the claim of engineers for a new hegemony to the professional domain and social values that was set by an intense conflict between the NTUA professors and the classicists of the Athens University. In

the last section, I present the dissolution of the technocratic consensus of the NTUA professors and engineers during the civil war turmoil, when politics once again took its revenge by reestablishing the ideological battle lines.

2. The technocratic background of the interwar era

After the Balkan wars and the First World War, Greece had been doubled in terms of land and population.[5] Eleftherios Venizelos, the liberal politician from Crete, had been the protagonist figure of the time. He first came to power in 1910, declaring a modernizing political agenda.[6] The expansion of the country was translated into an increase in public works, new administrative structures, new educational institutions, and in the expansion of the engineering profession.

The social and political reforms of liberals towards a model of a civil society as well their strong irredentism, in respect of territorial expansion of the country in Asia Minor and Thrace, where Greek population lived, resulted to a strong political dispute with the Greek monarchy and its political adherents.[7] In 1924, the coalition of liberals, having the support of the army, abolished the monarchy and established the Greek Republic. The turbulent starting point of the Republic stamped its short life. The irresolute steps of economy, the restitution of one million and more Greek refugees from Asia Minor, who came to Greece after the defeat to Greek-Turkish war, the social segregation and conflicts, as well as the permanent political instability comprise a thick description of the era. From 1924 to 1928; 9 parliamentary governments, 6 military coups d' etats, and one dictatorship took place. In 1928, Venizelos again became Prime Minister and ruled the country until 1932. In 1932, the monarchists won the elections, opening the agenda of a strong political crisis, which ended the Republic and the parliamentary system in 1936.[8]

During the 1920s, the modernizing ideology of engineers was mainly identified with the Liberal Party's leader visions, Eleftherios Venizelos, and his allies in politics and the army. In any case the major institutional reforms in regard of engineers, the upgrading of the Polytechnic School of Athens to university level (1914), the establishment of the Ministry of Transportation (1914), as well as the establishment of the Technical Chamber of Greece (1923) were strongly connected with the modernist agenda of liberals.[9]

The National Technical University of Athens,[10] the successor of the School of Arts (established in 1837), with five schools (Civil, Mechanical - Electric Engineering, Architecture, Chemical, and Surveying Engineering), was the sole institution of higher technical education in the interwar era. During the period 1915-1940, 2007 engineers graduated from NTUA. The majority of them were civil engineers, as well as of middle and upper class origin. Fees were high and many of the graduates came from elite middle schools. NTUA was a school for men, who represented a social and intellectual elite.[11] The Ministry of Transportation reshaped and extended the state bureaucracy, introducing modern regulations in regard of administration and construction of public works. It strengthened the already strong links of the profession with the state and it actually became one more symbol for the upheaval of the social role of engineers. The Technical Chamber was a corporatist organization with obligatory membership. It was nominated as the profession's exclusive representative but also as the official technical consultant of the state. In 1935, 2146 Greek engineers and members of the chamber were integrated into a corporate and elite socio-professional group. The majority of them were members of the state bureaucracy or freelancers working in public works and housing constructions.[12]

These three institutions stamped the professional identity and culture of Greek engineers. The strong link with the state, the corporatism of the professional organization as well as the elite profile of studies and profession empowered the technocratic inclinations. The idea of modernization and rationalization of everything, in a context of strong political and economic crisis, formed a sort of eschatology of progress that was intimately tied to the social role of the profession. This ideological set, besides Greek localities, was strongly influenced by the discursive framework about engineers, politics and technology in USA and Europe.

Edwin Layton illuminates the ways through which ideas like the conservation and rational utilization of natural resources, the rational organization of time, the elimination of waste and leisure, and the subordination of economics and politics to the schedules of production were put forward as the necessary prerequisites towards an ideal of universal progress.[13] During an era of technological enthusiasm[14] the engineers proposed that the social problems should be treated through social engineering, combined with political neutrality. In this sense, they were suggesting a different kind of politics, a system empowered by the principles of rationalization and

scientific objectivity, free from the defects of political contingencies and conflicts. In this context, professional values, mostly rooted in a Weberian ideological basis, were very easily transformed into technocratic ideologies, reviving aspects of a revised Saint-Simonian utopia. Technocracy, given the differences in US and European contexts, was emerged as a political and economic program, which declared the replacement of existing politics with the power of science and technology. [15]

The strong legacy of positivism and the tradition of rationalism that stamped the ideology of the French engineering corps and French technocracy[16] influenced the discourse about rationalization of production and society in Greece during 1920s.[17] In the beginning of the 30s, the technocratic "revolt" of engineers in USA, the way it was expressed in the 1920's and 1930's by Veblen and Scott, was another source of inspiration for Greek engineers.[18] During the second part of 1930s, ideas borrowed from the German "geist" and the confrontation of "Kultur" and "Zivilisation" prevailed to the Greek technocratic agenda.[19]

In the beginning of the 20s, the leadership of Technical Chamber of Greece tried to bridge the tradition of the early technocratic ideas, of the 19th century military engineers, with the complex present of the Greek Republic (1924-1935). Elias Agellopoulos, the first president of the Chamber, a civil engineer, graduate of Ecole de Ponts et Chaussées, compiled the legacy of the ancient Greek rationalism with the rhetoric of French State Corps of engineers. He searched for the Archimedean point of view of rationalism, which would guarantee the unique effectual solution for social problems and offered the spontaneous intention of engineers for progress as an unselfish gift to the state and society.[20]

At the same time, the main stream of the technocratic ideal was expressed by a small group of industrialists – engineers, who had studied in the Polytechnic of Zurich, and their adherents. The journal *ERGA* (1925-1932) represented the ideas of the group. The journal praised the spirit of the industrial rationalization and mechanization; it became the outspoken disseminator of Taylorism and Fordism. It supported the ideas of economic liberalism and expressed the values of individuality strongly resembling the American entreprenual ideal. It also tried to pacify the fears of several social groups and to confront the critique of the romantic intellectuals, who considered industry and the emerging civil society as a threat to the social coherence. In the beginning of the 30s, when the 1929 world economic crisis came to Greece, the

members of the group tried to be accommodated in the new framework supporting a type of directed economy, based on protectionism and state control.[21]

In the mid-1930's, heated discussions on the country's viability, resulted in a strong version of the autarky ideal that approached a notion of economic nationalism.[22] The economic liberalism, as well as its political counterpart, seemed unable to face the economic and social problems; the vision of liberalism was replaced by the vision of state control. In this complex juncture new ideological syntheses were formed among engineers. It was the time for Nikolaos Kitsikis.

