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DEMETRIOS EGINITIS: RESTORER OF THE ATHENS OBSERVATORY

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Abstract: Demetrios Eginitis (1862–1934), one of the most eminent modern Greek astronomers, directed the National Observatory of Athens for 44 years (1890-1933). He was the fourth director since its founding, and was responsible for the restoration and modernization of the Observatory, which was in a state of inactivity after the death of Julius Schmidt in 1884. Eginitis ordered the purchase of modern instruments, educated the personnel, enriched the library with necessary and up-to-date books and arranged for new buildings to be built to house new telescopes and accommodate the personnel. Moreover, he divided the National Observatory of Athens into three separate Departments: the Astronomical, the Meteorological and the Geodynamic. D. Eginitis' contribution to Greek society went beyond his astronomical accomplishments. He was instrumental in the adoption of the Eastern European time zone for local time in Greece, and he succeeded in changing the official calendar from the Julian to the Gregorian. Having served twice as Minister of Education, he created many schools, founded the Academy of Athens and the Experimental School of the University of Athens. Eginitis was fluent in French, German and English, and therefore was the official representative of his country in numerous international conferences and councils.

Keywords: Athens Observatory, Greece, Gregorian Calendar, Academy of Athens

1 THE FOUNDING OF THE ATHENS OBSERVATORY – ITS FIRST DIRECTORS

The National Observatory of Athens (Figure 1) was founded in 1842 and the main building was built in the period 1843-1846 on top of the Hill of the Nymphs (*Lofos Nymphon*) opposite the Acropolis, at geographical latitude $\varphi = 37° 58' 27''.42$ N, longitude $\lambda = 23° 43' 07''.3$ and altitude 107 m above sea level. The cost of the construction exceeded 500,000 drachmas, a very large amount for the period, of which 300,000 were donated by the rich merchant Baron George S. Sinas, then General Consul of Greece in Vienna.

The main building was designed in 1842 by the architects Theophil Hansen (1813–1891) of Denmark and Edward Schaubert (1804–1860) of Germany, based on the suggestions of the Danish astronomer Heinrich Christian Schumacher (1780–1850). Schumacher is best known for establishing the Altona Observatory and publishing the *Astronomische Nachrichten* journal (1822). The building is in the shape of a cross, with its sides aligned in the four cardinal directions, and at the centre is a small domed tower (see Plakidis and Kotsakis, 1978).

The National Observatory of Athens was officially inaugurated by King Otto I (Otto von Wittelsbach I, 1815–1867) on the morning of 8 July 1842 (using the current calendar system), during the partial solar eclipse of that day. The first (meridian) astronomical observations were performed on the evening of 21 September 1846 by the Observatory's founder and first Director, Georgios K. Vouris (1790–1860), Professor of Mathematics and Physics at the University of Athens. Vouris (Figure 2) also taught astronomy after 1844. As Director of the Observatory he organized its offices and conducted mainly meteorological obser-vations. After his retirement, due to health problems in 1858, the Director's duties were temporarily carried out by Professor I.G. Papadakis of the University of Athens. Later that year, Baron Simon Sinas (son of George) proposed that the Directorship be given to the German astronomer Johann Friedrich Julius Schmidt (1825–1884).

Schmidt (Figure 2) was distinguished as an Assistant to Friedrich Wilhelm August Argelander (1799–1875), the creator of *Bonner Durchmusterung* catalogue (1859-1862). In 1858 Schmidt accepted the offer by Baron Simon Sinas and became the second Director of the Observatory, with a monthly salary of 1,000 drachmas, paid by Baron Sinas (Plakidis, 1960).

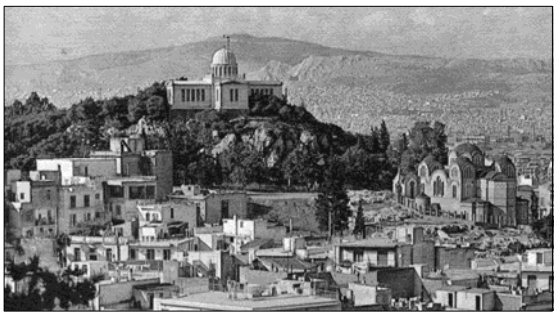


Figure 1: The National Observatory of Athens.

The scientific work of Schmidt in Athens included observations of nebulae, comets, sunspots, meteors and the zodiacal light. His main accomplishment, however, was the compilation and drawing of a large topographical map of the Moon, the result of 34 years of lunar observations (between 1840 and 1874). This exquisite map was bought by the Prussian Academy of Sciences, which financed its printing and publishing in 1878, along with the accompanying volume of explanatory notes. It is mainly for this work, which shows 32,856 distinct characteristics of the lunar surface, and is its most detailed representation before the era of photographic atlases, that Julius Schmidt won a place in the history of astronomy. A capable observer of the skies, Schmidt discovered a comet in 1862, five variable stars and a nebula (1865-1866, 1872-1873), and two novae: Nova Coronae Borealis on 13 May

1866 and Nova Cygni 1876. His papers were written in German and published in two series entitled *Publications of the Observatory of Athens*. This publication was paid for by Baron Simon Sinas (ibid.).

After the death of Julius Schmidt, the directorship was given to his collaborator Demetrios Kokkidis (1840–1896), who occupied it for six years, until 1890 (see Figure 2). In that year a young astronomer, educated in France, returned from Paris. His name was Demetrios Eginitis (Figure 2), and he was destined to play a key role at Athens Observatory.

Figure 2: The first four directors of the National Observatory of Athens (courtesy: Institute of Astronomy and Astrophysics, National Observatory of Athens).

