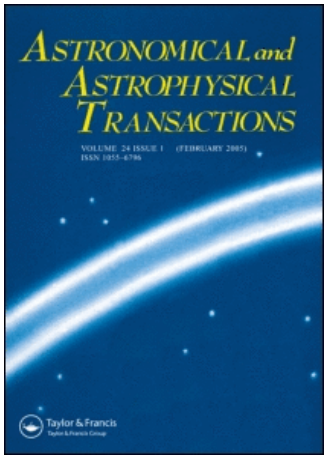

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THE CHRISTIAN CHRONOLOGIES OF THE CREATION AND THE VIEW OF MODERN ASTROPHYSICS

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How many different chronologies have been proposed for the beginning of the Creation?

It is, of course, well known that the Jewish chronology starts from 7 October (1 Tishri) 3761 BC; however, this starting point apparently did not satisfy various scholars nor Christian savants and astronomers. As a result, from time to time miscellaneous dates were being proposed, from the Jewish historian Josephus (first Century AD) up to the French humanist Joseph Scaliger (1484–1558) and the famous Polish astronomer Johannes Hevelius (1611–87). Not only the scholars of these eras but also the Christian Churches defined through Ecumenical Council decisions the beginning of the Creation.

In this study we present the proposed dates, while we note that especially the date proposed by James Ussher (1581–1656), Archbishop of Armagh (Northern Ireland), that is the year 4004 BC and not the centurial year 4000 BC, is due to the historians' belief that Herod died in 4 BC. Thus, Ussher added these 4 years to the year 4000 BC in order to have a more accurate chronology in respect to the birth of Christ, a birth placed by him, as well as by many chronicle writers of the era, in 4 BC.

Keywords: Creation; chronology; Joseph Scaliger; James Ussher; Johannes Hevelius

1 THE CHRONOLOGIES

The *Bible* uses as its chronological basis the reigns of the various monarchs, a fact that renders difficult the identification of its chronologies with those coming from catalogues of kings of the same period. The years were not numbered in a linear succession but according to a particular king's reign.

As Whitrow (1989, pp. 52–53) mentioned:

> It has therefore frequently been maintained that for the ancient Hebrew time was a unidirectional linear process extending from the divine act of creation to the ultimate accomplishment of God's purpose and the final triumph, here on earth, of the chosen people Israel. . . . For the Hebrews the present was never a clearly delimited unit with precise boundaries but was part of a continuum stretching from the beginning to the end of time and was continually influenced by both past and future. It is significant that the Old Testament contains no numbered dates, despite its concern with an intricate historical record.

Nevertheless, for the Jewish chronologies there are also the Jewish books *Sefer* '*olam rabba*' (*The World Order*) and *Megillat Ta'anit* (*Parchment of the Fasting*), which correlate known

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events with specific dates. Indeed, according to rabbi Joshi ben Halfata, in *The World Order* the years of the Jewish calendar are counted from the Creation of the world, which is calculated by adding backwards the periods in the *Holy Bible* (1979) up to the Creation (Genesis 1: 1–31, 2:1–3). This counting was not used before the eighth century AD, but from the ninth Century AD it was carved on the Jewish graves and since the twelfth Century AD was used by all Jews. Therefore, since the ninth to twelfth century AD and up to this day the Jewish chronology system sets as its starting point the supposed year of the Creation of the world (anno mundi (AM)), which is placed by the Judaic holy tradition on 7 October (1 Tishri) 3761 BC, written in the corresponding date of the proleptic Gregorian calendar. We note that, according to the testimony of the Arab astronomer, mathematician and chronologist al Biruni (1879) (Abu Ar Rayhān Muhammad ibn Ahmad al Biruni, AD 973–1050) in his opus *Atkhar al-Bakiyiah* (*The Chronology of Ancient Nations*), the chronology since Adam's time corresponded to the year 3760 BC.

However, the date 7 October 3761 BC, or 3760 BC since Adam, was not convincing to either Christian or Jewish scholars. Thus, other years were proposed for the beginning of the Creation, such as 5624 BC and 4163 BC by the Jewish historian Josephus.

Despite the influence of the Jewish culture on Christianity, Christian philosophers and theologians based on the Holy Scripture (although the Scripture does not contain dates) gave different years and dates for the beginning of the Creation. It seems that the determination of the date of Creation was of great significance because, according to Whitrow (1989, p. 65): 'Time for Christians began with the Creation and would end with Christ's Second Coming. World history was bounded by these two events'.

