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AUTHOR

Christos Karampatsos
Postdoctoral Fellow, Department of History and Philosophy of Science, National and Kapodistrian University of Athens & Adjunct Faculty, Department of Electrical Engineering, University of West Attica
chriskaraba@phs.uoa.gr
Orcid 0000-0002-5213-3142

Spyros Tzokas
Postdoctoral Fellow, Institute for Mediterranean Studies of the Foundation of Research and Technology-Hellas (FORTH)
stzokas@gmail.com
Orcid 0000-0003-2386-5288

Giorgos Velegrakis
Postdoctoral Fellow, Institute for Mediterranean Studies of the Foundation of Research and Technology-Hellas (FORTH) & Adjunct Faculty, Graduate Program in STS, National and Kapodistrian University of Athens
gvelegrakis@phs.uoa.gr
Orcid 0000-0003-3888-5484

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The endless potentiality: A century and a half of Greek oil aspirations (and what often becomes of them)

Abstract

This article focuses on select instances of the history of Greek petroleum geology, spanning over 150 years of -mostly failed- oil exploration attempts. Firstly, we focus on the pre-WWII period, and show how early Greek petroleum geologists formed their expertise during successive periods of crisis and war. We then venture into the re-emergence of Greek hydrocarbon aspirations after the 2010 "Greek crisis". Following relevant contributions, we approach Greece as a country where hydrocarbons display material effects despite their physical absence. We portray contemporary Greek petroculture as a mixture of popularized petroleum geology and tacit geopolitical calculation. Finally, we show that the post-2010 Greek hydrocarbon policy is less motivated by hydrocarbon aspirations and more by a long-standing Greco-Turkish rivalry in the Eastern Mediterranean.

Acknowledgements

Christos Hadziiosif, Professor Emeritus of the University of Crete, sensed the potential merits of a history of Greek oil exploration as early as 1993, at a time when the matter was quite unheard of. He has provided invaluable guidance and material assistance to our research since 2017, when it was little more than a two-page proposal. Professors Gelina Harlaftis of the Institute for Mediterranean Studies-FORTH and Aristotle Tympas of the National and Kapodistrian University of Athens have also supported our efforts in more ways than we would care to count. We would also like to thank Eva Masoura for digitally processing the pictures, Nikos Alexis for sharing his archive, and the two anonymous peer reviewers for their scrutiny of our article and their enlightening comments on its methodology and structure.

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Most oil exploration experts work for the large oil companies.
Hence they form their opinions accordingly.
Alexandros Diomidis, 1935[1]

INTRODUCTION: ON OIL EXPERTS AND POLITICAL SAVVY

1 Hydrocarbon-wise, Greece is quite the peculiar place. The Greek State has attempted oil exploration in various instances since the mid-nineteenth century, most often in times of crisis and war anticipation. As far as oil discovery is concerned, Greek efforts have remained for the most part fruitless. However, they have been invariably accompanied by a vocal discourse, wherein notions of hydrocarbons as "subterranean treasure" and "instrument of fiscal salvation" are firmly intertwined with opaque technical terms borrowed from the discipline of petroleum geology. This discourse has matured over decades of successive application. It has resulted in a rarely contested historical narrative of Greek oil exploration, replete with nationalism, missed opportunities, "state incompetence" and unfair treatment by the Western powers.[2] It has emerged once more in recent years and currently dominates all relevant conversation in Greece,[3] closely related to rising geopolitical tensions over maritime sovereignty rights in the Eastern Mediterranean.[4]

2 In other words, Greece is one of those puzzling places where hydrocarbons display concrete material effects despite their physical absence.[5] Scholars faced with similar instances of hydrocarbon's "absent presence", have proposed to study resources beyond their valuation and circulation as commodities in global markets. Instead, resources should be approached as "historically and ontologically becoming" via an array of state and social practices ranging from state expansionism and irredentism to infrastructure construction and the application of expert knowledge.[6]

3 Our article follows this train of thought; we explore the historical origins and most recent applications of the Greek hydrocarbon discourse by following the emergence of a Greek version of the petroleum geology discipline and its practitioners. Previous work in the History of Technology and STS Studies has shown that technical experts are often able to assert political power through the implementation of science and technology.[7] Petroleum geologists in particular, employ practices of a deeply artisanal, technopolitical nature from a complicated junction between personal, corporate, and state interest.[8]

1 Alexandros Diomidis was a Greek economist and statesman. In various occasions between 1910 and 1950 he served as a Minister of Economics, Minister of Foreign Affairs and Governor of the Bank of Greece, even becoming Prime Minister in 1949. He became intimately involved in oil matters during the 1930s. See Nikos Pantelakis, Αλέξανδρος Ν. Διομήδης *[1874-1950]:* Ένας Αυθεντικός Εκπρόσωπος της Αστικής Τάξης [Alexandros Diomidis: A genuine representative of the bourgeoisie, 1874-1950] (Athens: *Metamesonykties Ekdoseis*, 2018), 327-345, the quote (taken from his private correspondence) in 336.

2 Efi Marinou, "Τα ξένα συμφέροντα έσβησαν το κερί" [Foreign Interests have put out Keri], *Eleftherotypia,* 6 August 1995.

3 Elias Nikolaidis, "Μπορεί το Πετρέλαιο να σώσει την Ελλάδα;" [Can Oil save Greece?], *Ta Nea*, 25 September 2012; Costis Stambolis, "Lack of state support hinders Greece's oil exploration", *Financial Mirror,* 16/03/ 2020. Url: **https://www.financialmirror.com/2020/03/16/lack-of-state-support-hinders-greeces-oil-exploration/** (accessed 22/05/2023).

4 Zeynep Oguz, "Harnessing Indeterminancy: The Technopolitics of Hydrocarbon Prospects", *Platypus*, 20/07/2021. Url: **https://blog.castac.org/2021/07/harnessing-indeterminacy-the-technopolitics-of-hydrocarbon-prospects/** (accessed 22/05/ 2023).

5 Tanya Richardson, Gisa Weszkalnys, "Resource Materialities", *Anthropological Quarterly,* vol. 87, n°1, 2014, 5-30, 22.

6 Ibid., 21; Kärg Kama, "Temporalities of (un)making a resource: Oil Shales between Presence and Absence", *in* Matthew Himley, Elizabeth Havice and Gabriela Valdivia (eds.), *The Routledge Handbook of Critical Resource Geography* (London and New York: Routledge, 2022), 57-67, 59; Zeynep Oguz, "Speculative Undergrounds: Oil's Absent Presence, Neo-Imperial Nationalisms, and Earth Politics in Turkey", *Cultural Anthropology,* vol. 38, n° 3, 2023, 26.

7 Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity After World War II* (Cambridge: The MIT Press, 1998), 14-17.

8 Andrew Barry, *Material Politics: Disputes along the Pipeline* (Chichester, West Sussex: Wiley/Blackwell, 2013), 141-3.

Similarly to other practitioners of the earth sciences, they are not just aiming at the discovery of some indisputable subsoil truth. Instead, their very questions stem from a powerful "context of motivation" made of national interest and historical circumstance.[9] The answers and scientific estimates they thus produce remain inscrutable until one considers their economic, institutional, and historical context.[10]

4 Accordingly, our periodization of the history of petroleum geology in Greece considers the turbulent history of the Greek State. We discern five distinct periods of oil exploration and the production of oil discourse. The first is between 1865 and 1905, when oil exploration was mostly centred on Zakynthos, an island of the Ionian Sea. Even as early as this, one can find traces of the peculiar blend of oil knowledge and political calculation that would come to characterize later exploration attempts. The second period is between 1912 and 1923, when the Greek State attempted oil exploration while being engaged in four successive wars. Early Greek petroleum geologists formed their expertise and methods of public intervention during this war decade. Third is the period of economic crisis and war preparation that lies between the Greek bankruptcy in 1932 and the initiation of the Second World War in 1939. It featured the reemergence of the Greek State's oil exploration attempts, and the formation of a mature oil discourse that was expressed in scientific reports and the public domain alike. A fourth period of oil exploration lies between 1960 and 1982. In the 1960s, the Greek State initiated a series of oil exploration attempts that coincided with intense Greco-Turkish conflict. The conflict culminated in a war over the possession of the island of Cyprus in 1974.[11] Oil exploration attempts went on until 1982 and produced the only viable Greek oil deposit to date, offshore the city of Kavala in the Northern Aegean.[12] The fifth period is still ongoing; it features the re-surfacing of Greek hydrocarbon aspirations after the Greek bankruptcy of 2010 as well as rising tensions in the Eastern Mediterranean.

5 In what follows, we describe the pre-WWII oil exploration attempts, emphasizing the emergence of a Greek version of petroleum geology and its interplay with public oil discourse. We then use our historical narrative to venture into the post-2010 re-emergence of Greek hydrocarbon aspirations. In the process, we show that Greek petroleum geologists are far removed from the archetype of the socially disconnected scientist, hardly prone to "neglecting aspects of the oil question" due to some single-minded scientific approach.[13] Instead, our protagonists are scientists armed with deep political and economic savvy, more than able to relate their expert knowledge to wider social and state imperatives. What's more, the context of motivation under which they usually operate is one of crisis and war preparation. The resulting interplay between geopolitics and science has best been described as "science in grey": not covert scientific activities funded

9 Naomi Oreskes, "A Context of Motivation: US Navy Oceanographic Research and the Discovery of Sea-Floor Hydrothermal Vents," *Social Studies of Science*, vol. 33, n° 5, 2003, 726-30.

10 Michael Aaron Dennis, "Drilling for Dollars: The Making of US Petroleum Reserve Estimates, 1921-25", *Social Studies of Science,* vol. 15, 1985, 241-242; Peter Shulman, "'Science can Never Demobilize': The United States Navy and Petroleum Geology, 1898-1924", *History and Technology,* vol. 19, n° 4, 2003, 377; Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2011), 45-59.

11 For the resurfacing of oil exploration attempts in the 1960s, see Yannis Fotopoulos, Stathis Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece", *Global Environment,* vol. 15, 2022, 322-69, 334-342. For an overview of Greek state policies in the period, see Christos Tsakas, *Post-war Greco-German Relations, 1953-1981* (London: Palgrave Macmillan, 2022).

12 The modest "Prinos deposit" was discovered in the 1970s and has produced 120 million barrels of oil in its 40 years of operation since 1981- today it requires state funding to continue production. Chrissa Liaggou, "Lufthansa Model for Prinos Oil", *e-Kathimerini*, 31/05/2020. Url: **https://www.ekathimerini.com/economy/253253/lufthansa-model-for-prinos-oil/** (accessed 22/05/2023).