2 THE EDUCATION AND CAREER OF EGINITIS BEFORE THE ATHENS OBSERVATORY DIRECTORSHIP

Demetrios Eginitis (Archer, 1935) was born in Athens on 22 July 1862, and graduated from the famous Varvakeio School of Athens in 1879. In the same year, he began his studies in the Faculty of Physics and Mathematics in the Philosophical School at the University of Athens (Figure 3). He graduated in 1886 with a Doctor of Philosophy degree in mathematics (Stefanides, 1948). The Athens University's Council for post-doctoral studies awarded him a scholarship so that he could take astronomy and mathematics classes at the Sorbonne in Paris. The following year, on 1 November 1887, he was accepted as an apprentice astronomer (*élève astronome*) at the meteorological observatory of Montsouris and, somewhat later, at the Paris Observatory, where he finally became a staff astronomer, in 1889.

When in France, Eginitis also worked at the Laboratory for Stellar Spectra in Salet, at the Physics Laboratory of Cornu, at the meteorological centre of Parc Saint Maur and at the Meudon Observatory. In addition, he worked outside Paris for a while, at the Observatory of Nice, and even outside of France, in Lockyer's astronomical laboratory in England.

At the Paris Observatory, Eginitis worked diligently for two years with the meridian circle carrying out regular equatorial observations (i.e. measurements of the culmination of stars for mapping of the northern skies and determinations of the proper motion). He also observed asteroids and variable stars with the meridian telescope located in the western dome (Makris, 1975).

Eginitis became internationally known for his classic treatise *Sur la Stabilité du Système Solaire* (*On the Stability of the Solar System*), in which he studied the secular variations (anomalies) of the semi-major axes of the planetary orbits. He submitted this in 1889 to the Paris Academy, where it was presented by Rear-Admiral Mouchez (the Director of Paris Observatory). In the same year, his treatise on celestial mechanics was published in the *Annales de l'Observatoire de Paris* (Eginitis, 1889), where for the first time Eginitis is referred to as a staff astronomer (*astronome*); this was an important career step for such a young man.

2.1 The Treatise *Sur la Stabilité du Système Solaire*

Astronomy prior to 1900 was based on the assumption of the invariability of the semi-major axes of the planetary orbits. It was assumed that if, due to the mutual attractions among the planets, their distances from the Sun were secularly changing, even by an imperceptible amount every year, then after several thousands of years their approach to or recession from the Sun would be such that the Solar System would be destroyed in either case. Therefore, many eminent scientists attempted to prove the constancy of the axes of the planetary orbits, including the mathematicians and astronomers J.L. Lagrange (1736–1813), P.S. Laplace (1749–1827) and S.D. Poisson (1781–1840). Moreover, this hypothesis was casually taken as a fact by many astronomers of the nineteenth century. The problem had been solved, albeit incompletely, with respect to first-order anomalies by Laplace, with respect to first-order and second-order anomalies by Lagrange and Poisson, and with respect to third order anomalies by S.C. Haretu (Eginitis, 1951: 16).

Eginitis proved in a mathematically-elegant way that the average distances of the planets from the Sun do not remain constant but instead are constantly changing: He proved that the semi-major axes of the planetary orbits are subject to anomalies of the third order, which are periodic but with large durations that equal the periods of the anomalies of the orbital eccentricities and inclinations. Eginitis verified his work in the cases of Earth and Saturn, planets that were currently approaching the Sun due to these anomalies. The reason for these anomalies is the attraction by Venus in the case of the Earth, and the attraction by Jupiter in the case of Saturn.

Eginitis refuted the basic question that was asked in the Academy, which is whether our world will be destroyed. The Earth would approach the Sun for 20,000 years and then the semi-major axis of its orbit will start to increase for a corresponding period of time. After that, the cycle will continuously repeat. To the next question, whether the Earth would ever approach the Sun to the point where the heat would be unbearable and life on Earth would be impossible, Eginitis answered that the variations of the average distance to the Sun will be so small that no special effects will be observable on Earth. With this work Eginitis won the appreciation and respect of the French astronomical community and especially of Camille Flammarion (1842–1925), who congratulated him in a letter.

During his period in France, Eginitis (Figure 4) published more than one thousand astronomical observations in the *Annales de l'Observatoire de Paris* and in the *Comptes Rendus* of the French Academy of Sciences (Eginitis, 1951: 14).

2.2 The Invitation by the Greek Government

Eginitis' accomplishments quickly became known in Greece, and in 1889 the Greek Prime Minister, Charilaos Trikoupis, notified him through Petros Lykoudis, the Military Attaché at the Greek Embassy in Paris, that the Government wanted him to return to Greece and apply his knowledge to the National Observatory of Athens as its Director. Although moved by the honour of this invitation, Eginitis hesitated because he knew that following the death of Schmidt, the Observatory had been largely inactive. Indeed, the bad economic situation of the nation and the death of Baron Simon Sinas on 27 April 1876 had left the Observatory in a difficult position.

Nevertheless, after repeated pressure by Trikoupis, Eginitis decided to abandon his successful career in Paris and return to Greece, but only after the Greek Government promised that it would fulfil the following four conditions (see Eginitis, 1951: 22):

a) The purchase of new scientific instruments;
b) The construction of adequate new buildings;
c) Appointment of sufficient scientific and supporting staff of Eginitis' choice; and
d) Payment to him of a salary equal to what Schmidt had received.

