Publ. Astron. Obs. Belgrade No. 96 (2017), 435 - 440 *Contributed Paper*

ONE LETTER CONCERNING CALENDAR REFORM

V. TRAJKOVSKA and V. PROTITCH-BENISHEK

Astronomical Observatory, Volgina 7, 11060 Belgrade 38, Serbia
E–mail: vtrajkovska@aob.rs
E–mail: vprotic@aob.rs

Abstract. In this work the authors present a letter from 1924, which was sent by director of National Observatory of Athens Dimitrios Aiginitis (1862-1934) as a response to the professor of Belgrade University Milutin Milanković (1879-1958). The letter was written in French and it explains why the resulting differences were existing in calculation of the Easter date, on which both of them worked separately, and that was the main object of interest in a letter previously sent by Milanković.

1. INTRODUCTION

The calendar reform issue was particularly actualized at the end of the nineteenth and in the first decades of the twentieth century. After World War I the Eastern European Orthodox countries adopted the Gregorian calendar in the state administration, while in the Church the Julian calendar still remained in usage, because of which started activities aimed at its reforming.

In 1923 in Constantinople the Panorthodox Conference was convened[1] where the question concerning the reform of the Julian calendar was being solved and where the official proposal of the Serbian Orthodox Church was the project of Maksim Trpković. Milutin Milanković, as Serbian delegation member at this meeting, in order to achieve an agreement with the Gregorian calendar as long as possible, which was required at the meeting because of the socio-political circumstances of that time (Simovljević, 1996), proposed a change within the part of Trpković's calendar which concerns the intercalatuion rule but without changing the basis in it (Kečkić, 2001). The Congress adopted this proposal of reforming the Julian calendar which is known as Revised Julian calendar or New Julian calendar; also, after its authors the following names are used: the Trpković-Milanković's calendar (or Milanković's calendar).

Some Orthodox Churches have adopted this calendar, but some of them still use the Julian calendar.

[1] During the meeting the name was changed into Panorthodox Congress

2. THE CONTENT OF THE LETTER

The content of the letter[2] wich was sent by the director of the National Observatory of Athens Dimitrios Aiginitis (1862-1934) as a response to Milutin Milanković (1879-1958), professor of Belgrade University, it concerns the questions of the calendar reform. The letter is dated November 7, 1924 and it was written in French, which was mostly used in that time in correspondence.

In this letter it was briefly explained why the resulting differences existed in the calculation of the Easter date, on which Aiginitis and Milanković worked separately. This is the main object of interest in a letter previously sent by Milanković.

On the first page of the letter the Easter dates are given for a set containing five years which were calculated by Milanković and by Aiginitis.

Table 1: Calculated Easter date according to Milanković ($Easter_M$) and Aiginitis ($Easter_A$)

$Year$	$Easter_M$	$Easter_A$
1927	24 April	17 April
1943	28 March	25 April
1954	25 April	18 April
1962	25 March	22 April
1967	2 April	26 March

As it can be seen in the table (given in the letter), their Easter dates are different. Aiginitis indicated that the cause of these differences arose from different principles of calculating the Easter date, i.e. due to Milanković's calculating the Easter date on the basis of the full-moon day, though it must be calculated according to the Church rule, which is based on the fourteenth day of the lunation.

The traditional way of calculating the Easter date is based on the rule adopted at the Nicaea Council in 325, where in calculating one takes the fourteenth day of the lunation. Aiginitis adds that the Easter rule is followed by all Christian Churches and he mentions it briefly:

"Easter should be celebrated on a Sunday after the fourteenth day of the first lunar month (lunation) after the vernal equinox". Also, Aiginitis cites the reference "Les Constitutions apostoliques".[3]