13 Rüdiger Graf, "Expert Estimates of Oil-Reserves and the transformation of 'Petroknowledge' in the Western World from the 1950s to the 1970s", *in* Frank Uekötter and Uwe Lübken (eds.), *Managing the Unknown: Essays in Environmental Ignorance* (New York, Oxford: Berghahn, 2014), 141.

for military purposes, but science informed by and tacitly oriented towards confidential state imperatives.[14]

6 As we are about to see, from very early on this "science in grey" found its way into the public discourse that accompanies Greek oil exploration for more than one and a half century. The result is an amalgam of scientific discourse and political calculation which constitutes a significant part of Greek petroculture and may well be the most successful product of one and a half century of Greek oil exploration attempts. Its origins and contemporary use constitute the main subject of this article.

THE EMERGENCE OF A MYTH: ZAKYNTHOS, 1865-1905

7 Zakynthos is an island of the Ionian Sea, situated at the westernmost part of the Greek territory. Best known today as a tourist attraction, Zakynthos has been a well-known oil premise since antiquity and is mentioned as such by Herodotus.[15] Moreover, there are constant surface appearances of oil, not only following earthquake activity, but also in the bottom of a lake called "Keri". As a result, the first modern oil exploration attempts can be detected as early as 1865. Only a year after the island's annexation in 1864, the Greek state was quick to concede exploration rights to "an Anglo-American company established by D. York".[16] The project has been documented thanks to the presence of Henri Coquand, a French geologist who at the time participated in an exploratory mission studying European petroliferous regions. His final conclusions were hardly encouraging: "In Wallachia [in Romania], a deposit of such small magnitude and low fertility would remain unnoticed".[17]

8 Coquand proved to be right and the 1865 attempt failed, not leaving much evidence behind.[18] The matter took a more serious turn in 1891, when Boverton Redwood, "the *éminence grise* of British oil policy before the First World War"[19] visited Zakynthos, inspected the surface appearances and took samples.[20] He then applied for a concession.[21] Instead of conceding rights, the Greek state sent Georgios Damalas, a "geometer" to conduct exploratory drilling. Damalas' well went as deep as 100 meters before the drill broke upon encountering a layer of hard granite.

9 A sort of local oil expertise flourished next to this fervent activity. One of its most organized samples can be found in a speech given by Nikolaos Minotos, a local lawyer and member of the "Zakynthos studious club" in 1894. Minotos was intimately acquainted with the 1891 exploration efforts and had personally met with "the prominent English engineer" [i.e., Redwood] organizing them. Minotos knew that American drilling attempts could reach a depth of 600 meters, dwarfing the one attempted in 1891. He was well-versed in the "anticline theory", the common paradigm for petroleum geology proposed by Israel White in 1885, and knew that a "granite plaque" such as the one that broke the drill in 1891, was "usually encountered above a

14 For the notion of "science in grey" and its "hybrid" practitioners, see Roberto Cantoni, *Oil Exploration, Diplomacy, and Security in the Early Cold War: The Enemy Underground,* (New York and London: Routledge, 2017), 248-249.

15 Thomas Ethelbert Page, Edward Capps, William Henry Denham Rouse (eds.), *Herodotus with an English translation by A.D. Godley in four Volumes, II, Books III and IV* (London; New York: William Heinemann & G. P. Putnam's Sons, 1928), 397. The reference in Herodotus' works is *Book IV*, §195.

16 Evagelos Bombos, Τα Πετρέλαια της Ζακύνθου και τα εξ αυτών Προϊόντα [The oils of Zakynthos and their products] (Piraeus: Typografeion Efth. Proukaki, 1938), 5-6.

17 Henri Coquand, "Description géologique des gisements bituminifères et pétrolifères de Sélenitza dans l'Albanie et de Chieri dans l'île de Zante", *Bulletin de la Société Géologique de France*, vol. 25, 1868, 67.

18 Nikolas Minotos, «Περί των εν Ζακύνθω Πετρελαιοφόρων Πηγών και Περί Πετρελαίων εν Γένει: Μελέτη αναγνωσθείσα εν τω Συλλόγω Φιλομαθών Ζακύνθου την 3ην Ιουλίου 1894» [On the Zakynthos petroliferous sources and oil in general: A study read before the Zakynthos studious club on 3 July 1894] (Zakynthos: Ai Mousai, 15 July 1894 – 1 August 1894).

19 Daniel Yergin, *The Prize: The Epic Quest for Oil, Money and Power* (New York: Free Press, 2008 [1991]), 123.

20 Sir Boverton Redwood, *Petroleum,* vol. I (London: Charles Griffin & Co., 1906 [1896]), 36.

21 Minotos, «Περί των εν Ζακύνθω Πετρελαιοφόρων Πηγών και Περί Πετρελαίων εν Γένει» (cf. note 18) .

petroleum deposit".[22] He could also relate drilling to the "common good" of the people of Zakynthos; according to contemporary knowledge, the earthquakes plaguing the island since antiquity were due to "underground water that evaporated and exploded akin to a steam engine". Drilling would free the water from its underground enclosures, thus relieving Zakynthos from its earthquake problem.[23]

10 Finally, Minotos was well-versed into oil's geopolitical intricacies. He described the global battle for oil markets as a battle for the transport of oil, knew the exact share belonging to American and Russian interests,[24] and was a firm supporter of Russian oil. Not only because it gave "a much clearer light when burnt in oil lamps", but also because "us people of earlier generations (...) have learnt to love the enemies of our ancient enemies – we have learnt to love Russia. As my late father used to say, if not for the Muscovites, we would all be Francs and Turks".

11 This nineteenth century Zakynthos islander was neither petroleum geologist nor international relations expert; he was a lawyer and a man of his time, place, and social class. Through personal work and involvement with foreign experts, he had managed to educate himself on a wide array of oil matters ranging from geological theories to the technical details of oil drilling and transport. He was able to relate such "technical matters" to market competition and international conflict, all the while reserving a place for personal, class and national interest. This mingling of political, technical, and economic discourse is evident in his treatment of earthquakes. The theory connecting underground water deposits with earthquakes is quite obsolete by today's standards; it was however efficiently used to relate oil drilling with the "common interest of the people of Zakynthos". Drilling would not only contribute to personal wealth; it would also avert earthquakes.

The 1891 oil exploration attempt had been aban- 12
doned. For Minotos however, geological theory, the state of international relations, and the common good of the people of Zakynthos suggested otherwise: "the underground treasure that is in all probability hidden in Zakynthos, remains unexploited". Minotos suggested that the existence of oil should remain a potentiality for reasons that extended beyond mere subsoil reality. As we shall see, such reasons were indeed abundant in the years to come, and the endless potentiality of oil first formulated by Minotos would accompany Greek hydrocarbon discourse for more than a century.

OIL POTENTIALITY AND SCIENTIFIC FACTS, 1912-1923

Between 1912 and 1922 the Greek State was 13
involved in no less than four wars, including the Balkan Wars (1912-1913), the First World War (1916-1918), and an all-out Greco-Turkish War (1920-1922), best known today as "the Asia Minor Expedition" and in Greece as "The Asia Minor Disaster". By the end of this war decade, the Greek state had doubled its territory and population by annexing the so-called "New Lands", meaning Southern Epirus, Southern Macedonia, Western Thrace, the North Aegean Islands and Crete (fig. 1).

In the meantime, oil was transforming from an 14
efficient light source chiefly used in lamps, to an asset of increasingly strategic importance, in peace and –most importantly- war.[25] The possibility of oil deposits in the "New Lands" was

22 Israel White, "The Geology of Natural Gas", *Science*, vol. 5, n° 125, 1885, 521; Brian Frehner, *Finding Oil: The Nature of Petroleum Geology, 1859-1920 (*Lincoln and London: University Of Nebraska Press, 2011), 71-73.

23 The Zakynthos seismogenic region frequently produces "strong earthquakes with magnitude up to 7.0"; Basil Papazachos, "Large Seismic Faults in the Hellenic Arc", *Annali di Geophysica,* vol. XXXIX, n° 5, 1996, 894.

24 Minotos gave a 58,3% market share for American, vs 41.7% for Russian oil companies; his description does not differ much from the one given by Yergin; see Yergin, *The Prize: The Epic Quest for Oil, Money and Power*, 40-61 (cf. note 19).

25 Yergin, *The Prize: The Epic Quest for Oil, Money and Power*, 151-67 (cf. note 19); Nuno Madureira, "Oil in the Age of Steam," *Journal of Global History*, vol. 5, n° 1, 2010, 75-94; David Painter, "International Oil and National Security," *Daedalus*, vol. 120, n° 4, 1991, 183.

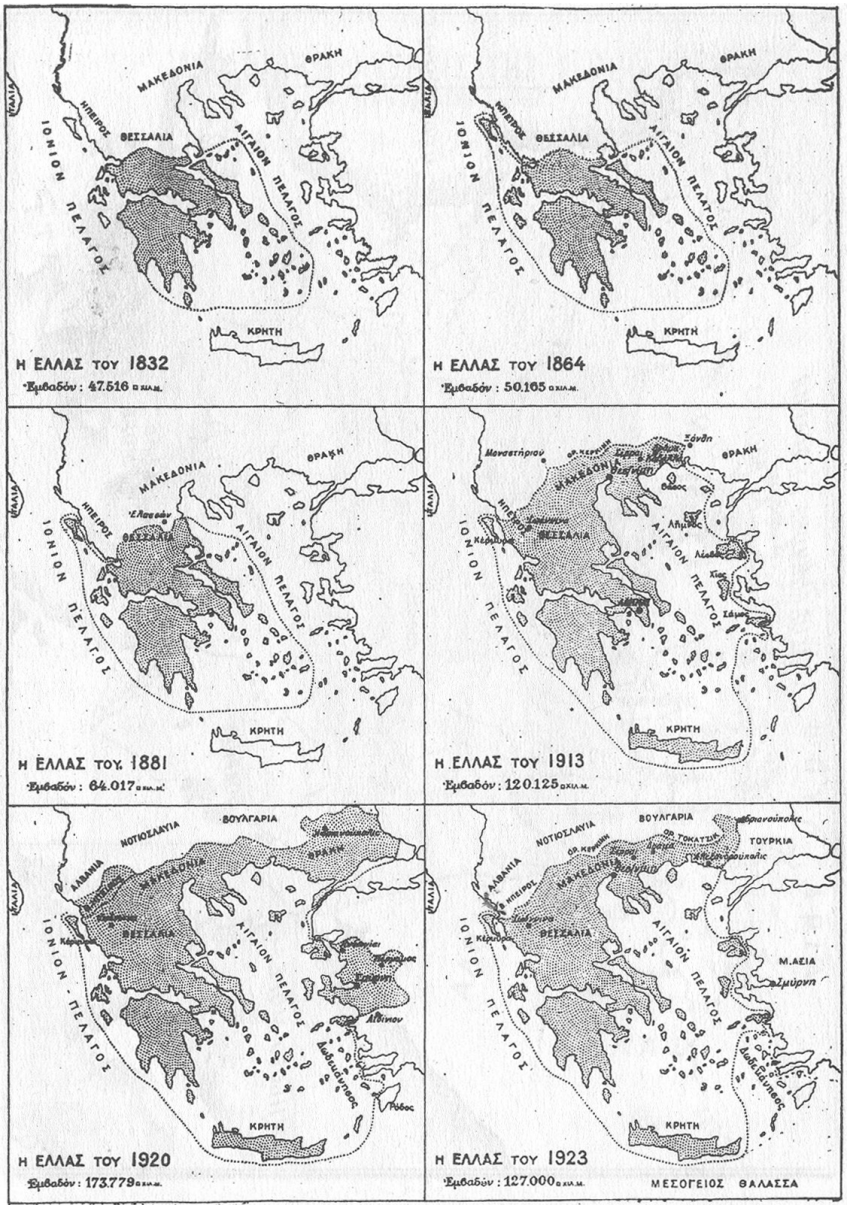

Figure 1: Expansion of the Greek Territory (1832-1923). The annexation of the "New Lands" took place between 1912 and 1923. Source: Yannis Milios, Ο Ελληνικός Κοινωνικός Σχηματισμός: Από τον Επεκτατισμό στην Καπιταλιστική Ανάπτυξη [The Greek Social Formation: From Expansionism to Capitalist Development] (Athens: Kritiki, 2000), 389.