So the Greek Government promised to supply Eginitis with the necessary means and staff to establish astronomical research at a viable level in Greece, and even agreed to pay him Schmidt's salary (although that had been paid by Baron Sinas, and was far beyond what any other public sector employee was receiving at the time). Fortunately, King George I of Greece had shown a special interest in Eginitis, and so the Minister of Education, G. Theotokis, was able to submit a special bill to the Parliament which explicitly mentioned the conditions relating to the new Director of the Observatory, and his elevated salary 'honoris causa'. Despite the peculiarity of the bill, on 17 May 1890 it was approved unanimously by all the parties in the Parliament, and on 19 June 1890, at the age of just 28, Demetrios Eginitis was appointed Director of the National Observatory of Athens (see Makris, 1975).

3 THE FIRST STEPS AS A DIRECTOR

Eginitis immediately began developing and applying his program, slowly but systematically working his way through the many obstacles imposed by the political strife of the period and the usual bureaucracy.

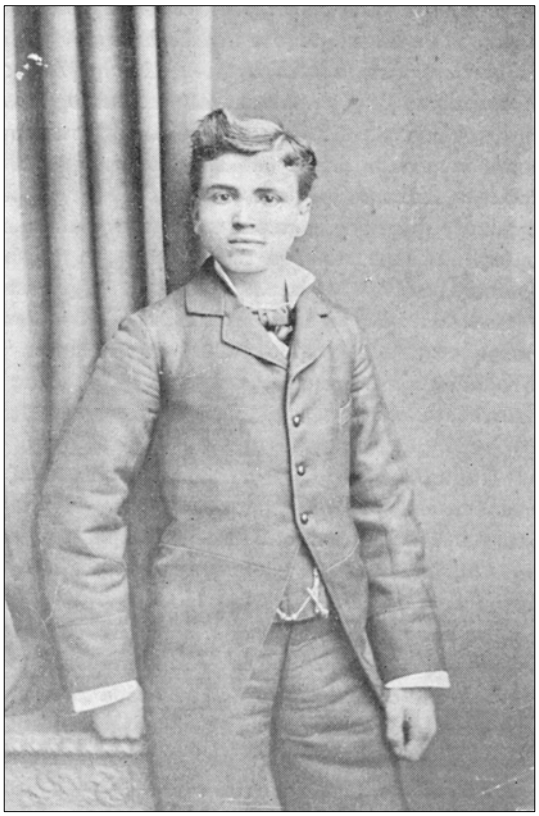


Figure 3: Eginitis as a student (courtesy: Institute of Astronomy and Astrophysics, National Observatory of Athens).

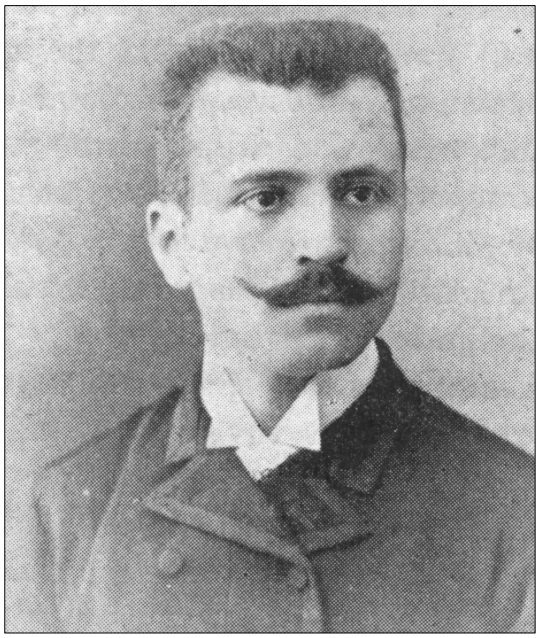


Figure 4: Eginitis as an astronomer in Paris (courtesy: Institute of Astronomy and Astrophysics, National Observatory of Athens).

The Observatory building was the original one on the hilltop opposite the Acropolis. Eginitis provided guidelines for the construction of a new building for the observers, and he also arranged for the planting of a cluster of pine-trees around the main building. After that, domes were erected for a meridian telescope and an equatorial telescope. The latter instrument was sited on an adjoining hill, which was specifically bought by Eginitis for this purpose. These activities and the purchase of the new instruments were financed by rich donors, whom Eginitis knew personally and had persuaded to provide the necessary funds (ibid.).

In 1892, two years after his appointment as Director of the Observatory, Eginitis was also appointed Professor of Astronomy and Geodesy at the Military School of Army Officers (which was called the *Evelpidon School*), a post he retained until 1902. In 1895 the next Government, under Theodoros Deligiannis, submitted a bill to Parliament proposed by Eginitis "… about the organization of the Observatory and its stations." When this bill became a law, the National Observatory of Athens was divided into separate Astronomical, Meteorological and Geodynamic Departments. With the separation of these activities in place, Eginitis proceeded to make following organizational changes:

a) In the Astronomical Department he organized the chronometer regulation service for ships of the Greek Navy and commercial ships based on the accurate determination of local time made from regular meridian observations with the Starke-Fraunhofer Transit Circle. That is, Eginitis essentially created the official time service for all maritime calculations.
b) Through the Meteorological Department, he founded the Greek Meteorological Service (today known by its Greek initials as EMY), and organized a network of stations covering most of Greece. The EMY started issuing daily weather bulletins that were sent to the major agricultural centers and port authorities of the nation. Eginitis connected the EMY with the rest of the world through the telegraphic network of the Eastern Company; thus, the EMY received free meteorological telegrams from 55 foreign meteorological stations.
c) For the study of earthquake activity in Attica by the Geodynamic Department, he established seismographic stations in cooperation with the geologist S. Papavassileiou (Plakidis, 1960: 7).

