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**THE ANTIKYTHERA MECHANISM:  
HISTORICAL REFERENCE AND  
ASTRONOMICAL EXTENSIONS**



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To my parents

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## **1. INTRODUCTION**

The Antikythera Mechanism is one of the most significant mechanical inventions in history. It is a case of an astronomical precision instrument, designed with an astonishing mechanical perfection, placed in a wooden chest which has graduated plates on its external sides. Internally it consisted of more than 30 intertwined gear-wheels, exentrically placed. The wheels, which were organised epicycloidly,

were set in motion, on a different velocity each, by a revolving manually-operated shaft.

According to the inscriptions, pointers demonstrated the courses of Sun and



Picture 1. Potamos cove in Antikythera

Moon, as well as the phases of the Moon and of the planets across the Zodiac. The Mechanism was brought to light in a shipwreck in the proximity of the Greek island Antikythera. Particularly, the wreck of a Roman ship was found by sponge-divers from Simi in 1900, in the region of “Pinakakia” (near the Potamos cove) in Antikythera (Archaeological Newspaper, Athens 1902).

The ship was filled with art treasures (statues, jewelry, amphorae, pieces of furniture etc) and it is believed that it departed from some port of the East Aegean islands or of Asia Minor, heading to Rome (Val. Stais, “The Findings from Antikythera”, Athens 1905). This shipwreck initiated the area of submarine excavations, upon a large scale, in 1901 A.D. but the price to be paid was heavy: one sponge-diver dead and two crippled (Emm. Lykoudis, “Pages”, Athens 1920). Among

the findings of the great “Treasure of Antikythera” (a large part of which adorns the Archaeological Museum of Athens in the present day), is included the unique astronomical instrument, the artifact that became known as the “Antikythera Mechanism”.

Just before the Easter holiday in 1900, one ship boarding sponge-divers from Simi is forced to cast anchor near Antikythera due to weather conditions. When a dive is attempted, one of the divers surfaces terrified. What frightened the sponge-diver

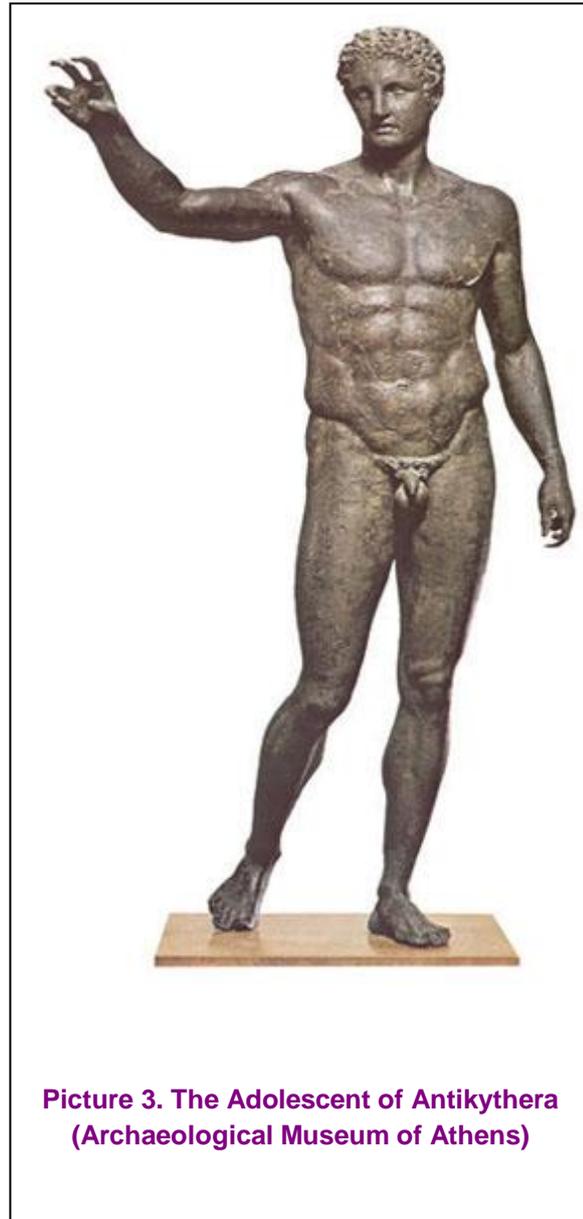


**Picture 2. The archaeological findings that constitute the Antikythera Mechanism (Nature, 2006, Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism)**

from Dodecanese was part of a statue that waited to be discovered for nearly 2.000 years. While the sponge-divers searched that area looking for natural treasures, on that exact area laid sunken a treasure of a different kind. A Roman craft,

estimated at first to have set sail from Asia Minor around 80 B.C. (“The Findings from Antikythera”, Val. Stais, Athens 1905) but never reached its destination. Most likely at the behest of a Roman merchant or pirate, the ship was laden with treasures : jewelry, brazen and marble statues (the Adolescent of Antikythera among them), along with a scientific instrument of incredible complexity.

The captain from Dodecanese, Dimitrios El. Kontos, reported his chance discovery to the Greek authorities (Dodecanese were under Turkish hold) and agreed with the minister of Education at that time, Spyridon Stais, to put not only the ship but its crew as well at the disposal of the archaeologists with a remuneration (Archaeological Newspaper, Athens 1902). The undertaking, that lasted from November 1900 until September 1901, was not easy: diving into depths of 45-60 meters where the shipwreck laid involved many dangers. One of Kontos' men lost his life, while two others suffered serious injuries during the recovery of the treasure (Emm. St. Lykoudis, "Pages", Athens 1920). The venture lasted until next winter (1901), when the storms precluded further diving. The recovered findings were taken to the Archaeological Museum of Athens to be cleaned and studied.



**Picture 3. The Adolescent of Antikythera  
(Archaeological Museum of Athens)**

As the statues aroused the interest of archaeologists and preservers, the rest of the treasure was overlooked for a while. Eight months after the transportation of the findings to Athens, former minister of Education, Spyridon Stais (and not the archaeologist Valerios Stais, cousin of Spyridon, as it is mentioned in many books in the following years, due to a confusion caused by the names), along with the steward of Antiquities of the museum examined a rusty metal object. To their great astonishment they realized that it bore plenty of gear-wheels along with inscriptions

onto the sides that were distinguished under the rust and the marine depositions (“Scrip” Newspaper, 21/05/1902, “Estia” Newspaper, 22/05/1902).

At first, they considered it to be an astrolabe, (“Estia” Newspaper, 23/05/1902, “Scrip” Newspaper, 25/05/1902, “Empros” Newspaper, 25/05/1902, “Acropolis” Newspaper, 01/06/1902), but soon the complexity of the finding, that was given the name “Antikythera Mechanism”, as it has already been mentioned, led the scientists to reconsideration. The thorough study of the Mechanism during the '50's by Derek J. de Solla Price, George Stamiris, a Greek scientist specialized in studying inscriptions and Charalampos Karakalos, nuclear physicist of “Dimokritos”, showed that it was

the most complex mechanism of the ancient times. (It is a noted fact that the Mechanism is the only ancient finding that bears scales with gratings and calibrations). Nevertheless, neither then nor during other studies in the '70's was it possible to determine the role of the Mechanism.



**Picture 4. Inscriptions on the fragment 19 of the Antikythera Mechanism (Archaeological Museum of Athens)**

It is a fact that, at least in the beginning, this so significant (as it was later proved) finding went unnoticed and months had to pass before the experts' attention was drawn to the pieces with the distinct marks of gear-wheels upon them and to the illegible handwriting. However, the lasting stay in the sea and the poor maintenance

due to lack of experience, destroyed a big part of the Mechanism, making its studying difficult to the experts that worked on it.

Price's hypothesis was that the Mechanism was constructed in the academy of Poseidonios from Rhodes, a Stoic (Derek de Solla Price, "Gear-wheels from the Greeks, 1974). Rhodes island at that time was considered a core area regarding not only rhetoric, art and astronomical studies but Mechanics too. Price believed that the ship that carried it to Rome was transporting other scientific inventions as well.

Other studies indicate that the Antikythera Mechanism was constructed around 150-100 BC., before the time of Poseidonios. Another initial assumption was that the famous astronomer Hipparchus from Rhodes or Hipparchus from Nicaea, considered the "father of Astronomy" by many, was the mastermind of the most perfect mechanism of the world until the appearance of the medieval mechanical clocks that were used in the Cathedrals (I. Theofanidis, 9<sup>th</sup> tome, page: 140-153, "Records of Athens Academy", 1934).

Other links ("The Findings from Antikythera", Val. Stais, Athens 1905) indicate that the ship that carried the Mechanism set sail from the coast of Asia Minor starting its journey to Rome. The identity of the constructor and the location where this mechanism was constructed remains until today, unknown, since no theory can accumulate enough evidence regarding them.

The strange finding was studied by Rediadis (1902), Rados (1910) and Theofanidis (1930), who first built an unfinished bronze working model that resembled a complex astronomical clock. Afterwards it was forgotten, until the British professor Derek de Solla Price in USA, got down to it [first publication in 1959 (Scientific American Magazine, "An Ancient Greek Computer"), overall occupation with it exceeding 30 years} and with the help of the nuclear physicist of "Dimokritos", Char. Karakalos, and the epigraphist of Princeton, George Stamiris, studied it thoroughly for the first time and built a reconstruction of the Mechanism. In his comprehensive article in the journal "Scientific American", in 1959, entitled "An Ancient Greek Computer", he claimed that this Mechanism is the "oldest sample of scientific technology that survived to this day and completely alters our standpoints regarding the ancient Greek technology".

In the beginning of the '80's, British Michael Wright demonstrates his own interpretation, discarding the existence of a differential gear-wheel in the Mechanism, adding new ones and replacing the two concentric rings, that Derek de Solla Price provided in the back side, with spirals. A new cycle of debates begins. However, it is now obvious that the solution of this technological enigma calls for an interdisciplinary treatment.

Therefore, twenty years later, the Antikythera Mechanism



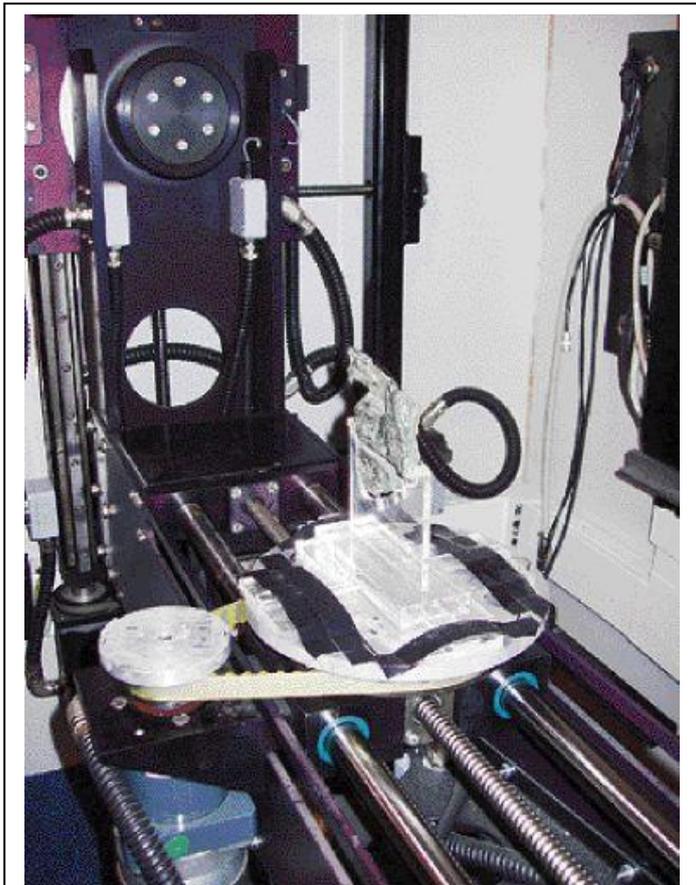
**Picture 5. Price and the model of the Mechanism that he constructed**

Research team is formed by British (Mike Edmunds and Antony Freeth from Cardiff University) and Greek researchers (Xenophon Moussas, John Mpitsakis from Athens University and John Seiradakis from Aristotle University of Thessaloniki), that is later complemented with Mrs. Magkou and Zapheirpoulou from the National Archaeological Museum and Mr. Tselikas from the Cultural Institution of the National Bank. In the beginning of 2005 the new decipherment effort is set under the patronage of the Civilization Department, funded by the Leverhulme UK Institution,

and with the usage of ultramodern technology the new study begun. Its results, which were announced in November 2006, in a conference that took place in Athens and on a parallel publication in Nature (Nature, “Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism”, 2006), confirm that the Mechanism was a particularly advanced, portable astronomical instrument (as characteristically quoted by Mr. Seiradakis, a “contemporary laptop”) and trigger a new round of

interest and debates in the international scientific community.

The research team, which began working on the project in the fall of 2005, utilizes the most modern technologies (products by companies such as Hewlett Packard, X-Tek Systems UK, Volume Graphics) in order to bring into the light unknown parts of the Mechanism. More specifically, experts of Hewlett-Packard (HP Labs, California) developed the avant-garde system of digital data display PTM



**Picture 6. The tomographer of X-Tec (Antikythera Mechanism Research Project)**

Dome. With that became possible the “reappearance” of almost erased texts and elements on the surface of the Mechanism that are not discernible even with usage of the best systems of conventional and digital photography. Correspondingly, researchers of the X-Tek company, designer of the avant-garde tomographer Blade Runner, that was developed specifically for the studying of the Antikythera Mechanism (weighing 8 tons), took by using it a series of pictures that enable the

reading of the inscriptions as well as the accumulation of data regarding the internal structure of the Mechanism.

## **2. Historical Reference**

### **2.1. Early mentions of the Shipwreck and the Antikythera Mechanism**

The discovery of the Antikythera shipwreck engaged the Press very quickly, and ignited the Greeks' interest. The contemporary newspapers started publishing very frequent reports of the shipwreck, its findings, even the procedures of the salvage of the antiquities that were found in the wrecked ship.

Also, the specialists involved in the studies of the shipwreck began publishing many books. The Archaeological journal dedicated a whole issue to the findings in the shipwreck, and there are references to two more, and many pages have been written on the records of the archaeological association regarding the subject. In 1903, the archaeological museum published a book written by the head of the National Monetary Museum, I.N. Svoronos, entitled "The Antikythera Treasure". Archaeologist Valerios Stais, published in 1905 a study upon the origins of the ship that suffered shipwreck 2000 years ago, entitled "The Findings from Antikythera". Professor of nautical history in the faculty of Marine Novices, Konstantinos Rados, published in 1910 his book, "About the Antikythera Treasure". Emm. Lykoudis, legal adviser of the state and supervisor of the salvage of the antiquities, published in 1920 the journal he kept during the salvaging, entitled "Pages".

The viewpoints of those who study the shipwreck and its findings, as we will witness thereafter, contradict each other many times, without being able to settle on a definite theory, since even today, 110 years after its discovery, many questions remain unanswered.

### **2.1.1. Records of the Archaeological Association**

In the Records of the Archaeological Association of the years 1900 and 1901, there are various references with regard to the Antikythera shipwreck.

#### **A. Year 1900**

In the Records of 1900 (pages 95-102), there is an announcement “About the statues found in the sea near Antikythera”, which was written by the secretary of the Archaeological Association on 28 of January in 1901, after the first general conference of the associates.

According to this announcement, sponge-divers from Simi accidentally discovered a collection of ancient statues in the bottom of the sea surrounding Antikythera, a discovery that they immediately reported to the Government. Next, there follows a description of some of the recovered statues and especially the bronze statue of Hermes or the Adolescent of Antikythera, as the statue is known.

In the end of this announcement, it is speculated that the statues of Antikythera were stolen by a Roman general, maybe Syllas, with the intention to bring them to Rome. However, the ship in which the statues were being transported, encountered a tempest and suffered shipwreck in the sea of Antikythera. Consequently, these works of art were lost in the bottom of the sea, only to be found again after 2000 years had passed.

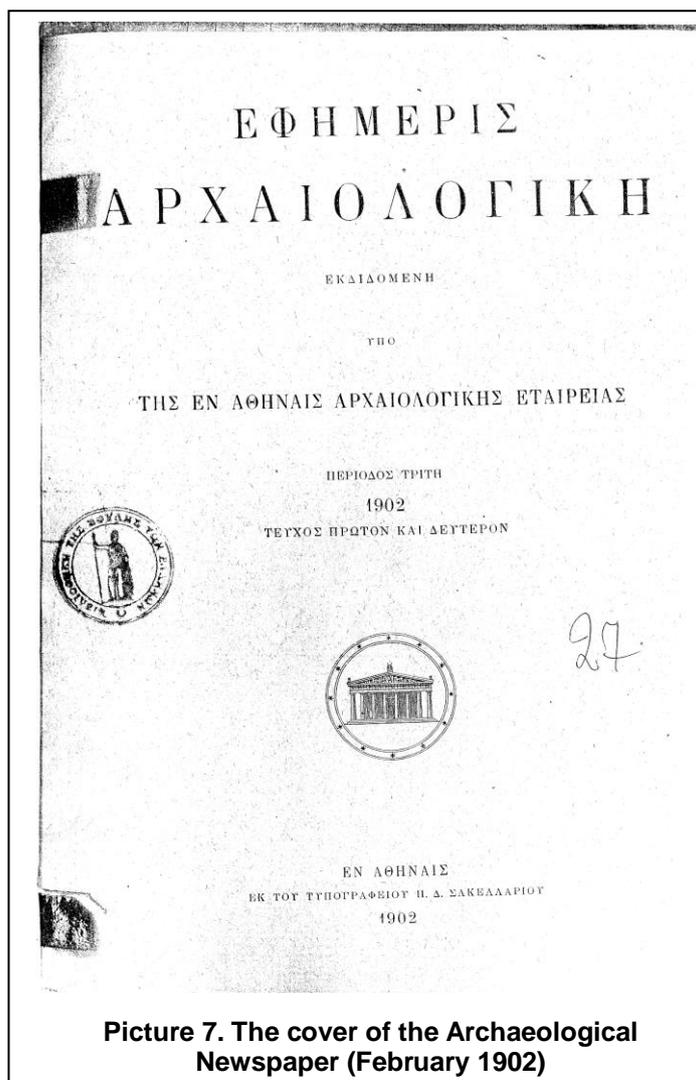
#### **B. Year 1901**

In the Records of 1901 (page 17), it is mentioned that in the financial statement of the Archaeological Association, an expenditure of 3500 drachmas is registered to be given as a gift (500 drachmas to each), to the 7 sponge-divers from Simi that helped with the recovery of the antiquities of the Antikythera shipwreck.