promptly brought to the fore. Foremost among the areas of interest was the valley of the Molitsa River in Epirus, near the "Dragopsa" village (fig. 2). The Ottoman administration was aware of the Dragopsa case at least since 1910 when Ludovic Mrazek and his student C. Niculescu, esteemed geologists of the University of Bucharest, arrived at the area to inspect surface indications.[26] After the area changed hands in 1914, it was repeatedly inspected by joint French and Greek expeditions.

In January 1919 a "Franco-Greek petroleum syndicate" was founded to exploit the "petroliferous strata" in Epirus, the Ionian Isles and Peloponnese. The Syndicate was funded by French banks and directed by Alfred Pouyanne, former colonel of the French Army and early wartime explorer of Dragopsa.[27]

As early as December 1919, Pouyanne reported that the Syndicate "counts on discovering oil very soon in suitable quantities for industrial

26 Constantin Niculescu, "Contributions à la Géologie de l' Épire (Environs de Janina)", *Bulletin de la Section Scientifique de l' Academie Roumaine*, vol. 3, n° 1, 1914.

27 Pantelakis, Αλέξανδρος Ν. Διομήδης *[1874-1950]*, 328-29 (cf. note 1).

Figure 2: The "appearances of mineral hydrocarbons in Greece", as depicted in a 1920 report. Zakynthos is the last island to the Southwest, opposite Peloponnese. Dragopsa lies near Ioannina city, opposite Corfu Island. Notice the absence of borders. Source: Georgios Georgalas (ed.), Επιτροπή επί των καυσίμων: Πορίσματα, εκθέσεις και υπομνήματα του μεταλλευτικού τμήματος αυτής [Fuel Committee: Findings, Reports and Memoranda of its Mining Section] (Athens: Ipourgeion Ethnikis Oikonomias, 1920), appendix.

exploitation". Speaking of industrial exploitation, he proposed building an oil refinery in Piraeus and requested that the Syndicate be granted exclusive refinement rights for thirty years.[28] The Greek Government did not share Pouyanne's optimism. The "relevant bureaus" of the Ministry of National Economy deemed the Syndicate's exploration attempts to be "uncertain" and concluded that the Syndicate was in fact trying "to secure an oil refinement privilege in advance". They judged any agreement to be "premature".[29]

28 Alfred Pouyanne, "Syndicat Franco-Hellenique des Petroles à Monsieur le President du Conseil du Gouvernement Hellenique" (Folder 353), General State Archives, Prime Minister's Office, 13-26/12/1919.

29 Konstantinos Spyridis, "Konstantinos Spyridis to Eleftherios Venizelos" (Folder 353), General State Archives, Prime Minister's Office, 12/01/1920. We are grateful to Nikos Alexis for sharing these documents with us.

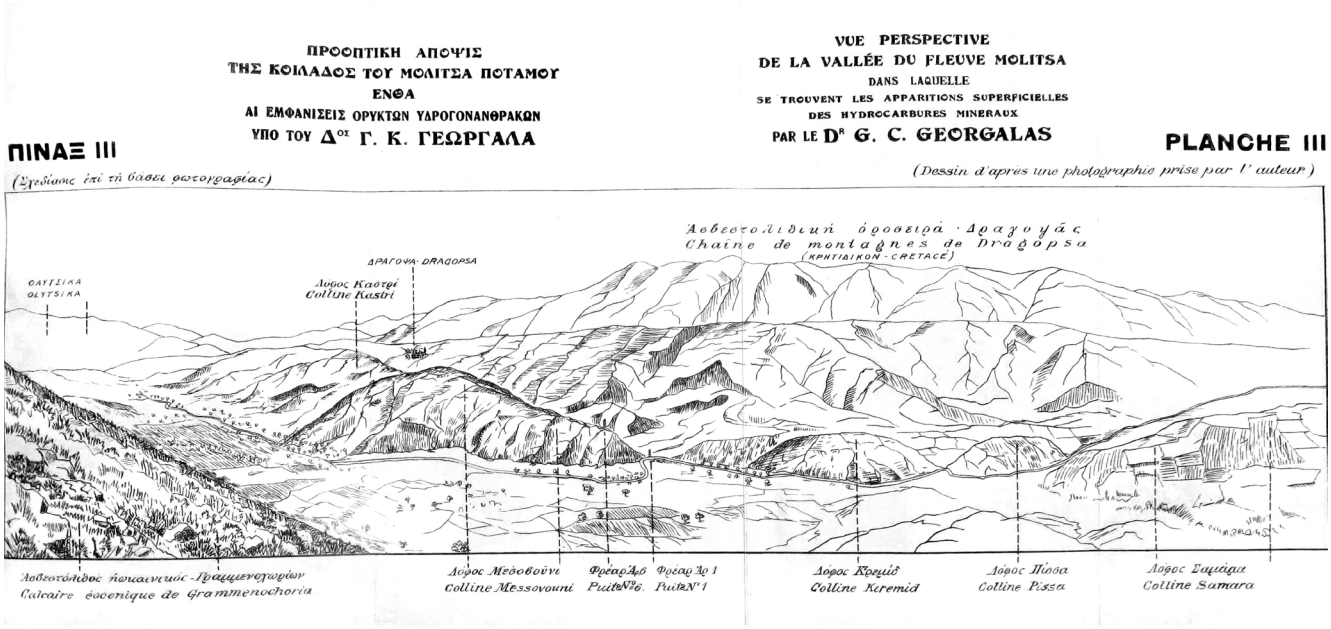

Figure 3: The valley of the Molitsa River as depicted by Georgalas "on the basis of a photograph", that was presumably taken during his 1920 trip with C. Niculescu. Dragopsa village appears to the upper middle and left. Source: Georgios Georgalas, Αι εν Ηπείρω εμφανίσεις ορυκτών υδρογονανθράκων και αι επ' αυτών ερευνητικαί εργασίαι [The Mineral Hydrocarbons in Epirus and research work thereon] (Athens: Ipourgeion Ethnikis Oikonomias, 1922), table II.

16 Obviously, the "relevant bureaus" of the Ministry of National Economy were much less naive than Pouyanne thought them to be. They were also newly founded; the agency that would later be known as the "Geological Bureau of the Ministry of National Economy" was founded in December 1918. The Head of the Bureau, Georgios Georgalas (1887-1980) was a young geologist who had completed his dissertation in 1909. Initially side-lined by other competing young geologists, in 1918 he somehow managed to be appointed Inspector Geologist of the Ministry of National Economy and embarked on a rapid familiarization with the technical and political aspects of the fossil fuel question.[30]

17 In August 1920, Romanian geologist Niculescu was called back to Epirus and began exploratory drilling. Georgalas immediately used his position as Inspector Geologist to secure a mediating position between the Franco-Greek Petroleum Syndicate and the Ministry of National Economy. He enjoyed access to Niculescu's reports towards the Syndicate and had the opportunity to personally visit the site of the exploratory drillings in the company of Niculescu himself (fig. 3).[31]

18 All this combined with a growing realization of his new role as a public intellectual. The young geologist quickly realized the value of "hobnobbing with political and social elites", as evidenced by his eventual enrolment into the Greek freemason society.[32] He also learnt to manoeuvre between the sceptic stance privately expressed

30 Georgios Georgalas, "Αι εν Ελλάδι εμφανίσεις ορυκτών υδρογονανθράκων" [Hydrocarbon Appearances in Greece] *in* George Georgalas (ed.), Επιτροπή επί των καυσίμων: Πορίσματα, εκθέσεις και υπομνήματα του μεταλλευτικού τμήματος αυτής, [The Fuel Committee: Findings, Reports and Memoranda of its Mining Section] (Athens: Ministry of National Economy, 1920). For this complicated story, see Christos Karampatsos, "Το γενικότερο συμφέρον του κράτους: Η «συνέχεια των ελληνικών χωρών» και οι Έλληνες γεωλόγοι, 1908-1925" [In the State's General Interest: Greek Geologists and the "Continuity of the Greek Lands", 1908-1925], *Ta Istorika,* vol. 73, 2021, 125-54; also, Christos Karampatsos, Spyros Tzokas, Giogros Velegrakis, Gelina Harlaftis, "Is There Oil in Greece? Oil Exploration and Scientific Conflict during the First Years of the Greek Geological Survey", *The Historical review/La Revue Historique,* vol. 19, 2023, 77-111.

31 Georgios Georgalas, Αι εν Ηπείρω εμφανίσεις ορυκτών υδρογονανθράκων και αι επ' αυτών ερευνητικαί εργασίαι [The mineral hydrocarbons appearances in Epirus and the research work thereon] (Athens: Ministry of National Economy, 1922), 21 and 29. Georgalas' visit probably took place during the autumn of 1920.

