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ART. VIII.—*Corrections of the Canon of Ptolemy, required in order to place it in harmony with the Solar Eclipses of Jan. 11th, B.C. 689, and May 28th B.C. 585. By J. W. BOSANQUET, ESQ.*

[Read 16th June, 1855.]

IN a paper which I had the honour of reading before this Society on the eighth of July last, I endeavoured to establish—First, that the remarkable astronomical phenomenon which occurred in the fourteenth year of Hezekiah, King of Judah—viz., the retrograde motion of the sun's shadow on the dial, or steps, of the king's palace at Jerusalem, accompanied by some visible wonder in the heavens—must have been the effect of an eclipse of the sun. Secondly, that if the phenomenon was indeed caused by a solar eclipse, it must have been one combining the following distinguishing characters, viz. :—

1st, That it should have been visible at Jerusalem.

2nd, That it should have occurred within about twenty days of the winter solstice.

3rd, That it should have occurred about noon-day.

4th, That the occultation should have been on the upper limb of the sun.

And, from independent historical evidence, that it should be looked for in the year B.C. 689 or 688.

Thirdly, that such an eclipse is found by computation to have actually taken place at Jerusalem on the 11th January, B.C. 689, between the hours of eleven and twelve o'clock; that, though from the imperfection of the means of computation it is impossible at present to fix the exact time of central conjunction of sun and moon at that remote date, yet that the tendency of certain proposed corrections in astronomical tables is to bring the time near upon noon-day; and that, since no other eclipse, combining all the above characteristics, could have occurred at Jerusalem within many hundred years, there is high degree of probability that the fourteenth year of Hezekiah was marked by this eclipse, and that the third year of the reign of Sennacherib, which we know from Assyrian monuments was concurrent with the fourteenth of Hezekiah, should also be placed in the year B.C. 689.

The object of the following remarks is, to point out how far it will be necessary to alter the position, in the era of Nabonassar, of the five

last kings of Babylon mentioned by Berossus, who would appear to be erroneously placed in the canon of Ptolemy, on the assumption of the correctness of the proposed date for the fourteenth of Hezekiah and third of Sennacherib ; and to fix the dates of the reigns of those five kings, in harmony both with the eclipse of B.C. 689, and with the now ascertained date of the eclipse of Thales, B.C. 585, which is equally at variance with their present chronological position, as is also the record of the earliest Chaldean historians.

This undertaking is in some degree imposed upon me ; for, having ventured to dispute some of the most important dates of a long established scheme of chronology, on the ground of the inconsistency thereby produced between sacred and profane historians, I feel called upon to show how a more consistent scheme of dates may be framed in accordance with my view of historical facts : and more especially, because all who treat upon this period of ancient history proceed on the assumption of the undisputed accuracy of the Babylonian canon, which is, in its present form, directly opposed to my arrangement. I am fully aware of the weight of responsibility incurred in venturing to dispute the authority of this supposed venerable record, which has received the sanction of such men as Marsham, Scaliger, Petavius, Ussher, Sir I. Newton, Prideaux, Dodwell, Clinton, Greswell, Ideler, and all modern chronologists ; but I do not shrink from the undertaking, feeling confident that I shall be sustained in my opinion, on a closer examination of the evidence of ancient history, and also by the more accurate science of modern astronomy, which is the surest foundation upon which to build a scheme of chronology.

In the first place, the antiquity of the canon of Ptolemy, in its present shape, is greatly exaggerated, when it is supposed to have been compiled in the time of Berossus. I do not deny that the era of Nabonassar, beginning in B.C. 747, was used by Chaldean astronomers at that time, nor that astronomical observations were recorded in the years of that era, with the addition of the names of the kings under whom the observations were made, with the particulars also of the day, month, and year of their reigns ; but I deny that any acknowledged list of kings of Babylon, with the dates of their reigns fixed in that era, such as we now see in the canon of Ptolemy, was known to historians, either in the time of Berossus, or for at least two centuries after his time.

Berosus himself was, indeed, both historian and astronomer, and, without doubt, as fully acquainted with the dates of the reigns, as he was with the names he mentions of the successive monarchs on the throne of Babylon. His chronology, I doubt not, was correct ; and

I shall presently show that it was greatly at variance with that of the canon, and in conformity with that which I propose.