Theophilus of Antioch was (since AD 169) the sixth Patriarch of Antioch as reported by the church historian Eusebius (1959, Vol. IV, p. 20). As a patriarch, he wrote a famous apologetic work against the gentiles entitled *Three Books for Autolykos*; as a church writer, he was the first to use the term 'trinity' (B 15) and his theology exerted a serious influence on subsequent theologians. Theophilus of Antioch argued, towards the end of the second Century AD, that on the question of chronology the text of the *Bible* is a sufficient guide. Based on the holy text, he calculated that the Creation of the world took place 5700 years before his era; in other words, in approximately 5500 BC according to the subsequent chronology based on the birth of Christ, which was introduced by the Scythian monk Dionysius Exiguus in the sixth century AD. In the bibliography, however, it can be found that the Antiochians (Syrians) were using the year 5969 BC as the year of the Creation.

Sextus Julius Africanus (AD 180–250), a Christian historian of the first years of Christianity, wrote in AD 221 a notable historical work, entitled *Chronographies or Chronological Pentavivlon*. It is a five-volume treatise dealing with the history of the world from its Creation up to AD 221, that is the third year of the reign of Heliogabalus. In this work (Sextus Julius Africanus, 221, Vol. X, pp. 35–108), Sextus proposes as the year of Creation the corresponding year 5499 BC. As a basis for his calculations he also considers the texts of the Holy Scripture, using them in order to unify the Eastern, the Jewish and the Greco-Roman chronologies. As the first Christian attempt at a universal history, and as the source of all later Christian chronography, this work is of great importance. Eusebius made it the foundation of his *Chronicle*. It is the source of all later Byzantine writing of history, so that for centuries the Christian world accepted the dates and epochs calculated by Sextus Julius Africanus. Unfortunately, only fragments of this work exist now.

Eusebius of Caesarea or Eusebius Pamphili (AD 263/5–340), known as the father of *The Ecclesiastical History*, was Bishop (314–340) of Caesarea in Palestine. The nickname Pamphili was taken from his teacher, the priest and martyr Pamphilus of Caesarea. In AD 325, Eusebius attended the Ecumenical Council of Nicaea, where he delivered the opening address speech. As a result of his political and religious learning, he was highly regarded by Emperor

Constantine I. His works include a universal history entitled the *Chronicon*, *The Ecclesiastical History* in ten volumes and the apologetic works *Praeparatio Evangelica* and *Demonstratio Evangelica*. Eusebius tried to adapt the various chronological methods up to his era to the Judaic tradition. As a result, he calculated in his *Chronicon* the time span from the Creation of the Universe to the birth of Christ as equal to 5198 years.

In comparison, Clemes of Alexandria postulated 5591 BC as the year of Creation, a value adopted in the fourth Century AD by Andreas of Byzantium. However, the Byzantine authors were using the year 5502 BC following some Alexandrine system.

The Christian Church, because of the great variety of Creation dates in circulation, was finally forced to set a date common for all Christians. So with the third Canon of the Penthekti Ecumenical Council (AD 691) the date 1 September 5509 BC was defined as the first day of the Creation. The era with the above starting point was called the Byzantine Era or Era of Constantinople. (The Penthekti Council was not a separate Ecumenical Council, but it was considered as the legislative appendix of the Sixth (initially) and finally of both the Fifth and Sixth Ecumenical Councils, for both these Councils had not produced legislative work.) This decision was accepted by the whole Christian world, which had already started to differentiate into 'eastern' and 'western' – politically in the beginning, and spiritually and culturally afterwards. The above date was officially accepted by the State during the reign of the Emperor Leo VI the Wise (AD 886–912), while the Roman Catholic Church adopted since the Renaissance period the Byzantine Era in its *Book of Martyrs*.

At about the same time period with the Penthekti, Beda Venerabilis (Venerable Bede, AD 677–735), an eminent English theologian and later a Saint of the Roman Catholic Church, but also a significant historian, had calculated the interval between Creation and Incarnation to be equal to 3952 years in his opus *Historia Ecclesiastica Gentis Anglorum* (Bede, 1935). Bede's chronological treatises *De Temporum Ratione* and *De Temporibus Liber* also contain summaries of the general history of the world from the Creation to 703 and 725 respectively. According to Bertrand Russell (1946, p. 414): 'The Venerable Bede was a monk at Jarrow, and his pupil Ecgbert, first bishop of York, founded a cathedral school, where Alcuin was educated.'

At the beginning of the twelfth century, the Byzantine writer Georgios Kedrenos, in his Byzantine Chronicles under the title *Synopsis Historion*, begins with the Creation (ktisis) of the world, which he places in the year 5506 BC and reaches the year of the coronation of the Emperor Isaakios Komnenos (AD 1057).