32 Jeffrey Bartos, "The Accumulated Knowledge of a Thousand Generations: U.S. Mining Engineers as Public Intellectuals", *Technology and Culture,* vol. 62, n° 4, 2021, 1174. Georgalas freemason liaisons culminated in the 1930s; see below, section 4.

in the Ministry's internal communication and a scientifically informed optimism that came to characterize his public interventions.[33] Such interventions typically began by pointing out the strategic significance of "king oil" and predicting the imminent "practical disappearance of anthracite".[34] Strategic predictions were followed by a display of Georgalas' rapid acquaintance with petroleum geology. Mrazek's novel "diapiric anticline" notion was casually enrolled as a geological theory possessing the rare trait of immediate practical application. The Romanian's suggestion that "salt diapirs provided an effective seal for hydrocarbons",[35] could direct actual drilling attempts so that they "define the extent of the deposit under the hypothesis that the carboniferous strata meet underground, enclosed by the impermeable salt-bearing strata".[36]

19 His most notable discovery, however, was the rhetoric he came up with to confront the question of the actual existence of oil. From 1920 onwards, he learnt to divide the question in two distinct parts. The first part of the question concerned the existence of oil in Epirus. Here the answer was "definitively positive". The analogies of the "carboniferous zone of Western Greece" to the Carpathian one were plenty, extending from their "genesis" and age to the existence of "diapiric anticlines". The second part of the question concerned the economic viability of the oil deposits. Regrettably this was "impossible to answer"; according to Mrazek "an estimate of this kind of deposits is difficult, if not impossible (...) and when Mrazek speaks thus, I am forced to fall silent".[37]

Georgalas was anything but silent. He had 20
developed a method to rhetorically substantiate the potentiality of the Greek oil deposits, all the while preserving his scientific credibility in the face of possible future debacles. He was developing connections to the daily press; when oil was allegedly discovered in the vicinity of Trikala Thessaly, Georgalas was the one to calmly intervene in the public discourse[38] and eventually disprove its existence.[39] His context awareness was made evident by his 1922 venture into war geology, a new sub-discipline which he clearly saw as an opportunity to secure employment of geologists by the army.[40]

This rapid buildup of political and geological 21
savvy was fuelled by historical circumstance. In February 1922, the Franco-Greek Petroleum Syndicate abandoned the promising Dragopsa deposits, presumably under orders from "Paris".[41] This decision was less related to geological estimates and more to geopolitical ones. The war in Asia Minor was as good as lost at least since 1921, and France was increasingly supportive of the Turkish efforts.[42] In August 1922, Georgalas, now recognized as the most prominent Greek oil expert, attended the 13th International Geological Congress in Belgium, to attract anew foreign oil investment to Western Greece. He concluded his presentation with a display of his newly discovered rhetorical ploy: "interesting future [oil] applications" in Epirus

33 Georgalas presented his essay on Epirus oil before the Greek Society of the Physical Sciences in March 1921 and published it in *Bulletin of the Hellenic Society of Natural Sciences,* 2, n° 9-10, 1921. The same essay was published in 1922 as Georgalas, Αι εν Ηπείρω εμφανίσεις ορυκτών υδρογονανθράκων και αι επ' αυτών ερευνητικαί εργασίαι [The mineral hydrocarbons in Epirus and research work thereon] (cf. note 31).

34 Ibid., 5.

35 Constantin Roman, *Continental Drift: Colliding Continents, Converging Cultures* (Boca Raton: CRC Press, 2000), 12.

36 Georgalas, Αι εν Ηπείρω εμφανίσεις ορυκτών υδρογονανθράκων και αι επ' αυτών ερευνητικαί εργασίαι [The mineral hydrocarbons in Epirus and research work thereon], 21 (cf. note 31).

37 Ibid., 24, 28.

38 Anonymous, "Πετρέλαιον εις Τρίκαλα" [Oil in Trikala], *Empros*, 24 December 1921.

39 Georgios Georgalas, "Natural Gas in Thessaly", *Economic Geology*, vol. 19, n° 1, 1924.

40 Georgios Georgalas, "Πολεμογεωλογία" [War Geology], *To Mellon*, vol. 4, n° 39-40, 1922, 10; On the development of "military geology", see Edward Rose, "Military Geology: An American Term with German and French Ancestry", *Earth Sciences History*, vol. 38, n° 2, 2019, 357–70.

41 Pantelakis, Αλέξανδρος Ν. Διομήδης *[1874-1950]*, 330 (cf. note 1).

42 Douglas Dakin, *The Unification of Greece, 1770-1923,* New York: St. Martin's University Press, 1972, 231-232; Giannis Gianoulopoulos, "Εξωτερική πολιτική" [Foreign policy], vol. A2, *in* Christos Hadziiossif (ed.), Ιστορία της Ελλάδας στον 20ο Αιώνα [History of Greece in the twentieth century], (Athens: Vivliorama, 2002), 135.

were, after all, "not impossible".[43] The Greek Army in Asia Minor collapsed only a few days later. In the following decade the Greek State had to come to terms with the end of its imperial aspirations, not to mention the integration of more than a million refugees from Asia Minor. Oil exploration became less of a priority.

22 Georgalas' personal ambitions fared rather better than the national ones. At long last he had acquired tenure, even if it was at the newly established Agricultural University.[44] In 1925, he became Director of the unified Greek Geological Survey. There are even some subtle hints that he realized the new imperatives governing the now stabilized Greek territory. His next oil exploration proposal was submitted in 1923 and was irrelevant to his well-studied Epirus deposits. It concerned the village of Tavri in Western Thrace, near the city of Alexandroupoli,[45] an area today thought to be of acute geopolitical significance, serving as a gateway to bypass the Bosporus straits and disregard the Treaty of Montreux.[46] In 1923, the proposal was rejected and its actual reasoning would remain unknown until the next decade, and the next section of this paper. As we shall see, it was suggestive of the uses Georgalas would find for his wartime knowledge in the years to come.

THE FORMATION OF A MATURE OIL DISCOURSE, 1933-1940

23 The next major appearance of the Greek oil deposits took place during another period of major political turbulence and war anticipation. A 1932 state bankruptcy was followed by acute political instability. Following a failed coup in March 1935, Ioannis Metaxas, former General, Military Engineer and Minister of Public Works, successfully imposed a dictatorship in August 1936.

The Greek State's oil aspirations were much more consistent than its political system. They resurfaced in 1933, immediately following the 1932 bankruptcy.[47] They gained momentum in the beginnings of 1936, only months before the official imposition of the Metaxas dictatorship, when "large oil deposits" of "colossal importance" were discovered in Western Thrace.[48] The most informed series of relevant articles appeared in *Oikonomologos Athinon* newspaper only days after the dictatorship was officially imposed and went on until January 1937. Here, next to Herodotus, one could find "the director of the Geological Survey G. Georgalas [who] as early as 1920 scientifically examined the Ioannina region with quite satisfactory results". Exploratory drillings were taking place in Tavri village, near Alexandroupoli, the exact place of Georgalas' 1923 rejected drilling proposal.[49] 24

The reasoning was now made clearer. An oil discovery in Thrace would lead to a "clash" between oil majors such as "Dutch Royal [sic], the Anglo-Persian Company, and Standard Socony Corporation, always ready to quarrel over the new deposits as part of their struggle to demarcate spheres of influence between the New and the Old World".[50] However, the oil majors "in fact represent[ed] the interests of the British and the American State", who were the "actual" entities "antagonizing for supremacy over Greece".[51] Oil 25

43 Georgios Georgalas, *Les hydrocarbures naturels en Grèce – Extrait du Compte Rendu du XIII^e Congrès géologique international 1922* (Liege: Imprimerie Vaillant-Carmanne, 1926), 1359.

44 Michail Stefanides, Εθνικόν και Καποδιστριακόν Πανεπιστήμιον Αθηνών: Εκατονταετηρίς, *1837-1937,* Τόμος Ε', Τεύχος Β' [National and Kapodistrian University of Athens: A centennial, 1837-1937, Vol. V] (Athens: Ethnikon Tipografeion, 1948), 28-31, 67.

45 Georgios Georgalas, "Υπάρχουν πετρέλαια εν Ελλάδι;, Γ' " [Is there oil in Greece?, part III], *Chemical Annals,* vol. 2, n° 4, 1937, 82.

46 Laura Pennisi, "Greece between the hammer and the anvil: Geopolitical Games in the Eastern Aegean", *SpecialEurasia.com,* 05/11/2021. Url: **https://www.specialeurasia.com/2021/11/05/greece-between-the-hammer-and-the-anvil-geopolitical-games-in-the-eastern-aegean/** (accessed 01/03/2023).

47 Pantelakis, Αλέξανδρος Ν. Διομήδης *[1874-1950]*, 336-341 (cf. note 1).

48 E. Tzamouranis, "Έχει και η Ελλάς πηγάς πετρελαίου – Το πολύτιμον υγρόν – τι ευρέθη εις Θράκην," [Greece possesses oil too – The valuable liquid – What was discovered in Thrace], *Athinaika Nea*, 6 February 1936.

49 (Anonymous), "Υπάρχει Πετρέλαιον εν Ελλάδι;" [Is there oil in Greece?], *Oikonomologos Athinon,* 15 August 1936.

50 Ar. Avramidis, "Υπάρχει πετρέλαιον εν τη Δυτική Θράκη;" [Is there oil in Western Thrace?] *Oikonomologos Athinon,* 5 December 1936.

51 (Anonymous), "Υπάρχει Πετρέλαιον εν Ελλάδι;" [Is there oil in Greece?] (cf. note 49).

exploration was tantamount to tying the interests of the Great Powers in a crucial point of the Greek Territory and was thus much more beneficial than the simple discovery of oil would suggest.

26 There can be little doubt that the actual source of the articles was Georgalas. He was referred by name, and his former exploration proposals were resurfacing. Most indicatively, the titles and argumentation of the articles invariably followed his 1920s rhetorical ploy, now condensed in a deceptively simple question: "Is there oil in Greece?"[52] In January 1937 Georgalas, now a full-fledged freemason,[53] took over the chair of Mineralogy and Petrology of the University of Athens. The title of his inaugural address was "Is there Oil in Greece?" The answer was formulated in the usual manner. Greece "certainly possesse[d] oil deposits, although of unknown quantity and synthesis". Exploratory drilling had to be "immediately performed" in areas where "serious scientific evidence of the possibility of oil deposits exists". His geological and rhetorical tour de force was met by "vigorous and extended applause" by the esteemed audience.[54]

27 Georgalas' public interventions stemmed from much more subtle dealings that were in the meantime taking place inside the Greek Administration. Ioannis Drosopoulos, Governor of the National Bank of Greece, and Alexandros Diomidis, former Minister of Economics, were amid negotiations with various foreign actors, including the British Hambro Bank, the Mexican Eagle Oil Company and unnamed "German interests". The two Greek statesmen were aware of oil's international implications and were trying to secure British funding by threatening that otherwise the concessions in Thrace would regretfully "pass to German hands".[55] When they nevertheless failed to secure British funding for the Thracian venture, the National Bank of Greece urged to comply. Despite the negative internal reports received, Drosopoulos insisted that oil exploration in Thrace was "of such importance for the national economy" that the National Bank should fund it even "à fonds perdus".[56]

28 Indeed, the National Bank went on to invest 20.000.000 drachmas of "fond perdus", initiating a period of intense oil exploration that would last until 1939. In addition to Western Thrace, the areas explored included West Peloponnese, Central Macedonia and, once again, Epirus and Zakynthos.[57] The press went wild on several occasions.[58] Meanwhile, a small army of Greek and foreign oil experts were exploring the Greek territory. The reports delivered before 1939 were invariably positive, if not enthusiastic. Beside Georgalas' subtle manoeuvres between scientific credibility and all-out speculation, we find Ioannis Trikalinos, another professor at the University of Athens, who as early as 1936, used similar rhetoric to predict that the exploitation of the Epirus area would accrue "big profits".[59]

52 An article with the exact same title had appeared in the same newspaper in 1933, when the Greek state began auctioning concessions for Macedonia and Thrace to no avail; Ar. Avramidis, "Διεπιστώθη η ύπαρξις πετρελαίου εν τη Δυτική Θράκη" [The existence of oil verified in Western Thrace], *Oikonomologos Athinon,* 9 January 1937.