For the present, it will be sufficient proof of my assertion—that the current version of the canon was not adopted by Berosus—that Demetrius, writing soon after Berosus, in the third century B.C., places the first year of Nabucodonosor, or Nabokolassar, twenty-six years later than the canon; that Josephus, in the first century after Christ, with Berosus in his hands, had no such list of reigns and dates before him as is contained in the canon; and that Clemens Alexandrinus in the second century, Africanus in the third, Eusebius in the fourth, though professed chronologists, had no such authoritative document before them to which to refer for dates.

Nevertheless, I would not be supposed to undervalue the importance and authority of parts of this celebrated canon. Its value consists in the astronomical data upon which it is founded: that is to say, on the series of lunar eclipses observed and recorded at Babylon, which have been preserved in the *Almagest* of Ptolemy, the astronomer of Alexandria. Where it rests upon such data, its authority of course is indisputable. I think, therefore, that Theon's copy may be followed from the first year of Nabonassar, B.C. 747, to the twentieth year of Nabopalassar, B.C. 606, during which period the reigns of Mardocempadus and Nabopalassar are fixed by three lunar eclipses. The reign of Cambyzes, king of Persia, is also fixed by an eclipse; and the reign of his successor, Darius, the son of Hystaspes, by two eclipses towards the latter part of his reign. The position of the five last kings of Babylon, however, from Nabokolassar, or Nebuchadnezzar, to Nabonidus, stands upon no such solid foundation. No eclipse, or other astronomical observation, is recorded as marking the date of either of these reigns. On the contrary, if the solar eclipse at Jerusalem, in B.C. 689, really took place in the fourteenth year of Hezekiah, and the solar eclipse of Thales, in B.C. 585, preceded the fall of Nineveh, and the accession of Nebuchadnezzar to the throne of Babylon, we have direct astronomical authority for displacing the position of those five reigns in the canon.

Let us quote a few instances from Ptolemy's *Almagest*, of the astronomical data upon which the canon is framed, in order to ascertain how far we are compelled to adhere to its arrangement, and how far we are at liberty to question its correctness. In Book iv. ch. 6, Ptolemy writes: "the first of three very ancient eclipses observed by the Babylonians occurred in the first year of Mardocempadus, on the 29th day of the Egyptian month Thoth. The moon began to be eclipsed one complete hour after rising; and the eclipse was total."

Now, by computation, it appears that such an eclipse of the moon occurred at Babylon on the 19th March, B.C. 721, which is the first year of Mardocempadus in the canon. There are two other eclipses recorded with the same particularity, as having occurred in the second year of the reign of Mardocempadus, B.C. 720, to which I need not refer. There is no difficulty with astronomers in computing with accuracy the times and phases of the most ancient *lunar* eclipses; and the three thus referred to having been repeatedly verified, we cannot doubt the correctness of the date assigned to the year of the accession of this king to the throne of Babylon. Ptolemy further states, in the seventh chapter of the same book of the *Almagest*, that, "from the second year of Mardocempadus (18th Thoth) to the 2nd Choiak, in the nineteenth year of Adrian, there are 854 Egyptian years, and 73 days." Nothing, therefore, can be more perfect and precise than the data concerning the position of this reign. The position of the important reign of Nabopalassar, the father of Nebuchadnezzar, is equally well established. In the xivth chapter of the Vth Book of the *Almagest*, we find it written—"In the fifth year of Nabopalassar, which the 127th from Nabonassar, on the 27th day of Athyr, according to the Egyptians, towards the end of the eleventh hour, the moon began to be eclipsed at Babylon, and a fourth part of the diameter was eclipsed from the south." This eclipse is computed to have fallen on the 21st April, B.C. 621; and in that year, accordingly, we find the fifth year of Nabopalassar accurately fixed in the canon.

No astronomical observation marks the reigns of the five Babylonish kings who follow Nabopalassar, as we have already observed, viz. :—

Nabokolassar	=	Nebuchadnezzar.
Ilverodam	=	Evil-Merodach.
Neriglissar	=	Nergal-Sharezar.
Laborosoarchod.		
Nabonidus.		

Nor is there any observation recorded by Ptolemy whereby to fix the reign of Cyrus. But in the reign of Cambyses there is record of an eclipse, which is of the greatest importance, as it is that upon which our present scheme of chronology is chiefly founded. Ptolemy writes, in the xivth chapter, Vth Book—"In the seventh year of Cambyses, which is the 225th from Nabonassar, on the 17th day of Panemoth, according to the Egyptians, one hour before midnight, half the diameter of the moon was eclipsed from the north." This eclipse fell

by computation in July, B.C. 523 ; and thus we collect from Ptolemy that

The 1st of Nabonassar was	..	..	..	B.C. 747
1st of Mardocempadus	..	..	..	721
5th of Nabopalassar ..	..	..	..	621
7th of CambySES	..	..	..	523

No one, I presume, would venture to dispute the correctness of any of these dates, nor is it my purpose in any way to disturb them. On the contrary, I accept the canon, as regards the Babylonian kings, as far as the twentieth year of Nabopalassar, B.C. 606, and also the date of the reign of the Persian CambySES, as absolutely established.

