

have given him by you, and accept of my best Acknowledgments for your Favours. I am, with the greatest Regard and Esteem,

S I R,

Castle-Dobbs, Feb. 10.
1746-7.

Your most obedient

humble Servant,

Arthur Dobbs.

XIII. *A Letter from the Rev. Mr. G. Coffard, to the Rev. Thomas Shaw, D. D. F. R. S. and Principal of St. Edmund-Hall, concerning the Chinese Chronology and Astronomy.*

Reverend Sir,

Read April 30. 1747. **T**HE Subject of our late Conversation turn'd upon the Affectation of some Nations, in carrying up their Histories to so immoderate a Height, as plainly to shew those Accounts to be fictitious and without Foundation. This, it was agreed, was the Case of the *Babylonian* and *Egyptian* Accounts; and you seem'd to think it would be found, to be the same with any other People that should make the like Pretensions.

The only People in later Times that have been thought to contradict this Opinion are the *Chinese*, of whose History the World hath been taught

taught to entertain very extraordinary Conceptions. But that even They will be no Exception to your Surmize, but, on the contrary, a strong Confirmation of it, will, I persuade myself, appear, from what I am now going to offer.

I need not inform you, that the Eastern Writers in general are much addicted to Fable and Romance. This is a Fact too well known to need any Proof; and therefore great Judgment is many times required to distinguish what is real from what is purely imaginary, improbable, and absurd. I say this, not so much with regard to their Accounts of foreign Nations, with whose Affairs they may be presumed to be less acquainted, as of their own ancient State and Condition, and that in Ages not exceedingly remote. But if this Observation holds but too true, with respect to those whose History we are in some manner acquainted with, how much ought it to put us upon our Guard as to those we are in great measure absolute Strangers to?

The best Accounts we have received of *China* are owing to the *Jesuits*. But those Accounts themselves are, I am afraid, to be frequently received with great Caution. These Fathers have been sometimes, perhaps, not sufficiently versed in *European* or *Chinese* Learning, or both, to give us proper Information. At other times, it may be, they have been too much prejudiced in Favour of their Converts, or had Ends to serve, of which the World hath not been properly enough apprised. To have propagated their Religion only in a barbarous and uncultivated Nation, would not have been so much for the Credit of the Mission, as to have been able to introduce it

among a People civilized and polished by Arts and Literature.

Suspicious as these and the like Circumstances are, is it not surprizing to hear Authors, upon their Words only, and upon little or no Foundation besides (as I question not will appear), asserting with so much Positiveness, that the *Chinese History reaches up indisputably to the Times of Noah (a)*? A thing so far from being *indisputably* true, that no Article whatever perhaps will admit of greater Debate. 'Tis true indeed, the *Chinese* give us a long List of Kings that reigned among them from the Time of *Fo-hi*, and a Series of Dates, that, if allowed, may carry up his Age 2952 or 2847 Years before the Christian *Ara (b)*. But how easy is it to feign * Dates and Successions of Kings! Let it be made appear what Foundation this Chronology depends on; what ancient Monuments the *Chinese* have, and in what manner preserv'd. Marbles, I suppose, they have none; and their Paper, such at least as is brought into *Europe*, appears to be of too fine a Consistence for the Preservation of Records.

You will be told, Sir, perhaps, that a great Part, at least, of their *Chronology* is verified by *Eclipses*. A very pompous Argument! but, when narrowly examined into, will be found to prove just nothing at all. We are told indeed (*c*), that the ancient *Chinese* Observations consist of 26 *Eclipses* of the *Sun*, and 21 Conjunctions of *Jupiter* with the fix'd Stars.

The

(a) *Shuckford's Connct.* Vol. I. p. 101. (b) *Ibid.* p. 29.

* See these *Transf.* No. 415. p. 397, where this Chronology seems to be set in a true Light by the Viceroy himself of *Canton* 1724. *C.M.*

(c) *Obs. Math. Astron. Geogr. Chronol.* Tom. I. *Pref.* p. 13, 14.

The oldest *Eclipse* of the Sun is placed in the first Year of the Reign of *Tching-Cham* (d), supposed to coincide with the Year before *Christ* 2155: But the oldest Conjunction of *Jupiter* reaches no higher than the Year after *Christ* 73 (d): And how inaccurate the Observation was, appears from hence, that the *Chinese* only mark the Day when that Conjunction happened.

But the Question naturally arising here is, How it comes to pass, that the *Chinese* Accounts afford no Example of any planetary Conjunction before this, when they produce an *Eclipse* of the Sun 2228 Years earlier? By what good Fortune came that *Eclipse* to be preserved, and all Appulses of the *Planets* to fixed Stars for so many Years be lost? Let us suppose, that these were Things below the Notice of *Chinese* Astronomers; or that they did not know what Use to make of them. But in what manner must we account for this, That we hear nothing of any other *Eclipse*, till the Year before *Christ* 776 (f)? That all the *Eclipses*, observed during so long an Interval as 1379 Years, should have perish'd, and this *one* have escaped, requires a pretty strong Faith to believe.