In 1896 Eginitis succeeded Demetrios Kokkidis as Professor of Astronomy and Meteorology at the University of Athens, a position he retained until his death. In 1903 he became Dean of the Philosophical School of the University, and it was during his tenure that a separate School of Physics and Mathematics was formed. In 1908-1909, Eginitis would become Dean of this School as well.

The first period of Eginitis' Directorship ended on 18 July 1910 when he submitted his resignation from his positions at the Observatory and the University. His resignation was a protest against the political 'cleansing' of the University by the Government, which was expelling its political opponents from public institutions. However, after the Minister of Education promised that all the expelled professors would return to their previous posts, and Prime Minister, Eleftherios Venizelos, insisted on this happening, Eginitis resumed his duties as Director of the Observatory (on 17 November 1910) and as a Professor at the University (on 24 January 1912).

Beyond his administrative and scientific work, Eginitis was essentially the permanent representative of Greece at international conferences on astronomy, seismology, geography and even of archaeology, because of his multiple interests and the fact that he was fluent in French, German and English. For example, in 1905 he participated in the international archaeological conference held in Athens, where he presented his paper on "The climate of Athens in the ancient times" Kotsakis, 1979: 27). In another such conference (in Cairo, in 1909) he presented his work on "La brise de mer et la bataille de Salamine" (i.e. "The sea breeze and the naval battle of Salamis") (Eginitis, 1951: 52).

4 REFORM OF LOCAL TIME AND THE CALENDAR IN GREECE

In August 1908, Eginitis represented Greece at the International Geographical Conference in Geneva, which was held to commemorate the 350 years of the city's University. As a Vice-president of the relevant section he submitted a proposal "… for the regular wireless broadcasting at certain times daily of the accu-rate local time of each place, in order to determinate the geographical latitudes at both sea, for the benefit of navigation, and on land, for the advancement of astronomy, geography and of science at large." This proposal was unanimously accepted by the participants and became an international agreement among the nations of the Earth (Eginitis, 1951: 49).

Greece's adoption of the international time system and time zones was the direct result of Eginitis' persistence on this matter. The official time in Greece was, up to then, the mean local time of Athens. However, when the railroad connected Greece with the rest of Europe there was an urgent need to link the national time system with the European one. Eginitis' intense efforts persuaded the Greek Government to adopt the hour zone of Eastern Europe on 28 July 1916, and it is still in force in Greece today. Eginitis wrote an article on the great importance of the time change under the title "The unity of time". This article was published in two parts by the newspaper *Estia* on 12 and 13 June 1916, and in it he explains why Greece adopted the eastern European hour:

> Greece lies mostly in the section [hour zone] of Eastern Europe and partly in the one of the Central Europe, as well; therefore, according to the rule of the sections system, we must take the time of the Eastern Europe, which is closer to the local time for the largest part of the country. By adopting the time of Eastern Europe, we shall turn our clocks 25 minutes ahead, while if we adopted the time of Central Europe we should turn them 35 minutes back. Therefore, if instead of the central European time we adopt the eastern European one, all our occupations will start one hour earlier.

In addition to the local time reform, Eginitis introduced the measure to adopt the Gregorian Calendar as the civil one in Greece. The Gregorian Calendar replaced the Julian Calendar in 1923, along with the International System of weights and measures. On the important subject of the calendrical reform Eginitis

gives us interesting information through his announcement, "The question of the reform and of the unity of the calendar", which was presented to the Academy of Athens at its meeting on 24 February 1927:

> In December 1918, realising that not only the difficulties on which the unification of the calendar was stumbling had ceased to exist, but also important international and national reasons supporting its immediate application had appeared due to the World War, I considered that I had to seize the opportunity and propose the correction of our calendar. Therefore, I submitted, in December 1918, to the Greek Government a lengthy memorandum in which I was proposing: a) The addition of 13 days to the civil calendar's date, leaving the date of the religious festivals, i.e. of the religious calendar, intact, until an agreeing decision of our Church. b) The introduction in Greece of the International System of weights and measures.

Eventually this memorandum was communicated from the Ministry of Education to the Holy Synod of the Church of Greece. The Synod formed a committee, which voted in its last meeting, on 6 March 1919, that the State could change the calendar, while the Church, in agreement with the Ecumenical Patriarchate, would proceed to the compilation of a new calendar. The Greek Government, after a suggestion by Eginitis, proceeded to make the change. In the announcement mentioned above, Eginitis reports:

> By our suggestion, with a legislative decree issued on 18 January 1923 [old calendar] the Julian Calendar, being in force in Greece since two millennia, was replaced by a civil calendar according to which was accepted the Gregorian chronology since 16 February 1923 [old calendar], a date that was named 1 March 1923, without any change of the religious festivals.

Eginitis proposed at the first conference of the International Astronomical Union (IAU), held in Rome in May 1922 that the League of Nations should establish a Committee for calendrical reform. This Committee was indeed established by the League of Nations; in it Eginitis was a member representing the Ecumenical Patriarchate and introducer of the issue. The League of Nations appointed Eginitis as a member of its permanent Commission for the calendrical issue, while the Ecumenical Patriarchate awarded him a higher honorary office (officium) for his distinguished services to the Church. In parallel, the International Association of Scientific Academies established a Committee to study the disadvantages of both the Julian and the Gregorian Calendar and suggest a reformed calendar, free of these disadvantages. Eginitis was again appointed as a member of this Committee (*Comité- d'étude pour la Réforme du Calendrier*). After the decoupling of the civil calendar from the Orthodox Church and the canon of the religious holidays, the Greek Government accepted the Gregorian Calendar as the civil one. The Church of Greece initially retained the Julian Calendar, but in 1924 it adopted the New Rectified Julian Calendar, which was identical to the Gregorian one for the next few centuries (Theodossiou and Danezis, 1995: 145f).