Kitsikis (1887-1978) was the offspring of a bourgeois family, graduate of Civil Engineering School of Athens Polytechnic in 1907; he also studied in Polytechnic School of Berlin and for a short time he attended the Poincare classes in Paris and Ecole de Ponts et Chaussées. He was a close political friend of the politician Alexandros Papanastasiou, a social democrat and leader of the left wing faction of the liberal coalition and he was appointed a high rank executive of the Ministry of Transportations, during the radical period of liberals' governance (1917-1920). In 1916, he was elected professor of statics in NTUA, at the age of 28, and during 1939-1941, for first time Rector of NTUA.[23] His recurrent triumphal elections in the Greek Senate as representative of engineers, in 1929 and 1932, as well us his elections as a chair of the Technical Chamber, in 1931 and 1933, were projected as symbolic victories against polarization and political conflicts. The official rhetoric of the Chamber declared that the engineers preferred the devotion to rationalism and the technocratic ideal rather than nonsensical politics.[24]

Under Kitsikis leadership (1931-1935), the Chamber articulated an ideology that started from a modest corporatism in 1931 and by 1935 had been transformed to the idea of a "Technical State" – in essence a rational dictatorship of engineers that resembled Veblen's and Scott's utopia. After 1932, the Chamber's rhetoric castigated all the more the paralysis of the parliamentary system and the inefficiency of politicians, who could not understand the rational dictates of the new machine age.

In this context, the young engineer Eftihios Kokkinopoulos, a student and protégé of Kitsikis, published an article in 1933, to the official journal of the Chamber, *Technica Chronica,* titled "Technocracy". Kokkinopoulos presented an overview of the basic ideas of the Howard Scott's technocracy movement. The author

did not fully align himself with the movement and, in a reference to Mussolini, claimed that power cannot be the exclusive privilege of a single social class. Nevertheless, Kokkinopoulos' article was unequivocal on Scott's contribution, on the use and rational management of resources and on humanity's technical potential.[25]

By 1935 the idea that the parliamentary system was definitely an obstacle had matured. Kitsikis speaking about fascist Italy, Nazi Germany, Kemalist Turkey and France of Poincare commented: "*We could imitate these paradigms under the condition that we don't forget the Greek peculiarities. We must keep in mind that in three of them the accomplishment of technological revival presupposed the abolishment of the parliamentary system and the establishment of a powerful state. This condition obliges us to move towards our ends slowly"*[26] Solutions to the socio–political problems and the country's technological development were available only through social engineering. According to Kitsikis' ideological synthesis, the state, the profession and science were to be integrated into a unique rational apparatus that would claim political hegemony for engineers and would guarantee the controlled modernization of the country in terms of rationalization and technological development.[27]

The civil engineer Athanasios Roussopoulos, another graduate of NTUA, executive of the Chamber, NTUA professor, student and protégé of Kitsikis too, was one of the motive forces of this synthesis. Roussopoulos in his book, *Towards an Essential System of Thought and Order: Constructing and Delighting,* in 1936, asserted that the goal of the "*Technical State*" is difficult and takes time to be accomplished. A realistic solution for the encounter of the crisis could be an intermediate step, the "*Semi Technical State*", an alternative that could be accomplished either in the bolshevist or in the fascist system, given a leading role for engineers. Roussopoulos asserted that "…*both* (bolshevist and fascist states), *despite their nominal ideological differences, could guarantee the prosperity for the people*" Assertions like these attest the "quaint" convergences that grew on the technocracy grounds and help us to understand the alliance of engineers with dictatorial regime in Greece at the end of the 1930's, as well as the technocratic consensus during 1940's in NTUA.[28]

In the middle thirties, many intellectuals and politicians asserted that the modest corporatism and statism were no longer sufficient to guarantee a way out

from the crisis. According to them an emancipated ideal of economic and technological progress, in a context of a civil society, seemed equally dangerous with communism. The confrontation with materialistic modernity, conceived as the main cause of the crisis and social revolt, presupposed among others the subordination of the technocrats to the power of the national ideals and values.[29] The ideological context of this subordination was based on a rich Greek traditional inheritance, and a variety of foreign ideological influences. In the case of Greece it was the Parthenon's ancient glory, which invigorated the already strong idea of techno-nationalism of engineers.[30] Many engineers were influenced by this ideology. Among them, the most prominent was the mechanical engineer Konstantinos Georgikopoulos, who had studied in Munich. Georgikopoulos was professor of mechanics and rector of NTUA in 1937-1939.[31]

The long term political and social crisis wrung out the Republic and paved the way for the restoration of the Greek monarchy by late 1935, and, following this, the dictatorship of Ioannis Metaxas, an ex military engineer, on August 4th 1936.[32]

During the dictatorship period, the consensus of technocrats to the domestication of rationalism and technology to the idea of an eternal national grandeur – to the great national "essences"- legitimized the perspective of the technological and industrial development of the country that was supported by the professors of NTUA and the engineers. It gave them strong advantages in their competition with the classicist professors of Athens University, the romantic, technophobic intellectuals and the adherents of the traditional culture.