## 2.1.2. Archaeological Newspaper (February 1902)

### A. February 1902

The Archaeological Newspaper, devoted its first and its second issue of 1902 (15 of February 1902), to the findings of the Antikythera shipwreck. In there, for the first time, a thorough description of the shipwreck's antiquities was published. As is mentioned in the book's prologue: "The Archaeological Association, wishing to notify these facts and thus facilitate the ongoing scientific research, decided to go through publishing all of the significant items that were salvaged from the sea".



Picture 7. The cover of the Archaeological Newspaper (February 1902)

At first, there is a reference to the chronicles regarding the discovery of the shipwreck by sponge-divers from Simi at the end of 1900. The discovery of the hand of a bronze statue is described, as well as the actions taken by the shipmaster Dim. Eleuth. Kontos to inform the Greek government. Despite the government's initial justifiable disbelief, D. Kontos and his divers were given permission by the minister of Education (or Minister of Ekklesiastics as it refers in the Archeological Newspaper), Spyridon Stais, to salvage the antiquities with a remuneration. The work began in

November, 1900, and lasted until September, 1901. The salvaging of the light objects was done with the help of the ship's tackle blocks, while the heavier ones were salvaged with the help of a capstan.

The circumstances of the salvaging were often aggravating, due to storms and gales, the big depth of the shipwreck (25-34 fathoms), including the merging with extraneous objects that the antiquities went through during their long stay in the bottom of the sea. The remuneration which the Greek Government gave the divers was 150000 drachmas, while every single one of the participants in the project was remunerated with 500 drachmas from the Archaeological Association.

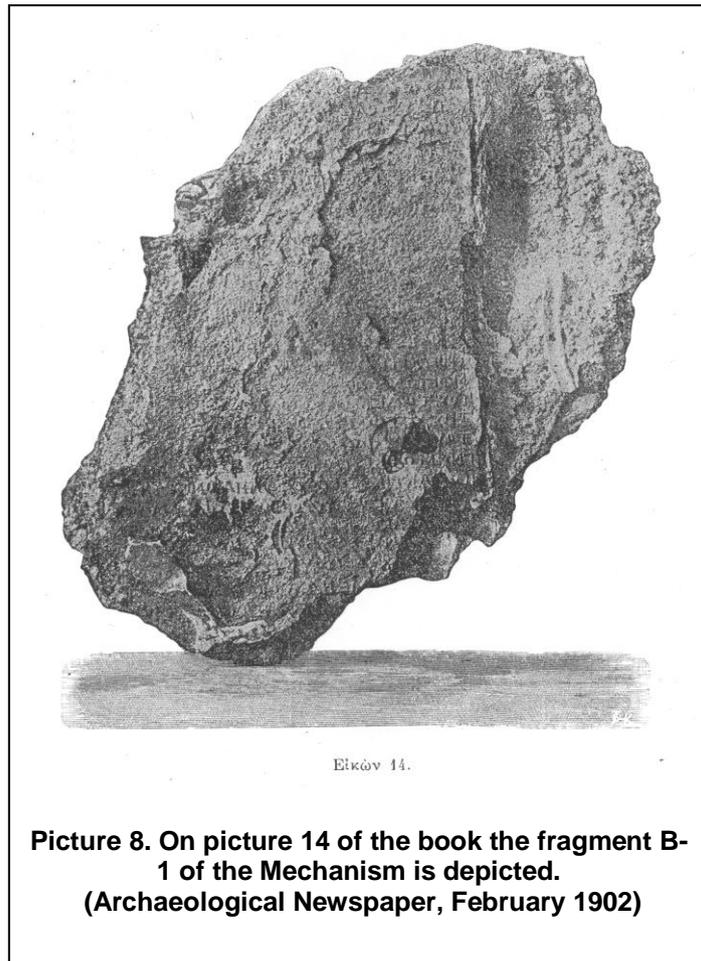
The findings that were bronze or marble statues, as well as objects that belonged to the ship and its crew, were transported to the National museum.

There is a thorough description of the bronze findings, statues and objects, and of the statue that became known as the "Adolescent of Antikythera" among them. This statue was taken out in many pieces, the welding of which was undertaken by the French Andre, who reconditions works of art. These findings did not sustain large damage, due to the strength of the copper with regard to the detrimental influence of the saltwater. They assuredly incurred chemical clearing, although they have lost their original color.

On the contrary, the marble statues that were found in the shipwreck, sustained a lot of damage, due to corrosion and also due to the sea animals that made their nests into them. There is a small description of the pieces that were well maintained, enough for their shape to show.

The appliances of the crew that were discovered in the shipwreck are of huge importance, since they helped with the dating of the shipwreck. These appliances include clay, glass or metal ceramics as well as other small objects, the Antikythera Mechanism among them.

In the end of the book, it is mentioned that among the findings existed a strange bronze object, its measurement being 0,15×0,16, which is called the clock. This object is described as a machine made up of many wheels, that is encircled by a wooden square compass accompanied by leaden pages with letters graven on them. These inscriptions are considered to be operating instructions for the machine, and its use is most probably of an astronomical nature. This machine sustained a very large damage due to its long stay in the sea, and its clearing is very difficult. The machine later on was denominated as the Antikythera Mechanism.



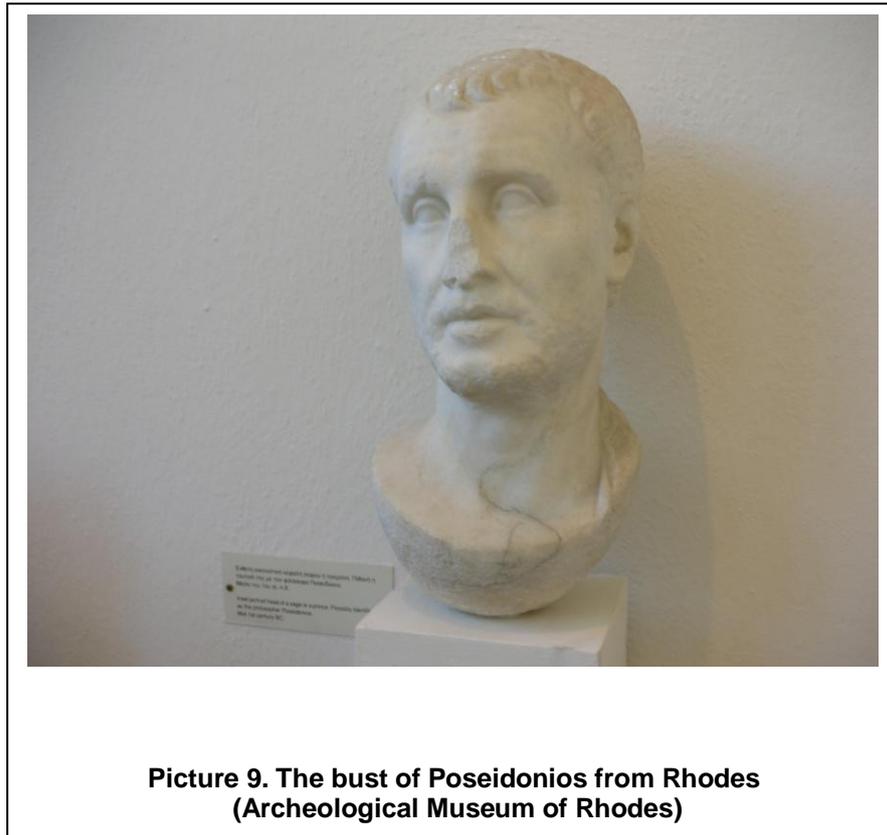
**Picture 8. On picture 14 of the book the fragment B-1 of the Mechanism is depicted. (Archaeological Newspaper, February 1902)**

## **B. Stone Statue from Antikythera**

On page 202 of the issues 3 and 4 of the Archaeological Newspaper, third period of 1903, there is an article entitled “Stone Statue from Antikythera”, written by G. Nikolaidis Chris on 5 January 1904. This article refers to the marble statue that was salvaged from the Antikythera shipwreck, which I.N, Svoronos alleges that represents Orthiadis the Lacedaemonian, while others assume it represents an athlete or a soldier. Author G. Nikolaidis alleges, using arguments based on extracts of Iliad, that the statue represents Lykaonos in the scene of his murder by Achilles and hopes that further investigations of the shipwreck will reveal the statue of Achilles as well.

### C. “The Astrolabe from Antikythera”, P. Rediadi

In 1910, Periklis Rediadis, lieutenant of the Royal Navy, published an article in the Archaeological Newspaper with regard to the Antikythera Mechanism, entitled “The Astrolabe from Antikythera”.



In this article, Rediadis refers to the nature of the Mechanism, and confutes the arguments of the classic scholar from Monaco, Albert Rehm, who asserted that the Mechanism was a

planetarium like the “sphere” of Archimedes and of Poseidonios (Albert Rehm, *Philologische Wochenschrift*, 1907). Rediadis registers explicitly the reasons why according to him Rehm’s approach was wrong.

Rediadis’ first argument is that the “sphere” is described as an informative instrument, while the Mechanism is indisputably an astronomical Mechanism. Also, the Mechanism’s provision of protractors indicates that it was a hypsometrical instrument contrary to Rehm’s opinion. The characterization of the instrument as an astrolabe, Rediadis ascribes it to this exact attribute, without wanting to identify it with the classic astrolabe. Furthermore, Rediadis claims that the Mechanism is an instrument that cannot be pertained to any known astronomical instruments of the ancient times.

The next argument that Rediadis mentions, is that the “spheres” were bulky and heavy instruments and materials such as wood and plaster were used for their construction. On the contrary, the Mechanism’s measurements are very small, characteristic of the measurements of hypsometrical instruments (astrolabes for example). Another clue is that the Mechanism’s gear-wheels are made of copper, which is brittle and yielding. Rediadis concludes that it would be impossible for such a small instrument to be able to function as a base for the sizable “sphere”.

The third argument is that the shape of the “spheres” was spherical, as their term indicates, and they don’t mechanically represent the motion of the planetary system at surface level, over against the Mechanism.

Furthermore, Rediadis’ line of argument is supported by the fact that “spheres” appeared to be hydraulic machines, aka machines that used water as their driving force. The Mechanism however, does not seem to possess such characteristics.

He also refers to the word ΠΑΧΩΝ, which stands for the Egyptian month equivalent to May, which was discovered graven on the Mechanism and was identified by Rehm. According to Rediadis, it would not have been possible (due to lack of space) to note down all the months of the year on that part of the Mechanism, and month Pachon (ΠΑΧΩΝ), does not bear any astronomical-related importance (there is neither an equinox nor a solstice in it).

Rediadis gives validity to his force of arguments, by referring to two arcs that were found during the studies of parts of the Mechanism, that bore two different division systems. As he mentions, these two arcs belong to circles, divided into 60 and 360 parts accordingly. These two systems were known in the ancient times, therefore the Mechanism must have been constructed during a period when both of these systems were in use, and that means between 3<sup>rd</sup> and 5<sup>th</sup> century AD.

Finally, he refers to the instrument’s performance and he claims that it was used to measure the altitude of the stars, being adjusted to the season and the location of the observation following the operating instructions. The instrument’s gear-wheels set in motion appropriate pointers, so as to enable the resolution of astronomical problems.

### **2.1.3. Reports of the Shipwreck and the Antikythera Mechanism και on the Press of that Period**

In the years followed by the discovery of the Antikythera shipwreck, the contemporary Press kept up with the advancements of the ongoing research in the matter of the shipwreck. Some of the epoch's most renown newspapers began publishing articles referring to the shipwreck and its findings.

After a research that studied the newspapers "Acropolis" (March 1 to June 30, 1902), "Estia" (January 1 to 19, 1901 and May 1 to December 31, 1902), "Eleutheros Typos" (May 1 to 31, 1902), "Empros" (May 1 to 31, 1902), "Scrip" (May 1 to 31, 1902), "Sphera" (March 1 to December 31, 1902), "Proia" (April 13, 1901 to August 25, 1904), all the articles with reference to the shipwreck were recorded (APPENDIX II). In the newspaper "Proia" no relevant article was found. In the newspaper "Scrip", on May 21, 1902 the Antikythera Mechanism is mentioned for the first time in a registered source (although the Archaeological newspaper published an issue dated on February 1902, in which the Antikythera Mechanism is mentioned, as is noted in G. Nikolaidis' article "Stone statue from Antikythera", which although written in May 21, 1904, it was published in an issue of 1903 in the Archaeological newspaper, thus we can assume that the issues of the Archaeological newspaper are published under a date prior to their first publication). These articles refer mainly to the procedures of the shipwreck's salvaging, to the welding of the statue of Hermes (Adolescent) of Antikythera, to the Mechanism, as well as to the remuneration of the divers for the recovery of the antiquities. Further on, we will make mention of the most important parts of these articles.

On January 1<sup>st</sup>, 1901, the newspaper "Estia" published an article entitled "the Cythera treasure". According to this article, there lies the suspicion that the antiquities of the Antikythera shipwreck are damaged during their salvaging, that is based mainly on the fact that the extremities of the statues are being recovered and not the bodies, since the antiquities are entwined with seaweeds and corals in a compact clump, from where the extremities were left out so as to be more easily detached. On this

hypothesis was based the proposition to suspend the activities, until the technology of the salvaging machines is developed. However, this assumption goes against the fact that the severance of the extremities appears to have happened in the course of time. Additionally, the salvaging of the sizable statue of Centaurs as intact was made possible. But if the fact that the antiquities are entwined in a compact clump stands true, and the activities were to halt temporarily, even in the future it will be a difficult task to brake it loose from the bottom of the sea. Under these circumstances, the ministry of Education decides not to halt the activities, but to increase the number of the employed divers instead, without decreasing their remuneration.

From March 5<sup>th</sup> to May 17<sup>th</sup>, 1902, a series of articles was published by the newspapers “Acropolis”, “Estia”, “Empros” and “Scrip”, referring to the “Hermes of Antikythera” (nowadays he is named the “Adolescent of Antikythera”), the bronze statue that was discovered in the shipwreck. These articles refer to the activities concerning the melding of the statue, since it was found in pieces.

### **Adolescent of Antikythera**

On March 5<sup>th</sup> , 1902, newspaper “Acropolis” published an article entitled “Hermes’ welding, the ministry’s actions”. This article refers to the invitation made by the Ministry of Education to French welder Andre, asking him to undertake the welding of the statue. According to the article, the Ministry is awaiting his response and is willing to call other famous welders to the task, in case Andre denies.

On March 9<sup>th</sup> , newspaper “Acropolis” publishes another article entitled “Hermes’ welding, Andre is not coming”, in which it is reported that the answer of the French welder has arrived and it is negative.

The following day, on March 10<sup>th</sup>, 1902, one more article is published by “Acropolis” newspaper, entitled “Hermes’ welding, the ministry’s tries”. According to this article, Andre’s response is not definitive, and he accepts to come under certain conditions. For this reason, minister Momferratos requested from the principal of the French archaeological faculty Omol, to intervene in order for Andre to accept the ministry’s propositions.

On April 7<sup>th</sup> of the same year, newspaper “Acropolis” published another article entitled “Hermes’ welding, Andre’s letter”, which reports that Andre replied positively to the ministry’s proposition to come to Greece and undertake the welding of the statue, and requests to be informed about the conditions under which he will work. According to the article, minister Mosferratos will ask Andre to first come to Greece and then they will discuss the conditions. Also, Egyptian welder Visanto will come to Greece for the welding of the statue, whose cooperation was ensured by the General Agent of Greece in Egypt.

On April 16<sup>th</sup>, 1902, newspaper “Acropolis” publishes an article entitled “Hermes’ welding, Andre’s conditions”. According to this article, Andre agreed to undertake the statue’s welding, under the condition that he is remunerated with the sum of 12 thousand drachmas. Ministry replied that it’s impossible to pay him this sum, and suggests that he comes to Greece in order to discuss matters. Andre agreed with this, and is expected in Greece during the first fortnight of May.

One more article was published by the newspaper “Acropolis” on May 2<sup>nd</sup>, 1902, entitled “the Adolescent of Antikythera, Andre’s arrival”. According to this article, Andre took his departure from Paris 3 days ago, and will arrive to Greece the coming Friday or Saturday. Immediately after his arrival, he will examine the statue and he will hand in a presentation, as did Viennese Stourm, so as to demonstrate the way of the statue’s welding, and he will submit to the Government his terms. The difference between the two welders is that Stourm under no condition will he accept to come to Greece and undertake the statue’s welding.

On the same day, May 2<sup>nd</sup>, 1902, one more article was published, by the newspaper “Estia”, entitled “When Andre comes”, according to which Andre departed from Marsalis the previous day and arrives to Piraeus on the coming Monday.

On May 3<sup>rd</sup>, 1902, newspaper “Empros” published an article entitled “Mr. Andre arrives on Monday”. According to this article, on the previous day the ministry of Education was notified that Andre departed from Marsalis boarding Messazeri’s steam vessel and will arrive to Piraeus on Monday, May 6<sup>th</sup>.

On the same day, May 3<sup>rd</sup>, 1902, newspaper “Scrip” published an article entitled “The welding of the Bronze Statue”, according to which the ministry of

Education was notified with a telegram from Paris about the departure of the French welder Andre to Piraeus.

On May 5<sup>th</sup>, 1902, newspaper “Scrip” published an article entitled “Andre’s arrival”. According to this article, on the following day Andre will arrive to Piraeus, therefore the ministry of Education assigned principal of Piraeus’ high school Dragatsis the task of Andre’s reception, organizing a party in his honor.

On May 7<sup>th</sup>, 1902, an article was published by the newspaper “Estia”, entitled “ The welding of Hermes statue”. According to this article, that morning Andre visited the Museum accompanied by the minister of Education and the principal of the French Archaeological faculty, where he examined the statue and concluded that its welding was possible. After a conference with Minister Mosferratos he announced to the ministry that the welding would be preferably done in September, when the weather will have chilled, and that he would return to Paris until then.