5 MATURITY AS DIRECTOR AND SCIENTIST

It can be said that Demetrios Eginitis (Figure 5) was the one scientist who contributed in an exemplary way with his studies to the promotion of astronomy, meteorology and seismology in Greece, while at the same time helping considerably the development of the national economy, especially in the fields of agriculture and navigation. During the forty-four years in which he was Director of the National Observatory of Athens, through his scientific work in astrometry, his international publications, his presence at international conferences, his books and articles, and by sending young astronomers to study abroad, he introduced the Observatory to the international scientific community. In the later years he participated in the Madrid Conference on Geodesy and Geophysics. The last international conference he attended was the IAU meeting at Cambridge (Massachusetts) on 2 September 1932, where he also represented the Academy of Athens (Eginitis, 1951: 90).

Figure 5: A sketch of Demetrios Eginitis as Director of the National Observatory of Athens (courtesy: Department of Astrophysics-Astronomy and Mechanics, National and Kapodistrian University of Athens).

Eginitis became a Fellow of many foreign scientific societies, such as the Royal Astronomical Society in London, the French Astronomical Society (Société Astronomique de France), the German Astronomical Society (Astronomische Gesellschaft), the Portuguese Institute of Coibra and the International Meteorological Committee (Comité Météorologique International). He was also a member of the IAU Committee on Meridian Observations. The director of the Paris Observatory, Dr Loovy, in a speech to the Academy of Sciences under the title "Nouvelle organisation des études d'Astronomie et Physique du Globe à l'Observatoire National d'Athènes" (i.e. "New organization of the astronomical and geophysical studies at the National Observatory of Athens") emphasized that

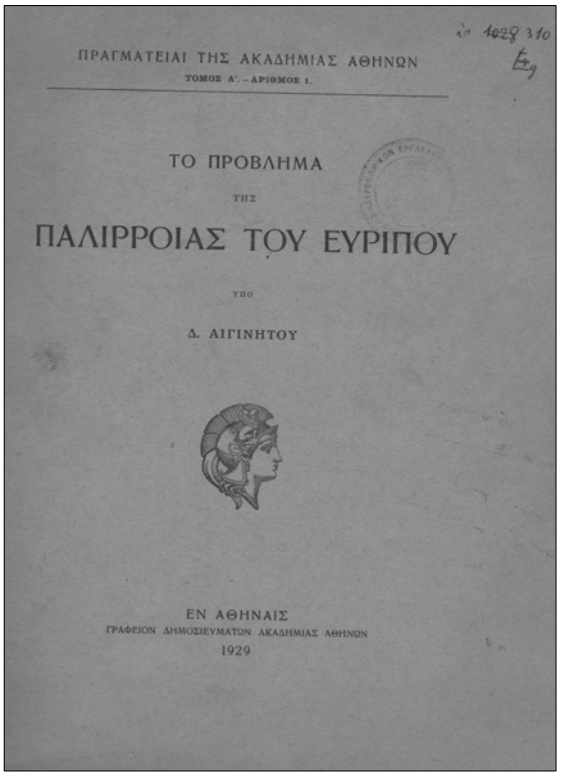
> Since D. Eginitis assumed the direction of the Athens Observatory in 1890, a considerable development took place in the scientific activity of this institution, which had already been distinguished by the publications of Julius Schmidt, the famous predecessor of the present Director. The Paris Observatory can lay a claim upon the honor that in D. Eginitis it created one of its best students. (Xanthakis, 1975: 3).

Eginitis was honoured several times by the Academy of Athens, while France also honoured him with the medal of the Legion of Honour (Arthur, 1935: 12).

5.1 The Explanation of the Evripos Phenomenon

Aristotle and Eratosthenes (ca 200 BC) tried to explain the phenomenon of the anomalous strong tidal current observed in the Evripos Straits in Chalkis, central Greece. In modern times, especially during the nineteenth century, other scientists endeavoured to do the same. A complete explanation was finally provided by Demetrios Eginitis.

According to Eginitis (1926), the main tidal bulge begins in the Mediterranean Sea and travels to the open Aegean Sea and the South Euboean Gulf (Notios Evoikos Kolpos). Because of the different length of the path, the tide coming from the south arrives at the narrowest point, where a bridge separates the South from the North Euboean Gulf (Voreios Evoikos Kolpos), seventy-five minutes earlier than the tide that arrives from the north, which has travelled around the long island of Euboea (Evoia), the second largest of the Greek islands. So the level of the water to the south of the bridge rises 30 to 40 cm relative to that of the water to the north of the bridge, thus creating a northward current. Six hours later the conditions are reversed and the waters move southward. This 'normal' situation prevails when the lunar phase is near Full Moon or New Moon. However, for several days around the first and last quarter phases, that is, when the tides are the weakest, the currents are mainly irregular. One must remember that in a small restricted sea like the Aegean, the tides are much weaker than in any ocean. Therefore, during the 'irregular days', other factors come into play, such as the morphology of the sea floor, the current atmospheric pressure, the winds, etc. (see Kotsakis, 1977).


ΠΡΑΓΜΑΤΕΙΑΙ ΤΗΣ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ
ΤΟΜΟΣ Α'. — ΑΡΙΘΜΟΣ 1.

ΤΟ ΠΡΟΒΛΗΜΑ
ΤΗΣ
ΠΑΛΙΡΡΟΙΑΣ ΤΟΥ ΕΥΡΙΠΟΥ
ΥΠΟ
Δ. ΑΙΓΙΝΗΤΟΥ

ΕΝ ΑΘΗΝΑΙΣ
ΓΡΑΦΕΙΟΝ ΔΗΜΟΣΙΕΥΜΑΤΩΝ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ
1929

Figure. 6: The front page of Eginitis' treatise about 'The problem of the Evripos Tide' (1929).