These ideas were the framework for the alliance among NTUA, the Technical Chamber of Greece, and the August 4th regime during 1936-1941. The regime used and sanctioned this ideological synthesis in the context of what it was called the '3rd Greek Civilization' – an ideological construct regarding a linear continuity from ancient Greece to Byzantium and Christian Orthodoxy, and from there to the modern Greek nation state.[33] I can also add a last event, which, I think, exemplifies in a unique way the alliance between engineers and the 4th August regime: in 1939, Nikolaos Kitsikis, the liberal and moderate corporatist of the 20s, who was transformed into a radical technocrat in the middle 30s, was finally appointed Rector of the NTUA.[34]

3. The NTUA during the years of the Nazi occupation.

The War and the occupation had an overall disruptive effect on the existing structures and equilibriums of Greek society. A similar trend is also reflected in developments in NTUA during this period. Serious anomalies in the institution's functioning were already apparent since October 1940. Most students and a number of professors were drafted, and teaching came to a halt. The buildings of NTUA were used as a hospital by the Greek army, and were then occupied by the Italians.

Kitsikis, after the end of his tenure, in 1941, was succeded by Ioannis Theofanopoulos (1941-43), a mechanical engineer, graduate of NTUA in 1899, professor since 1907, who had also studied in Germany. Kitsikis was reelected vice – rector, an office which according to the organization of NTUA guided automatically to the rector office after two years. It is worthy to note that in 1941, nobody could imagine, not even Kitsikis personally the ideological turn of 1943.[35]

Between 1941 and 1942 there were efforts to resume the educational process, but the overall context turned out to be radically different to that of the pre-war years. In general, it became almost impossible to maintain continuity of the educational process. A victim of the vagaries and upheavals of the time, the NTUA was shut down on several occasions.

The new set of factors that the period between 1941 and 1944 ushered in can be described as fractures within the meritocratic and highly paternalistic character of the institution's administration. In 1941, there was an unprecedented increase in student admissions. Though 162 passed entrance exams, 334 were admitted as a result of intervention by the government. In a context of general paralysis the idea of meritocracy seemed completely needless. In addition to this, after the closure of the Greek Military Academy, 450 cadets were admitted to the NTUA schools. In 1943, when the situation regarding cadets had become stable, there were 1075 officially registered students, compared to 677 in 1941. [36]

In the anomalous juncture of the occupation years, the students took part in the resistance movement against the Nazis. Many were arrested, tortured and killed. These led to the emergence of a political consciousness that manifested itself in heated debates between left-wing and right-wing students, who sought to become the

dominant force in NTUA. Highly participatory student procedures were flourished, through bodies such as the Student Club, the Student Financial Assistance Fund, the Student Union, and various committees regarding everyday issues connected to the institution. All of these activities and practices were almost unthinkable in the pre-war years. [37]

4. The construction of the future

The calamities of the war, as well as the collapse of the economy and prewar sociopolitical system opened the agenda for the post war reconstruction of the country. In this context, the model of Soviet industrialization seemed particularly tempting to countries that, like Greece, had limited possibilities of large-scale investment and an infirm private industry. Additionally, the liberal modernization experiment of the ’20’s and the alliance of “rational machines” and great “national essences” during the 4th August dictatorship, in the second half of 1930’s had not yielded the expected results.

For the most NTUA professors this period represented a turning point. It was a new beginning for the institution and for the profession itself, in an atmosphere of expectations and strong optimism for the post-liberation period, as far the war and occupation seemed to approach to an end. This outlook included a critical stance towards the NTUA as a hothouse for state technocrats and envisaged a different role for the institution and for the engineering profession in the post-war context. It also incorporated and made use of research that was carried out in the interwar period by the Technical Chamber and NTUA. This research focused on natural resources, technical infrastructures and industrial development in Greece with a view towards productive autarky.[38]

When Nikolaos Kitsikis became for the second time Rector of NTUA in September 1943, this trend assumed a number of concrete characteristics and a strong momentum. Kitsikis, in this era of major reorientations and expectations, and under the influence of his left-wing students,[39] was discovering communism and identifying it with the heaven of technocracy.[40]

To some degree or other, the NTUA professors were gradually realizing that Kitsikis was essentially following and articulating the post-war technical and economic program of the left wing National Liberation Front (NLF) and the Greek

Communist Party. However, despite the absence of any connection with the Left, the majority of the faculty, who supported Kitsikis, did so because they acknowledged that the driving force behind his reforms was his desire to uphold the technocratic ideal. For the moment their devotion to the vision of technological development of the country and the social upgrading of NTUA and engineers seemed to be stronger than their traditional political commitments, producing an alternative way of thinking politics, legitimized by the rationalism of science and the effectiveness of technology. Science and technology, as well as the hegemony of engineers to the new era were projected as preconditions for the elimination of what was being perceived as the gridlock of the pre-war years and for the country's transition from poverty to sufficiency and from dependency to an autarky ideal. The phrase of the professor of Surveying, Dimitrios Lambadarios, rector in NTUA the period 1928-1933, expresses explicitly this inclination: "*All of us must be apostles to declare in every direction that engineers hold in their hands the future of the post war world"*.[41]

Kitsikis in his inaugural address to the NTUA Faculty Council and in his memorandum to students he outlined his priorities for his new term in office. The main ideas in his statements included not only administrative initiatives for the extraordinary conditions created by the occupation, the strengthening of the national morale and student unity. He also envisaged a key role for the institution in the economic restructuring and development of the country in the years following the liberation. And since time and tide wait for no man, Kitsikis insisted that the construction of the post-war future, at least in so far as the NTUA was concerned, was to begin immediately.[42]

The entire discussion on these issues came to a head, as already was told in the introduction of this article, during Kitsikis's inaugural address to the new students of NTUA on November 13, 1943.