The French (but of Italian origin) humanist Joseph Justus Scaliger (1540–1609) was placing initially the beginning of the Creation in 3949 BC and later in 4713 BC, a year that formed the starting point of the Julian Period of 7980 years which he himself introduced. Scaliger thought that it would be extremely useful to introduce a continuous system of periodic time measurement, spanning very large time intervals. Thus, the Julian Period was invented (1582), bearing the name of Scaliger's father, well-known medical doctor and philosopher Julius Caesar Scaliger. The Julian Period, starting at noon on 1 January 4713 BC, is a cycle of 7980 years resulting from the multiplication of three basic smaller cycles: the Metonic cycle (lunar) of 19 years, the solar cycle of 28 years and the Roman Indiction of 15 years, so that $7980 = 19 \times 28 \times 15$. Scaliger presented his proposition in his *Opus de Emendatione Temporum* (*Of the Correction of Times*), which was published in Paris. Later, he published his work *Thesaurus Temporum*, *Complectens Eusebi Pamphili Chronicon*, in which he reconstructed the *Chronicon* of Eusebius Pamphili. Scaliger, by extrapolating backwards the three temporal cycles mentioned above, realized that according to the Julian calendar these cycles concurred in the year 4713 BC. So he assumed that all historical events took place after the characteristic date 1 January 4713 BC, which he regarded, for chronological purposes, as the beginning of the Creation, counting it as day 1 and building up his chronology from there. Today, the Julian Period has some applications in observational astronomy.

The Irish scholar and theologian James Ussher (1581–1656), Archbishop of Armagh (Northern Ireland) since 1625, Primate of All Ireland and Vice-Chancellor of the Trinity College in Dublin, proposed in his work *Annales Veteris Testamenti* as the first day of the Creation of the Earth Sunday, 23 October 4004 BC. This date is derived from the standard technique of adding biblical generations. Using this date as a starting point, which corresponds to the year 710 of Scaliger's Julian Period, Ussher calculated the dates of other biblical events, concluding that humanity was created 5 days later, on Friday 28 October 4004 BC. Next, he calculated that Adam and Eve were driven from Paradise on Monday, 10 November 4004 BC and, going on, he postulated that the Ark of Noah touched down on Mt Ararat on 5 May 1491 BC 'on a Wednesday'.

James Ussher proposed as the year of Creation not the centurial year 4000 BC, but the symmetric year 4004. This is due to the historians' belief that Herod died in 4 BC. Thus, Ussher added these 4 years to the year 4000 BC in order to have a more accurate chronology in respect to the birth of Christ, a birth placed by him, as well as by many chronicle writers of the era, in 4 BC. The study of the Archbishop of Armagh was published in 1650 and since then his conclusion was cited as a note in every official edition of the *Old Testament* by the Church of England up to at least the Victorian era. This chronology was also inserted in the margins of many editions of the Authorized Version (King James Version) of the *Bible* in the nineteenth Century and has been used as a 'proof' of the fallacy of evolution, molecular biology, astrophysics and many other scientific endeavours in the twentieth century.

During the same period, refinements of other scholars further pinpointed the above date to 9 am, London time, or midnight in the Garden of Eden (Milton, 1996, p. 47). A contemporary of Ussher, Dr John Lightfoot (1602–75), Master of Catharine Hall, Vice-Chancellor of the University of Cambridge and one of the most eminent scholars of his time, specialist in Hebrew studies, is said not only to have verified Ussher's date but moreover to have redetermined the moment of Creation with greater accuracy (Lightfoot, 1642) (see also Lightfoot (1822–5)):

> Heaven and earth, centre and circumference, were created together in the same instant; . . . man [was] created by the Trinity about the third hour of the day, or nine of the clock in the morning.

However, there is no mention here of 23 October 4004 BC. On the contrary, in another work *The Harmony of the Four Evangelists* . . . , in its *Prolegomena* (London, 1644), Lightfoot clearly states that the world was created at the equinox in September 3928 BC.

Later, several scholars and researchers ridiculed the above-mentioned hour-of-the-day accuracy; Ronald Millar wrote (1972) that only a Vice-Chancellor of Cambridge would have the audacity to place the date and time of the Creation of the Universe as the date of the start of the academic year! It should be noted, however, that in the 42-volume *World History* published by the Union of London Booksellers in 1779, it is written that the world was created 4004 years BC, during the autumnal equinox, and that the creation of the first humans crowned the work of Creation in the Eden of Euphrates, at a distance of 2 days from Basra (Wells, 1920, p. 8). As Hanbury Brown (1986, p. 201) mentioned in his *The Wisdom of Science*:

> That mysterious date (*e.g.* 4004 BC) proposed on 1650, by Archbishop Ussher, adding biblical generations, is – according to the 11th edition of *Encyclopaedia Britannica* – slightly wrong; the correct date is 4157 BC.