53 Georgalas edited the first volume of the Greek "Freemason Encyclopedia", published in 1934; see Georgios Georgalas and Nestoras Laskaris, Εγκυκλοπαίδεια της Ελευθέρας Τεκτονικής *[Encyclopedia of Freemasonry],* Volume A, 1934.

54 (Anonymous), "Τα πετρέλαια της Ελλάδος – Τι είπεν ο κ. Γεωργαλάς" [The Oils of Greece – What was said by Mr. Georgalas], *Athinaika Nea*, 1937; this article summarizes the conclusions of Georgios Georgalas, Υπάρχουν πετρέλαια εν Ελλάδι; Εναρκτήριον μάθημα εν τω Πανεπιστημίω *(28-1-1937)* [Is there oil in Greece? Inaugural speech in the University of Athens] (Athens: Anatipon Himikon Hronikon, 1937), 67-70.

55 Pantelakis, Αλέξανδρος Ν. Διομήδης *[1874-1950]*, 338 (cf. note 1).

56 Ibid., 340-341.

57 For a recent attempt to summarize Greek oil exploration since 1865, see the Appendix in Fotopoulos, Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece", 322-69 (cf. note 11).

58 For example, William Helis, the "multimillionaire Greek expatriate" who was given the concession in Western Peloponnese, was visited by Metaxas himself. The two of them predicted the transformation of the small nearby city of Pyrgos to a "metropolis complete with an airport, automobiles, cinemas, manors etc"; see Athanasios Georgiou, "Ο Πύργος θα Εξελιχθεί Συντόμως εις Μεγάλην Πόλιν" [Pyrgos soon to Evolve into a Major City], *Skrip,*1 June 1939.

59 J. K. Trikalinos, "About the Oil-Asphalt Beds of the Epirus National Area", item 32, *Archive of the Institute for Geology and Subsurface Research*, 1936, 9.

29 In the meantime, equally informed experts were focusing on Zakynthos. Dionysios Kollaitis, a local industrialist, merchant, and ship-owner, had been granted a concession immediately after the Balkan Wars.[60] His efforts were revitalized in 1933, when Aristotle Tsakonas, an engineer of the Mining Department of the Ministry of National Economy visited the site. Tsakonas found the geological structure to be "very encouraging" and suggested that "many drillings must take place in different locations".[61] Kollaitis was indeed funded to keep on drilling until the autumn of 1936, when his installations were visited by Evagelos Bombos, an expert chemist sent by the Greek Navy to assess whether the oil produced was compatible with the Navy's ship boilers.[62] Bombos took samples, noticed that they included water "in the form of ultrathin droplets" and went on to remove the water by "intense centrifugation". Interestingly, he omitted the centrifugation from his calculations of calorific value,[63] thus allowing him to conclude that Kollaitis' oil was "not altogether useless" and suggest "drilling continuation until the creation of a network of shafts". Kollaitis' drilling attempts thus went on from 1933 to 1940 at the cost of 1.000 drachmas per meter of depth,[64] which goes a long way towards explaining his preferential treatment by both Tsakonas and Bombos.

30 On the contrary, reports delivered after the 1939 British war declaration on Germany were invariably disappointing. A report for the Katakolo area near Pyrgos, concluded that "production (...) if present, would be too deep to be reached with the equipment presently at hand".[65] Another report, concerning the vicinity of Dragopsa, Epirus, criticized Trikalinos' tendency to "more or less accept (...) the original conclusions of Niculescu" and judged his "previous interpretations" to be "quite untenable".[66] The final reports on Thrace and Epirus were delivered in 1939 by Vincent Charles Illing, a British "internationally distinguished petroleum geologist".[67] Illing refuted the "much promising results" previously delivered by German geologists and concluded that "existing data are sufficient to disprove the existence of oil in marketable quantities".[68] These reports were the official reason for the unceremonious abandonment of the 1933-1940 exploration efforts.[69] However, they were hardly mentioned by the press and remain buried in various State archives until today.

31 From a historical standpoint, the reports produced before 1939 are much more interesting. The Greek experts worked under the powerful context of motivation provided by economic crisis and war preparation. They were involved in negotiations with foreign oil firms and banks and became aware of oil's geopolitical intricacies. They manoeuvred between private and state interests, secured press connections, and developed a public rhetoric designed to combine scientific caution with unreserved enthusiasm.

32 The mature oil discourse produced by 1940 would form the scientific and rhetorical backbone of any future Greek oil exploration venture. Georgalas' "Is there oil in Greece?" book is still being referred to whenever the oil matter resurfaces in the public discourse. Trikalinos went on to become one of the most prominent experts on the Epirus deposits.[70] Bombos' essay on the

60 Elias Gounaris, "Έκθεσις του Επιθεωρητού των Μεταλλείων Ηλία Γούναρη" [Report of the Inspector of Mines Elias Gounaris], *Nea Imera,* 28 February 1914.

61 Aristotle Tsakonas, "Report on the Petrol Springs (session D. Kolaitis) in Spot Keri", Item 29, *Archive of the Institute for Geology and Subsurface Research*, 1933, 4 and 5.

62 Bombos, *Τα Πετρέλαια της Ζακύνθου και τα εξ αυτών Προϊόντα* [The oils of Zakynthos and their products], 9 (cf. note 16).

63 Ibid., table 1, fn. 1.

64 Ibid., 23.

65 F. J. Roesli, "William Helis Grecian Project: Memorandum on Geological and Exploration Work", Item 45, *Archive of the Institute for Geology and Subsurface Research*, 1939, 8.

66 H. Vincent, "Geology of Oil Sand, Bitumen etc. Occurences in Epirus", Item 49, *Archive of the Institute for Geology and Subsurface Research*, 1939, 7.

67 Norman Leslie Falcon, "Vincent Charles Illing, 1890-1969", *Biographical Memoirs of Fellows of the Royal Society,* vol. 16, 1970, 365.

68 Pantelakis, *Αλέξανδρος Ν. Διομήδης [1874-1950]*, 345 (cf. note 1).

69 Id.

70 Ioannis Trikalinos, *Τεκτονική Δομή και Γένεσις των Πετρελαιοφόρων Κοιτασμάτων της Ηπείρου* [Tectonic structure and genesis of the Epirus petroliferous strata] (Athens: Coordination Service, 1951).

oils of Zakynthos remains the major source used whenever the existence of oil in Zakynthos needs verification. Oil-wise, the 1933-1940 efforts remained fruitless. At the same time, the potentiality of the Greek oil deposits had been made endless. As we are about to see, this was by no means a small feat.

GEOPOLITICAL NUMBERS, 2010-2023

33 The most recent re-emergence of Greek hydrocarbon ambitions can be traced back to 2010. In March, the United States Geological Survey (USGS) published two reports assessing "the undiscovered oil and gas resources" of the eastern Mediterranean to more than 3 billion barrels of "recoverable oil" and more than 300 trillion cubic feet of "recoverable gas".[71] The reports "changed the whole geological conception of the area", by suggesting the existence of a second "petroleum system" besides the already existent one.[72]

34 The USGS' estimates of the "recoverable reserves" were as political as ever.[73] Noble Energy, a U.S. hydrocarbon exploration company, was already working on the "Leviathan" natural gas deposit off the coast of Israel and would announce the discovery a few months later in December 2010.[74] Noble's exploratory drillings were also under way offshore Cyprus and would lead to the discovery of "about 1 trillion cubic meters of gas". What's more, the new discoveries possessed wider geopolitical significance; they were presented as a "major, positive impact on Europe's gas-diversification strategy, helping it significantly reduce its dependence on Russia".[75]

Figure 4: 23 April 2010. Greek Prime Minister George Papandreou announces the Greek bankruptcy from the frontier island of Kastellorizo. Source: Nikos Giannopoulos, "Καστελόριζο: 12 χρόνια από το διάγγελμα Παπανδρέου και από την έναρξη του μνημονιακού ζόφου" [Kastelorizo: 12 years since Papandreou's proclamation and the beginning of the Memorandum gloom], *News247,* 23/4/2022. Url: **https://www.news247.gr/politiki/kastelorizo-12-chronia-diaggelma-papandreoy-apo-enarxi-mnimoniakoy-zofoy.9607291.html** (accessed 17/3/2023).

35 The USGS' timeliness soon acquired a Greek aspect. In April 2010, only a month after the publication of the reports, Greek Prime Minister George Papandreou publicly admitted that the Greek state had gone bankrupt and would seek assistance from the International Monetary Fund. He chose to announce the bankruptcy from the Greek island of Kastellorizo, resulting in an infamous photograph (fig. 4) and a lot of ridicule for his choice to juxtapose such ominous news with the island's "serene beauty".

36 Besides its "serene beauty" however, Kastellorizo was also "the easternmost frontier of Greece".[76]

71 U.S. Geological Survey, "Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean", *Eastern Mediterranean: U.S. Geological Survey Fact Sheet 2010*, 12/03/2010. Url: **https://pubs.usgs.gov/fs/2010/3014/** (accessed 05/03/2023).

72 Giannis Mpasias, «Πέρα από την αναζήτηση υδρογονανθράκων στην Ελλάδα» [Beyond Hydrocarbon Exploration in Greece], *in ΕΔΕΥ,Υδρογονάνθρακες στην Ελλάδα: Ο ρόλος της ΕΔΕΥ* [Hydrocarbons in Greece: The Role of the HHRM] (2020), 11; Spyros Mpellas, «Οι παραχωρήσεις στον ελληνικό χώρο και η διαχείρισή τους από την ΕΔΕΥ» [Concessions inside the Greek Territory and their Direction by the HHRM], *in ΕΔΕΥ, Υδρογονάνθρακες στην Ελλάδα: Ο ρόλος της ΕΔΕΥ* [Hydrocarbons in Greece: The Role of the HHRM] (2020), 34.

73 For early technopolitical estimates by the USGS, see Michael Aaron Dennis, 241-65; for the political uses of "recoverable reserves estimates" in the 1970s, see Mitchell, *Carbon Democracy: Political Power in the Age of Oil*, 180 (cf. note 10).