In this address, Kitsikis delineated the principles of the post-war era's technocratic ideal before a standing ovation audience. On the cover of the text of the address we find the principal idea: "*The country's industrialization ought to be the aim of all those who will be in the vanguard of the nation's future fortunes*". It was clear that the plans for the construction of the post-war industrial future were being drafted at the NTUA. [43]

Kitsikis presentation of the curricular reforms linked the proposed changes in the training of engineers with the prospect of the country's productive restructuring. He spoke of the need for large-scale reclamation (irrigation/water management) projects that would change the face of agricultural production. He spoke of the increasing necessity for large hydroelectric power plants that would cater to the country's power needs and make it self-sufficient. The rector, paraphrasing Lenin's famous slogan "*socialism is equal to soviets plus electrification*", characteristically stressed: "*the future of Greece, the chances for prosperity and wealth will be the 5 billion KW outputs of the proposed plants*".[44] He connected plans for the production of electric power from hydrothermal sources with the development of heavy industry, steelworks, chemical industry in a context of controlled state economy and so on. He would declare that the country was rich in raw resources that awaited the technical know-how to turn them into national assets. He even spoke of the necessity for urban and regional reconstruction in accordance with modern town-planning and architectural principles. It was his firm belief that this entirely new universe was to emerge from the reorganization of NTUA, while the technical education and expertise of engineers would be called upon to bring forth the new reality. For this reason Kitsikis declared: "*For the NTUA, no sacrifice is extravagant. The nation must support it with love and devotion, because NTUA will guide the nation to prosperity*".[45] His language captured the spirit of the era. The address began and ended with the declaration of the need to create "*the army of technicians that will fight and win the battle of technique for Greece*".[46]

The consensus of the majority of the professors does not mean absence of objections and conflicts of opinions to proposed reforms. However it is impressive the way the controversies were handled by Kitsikis. In a sense, it was almost like a one-man show with the rector in the role of the protagonist.

Some of the professors expressed reservations by citing the unfavorable conditions of the time and the inappropriateness of collaboration with the quisling governments.[47] But Kitsikis, supported by many other professors, countered that NTUA should be ready to contribute immediately to the reconstruction of the country when the liberation day comes. Another argument he used was that the occupation and the absence of parliamentary institutions were ideal conditions for the reforms to acquire a legal foundation swiftly and without much deliberation or contention–

which was, in fact, how the NTUA Faculty Council would eventually present the case. He said: "…*it is difficult under normal political circumstances, in the context of a democratic system with parliaments and senates to succeed in validating a law, which needs money to be implemented.*"[48]

Others, like the liberal professor of economics Spiridon Koronis, voiced objections that had a more long-term political dimension. Their argument was that the proposals seem to put the future of NTUA and the country on the foundation of a political system that presupposed central planning and involved a rejection of the liberal social and economic model. They also believed that the proposals, in addition to being of questionable value, were tied up with an uncertain postwar reality.[49] Kitsikis's response to this kind of observations was that since his model combined science with the welfare of the nation, it was the best one available and for this reason would prevail.[50]

Kitsikis was prepared to change anything in response to individual objections, on condition that such changes left things at a substantive level intact. If they insisted upon details, he would simply respond by more or less saying that they had not understood a thing. [51]

To those who accused him of having breached administrative etiquette and for handling this in a undemocratic way, he would respond by saying that, as Rector, he was in charge of an administrative body but, most importantly, of something on a bigger scale: "*the reorganization ... of the NTUA has the potential of being the first step towards Greek prosperity*".[52] He also declared that the very nature of these aims required the expansion of his authority. [53]

During a meeting of the Faculty Assembly, in December 1943, Kitsikis brought up the issue of reforms in a preemptive gesture, designed to checkmate his opponents. He presented them with a choice between the approval of law 935 along with an expansion of his authority, and, in the absence of a unanimous approval, his resignation. The result was overwhelmingly in his favor as 39 of the 48 professors present voted for Kitsikis and his reforms.[54]

These declarations took an official form in laws 935/1943 and 1493/1944. It has been already noted that these laws were enacted by the 1943-44 collaborationist Greek government.[55]

Law 935[56] stipulated that there were to be reforms in all of the NTUA schools, with particular emphasis on the School of Civil Engineering and the School of Chemical Engineering. With respect to the former, after the fourth year of studies the law called for a bifurcation into the departments of Construction – Transportation Engineering and Civil – Hydraulic Engineering, each with a 1-year curriculum. The law also called for the creation of 4 new chairs that would meet the needs of these departments, along with the creation of hydromechanics and soil mechanics laboratories. These reforms were directly linked to the aim of urban restructuring and to the construction of a large-scale irrigation and hydroelectric infrastructure.

The School of Chemical Engineering consisted of three schools: the School of Chemical Metallurgy, the School of Chemical Mining – both with a 5-year curriculum– and the School of Chemical Engineers with a 4-year curriculum. To cover the needs of these schools, seven new chairs were created, along with a laboratory for Chemical Electrotechnics. For the School of Electrical and Mechanical Engineers, the law called for a potential bifurcation at the discretion of the NTUA administration into 2 additional schools of Mechanical and Mining Engineering and Mechanical and Metallurgical Engineering. The creation of these schools was directly linked to the aim of exploiting the mineral deposits and the development of heavy mining and chemical industry.

As far as the School of Architecture was concerned, the law called for the creation of two new chairs, History of Architecture and Philosophy – Theory of Art. These were designed to be precursors to the Architecture school's Institute of Research and Art, but also with the aim of introducing the subject of philosophy to all Polytechnic schools.

The law also stipulated that the School of Agronomy and Surveying would become the School of Surveying Engineers, while a number of further regulations stipulated that graduates from this school would be employed by the state administration (Transport ministry) and would have as their main task the drafting of the national cadastral. The compilation of the cadastral was connected with the plans of a general zoning reconstruction in the post-war period.

Law 1493, which was enacted in 1944[57] (seven months after the law 935), completed the process of the reforms at the Polytechnic. This new law called for the

division of the School of Mechanical – Electrical Engineering into the departments of Mechanical Engineering and Electrical Engineering (each with a 4-year curriculum) and the departments of Naval Engineering and Aircraft Engineering, both with 5-year curricula. The establishment of these departments was directly linked to the post-war objectives for the development of an electrical industry, mechanical construction and a naval industry. One distinct characteristic of the applied orientation of these new departments were regulations that prescribed long-term practical training of graduates in industrial units selected by the NTUA authorities.