But farther, we are told, that they observed the *Winter Solstice* in the Year before *Christ* 1111. There is nothing, it is true, impossible in this; for it is not said how accurate the Observation was. The
Difficulty

(d) *Ibid.* p. 18.

(e) *Ibid.* p. 15.

(f) Not much before the oldest *Babylonian* Eclipse that is preserved. See *Letter to M. Folkes Esq;* p. 21.

Difficulty is only to ascertain the Fact, and convince reasonable People that it was made at all.

'Tis well known, and allow'd by the Missionaries themselves, that the Reception they have met with in *China* hath been more owing to their Character as *Philosophers* than *Apostles* (g). When therefore they brought with them into the Country Accounts of *European* Discoveries, and particularly in *Astronomy*, might not the *Chinese*, agreeable to their vain-glorious Character, tell them, that they had of their own much older than any thing they could pretend to? It may be said indeed, that this is no more than Supposition, and which consequently argues but little: But then the Supposition is so easy and natural, that it requires at least the contrary to be made out by some very good Proof.

One Reason why this may be insisted on the more is, that the *Chinese*, according to the *Fathers* themselves, have not always been faithful in their relating Observations. *T-hang*, about the Year after *Christ* 721, had the Reputation among them of an able *Astronomer*; but being mistaken, it seems, in his Calculation of an *Eclipse*, rather than own his Ignorance, he pretended, that the *heavenly* Bodies did not always observe the same Laws. In Support of which extraordinary Hypothesis, he urged, that, in the Time of *Tsin*(h), the Star *Sirius* was eclipsed by the Planet *Venus*; tho' the Latitude of *Sirius* is $39^{\circ} 32' 8''$, and that of *Venus* never exceeds 4° . The same

(a) *Observat. ut sup. Tom 2. p. 117.* (b) *Observat. ut sup. Tom. 2. p. 86. Flamsteed's British Catal. Greg. Astron. p. 5.*

same Sort of Observation with this, I suppose, is the other of the Conjunction of *Saturn*, *Jupiter*, *Mars*, *Venus*, and *Mercury*, in the Constellation *Cbe*; when the *Sun* and *Moon* likewise were in Conjunction in 15° of *Aquarius*, in the Time of *Tchouen yu* (i).

And to put it out of all Doubt, that the *Chinese* are capable of obtruding upon the World *fictional* Observations, we need no other Authority still than that of the *Learned Fathers* themselves. In the Year 1725 (k) the *Missionaries* sent into *Europe* an Account of an Approximation of the four Planets *Jupiter*, *Mars*, *Venus*, and *Mercury*. Such planetary Conjunctions, it seems, in *China*, are look'd on as happy Omens of good Fortune to the Prince upon the Throne. The *Chinese* therefore, as if bred up at the Court of *Versailles*, with a true *French* Politencis, in Compliment to their Sovereign, mark'd in their Registers a Conjunction of all the 7. This false Account of an imaginary Conjunction, as the *Learned Jesuit* himself observes, may, in future Times, be the Occasion of very great Errors. — To the *Chinese*, I suppose he means; for in *Europe* the Danger will be but small; where there are better Tables, exacter Accounts, and more accurate Observers, than the most sanguine *Jesuit* will pretend to be among the *Chinese*. But if they would venture at recording such a spurious Observation, at a time when they were sure of being detected, what may we not suspect them

to

(i) *Observat. ut sup.* Tom. 2. p. 149.
sup. Tom. 2. p. 33.

(k) *Observat. ut*

to have been guilty of, when they had none to confront them ; and how little may we presume they know of the Uses to be made of *Celestial* Observations?

We are told, with great Pomp and Assurance (l), That there *always* was in *China* an Office of *Mathematics*, and another of History : That it is the Business of the former to calculate *Eclipses* ; and of the latter to register them, and every other Occurrence that happens in the State.

It would have been well, if the *learned Fathers* had told us with a little more Exactness what we are to understand by the Term *always* ; and whether the *Chinese* are acquainted enough with the Uses for which *Eclipses* serve, to make it probable, that they should have had such an Office any *considerable Number of Years*, and much less *always*. May we not in the mean time suspect, upon hearing such Language as this, that the *Fathers* mistake *Pekin* for *Paris* ; and, having their Heads full of the *Academy of Sciences*, cannot help figuring to themselves the like in the remotest Corners of *Asia* ?