From the year B.C. 606, however, I begin to differ from the canon, Not only because it is here unsupported by astronomical authority, and also contradicted by astronomical data, inasmuch as the eclipse of B.C. 585 is found to follow instead of preceding the date of the first year of Nebuchadnezzar, as fixed in the canon ; but because its arrangement of the five last Babylonian kings appears to me to be at variance both with the evidence of the most ancient and trustworthy secular historians who have written concerning the period, and directly opposed to the evidence of contemporaneous sacred writers. The only trustworthy authors of secular authority on the subject are Herodotus and Berosus : Herodotus as living nearest to the times in question—perfectly unbiassed and scrupulously desirous of recording truth ; Berosus as the historian who has expressly treated upon Assyrian and Babylonian matters with the most ample and authentic materials surrounding him to draw from. Ctesias and Diodorus, who followed him, whose lists of kings are yet unconfirmed by existing monuments, I set aside as of no great authority, as also all ecclesiastical writers, who are of a much later date, who bring no new matter to bear on the subject, and who are inexact, contradictory, and biassed by their own particular views of sacred chronology.

Now the accounts which we derive from Herodotus and Berosus, when compared together, lead to one and the same result as regards the date of the reign of Nebuchadnezzar, by which reign the other four must be regulated. Berosus, who unfortunately can only be consulted through fragments extracted from his work, chiefly by Polyhistor, Abydenus, and Josephus, the first and last of whom undoubtedly consulted the original work, distinctly tells us through Polyhistor that Nabupalsar, or Nabopalassar, *was king of Assyria* ; and, moreover, that he was the king called by the Greeks Sardanapalus ; and that his reign in Assyria, as all other authorities testify of Sardana-

palus, lasted *twenty* years. Eusebius distinctly states, in more than one place, that Polyhistor copied from Berosus;¹ and this testimony of the Chaldean historian to the fact that Nabopalassar reigned in Assyria is of the deepest importance, as throwing an entirely new light upon this period of history. From the same authority we collect that Babylon had been conquered and annexed to the Assyrian empire in the reign of Sennacherib. So that Nabopalassar, (Sardanapalus) was king of the united kingdoms of Nineveh and Babylon, his throne being at Nineveh: and there he must have passed the first twenty years of his reign, dating, as we have already ascertained, from the record of an eclipse in the fifth year of his reign, *i. e.*, as lord paramount of the Assyrian empire, from B.C. 625 to 606.

Again, copying from Berosus, Polyhistor relates how Sardanapalus reigned *over the Chaldeans twenty-one years* (*qu. twenty-nine*), and contracted a marriage for his son Nabuchodrossor with a daughter of Astyages,² just before the destruction of Nineveh; and Abydenus, who gives the same history at greater length, tell us that this alliance was contracted by the father of Nabuchodrossor, whom he calls Busalossor (Na-busalossor, or Nabopalassar) during the time when Saracus was reigning at Nineveh; that Busalossor was then acting as leader of the armies of Saracus, and revolted against him, upon which Nineveh was destroyed, and Nabuchodrossor immediately after began to reign.³ So that while Saracus, the successor of Nabopalassar, was reigning at Nineveh, Nabopalassar had become either his vassal or ally on the throne of Babylon.

Lastly, from an invaluable extract from Berosus, preserved by Josephus, and set down in the very words of the Babylonish historian, we find that Nabopalassar reigned *twenty-nine years at Babylon*, and that in his twenty-ninth year he was succeeded by his son Nebuchadnezzar. So that, according to the highest Chaldean authority, Nabopalassar reigned twenty years in Nineveh, and twenty-nine in Babylon,

¹ "From Xisuthrus, and from the time of the Deluge, even to the time when the Medes took Babylon, Polyhistor enumerates eighty-six kings, and mentions them each by name, from the work of Berosus."—Aucher's Eusebius, p. 19. And again, after enumerating the kings of Babylon down to the capture of Babylon by Cyrus, Eusebius writes—"As Berosus briefly relates each event concerning the kingdom of the Chaldeans, so in the same manner has Polyhistor described it."—p. 23. Nevertheless, we may be certain that Polyhistor was giving his own version, not that of Berosus, when he enumerates the Persian kings who followed Cyrus; because the passage does not correspond with the extract given by Josephus, in the words of Berosus, concerning the same events.