74 "Noble Energy Announces Significant Discovery at Leviathan Offshore Israel", *Offshore Energy,* 29/12/2010. Url: **https://www.offshore-energy.biz/noble-energy-announces-significant-discovery-at-leviathan-offshore-israel/** (accessed 19/05/2023).

75 Theodoros Tsakiris, "Cyprus' Natural Gas Strategy: Geopolitical and Economic Preconditions", *Mediterranean Quarterly,* vol. 28, nº 1, 2017, 29-30.

76 "Twelve Years after Kastelorizo", *Oikonomikos Tahidromos,* 23/04/2022. Url: **https://www.ot.gr/2022/04/23/english-edition/twelve-years-after-kastelorizo/** (accessed 19/05/2023).

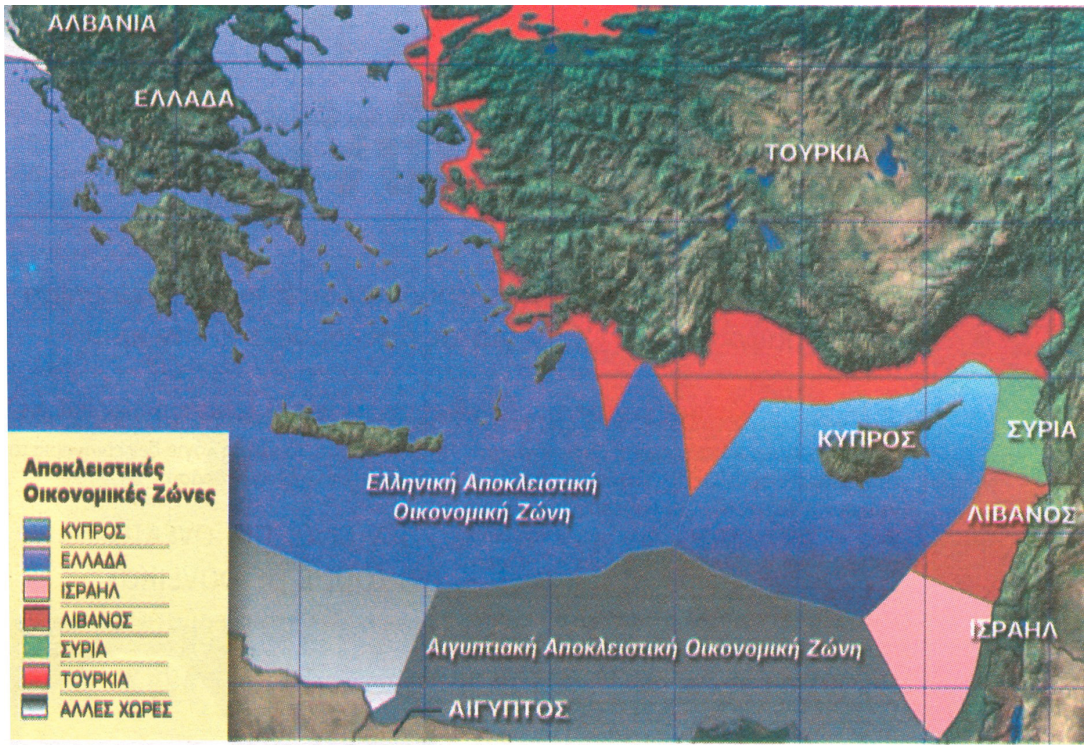

Figure 5: A typical depiction of the (supposed) Greek "EEZ" in 2011. The island of Kastellorizo lies to the east of Rhodes and is not visible due to the scale of the map and its miniscule size. According to the Greek Press, its mere existence was enough to connect the Greek "EEZ" with the Cypriot one. Source: Eleftherotypia newspaper, 9 January 2011.

Unsurprisingly, Papandreou's island venture acquired deeper meaning in the following months, as two new notions were introduced in the Greek public discourse. The first notion was the "Exclusive Economic Zone". The "EEZ" was an alternative to the "continental shelf" notion; it had been introduced in International Maritime Law several decades ago, via the 1982 United Nations Convention on the Law of the Sea (UNCLOS). By 2010, Cyprus had already used it in demarcation treaties with Egypt (2003), Lebanon (2007) and Israel (2010).[77] Rather strangely, the "EEZ" was virtually unheard of in Greek public discourse until 2011; despite having validated UNCLOS in 1995, the Greek State was content to use the "continental shelf" notion to negotiate Greco-Turkish maritime territorial disputes.

This neglect for the "EEZ" notion was abruptly reversed from 2011 onwards. According to the Greek press, the "EEZ" would readily replace the "continental shelf" notion. Luckily, Greece was supposedly entitled to a particularly large "Exclusive Economic Zone", because of the existence of the now familiar island of Kastellorizo. The existence of the miniscule frontier island was allegedly enough to connect the Cypriot and Greek "Exclusive Economic Zones" into a continuous maritime territory (fig. 5).[78] By 2015, an EEZ proclamation was widely regarded "as the prerequisite of any [Greek] hydrocarbon exploitation venture".[79] 37

Which brings us to the second notion introduced after 2010, namely the "hydrocarbon deposits" of Greece and the Eastern Mediterranean. These so-called "deposits of hope" were allegedly "verified by the USGS". According to the Director of 38

77 Anastasia Strati, «Η Αποκλειστική Οικονομική Ζώνη και η σημασία της για την αναζήτηση, έρευνα και εκμετάλλευση υδρογονανθράκων», [The Exclusive Economic Zone and its Importance in Hydrocarbon Exploration, Research and Exploitation], *in Νικόλαος Φαραντούρης και Τιμολέων Κοσμίδης (επ.), Δίκαιο Υδρογονανθράκων,* [Hydrocarbon Law] (Αθήνα: Νομική Βιβλιοθήκη, 2015), 115-152.

78 Stavros Lygeros, «Η Σημασία Ανακήρυξης Ελληνικής ΑΟΖ» [The significance of declaring a Greek EEZ], *Kathimerini,* 23 January 2011.

79 Angelos Syrigos, *Ελληνοτουρκικές Σχέσεις,* [Greco-turkish relations] (Athens: Patakis, 2015).

the Cypriot Energy Agency, Solon Kasinis, they were enough to cater for Cyprus' needs for the next 150 years.[80] In the case of the bankrupt Greek state, they would lead to instant fiscal salvation, as their "potential" value was estimated to be "about 300 billion dollars".[81] Luckily, they were conveniently placed inside the Greek and Cypriot "Exclusive Economic Zones", especially when Kastellorizo was taken into account.

39 In August 2011, this intense popularization campaign met with actual Greek Strategy with the publication of Law 4001/2011, best known as "the Maniatis Law" from its instigator, Yannis Maniatis, an engineer and University Professor who remained Minister of Environment, Energy and Climate Change for six consecutive years under three different Governments.[82] Buried in page 81 of 100, one could find article 156, a "modification" of the previous law (2289/1995) governing oil exploration. The legal jargon was almost impenetrable.[83] However, according to various Greek international relations experts, Law 4001/2011 was in fact a "de facto demarcation of our continental shelf".[84] Maniatis has recently admitted that by his 2011 law, "we first (...) have claimed that continental areas and most importantly islands possess a continental shelf and an Exclusive Economic Zone".[85] It goes without saying that "islands", included Kastellorizo.

40 Law 4001/2011 was portrayed as an effort to "modernize the legal and organizational framework" governing Greek hydrocarbon exploration efforts.[86] Tacitly, it approached the EEZ and continental shelf notions as interchangeable, all the while supporting the Greek position that islands should be included in demarcation agreements despite Turkish wishes. Today it is rightly regarded as the initiation of a "[Greek] tendency to unilaterally demarcate an EEZ",[87] resulting in a period of intense Greco-Turkish rivalry in the Eastern Mediterranean.

41 Since their emergence, these precarious plans included an interesting technopolitical aspect. Every "hydrocarbon discovery" is accompanied by an extension to the global transport network of hydrocarbons.[88] In the case of Greece, the proposed extension was named "Eastmed". The Eastmed is a pharaonic 10-billion-euro offshore pipeline project that would connect the deposits of Israel and Cyprus to Greece, Italy, and thereafter central European countries (fig. 5). Also "the brainchild of Yannis Maniatis", it was first proposed alongside the 2011 Law and is since being discussed.[89]

80 Andreas Kostouris, «Φυσικό Αέριο για 150 Χρόνια στην ΑΟΖ Κύπρου» [Natural Gas for 150 years in the Cypriot EEZ], *Kathimerini,* 16 January 2011.

81 Chrisa Liaggou, «Κοιτάσματα Ελπίδας για Φυσικό Αέριο στον Ελλαδικό Χώρο» [Gas Deposits of Hope in the Greek Territory], *Kathimerini,* 17 December 2010.

82 Maniatis served between 2009 and 2015; see The Secreterial General for Legal and Parliamentary Affairs, "Κυβερνήσεις από το 1909 έως σήμερα", [Governments from 1909 to today]. Url: **https://gslegal.gov.gr/?page_id=776&sort=-time** (accessed 12/03/2023).

83 The 2011 "modification" stated that "in the absence of a demarcation agreement with neighboring states", the external "border of the Greek Continental Shelf and Exclusive Economic Zone (once demarcated)" would be measured beginning from "baselines" that were "continental and insular alike"; see "Νόμος 4001: Για τη λειτουργία ενεργειακών αγορών ηλεκτρισμού και φυσικού αερίου, για Έρευνα, Παραγωγή και δίκτυα μεταφοράς Υδρογονανθράκων και άλλες ρυθμίσεις" [Law 4001: For the operation of energy markets for electricity and natural gas, for Hydrocarbon Exploration, Production and Transmission Networks and other regulations], *Government Gazette*[*ΦΕΚ*], n° 179, 22/08/2011, 3873.

84 Konstantinos Filis, «Η εξαργύρωση της στήριξής μας στο Ουκρανικό» [Redeeming our support for Ukraine], *Kathimerini,* 9 October 2022.

85 Vasiliki Siouti, «Συνέντευξη με τον Γιάννη Μανιάτη» [Interview with Giannis Maniatis], *Lifo*, 11/10/2021. Url: **https://www.lifo.gr/podcasts/lifo-politics/giati-ayxithike-i-timi-toy-fysikoy-aerioy-kai-pos-tha-ginei-i-metabasi-stin** (50:00-51:10) (accessed 12/3/2023).

86 Fotopoulos, Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece", 345 (cf. note 11).

87 Alexis Irakleidis, Andreas Stergiou, Thodoros Tsikas, Konstantinos Tsitelikis, «Για μια διαφορετική ελληνοτουρκική προσέγγιση» [For a Different Greco-Turkish approach], *Kathimerini,* 23 February 2023.