A new school, for one-year postgraduate studies, was also established, the School of General Applied Science. There were plans for the establishment of a Physics and Mathematics Department and, potentially, for Economics and Management Departments. Officially, the new school would accept only a remarkably small number of top-class students – 10 to 15 students a year – from the Polytechnic and the Physics and Mathematics Schools of the Universities of Athens and Thessaloniki, who would study towards their PhD's in the physical and mathematical sciences.

The entire debate about the establishment of this school shaped a Greek version of classicism versus positivism, compounded by academic antagonisms between the NTUA and the University of Athens as both sought to prevail not only within the various academic fields and professions, but also within the prevailing ideologies and social values. By tradition, the Greek intellectual milieu, with its adherence to the sovereignty of classicism, regarded the material domain as being subordinated to the intellectual one. According to Athens University professors, the reforms at the NTUA upset this hierarchy of values by declaring material production to be the supreme national priority. [58] They would declare with characteristic anxiety: "*Since the end of the last war, humanity lives in a constant turmoil, in an unimaginable social, ethical, political as well as cultural crisis. The reason for this crisis is the mechanicalism, that is the unilateral orientation of human intellect…it is out of question that moral progress, compared with its technical counterpart, has remained behind"*[59]

The NTUA faculty, in a war like atmosphere, responded that science had to be either geared towards the needs of society and the times, or it has no reason to exist.: "*The emancipation of human spirit is the result of the development and*

systematization of science during the last century; a kind of science which combined knowing, understanding and acting, contrary to the disinterested ideal of ancient contemplative knowledge".[60]

The Civil War and the split of technocratic consensus

Nevertheless, the consensus on the technocratic ideal turned out to be exceptionally precarious in a setting of urgent political disagreements and the volatility of the times. In just a few weeks after the departure of the Germans, and as the storm clouds of the impending civil confrontation between the Left and the Right were gathering, Kitsikis's hegemony in the NTUA seemed shaky.[61] The left-wing uprising and its aftermath that broke out in December 1944 spread over the technocratic consensus in NTUA. The following is a brief sketch of events.

The student battalion of ELAS (National Popular Liberation Army), 'Lord Byron', led by Grigoris Farakos, a student at the School of Electrical Engineers, sought refuge at NTUA's buildings on Patission Street. On December 6, 1944 the student battalion came under attack by British tanks and infantry. The building was taken on the same day after a battle.[62]

The NTUA Faculty Assembly convened on January 18, 1945 a few days after the signing of the ceasefire. With Kitsikis absent, they almost unanimously condemned the uprising. Further exacerbating what was already a heavy climate was the fact that, in its retreat, ELAS had taken hostages three NTUA professors – Ioannis Theophanopoulos, professor of mechanical engineering and Rector from 1941 to 1943, George Sarropoulos, professor of electrotechnics and Spyros Koronis, professor of political economy. Some, like for instance K. Georgikopoulos, spoke of the need to maintain a calm and moderate stance by appealing to a tradition of concord among NTUA professors during difficult times in the past. Others, however, in indirect reference to Kitsikis, spoke of those who were morally responsible for the situation, of the left-wing professors aligned with NLF and of left-wing students that took part in the events.[63] This tension came to a head in the next few days when news came of the deaths of Theophanopoulos and Sarropoulos. Koronis was still missing and news of his death came later. The technocratic front had been fractured. [64]

The outcome of the December adventure and the defeat of the Left marked the end of the Kitsikis reforms. Kitsikis was one of 4 professors to be dismissed between 1945-6, accused of having instigated or taken part in the December uprising.[65] The same period, in the context of what historiography has called 'right-wing terror' and in view of the impending civil war of 1946-49, saw a generalized persecution of left-wing students that took the form of imprisonment, exile and a ban on entry to the institution.[66] This was also the fate of a part of the institution's clerical staff, who were accused of having taken part in the events or for their left-wing and Greek Communist Party sympathies.[67] This had a direct effect on the reforms, which were gradually phased out between 1945 and 1947.[68] Thus, when NTUA entered the post-war era it bore the scars of the break-up of the technocratic front. Kitsikis's story cast a long shadow on the institution for years to come, though his shadow was not the only one.

The story, however, does not end here. In the difficult years that followed, Kitsikis became a leading figure in the Left's research project on the post-war economic and technological restructuring of the country.[69] He was instrumental in the founding of *Antaios* in 1945, a technical-scientific journal, whose director was the lawyer and economist D. Batsis. In September 1945, together with other left-wing engineers and scientists, he founded the 'Scientific Society for the Study of Modern Greek Problems' (also known as EPAN, an acronym for 'Science and Reconstruction' in Greek). Both EPAN and Antaios became focal points and platforms for left-wing engineers and scientists. In October 1945, Kitsikis and Batsis co-authored the economical-technical section of the 7th party congress speech of Nikos Zachariadis, the general secretary of the Greek Communist Party.[70] The final result of this collaboration was described in D. Batsis book *Heavy Industry in Greece*,[71] which was the Left's technocratic opus magnum published in June 1947. The book recommended what in fact was a Soviet replica of industrial development, with five-year plans based on internal sources of finance and strong state control. The political and military defeat of the Left in the mountains of northern Greece, in 1949, was also a defeat for Kitsikis's left-wing technocracy. A legal ban on *EPAN* in 1950 was followed by the closure of *Antaios* in 1952. In the same year, D. Batsis was sentenced for espionage and executed. Kitsikis, in the 50s and 60s, became a prominent left-wing political activist.

Conclusion

The attempt to reform the NTUA in 1943-44 was a cameo in the consecutive metamorphoses of the technocratic ideas of Greek engineers from the interwar period to the 1940's. During the 1930's, these ideas became an organic part of the preexisting rhetoric that questioned parliamentarism, demanded the strengthening of state regulation and, finally, reached the stage of an open flirtation with the interwar totalitarianisms. It is through these ideological paths that engineers like Kitsikis encountered communism within the extraordinary circumstances created by the Nazi occupation of Greece. The reform in NTUA resulted in the creation of a broader alliance around Kitsikis's technocratic utopia.