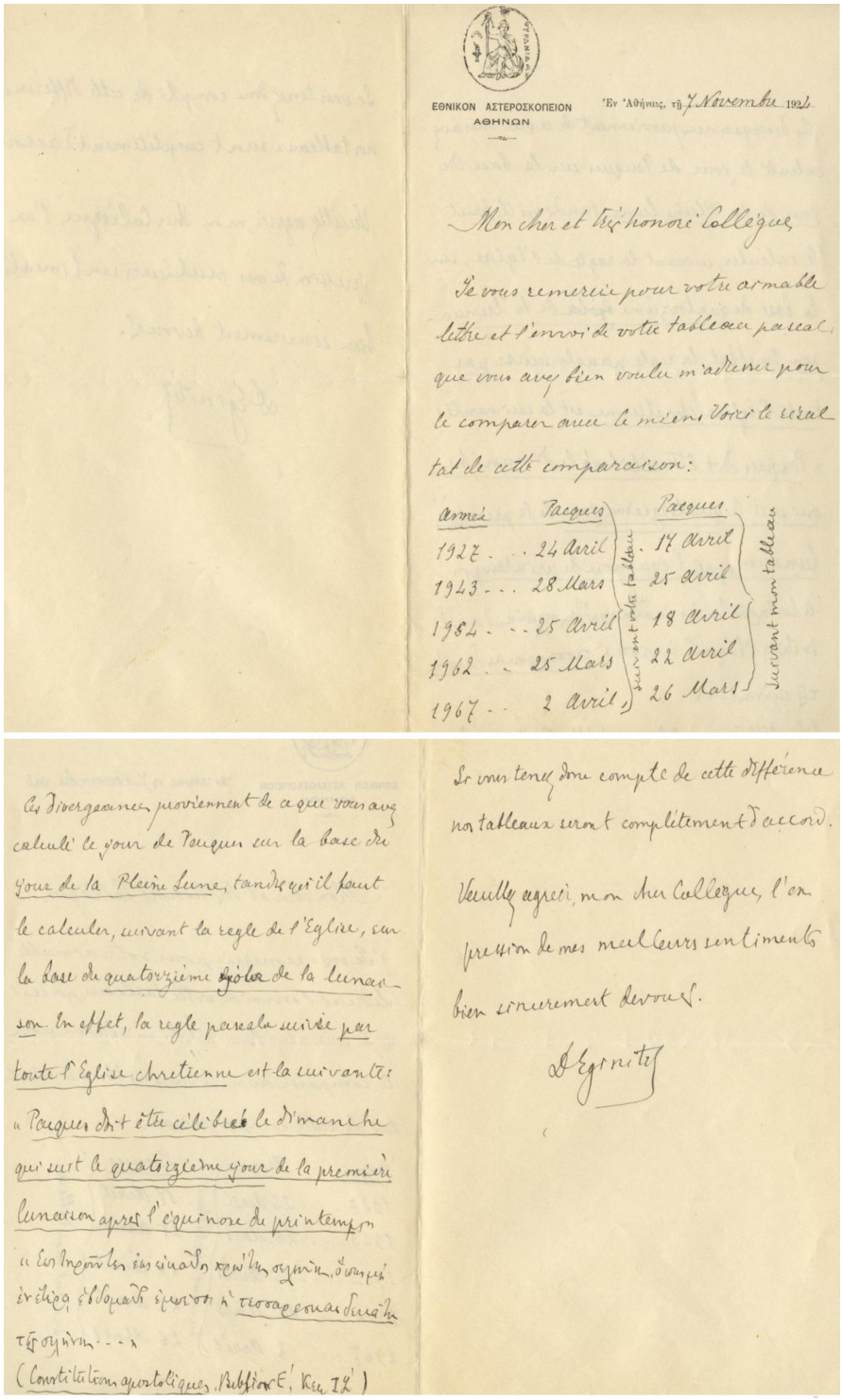
And so in the end of the letter he recommended to Milanković: "If you take this difference into account, our tables will completely agree" ("Si vous tenez donc compte de cette difference nos tableaux seront completement d'accord").

About the Easter rule Maksim Trpković (1864-1924) writes in more detail in his work "Calendar Reform" published in 1900. He states also that according to the decision of the Nicaea Council in 325[4], "Easter has to be celebrated every year for

[2]This letter was for the first time exposed during the exhibition "House on the stellar road", in the SASA gallery on the occasion of 125 years of the Astronomical Observatory of Belgrade. Otherwise, the letter was borrowed from a private collection which belongs to Vojislava Protitch-Benishek.

[3]The "CHRISTIAN SOURCES" collection presents texts from the first centuries of Christianity, together with all the elements (notes, indices, etc.) which can facilitate the understanding or study.