Be this as it will, they tell us, That the *Mathematicians* have often had the Credit to take out of the Registers their *false* Calculations, and substitute in their room others, agreeing with Observations. — But where Things are kept with so little Exactness, what can be expected but Confusion ? What less indeed can be expected than what the *Fathers* assure us themselves hath frequently been the Case (m), That,
by

(l) *Observat. ut sup.* Tom. 2. p. 158.
p. 159.

(m) *Ut sup.*

by this means *Eclipses* have been preserved, that Calculations made by *European* Tables demonstrate to be false? Can we wonder likewise, that the *learned Fathers* should doubt many times, whether such or such a particular Eclipse be an *Observation* made at the Time, or the Result only of a *Calculation*, and perhaps a false one (*n*)?

For, after all that hath been said of *Chinese Eclipses*, and the *Calculations* of them, it is agreed, (*o*) that, before the Time of *Lieou kong*, or *A. D.* 206. they had no fix'd Principles upon which to proceed in that Business. — This Observation, I am afraid, will extend to much later Times; or 'tis scarce to be imagined they should look upon total *Eclipses* of the Sun as ill Omens.—In consequence of this superstitious Belief, we are told (*p*), That the *Chinese Astronomers* have carried their Compliment to the Family on the Throne so far, as to affirm no such *Eclipse* could happen during their Time. On the other hand, should an *Eclipse* of this sort happen, without being foretold, they immediately pretend it to be a Warning from Heaven of some Misfortune likely soon to befall the Government. But if it should be foretold, and not come to pass, they would then make the many Virtues of the Sovereign the preventing Cause; and, what is better still, a Shelter for their own Ignorance. Such Notions as these however, I think, plainly demonstrate them to be very *bungling Astronomers*; and that they can hardly look upon these *Phænomena*

as

(*n*) *Obs. ut sup.* Tom. 2. p. 159.
Tom. 2. p. 32.

(*p*) *Ibid.* p. 33.

(*o*) *Observat. ut sup.*

as depending on establish'd invariable Laws of Nature; the Consequence of which is, that they can no more attempt bringing them to a *Calculus*, than Winds, Thunder, and Lightning, and the like.

It was observed before, that the *Mathematicians* had many times the Art or the Credit to take out of the Registers their false Calculations; but we are told in the same Place, That, before they were re-positied there, they were presented to the Emperor, for his Inspection. Let any one, that knows the least of the despotic Governments of the East, reflect on the Probability of this; and whether the Attempter would not run great Danger of paying for it with his Head.

What hath been already said, will, I suppose, be more than sufficient to shake the Credit of *Chinese* Observations. But what must we think of those very ancient ones, when we are farther told (*q*), That, from the Time of *Tchun-tseou*, or 480 Years before *Christ*, the *Chinese* themselves allow *Astronomy* was almost intirely neglected among them; and that *Tsin-chi-hoang*, whose Reign began in the Year before *Christ* 246, order'd all Books of *History* and *Astronomy* to be burned (*r*)? But every one will easily imagine what Destruction of Observations must have been made during a Neglect of these Studies for 234 Years; and how little would remain to be burned by this *anti-astronomical Prince*.

It

(*q*) *Observat. ut sup.* Tom. 2. p. 1.

(*r*) *Ibid.* p. 2.

It was owing to this Devastation. it seems, that the *Chinese* are said to have lost the Method taught by the Ancients, and particularly the Emperor *Tao*, of calculating the Places of the 7 *Planets*, and the fixed Stars (*f*). It may with good Reason be questioned, whether they really had any Methods of calculating their Places at all: For to what Purpose could such Calculations serve, when their Catalogues of Stars, many Centuries later, are acknowledged to have contained nothing more than bare *Names*, without *Latitudes*, *Longitudes*, *Right Ascensions*, or *Declinations*? Such their Catalogues were, if they deserve that Name, that were made under the Race of Emperors called *Song* (*t*), or between *A. D.* 591 and 620; and it will be difficult to prove they were any thing else, before the *Jesuits* introduced there *Tycho-Brabe's*, or other *European* ones. As to the Places of the Planets, how little they were able to compute them will appear from hence, that the utmost that *Lieou-hin* and *Lo-hia-hong*, in the Year before *Christ* 66, pretended to, was to calculate a plain rectangled Triangle (*u*). In what manner they did this is not said; but it would be well, if the *learned Fathers* would make it appear that the *Chinese* had, in much later Times, any thing like a Table of natural Sines and Tangents. A small Skill in *Mathematics* is requisite to apprehend from hence how bungling their Astronomy must have been; and if so, much more that of the Ages preceding them!

And

(*f*) *Observat. &c.* Tom. p. 3.
p. 65.

(*t*) *Observat. &c.* Tom.

(*u*) *Observat. ut sup.* Tom. 2. p. 8.