On the same day, May 7<sup>th</sup>, 1902, newspaper “Empros” published an article entitled “Andre’s arrival” according to which Andre arrived to Piraeus on the previous day and upon his arrival, he was provided with every convenience possible from Piraeus Authorities and his luggage did not incur import duties. Mr. Andre expressed his admiration for the Greek climate and went to the railway station from where he departed to Athens, where he arrived in 13.30. Mr. Andre, who currently resides in hotel “Minerva”, had a conversation with the general secretary of the ministry of Education Al. Kolyvas and express his gratitude for the honor of being assigned the great work of welding of Hermes’ statue. Next, Andre, accompanied by Kavvadias, visited the Archaeological museum, examined the statue and expressed his admiration for its artistry. He asked to examine it for a second time, and then he would submit to the ministry a presentation with his suggestions about the welding, as Stourm had done. Also, Andre expressed a first estimation that the welding of the statue, though it wouldn’t present many difficulties, will last several months and he assured that his work will be proportional to the huge value of the statue, and will be performed in such a way that future possibilities of damage will be excluded.

Also on the same day, newspaper “Scrip” published an article entitled “the Welding of the Bronze Statue”. According to this article, Andre arrived to Piraeus on the previous day around 13.00, where he was impressed by the large number of shoe-

shiners that approached him to offer their services. Around 15.00 he visited the ministry of Education, where he discussed with the General Secretary Kolyvas. Furthermore, Andre will visit various antiquities, such as those that are kept in a special chamber in the Piraeus Gymnasium.

On May 8<sup>th</sup>, 1902, newspaper “Estia” published one more article entitled “The welding of Hermes, Andre’s presentation”, according to which that morning Andre submitted his report about the welding of the statue to the ministry of Education. No reference to his remuneration was made, as it was decided that this matter would be dealt with later.

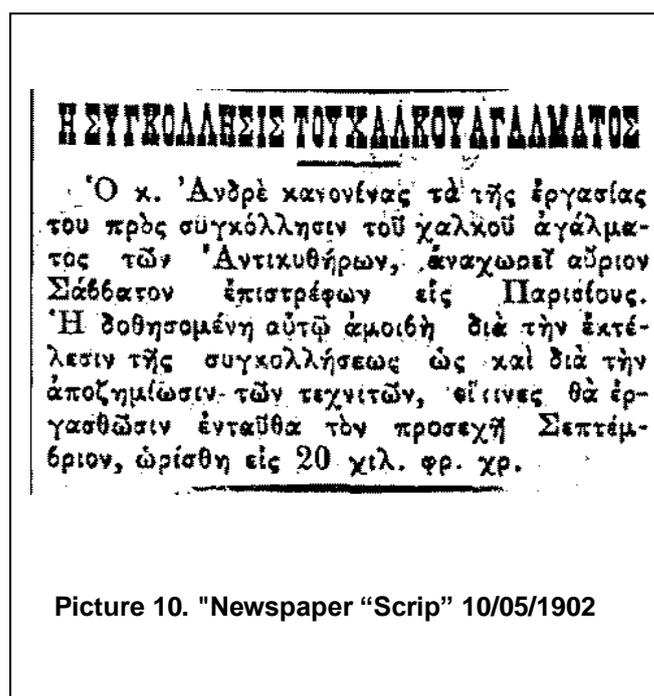
On that day, May 8<sup>th</sup>, 1902, newspaper “Scrip” published an article entitled “the Welding of the Bronze Statue”, according to which in the morning of the previous day Andre went to the Museum with the ministers Momferratos and Triantafullakos and the principal of the French Archaeological faculty Omol, where he, thoroughly this time, examined the fragments of the statue. Andre proposed that the welding would take place in September, when the weather would chill, and he will submit a report to the Ministry considering the way of the welding, and he will discuss as well the matter of his remuneration.

On May 9<sup>th</sup>, 1902, the same newspaper “Scrip” published an article entitled the Welding of the Bronze Statue”. According to this article, on the previous day Andre submitted to the Ministry a presentation regarding the welding of the statue, where he proposes that he makes the preparations in Paris, and he returns to Athens in September to weld the statue. The same afternoon, he went to the Museum to examine the fragments of the statue for one more time.

On the same day, May 9<sup>th</sup>, 1902, newspaper “Empros” published an article entitled “Mr. Andre’s suggestions, the welding of Hermes – The time and way of the welding – the required expenditure” according to which on the previous day Andre submitted to the Ministry his suggestion about the welding of the statue and suggests that the welding begins in September, and that it will be done using a mixture of his own invention, with which he will complement the missing limbs from the statue. Stourm had proposed something similar, the difference being that he proposed to fill the insides of the statue with the mixture. On the contrary, Andre promised to place an iron garland in the statue’s interior, so as to exclude future damage, and that the time

the welding will last will not exceed 2 months as well. The minister of Education replied in the afternoon that he accepts the suggestions, although there was no talk of Andre's remuneration that is expected to range between 15 and 20 thousand drachmas. Andre will depart to France, from where he will return in the end of August.

On May 10<sup>th</sup>, 1902, the same newspaper published an article entitled "the Welding of Hermes, what will it cost – Mr. Andre's departure" according to which



Picture 10. "Newspaper "Scrip" 10/05/1902

Andre will depart from Piraeus with Messazeri's steam vessel. His remuneration cannot exceed 20000 drachmas, a sum which is average in proportion to the work of the welding.

On the same day, May 10<sup>th</sup>, 1902, newspaper "Scrip" published an article entitled "the Welding of the Bronze Statue". According to this article Andre will depart the

next day from Piraeus and return back to Paris. His remuneration will come up to 20000 drachmas.

On May 11<sup>th</sup>, 1902, newspaper "Empros" published an article entitled "Mr. Andre in Piraeus", according to which in the morning of the previous day, Andre visited the Archaeological Museum of Piraeus.

On May 17<sup>th</sup>, 1902, newspaper "Scrip" published an aarticle entitled "the Welding of the Bronze Statue". According to this article, Andre upon his return to Paris, sent a letter to the minister of Education Momferratos, in which he thanks him for his hospitality in his country and for the acceptance of the suggestions he made himself.

## **Tries in regard of finding a crew for the salvaging of the antiquities and the payment of the divers**

Another subject which greatly concerned the newspapers, was the procedure of finding a crew for the salvaging of the antiquities from the bottom of the Antikythera sea (nowadays no more submarine excavations in the bottom of Antikythera sea that we know of have taken place, since 1901 and thereafter), and the payment of the divers as well.

On April 1<sup>st</sup>, 1902, newspaper "Acropolis" published an article entitled "the submarine Antiquities, Monaco's Machines". From this article we conclude that the ministry of Education asked the prince of Monaco to concede his state's diving machines to the Greek government. According to the article, the prince replied that he concurs, as long as he is informed about what the machines will be used for, since they are particularly sensitive. The ministry will send the prince its reply within the week, notifying him that the machines will be used for the salvaging of the antiquities.

On May 2<sup>nd</sup>, 1902, newspaper "Acropolis" published one more article entitled "the submarine Antiquities, the reply of prince of Monaco". According to this article, prince of Monaco replied to the Ministry that he refuses to concede the machines that were asked from him and that they are inappropriate for the task that the Greek government wants to use them to perform. After this, the Greek government decided to appeal to the archaeological association of Geneva, which has machines appropriate for the salvaging of the antiquities.

On the same day, newspaper "Sphere" published an article entitled "the Antiquities in the Bottom of Antikythera Sea", according to which the ministry of Education wants to contact the Geneva Association, in order to ask them to send divers to help with the salvaging of the antiquities in Antikythera, whose payment will be proportional to the value of the objects that will be salvaged.

On May 10<sup>th</sup>, 1902, newspaper "Eleutheros Typos" publishes an article entitled "The divers in Antikythera, their remuneration". According to this article, the ministry of Education asked the ministry of Economy to issue a warrant of 70000 drachmas for the payment of the divers in Antikythera that salvaged the antiquities

from the bottom of the sea. This approbation will be presently certified by a Royal Edict.

### **Finding the fragments of Antikythera Mechanism**

Another matter that concerned the newspapers was the bronze fragments of a mechanism that were discovered among the shipwreck's antiquities, the fragments of the Antikythera Mechanism.

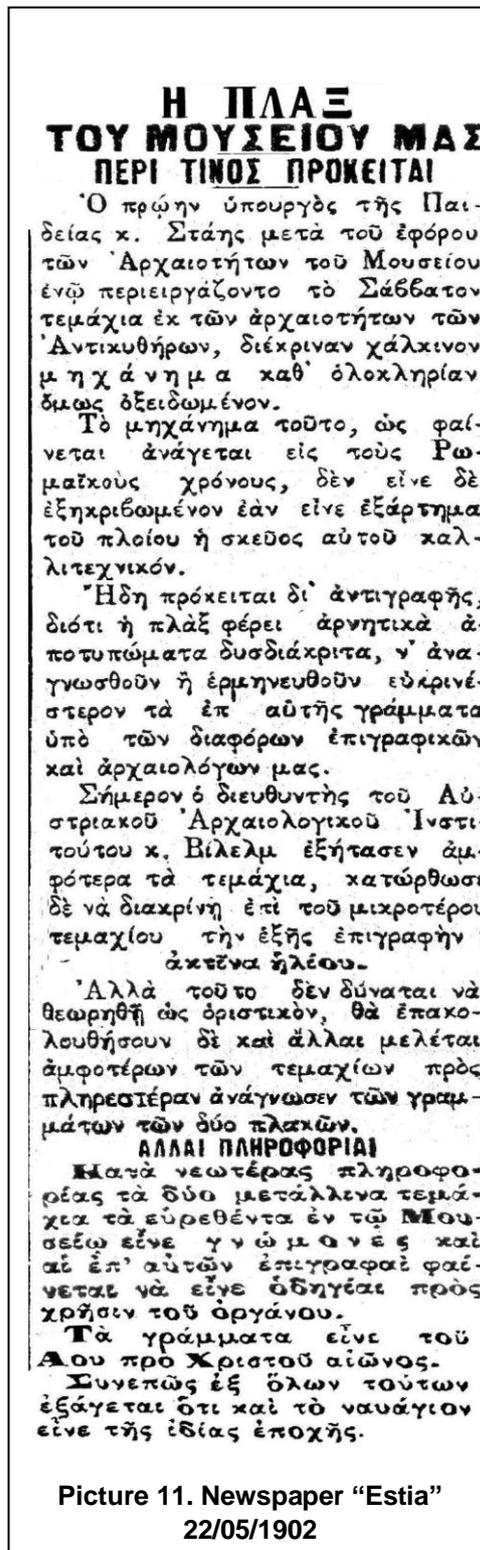
On May 21<sup>st</sup>, 1902, newspaper "Scrip" published an article entitled "Great Discovery among the Antikythera Antiquities" according to which, the previous afternoon former minister Stais, during his visit to the Archaeological Museum, accompanied by his wife and sister-in-law, and while he was in the room that the Hermes statue was kept, noticed accidentally pieces of copper upon which he discerned a fragment of a wheel with cogs encircling its external perimeter. Investigating and gathering more of these pieces, he managed to assemble them, so as the whole wheel was formed, and he noticed around it an inscription with letters that were distinguishable, when watched from the back surface of the plate. The reading of the inscription was not possible at that time and that is why the help of the principal of the Austrian Institute will be requested, a great archaeologist specialized in reading ancient inscriptions. After the reading of this inscription, the case of the temporal period in which the antiquities of Antikythera belong will be solved. (If we assume that the date that is recorded in the end of the Archaeological Newspaper's articles, February 15<sup>th</sup> 1902, is the actual date of its distribution, there is definitely the possibility that this publication was made in service of public relations, and that the discovery of the Mechanism's fragments by the archaeologists had occurred several months before, since there is reference to the Mechanism in this particular article of the Archaeological Newspaper).

On May 22<sup>nd</sup>, 1902, newspaper "Estia" published an article entitled "the Payment of the Kytherian Divers". According to this article, on that day, the minister of Education Mosferratos signed a monetary warrant of 70000 drachmas for the payment of the divers that participated in the salvaging of the Antikythera antiquities.

On the same day, May 22<sup>nd</sup>, 1902, newspaper “Estia” published an article entitled “our Museum’s Plaque, what it is about”. According to the article, on the previous Saturday, Sp. Stais, former minister of Education, accompanied by the steward of antiquities and while they were examining pieces of the antiquities, they noticed a bronze mechanism completely rusty. This mechanism was estimated to belong in the Roman epoch and it is unknown whether it was a part of the ship’s manufacture. The mechanism’s plaque bears many inscriptions which archaeologists and epigraphists are called to interpret. On that day, Wilhelm, principal of the Austrian Archaeological Institute, while examining the two pieces of the mechanism, he discerned on the smallest one the inscription “sun’s ray” (“**ακτίνα ηλίου**”). In the end of the article, it is reported that according to new information, these two metal pieces appear to be squares and the inscriptions appear to be operating instructions for this instrument. The letters are of the 1<sup>st</sup> century BC, therefore the shipwreck must have occurred in the same era.

Also, on the same day, May 22<sup>nd</sup>, 1902, newspaper “Scrip” published an article entitled “the Antikythera Antiquities, the Plaque with the inscriptions”. According to this article, the accidental discovery of the plaque by Stais is of great importance, as it may provide us with information concerning the age of the antiquities of the shipwreck

and what the bronze statue that was denominated Hermes actually represents. On the



previous day, archaeologist Vyzantinos examined the plaque for the first time, where on one of the pieces he discerned the letters “ΤΩΝ...” and “ΙΝΟΝ...” and on the other piece the letters “...ΓΝΩΜΩΝ.... ” and “...ΦΙΡΜΙΟΣ...”. In Vyzantinos’ opinion, the antiquities age between 150 BC and 200 AD, therefore the plaque will be examined again more thoroughly, in order to determine the accurate date. To this purpose, Wilhelm, the principal of the Austrian Institute will visit the Museum, along with other archaeologists specialized in reading inscriptions.

On May 23<sup>rd</sup>, 1902, newspaper “Estia” published one more article entitled “The Antikythera plaques, Archaeologists’ opinion”. This article refers to the two bronze plaques that were found in the Museum and mentions that even though they were examined, their use did not become understandable. Wilhelm expressed his opinion that maybe it is a solar watch, while Svoronos claimed that it is an astrolabe. According to the article, the instrument was placed inside a bronze compass, wherein were graven the operating instructions of the instrument upon a leaden plaque. Svoronos suggested that it was a unique heirloom, and that it should be studied by astronomers so as its precise use would become understandable, before any attempt was made to clean it.

On the same day, May 23<sup>rd</sup>, 1902, newspaper “Acropolis” published an article entitled “The Museum’s Plaque”. According to the article, a bronze machine was discovered among the statues of Antikythera, which has reference to the Roman times, and consists of two metal pieces that are squares, where on the inscriptions appear to be instructions concerning the instrument’s use. The letters on the inscriptions are of the 1<sup>st</sup> century BC.

The same issue included one more article entitled “The Divers of Cythera”, according to which at previous day’s noon the minister of Education Momferratos signed the monetary order concerning the payment of the divers of Antikythera.

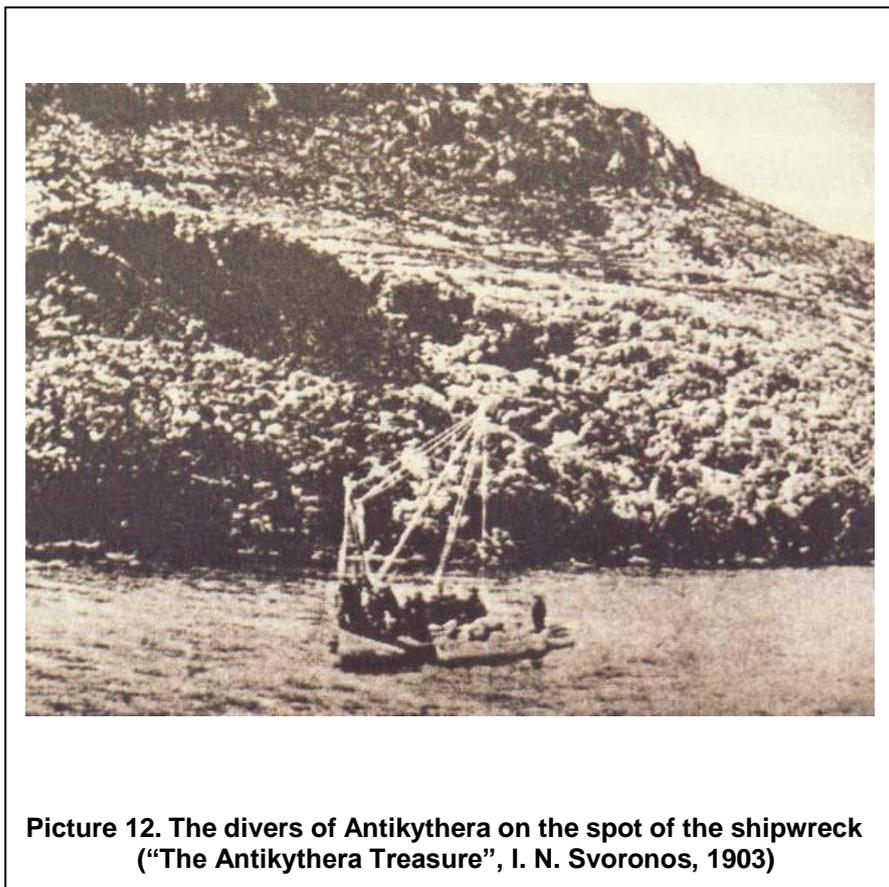
On the same day, May 23<sup>rd</sup>, 1902, newspaper “Scrip” published an article entitled “the Bronze Plaque of Antikythera, nautical Compass”, according to which, as the thorough examination of the bronze plaque that took place on the previous day shows, it is about a part of a nautical instrument, most probably a square, that was used as a compass. A discovery like this is of huge importance, since no similar instrument has been salvaged. The inscriptions on the plaque are operating

instructions for the instrument and the letters pertain to the 1<sup>st</sup> century BC. Wilhelm managed to read the inscription “ray of the sun” on the totally rust plaque, while the examination of the bronze pieces continues.