² Aucher's Euseb. p. 22.

³ Ibid, p. 27.

together forty-nine years. And this length of reign well accords with his state of infirmity, as described by Berosus at the end of his life. Now the forty-ninth year, counted from B.C. 625, brings us to the year B.C. 578 for the first year of the reign of Nebuchadnezzar; and this I believe to be the true date of the commencement of his reign, falling as it does, and as it should do, a few years after the eclipse of Thales.

But it may be asked, should we not read twenty-one years with Polyhistor and the canon, rather than twenty-nine years with Josephus, in contradiction of the canon, as the length of the reign of Nabopalassar over the Chaldeans? and may it not be the mere invention of Polyhistor, rather than the record of Berosus, that Nabopalassar reigned at Nineveh? My answer is, that there is the strongest confirmation that Polyhistor has correctly copied Berosus in giving a double reign to Nabopalassar, first at Nineveh and then at Babylon; and that he has incorrectly curtailed the reign in Babylon from twenty-nine to twenty-one years, writing *év* for *έννεα*, in the fact that Demetrius, who was contemporary with Berosus, and wrote in the reign of Ptolemy Philopator, more than one hundred years before Polyhistor, and who cannot but have seen the work of Berosus, one of the valuable contributions to the Alexandrian Library of that day, has expressly fixed the year B.C. 578 as that of the first year of the reign of Nebuchadnezzar. For he tells that the last captivity from Jerusalem, under Nebuchadnezzar, was 338 years and three months before the reign of Ptolemy Philopator, or November, B.C. 222; which leads us to August, B.C. 560, as the date of that captivity; and as this event took place in the nineteenth year of Nebuchadnezzar, his first year, according to Demetrius,¹ was B.C. 578. Such, then, is the distinct conclusion to be derived from Berosus.

The same definite result, as regards the date of the fall of Nineveh, and the rise of the kingdom of Babylon under Nebuchadnezzar, may be derived from a consideration of the words of Herodotus. He tells us that Nineveh was finally taken by the Medes twenty-eight years after the Assyrian empire had fallen under the dominion of the Scythians, and that these twenty-eight years began at the time of the

¹ "Demetrius says, in his work concerning the kings of Judea, that the tribes of Benjamin and Levi were not carried into captivity by Senacherim; but that from this deportation to the last from Jerusalem by Nabuchadonosor was a period of 128 years and six months. And that from the time when the ten tribes were made captive from Samaria to the reign of the fourth Ptolemy (Philopater) was 573 years (qu. 473) and six months. And from the carrying away from Jerusalem, 338 years and three months. Philo, however, wrote the kings of Judah differently, from Demetrius."—Clemens. Alex., Strom. i.

overthrow of the last Assyrian king, and expired *after the date of the eclipse of Thales*. This period of twenty-eight years, therefore, could not have commenced earlier than B.C. 612, which is in the middle of the reign of Sardanapalus, according to all accounts: and as it did commence with the overthrow of the last Assyrian king, it must be counted from the last year of Sardanapalus at Nineveh, B.C. 606. Now twenty-eight years, counted from, and inclusive of, that date, brings us to the year B.C. 579 for the final destruction of Nineveh, which we have already seen, from Berossus, immediately preceded the accession of Nebuchadnezzar to the throne of Babylon, B.C. 578.

Nothing, it would appear, can be more consistent and precise than this result of a comparison of the two ancient historians. How is it, then, that the compiler of the canon has arrived at a different conclusion? The difference, no doubt, is of very ancient origin, and the cause of it, I think, is to be traced on the face of the document itself.