The study of the 'Evroipos Phenomenon' by Eginitis was published in a separate 128-page volume of large format, under the title "To provlema tis palirroias tou Evripou" ("The problem of the Evripos Tide") in the series *Pragmateiai tis Academias Athinon* (*Treatises of the Academy of Athens*), Volume 1, Number. 1 (Publications Bureau of the Academy of Athens, 1929) (see Figure 6 above). The same treatise was published in French under the title "Le problème de la marée de l'Euripe", as an excerpt of the *Annales de l'Obser-vatoire National d'Athènes*, Volume XI (Athens, 1931).

As is evident from this study, Eginitis worked not only in astronomy, meteorology and seismology, but also in the science of tidal studies. At the same time he was delving into geography, and proposing to the State solutions on irrigation and on the exploitation of the Greek natural resources. On this topic, Eginitis had already developed numerous initiatives by 1908, and in his work on the Athenian climate he discussed the provision of water to Athens. In this work he suggested that the problem could be solved with the construction of dams in Attica and the creation of reservoirs where rainwater and the flow from melting snow from the Parnitha Mountain could be stored. He also proposed the construction of trenches on the slopes of Attica Mountains for the controlled channeling of water into the sea. The suggestions put forward by Eginitis became reality with the construction of the Marathon Dam in 1931, which solved Athens water problems for the next decades.

6 EGINITIS AS THE MINISTER OF EDUCATION

On 21 April 1917 Eginitis was appointed Minister of National Education in the new Government of Alexandros Zaimis, and he remained in this post until 14 June of that year. His participation in the Government was a result of the esteem by King Alexander I and of the trust by the French and British during World War I. Negotiations with the French General, Maurice Sarrail (1856–1929), Chief of the Allied Forces in the region, on how King Constantine (who resigned following pressure from the Allies) would leave Greece, took place with the initial participation of D. Eginitis, who later collaborated with Pericles Argyropoulos on the same issue. In fact, King Constantine's farewell address to the Greek people was written by Eginitis and Fokion Negris.

Even after his departure from the Ministry, Eginitis continued to have almost the final word on educational matters: in 1918 he was the President of the Committee that wrote the law for the functioning of the University of Athens, then the sole university in Greece. Eginitis was also sent by the Greek Government on several missions to other countries. Probably his most important mission was in the summer of 1920, when he went to Paris in the hopes of influencing the French press, which was then maintaining a pro-Turkish stance. One month after Eginitis arrived, the French Prime Minister and Foreign Minister, Alexandre Milleran (1859–1943), called the editors of the newspapers and urged them to support the Greek interests, which essentially were aligned with the French ones. Also, through an inspired three-hour speech and discussion in the French senate, Eginitis was able to convince the

senators that their pro-Turkish policy would bring a collapse of French influence in the East.

On 6 March 1926, Eginitis was once more appointed Minister of Education, this time in the dictatorial Government of Theodoros Pangalos. Although this second period would be only slightly longer than the first one, lasting until 16 June 1926, it resulted in some major accomplishments. It was Eginitis' decision that led to the construction of five large educational buildings in Athens. In one of these the Experimental School of the University of Athens was created, which filled a large gap in the Greek educational system. In the countryside, he arranged for more than 300 public schools to be built, contributing considerably to the upgrade of primary education throughout the nation.

In Athens he bought the Heinrich Schliemann mansion (Iliou Melathron) to use as the National Gallery; he restored and renovated the archaeological museum of ancient Olympia; and he arranged for the purchase by the State of the Duchess of Placentia's mansion in downtown Athens, where the Byzantine Museum found a better residence after the inadequate basements of the Academy of Athens.

Eginitis also initiated the building of the Philekpaideftiki Etaireia (the Philo-educational Society) and, as the executor of the will of Marinos Koryialenos, he gave the required amount for the establishment of a microbiological laboratory at the University of Athens. He created the Organization of the Educational Council in the Ministry of Education and restored to operation the second Greek university, the University of Thessaloniki, and opening its Philosophical School. He published the statutes of operation of the Rizareios Ecclesiastical School, the Athens Eye Hospital, the Pediatric School of the University of Athens and various other institutions. He submitted bills for the protection of the intellectual property and compulsory education, while he reintroduced technical courses in the school curricula. He fenced in Marathon's Tomb and shaped its area, also adding a statue at its base. He negotiated with American archaeologists the issue of large-scale excavation of the archaeological sites in Athens, so that the whole project would be accomplished with the equal participation of Greek archaeologists (who had largely been ignored in previous agreements). In addition to all these, Eginitis succeeded in persuading Queen Olga to donate the heirlooms of the Kings of Greece, and these treasures are now exhibited in a special section of the Ethnological Museum.

However, the single most important act of Eginitis as the Minister of Education is almost certainly the founding of the Academy of Athens (Figure 7), in 1926. He had started to prepare the ground much earlier. Prime Minister Eleftherios Venizelos had succeeded in having Greece accepted into the International Union of Academies, and had promised that a Greek Academy would be established. Nevertheless, for various political reasons, the Academy had not been founded, and Greece was therefore in danger of being evicted from the Union. Eginitis considered the Academy a necessity regardless of the position in the International Union, so he proceeded with this issue immediately upon beginning his second ministerial term of office. The inaugural ceremony and session of the Academy of Athens took place on 25 March 1926 in the central hall of the estate built for it many decades earlier by Baron Simon Sinas during the reign of King Otto I. The session was declared open by Theodoros Pangalos, and those present were then addressed by Eginitis as the Minister of Education and by Fokion Negris, its first President. The founding of the Academy of Athens is considered by most reviewers as Eginitis' greatest gift to Greece. Demetrios Eginitis became Vice-President of the Academy in 1928, and was President from 10 January 1929.