Also in the same issue, there was another article entitled “the Remuneration of the divers of Antikythera” according to which, on the previous day, the minister of Education signed a monetary order for the payment of a part of the remuneration to the divers of Antikythera, that is estimated to be a sum of 70000 drachmas.

Newspaper “Eleutheros Typos”, on the same day, May 23<sup>rd</sup>, 1902, published an article entitled “the Antikythera antiquities” which mentions that on the previous day the minister of Education, Momferratos, gave to the ministry of Economics the monetary order for the payment of the divers of Antikythera, which reaches the total sum of 70000 drachmas.

On the following day, May 24<sup>th</sup>, 1902, the same newspaper published an

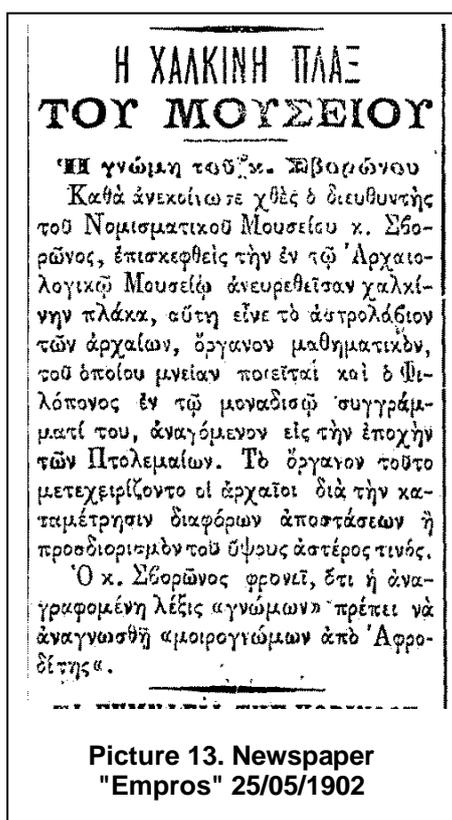


article entitled “Archaeological finding”. According to this article, while former minister of Education Sp. Stais, along with the steward of antiquities were processing the antiquities of

Antikythera, they noticed two bronze pieces, parts of a machine, entirely rust, which

machine could be a component of the ship itself. The two pieces bear inscriptions, which were examined by the principal of the archaeological Institute Wilhelm, who managed to discern on the smallest one the words “Ακτίνα Ηλίου” (Ray of the Sun). According to the specialists, the pieces are squares, and the inscriptions are operating instructions for the use of the instrument. The letters are of the 1<sup>st</sup> century BC, therefore it is assumed that the shipwreck is of the same era, however this assumption is kind of wildcat.

On May 25<sup>th</sup>, 1902, newspaper “Scrip” published an article entitled “the Antikythera Plaque”, according to which the General Steward of Antiquities, although he examined the bronze plaque that was found among the antiquities, he did not reach a conclusion. On the other hand, numismatist I.N. Svoronos, after examining the plaque, expressed the estimation that it is the so-called astrolabe (his estimation was also based upon the observation of a ring), of which Ptolemaios speaks, and he presumed that the letters “...γνώμων” (which means square), belong to the word “μοιρογνώμων” (which means protractor) . He also discerned the words “από Αφροδίτης” (which means “from Aphrodite”). This instrument, in Svoronos’ opinion, was used to measure the distance between stars and pertains to the 1<sup>st</sup> century BC.



On the same day, May 25<sup>th</sup>, 1902, newspaper “Empros”, published an article entitled “the Museum’s bronze Plaque” according to which the principal of the Numismatic Museum I.N. Svoronos, after examining the bronze plaque that was discovered in the archaeological Museum, he suggested that it was the astrolabe of the ancient times, of which Filoponos speaks in his book, and is of the Ptolemaic era. This instrument was used to measure distances between stars, as well as their altitude. Finally, in Svoronos’ opinion, we must read the phrase “μοιρογνώμων ἀπὸ Αφροδίτης” (which means

“protractor from Aphrodite”) instead of the word “γνώμων” (“square”).

On June 1<sup>st</sup>, 1902, newspaper “Acropolis” published an article entitled “the Astrolabe, No discovery” according to which the investigations concerning the use of the so-called astrolabe that was discovered among the antiquities of Antikythera have not reached a conclusion yet, since the damage it has sustained due to its long stay in the bottom of the sea is huge. Some researchers, referring to ancient authors, claim that it was used to measure the geographic latitude, while others that it was a purely astronomical instrument.

On June 5<sup>th</sup>, 1902, newspaper “Sphere”, published an article entitled “Salvaging of the

Antikythera

antiquities”. According

to this article, the Life-

Guard Association of

Geneva suggested to

the ministry of

Education that it would

undertake the salvaging

of the antiquities of

Antikythera, under the

condition that the

Government would pay

them 5000 francs for

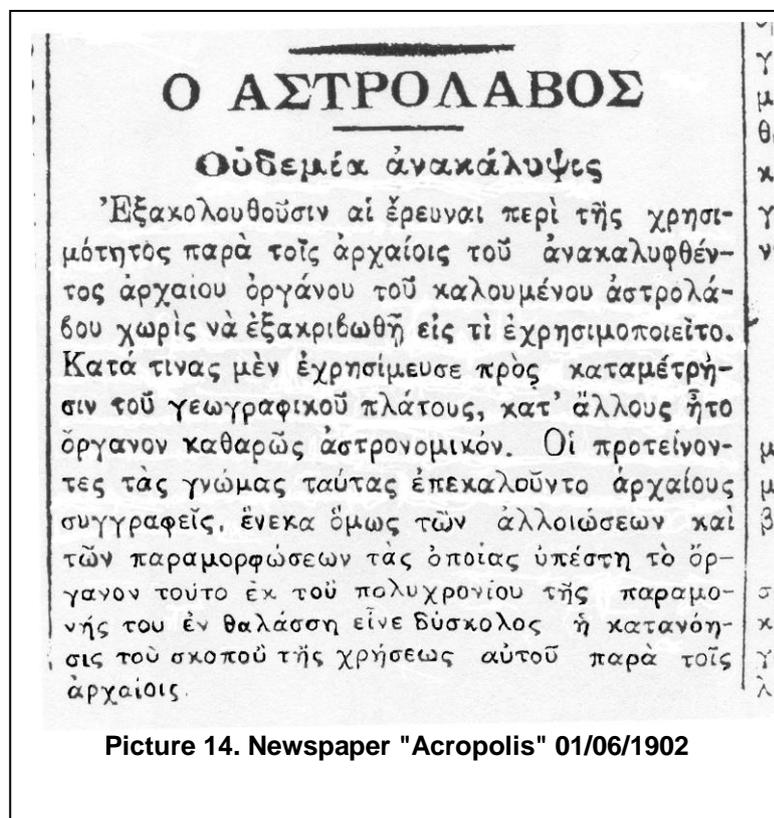
the transportation of the

tools, 100 francs for

every workday and 50% of the total monetary worth of the antiquities that were to be

salvaged. The Government turned down this terms, and will submit new proposals.

On June 6<sup>th</sup>, 1902, newspaper “Estia” published an article entitled “the salvaging of the antiquities of Antikythera”, according to which it is presumed that the minister of Education Momferratos turned down the proposition of the Life-Guard Association, one of the most renowned salvaging companies, as it obtains machinery



Picture 14. Newspaper "Acropolis" 01/06/1902

that can operate at a depth of 150 meters and salvage the antiquities from the bottom of the sea of Antikythera, because the conditions that the Association imposed were such that the Government could not accept without the enactment of a new law, thus the Government asks for the moderation of these conditions.

On September 26<sup>th</sup>, 1902, newspaper “Sphere” published an article entitled “The Hermes of Antikythera”. According to this article, French welder Andre announced to the ministry of Education that the welding of the statue of Hermes is almost completed, and only a few complementary operations remain, that will last until the coming Monday at the most.

On October 4<sup>th</sup>, 1902, newspaper “Estia” publishes an article entitled “Farewell”, in which it gives thanks to the French welder Andre and fares him well, now that he returns to his homeland after the completion of the welding of the statue of Hermes.

On October 28<sup>th</sup>, 1902, the same newspaper published an article entitled “the antiquities of Antikythera, Mr. Momferratos’ decision”. According to this article, Athinogenis, delegate of the minister of Education in Geneva about the conduct of the negotiations with their life-guard Association concerning the salvaging of the antiquities of Antikythera, has returned to Greece and two days ago, conferred with minister Momferratos. The minister authorized Athinogenis during his visit to Geneva to conduct new negotiations with the Association, and notify to them the conditions under which the Ministry agrees to strike a definite bargain.

On November 19<sup>th</sup>, 1902, newspaper “Estia” publishes an article entitled “the Antikythera antiquities, how they will be salvaged, Pino submarine, great invention”, according to which the Greek Government contacted the Italian inventor Pino about the salvaging of the antiquities of Antikythera, who asked for an iniquitous sum of money as a remuneration in order to undertake it. Pino’s invention, which could carry out the salvaging of the antiquities, is a submarine which has the capability to go down at the depth of 150 meters and work there for 12 hours straight.

#### 2.1.4. “Panathinaia” Magazine

Apart from the newspapers, various magazines were concerned with the subject of the Antikythera shipwreck and the antiquities that were discovered on it. One of these magazines is “Panathinaia”, from where all the relevant articles that were published from October, 1901 to March, 1902, as well as from June 30<sup>th</sup>, 1903 to September 15<sup>th</sup>, 1904 are recorded. Following, there is a collective reference.

On June 30<sup>th</sup>, 1903, in the “Archaeology” column, there was an article published concerning the book “National Museum of Athens, photocopies of its treasures accompanied by explanatory text by I. N. Svoronos”, which refers to the antiquities that are kept in the National Museum. The first and the second number of the book, are dedicated to the findings of the Antikythera shipwreck, and include lots of pictures that serve the purpose of asserting the outlook of the author I.N. Svoronos. In this book, Svoronos maintains arguably that the most marvelous (in his opinion) statue that was discovered in the Antikythera shipwreck, represents Perseas, holding the head of Medusa in his left arm. He also claims that the head that was discovered and considered to be the head of a boxer, belongs to the bronze statue of Deinias from Argos. Svoronos, in order to support his claim, sketched a synthesis of the statue’s parts, by the picture that is found on a discovered coin of Argos that he believes to be an accurate replica of the statue. The body of the statue, that is missing, has been seen by the divers at the bottom of the sea. Svoronos, apart from the aforementioned, has achieved other constitutions of many of the Antikythera antiquities.

On December 31<sup>st</sup>, 1903, in the “Archaeology” column, there was an article published entitled “the Antikythera astrolabe”, written by Pericles REDIADIS. This article refers to the mechanical construction that was accidentally discovered by the minister of Education Sp. STAIS among the antiquities of Antikythera. According to the article, the use of the instrument, on which there was an assembly of gear-wheels, remains unknown due to the damage sustained because of time. The clearing of this bronze instrument, that consists of three pieces, is very difficult due to its long stay at the bottom of the sea. REDIADIS, in this article, assumes that if there was some sort of spring as part of the instrument, we could then consider it a type of clock. However, the inscriptions on the instrument that are probably its operating instructions, pertain according to Svoronos to the 3<sup>rd</sup> century AD, a time when clocks of such type were

not invented yet. No similar mechanism of the ancient times has been retrieved, so it is unlikely that it can be considered as a type of nautical instrument. All the same, parts of the inscriptions on the instrument that were made possible to read by Svoronos and Wilhelm, include astronomical words and terminology. If we add to this the fact that the measure of time with the help of the stars' position was important to the ancient sailors, and that astrolabes enabled this measurements, we can't but draw the conclusion that this discovery in the shipwreck was also an astrolabe, somewhat more advanced than the contemporary ones. The instrument was kept in a wooden box and its measurement, amplitude and height, was 16 and 13 cm correspondingly.

In the number that was published in the fortnight from 15 to 31 of July in 1904, the article that is contained in the "Archaeology" column refers to the backing of Svoronos' outlook by foreign archaeologists, with regard to the findings in Antikythera. This viewpoint asserts that the findings come from Argos and their transportation took place in the times of Constantine the Great. Also, the great bronze statue is considered to represent Perseas and to be of Lysippus' school of art.

In the number that was published on September 15<sup>th</sup>, 1904, in the "Archaeology" column, the article refers to the book that was published by I. N. Svoronos under the title "The statue of the Defender from Antikythera and Attic leaden symbol". In this book, Svoronos relates the so-called "Aiming" statue that was found in the Antikythera shipwreck with the Attic leaden symbol. In Svoronos' opinion, this statue represents a tired soldier in defense.

### **2.1.5. "The Antikythera Treasure", I. N. Svoronos**

In 1903, a study about the Antikythera shipwreck and its findings was published by Beck and Bart, authored by I. N. Svoronos. Further down, we will refer concisely to some of this book's passages, in which there are included lots of pictures, since it is about a particularly extent study where Svoronos refers explicitly to the chronicles of the shipwreck's salvaging, to the procedures that followed the salvaging of the antiquities and individually to each one of them.

The book starts with describing the discovery of the shipwreck. On Easter of 1900 two ships boarded by sponge-divers from Simi, during their return from the north coasts of Africa (according to the testimonies of the divers' relatives, the sponge-diving activities lasted from spring to August-September, therefore Svoronos might have made a mistake, and the sponge-divers were sailing to Africa), cast anchor at Antikythera due to severe weather, where at the spot "Pinakakia", 25 meters away from the shore of "Glyfadia" cape in the island's NE, they dived looking for sponges. Then, diver Elias Stadiatis (or Lykopantis, as it was his real name) at a depth of approximately 35 fathoms, gazed wonder-stricken at a solid pile of bronze and marble statues that extended beyond 50 meters. The diver pulled off one bronze statue's right arm and rose to the surface to announce his discovery to his comrades. Then, captain Dim. El. Kontos went down to the bottom of the sea himself to make sure of Stadiatis' claims, and returned to Simi with his crew.

After many months of conferences with the local squires (Simi at the time was occupied by Turkish forces), they decided to inform the Greek Government of their discovery. So, on November 6<sup>th</sup>, 1900, the sponge-divers from Simi, accompanied by the professor of Archaeology A. Oikonomou, also from Simi, presented themselves to the contemporary minister of Education Sp. Stais and informed him of their discovery, demonstrating as evidence the bronze arm that Stadiatis had pulled off the statue. Also, they announced that they were willing to undertake the salvaging of the antiquities with a remuneration, and under the condition that the Government would provide them with the necessary salvaging equipment and a military ship for assistance. Stais accepted their offer and on November 24<sup>th</sup> they departed to Antikythera followed by the troop ship "Mykali".

The salvaging of the antiquities by the divers were rendered particularly difficult due to tempests that prevailed and lasted many months. On December 27<sup>th</sup>, 1900, a telegram arrived in Athens that announced the salvage of the bronze statue of Apollo or Hermes of Antikythera.

Around the end of January, 1901, the divers announced to the ministry of Education that it was impossible to salvage some of the heavy marble statues that they had found at the bottom of the sea and the contemporary minister Sp. Stais decided to go to the place of the shipwreck himself, along with the general steward of antiquities

P. Kavvadias and the legal adviser of the ministry, Emm. Lykoudis. They arrived at Antikythera on February 8<sup>th</sup> on “Mykali”, that meanwhile had returned to Piraeus, whose captain was commander Th. Theoxaris.

Lots of marble statues, considerably shattered, were salvaged by the bottom of the sea and were transported to the Archaeological Museum in the middle of February.

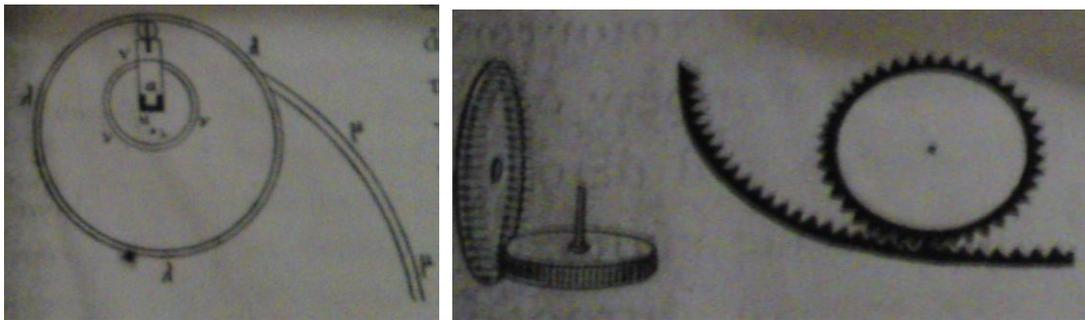
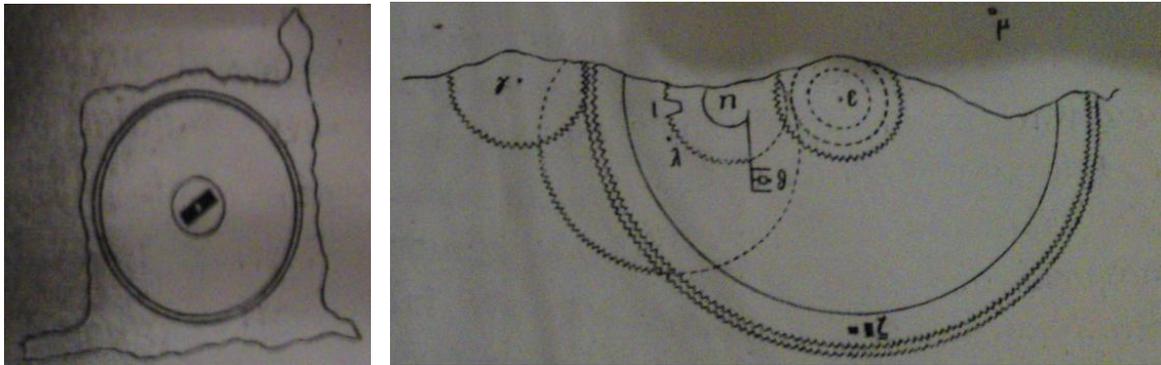
On February 19<sup>th</sup>, the exhausted divers refused to continue working and Stais convinced them to resume the dives for eight more days over additional remuneration, and under the promise that after the passing of the eight days they will be given a tow to Piraeus.