There are three copies of the canon extant; two preserved by Syncellus, one of which he calls the Ecclesiastical Canon, the other the Astronomical Canon; and a third which has been recovered from a work of the astronomer Theon, of the fourth century. The three copies are agreed as to the number of years to be counted from the reign of Nabonassar to the death of Alexander the Great—viz., 424 years. They are also agreed as to the date of the first year of Cyrus—viz., $\text{Æ. N. 210} = \text{B.C. 538}$. But they differ from each other in the arrangement of the intermediate reigns, being three different attempts, as I conceive, to adapt the reigns of the kings of Babylon and Persia to the well-known era of Nabonassar, which we learn from Syncellus was first made use of by the Chaldeans for astronomical purposes, and from them adopted by the Greek astronomers of Alexandria. The difficulty then, as now, was how to reconcile the chronology of Persia, the reign of whose second king, Cambyzes, was fixed by an eclipse observed at Babylon, as beginning in B.C. 529, with the chronology of Babylon, whose last king, Nabonidus, was conquered by Cyrus, the supposed predecessor of Cambyzes, about sixty-eight or seventy years after the first year of Nebuchadnezzar,—that is to say, about the year B.C. 511 or 509.* Abundant evidence of the perplexity of chronologers on this point may be found in Josephus and the early ecclesiastical writers. The enigma has remained unexplained even to the present day.

The Ecclesiastical Canon, which gives thirty-one years to the reign of Cyrus, after the fall of Astyages, boldly places the first year of

* This difference of two years, arises from two years more being given, in some of the copies, to the reigns of Evilmerodach and Neriglissar.

Cambyes in B.C. 507, in defiance of the eclipse of B.C. 523, in his seventh year. This copy of the Canon is altogether the most inaccurate of the three. The true date of the fall of Astyages is, however, preserved in this copy, viz., B.C. 539. And, it is worthy of remark, that the last king of Babylon, Nabonidus, is here declared to our astonishment to be Asytages himself. Such is the mode adopted in the Ecclesiastical Canon of reconciling the conflicting traditions concerning Babylonian and Persian chronology.

The Astronomical Canon shifts the eclipse of B.C. 521 from the reign of Nabopalassar the father, to Nabokolassar the son, placing it also in the seventh instead of the fifth year of that reign: thus violating one of the immoveable data of Babylonian chronology. It retains, however, the true traditional date of the fall of Astyages, and also the length of that king's reign. This was the current copy in the hands of mathematicians in the time of Syncellus; and, like the Ecclesiastical Canon, assumes the identity of Astyages and Nabonidus, the last king of Babylon. The reign of Cambyes is correctly fixed in this copy.

We now come to consider the arrangement of the third copy of the canon, which has been adopted by chronologers for the three last centuries, as indubitably correct. This copy places the reigns of Nabopalassar and Cambyes in strict conformity with the dates of the eclipses in their reigns. It also preserves, like the other two copies, the year B.C. 538 as the first year of Cyrus at Babylon. Now there is something very remarkable about this date, and here lies the source of difference between the Canon and Berosus. Though almost every other Babylonian or Persian reign has been considered moveable in one or other copy of the canon, no one has dared to tamper with this date of the first year of Cyrus. Whether it had been definitively settled by Eratosthenes, or whatever may have been the authority upon which it rested, certain it is, that the Alexandrian chronologers, who made use of the era of Nabonassar, considered the year B.C. 538 for the first of Cyrus as firmly fixed, as if it had been determined by an eclipse recorded in the reign. I also accept this as a true date handed down by tradition: though not as the date of the first of Cyrus in Babylon. Probably, at the time it was fixed by ancient chronologers, other data for determining it, than we now possess, were accessible. We may, however, with great precision, determine this epoch from materials now at hand. What, then, was the nature of the tradition? The tradition clearly was, as we may collect from the two copies of the canon we have already considered, that Astyages, king of Media, was deposed in B.C. 539; and that

Cyrus took his throne in B.C. 538. This tradition is preserved also in the apocryphal book entitled *Bel and the Dragon*, a book of very early date, which begins thus: "And king Astyages was gathered to his fathers, and Cyrus of Persia received his kingdom." And then proceeds to describe how Cyrus worshipped Bel in Babylon; showing how the writer supposed that Cyrus succeeded Astyages in Babylon. I will now briefly show that the year B.C. 539 is in fact the year in which Cyrus deposed Astyages; and 538 the year in which Cyrus began to reign in Media.

Cyaxares, the father of Astyages, according to Herodotus, reigned forty years in Media—his son Astyages thirty-five years—together seventy-five years. The eclipse of Thales, B.C. 585, occurred in the reign of Cyaxares: he could not have begun to reign, therefore, more than forty years above that date, or before B.C. 624. He succeeded Phraortes, who was slain by a king of Nineveh: and in the book of Judith, we read of a king of Nineveh (Vulgate copy) who, in his twelfth year, slew Arphaxad, king of Media. Nabopalassar, we have seen, was king of Nineveh from B.C. 625 to 606, and his twelfth year was B.C. 614. Phraortes, or Arphaxad, therefore, was slain in B.C. 614; and Cyaxares began his reign in B.C. 613. Now, counting seventy-five years from B.C. 613 inclusive, we come to the year B.C. 539 for the last of Astyages; and Cyrus must have begun to reign in Media in B.C. 538.

