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ORTHODOXY AND HERESY IN BYZANTIUM

THE DEFINITION AND THE NOTION OF ORTHODOXY
AND SOME OTHER STUDIES ON THE HERESIES
AND THE NON-CHRISTIAN RELIGIONS

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CORRECTION OF THE EASTER *COMPUTUS*:
HERESY OR NECESSITY?
FOURTEENTH CENTURY BYZANTINE FORERUNNERS
OF THE GREGORIAN REFORM

INTRODUCTION: CALENDAR PROBLEM IN CHRISTIAN WORLD

The difference between the Catholic and the Orthodox (Eastern Orthodox and Oriental Orthodox as well) calculations of the main Christian feast, Easter, is nowadays one of the most obvious points of disagreement between the Christian Churches. In Russia, where the Church continues to use the old Julian calendar, this peculiarity is often interpreted as an important part of the Orthodox tradition and its alteration is considered a deviation and heresy. This attitude goes back to the reaction of the Greek Orthodox world to the famous calendar reform introduced in 1582 by the bull *Inter gravissimas* of Pope Gregory XIII. That year, three Orthodox Patriarchs issued in Constantinople a synodal *sigillion* that severely concluded: «Whoever does not follow the customs of the Church as the Seven Holy Ecumenical Councils decreed, and Holy Easter, and the Calendar with which they did well in making it a law that we should follow it, and wishes to follow the newly-invented *Paschalion* and the New Calendar of the godless astronomers of the Pope, and opposes all those things and wishes to overthrow and destroy the dogmas and customs of the Church which have been handed down by our fathers, let him suffer anathema and be put out of the Church of Christ and out of the Congregation of the Faithful»¹.

Indeed, the Calendar and Easter question is one of the oldest problems of the Christian world. Already in the second century it was at the centre of the polemic between Roman and Asian Churches, which claimed to be observing the genuine apostolic tradition. A great number of calendars coexisted in Hellenistic and early Roman times in different

¹ The English translation published electronically at www.orthodoxinfo.com/ecumenism/prot_rc_heresy.aspx, accessed 27 December 2009.

regions of the Mediterranean, and in the Greek Orient nearly every large city had its own system of time reckoning. During the first centuries of Christianity the Christian *computus* (as Easter tables are usually called), deriving from the Hebrew lunisolar calendar, was being accommodated to the calendar of the Roman World, introduced by Julius Caesar, which had no connection with the Moon at all. The additional difficulty was the need to coordinate the Easter date with the first day of the week, Sunday.

After a rather long period of discordance, when many regional calendars and *computus* traditions coexisted in different Churches, the First Ecumenical Council at Nicaea (325) took measures to coordinate the celebration of the main Christian feast. The task was appointed by the Emperor Constantine the Great himself, who had been displeased by the absence of unity among Christians in his Empire. Nevertheless the decisions of the Council of Nicaea were far from definitive. In the 4th and 5th centuries Christians in the East and the West celebrated Easter at different dates in several instances. It does not, however, look like a burning problem in our sources. The real difficulties began only when the difference concerned the main sees, such as Rome and Alexandria, as was the case in A.D. 444 and 455. The Roman Church faced the necessity to leave behind the old Roman *computus*, the 84-year cycle. It was not an easy decision for Pope Leo the Great, who was very concerned about the authority of the see of St Peter. The attempt was undertaken to construct a new western *computus* where the accuracy of the 19-year cycle was compatible with the old Roman Easter tradition. But the task, which was commissioned to the Gaul computist Victorius of Aquitania, was too complicated to be resolved successfully, and already in the next century the Roman Church accepted the classical type of the 19-year cycle – the Alexandrian one, which was known in the West as the *computus* of St Cyril. It was translated into Latin and continued till A.D. 626 by Dionysius Exiguus, and the account of the years from the *Incarnatio Domini* in his Easter table, which Dionysius for some reason began from the year which we call now A.D. 1 – is nowadays the most common dating system the world over².