88 Philippe Le Billion, "The Geopolitical Economy of 'Resource Wars'", *in* Philippe Le Billion (ed.), *The Geopolitics of Resource Wars: Resource Dependence, Governance and Violence,* (London: Frank Cass, 2005), 8.

89 John Psaropoulos, "Pipeline Dreams: Eastern Mediterranean Gas Creates New Allies and Deepens old Enmities", 03/10/2018. Url: **https://www.washingtonexaminer.com/weekly-standard/pipeline-dreams** (accessed 13/03/2023).

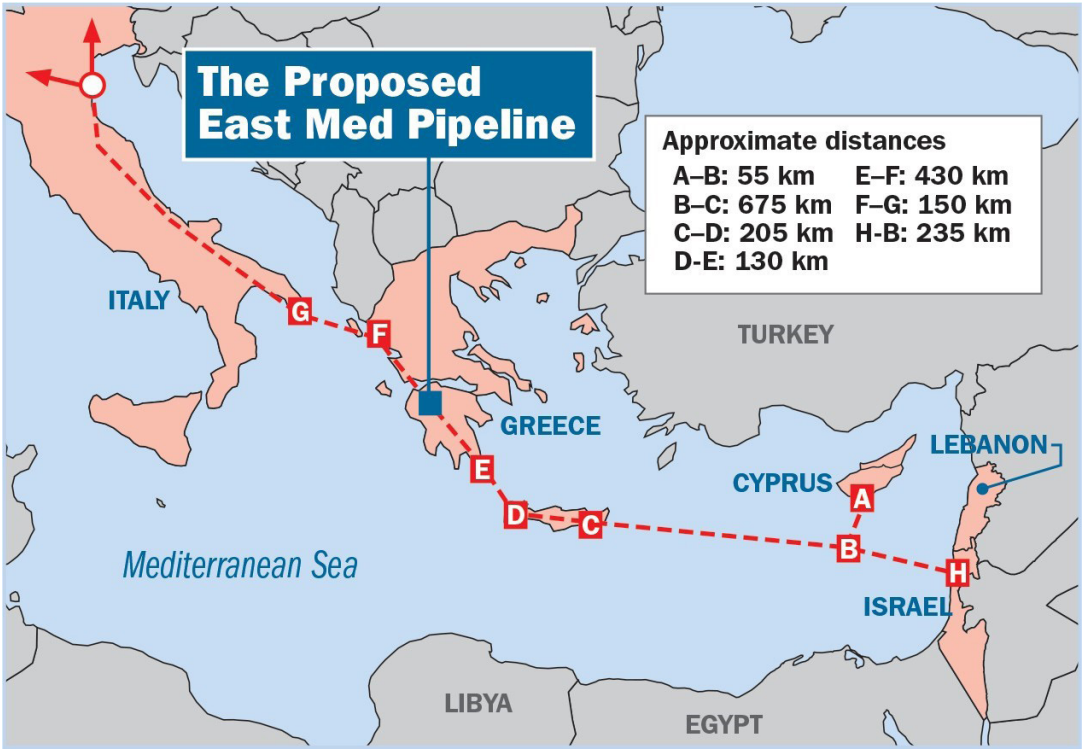

Figure 6: The proposed East med pipeline. Source: Anonymous, "Μπαίνουν οι υπογραφές για EastMed: Τα πλεονεκτήματα και η συμμαχία που... τρελαίνει τον Ερντογάν" [Signatures for EastMed: the advantages and the alliance that drives Erdogan crazy], *Hellas Journal,* 1/1/2020. Url: **https://hellasjournal.com/2020/01/benoun-i-ipografes-gia-eastmed-ta-pleonektimata-ke-i-simmachia-pou-treleni-ton-erntogan/** (accessed 17/3/2023).

42 The Eastmed project aspires to enroll foreign support for the Greek plans through its supposed geopolitical significance. If ever completed, it would provide large European countries with non-Russian hydrocarbons by a non-Turkish route.[90] It would be an alternative to the already existent Baku – Ceyhan pipeline. It would thus align Greek and Cypriot national interests to those of Israel and the United States and consolidate Greek dominance in the Eastern Mediterranean from Cyprus to Crete.[91] Theodoros Tsakiris, a Cypriot energy expert who served as Maniatis' scientific advisor, summarized the stakes involved. According to him, Greek and Cypriot hydrocarbon policy is not "driven by the discovery of hydrocarbons and the need to monetize them. It is driven primarily by the need to counterbalance [the Turkish] vision of the Eastern Mediterranean as an 'Ottoman Lake' within the framework of its revisionist policy".[92]

43 The Greek community of oil experts readily enrolled in this multi-faceted effort. In 2012, the Energy Commission of the Academy of Athens organized a conference titled "Greek Hydrocarbons: From Exploration to Development". Maniatis, who delivered the introductory speech, was adamant: "Greece will not leave an inch of its sovereignty unexplored, be it continental or maritime".[93] The experts present included a

90 For the origins of the "European dependence on Soviet Gas" see Per Hogselius, *Red Gas: Russia and the Origins of European Energy Dependence,* (New York: Palgrave/Macmillan, 2013). For large technical systems that "may be built for one purpose and later on be exploited for another", see 223.

91 Theodoros Tsakiris, *Ενεργειακή Ασφάλεια και Διεθνής Πολιτική* [Energy Security and International Policy] (Athens: Papazisis, 2018), 755-56.

92 Theodoros Tsakiris [Cyprus' Natural Gas Strategy], 30. For Tsakiris' "three years tenure" as a scientific advisor in the Greek ministry of energy, see Tsakiris [*Energy Security and International Policy*], 10.

93 Yannis Maniatis, «Ο Ορυκτός Πλούτος Θεμέλιο Ανάπτυξης» [Mineral Wealth: The foundation of Development], *in* Loukas Christoforou (ed.), *Ελληνικοί Υδρογονάνθρακες: Από την Έρευνα στην Εκμετάλλευση* [Greek Hydrocarbons: From Research to Development] (Athens: Akadimia Athinon, 2012), 29.

long list of Greece's most prominent engineers, petroleum geologists and policy makers. Granted, some of them remained doubtful of the existence of hydrocarbon deposits, especially when pertaining to the South of Crete.[94] The rhetoric used to overcome such doubts was eerily reminiscent of Georgios Georgalas: "*There are hydrocarbons in our country*. The question is *how many, where and how they will be exploited*".[95]

44 Actual methods, on the other hand, had somewhat improved. Elias Konofagos, a prominent chemical engineer and former executive of the Greek Petroleum Corporation [Ellinika Petrelaia], participated in the 2012 conference, along with his colleagues Antonios Foskolos and Alain Bruneton. Their complex geological argumentation concluded that the area offshore Crete signaled "a new perspective for locating hydrocarbon deposits in Greece".[96] Konofagos described his methods in a 2013 newspaper interview:

> Solon Kasinis, the Cypriot energy director, called me and asked: "Elias is there something to the south of Crete?"
> I answered: "I believe there is, but I cannot say; it's only a possibility".
> And he tells me: "Elias, even if there is nothing to the south of Crete the area should be opened to research for geopolitical reasons (...). Just imagine if -lo and behold- we find something, how much the transport cost will be reduced by connecting the deposits, for Europe and all of us".

Thus motivated, Konofagos went on to process "official and unofficial seismic data" that came in his possession by means he neglected to mention. He used his acquaintance with Alain Bruneton, former Director of the French Petroleum Institute, to partake of the Institute's computing facilities. They thus calculated that there was "a 50% chance" to discover hydrocarbons to the south of Crete.[97] Faced with "accusations from colleagues", Konofagos described his scientific calculations with the phrase "I call these numbers, geopolitical numbers".[98] 45

These were geopolitical numbers indeed. Since its initial inception, the Eastmed pipeline project faced severe critique concerning its economic viability. If hydrocarbon deposits were somehow discovered along its route, the project would be made much more viable. In the following years Konofagos went on to become one of the most active promoters of the "expansion of Greek hydrocarbon resource spaces in the Eastern Mediterranean".[99] Unsurprisingly, other Greek hydrocarbon experts were following suit. At least as early as 2015, a consensus had been formed according to which "indications of hydrocarbon deposits of substantial quality [could be found (...)] along an arc from the North Ionian Sea, South of Crete to the island of Kastellorizo".[100] 46

The arc of potentiality delineated by Greek geologists followed the proposed course of the Eastmed pipeline. It also included a familiar 47

94 Loukas Christoforou, «Πορίσματα ημερίδας» [Workshop conclusions], *in* Loukas Christoforou, op. cit., 18.

95 Loukas Christoforou, «Πρόγραμμα» [Programme], *in* Loukas Christoforou, op. cit., 11. Emphasis in the original.

96 Antonios Foskolos, Ilias Konofagos and Alain Bruneton, "Οι Συγκλίνουσες Λιθοσφαιρικές Πλάκες και η Ταυτόχρονη Ύπαρξη Πρίσματος Επαύξησης και Λασποηφαιστείων στην Υπεράκτιο Νότια Κρήτη. Νέες Προοπτικές Εντοπισμού Κοιτασμάτων Υδρογονανθράκων στην Ελλάδα" [The Occurrence of Converging Plates, Mud Flow Volcanoes and Accretionary Prism Complexes offshore Crete. A New Perspective for Greece's Oil and Natural Gas Resources], in Loukas Christoforou, op. cit., 115-138, 135. For the same article in English, see Id. "Cretan Gas Fields – A New Perspective for Greece's Hydrocarbon Resources", *Pytheas Market Focus,* 30/3/2012.

97 The 50% estimate cited here is a popularized summary of the methods used to categorize hydrocarbon resources as "possible", "probable" and "proved"; see Society of Petroleum Engineers, "Petroleum Resources Classification System and Definitions". Url: **https://www.spe.org/en/industry/petroleum-resources-classification-system-definitions/** (accessed 15/03/2023).

98 Sofia Papaioannou, "Να προηγηθεί η Έρευνα σε κοιτάσματα της Ν. Κρήτης" [Research of Offshore South Crete Deposits should Take Precedence], *Kathimerini,* 20 January 2013.