7 THE LAST YEARS AND POST-MORTEM HONOURS

On 24 January 1931, in a special meeting of the Academy, the forty years (1890-1930) of scientific activity of Demetrios Eginitis were celebrated, and a special issue of the Academy's Proceedings was published. The then President of the Republic, Alexandros Zaimis, attended the celebration, while the Prime Minister, Eleftherios Venizelos, sent a message with his sincere wishes. From 1931 till his death, in 1934, Eginitis continued to offer his services to the Academy, and was its General Secretary in 1933-1934. He also continued his scientific work both in the Academy and at the Observatory. He consumed much of his time presiding over the Academy's Committee for the Greek language issue. Actually his very last text was the report on the conclusion of this Committee. This report, entitled "The language issue: The Modern Greek language", was published finally in 1958, in the "Treatises of the Academy of Athens" series (Volume 23, Number 4).

Figure 7: Academy of Athens.

Demetrios Eginitis died on 13 March 1934, and his State Funeral took place the next day in the church of St. George Karytsis in downtown Athens. He was buried in the First Cemetery of Athens, in a small mausoleum (see Figures 8 and 9) which was donated by the Athens municipality. The main funeral oration

was given by the then Dean of the School of Physics and Mathematics at the University of Athens, Professor of Chemistry, Konstantinos D. Zeghelis (1870–1957). On the day of Eginitis' death, the University of Thessaloniki held a scientific memorial meeting, in which his work was described by Professor Petros Kontos.

Figure 8: Eginitis' mausoleum in the First Cemetery of Athens.

After Eginitis' death, various biographical texts were published, with emphasis in his scientific activities and work. Most important among these are the one written by Stavros Plakidis (Astronomy Professor at the University of Athens) and published in the *Bulletin of the Secondary Education Mathematicians' Association* (volume of 1934, pp. 445-446) and the one published in the March 1935 issue of the *Journal of Calendar Reform*, an American edition of the World Calendar Association, written by Laird W. Archer under the title "Passing of a Pioneer", which fully represents the personality of D. Eginitis. Another contemporary biographical sketch can be found in the *Who is Who in Central and Eastern Europe* (Zurich 1933-1934).


Figure 9: On the east side of his mausoleum it is written in Greek: 'Religion-Astronomy-Education'.

In 1974, on the occasion of the 40th anniversary of Eginitis' death, relatives, students and his surviving friends and collaborators formed a committee (comprising University of Athens Professors L. Karapiperis and D. Kotsakis, and the Lecturer K. Makris) to organize a scientific memorial meeting and the publication of a volume with scientific papers from all of the sciences to which Eginitis contributed. On 26 February 1975 this meeting was held in the large hall of the Evgenides Foundation, and in the associated scientific tome published *in memoriam*, thirty-four papers on astronomy, mathematics, meteorology seismology, and physics, written by 39 authors, found their place.

8 PUBLISHED WORKS OF DEMETRIOS EGINITIS

8.1 Publications of the Academy of Athens

The very first scientific announcement at the Academy of Athens, in its April 8, 1926 meeting, was the talk "On variable stars" by Eginitis. This was the first of a long series of announcements by Eginitis at the Academy, including the following:

a) In Greek (titles translated into English): "The droughts and the necessary watering and irrigation works in Greece." (meeting of 2 December 1926); "The calendar reform in the League of Nations." (24 February 1927); "The transits of Mercury in front of the solar disc." (8 December 1927); "The Corinth earthquake of 22 April 1928 and its consequences." (3 May 1928); "The problem of the Evripos Tide." (1928 December 8; this was included, also, in the *Treatises* series—see below); "The 'blue coal' and the industrial exploitation of the Evripos current." (17 January 1929); "On the climatological adequacy of Egyptian cotton cultivation in Greece." (16 May 1929); and "The evolution of the worlds." (26 December 1929).
b) In French: "La contribution des géographes de l'antiquité à la découverte de l'Amérique." (16 April 1931); "Les marées dans la science ancienne." (12 May 1932); and "La longitude de l'Observatoire d'Athènes." (20 May 1932).

In particular, in the series *Pragmateiai tis Academias Athinon* (*Treatises of the Academy of Athens*) were published, as already mentioned, "The problem of the Evripos Tide." in Volume 1, Number 1 (1929) and "The language issue: The Modern Greek Language." in Volume 23, Number 4 (1958).

8.2 *Annales de l'Observatoire National d'Athènes*

The Annals of the National Observatory of Athens were published in French, totaling 12 volumes up to 1932. Among other papers, Eginitis published the following important contributions:

"Le tremblement de terre de Constantinople." *Annales de Géographie*, IV, 151-165 (Athènes, 1895).
"Le climat d'Athènes.", *Annales de l'Observatoire National d'Athènes*, I, 1-220 and 391-395 (Athènes 1898b).
"Le climat de l'Attique.", *Annales de Géographie*, XVII, 98-115 (Athènes 1908).
"Sur la question du calendrier dans l'Europe Orientale.", *Annales de l'Observatoire National d'Athènes*, IX, 7-17 (Athènes 1926).
"Le problème de la marée de l'Euripe.", *Annales de l'Observatoire National d'Athènes*, XI (Athènes 1931).