The success of the Dionysian era was the result of the slow but inevitable process of calendar unification, which started in the time of

² For the so called Dionysian problem see: A.A. MOSSHAMMER, *The Easter Computus and the Origins of the Christian Era*, Oxford 2008 (Oxford Early Christian Studies). Cf. also my review in *Вестник Православного Свято-Тихоновского гуманитарного университета. Серия: Богословие. Философия* 4 (28) (2009), pp. 66–74.

Caesar. The first step in this way was the Julian calendar that became the common dating system in the Late Antique world. This calendar, with some regional variations, was for many centuries common to all Christian communities even after the schisms of the fifth and the sixth centuries and the collapse of the Eastern Roman Empire in the seventh century. The next step in the unification was the Alexandrian *computus* – a lunisolar calendar system, constructed in the third century by the famous Alexandrian scientist Anatolius, bishop of Laodicea, on the basis of the Julian calendar and the classical 19-year cycle of Meton the Athenian. The main idea of this important invention consists in the fact, that the combination of the 19-year cycle with the Julian year generates a cycle with 19 solar years = 235 lunar months = 6939,75 days. This equation is the same as in the 76-year cycle of Callippus – one of the most accurate lunisolar cycles of Antiquity. Its accuracy is rather high: one day in 312 years for lunar phases (instead of one day in 62 years in Meton's cycle) and for the tropical year – one day in 128 years (just as in the Julian calendar; in Meton one day in 48 years already)³.

The Alexandrian cycle was not the sole type of the Julian *enneadekaëteris*, but the most respected one. All other variants, invented from the fourth to the seventh centuries (e.g. the *cyclus lunaris* of Dionysius' table, the cycle of Heron in the sixth century, the cycle of *Chronicon Paschale*), had to accept the Alexandrian set of Passover full moons. The only exception was the Armenian *computus* (mid-sixth century), but its peculiarity comes to nothing more than a sole date – April 6 instead of Alexandrian April 5. This discrepancy is relevant for the Easter date four times in 532 years (with periods of 95, 95, 95, 247 years). Such occurrence became invariably a subject of fierce polemics between Armenians and other Christians, from A.D. 570 onward. The most important feature of this polemics is that Armenians were obliged to defend their date not only against «the curved Easter» (*tsra zatik'*) of Orthodox Greeks and Georgians, traditionally treated by them as «Chalcedonian Nestorians», but against their brothers-in-confession Copts and Ethiopians, firm adherents of the Alexandrian tradition⁴.

³ E. SCHWARTZ, *Christliche und jüdische Ostertafeln*, Berlin 1905; Д.А. ЛЕБЕДЕВ, *Из истории древних пасхальных циклов*, in *Византийский временник* 18 (1911) [1913], pp. 148-389; В. KRUSCH, *Studien zur christlich-mittelalterlichen Chronologie: Die Entstehung unserer heutigen Zeitrechnung*, Berlin 1938.

⁴ П.В. КУЗЕНКОВ - К.А. ПАНЧЕНКО, «Кривые Пасхи» и Благодатный Огонь в исторической ретроспективе, in *Вестник Московского университета*, серия 13, 4 (2006), pp. 3-29.

At the opposite part of the Christian world Britain and Ireland were another camp of «calendar dissidents». The Irish were the last to give up the old Roman 84-year Easter *computus* in the eighth century, while the rest of the Christian world from Gaul to Mesopotamia was already employing the much more accurate 19-year cycle. Thereby, the Calendar controversy was in no way a new matter for Christian communities. Nor was it strictly tied with any confessional, ethnic, or cultural rivalry.