After the work ceased, one of the divers’ captain, Fotiadis, presented himself to the minister Sp. Stais and announced that he was willing to hire other divers in order to continue the salvaging of the antiquities. In fact, on March 9<sup>th</sup>, the captains from Simi stated that they hired a new crew with ten divers instead of the former six, and they departed to Antikythera on March 17<sup>th</sup>.

The work ceased on September 30<sup>th</sup>, 1901, being impossible for the divers to salvage the remaining antiquities, with the tragic account of the death of one of the divers and the disablement of two others. Their remuneration reached the sum of 150000 drachmas, 500 drachmas to each contribution of the Archeological Newspaper.

Following, Svoronos refers to the procedures of the welding, the clearing and the study of the shipwreck’s antiquities. He describes the procedures of the welding of the bronze statue that he assumes that it represents Perseas (at first it was identified with Hermes), and supports his claims that these antiquities come from Argos.

Next, he comprehensively describes each one of the salvaged findings, one of which was the Antikythera Mechanism. Svoronos, not being sufficiently educated on the subject, assigned the commander of the Navy P. Rediadis the task of writing an article about the Mechanism, which he included in his book. Rediadis writes a thorough description of the instrument and analyzes his viewpoint regarding its use and origins.



**Picture 15. Rediadis' sketches regarding the Antikythera Mechanism**

Rediadis begins with underlining that the instrument is almost completely damaged due to its long stay in the sea and it is impossible to comprehend its exact nature. Three pieces have been found and a small wheel (A, B, C, D), that belong to the Mechanism. On piece A, that bears marks of the wooden case wherein the instrument was, gear-wheels appear on both its sides. Piece B bears visible, indistinct parts of inscriptions, some of which were read by Svoronos and are included in the book. Traces of gear-wheels are detected on it also. On piece C there are distinguished inscriptions on one of its sides, and on the other one there is one circle ascribed into another circle. Piece D is a small gear-wheel.

Rediadis continues making his personal observations regarding the way the instrument was constructed and its inscriptions and he characterizes it as one artifact of extreme value, such as no similar has ever been confirmed to exist in the ancient times. Finally, he reaches to the conclusion that the Mechanism was an hypsometric instrument, on which, according to the operating instructions, the latitude of the location and the season of the year were regulated, after the astronomical triangle was mechanically solved by it.

### **2.1.6. “The Findings from Antikythera”, Valerios Stais, 1905**

In 1905 a dissertation was published by archaeologist Valerios Stais regarding the date of the Antikythera shipwreck, the origins of the antiquities that were found in it and the so-called “Adolescent” from Antikythera, entitled “The Findings from Antikythera”. V. Stais underlines in his book that it is of great importance to define the date the shipwreck occurred, as well as the location from where the ship set sail only to end up in the bottom of the Antikythera sea.

The author objects to Svoronos’ outlook and considers it impossible that the origination of the ship was Argos. With regard to the chronological date of the shipwreck, V. Stais refers among other things to some of the pottery objects that were found in the shipwreck, which he believes that due to their pattern they were objects that belonged to the ship and they bore Greek and Latin letters. Hence, he draws the conclusion that the time of the shipwreck is set in the Greco-Roman years and that the ship set sail from or had as a destination a Roman country.

He refers to the inscriptions on the Antikythera Mechanism, an artifact he considers that plays a determinative role in the estimation of the time the shipwreck occurred, since he has no doubts that it comprised a component of the ship, thus it is contemporary with it. The way the letter “A” is graven in the inscriptions, places the construction of the instrument between 4<sup>th</sup> and 1<sup>st</sup> century BC, and letter “Ω” exists in inscriptions of the 2<sup>nd</sup> and 1<sup>st</sup> century BC. Another finding in the shipwreck, a stamp, gives us exactly the same information as the Mechanism does, considering the letters that are imprinted on it. These are only some of the arguments that lead Stais to conclude that the shipwreck could not have taken place after the 1<sup>st</sup> century BC.

According to V. Stais, the ship must have set sail from a port in Greece or Asia Minor, with some port of the Roman Empire as its destination. The purpose of this journey, was the transportation of artifacts, statues and pottery objects to be sold in the West, something very common during the Greco-Roman times.

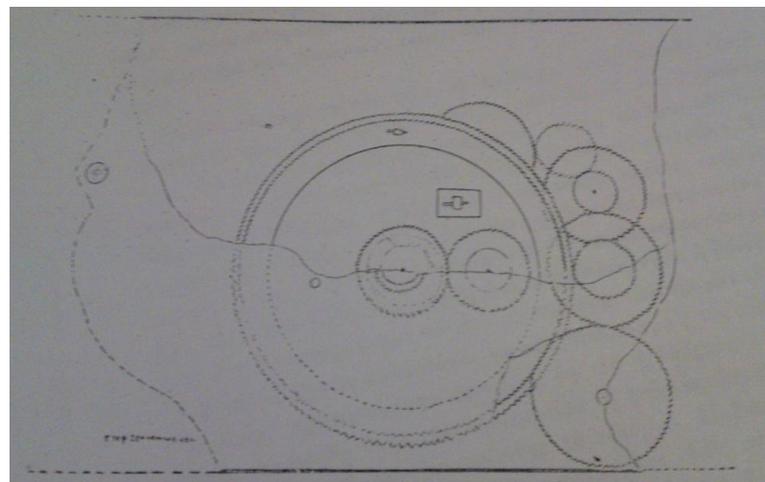
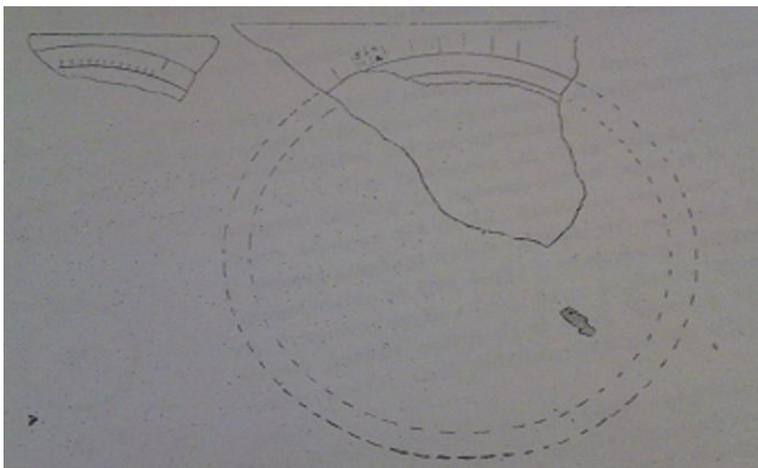
These artifacts were not all originals. Most of them, especially the marble statues, were copies of other great works of art, produced en mass to be sold.

In regard to the bronze statue of the “Adolescent” of Antikythera, V. Stais speculates that it represents Paris, who holds an apple in his right lost hand, sculpted by Eufranoras, of whom no other sculpture has been retrieved.

### **2.1.7. “About the Antikythera Treasure”, Konstantinos Rados, 1910**

In 1910, Konstantinos Rados, professor of nautical history in the academy of navy novices, authorized and published the book “About the Antikythera Treasure”. In this book, Rados compares the Antikythera Mechanism with astrolabes, relative clocks, mechanical logs and planetariums, finding resemblances and differences. He gives a detailed description of the Mechanism and these other instruments, as well as a small reference to the submarine excavations towards finding antiquities.

According to Rados, the Mechanism is the most mysterious finding of the Antikythera shipwreck, which provides us with very few clues concerning its nature, due to the damage it sustained during its long stay in the sea. Rados counts 15 bronze gear-wheels on the instrument, one of which is double, and served undoubtedly in the rotation of a pointer. He describes analytically the shape and the arrange of the gear-wheels, providing sketches and pictures of the instrument. The author also notes the difficulty that the reading of the instrument’s inscriptions presents, something that if it was to be achieved, would solve all the mysteries pertaining to it.



**Picture 16. Rados' explicatory sketches about the Antikythera Mechanism**

Next, Rados does a description of the classic astrolabe to reach the conclusion that it could not have respect to the instrument that was found in the Antikythera shipwreck, since classic astrolabes did not have gear-wheels.

He goes on, noting that it could not be a nautical astrolabe either, since instruments of this kind were first used in navigation many centuries later, and if we take into consideration that the fact that the inscriptions on the instrument belong to the 1<sup>st</sup> century BC is true, we understand that it would be improbable to relate the Mechanism with something like that, knowing from Vitruvius (M. Vitruv, Pollionis

de Architectura, Lib. IX e. VII: “Arachnem Eudoxus Astrologus”) that in those times, a flat astrolabe was yet unknown even as an astronomical instrument.

Next, he describes the relative clocks and he rules out the identification of the Mechanism with something like that since its graven plaque does not bear the Zodiac, as they do, and its mechanism is way more complicated.

However, we can neither identify the Mechanism with a mechanical log (an instrument that measures distance), according to the author, since this instrument was invented much later on, and lacked the elegance and subtlety that characterize the finding in the shipwreck.

Rados goes on supporting A. Rhem’s point of view, a professor of classical literature, that the Antikythera Mechanism was a kind of Planetarium or Sphere and he describes their history and use.

In the end, Rados refers to the desultoriness of the submarine excavations, such as the salvaging of the Antikythera antiquities, and to the catastrophic consequences to the antiquities.

### **2.1.8. “Pages”, Emm. Lykoudis, 1920**

Emm. Lykoudis, legal advisor of the ministry of Education, on February 7<sup>th</sup>, 1901, went to Antikythera with minister Sp. Stais where he watched at close quarters the salvaging of the antiquities. In the time he stayed there he kept a journal which he published in 1920, entitled “Pages”. Following, I will refer concisely to some points of this journal’s “pages”.

On February 7<sup>th</sup> at 11:00 in the morning, “Mykali” set sail accompanied by “Syros” (a military ship with a steam-engine) and an anchor hoy from Piraeus to Antikythera, with many difficulties. Due to stormy weather, “Mykali” did not arrive at Antikythera until next day’s afternoon at 5:00 a.m. Immediately the divers began working and salvaged marble statues, every single one of them shattered.

In the following day, February 9<sup>th</sup>, the captain of “Mykali” managed to draw close to the rocks on his ship, so a huge statue of a man sitting on a throne was salvaged.

On February 12<sup>th</sup>, the divers succeeded in strapping a huge body of a headless horse, but the ties were loosened, thus the statue was lost in the abyss.

On February 17<sup>th</sup>, a diver announces the possible existence of statues under a huge rock. Immediately it became obvious that the rock had to be hauled, in order to reveal the findings it concealed. The rock was tied to the harbor-tag and was removed. But because it created problems to the ship’s movement, they thought of sending a diver to cut loose the rock and release it. Then, Mr. Stais suspected rightly that this rock could in fact be a big statue, and he requested it would be retrieved in the surface. The rock actually reached the surface and it was revealed to be a statue of Hercules of huge size.

On July 31<sup>st</sup>, Lykoudis returned to the site of the shipwreck (from where he had left on February 19<sup>th</sup>) to watch the second part of the works. In his journal he writes upon that day that the divers claimed that under two big rocks there were marbles, so it was necessary that the rocks were hauled in order to set them free. In fact “Mykali”, with much difficulty, managed to drag the rocks in the abyss and from that spot there was salvaged a mass that consisted of limbs of marble statues, pieces of copper and wood.

On August 2<sup>nd</sup>, during his journey back home to Piraeus, Lykoudis notes down various thoughts regarding the works of the salvaging. Among other things, he comments on the bad condition in which he found the divers during this second visit to the work site. Two of them were left semi-paralyzed and one more, Georgios Kritikos, died from the divers’ disease.

## **2.2 Up-to-date Reports of the Antikythera Mechanism**

In the following years, the mystery that covered up the shipwreck and its findings continued to interest the scientific community. Articles were published

regarding the shipwreck, as well as books – some of them in regard of the Antikythera Mechanism.

### **2.2.1. “Helios” Magazine**

In 1957, Styl. Emm. Lykoudis of Athens Academy (son of Emm. Styl. Lykoudis), wrote and published in “Helios” Magazine (numbers : 343, 345, 347, 348, 350, 351, 355) some articles regarding the Antikythera shipwreck and the findings in it.

Lykoudis published his first article in number 343, in which he reported that the reason he was concerned with this matter after so much time, was the discovery of some notes he kept when the archaeological disputes were taking place. In this first article, he gives a brief description of the Antikythera island.

In number 345, he begins describing an incident, related to the discovery of the shipwreck: In 1897, the Greek government installed optic telegraphs in the islands of Cythera and Antikythera, to enable communication with Crete, since the Turkish administration, the occupant of Crete at the time, had forbidden the transmission of telegraphs to Greece and vice versa. On the holiday of Zoodochos Pigi in 1900, the telegrapher of Antikythera transmitted to the telegrapher of Cythera a report concerning the discovery of an archaeological treasure, which caused a huge stir to the Government and the archaeological circles. This report, noted that ten days ago, on Great Tuesday, 1900, two ships boarded with sponge-divers from Simi, upon returning from the coasts of North Africa (probably this information was mistakenly retrieved by svoronos' book, because as it has been aforementioned, the sponge-divers were heading towards North Africa ), were forced to run aground in the Potamos cove of Antikythera due to severe weather. There, a diver who was searching for sea-food for the fast the days required, found antiquities in the bottom of the sea, that extended at least for 55 meters, and he pulled off the arm of a bronze statue to prove his finding. The captains of the ships, after confirming the discovery by diving to the bottom of the sea themselves, set sail to Simi. Several months after, the two captains presented themselves to the minister of Education, Spyros Stais, showed him the

bronze arm as evidence and requested his permission to retrieve the archaeological treasure with a remuneration. Thus began the salvaging of the antiquities under many difficulties. On December 27<sup>th</sup>, 1900, the salvaging of the great bronze statue of the “Adolescent” was announced and 35 bronze and marble statues were salvaged in total, along with 4 statues of horses, various objects of the ship and piles of arms and legs. From these piles it appears that the statues lying on the bottom of the sea are much more than the salvaged ones, fourfold at least.

In number 347, Lykoudis refers to the divers from Simi and to the dedication they demonstrated all along the salvage procedures. Next he refers to the site the antiquities were found upon, on the bottom of Antikythera sea. They occupied a space of 52 meters along, and lied classified in piles, the bronze apart from the marble ones. On this site, only one human skeleton was found, which indicates that the crew of the ship and its passengers, if there were any, had the time to abandon it before it went down.

In number 348, he describes the layout of the antiquities on the bottom of the sea. The first finding was found 25 meters away from the shore, a spot where the prow of the ship must have been. The collection of the bronze statues followed, that had apparently been placed in the first hold as lighter than the marble ones, so that the ship would maintain balance. In the same place four leaden cones were found, that in Lykoudis’ opinion were used for measuring the distance of the bottom of the sea that was done from the prow, while approaching the shore. On the same spot various utensils of cheap manufacture were also found, a fact that indicates that in that part of the ship there were the lodgings of the ship’s crew. Next, in the direction of the stern, the collection of the marble statues was found, and far behind that luxurious objects that could have belonged to the topmost members of the ship’s crew, whose lodgings are usually in that side. Lykoudis thereafter refers to the Antikythera Mechanism, which he characterizes as the most mysterious finding of the shipwreck and basing his assumption on the fact that Alexandria of Egypt monopolized the manufacture of such kind of instruments, he claims that the treasure could have originated from there.

In number 350, Lykoudis refers to the statues that were found in the shipwreck, some of which were originals while some others being copies of senior pieces of art. Some of these copies appear to have been loaded on the ship

immediately after their make, a fact that proves that they were manufactured en masse so as to be sold. Next, he describes some of the most renowned statues that were found among the pieces of the treasure.

In number 351, Lykoudis' article refers exclusively to the great bronze statue of the Adolescent of Antikythera, to the procedures of its clearing and welding and to the abiding dispute between the specialists regarding who it represents. The first clearing of the statue was undertaken by professor of chemistry Othon Roussopoulos in June, 1901, and the welding was completed by the French welder Alfred Andre (the welding took place from August 14 to September 30, 1902). Regarding the dispute between the specialists about the statue's identity, Lykoudis characteristically mentions the fact that the caricaturist Themis Anninos, published a picture book in which every caricature represented a different identity of the "Adolescent".

In number 355 of the magazine, Lykoudis published an article containing possible conclusions regarding the treasure of Antikythera, in the context of questions and answers. These conclusions were the following :

- a) The distance that the antiquities covered in the bottom of the sea indicates that the ship's extent was a little over 52 meters and its maximum width a little under 17 meters. Ships of that size had a crew of 680 men and were used in the Ptolemaic times.
- b) Among the findings various valuable objects were discovered, which probably belonged to passengers aboard the ship, as well as copies of statues made for commercial purposes. Thus, the ship was mercantile and not military.
- c) The wind that forced the ship to take refuge in the spot where it finally shipwrecked (east side of the Antikythera island) must have been western. Winds of this kind in that region (a shift of a northern wind to a western one) usually occur in May, so it is possible that the shipwreck happened in this month.
- d) The ship's course must have been from North to South.
- e) On a part of the ship's skeleton that was found in the bottom of the sea, there are traces of charring, thus the catastrophe was possibly caused by a fire.
- f) Among the findings there were also found fragments of a luxurious bed, similar to four others that have been found in Asia Minor and in Italy. The

time in which these four beds were used, indicates that the shipwreck occurred between 2<sup>nd</sup> and 1<sup>st</sup> century BC. Besides, the type of the letters on the Mechanism that was discovered among the findings indicate that the time the shipwreck occurred could not be defined later than the 1<sup>st</sup> century BC.

- g) The ship's destination could have been Alexandria of Egypt, since only there ships of this size were built at the time, and since it was eminently the place where astronomical instruments such as the Antikythera Mechanism were constructed.

### **2.2.2. Rest Reports**

In the following years, many scientists were interested in the subject of the Antikythera Mechanism, publishing articles and books on the subject.