Other titles of papers in the *Annales* by Eginitis are:

"La latitude de l'Observatoire d'Athènes"; "L'équatorial Doridis"; "L'éclipse solaire de 30 Août 1905"; "La Comète Morehouse"; "Les grands sismes du 28 Décembre 1908 et du 23 Janvier 1909"; "Les éléments du magnétisme terrestre à Athènes pendant les années 1904-1908"; "Etude des sismes survenus en Grèce,

pendant les années 1904-1908"; "Les éléments magnétiques à Athènes, pendant les années 1904-1908"; "La comète de Halley"; "Saturne, 1910-1911 et 1911-1912"; "Jupiter, 1911"; "La Nova Lacertae"; "Le tremblement de terre du golf de Corinthe du 30 mai 1909"; "Les sismes survenus en Grèce, pendant les années 1909-1911"; etc.

Unfortunately, due to lack of adequate funding, the publication of the *Annales* ceased after 1932, thus leaving valuable observational material in the archives of the Observatory of Athens unpublished.

8.3 The *Analecta* of 1920

The daughter of D. Eginitis, Egli Eginitis-Botsaris, collected some works of her father, written in French, and published them in 1920 as a separate volume under the general title *Analecta* (Athens 1920). The most important of these works are:

"Mémoire sur la Stabilité du Système Solaire"
"Résultats des observations d'étoiles filantes"
"Résultats des observations sismiques, faites en Grèce, pendant l'année 1899"
"Observations météorologiques, faites aux stations départementales, pendant les années 1894-1899"
"Anciennes observations de pluies d'étoiles filantes"
"L'agrandissement des disques du soleil et de la lune à l'horizon"
"Résultats des observations sismiques, faites en Grèce de 1893 à 1898"
"La politique turcophile équivaudrait à l'effondrement le l'influence de la France en Orient"

8.4 Books

The titles of the following Greek books by Eginitis have been translated into English:

Practical Meteorology: Guide for the Meteorological Stations in Greece (Athens, Ethniko Typographeio, 1892).
Lessons in Geodesy (Athens, Evelpidon Military School, 1895-1896).
General Astronomy (Athens, Evelpidon Military School, 1897).
The Sky (translation & adaptation of C. Flammarion's book) (Athens, Syllogos pros diadosin ofelimon vivlion, 1900).
The Climate of Greece, two volumes (Athens, Vivliothiki Marasli series, D. Sakellariou, 1908).
Elements of Cosmography, for 4th Grade of Gymnasium Schools (Athens, Organismos Ekdoseos Didacticon Vivlion, 1910).
Astronomy Lessons, Taught at the National University in the Academic Year 1914-1915 (Athens, Panepistimiakon Typographeion, 1917).
Stars (Athens, Syllogos pros diadosin ofelimon vivlion, 1918).
Meteors (Athens, Syllogos pros diadosin ofelimon vivlion, 1927).

8.5 Other Scientific Papers in French

"Sur la Stabilité du Système Solaire." *Annales de l'Observatoire de Paris*, Mem. 19, H1 (1889).
"Sur l'agrandissement des disques du Soleil et de la Lune à horizon." *Comptes Rendus des Séances de l Académie des Sciences*, 126, 1326-1329 (1898a).
"Radiants observés à l'Observatoire National d'Athènes." *Astronomische Nachrichten*, 159, 361 (1902).
"Le climat d'Athènes en Grèce ancienne." *Comptes Rendus du Congrès International d'Archéologie, I^re session,* Athènes, imprimerie 'Hestia', C. Meissner et N. Kargadouris (1905).

8.6 Miscellaneous Articles

The titles of the following articles in Greek by Eginitis have been translated into English:

"Cosmology", the text of his talk to the 'Society of the Friends of the People' on 8 April 1891, printed in the printing-office of the newspaper *Asty*, Athens, May 1891.
"Shooting stars and bolides." *Estia* newspaper, Athens, 9 January 1894.
Two announcements on the climate of Athens in the *Bulletin of the Industrial and Commercial Academy*, Athens, December 1895 issue.
"The Universe", his inaugural lesson at the University of Athens on 23 October 1896, was published in an issue of the *Athena* magazine, Volume 9, Athens, 1897.
"The Nature", *Athinai* newspaper's monthly inset no. 4, February 1908, pp. 17-20.
"The forecast of weather." *Melete* magazine monthly publication of the 'Syllogos pros diadosin ofelimon vivlion', issues 8-10, Athens, 1907.
"The National Observatory in the twenty years 1890-1910." Athens, 1910.
"Halley's Comet and the scientific struggle", the text of his talk to the 'Archaeological Society' on 8 December 1910, printed as a booklet, Athens, January 1911. (Of special interest are his notes on the large curvature of the comet's tail.)
"The latest appearance of Halley's Comet." *Melete* magazine (monthly publication of the 'Syllogos pros diadosin ofelimon vivlion'), issue 37, Athens, January 1911.
"Activities and needs of the National Observatory." Athens, 1916.
"The unity of time." *Estia* newspaper, Athens, 12 and 13 June 1916.
"The work of 25 years: activities and needs of the Observatory." Edition of the Observatory of Athens, Athens, 1916.
"The official time." *Imerologion tis Megalis Ellados*, Athens, G Drosinis, 1922.
"Is the Universe infinite?" *Imerologion tis Megalis Ellados*, Athens, G. Drosinis, 1923.
"On the change of the calendar", the memorandum he submitted at the IAU's session in Rome in 1922, published in the *Epistimoniki Icho* magazine, Spyridon N. Papanikolaou editions, Athens, 1923 February-March issues.
"The unknown forces." *Imerologion tis Megalis Ellados*, Athens, G. Drosinis publ, 1926.

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