There is no doubt that the fiery personality of Nikolaos Kitsikis was a decisive factor in the configuration and accomplishment of this fragile and temporary alliance. Kitsikis, who became the inspiration behind the reform plan, turned the new curriculum model into an organic part of the postwar development prospects within a communist context. He also managed to secure the consent of the majority of the NTUA professors by steering a course through their reservations and disagreements. Furthermore, his role during the brief technocratic 'uprising' of engineers in the mid 1930's was not less significant. Yet the passion for technical progress, and especially within the atmosphere of heightened expectations in respect of the imminent liberation, became the basis for a consensus by NTUA professors for Kitsikis's plan, even though this required serious political differences to be overcome and, more importantly, an official stamp of approval by a quisling government. The technocratic ideal seemed set to triumph and the NTUA was becoming its flagship.

But the outer shell of the technocratic consensus proved once again to be far too fragile and unable to withstand the seas of politics.

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[1]According to an oral testimony by Grigoris Farakos. Farakos was student in the School of Mechanical & Electrical Engineering in NTUA during the 1940's, and he was in the audience of Kitsikis's speech in November 1943. Interview with G. Farakos, May 2000.

[2] Kitsikis, N. "The Rector's Speech to the Students of NTUA, in November 13th 1943", *Technique*, Athens 1943. Kitsikis's Archives, p. 3.

[3] See for example, Margaritis, Giorgos, *History of the Civil War in Greece, 1946-1949*, Athens, Vivliorama, 2001.

[4] Layton, Edwin. *The Revolt of Engineers, Social Responsibility and the American Engineering Profession*, Baltimore and London, The John Hopkins University Press, 1986. Hughes, Thomas P. *American Genesis*, Viking, 1989. Hard, Mikael - Jamison, Andrew (edit.), *The International Appropriation of Technology, Discourses on Modernity, 1900-1939*, MIT, 1998. Hard, Mikael and Jamison, Andrew (edit.), *Hubris and Hybrids. A Cultural History of Technology and Science*, New York, Routledge, 2005.

[5] The Greek population increased from 2,630,000 in 1907, within an area of 63,200 km^2, to 5,530,000 in 1920 (149,150 km^2), to 6,200,000 in 1928 (129,300 km^2). Petmezas, Socrates. "Demography", *History of Greece in the 20th Century*. *The Beginning, 1900 1922*, Athens, Vivliorama, 2000, v. A1, 42-43 (in Greek).

[6] Kitromilidis, Paschalis (edit), *Eleftherios Venizelos. The Trials of Statemanship*, Edinburgh, Edinburgh University Press, 2006.

[7] In 1915, Venizelos confronted the King Constantinos, regarding the participation of Greece in the World War I; this conflict resulted in the expulsion of the liberals from the government. The latter resumed power in 1917 with the decisive intervention of the western allies (ENTENTE). In 1920, the conservative coalition won the elections. In 1922, the conservatives were again overthrown after the defeat of the Greek army in the Greek–Turkish war and the violent ejection of the Greek population from Asia Minor by Turks nationalists, under the leadership of Mustafa Kemal Ataturk. About 1.104.000 Greeks were forced to abandon their native lands in Asia Minor and Thrace and come as refugees to Greece. Kitromilidis, Paschalis (edit), *Eleftherios Venizelos. The Trials of Statemanship*, Edinburgh, Edinburgh University Press, 2006. See also: Mavrogordatos, George, *Stillborn Republic, Social Coalitions and Party Strategies in Greece, 1922-1936*, Berkley, University of California Press, 1983.

[8] Dafnis, Grigorios, *Greece Between two Wars*, Athens, KAKTOS, 1997 (second edition), (in Greek). Mavrogordatos, 1983 (in Greek); Hering, Gunnar. *The Political Parties in Greece, 1821-1936.* Athens, MIET, 2004, vol. B', p. 1046-1254 (in Greek).

[9]Antoniou, Yiannis, *The Greek Engineers, Institutions & Ideas, 1900-1940,* Athens, Vivliorama, 2006 (in Greek), p. 210-277, 301-353.

[10] Regarding the historiography of the Polytechnic School of Athens, see: Biris, Kostas. *History of the National Technical University of Athens* (in Greek), Athens, NTUA, 1957; Antoniou,, p. 91-126, 194-209, 210-300.

[11]The graduates of NTUA during the period 1915-1940 were: 1043 civil engineers, 214 architects, 194 surveying engineers, 361 mechanical and electrical engineers, and 195 chemical engineers. About 71% of them were sons of professionals, traders and rentiers, while only 1.5% were of labor class origin. Antoniou 2006, p. 253-255.

[12] 664 had graduated from foreign technical schools, 1070 were civil engineers (49.9%), 222 were architects, 440 mechanical and electrical engineers, 140 chemical engineers, 39 mining engineers, 12 naval architects, and 198 surveying engineers. In 1934, about 43% of Greek engineers worked for the state, 9% worked to various facilities, 10% were employed by technical companies, 7% were entrepreneurs and owners of various companies, 26% were freelancers, while only 4% worked in industry. *Technical Year Book of Greece,* Athens, edit. Technical Chamber of Greece, 1934, v. B. Antoniou, 2006, p. 314.

[13] Layton, 1986. See also, Picon, Antoine, «French Engineers, Social Thought, and the Technocratic Temptation. 18th-20th centuries», *National Identities of Engineers their past and Present,* Antoniou, Y. Assimakopoulos, M. Chatzis, K. (guest edits), Krige, J. (edit.) *History and Technology*, v. 23, n. 3, September 2007, p. 197-208.

[14] Hugh, 1989.

[15] Akin, William. *Technocracy and the American Dream, the Technocrat Movement, 1900-1941*, University of California Press, 1977, p. 64-79, 149-170. Maier, Charles, «Between Taylorism and Technocracy: European Ideologies and the Vision of Productivity», *Journal of Contemporary History*, 5, 1970. See also Pikon, Antoine, *Les Saint-simoniens : Raison, imaginaire et utopie, Paris, Belin*, 2002.