[4]In such a manner some of the Christians had celebrated the Easter before Necaea decision.



ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ
ΑΘΗΝΩΝ

Ἐν Ἀθήναις, τῇ 7 Novembre 1924.

Mon cher et très honoré Collègue,

Je vous remercie pour votre aimable lettre et l'envoi de votre tableau pascal, que vous avez bien voulu m'adresser pour le comparer avec le mien. Voici le résultat de cette comparaison:

Années	Pâques (suivant votre tableau)	Pâques (suivant mon tableau)
1927	24 Avril	17 Avril
1943	28 Mars	25 Avril
1954	25 Avril	18 Avril
1962	25 Mars	22 Avril
1967	2 Avril	26 Mars

Ces divergences proviennent de ce que vous avez calculé le jour de Pâques sur la base du jour de la Pleine Lune, tandis qu'il faut le calculer, suivant la règle de l'Eglise, sur la base du quatorzième épakte de la lunaison. En effet, la règle pascale suivie par toute l'Eglise chrétienne est la suivante: « Pâques doit être célébré le dimanche qui suit le quatorzième jour de la première lunaison après l'équinoxe de printemps » « Εἰς ἡμῶν δὲ ἐν οὐδενὶ κανόνι σημεῖον, ὅ ἐστι μετὰ ἐπίκτης ἑβδομὰς ἔρχεται ἡ τεσσαρεσκαιδεκάτη τῆς σελήνης. - - »
(Constitutions apostoliques, Βιβλίον Ε', Κεφ. ΙΔ')

Si vous tenez donc compte de cette différence nos tableaux seront complètement d'accord.

Veuillez agréer, mon cher Collègue, l'expression de mes meilleurs sentiments bien sincèrement dévoués.

Aiginitis

Figure 1: The faximil of Aiginitis's letter which was sent to Milanković.

the eternal time, in the spring, that is, after the vernal equinox on the first Sunday that comes after the 14th day of the first lunar month (lunation), which is (14 day of the lunation) can happen on the very equinoxes or later (Trpković, 1900).[5]"

The paschal moon or the lower paschal limit, which is the 14th day of the lunation, counting from the conjunction, is determined according to the19- years cycle or according to the golden number with epacts for each year. Trpković corrected the paschal reckoning (corrected the error in Meton's cycle, using the contemporary astronomical data with respect to the meridian of Jerusalem.[6]

In this way, according to Trpković's proposal of calendar reform at the Pan-Orthodox Meeting in Constantinople in 1923, Easter will be celebrated after the equinox (March 21) on the first Sunday that falls from the14th day (exclusively) to the 21th day (inclusive) from the new moon (as defined in "The Apostolic Constitutions", vol V, Chapter 17.)

Milanković argued that the paschal reckoning should be replaced by exact astronomical reckoning for which the data would be obtained from four observatories (Athens, Belgrade, Bucharest and Pulkovo), and which was adopted at the Pan-Orthodox Meeting in Constantinople in 1923, i.e. to use the astronomical full moon in determining the Easter date. In the Church circles the decision on calendar reform was criticized and labeled as non-canonical due to the disrespect and replacement of the paschal reckoning i.e. Church rules, and because according to the adopted calendar the vernal equinox occurs more frequently on 20 March, following the Gregorian calendar (Trajkovska, 2003).

In his work Milanković (1923) in Appendix 9 gave a table with Easter dates for the next 50 years (since 1924) in parallel for the Eastern Church, i.e. for those calculated for the calendar solution accepted at the Meeting in Constantinople in 1923, taking the data for the astronomical moon and for the Western Church. In this table are observed differences in the dates of Easter for those 5 years that had been specified in the letter of Aiginitis. Milanković did not cited the data source of the Western Church. Bearing in mind the correspondence with Aiginitis and the already mentioned Easter date for the 50-year period in both cases (in the letter and in Appendix 9 of Milanković (1923) most likely Milanković reached these data through Aiginitis.

Milanković dealt with the calendar reform for a short time, only a month, studying it before the Meeting in Constantinople in 1923 and did not pay sufficient attention to the paschal reckoning, which he also mentioned.