SCIENTIFIC AND RELIGIOUS PROBLEMS

The Alexandrian *computus*, based on the 19-year lunisolar cycle, was the most accurate among the practically oriented calendar systems of Antiquity. More punctual astronomical periods, such as the 304 year cycle of Hipparchus, could not be applied to calendar tasks. The full Easter *computus* has to take into account not only the dates of full moons, but also weekdays, and so it forms a combination of the lunisolar, the week, and the Julian bissextus periods. For the 19-year cycle it means the full period of 532 years – a rather long table to be written and copied for practical use. The more convenient variant was a matrix with two cycles – 19-year «lunar» and 28-year «solar» (in fact the weekday cycle). The use of such a tool was not very complicated, and any educated cleric was able to determine the date of Easter – even having no idea of the real astronomical and mathematical structure of the system as a whole.

With all its accuracy and convenience, the Christian *enneadekaëteris* was far from being perfect. Every 128 years the real date of the vernal equinox moved one day off from March 21 – the equinoctial limit of the Alexandrian *computus*. However, such an error was not easily noticeable, as opposed to the apparent mistake in the lunar phases. The Passover dates of the Easter tables (*XIV lunae*, νομικὸν πάσχα, паска жидомъ) slowly but surely drew back from the real full moons, one day in 312 years approximately. Therefore, the divergence was to be noticed in the seventh century, when this period had elapsed from the inception of the Alexandrian Easter table about A.D. 300. From the tenth century the moon error was already two days, and till the fourteenth century it reached a full three days – an inaccuracy too big to be ignored. So, the problem of the calendar reform was put on the agenda.

In the Middle Ages the Christians in Byzantium and Europe were not alone in their attention to the full moons. The Jews, as many centuries before, were celebrating their festivals according to the lunisolar

calendar, with the Passover in the evening from the 14th to 15th day of the lunar month of Nisan. We have very little knowledge about the early history of the Rabbinic calendar, but it can be taken for sure that in the tenth century the Jewish communities used the modern calendar system⁵. The Jewish calendar is based on the lunar period of Hipparchus-Ptolemy: 29 days 12 hours 793 *kh^alakim* (44 min. 3 1/3 sec.). It is a very precise parameter, with the error reaching one day only after more than 13.670 years. The Muslims in neighbouring countries also were attentive to the moon, and the Muslim scientists acquainted with the Christian *computus* did not miss the opportunity to deride its inferiority⁶. So, the problem of the *computus* error was not purely scientific, it obviously reflected on the authority of Christian religion.

The lunar correction was made by Byzantines both effectively and simply. Instead of the *epactae* (the age of the moon on the eve of the New Year) the *themelia* («foundations») were introduced as the basic phase of the moon. In the eleventh century the *themelion* of a year was one day more than the classical *epactae*, and in the fourteenth century it had reached three days. By this operation the age of the Moon was counted more or less correctly. Of course, it was not quite a legal operation: the Passover «full moon» could be found not as the 14th or 15th day of the moon's phase, as it should be, but the 16th, 17th and 18th day. However, any inaccuracy at this point doesn't play a sufficient role in the determination of the Easter date, because in any event it is to be postponed till the nearest Sunday several days later. As the prominent Byzantine canonist of the fourteenth century Matthew Blastares says, «this anomaly about the day of *Pascha*, caused by the time and by the course of planets, causes no harm to the piety at all, but increases its eminence: for hereof the divergence between *Pascha* of the Law (*i.e.* Passover) and our (*i.e.* the Easter) becomes even more evident»⁷.

From the theoretical point of view, the error of the vernal equinox was much more serious. This point of the solar orbit, where the Sun enters the Zodiac sign of Aries, from the middle of the third century was

⁵ S. STERN, *Calendar and Community: A History of the Jewish Calendar, 2nd c. BCE-10th c. CE*, Oxford 2001.

⁶ E.g. AL-BĪRŪNĪ, *Āthār al-Bākiya* 16 [АБУРЕЙХАН БИРУНИ, *Избранные произведения*, I, Ташкент 1957, p. 341] (the edition and translation of E. Sachau has a *lacuna* at this place).