In 1959, Derek de Solla Price published an article regarding the Mechanism in the magazine *Scientific American*, entitled "An Ancient Greek Computer". In this article, Price makes an early estimation of the instrument's use. In 1974, he published his book entitled "Gears from the Greeks", which is the first extended and analytical study that was published in recent times regarding the matter of the Mechanism. In this project, Price speaks of the shipwreck, narrates its discovery, describes the Mechanism's fragments and notes down its possible use.

In 1994, Xristos Lazos, historical researcher, published a book entitled "The Antikythera Calculator, a Greek invention of 80 BC." In this book, Lazos speaks of the discovery and the historical origins of the Antikythera Mechanism, the parts it is consisted of and the research Price did.

In 2006, the Antikythera Mechanism Research team published an article in *Nature* magazine, entitled "Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism", in which the technical characteristics of the Mechanism are concisely described.

Journalist Jo Marchant published in 2008 a book entitled "The Antikythera Mechanism – Decoding the Heavens". In this book, Marchant speaks of the great and

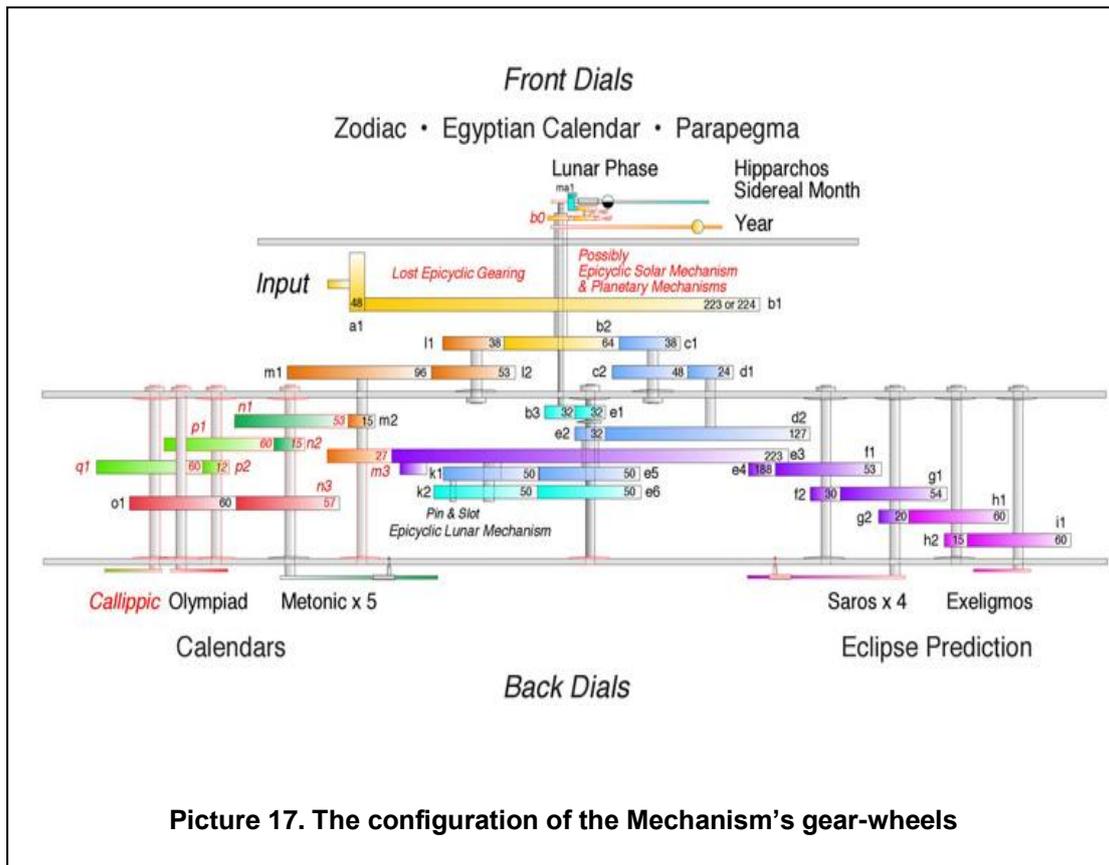
nowadays proverbial instrument that was discovered among the findings of the Antikythera shipwreck, and describes the research that has been done regarding it.

On July 31<sup>st</sup>, 2008, the Antikythera Mechanism Research team published one more article in Nature magazine, entitled “Calendars with Olympiad display and eclipse prediction on the Antikythera Mechanism”, extended enough this time, regarding the new research and discoveries that have been made about the Antikythera Mechanism. In this article, the calibration discs on this mysterious instrument are mainly described, among which is included for the first time an Olympian calibration disc.

### **3. Astronomical Extensions of the Antikythera Mechanism**

The Antikythera Mechanism, as mentioned above, was a complex astronomical instrument of accuracy. However, what was its exact application and what did this mysterious instrument of the ancient times do exactly? Researchers are searching for the answer from the first moment of its discovery, and many studies upon this subject have been published.

According to the latest research, on the front calibration disc are noted down the positions of the Moon and the Sun on the Zodiac, as well as a calendar of 365 days that can be adjusted to bissextile years. The rear calibration discs were probably spiral. The upper one of those, which contains five rings, shows the 235 months of the Metonic cycle (according to Meton's 235 lunar months equal 19 solar years), the left upper auxiliary disc shows the 76 years of Kallipus cycle (Kallipus corrected the error in the Metonic cycle calculating that 76 solar years equal 940 lunar months) and the upper right auxiliary disc (Olympian calibration disc) represents the Hellenic games (Olympics, Isthmia, Nemea and Pythia). The nether rear calibration disc shows the Saros cycle (the Saros cycle has a period of 223 synodical months that equal 18 solar years, and can be used to predict eclipses of the Sun and the Moon) and the nether auxiliary disc shows the Advanced cycle (the Advanced cycle involves three Saros periods, aka 54 solar years) that predicts eclipses with even more accuracy than the Saros cycle (Nature magazine, “Calendars with Olympiad display and eclipse prediction on the Antikythera Mechanism”, 31/06/2008).



The above become obvious if we study the gear-wheels of the Mechanism and we count their cogs (Nature magazine, Decoding the Antikythera Mechanism: Investigation of an ancient Astronomical Calculator, Supplementary Notes 2). The Metonic cycle does 5 whole rotations in 19 years, so the prerequisite fraction is

$$\frac{5}{19}$$

as we extract from the configuration of the gear-wheels, and by calculating the percentage of their cogs, we conclude that the inter-twined gear-wheels b1-11+l2-m1+m2-n1 give the expected fraction

$$\frac{64}{38} \times \frac{53}{96} \times \frac{15}{53} = \frac{2 \times 32}{2 \times 19} \times \frac{53}{3 \times 32} \times \frac{3 \times 5}{53} = \frac{5}{19}$$

Kallipus' auxiliary disc performs one rotation for every Metonic cycle (5 rotations each) so the fraction must be :

$$\frac{1}{4} \times \frac{1}{5}$$

which is extracted by the gear-wheels p1+p2-o1

$$\frac{15}{60} \times \frac{12}{60} = \frac{1}{4} \times \frac{1}{5}$$

Saros disc performs four rotations in 223 synodical months and 235 synodical months equal 19 solar years. So the corresponding fraction is :

$$\frac{4}{223} \times \frac{235}{19}$$

which is extracted by the gear-wheels b2-l1+l2-m1+m3-e3+e4-f1+f2-g1

$$\frac{64}{38} \times \frac{53}{96} \times \frac{27}{223} \times \frac{188}{53} \times \frac{30}{54} = \frac{4}{223} \times \frac{235}{19}$$

One rotation of the Advanced disc equals three Saros cycles

94 rotations each), so the fraction is calculated :

$$\frac{1}{3} \times \frac{1}{4}$$

Which is extracted by the gear-wheels g2-h1+h2-i1

$$\frac{20}{60} \times \frac{15}{60} = \frac{1}{3} \times \frac{1}{4}$$

One more noticeable fact (Nature magazine, Decoding the Antikythera Mechanism: Investigation of an ancient Astronomical Calculator, Supplementary Notes 2) is that in the nether rear calibration disc 51 strange symbols were found (glyphs), which are pointers of eclipses and include  $\Sigma$  (Moon eclipse) and H (Sun eclipse).

### 3.1. Inscriptions

One of the main characteristics of the Mechanism is its inscriptions, which are located on many spots upon the instrument, like its back side, on the woodshed and the gates. Especially on the inscription of the woodshed there have been identified mainly astronomical terms.

These inscriptions are indicative of the Mechanism's operations, since they are about its operating instructions. On the back gate there is the number 235 ( $\Sigma\Lambda E$ ), that indicates the operation of the upper rear calibration disc (Metonic cycle) and on the inscription near the nether back disc we encounter the words  $\Phi\Lambda P O \Sigma$  (aka lighthouse) and  $I \Sigma I I A N I A$  (aka Spain) (Nature magazine, Decoding the ancient Greek astronomical calculator known as the Antikythera mechanism, 2006).

Up to the present time, 2160 letters have been read and identified upon these inscriptions (Nature magazine, Decoding the Antikythera Mechanism: Investigation of an ancient Astronomical Calculator, Supplementary Notes 2) with the use of the digital display system PTM Dome by Hewlett-Packard and the tomographers of X-Tek company.

Furthermore there is a statistical analysis of the frequency of each letter's occurrence in the inscriptions (Table 1) for a total of 1712 letters (Nature magazine, Decoding the Antikythera Mechanism: Investigation of an ancient Astronomical Calculator, Supplementary Notes 2). Among the characters on the inscriptions, there are several symbols and numbers, that have been excluded from the statistic. The confirmed letters are 1420 and the non-confirmed are 298. The term non-confirmed implies characters that have been read, however there is the possibility of a mistake in their identification with letters. The most frequently appearing letters are O (Omicron) and A (Alpha), and three letters appear only once.

| <b>Letter</b> | <b>Frequency of confirmed letters' occurrence</b> | <b>Frequency of non-confirmed letters' occurrence</b> | <b>Frequency of total number of letters' occurrence</b> |
|---------------|---|---|---|
| A             | 153   | 40  | 193   |
| B             | 1   | 0   | 1   |
| Γ             | 18  | 2   | 20  |
| Δ             | 33  | 5   | 38  |
| E             | 140   | 27  | 167   |
| Z             | 1   | 0   | 1   |
| H             | 67  | 15  | 82  |
| Θ             | 3   | 2   | 5   |
| I             | 139   | 21  | 160   |
| K             | 29  | 11  | 40  |
| Λ             | 38  | 10  | 48  |
| M             | 59  | 7   | 66  |
| N             | 124   | 22  | 146   |
| Ξ             | 6   | 2   | 8   |
| O             | 168   | 31  | 199   |
| Π             | 70  | 11  | 81  |
| P             | 55  | 12  | 72  |
| Σ             | 124   | 19  | 143   |
| Tα            | 104   | 18  | 122   |
| Y             | 41  | 10  | 51  |
| Φ             | 13  | 6   | 19  |
| X             | 14  | 8   | 22  |
| Ψ             | 1   | 0   | 1   |
| Ω             | 18  | 9   | 27  |

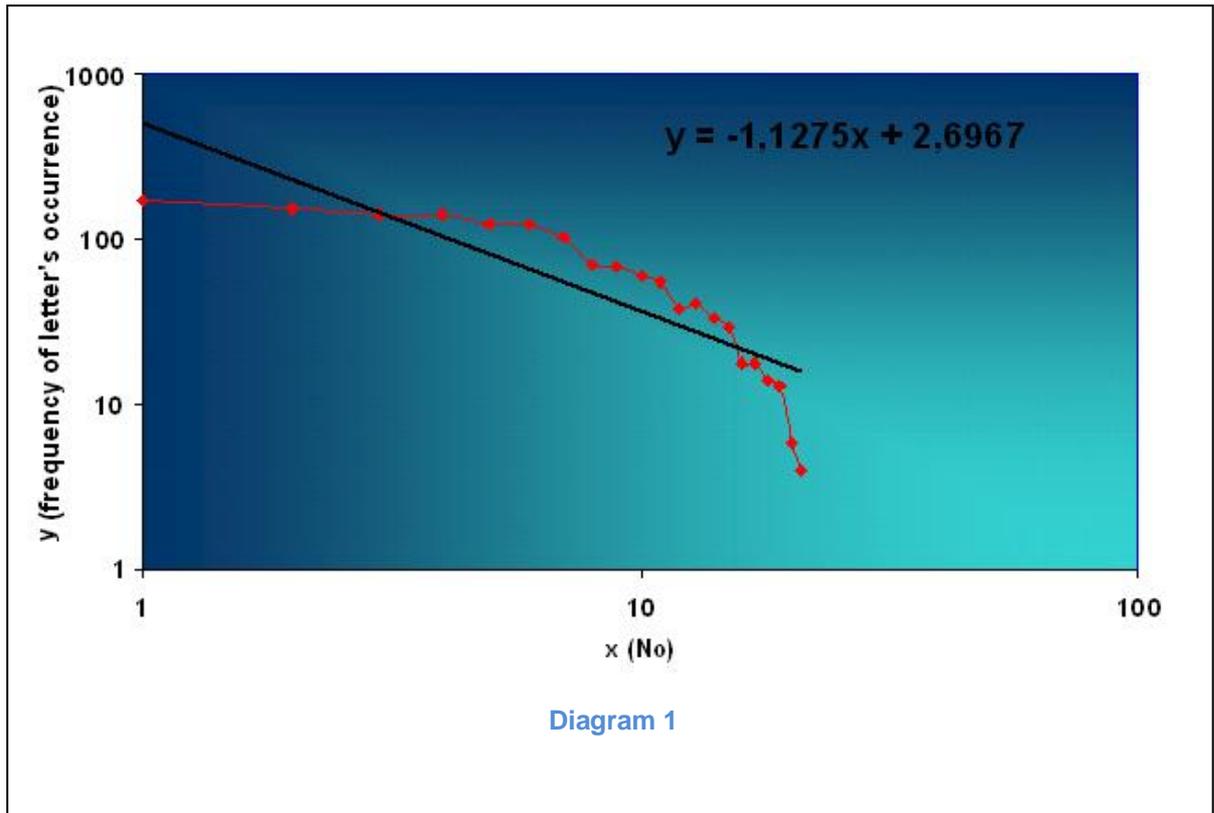
**Table 1**

According to Zipf's empirical law (Zipf's law), if we measure the frequency of each distributive word in a text and draw the scatter diagram on logarithmic axis, then the gradient of the straight line will equal -1. This law can be generalized at whatever sequence of characters that carries an information.

By applying this method to the confirmed letters of the Mechanism (Table 2), we have the corresponding scatter diagram (Diagram 1).

| No<br>(x) | letter | Frequency of confirmed letters'<br>occurrence (y) |
|-----------|--------|---|
| 1         | O      | 168   |
| 2         | A      | 153   |
| 3         | E      | 140   |
| 4         | I      | 139   |
| 5         | Σ      | 124   |
| 6         | N      | 124   |
| 7         | T      | 104   |
| 8         | Π      | 70  |
| 9         | H      | 67  |
| 10        | M      | 59  |
| 11        | P      | 55  |
| 12        | Λ      | 38  |
| 13        | Υ      | 41  |
| 14        | Δ      | 33  |
| 15        | K      | 29  |
| 16        | Γ      | 18  |
| 17        | Ω      | 18  |
| 18        | X      | 14  |
| 19        | Φ      | 13  |
| 20        | Ξ      | 6   |
| 21        | Θ      | 4   |
| 22        | B      | 1   |
| 23        | Ψ      | 1   |
| 24        | Z      | 1   |

**Table 2**



The straight line's components are :

$$y = \alpha + \beta x$$

$$\alpha = 2,696687$$

$$\beta = -1,12748$$

$$\sigma_{\alpha} = 0,163995$$

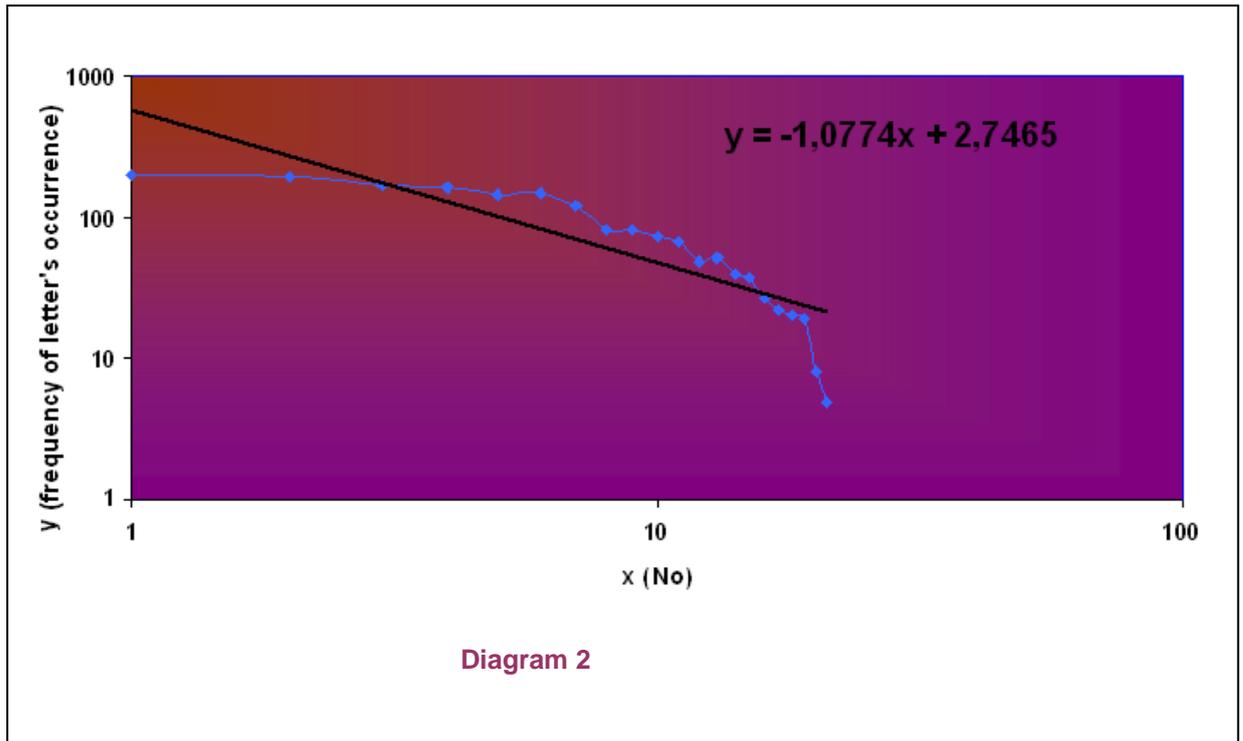
$$\sigma_{\beta} = 0,163926$$

As it appears, actually the straight line's gradient is very close to -1.