Christian churches use their own method of calculating the Easter date and they have never implemented the procedure in relation to the astronomical account of the day of the full moon. Probably, bearing in mind the Church's paschal rule for the Easter date, Maksim Trpković notes in his project of calendar reform that the calculation taking into account the results of astronomical measurements is more accurate, but the paschal reckoning is more convenient and practical.

[5]According to the Church calculation the full moon occurs on the 14. Day from the new moon counting from the appearing of the crescent moon.

[6]Before the paschal reckoning was made according to the Alexandrian time, because the author of the Julian calendar Sosigenes was born in Alexandria.

3. SOME NOTES ON THE WORKS OF AIGINITIS AND MILANKOVIĆ

Dimitrios Aiginitis was the director of National Observatory of Athens (NOA) in the period 1890-1934, when this institution experiences "renaissance". He obtained PhD degree in mathematics. In the period 1891-1896 in addition to the Astronomical Institute, two others were founded, the Meteorological and the Seismological Institutes with a new staff. Later the third departement of the Observatory was formed: the department of geodynamics. Almost in the same time in Belgrade the Observatory of Grand School was founded, by Milan Nedeljković (1857-1950) which was astronomical, meteorological and also covered seismology. Aiginitis reorganized the meteorological network and created a seismological service. With his efforts new instruments were ordered and installed. He organized the editing of the "Annales de l'Observatoire National d'Athenes" in French. Aiginitis had significant role in the political and academic life in Greece. He was Minister of Education and in 1926 he founded the Academy of Science in Athens. His contribution in accepting the World Time Zone system and the Gregorian Style Calendar in Greece was also important (http://www.noa.gr/museum/english/history_en.html).

Milutin Milanković, professor of Belgrade University, as academician was Vice President of the Serbian Academy of Sciences in three terms between 1948 and 1958, and was appointed the director of the Belgrade Astronomical Observatory (during the period Jan 27 to June 26, 1951), whereas since 1948 as President of the Scientific Council of SASA he served as its director (Protić and Protić-Benišek, 1982; Ševarlić and Arsenijević, 1989). First he was an engineer in Vienna, having acquired a doctorate in engineering, and after appointment as professor of applied mathematics at the University of Belgrade, dealt with the topics of climatology, astronomy, and geophysics. His most important work is astronomical theory of climate changes published in the "Canon of Insolation of the Earth and its application to the problem of ice ages" (1941) in German ("Kanon der Erdbestrahlung und seine Anwendung auf das Eiszeitenproblem"), which represents his entire lifelong work. Also, he dealt with moving of the poles of Earth rotation, reform of calendar, history of science etc.

4. CONCLUSION

The authors of this paper consider that the correspondence between the Dimitrios Aiginitis and Milutin Milanković is very important as for history of science so as to the understanding of certain questions of significance concerning the application of the calendar for the Church purposes, particularly in the calculation of Easter date. So it is strange that this letter was not present in the correspondence given by Milanković to SASA.

Acknowledgment

The authors wish to express their gratitude to Prof. dr Radomir V. Popović for useful coments concerning the application of the Easter rule in the Church's practice, as well as for his version of the translation of a part of the text from Aiginitis's letter.

References

Kečkić, D. J.: 2001, *Flogiston*, **11**, 47-75.
Milanković, M.: 1923, Reforma julijanskog kalendara, SKA, Pos. izd., Nauke prirodne i matematičke, **11**, Beograd.
Protić, M., Protić-Benišek, V.: 1982, *Zbornik radova Život i delo Milutina Milankovića 1879-1979*, Naučni skupovi SANU, knj. XII, Predsedništvo, **3**, 181-190.
Simovljević, L. J.: 1996, *Glas SANU, CCCLXXXI, Odeljenje prirodno-matematičkih nauka*, **58**, 1 -9.
Ševarlić, B. M., Arsenijević, J.: 1989, *Publ. Astron. Obs. Belgrade*, **36**, 25-37.
Trajkovska, V.: 2003, *Publ. Astron. Obs. Belgrade*, **75**, 301-306.
Trpković, M.: 1900, Reforma kalendara, Beograd
http://www.noa.gr/museum/english/history_en.html