⁷ MATTHAIOS BLASTARES, *Syntagma alphabeticum (s.v. Πάσχα)*: G. RHALLIS - M. POTLES, *Σύνταγμα τῶν θεῶν καὶ ἱερῶν κανόνων*, VI, Athens 1859, p. 408.

considered by Christian authors as the natural limit of the year⁸. The foundations for such a view lie not only in the ancient astronomic tradition, but in the Bible itself, where the month of Passover is regularly called the *first* month of the year⁹. If a full Moon fits before the equinox, this lunar month can not be regarded as the month of Passover, so the festival has to be postponed till the next full Moon. The problem was that nobody knew the exact date of the vernal equinox. In Late Antiquity there were several opinions about its date:

- March 25 (common to the Latin West till the end of the fourth century, e.g. in the African treatise *De solstitia et aequinoctia*);
- March 24 (attributed to Eusebius of Caesarea by later Syrian authors and to the Phrygian Montanists by Sozomenus in the fifth century);
- March 22 (the date obtained empirically by the famous astronomer Claudius Ptolemy in A.D. 140, is accepted in the fourth century by the *Constitutiones Apostolorum* and Epiphanius of Cyprus);
- March 21 (the earliest possible Passover full Moon in the Alexandrian *enneadekaëteris*).

While the Alexandrian cycle was becoming the most reverend variant of Easter *computus*, the last date strengthened its status as the common date of the vernal equinox in the Christian tradition. It was accepted in the Greek East by Andrew of Byzantium (353), Theophilus of Alexandria (390), the unknown author of the *Chronicon Paschale* (630); in the Latin West by Dionysius Exiguus (525) and Beda Venerabilis (c. 700). Moreover, in spite of the fact that the real point of the vernal equinox did move to March 20 already in A.D. 300–500 (and then to March 19 in A.D. 500–600 and so on to March 13 in the 14th century), there is no trace of distrust about its correctness in the Middle Byzantine sources. All the authors, from John the Damascene in the eighth century to Michael Psellos in the eleventh, regard March 21 as an adequate date of the vernal equinox in their astronomical treatises.

More scrupulous were the Oriental Christians. As early as c. 700 Jacob of Edessa deals with the one-day mistake accumulated «in so many years» and suggests a simple decision: to take one bissextile year as an ordinary one thus missing one day¹⁰. Symeon Barkaya, a Syrian author of

⁸ DIONYSIUS ALEXANDRINUS apud EUSEBIUS, *Historia ecclesiastica* VII, 20.

⁹ Ex 12,18; 23,15; Lev 23,5; Num 9,1–3; 28,16–17; Deut 16,1.

¹⁰ ELIAS NISIBENUS, *Opus chronologicum* II: ELIAE METROPOLITAE NISIBENI *Opus*

uncertain date (not later than A.D. 800), states, that «we Syrians have the equinox on the 19th day of Adār» (March 19)¹¹. The account of Jacob is done according to Ptolemy (one day mistake in 300 years), while that of Symeon corresponds more to the Jewish lunisolar calendar, where the values of the vernal *ṛkupa d^e-Rav-Ada* (the Hebrew term for solstices according to the fourth century *amora* Ada bar Ahawa) are as follows: March 20 for A.D. 250–550; March 19 for A.D. 550–850; March 18 for A.D. 850–1150 and so on.

The next step in determining the precise date of the equinox is represented by the chronological treatise of Elias Bar Shinaya, Metropolitan of Nisibis (A.D. 1016). Elias, who lived in the epoch of scientific blossoming in the Islamic world, was competent enough to compute a more precise length of the solar year (365,25 days without 24/110 of a day, resulting in a one-day mistake in 775 years), and consequently quite a reliable date of the vernal equinox for his time – March 15.