The compilers, therefore, of the three copies of the canon have each of them adopted the traditional date of the first year of Cyrus in Media as the date of his conquest of Babylon, and Polyhistor himself would appear to be the originator of this error.

Having thus succeeded in pushing up the last year of Nabonidus from B.C. 511, to B.C. 539, that is, twenty-eight years, the compiler of the third copy, while carefully adhering to all astronomical data, was compelled, in some way, also to raise the years of the four predecessors of Nabonidus to the same extent. This he has effected, not without apparent authority. For, availing himself of the doubtful reading before referred to, which assigns twenty-one years only to the reign of Nabopalassar, he has added one year to the twenty which he reigned in Nineveh; and ignoring altogether the twenty-nine years of subsequent reign in Babylon, he thus extracts the same number of twenty-eight years (the length of Scythian interregnum) which immediately precedes the accession of Nebuchadnezzar, placing the first year of that king's reign in B.C. 604, long before the eclipse of B.C. 585, which is quite inadmissible.

This, then, I believe to be the history of the compilation of the

three copies of this celebrated canon, by which the world has been imposed upon for the last three centuries ; concerning which, Calvisius has declared, that it is "omni auro pretiosior ;" Dr. Prideaux, that it is not to be receded from for the authority of any other human writing ; and on the authority of which, Niebuhr has declared, that the date of the conquest of Babylon, Olymp. 60. 1 = B.C. 538, is as firmly established as the dates of the capture of Moscow or Paris.¹

On the other hand, I affirm, without fear of confutation, that the year B.C. 538 is the date of the conquest of Astyages, and not of the conquest of Babylon ; and that the conquest of Nabonidus by Cyrus, must have taken place somewhere about the year B.C. 511. This was a tradition still current in the time of Clemens Alexandrinus, who states that some in his days placed the overthrow of Babylon, 186 years before the death of Alexander, that is, in B.C. 323 + 186 = B.C. 509. And Orosius, in the fifth century, still continued to argue emphatically for the same date, stating that "Babylon for the last time was overthrown by King Cyrus, at the time when Rome, for the first time, was freed from the tyranny of the Tarquins," (that is, in B.C. 509 or 510.) "The one for the first time was then subjected to the dominion of strangers, when the other for the first time spurned the pride of her native rulers. The one, at that time expiring, laid aside the inheritance ; the other, at the same time, in the prime of youth, began to recognise herself as heir. Then fell the empire of the East. Then arose the empire of the West."²

I will now advert to a difficulty, which might for a moment be raised in opposition to what has been advanced, and apparently on the authority of Berosus himself. At the close of the extract from Polyhistor, found in the Armenian copy of Eusebius,³ from which we have recovered the important fact, that Nabopolassar, according to Berosus, was the king called Sardanapalus, who reigned at Nineveh ; Eusebius writes: "After him, [Nebuchadnezzar]" says Polyhistor, "Neglissar reigned over the Chaldeans four years ; and after him Nabonedus seventeen years. In whose reign, Cyrus, the son of Cambyzes, led an army into the territory of Babylon. Nabonedus went out against him, and being conquered, fled. *Cyrus then reigned nine years in Babylon*, and died in battle on the plains of Daas. After him, Cambyzes reigned eight years. Then Darius, thirty-six years. After him, Xerxes, and the other Persian kings."

Now, if these are the words of Berosus, copied by Polyhistor, they are in strict conformity with the arrangement of the canon : and

¹ Lectures on Ant. Hist., vol. i, pp. 91, 92.

² P. Orosius contra Paganos, l. ii. c. 2 ; p. 74. ³ Aucher, p. 22.

Berosus himself, as Dodwell¹ argues, may indeed have been the author of the canon. They are not, however, the words of Berosus, but merely express the mode in which Polyhistor solved the chronological difficulty of reconciling Babylonian and Persian history. What Berosus wrote concerning the successors of Nebuchadnezzar, down to the time of Cyrus, is copied verbatim and at length by Josephus. In that passage, mention is made of a king not here referred to by Polyhistor, and there is no mention of Cyrus having reigned nine years in Babylon. If Berosus had so written, it is inconceivable that Josephus, with that author in his hands, should have rejected such an authority, and have assigned thirty years to his reign in Babylon before the accession of Cambyses.