99 Fotopoulos, Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece", 347 (cf. note 11).

100 Fotopoulos, Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece", 345-346 (cf. note 11). The source here is a 2022 interview with Yannis Grigoriou, former CEO of the Hellenic Petroleum Company Upstream Division.

vicinity of Epirus. As early as 2014, new oil exploration attempts were under way in Dragopsa by a "consortium of [Spanish] Repsol and [Greek] Energean Oil". An informative meeting was organized in nearby Ioannina city. The expert geologist delivering the keynote speech resorted to a familiar ploy: "we know that an oil system exists, but we do not know the whereabouts of the deposit". "Yet", concluded the article, "data gathering is already under way (...) the first drill will be installed within three years".[101]

48 Georgalas' rhetorical contraptions were reverberating all over Greece. For the time being, the outcome is also similar. When Repsol abandoned Greece, seven years later, no drillings had yet been performed.[102] In 2022, as this piece was being written, we learnt that exploratory drilling would commence anew in Epirus "within 2023". The expensive task would be undertaken by the (Greek) Energean Co., this time with no foreign assistance. The possibility of Greek "fonds perdus"[103] was once more looming on the horizon, as the current Minister of Energy and Environment, Kostas Skrekas, announced the "possibility of success" to be 15%. Thankfully, he was more confident when estimating the value of the Epirus deposit to 5 billion Euros.[104]

Actual implications are much more sinister. 49
Other states of the Eastern Mediterranean are aware of the Greek Eastmed strategy and proceed to plans of their own. The Turkish plans, to name the most important example, also enroll "earth politics in the service of neo-imperialist (...) aspirations".[105] A good part of these aspirations stems from a decades-long history of Greco-Turkish rivalry in the Eastern Mediterranean. Since 2019, Turkey and Greece have been in the process of claiming overlapping EEZs between Crete and Libya, over Konofagos' geopolitically estimated "probable" deposits. In January 2023, Exxon Mobil was performing seismic research in these disputed waters. Results were once more promising. As for a possible Turkish response, there was "nothing to worry about". Exxon Mobil's presence offshore Crete guaranteed "American support for this most geopolitically difficult area".[106]

The reporter delivering this spicy blend of geo- 50
physics, geopolitics and carefree war is the same one who introduced the "deposits of hope" 13 years ago. She probably remains unaware of the identical accounts produced by her peers in 1936.

CONCLUSION: ON HISTORY, PETROCULTURE AND WAR

We began this essay by pointing out that hydro- 51
carbon-wise Greece is quite the peculiar place. This hydrocarbon peculiarity is not a characteristic of the Greek subsoil; it is rather a peculiarity of a rhetorical, political and in fact historical nature. In any case, Greek citizens are bound to encounter it at some point of their lifespan, usually as indisputable "facts" that are abruptly introduced into the public discourse. The authors of this article are a case in point: we all reached adulthood in Greece during the 1990s and 2000s having not once heard of the "Greek hydrocarbon deposits", their long history and ominous implications. And yet, from the 2010 "Greek crisis" onwards, we were rapidly introduced into the

101 Anonymous, "Ένας αιώνας έρευνας για τα πετρέλαια των Ιωαννίνων," [A century of exploration for the Ioannina oil] *Epiruspost.gr,* 16/10/2014. Url: **https://www.epiruspost.gr/%CE%AD%CE%BD%CE%B1%CF%82-%CE%B1%CE%B9%CF%8E%CE%BD%CE%B1%CF%82-%CE%AD%CF%81%CE%B5%CF%85%CE%BD%CE%B1%CF%82-%CE%B3%CE%B9%CE%B1-%CF%84%CE%B1-%CF%80%CE%B5%CF%84%CF%81%CE%AD%CE%BB%CE%B1%CE%B9%CE%B1-%CF%84/** (accessed 04/11/2021].

102 Christos Kolonas, "Τι συμβαίνει με τα πετρέλαια στην Ελλάδα – 10 χρόνια μετά και ούτε μία γεώτρηση," [What is going on with the Greek hydrocarbon deposits – Ten years later and not even one drilling], *in.gr,* 04/04/2021. Url: **https://www.in.gr/2021/04/04/economy/oikonomikes-eidiseis/ti-symvainei-ta-petrelaia-stin-ellada-10-xronia-meta-kai-oute-mia-geotrisi/** (accessed 04/11/2021].

103 Pantelakis, *Αλέξανδρος Ν. Διομήδης [1874-1950]*, 338 (cf. note 1).

104 Chrissa Liaggou, «Υδρογονάνθρακες: Ερευνητική γεώτρηση στα Ιωάννινα το 2023» [Hydrocarbons: Exploratory Drilling in Ioannina in 2023], *Kathimerini,* 12 November 2022.

105 Zeynep Oguz, "Speculative Undergrounds", 29, (cf. note 11).

106 Chrissa Liaggou, «Η Exxon βιάζεται για Γεωτρήσεις στην Κρήτη» [Exxon in a rush to conduct drilling in Crete], *Kathimerini,* 9 January 2023.

hydrocarbon discourse that arose out of thin air in all its rhetorical and technopolitical glory, as if not one day had passed since the times of Nikolaos Minotos, Georgios Georgalas, and their peers. The Greek hydrocarbons displayed their ability to produce material effects despite their physical absence, as it had happened so many times in the past.[107]

52 As for the nature of these material effects, Ross Barrett and Daniel Worden have defined "oil culture" as "the symbolic forms that rearrange daily experience around oil-bound ways of life".[108] Such a rearrangement took place in post-2010 crisis-ridden Greece. It was a very abrupt and very material process that carries on for more than a decade, leading to the reemergence of long-standing State rivalries. The "symbolic forms" that rearranged our daily experience so abruptly, presented themselves as "science". They were in fact what Roberto Cantoni calls "science in grey": a mixture of petroleum geology, geopolitics and tacit knowledge amassed during one and a half century of Greek crises, wars, and oil exploration attempts. Symbolic forms of this kind are rarely analysed in the petroculture literature produced since 2010.[109] We think this neglect to be worthy of attention; one can hardly imagine a symbolic form more powerful, more diffuse or more opaque than science and technology.

53 In the preceding sections we have used the tools of the historian of science and technology to narrate the emergence and development of a Greek version of petroleum geology. Previous historical studies have shown that oil experts can and do assert political power through science and technology. They are often aware of the political stakes involved in their scientific undertakings. Their artisanal practices are heavily motivated by historical context. The science they practice is tacitly connected to wider state imperatives. Their Greek counterparts hardly proved lacking in any of these departments.

We have restricted our historical narrative to instances that reverberate to the present. One 54
such instance was the rhetorical ploy between "Is there oil" and "is this oil exploitable" which was introduced in 1921 and matured until 1940. Such ploys are not the exclusive intellectual property of Greek experts. They are rather a case of simultaneous invention characteristic of international oil exploration discourse since its beginnings. Gisa Weszkanlys has detected similar rhetorical ploys in São Tomé and Príncipe, where oil exploration also carries on since 1876 with meager results. She described how such ploys focus on "what people know and what they know they do not know" and how their proponents employ a fusion of practices, such as exploratory drillings, geological reports, and skilful rhetoric, to produce "an extended meanwhile in which [oil] potentiality is reassured".[110] As we have seen, Nikolaos Minotos, a humble Zakynthos-based lawyer, could grasp the merits of this endless potentiality and rhetorically justify it as early as 1894. Georgios Georgalas, a prominent Greek geologist, invented a way to scientifically substantiate it as early as 1920. His invention matured and saw widespread use until 1940; it currently reverberates all over Greece.

Another recurring aspect was the close rela- 55
tions between Greek petroleum geology and geopolitics. We have detected traces of these relations in the 1890s, the 1920s and the 1930s. They have been made clearer in the post-2010 period. Greek hydrocarbon experts are acutely aware of the technopolitical –and in fact geopolitical- nature of their scientific estimates. Such estimates constitute a significant part of current Greek petroculture; they are less motivated

107 Richardson, Weszkalnys, "Resource Materialities", 22, (cf. note 5).

108 Ross Barrett, Daniel Worden, "Introduction", *in* Ross Barrett and Daniel Worden (eds.), *Oil Culture,* (Minneapolis: University of Minnesota Press, 2014), xxvi.

109 For this "gap in the literature" and some exceptions in addition to the ones cited in the introduction, see Cantoni *Oil Exploration, Diplomacy, and Security in the Early Cold War: The Enemy Underground*, 15-7 (cf. note 14); for "science in grey", see Ibid., 248-49 (cf. note 14).

110 Gisa Weszkalnys, "Geology, Potentiality, Speculation: On the Indeterminacy of First Oil", *Cultural Anthropology*, vol. 30, n° 4, 2015, 620, 622.

by hydrocarbon aspirations and more by the current Greco-Turkish rivalry in the Eastern Mediterranean.

56 We should note that, for Greece, the sort of historical scrutiny we attempted remains quite rare. The few relevant historical works speak volumes with their recentness alone; as far as we know, they all date from 2018 onwards.[111] We think that the absence of historical scrutiny should be counted among the main characteristics of Greek petroculture. This historiographic absence amplifies the effect of two additional characteristics, namely a close relation to petroleum geology and an even closer one to geopolitics and international affairs. The results are ominous. For more than ten years since the latest re-emergence of the Greek hydrocarbon potentiality, a conflict raged and turned into an international one, involving all States of the Eastern Mediterranean; at times, even a war could not be excluded.[112] The reasoning of this decennial conflict remains opaque, covered under the thick layers of a rhetoric that is full of "scientific facts" and devoid of history. Whatever the future holds, we hope that our article serves as a reminder that there is significant price to pay when approaching matters of such social significance with no historical perspective. A reminder that matter and thought, physical reality and ideology, can indeed "entwine",[113] sometimes in quite sinister ways.

111 The sole exception is Christos Hadziiosif, *Η Γηραιά Σελήνη: Η Βιομηχανία στην Ελλάδα,* [An Old Moon: Industry in Greece], (Athens: Themelio, 1993), 194-195. Apart from that, see Pantelakis, *Αλέξανδρος Ν. Διομήδης [1874-1950]*, 345 (cf. note 1).; Karampatsos, Tzokas, Velegrakis, Harlaftis, "Is there Oil in Greece? Oil exploration and Scientific Conflict during the First Years of the Greek Geological Survey (1917-1925)" (cf. note 30); Karampatsos, "Το Γενικότερο Συμφέρον του Κράτους: Η 'Συνέχεια των Ελληνικών Χωρών' και οι Έλληνες Γεωλόγοι, 1908-1925" [In The State's General Interest: Greek Geologists and the 'Continuity of the Greek Lands', 1908-1925] (cf. note 30); Fotopoulos, Arapostathis, "From National to Cosmopolitan Hydrocarbons Resource Space: Hydrocarbons, Transnational Politics and the State in Greece" (cf. note 11); Christos Tsakas, "Shipping Tycoons and Authoritarian Rulers: Doing the Oil Business with the Greek Dictatorship, 1967-1974", *Journal of Modern Greek Studies,* vol. 38, n° 1, 185-208.

112 Anonymous, "Greek and Turkish warships in 'mini collision' – defence source," *Reuters.com,* 14/8/2020. Url: **https://www.reuters.com/article/greece-turkey-warships-idUKL-8N2FG22E** (accessed 16/07/2021).

113 Richardson, Weszkalnys, "Resource Materialities", 17 (cf. note 5).

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