For centuries the Byzantine scientists were obedient followers of Ptolemy's reception of the classical system of Hipparchus. As far as it is seen from Byzantine astronomical and astrological texts, even the knowledge of Ptolemy and his continuator Theon of Alexandria was not really thorough. The next step of the scientific research in this field, made by the Muslim authors, remained out of sight of Byzantine scholars for a long time. There were, of course, exceptions, and already in the eleventh century we have treatises with comparison of Ptolemy's data with «modern» scientists (*neoterōi*), i.e. Arabian astronomers of the ninth and tenth centuries¹². But only in the fourteenth century the Byzantine astronomy has known a real resurgence, from the entirely «classical» work of Theodor Metochites (*Στοιχείωσις ἀστρονομική*, 1316–1317) to the wide-range reception of the Oriental astronomic tradition by Chioniades and his school¹³.

The appearance in the fourteenth century of scholars who were considered experts in astronomy, and were well respected for their scientific knowledge in the Late Byzantine society, made the problem of the accuracy of the Christian *computus* one of the items of public disputations.

chronologicum. Pars posterior, ed. et interpr. I.-B. CHABOT, Parisii-Lipsiae 1909–1910 (Corpus Scriptorum Christianorum Orientalium, 62–63; Scriptorum Syri, 22, 24), pp. 52–53 (textus), 74 (versio).

¹¹ *Ibid.*, pp. 110–111 (textus), 119 (versio).

¹² See A. ТИХОН, *Tables islamiques à Byzance*, in *Byzantion* 60 (1990), pp. 401–425.

¹³ See D. PINGREE, *Gregory Chioniades and Palaeologan Astronomy*, in *Dumbarton Oaks Papers* 18 (1964), pp. 135–160.

DISCUSSION OF THE REFORM

One of the most ambitious figures among the Late Byzantine scholars was Nicephorus Gregoras¹⁴. A pupil of Theodor Metochites, he was very proud of his learning in astronomy, and was able to compute the solar eclipse of July 16, 1330¹⁵. About 1324, Gregoras, then 35 years old, presented to his patron emperor Andronicus II Palaeologus a project of the *computus* reform. The main feature of Gregoras' plan was a two-day shift of the Passover dates of the classical 19-year list (*canonion*): March 31 - March 20 - April 8 - March 28 and so on, instead of April 2 - March 22 - April 10 - March 30...¹⁶. This project and the story of it in Gregoras' *Historia Romana*¹⁷ gives rise to a lot of questions. First of all, Gregoras considers as the main problem of the Christian *computus* the false date of the equinox, March 21 instead of March 17¹⁸. His reasoning, however, is inconsistent at this point: at first he gives different dates according to Ptolemy, but then skips to March 17, arguing, that he has made it more exact (ἔγωγε αὐτὸς ἐξακριβώσας εὖρον) – probably, under the Jewish influence. Then he unexpectedly states that the mistake of the equinox can be easily corrected by the rejection of two days, so his variant of *canonion* fixes the earliest Passover on March 19. Gregoras' reform was received benevolently by the old emperor, who found it impossible however to introduce it into practice. «It would be uneasy – he said – to inform simultaneously all our compatriots in every mainland and island, and to convince them to be retrained. But any disagreement in the Easter celebration is undesirable. So, it is more convenient to leave it as it was heretofore». This opinion of a conservative politician displeased the ambitious scholar, who considered it to be quite possible to convince all citizens during two or three years, «as it was often done in ancient times»¹⁹.

The critical appraisal of Gregoras' project appears in the authoritative Byzantine lexicon of the canonical law, written in 1337 by Matthew Blastares²⁰. He paid attention to the Easter calculations, giving an expla-

¹⁴ See on him in general *PLP* 4443.

¹⁵ J. MOGENET - A. TIHON - R. ROYEZ - A. BERG, *Nicéphore Grégoras. Calcul de l'éclipse de Soleil du 16 juillet 1330*, Amsterdam 1983.

¹⁶ *PG* 19, coll. 1313-1316; cf. V. GRUMEL, *La chronologie*, Paris 1958, p. 55, tab. xv.

¹⁷ NICEPHORUS GREGORAS, *Historia* VIII, 13 [NICEPHORI GREGORAE *Byzantina historia*, cura L. SCHOPENI, I, Bonnae 1829 (Corpus Scriptorum Historiae Byzantinae), pp. 364-372].