That the words, however, are those of Polyhistor, and not of Berosus, is placed beyond all doubt, by reference to a passage extracted by Eusebius from Abydenus, which is in such close conformity with the words of Berosus given by Josephus, that we cannot but conclude that Abydenus and Berosus copied from the same source. So far, however, from supporting the view of Polyhistor, that Nabonidus was deposed by Cyrus nine years before the reign of Cambyses, that is, in B.C. 539, the passage from Abydenus declares the fact which I have already deduced from the fragments of Berosus, viz., that Nabonidus was deposed by Cyrus during the reign of Darius Hystaspes. The passage runs thus, speaking of Nebuchadnezzar: "who after reigning in great majesty, suddenly disappeared, being withdrawn from sight. His son, Amilmarodach, then reigned, who was slain by his son-in-law Neglisar, leaving an only son Labosorach, who came to an unhappy end by violence. Nabonedock was then raised to the throne, to whom it in no way belonged of right. Cyrus, when he conquered Babylon, gave this king the province of Carmania. *Darius, however, drove him some little distance away from that region.*"²

Here, then, is a most ancient Chaldean authority to the fact, that Nabonidus was conquered by Cyrus at Babylon, during the reign of Darius in Persia. And there is still one higher testimony than any which I have yet referred to, to the same fact, viz., that of one who was a ruler both under the empire of Babylon and the empire of Persia, who tells us, that he "prospered in the reign of Darius, and in the reign of Cyrus the Persian,"³ from whom we collect, that the third year of Cyrus over the empire of Babylon, was subsequent to the accession of Darius, called the Median, "the prince of the kingdom of Persia."⁴ Berosus also states, according to Clemens Alexandrinus,⁵ that in "the twelfth (eleventh) year of Zedekiah, king of Judah,

¹ *Dissertationes Cyprianicæ. Appendix.*

² Aucher's Euseb. p. 30.

³ Daniel, vi. 28. ⁴ Ibid. x. 13, and xi. 1. ⁵ Clem. Alex., Strom. i.

Nebuchodonosor made war upon the Jews and Phœnicians, seventy years before the reign of the Persians." These seventy years from thence can only end in the reign of Darius Hystaspes.

Such, then, were the chronological difficulties in reconciling Babylonian and Persian history, and such the various modes of solving them, in the days of the compilers of the various copies of the Babylonian Canon. The same difficulties yet remain unsolved, and are further aggravated by the precision with which modern astronomers have determined the actual date of the eclipse, which, according to Herodotus, terminated the Lydo-Median war, and which fixes, therefore, the time of the other events which are connected with that event. The mode of escape from the dilemma now usually adopted, and which indeed has received the sanction of Niebuhr, is, to set aside the authority of Herodotus at this point, and to declare that he has erred in connecting the eclipse of B.C. 585 with the war referred to, though this is one of the most distinct and circumstantial pieces of history contained in his work. The effect of this mode of dealing with the subject is, indeed, to preserve the true date of the reign of Cambyzes; but at how great a sacrifice! For a chronological arrangement is thus produced confessedly at variance both with Herodotus and Ctesias, which treats the work of Xenophon as romance, and which is in direct contradiction of the contemporary history of the book of Daniel.

The enigma, as yet, remains unsolved. I will now briefly refer to a solution of it, which appears to me capable of clearing up the difficulties, and upon which I propose to myself the honour of addressing this Society on some future occasion.

It is obvious that Herodotus has fallen into error somewhere in his chronology. Considering, however, how careful and scrupulous he is in collecting and recording facts, it is too much to charge him with so circumstantial an error as that imputed to him, concerning the sudden darkness which led to the termination of the war between Cyaxares and Alyattes. His error is one which any foreigner might fall into, even in the present day. He has incidentally mentioned two princes bearing the title Cambyzes, each of them son of Cyrus; and he begins his third book with the history of Cambyzes, son of Cyrus and Casandane, with every appearance of having some historical document before him concerning that king. Now, my hypothesis is, that the Cambyzes, son of Cyrus, here described is the father, not the son, of the Cyrus who conquered Babylon. He began to reign in the year B.C. 529, as collected from the Canon. Babylon was not taken, however, before this Cambyzes came to the throne, but during his reign in Persia, which fact is attested to by Xenophon. Cyrus also, the father of this Cambyzes, who conquered Cræsus, was not the grandson of Asty-