[16] Picon, 2007. Jakobsen et al, 1998, p. 110-117.

[17] Antoniou, Y. Assimakopoulos, M. Chatzis, K. "The National Identity of the Inter–War Greek Engineers: Elitism, Rationalism Technocracy and Reactionary Modernism", *History and Technology*, Antoniou, Y. Assimakopoulos, M. Chatzis, K. (guest edits), Krige, J. (edit.), Routledge, vol. 23, n. 3, 2007, p. 241-262

[18]Veblen, Th. *Engineers and the Price System,* New Brunswick and London, Transaction Edition, 1983 (first edition 1921), p. 131-145. Scott, Howard, *Science Versus Chaos,* New York, Technocracy Incorporated, 1933. Akin, William. *Technocracy and the American Dream, the Technocrat Movement, 1900-1941,* University of California Press, 1977, p. 64-79, 149-170.

[19] Herf, Jeffrey. *Reactionary Modernism, Technology, Culture and Politics in Vaimare and 3rd Reich*, Cambridge: Cambridge University Press, 1984. Hard, Michael. "German Regulation: The Integration of Modern Technology into National Culture", M. Hard – A. Jamison (edits), *The International Appropriation of Technology, Discourses on Modernity, 1900-1939*, MIT, 1998, p. 33-69.

[20] Agelopoulos, Ilias, "The Settlement of the Administration of the Technical Chamber of Greece" (in Greek), *ERGA*, Athens, 1925, is. 2, p. 44.
[21] Antoniou et al. 2007, p. 241-262.
[22] Chatziiosif, Christos, "The Viability of Greece and the Industry", *Volumes Dedicated to N. Svoronos*, Heraklio, PEK, 1986, v2, p. 330-368 (in Greek).
[23]NTUA Archives, Proceedings of NTUA Faculty Council, Book 1939, meetings: 18th and 19th, August, September 1939. (in Greek). NTUA Archives, Proceedings of NTUA Faculty Council,, book 1941, meeting 19, 12-9-1941 (in Greek).
[24] Kitsikis' first election in Technical Chamber attained a record; the number of participants at the polls doubled that of 1929, and 80% voted for him.[24] In 1932, he was reelected unanimously as representative of engineers in the Senate, and in 1933 he was also reelected president of the Chamber. This time, 1274 members went to polls (1870 were enlisted in the register) and 1152 voted for Kitsikis. "Proceedings of Meeting of Technical Chamber, 27/3/1933, ibid, is. 31, 1/4/1933, 378-382. See also, Triantafilidis, P. "The elections of Technical Chamber", ibid, is. 32, 15/4/1933, 418, 426-428.
[25] *Technica Chronica*, is. 29, 1.3.1933, p. 246-250.
[26] *Technica Chronica*, is. 77, 1/3/1935, 260.
[27] Kitsikis, N. "The Technical Apparatus of Greece, the Greek Technical Congress", *Technica Chronica*, is. 53, 1/3/1934, 234-236 (in Greek). "Year report of the Technical Chamber's Administrative Committee March 12th 1935", *ibid*, 1935, *Technica Chronica*, is. 77, 1/3/1935, 257-260 (in Greek). Antoniou, 2006, p. 361-399.
[28] Roussopoulos, Athanasios, *Towards an Essential System of Thought and Order. Constructing and Delighting* (in Greek), Athens, PIRSOS, 1936, 237-253, 257-260 (in Greek).
[29] Theotokas, Giorgos. "Facing our Social Problem", *Giorgos Theotokas, Thoughts and Assertions, Political Texts, 1925-1949* Alivizatos, N. & Tsapogas M. edits, Athens, ESTIA, 1996, v. A', p. 172, 181 (in Greek). Kirtsis, Alexandros, *Sociological Thought and Modernizing Ideas in Greek Interwar*, Athens, Nisos, 1996, p. 132-133. (in Greek).
[30] The affinities of this ideological schema to what J. Herf calls German 'reactionary modernism' are obvious. Herf Jeffrey. *Reactionary Modernism*. Technology, Culture and Politics in Weimar and 3rd Reich. Cambridge: Cambridge University Press, 1984. See also, Allen, Michael Thad, "Modernity, the Holocaust, and Machines without History", *Technologies of Power, Essays in Honor of Thomas Parke Houghes,* Allen, M. Thad and Hecht, Gabrielle eds. MIT, 2001, 175-214. Todd, Edmund N. "Engineering Politics, Technological Fundamentalism, and German Power Technology", *Technologies of Power, Essays in Honor of Thomas Parke Houghes*, Allen, M. Thad and Hecht, Gabrielle eds. MIT, 2001, 145-174.
[31] Antoniou, 2006, p. 361-408.
[32] Dafnis, Grigorios. *Greece Between Two Wars, 1923-1940,* Athens, KAKTOS, 1997 (2nd edition), p. 344-384 (in Greek).
[33]Noutsos, Panagiotis, "Components of 4th August Ideology", N. Svoronos, H. Fleisher (edits), *Proceedings of International Congress, Greece 1936-1944, Dictatorship, German Occupation, Resistance*, Athens, Educational Institution of Agricultural Bank of Greece, 1989, p. 59-69 (in Greek). Linardatos, Spiros, *4th August*, Athens, Themelio, 1966 (in Greek).
[34] *NTUA Archives*, Proceedings of NTUA Faculty Association, book 1937, meeting 1st, 14-5-1937. Proceedings of NTUA Faculty Council, Book 1939, meetings: 18th and 19th, August, September 1939.
[35] NTUA Archives, Proceedings of NTUA Faculty Council,, book 1941, meeting 19, 12-9-1941 (in Greek).
[36] NTUA Archives, Proceedings of NTUA Faculty Association, book 1942, meeting 2, 1/10/1942, p. 4-5 (in Greek). NTUA Archives, Proceedings of NTUA Council, book 1942, book 1942, meeting 30, 17/9/1943. NTUA Archives, Class Books 1938-1939, 1939-1940 and 1943-1944. *Official Gazette*, Law, 220, 1/6/1943.
[37] NTUA Archives, Proceedings of the Comity for NTUA Students Welfare, meeting 1, 11/11/1942, meeting 2, 15/12/1942 (in Greek).
[38] *The Economical Inquiry of the Great Technical Issues* (in Greek), Athens, edit. Technical Chamber of Greece, *1933*. This is a collective volume which includes the proceedings of a five months forum organized by the Technical Chamber in 1931-32. This collection expressed in an outspoken way the idea for the decisive intervention of the Chamber in the formation of the state policies in public works and in the economy generally.
[39] According to an oral testimony by Grigoris Farakos. Interview with G. Farakos, May 2000.