We note that the main problem of the chronologists was not so much the year as the date; they wavered between a spring (vernal) equinox Creation (21 March) and the corresponding autumnal equinox Creation (22–23 September), eventually converging towards the latter.

After Ussher and Lightfoot, the famous Polish astronomer Johannes Hevelius (Jan Hewelke, 1611–1687) also determined in his treatise *Prodromus Astronomiae*, posthumously published

in 1690, not only the date, but the exact hour, as well: 6 o'clock in the afternoon, in 24 October 3963 BC.

As Whitrow (1989, p. 131) mentioned:

> By 1660 at least fifty different dates had been assigned to Creation, depending on which version of the Old Testament and which counting method were used. . . . Newton's *Chronology of Ancient Kingdoms Amended*, posthumously published in 1728, and his *Observations Upon the Prophesies of Daniel and the Apocalypse of St John*, published in 1733, can together be regarded as providing a universal history of mankind that was intended to be the counterpart of the physical history of the world set out in his *Principia*. . . . Newton (1642–1727), however, was careful not to assign a specific date for the Creation.

Ronald Reese *et al*. (1981, pp. 404–5) pinpointed that:

> For Kepler and Longomontanus, the appropriate time was the summer solstice – both thought the solar apogee was at the head of Aries at the moment of Creation, with the Sun in Cancer. From we known rate at which the apogee moved, they extrapolated back in time to the dates 3993 BC and 3964 BC, respectively, incredibly close to the date that Ussher computed a half century later.

2 CHRONOLOGIES AND ASTROPHYSICS

All the above dates are used by the chronologists for the construction of the so-called eras in the astronomical ephemerides. In astrophysics, however, we accept the theory that the surface of the Earth was formed gradually and that the age of our planet is determined by techniques involving the calculation of the age of rocks through radiodating.

According to the geologists, the discovery of rocks dating from the period of the creation of the Earth is almost impossible, because these stones have been eroded long ago by geological processes and weather conditions. However, some crystals discovered in Australia have been radiodated as being 4.3×10^9 years old. Combining the results of this terrestrial research with solar, lunar and planetary studies, the astrophysicists and planetologists calculate that the creation of our Solar System, and therefore of the Earth as well, took place about 4.5×10^9 years ago. So the Earth was created 4.5×10^9 years ago, when a large gas and dust nebula condensed and formed a rotating disc. At the centre of this disc was formed the 'mother star', the Sun, while from the surplus material were created great numbers of small bodies of various shapes and sizes. These bodies, revolving around the Sun, were impacting each other and either they were being shattered or they were conglomerating in larger bodies. Finally they formed the largest bodies of our Solar System, the nine protoplanets including the Earth, about 4.5×10^9 years ago (Danezis and Theodossiou, 2000).

3 CONCLUSIONS

In modern astrophysics and cosmology, theory stresses, of course, that everything started approximately 15×10^9 years ago, when a 'primeval atom' was created, which contained all the space and the mass of the Universe concentrated into a so-called point singularity of superdense state. The explosion that followed according to the Big Bang theory created both the material Universe (visible and invisible) and the notion of time.

When we speak about the Big Bang which generated the Universe, we must not, of course, imagine it as an explosion of a bomb, for example a hydrogen bomb. The term Big Bang is rather misleading and it was introduced by the great opponent of the theory, the significant

British astrophysicist Sir Fred Hoyle (1915–2001). By the term Big Bang, cosmologists and astrophysicists mean an exponential and sudden expansion of the Universe out of the point singularity. In other words, the birth and the subsequent expansion of the Universe is in a sense the 'unfolding' of space and time out of a superdense and superhot state to a vast current reality, continually cooling off, within a space which is being created as the Universe is expanding.

Naturally, the primal question is always present: 'What caused the Big Bang?' This, together with some other questions, has not been answered yet by science. Moreover, according to the above, it has no meaning within the frame of modern physics and cosmology to ask what existed before, for the simple reason that the notion of the anterior and posterior presupposes the natural flow of time, which did not exist when the Big Bang happened.

Thus, compared with the 4.5×10^9 years accepted today as the age of the Earth, the few thousand years proposed by the older scholars and Christian writers seem an almost infinitesimal time span, smaller even than the about 8000 years that have passed (as it is currently estimated) since the invention of writing in Mesopotamia.

Consequently, according to the naturalistic evolution, the Universe originated some 15×10^9 years ago. Life subsequently began, probably as bacteria, and has been evolving ever since. The process of evolution has been driven by purely natural forces, without the intervention of a God, a Goddess or multiple deities. The Theistic evolution argues that evolution happened just as supporters of naturalistic evolution believe, but it was a tool created, used and/or controlled by God.

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