ages, but his son-in-law, as Ctesias declares, in direct contradiction of Herodotus ; and though he may have carried on war against the king of Babylon, as Justin and Herodotus relate, the capture of the city of Babylon, which really was effected by the grandson of Astyages, is not attributed to this Cyrus, either by Justin or Ctesias. On this hypothesis, the several histories of Cyrus, both sacred and profane, may be reconciled, and also brought into harmony with astronomical data. I will not dwell further upon this hypothesis, but now proceed to show how, if we accept the solar eclipse of B.C. 689 as connected with the third year of the reign of Sennacherib, and the solar eclipse of B.C. 585 as connected with events which preceded the fall of Nineveh, we shall be compelled to lower the position of the five last kings of Babylon mentioned by Berosus, thus :—

Nabuchodonosor	..	43 years,	beginning in B.C. 578
Ilverodam	..	2	.. .. 535
Neriglissaar	..	4	.. .. 533
Laborosoarchod	..	0 9 months	.. .. 529
Nabonidus	..	17	.. .. 528

Though the lunar eclipses, upon which the Canon of Ptolemy is founded, have always been capable of verification by astronomers without difficulty, it is only recently that the means of calculating ancient solar eclipses has become sufficiently accurate to admit of their application to chronology with any degree of certainty. For the first time, therefore, the Canon of Ptolemy is capable of being submitted to this stringent test of its accuracy.

I propose to apply the test, by first ascertaining the exact number of years which elapsed between the third year of Sennacherib, and the first year of Nebuchadnezzar, according to history ; and then, by counting the number of years so ascertained from the eclipse of B.C. 689, to determine the true position of Nebuchadnezzar in the Babylonian Canon.

Fortunately, we have three independent modes of determining the exact interval between these reigns.

1st, Demetrius, in the reign of Ptolemy Philopator, makes the interval 110 years.¹

2nd, The Chaldean historians, according to Eusebius, counted eighty-eight years from Sennacherib to Nabuchodonosor ; and to produce any consistency in the passage of Eusebius referred to, these eighty-eight years must be counted from the end of the reign of Sennacherib. Adding, therefore, the twenty-two last years of Sennacherib, to the eighty-eight, we obtain the same number, 110 years.

¹ See Note, p. 422.

3rd, Manetho, in the reign of Philadelphus, has given us the length of the period from the first year of Tarcos, or Tirhakah, in Egypt, to the death of Necho II, thus :—

Tarcos	18
Stephinales ..	7
Nechepsos ..	6
Necho I. ..	8
Psammetichus ..	54
Necho II. ..	16 ¹

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Now, the last year of Necho II. was concurrent with the first year of Nebuchadnezzar, and the first year of Tarcos was soon after the third of Sennacherib. For we are told that Pharaoh Necho was to be given "into the hands of those that *sought his life*, and into the hand of Nebuchadnezzar;" ² and also that he was smitten at Carchemish, by Nebuchadnezzar, in the first year of the latter king's reign.³ We know also from Berosus that he was in Egypt when his father died, and when he was recalled to Babylon to take the throne. He must have followed Necho, therefore, into Egypt, after his defeat at Carchemish, and then have slain him.

Sethos was on the throne of Egypt when Tirhakah came out of Ethiopia to assist him, in the third year of Sennacherib, and it is reasonable to assume that soon after that period Sethos was superseded by Tirhakah. So that we obtain about the same interval from Egyptian sources, that we have obtained from Chaldean and Jewish authority, viz., 110 years.

Now, 110 years, counted from the end of the year B.C. 689, brings us to the year B.C. 578 for the first year of Nebuchadnezzar, which is wrongly placed therefore in the Canon, in B.C. 604.

This triple testimony of Demetrius, Chaldean, and Egyptian authorities, to the length of interval between the third of Sennacherib and first of Nebuchadnezzar, is very strong; and if either the beginning of the period in B.C. 689, or the ending in B.C. 578, has been sufficiently determined by reference to astronomical data, the result we have arrived at must be correct. If both these dates, however, may be considered as established on the unerring basis of two solar eclipses, the conclusion is irresistible, and the Canon of Ptolemy must be rectified, by lowering the date of the five last kings of Babylon as proposed.

¹ Corrected from 6 to 16.

² Jerem. xl. vi. 25, 26.

³ Compare xlv. 2, with xxv. 1.