Now, if we add the non-confirmed letters to the statistic (Table 3), the corresponding scatter diagram (Diagram 2) will be the following :

| No<br>(x) | Letter | Frequency of total number of letters'<br>occurrence (y) |
|-----------|--------|---|
| 1         | O      | 199   |
| 2         | A      | 193   |
| 3         | E      | 167   |
| 4         | I      | 160   |
| 5         | Σ      | 143   |
| 6         | N      | 146   |
| 7         | T      | 122   |
| 8         | H      | 82  |
| 9         | Π      | 81  |
| 10        | P      | 72  |
| 11        | M      | 66  |
| 12        | Λ      | 48  |
| 13        | Υ      | 51  |
| 14        | K      | 40  |
| 15        | Δ      | 38  |
| 16        | Ω      | 27  |
| 17        | X      | 22  |
| 18        | Γ      | 20  |
| 19        | Φ      | 19  |
| 20        | Ξ      | 8   |
| 21        | Θ      | 5   |
| 22        | B      | 1   |
| 23        | Ψ      | 1   |
| 24        | Z      | 1   |

**Table 3**



The straight line's components are :

$$y = \alpha + \beta x$$

$$\alpha = 2,74646922$$

$$\beta = -1,0773659$$

$$\sigma_{\alpha} = 0,15663232$$

$$\sigma_{\beta} = 0,15656624$$

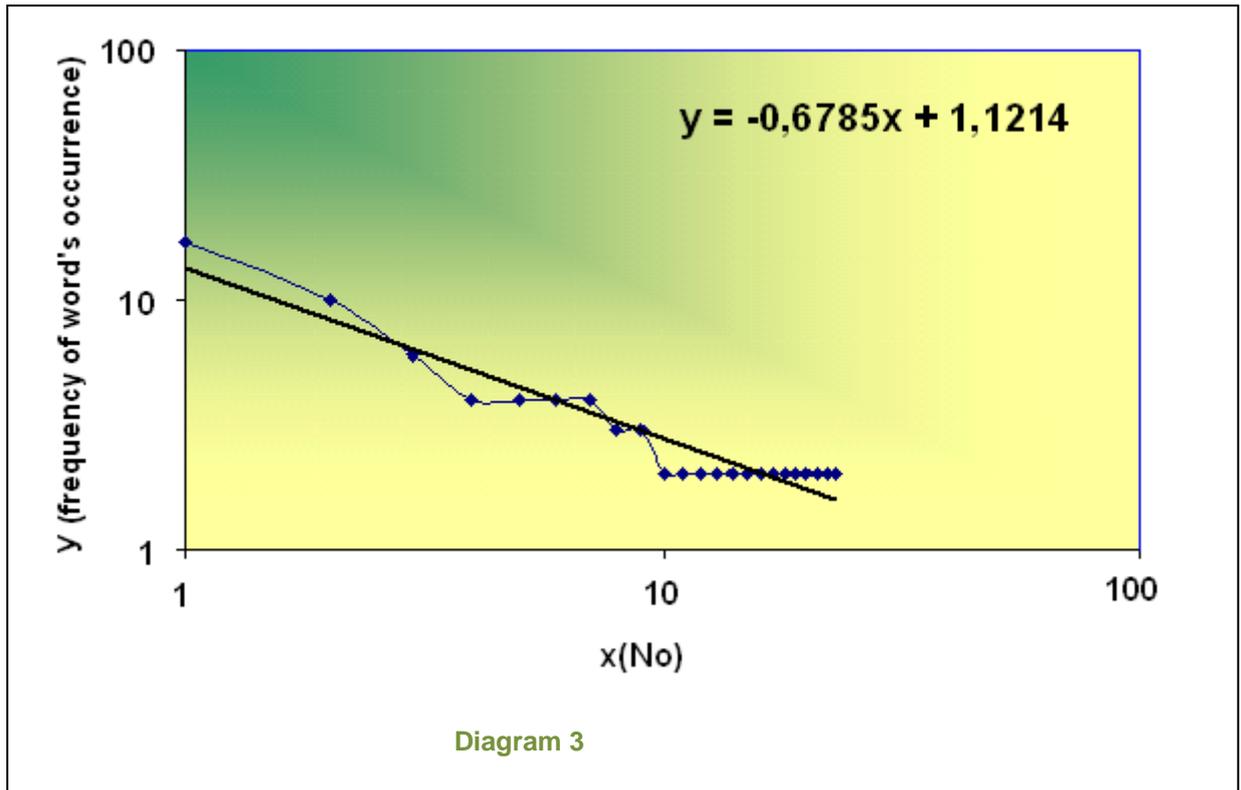
As it appears, actually the straight line's gradient is very close to -1 here too.

The same exactly procedure was followed next, in the frequency of words' occurrence, except for articles, prepositions and conjunctives, in the text of the inscription on the front gate of the Mechanism. Paleographer Agamemnon Tselikas did the count of the words. The most frequently appearing words in the text are the words HMEPA (Day) and HAIOΣ (Sun).

On the statistic, (Table 4) the words that appear only once were not included. The corresponding scatter diagram is the following.

| No<br>(x) | Frequency of words' occurrence (y) |
|-----------|------------------------------------|
| 1         | 17                                 |
| 2         | 10                                 |
| 3         | 6                                  |
| 4         | 4                                  |
| 5         | 4                                  |
| 6         | 4                                  |
| 7         | 4                                  |
| 8         | 3                                  |
| 9         | 3                                  |
| 10        | 2                                  |
| 11        | 2                                  |
| 12        | 2                                  |
| 13        | 2                                  |
| 14        | 2                                  |
| 15        | 2                                  |
| 16        | 2                                  |
| 17        | 2                                  |
| 18        | 2                                  |
| 19        | 2                                  |
| 20        | 2                                  |
| 21        | 2                                  |
| 22        | 2                                  |
| 23        | 2                                  |

**Table 4**



The straight line's components are :

$$y = \alpha + \beta x$$

$$\alpha = 1,1214$$

$$\beta = -0,6785$$

$$\sigma_{\alpha} = 0,045908$$

$$\sigma_{\beta} = 0,044323$$

It appears that the line's gradient deviates enough from the calibration -1, which is due to the fact that the sample of the words a) is small and b) lacks prepositions, conjunctives and articles.

## 4. Epilogue

Over two centuries ago, a ship loaded with treasures and sailing upon the Mediterranean seas, took refuge in the Antikythera island where it shipwrecked. The Antikythera antiquities waited almost for 2000 years to be discovered, and when they were finally found, they upset the whole scientific community as well as common citizens. The treasure consisted of statues of huge historical and architectural value, appliances and various other objects. Among the treasure, several strange “rocks” were accidentally discovered, that proved to be the shipwreck’s most mysterious and strange finding, the Antikythera Mechanism. From the first moment of the treasure’s discovery, scientists tried to explain the various mysteries that covered the shipwreck and its findings, many times arguing with each other, and they continue their research to this day.

110 years have passed since the discovery of the Antikythera shipwreck and many questions still remain unanswered and in fact, may never be answered. What was the point of the ship’s departure and which was its destination that it never reached? What does the bronze masterly work of the “Alolescent” represent? How many works of art still lie hidden in the bottom of the Antikythera sea waiting to be discovered? And finally, what was in fact this complicated astronomical instrument, so avant-garde for its proper time, who manufactured it and what was the operation of the Antikythera Mechanism?

## APPENDIX I

### Researchers that studied the subject of the Antikythera Mechanism and its findings

#### *John N. Svoronos*

John Svoronos was born in Mykonos in 1863 and is considered one of the most significant Greek numismatists. He served as the principal of the Numismatic Museum, principal of the state's Archaeological Council and from 1918 as a professor of Numismatics in the University of Athens. He died in Athens in 1922.



#### *Spyridon Stais*

Spyridon Stais was born in Cythera in 1859. He was a mathematician in secondary Education, a position he abandoned in 1892, when he was elected a Member of Parliament in Cythera for the first time. He took office in the Ministry of Education for the first time in 1900 and once more in 1903. On June 18<sup>th</sup>, 1904, he dueled, after a dispute, with a member of the Parliament in Trikala, Alexander Hatzipetrou, whom he killed. After this incident, due to the clamor of the public opinion, Stais handed in his resignation to the Government. He died in 1932.



#### *Emmanuel St. Lykoudis*

Emmanuel Lykoudis was born in Nauplio in 1849. He studied in Law School in the University of Athens, where he was proclaimed a Doctor in 1872. In 1875 he joined the judiciary and from 1888 he served in the Court of Appeals in Athens. From 1896 he served as a legal adviser to the state until 1905 and to the National Bank of Greece until his death. He died on October 13<sup>th</sup>, 1925.



#### *Stylios Em. Lykoudis*

Stylios Lykoudis, Emmanuel Lykoudis' son, was born in Ermoupolis in 1878. He studied in the Faculty of Nautical Novices, where he later served as a professor. He retired under the mark of vice-admiral and was distinguished as principal of Lighthouses. In 1939 he was elected a regular member of the Academy of Athens. He died in Athens in 1958.



#### *Constantine Rados*

Constantine Rados was born in Athens in 1862. He studied in the Law School in the University of Athens, from where he graduated in 1885, and then History. He did his doctorate in the University of Sorbonne and in 1895 was appointed a professor of Nautical History in the Faculty of Nautical Novices, from where he resigned in 1924 in order to work on writing. He died in 1931.







05/03/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Αί ενέργειαι του Υπουργείου

Το Υπουργείον της Παιδείας διεβίβασε χθές έγγραφον προς τον διευθυντήν της ενταύθα Γαλλικής Αρχαιολογικής Σχολής κ. Ωμόλ, δι' ού τον παρακαλεί όπως μεριμνήσῃ περὶ ὅσον οἶόν τε ταχύτερας καθόδου του γάλλου συγκολλητοῦ Ἀνδρέ προς συγκόλλησιν του Ἐρμού των Ἀντικυθέρων.

Το Υπουργείον ὡς ἐπιπροσφρήθην ἀναμένει τὴν ὀριστικὴν ἀπάντησιν του Ἀνδρέ ἂν κατέρχεται ἢ οὐ, προτιθέμενον ἐν ἐναντίῳ περιπτώσει νὰ προστρέξῃ εἰς ἄλλους συγκολλητάς, γνωστοῦς τὸ δυνατόν καὶ τοῖς προτείνῃ τὴν συγκόλλησιν του Ἐρμού.

09/03/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Ὁ κ. Ἀνδρέ δὲν ἔρχεται

Χθὲς ἐλήθη εἰς τὸ Υπουργείον της Παιδείας ἡ ἀναμενόμενη ἀπάντησις του γάλλου συγκολλητοῦ. Ἀνδρέ, εἰς τὸν ὁποῖον εἰς προτείνει τὸ Υπουργείον τὴν συγκόλλησιν του Ἐρμού των Ἀντικυθέρων.

Διὰ τῆς ἀπαντήσεώς του ὁ Ἀνδρέ, ἐκφράζει τὴν λύπην του πρὸς τὸ Υπουργείον διότι ἐνεκεν πολλῶν λόγων δὲν δύναται νὰ κατέλθῃ εἰς τὴν Ἑλλάδα καὶ ἀναλάβῃ τὴν συγκόλλησιν του Ἐρμού.

Κατόπιν τῆς ἀπαντήσεώς ταύτης τὸ Υπουργείον θὰ σκεθῇ πρὸς ποῦν ὡς ἀποσπῆ ἀνάθετον τὴν συγκόλλησιν του ἀγάλματος.

10/03/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Αἱ προσπάθειαι του Υπουργείου

Κατὰ τὰς νεωτέρας πληροφορίας ἡ ἀπάντησις του γάλλου συγκολλητοῦ κ. Ἀνδρέ, δὲν πρέπει νὰ θεωρηθῇ καὶ ὅσον ὀριστικὴ.

Ὁ γάλλος τεχνίτης διὰ τῆς ἀπαντήσεώς του υποδεικνύει ὅτι δύναται καὶ νὰ ἔλθῃ ὑπὸ τινος ὅμοῦ θροῦς.

Κατόπιν τῆς ἀπαντήσεώς ταύτης ὁ Υπουργὸς κ. Μομφερράτος παρεκάλεσε τὸν διευθυντὴν της ενταύθα Γαλλικῆς Ἀρχ. Σχολῆς κ. Ωμόλ νὰ μετολαβῆσῃ παρὰ τῷ κ. Ἀνδρέ καὶ νὰ τὸν πείσῃ νὰ δεχθῇ τὰς προτάσεις του Υπουργείου.

01/04/1902

ΑΙ ΕΝΑΙΟΙ ΑΡΧΑΙΟΤΗΤΕΣ

Αἱ μηχαναὶ του Μονακό

Ὡς γνωστὸν ὁ πρίγκηψ του Μονακό ἀπαντῶν εἰς τὸ ἐγγράφον του Υπουργείου της Παιδείας, περὶ παραχώρησος των κατασκευῶν μηχανῶν του Μονακό πρὸς ἀνάγκασιν των ἐν τῷ βυθῷ της θαλάσσης ἀρχαιοτήτων, ἐδήλωσεν ὅτι εἶνε προθυμότερος νὰ παραχωρήσῃ τὰς αὐταῦς μηχανὰς, ὑπὸ τὸν ὅμοῦ νὰ γνωρίσῃ προηγουμένως εἰς τί θὰ μεταχειρισθῶν αὐτὰς καθόσον εἶνε μηχαναὶ λεπταί, χρησιμεύουσαι διὰ τὴν ἀνάγκασιν ἐκ της θαλάσσης φωτῶν καὶ των τοῦτοις θυσίων.

Κατόπιν τῆς δηλώσεώς ταύτης του πρίγκηπος τὸ Υπουργείον συνέταξεν ἐγγράφον τὸ ὁποῖον ὁ ἀποστέλλῃ πρὸς αὐτὸν ἐντὸς της ἐβδομάδος καὶ διὰ τοῦ ὁποῖου τῷ καθιστῆ γνωστοῦν ὅτι ζητεῖ τὰς μηχανὰς διὰ τὴν ἀνάγκασιν των ἀρχαιοτήτων καὶ τὸν παρακαλεῖ ὅπως διευκολύνῃ τὸ ἔργον παραχωρῶν τὰ μηχανήματα.

07/04/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Ἐπιστολὴ του Ἀνδρέ

Ὁ γάλλος συγκολλητὴς κ. Ἀνδρέ ἐνδίδων εἰς ἐπανειλημένας παρακλήσεις του Υπουργείου, ἀπέστειλε ἐπιστολὴν πρὸς τὸ Υπουργείον της Παιδείας, δι' ἧς ἀγγέλλει ὅτι συγκατατίθεται νὰ κατέλθῃ εἰς τὴν Ἑλλάδα ὅπως συγκολλήσῃ τὸν Ἐρμόν των Ἀντικυθέρων. Παρακαλεῖ ὁμοῦ τὸ Υπουργείον νὰ τῷ καταστήσῃ γνωστοῦς τοὺς ὅρους ὑπ' οὓς θὰ ἔρχατο. Εἰς τοῦτο ὁ κ. Μομφερράτος ὡς πληροφοροῦμεθα θὰ ἀπαντήσῃ παρακαλῶν τὸν κ. Ἀνδρέ νὰ κατέλθῃ καὶ κατόπιν νὰ προσδύῃ εἰς διακανονισμὸν των ὅρων.

Συνάμα ἡγγέλην πρὸς τὸ Υπουργείον ὅτι ἀσυνεταῖ καὶ ὁ ἐν Αἰγύπτῳ συγκολλητὴς κ. Βισάντο, τὸν ὁποῖον ἀποστέλλει ὁ ἐν Αἰγύπτῳ Γεν. Πράκτωρ της Ἑλλάδος κ. Γρουπάρης.

16/04/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Οἱ ὅροι του Ἀνδρέ

Ὁ γάλλος συγκολλητὴς κ. Ἀνδρέ, ὅστις ἀρκεῖται νὰ ἀναλάβῃ τὴν συγκόλλησιν του Ἐρμού των Ἀντικυθέρων, κατὰ τὴν τελευταίαν αὐτοῦ ἐπιστολὴν πρὸς τὸ Υπουργείον ἐδήλωσεν ὅτι ζητεῖ ὡς ἀποζημίωσιν αὐτοῦ διὰ τὴν καθόδον καὶ τὴν ἐργασίαν 12 χιλ. δραχμῶν.

Εἰς τοῦτο τὸ Υπουργείον τῷ ἀπήντησεν ὅτι ἰδύναται νὰ προσδιορίσῃ τὸ ποσὸν τοῦτο, καὶ τῷ ἐπέστηεν νὰ κατέλθῃ ἐνταῦθα ὑπὸ τοῦς γνωστοῦς ὅρους της ἀποζημιώσεώς καὶ προδῆ εἰς σχετικὰς συνεντεύξεις.

Ὁ κ. Ἀνδρέ ὡς εἰσίναισι παρεδέχθη τὴν προτάσιν ταύτην του Υπουργείου καθὼς διὰ μεταγενεστέρων του ἀποστέλλῃ καθιστῆ γνωστοῦν εἰς ἀνεχώρησιν ἐκ Γαλλίας κατασκευασμένους εἰς Ἑλλάδα.

Ὁ γάλλος τεχνίτης καὶ ἀνατίθεται εἰς Ἀθήνας ἐντὸς του πρώτου ἡμισυαἰώνιου του προερχοῦς μηνὸς Μαΐου.

02/05/1902

Ο ΒΗΜΟΣ ΤΩΝ ΑΝΤΙΚΥΘΕΡΩΝ

Ἡ ἀριζὴ του Ἀνδρέ

Εἰς τὸ Υπουργείον της Παιδείας ἐλήθη τὸ ἐγγράμμα ἐκ Παρισίων του γάλλου συγκολλητοῦ κ. Ἀνδρέ, ἀγγέλλοντος ὅτι ἀναχωρεῖ ἐκ Παρισίων, καταρχόμενος εἰς Ἑλλάδα.