[40] Antoniou, Yiannis. *Technology and Industrial Development in Greece. The Ideas in the first Post-War Period: Zolotas, Batsis, Varvaressos*. Master Thesis, NTUA, Athens, 2000, p. 14-34, 81-84 (in Greek).
[41] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting 70, 11/12/1943, p. 24 (in Greek)
[42] NTUA Archives, Proceedings of NTUA Faculty Council, 1943, meeting 28, 3/9/1943 (in Greek).
[43] Kitsikis, N. "The Rector's Speech to the Students of NTUA, in November 13th 1943", *Technique*, Athens 1943. Kitsikis's Archives
[44] Ibid, p. 5
[45] Ibid, p. 10
[46] Ibid, p. 10
[47] Ibid, p. 53 & 59-61 (in Greek).
[48] NTUA Archives, Proceedings of NTUA Faculty Council, book 1943, meeting 35, 22/10/1943, p. 2 (in Greek). NTUA Archives, Proceedings of NTUA Faculty Council, book 1944, meeting 7, 31/3/1944, p. 36(in Greek).
[49] NTUA Archives, Proceedings of NTUA Faculty Council, book 1944, meeting 10, 28/4/1944, p. 164-172 (in Greek).
[50] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting 70, 11/12/1943, p. 66 (in Greek)
[51] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting 70, 11/12/1943, p. 68-69 (in Greek). NTUA Archives, Proceedings of NTUA Faculty Council, book 1943, meeting 39, 26/11/1943 (in Greek). NTUA Archives, Proceedings of NTUA Faculty Council, book 1944, meeting 14, 16/6/1944 (in Greek).
[52] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting 69, 4/12/1943, p. 31 (in Greek)
[53] NTUA Archives, Proceedings of NTUA Faculty Council, book 1943, meeting 39, 26/11/1943, p. 1-5, 11 (in Greek).
[54] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting. 69, 4/12/1943, p. 1-73 (in Greek).
[55] The collaborationist governments, during the period 1941-1944, despite their total subjection to the occupation authorities, continued to administer the state bureaucracy. The fact that they did not have any political or ethical legitimation, did not prevent, in many cases, individuals and social groups to claim a solution for their problems, appealing to them; but certainly this was not the case of the left-wing resistance. Chatziiosif, Christos. "The Greek Economy as Battle Field and Resistance", *History of Greece in the 20th century*: *Second World War. Occupation and Resistance*, Chatziiosif, Chr. (edit), Athens, Vivliorama, 2007, v. C1, p. 203 (in Greek).
[56] *Official Gazette*, n. 390, 19/11/1943, Law 935.
[57] *Official Gazette*, n. 390, 19/11/1943, Law 935.
[58] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1941-1943, meeting 75, 26/8/1944, (in Greek).
[59] Ibid, p. 20
[60] Ibid, p. 74
[61] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1944-1955, meetings 76, 3-11-1944 and 77, 6-11-1944 (in Greek).
[62] According to an oral testimony by Grigoris Farakos. Farakos. Interview with G. Farakos, May 2000. See also, Farakos, Grigoris, *Testimonies and Thoughts, 1941-1991. 50 Years of Political Action*, Athens, PROSKINIO, 1993, p. 57 (in Greek).
[63] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1929-1943, meeting 78, 18-1-1945 (in Greek). NTUA Archives, Proceedings of NTUA Faculty Council, book 1945, meeting 2, 26/1/1945 (in Greek)
[64] NTUA Archives, Proceedings of NTUA Faculty Council, book 1945, meetings: 3, 6-2-1945 and 8, 6-4-1945 (in Greek).

[65]NTUA Archives, Proceedings of NTUA Faculty Council, book 1945, meetings: 8, 6/4/1945, 13, 30/5/1945, 14, 5/6/1945. NTUA Archives, Proceedings of NTUA Faculty Council, book 1946, meeting 31, 11/10/1946 (in Greek).
[66] NTUA Archives, Proceedings of NTUA Faculty Council, book 1945, meetings: 10, 20/4/1945, 12, 18-5-1945, 15, 22/6/1945, 16, 4/7/1945. NTUA Archives, Proceedings of NTUA Faculty Council, book 1949, meeting 6, 11/2/1949 (in Greek).

[67]NTUA Archives, Proceedings of NTUA Faculty Council, book 1945, meetings: 22, 3-9-1945 (in Greek).
[68] NTUA Archives, Proceedings of NTUA Faculty Assembly, book 1944-47, 82η, 5/7/1945, (in Greek).
[69] Chatziiosif, Christos. "The reconstruction period 1945-1953 as a moment of modern Greek and European History", *The Greek Society during the first post war period*, Athens, Karagiorgas Foundation, 1994, p. 23-33 (in Greek).

[70] Zachariadis, Nikos. "The Present Situation of Greece and the Problems of the Popular Republic. Speech in 7th Congress of Communist Party of Greece", *OmnibusBook*, 1953, p. 175-200 (in Greek).
[71] Batsis, Dimitris, *The Heavy Industry in Greece*, Athens, 1947 (in Greek).