¹⁸ *Ibid.*, p. 366.

¹⁹ *Ibid.*, p. 373.

²⁰ See on him *PLP* 2808.

nation of the inaccuracy of the traditional *computus* in relation to the moon, as well as the date of the vernal equinox. Blastares explains the mistake of the Easter *computus* in respect of the moon (one day in 304 years) by the anomaly of the movements of the «Great Lights»; he compiled very scrupulous tables of the lunar phases according to the mean lunation of 29 d. 31' 50'' 9''' (in Ptolemy – 31' 50'' 8''' 20''''')²¹. He receives the solar year length of 365,25 days without a 1/300 (according to Ptolemy), so every 300 years the date of the equinox steps back in the Roman calendar. The table in the book gives the dates of the vernal equinox through about 2700 years – from the year of the world 4156 (1353 B.C.) with the date March 27, till 6856 (A.D. 1348) with March 18²². So, Matthew Blastares is aware of the inaccuracy of the traditional *computus* in relation to the moon and to the equinox, but he is sure that there is no reason to alter the *canonion* of the Fathers, because it is impossible to invent another system more precise and equally handy. Blastares mentions the project of skipping two days from the *canonion* beginning with the year 6841 (A.D. 1332/3), *i.e.* that of Nicephorus Gregoras, and reasonably argues that it can not avoid the accumulation of new error, but «will be hospitable to the excessive disturbance in the Church». What's more, he says that the error of the old *computus* is irrelevant to the main canonic prescriptions about Easter, but automatically moves away the Christian feast from the Jewish one, which is far from being regrettable²³.

The next person who dealt with the problem of the *computus* is Isaac Argyros in his treatise addressed to Andronicus Oenaeotes (1372)²⁴. A pupil of Gregoras, Argyros looks like a more competent astronomer than his teacher: he is not only acquainted with Persian scientists, but has personally observed the summer solstice «during a lot of days»²⁵. The error of the Roman year calculated by Isaac is «a little more than one hundredth of a day» – much more precise than Ptolemy's calculation and about the real value (1/128). In his treatise Isaac speaks a lot about the inaccuracy of the traditional *canonion*, that compels Christians to cele-

²¹ MATTHAIOS BLASTARES: RHALLES – POTLES, *Σύνταγμα* cit., pp. 417–418 (with several mistakes).

²² *Ibid.*, p. 424.

²³ *Ibid.*, pp. 424–425.

²⁴ On Isaac see *PLP* 1285.

²⁵ See A. ΤΙΗΟΝ, *Astronomie byzantine à l'aube de la Renaissance (de 1352 à la fin du XV^e siècle)*, in *Byzantion* 66 (1996), pp. 244–280.

brate Easter «not at the proper time», and mentions with respect Gregoras' «new *canonion*», which «was welcomed by the emperor, the senate and the select men of the Church»²⁶. But then he suddenly apologises, stating that he had no intention to condemn the inventors of the traditional Easter table, so «let my foes not move their calumniating tongues». The only task of his work, he says, is to demonstrate the impossibility of avoiding temporal errors by means of a *canonion*.

So, we can guess that there were people who would be ready to accuse Argyros (who was at the same time an active antipalaminite) of the blasphemy of the Fathers, a kind of «calendar heresy». And he had to be careful enough to make a brilliant display of his knowledge, but not to propose any novelty.

A curious note about the correction of the *computus* is interpolated in the same treatise of Isaac Argyros. Some anonymous reader in the year 1411 inserted into the text the following optimistic comment:

If, according to the belief of many people, it will be the end of all things at the end of the year 7000, there is no purpose to find out the method of correction of the lunar years, when only 81 years are left to use this method: for in these 81 years no significant difference will occur, even if those who will then live will use the old uncorrected method. But if the time of the end is indefinite, as some people think, and I join them, it would be appropriate to correct the method of the lunar *computus* and to add the epactae of the moon to those of the modern method, and so not to deviate from the rightness²⁷.