Ὁ κ. Ἀνδρέ ἀνεχώρησε πρὸ τριῶν ἡμερῶν τῆς προσεχῆς δὲ Παρασκευῆς ἢ τοῦ Σάββατου τὸ πλοῦ ἀρκεῖται ἐνταῦθα.

Ὁ γάλλος συγκολλητὴς εὐθὺς ἀμα ἀρχεθῆ ἐνταῦθα θὰ ἐξετάσῃ τὸ ἀγάλμα, καὶ θὰ υποδείξῃ ἐπιθεῖν, ὅπως καὶ ὁ Βενεταῖος Στούρι, εἰς τὸς θὰ καταδεικνύῃ τὸν τρόπον της συγκολλήσεώς του ἀγάλματος.

Κατόπιν θὰ υποβάλῃ εἰς τὴν Κυβέρνησιν τὸν ὅρον ὑπ' οὓς ἔρχεται τὴν συγκόλλησιν.

Ἡ διασπορὰ αὐτοῦ καὶ του Στούρι συνίσταται εἰς τὸ ὅτι ἐνῶ ὁ δεύτερος κατ' οὐδὲνα τρόπον σκεπτεῖ νὰ κατέλθῃ εἰς Ἑλλάδα καὶ ἐργασθῆ ἐπιτοῦ ἀγάλματος, ὁ πρῶτος ἔρχεται ν' ἀναλάβῃ τὴν συγκόλλησιν, ὑπ' οὓς ὅρους ὁμοῦ συμφωνεῖ μετὰ τὴν Ἑλληνικὴν Κυβέρνησιν.

02/05/1902

ΑΙ ΕΝΑΙΟΙ ΑΡΧΑΙΟΤΗΤΕΣ

Ἡ ἀπάντησις του Πρίγκηπος του Μονακό

Ὁ πρὸ καιροῦ ἐγγερόμενος τὸ Υπουργείον της Παιδείας θέλον νὰ ἐρχοῦν εἰς εὐρὴν πλοῦσιν ἀρχαιοτήτων εἰς ὁποῖαι μόνον κινεῖται εἰς τὸν βυθὸν της θαλάσσης ἀποστέλλῃ πρὸς τὸν πρίγκηπα του Μονακό ἐγγράφον νὰ παραχωρήσῃ αὐτοῖς τὰ κατασκευῶν αὐτοῦ μηχανήματα. Ὁ πρίγκηψ του Μονακό ἀπήντησε τότε ὅτι εἶνε πᾶν προθυμὸς εἰς τοῦτο ἀρεῖ μόνον νὰ γνωρίσῃ εἰς τί θὰ χρησιμοποιηθῶν ταῦτα.

Τὸ Υπουργείον κατέστρεψε γνωστοῦν τὸν σκοπὸν διὰ τὸν ὁποῖον ἐλήθησαν αἱ μηχαναὶ, καὶ παρεκάλε: ἂν εἶνε δυνατόν νὰ παραχωρηθῶν αὐτὰ.

Εἰς τὸ τελευταῖον τοῦτο ἐγγράφον του Υπουργείου ἐλήθη κατ' αὐτὰς ἡ ἀπάντησις του πρίγκηπος του Μονακό ὅστις ἀγγέλλει εἰς τὸ Υπουργείον ὅτι μετα' ἄλλης ἀναγκάζεται ν' ἀρνηθῆ, πλην ὅτι καὶ ἂν πρεσβύσει τὰ μηχανήματα αὐτὰ εἰς οὐδὲν θὰ ἀφαιρούσαν τὸ Υπουργείον καθὼς ὅμοῦ ἀπατάλληλα διὰ μὴν ταύτην ἐργασίαν.

Κατόπιν τῆς ἀπαντήσεώς ταύτης του πρίγκηπος του Μονακό ἡ Κυβέρνησις ἀπεράσισεν ἐπιστολικῶς πρὸς τὸν ἐν Αἰγύπτῳ ἐβριβύσαν ἀραβίαν, ἣ ὅποια ἔχει καταλάβῃ μηχανήματα διὰ τὴν ἀνάγκασιν των ἐναλίω ἀρχαιοτήτων.



03/05/1902

Ο Κ. ΑΝΔΡΕ

Έρχεται την Δευτέρα

Θετικά γνώμη χθες προς το υπουργείον της Παιδείας επί δε ενταξίαν έργων Γάλλου Συναλλήλου κ. Ανδρέ...

07/05/1902

Η ΑΦΕΙΞ ΤΟΥ ΑΝΔΡΕ

Επίσκεψίς του εις το Μουσείον. - Τί ειπε διά τον Έρωτην

Χθες άφικετο ενταξία διά του Μεσοκέρη εκ Μασσαλίας ο Γάλλος συναλλήλος κ. Ανδρέ...

Ο κ. Ανδρέ ανέβη ενταξία κατέβη εις το ξενοδοχείον της «Μηνίδας»...

Ο κ. Ανδρέ συναλλήλος διά μακράν μετά του γενικού γραμματέως του Γπουργείου κ. Αλ. Κολυβά...

Ο κ. Ανδρέ εις το Μουσείον

Ο κ. Ανδρέ άκολούθως, συνοδουίμενος και υπό του κ. Καδδαίου, έπληθεν εις το ενταξία Αρχαιολογικών Μουσείων...

Η συναλλήλος

Ο κ. Ανδρέ εν τούτοις προκαταβλητικός έκραζόμενος χθες μετά την πρώτην του άγάλλματος έκτίτασιν ιδεώσεων...

Η συναλλήλος επί της ιδεώσεων, έτι θέλει γείνει μετά πάσης της αναλόγου προς την άξίαν του άγάλλματος τίμησιν...

Ο κ. Ανδρέ εις Ηερατείαν

Η άφίξις του κ. Ανδρέ ήτο γνωστή, ο δε έρρος των Αρχαιοτήτων κ. Καδδαίου παρακάλεσε τον κ. Γυμνασιάρχην Πιραιώς...

Αι τελεμαται ναί αι άλλαι Αρχαιότητες, ανέκδοτοι δε είχαν Παράγας, παρέρχον πύσαν εύρολίαν εις την διαπραγή καλλιτέχνην...

Είς τον θρονόν αυτου ο κ. Ανδρέ έζητήσθη ένδοξως περί του κλήματος της Ελλάδος, έπαν δε ειπε λόγον ένδεικτον ύπομνηματικόν...

— Δίον παρασκευάσει καθόλου τώρα δε' έτα γράρουν αι έλληνικαί έφημερίδες...

Ο κ. Ανδρέ ανεβή κατάν εις τον ανθεραπειαν σταθμόν και την 1 1/2 μ. μ. ένβηθεν ενταξία.

09/05/1902

ΑΙ ΠΡΟΤΑΣΕΙΣ ΤΟΥ Κ. ΑΝΔΡΕ

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ. - Ο ΧΡΟΝΟΣ ΚΑΙ Ο ΤΡΟΠΟΣ ΤΗΣ ΣΥΓΚΟΛΛΗΣΕΩΣ. - Η ΑΠΑΙΤΗΣΘΗΣΟΜΕΝΗ ΔΑΠΑΝΗ

Ο ένταξία περισημίων Γάλλος καλλιτέχνης κ. Ανδρέ, μεταξίς χθες εις το ύπουργείον της Εκπαίδεξς...

Ο κ. Ανδρέ αναθέσεται το έργον της συναλλήσεως, όριζει όμως ως χρόνον ένάρξεως της εργασίας τούτης την 1ην Σεπτεμβρίου...

Ο ΤΡΟΠΟΣ ΤΗΣ ΣΥΓΚΟΛΛΗΣΕΩΣ

Ο κ. Ανδρέ ως προς τον τρόπον της συναλλήσεως είπεν ότι ούτος έτι γείνη διά μέγιστον της τίμης αυτού έσφοδρόσεως...

Τό μέγιστον διά του όποιου θα γείνη η συναλλήσις είνε στεροβάτων και ήγηγημένης άνταξίης, δε' αυτόν δε έχουσι γείνει πλείους συναλλήσεις παρά του κ. Ανδρέ.

Η ΔΙΑΦΟΡΑ

Έξ μόνη διαφορά, ως προς τον τρόπον της συναλλήσεως από τον ύπό του κ. Καδδαίου προαβόντα είνε ότι εν τού κ. Ανδρέ είχε προτείνει να πληρώσθ το έσωτερικόν του άγάλλματος...

Ο ΧΡΟΝΟΣ ΤΗΣ ΣΥΓΚΟΛΛΗΣΕΩΣ

Ο κ. Ανδρέ διά τήσαν την έργασίαν της συναλλήσεως του άγάλλματος έδήλωσεν, ότι δεν θ' άνατιθή χρόνος περισσότερος των 800 ημερών.

Έξ γνωστών, δεν χρόνον της συναλλήσεως ο κ. Καδδαίος είχαν αναθέσει εις έξήμερον.

Η ΑΠΟΖΗΜΩΣΙΣ

Κίς τας προτάσεις του προς τον κ. Μεσοκέρητον όκ. Ανδρέ οδώνε λόγον ποιείται περί του ποσού της πληρωθησομένης αυτου άποζημώσεως...

Η ΑΠΟΛΟΓΗ ΤΩΝ ΠΡΟΤΑΣΕΩΝ

Ο ύπουργός της Εκπαίδεξς κ. Μεσοκέρητος άπαντών χθες το έσπέρας διά της Ένωτιδος 'Ηφορίζων Αρχαιοτήτων προς τον κ. Ανδρέ επί των προτάσεων του έπλοε, ότι αποδέχεται τούτας.

Τό έγγραφον της άποδοξής των προτάσεων του κ. Ανδρέ άπεσάλη χθες εις το ξενοδοχείον της Ηερατείας.

Η ΑΝΑΚΟΡΗΣΙΣ ΤΟΥ Κ. ΑΝΔΡΕ

Εκτόστιν τούτον ο κ. Ανδρέ κατ' αυθεντικας ήμύν πληροφωρίας άπέρχεται εις Μασσαλίαν αύριον Σεπτεμβρίου...

10/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΕΡΜΟΥ

Τί θα στοιχίσθ. - Η άναχώρησις του Ανδρέ

Οι και χθες έγάρφον η άποζημώσις, ήτις θέλει πληρωθή εις τον κ. Ανδρέ διά την συναλλήσιν του καλικού άγάλλματος του Έρμου...

Ο κ. Ανδρέ άπέρχεται εις Μασσαλίαν διά του στήνον Σάββατον αποπλόντος εκ Πιραιώς άποπλοίου της έταιρίας Μεσοκέρη.

11/05/1902

Ο Κ. ΑΝΔΡΕ ΕΙΣ ΠΕΙΡΑΙΑ

Χθες την πρώην κατήλθεν εις Πειραιό ο Γάλλος τεχνίτης κ. Ανδρέ και έπισκέψη το Αρχαιολογικόν Μουσείον Πιραιώς υπό την όδηγίαν του κ. Γυμνασιάρχου...

25/05/1902

Η ΧΑΚΙΚΗ ΠΛΑΞ ΤΟΥ ΜΟΥΣΕΙΟΥ

Η γνώμη του κ. Σφόρωνου

Κατά άνεκίτως χθες ο διευθυντής του Νομισματικού Μουσείου κ. Σφόρωνος, έπισκεφθίς την εν τού Αρχαιολογικόν Μουσείον άνευρεθείσαν χαλικίνην πλάξιν...

Ο κ. Σφόρωνος φρονι, έτι η αναγραφόμενη λέξις «γνώμων» πρέπει να άναγνωσθή «μοιρογώμων» από 'Αρροδίτης.

03/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΧΑΛΚΟΥ ΑΓΑΛΜΑΤΟΣ

Τηλεγραμμάς ήγγελεν χθές εις τὸ Δ. υπουργὸν τῆς Παιδείας...

05/05/1902

Η ΕΛΕΥΣΙΣ ΤΟΥ ΑΝΔΡΕ

Ἄξιον εἶναι εἰς Πειραιᾷ τὸ Γάλλος συγκολλητῆς ἀρχαιοτήτων κ. Ἀνδρέ...

07/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΧΑΛΚΟΥ ΑΓΑΛΜΑΤΟΣ

Η ΑΦΙΞΙΣ ΤΟΥ κ. ΑΝΔΡΕ

Χθές τὴν 1ην ὥραν μ. μ. ἦλθε διὰ τοῦ Μεσσαριῆ εἰς Πειραιᾶ καὶ ἀμέσως ἀνῆλθεν εἰς τὸ ἔργο...

Ὁ κ. Ἀνδρέ μετέβη τὴν 3 ὥραν μ. μ. εἰς τὸ ὑπουργεῖον τῆς Παιδείας...

Δύο ὥρας βραδύτερον ὁ κ. Ἀνδρέ συνοδευθεὶς ὑπὸ τοῦ Γενικοῦ Ἐπιτρόπου τῶν Ἀρχαιοτήτων...

Ὁ κ. Ἀνδρέ, ὅπως καὶ ὁ πρὸ αὐτοῦ ἐξετάσας τὸ ἀγάλμα...

Ὁ κ. Ἀνδρέ κατέλειπε εἰς τὸ ξενοδοχεῖον τῆς Μινιέρδας.

Ο κ. ΑΝΔΡΕ ΠΕΡΙ ΤΗΣ ΣΚΟΠΗΣ

Τὴν προσοχὴν τοῦ ξένου καλλιτέχνου ἀπὸ ἀπειθείας εἰς Πειραιᾶ...

Τώρα πιστεύω ὅσα γράσαντο εἰς τὴν ἑλληνικὴν ἐφημερίδα...

08/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΧΑΛΚΟΥ ΑΓΑΛΜΑΤΟΣ

Ὁ Γάλλος κ. Ἀνδρέ μετέβη χθές τὴν πρωῒν εἰς τὸ Κεντρικὸν Μουσεῖον...

Ὁ κ. Ἀνδρέ, ὡς ἔγραψαν καὶ χθές ἐπέσει περὶ τοῦ αἰγυρίου τῆς ἐργασίας...

Ὁ κ. Ἀνδρέ δὲ ὑπέσθη ἔσθον περὶ τοῦ τρόπου τῆς συγκολλήσεως...

09/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΧΑΛΚΟΥ ΑΓΑΛΜΑΤΟΣ

Ὁ κ. Ἀνδρέ ὑπέσθη χθές εἰς τὸ ὑπουργεῖον τῆς Παιδείας...

Ὁ κ. Ἀνδρέ καὶ χθές τὸ ἑσπέρας μεταβίβη εἰς τὸ Μουσεῖον...

10/05/1902

Η ΣΥΓΚΟΛΛΗΣΙΣ ΤΟΥ ΧΑΛΚΟΥ ΑΓΑΛΜΑΤΟΣ

Ὁ κ. Ἀνδρέ κωνίζεας τὰς ἐργασίας τοῦ πρὸς συγκολλήσεως...

21/05/1902

ΣΠΟΥΔΑΙΑ ΑΝΑΚΑΤΑΓΩΓΗ ΔΙΑ ΤΗΣ ΑΡΧΑΙΟΤΗΤΟΣ ΤΩΝ ΕΠΙΓΡΑΦΩΝ

Χθές τὸ ἀπόγευμα ὁ ξένος ὑπουργὸς τῶν Ἑλληνιστικῶν κ. Σ. Σπυρίδης...

Ὁ κ. Σπυρίδης εὐρὴν καὶ ἄλλα τεμάχια καθάρσεως...

Ὁ ξένος ὑπουργὸς τῶν Ἑλληνιστικῶν κ. Σ. Σπυρίδης...

22/05/1902

ΑΙ ΑΡΧΑΙΟΤΗΤΕΣ ΤΩΝ ΑΝΤΙΚΥΘΩΡΩΝ

Η ΕΝΕΠΙΓΡΑΦΟΣ ΠΛΑΞ

Ἐχθὲς εἰς τὴν παρατηρητικὴν κόπτην τοῦ πρώην ὑπουργοῦ κ. Κεῖ...

Πρῶτος ἐπέσεως χθές εἰς τὸ Κεντρικὸν Μουσεῖον ὅπως ἐξέτασαν τὴν πλάκα...

Ἐπὶ ἄλλῃς δὲ τῆς αὐτῆς πλάκας, ἦτις περικεῖται...

Ἐπιβλέπωνται εἰς τὸν ἐπιπέδον τῆς πλάκας...

Ὁ κ. Κεῖ ἀναγνώσας ἀνεκρίθη εὖ τὴν γνῶσιν...

Ἦσαν ἀπαικτερότερα ἔργον ὀφειλόμενον...

Σήμερον δὲ μεταβῆ εἰς τὸ Μουσεῖον...

23/5/1902

Η ΑΠΟΖΗΜΙΩΣΙΣ ΤΩΝ ΑΥΤΩΝ ΤΩΝ ΑΝΤΙΚΥΘΩΡΩΝ

Ὁ ὑπουργὸς τῆς Παιδείας ὑπέγραψε χθές χρηματικὸν ἐντάλμα...

23/5/1902

Η ΧΑΛΚΙΝΗ ΠΛΑΞ ΤΩΝ ΑΝΤΙΚΥΘΩΡΩΝ

ΠΥΞΙΣ ΝΑΥΤΙΚΗ

Ἐκ τῆς γενεμένης χθές ὑπὸ τῶν παρ' ἡμῖν ἀρχαιολόγων...

Ἐάν πρόκειται τὸ μηχανήμα εἶναι ἡ ναυτικὴ...

Ὁ γραμματεὺς τοῦ Ἀδριατικοῦ Ἰνστιτούτου κ. Βίλγκε...

25/05/1902

Η ΠΛΑΞ ΤΩΝ ΑΝΤΙΚΥΘΩΡΩΝ

Ἐκκαλοῦται εἰς Κοζάνην καὶ προσελκύνται...

Ὁ Γενικὸς Ἐπιτροπὸς τῶν Ἀρχαιοτήτων ἐξετάσας...

Ὁ κ. Σπυρίδης κατέβη εἰς τὸ συμπέρασμα...

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