There were also several other late Byzantine treatises on the problem of the Easter *computus*, but we have no opportunity to analyze them here²⁸. Indeed, they can be regarded as a good example of the ideological transformation from the Christian Middle Ages to the Modern times.

²⁶ ISAAC ARGYROS, *Ad CEnaxotem dominum Andronicum, qui ratione traditas methodos postularat solis ac lunæ cyclorum, et eorum quæ ex his consequuntur*. PG 19, col. 1313.

²⁷ *Ibid.*, col. 1309.

²⁸ Cf. O. SCHISSEL, *Die Osterrechnung des Nikolaos Artabasdos Rhabdas*, in *Byzantinisch-neugriechische Jahrbücher* 14 (1937-1938), pp. 43-59; A. TIHON, *Il trattato sulla data della Pasqua di Barlaam comparato con quello di Niceforo Gregoras, in Barlaam Calabro: l'uomo, l'opera, il pensiero*, ed. A. FYRIGOS, Roma 1999, pp. 109-118; A. RIGO, *Gli interessi astronomici del cardinal Bessarione*, in *Bessarione e l'Umanesimo*, [catalogue of the exhibition: Venice 1994], ed. G. FIACCADORI, Napoli 1994, pp. 105-117.

CONCLUSION

The Byzantine authors to whom the fallacy of the traditional *computus* was a fact conclude that, as a result, the Christians often celebrate Easter at «wrong» dates. The main problem is here the violation of the Old Testament prescription about «the first month of the year», when Passover should be celebrated. But in fact, nowhere in the Bible can one find the exact date of the beginning of the year. In fact, the idea to fix the starting point of the solar cycle in the spring equinox and the beginning of the Aries is little more than pure speculation. The old Egyptian calendar had no fixed starting point in the solar year and wandered through the seasons. The Muslim lunar calendar pays no attention to the sun at all. The Jewish calendar with respect to the sun is not much more accurate than the Roman year: its solstice points move off from the real tropics one day every 216 years. What's more, in the Rabbinic tradition it is not the spring equinox, but the autumnal one that is considered to be *Rosh ha-shana* (the head of the year), and Passover is celebrated by modern Jews not in the first, but in the seventh lunar month. Nicephorus Gregoras says about the religious meaning of the inaccuracy of the Easter computing only that «the consequences of such an error are clear to everybody». This general phrase exposes the absence of a serious argumentation in favor of the reform of the *computus*.

The goal of any reform is a desire to improve. But what is the main quality of a calendar, religious or civic? Any calendar is a mathematical system invented to describe the main astronomic phenomena – day, month, and year. These planetary movements can not be described within each other through simple numbers, and the main art is to obtain a fraction that would combine exactness with applicability. In this respect the Julian *enneadekaëteris* is undoubtedly one of the best creations of the mathematical genius.

What's more, every attempt to improve and to correct the calendar provokes a tide of social discontent, because stability is one of the main qualities of any general system, like a calendar. The real necessity in the calendar reform never occurs from practical, scientific, or ritual reasons. The reason can be only political, when some social force needs to demonstrate its might and influence on the life of millions of people. The mightiest system consumes old and different variants, or marginalizes them. The resistance often looks like a struggle between tradition and innovation, and this was the case of the Orthodox reaction to «Gregorian heresy». But the Byzantine case was much simpler. It was nothing

more than an attempt made by certain intellectuals to demonstrate their profound competence in astronomy, and has neither political nor ecclesiastical interest.

As can be seen from the texts, the calendar problem was not very topical for Byzantines even in the fourteenth century, when the inaccuracy of the traditional *computus* became obvious to all. The project of the correction was never considered as «heretical», but rejected because of unwillingness of the emperor to disturb society. In fact, there was no real necessity for a calendar reform from the religious point of view, and even the Byzantine intellectuals found it more suitable to maintain the old good system «of the Fathers».

PAVEL KUZENKOV