And it will be yet further hard to imagine that they knew how to find the Places of the Planets, when we are assured (x), that *Tchang-tse-tsin*, about *A. D.* 550, was the first Person that introduced Equations into their Computations of the Planets Motions; that *Co-chiou-king*, about *A. D.* 1280, was the first *Chinese* that knew any thing of *Spherical Trigonometry* (y); and that, before the Arrival of the *Jesuits*, they were intire Strangers to the Inclinations of the Planes of the planetary Orbits (z).

After what hath been said, I think we need but little more to convince us of the small Acquaintance of the *Chinese* with *Astronomy*. They tell us however themselves (a), That, from the Time of *Tsin-chi-hoang* above-mention'd, they had no expert *Astronomer*, no Books of *Astronomy*, nor known Method of computing. All that remained were some *confused Traditions*, *Catalogues of Stars and Constellations*, and *Fragments of Books*. A mighty Encouragement all this, to expect reforming the *European Astronomy* or *Chronology* by the *Chinese*! What sort of *Catalogues* these were, hath been already observed; and we may, without Offence, I presume, beg to be excused from paying over much Deference to *Chinese Tradition*; at least, till the Fathers have better determined what Degree of Assent it deserves.

About *A. D.* 164. several *Jew* Families, and other Subjects of the Western Empire, came into *China* (b). At that time, as it is allowed by the
Jesuits

(x) *Observat. &c.* Tom. 2. p. 58, 59. (y) *Ibid.* p. 114.
 (z) *Ibid.* p. 84. (a) *Observ. ut sup.* Tom. 2. p. 30.
 (b) *Observ. ut sup.* Tom. 2. p. 119.

Jesuits themselves, *Ptolemy's Astronomy* was in great Vogue all over the East; and they seem to suspect, that by this means the *Chinese* might get some faint Knowledge of it. It is certain, that from this time we meet with Things unknown to their former Accounts of *Astronomy*. At this time, it is said (c), *Tchang-heng* made a Catalogue of 2500 Stars. Such a Catalogue as those already mention'd were, we may suppose it to be, if it was at all; for *Tchang-heng's* Book is lost; and what Accounts we have of him or his Works, depend on the Authority of others.

A. D. 284. (d) liv'd *Kiang-ki*, the first *Chinese* that is said to have known any thing of the Motion of the fix'd Stars. This we see was 120 Years after the above-mention'd Arrival of the *Jews* in *China*; but either they must have been unskilful Relaters, or the *Chinese* bad Disciples, since *Kiang-ki*, it seems (e), made that Motion to be at the Rate of 1° in 50 Years; whereas *Ptolemy*, it is well known, made it 1° in 100 Years. It may be said indeed, that this Difference shews it could not be borrow'd from *Ptolemy*; but then it shews at the same time, that it could not be the Result of any Series of Observations; and that is as much, I think, as we need be concerned about. And this will appear yet farther, by remarking, that *A. D.* 460, it was made by *Tson-chong* 1° in 45 solar Years and 9 lunar Months (f). At other times it was made yet different still; but never, I think, from Observations of the Stars themselves.

(c) *Obs. ut sup.* Tom. 2. p. 25. (d) *Ibid.* p. 44. (e) *Ibid.*
(f) *Ibid.* p. 52.

selves. The Method, it seems, was by comparing the Places of the Solstices in their own Time, with their Places in the Reign of the Emperor *Yao* (g), whom they supposed to have lived at a Time coinciding with 2300 Years before *Christ*. Let us suppose them to have been right in this (a Thing we are by no means obliged to allow), yet, as they never appear capable of taking the *Solstices* with any tolerable Degree of Accuracy, we cannot wonder at any Mistakes we may meet with.

You have seen, Sir, all along, constant Mention made of *Chinese Calculations*; the very Word used by the Fathers themselves; tho' I am sensible that Term will be apt to lead the unwary into great Errors. For the most that can be made of their *Calculations* is nothing more than finding the Places of the Luminaries by Numbers (expressing their Periods and Parts of Periods), or, in other Words, by their mean Motions. For, as to the *Sun*, we are assured (h), they made his Motion one *Chinese* Degree in a Day, without knowing any thing of an *Equation* necessary to correct it. It was not till the third Century that they had any *Equation* for the *Moon* (i); and *Tchang-tse-tsin*, about *A. D.* 530, as we have seen, was the first that used any for the *Planets*. It is observable, however, with regard to this Author, that there are no Writings of his extant (k); and therefore what is here said of him, may be nothing more than Report. Among an idle
vain

(g) *Observ. ut sup.* Tom. 2. p. 148.
(i) *Ibid.* p. 24.

(k) *Ibid.* p. 58, 59.

(h) *Ibid.* p. 6.

vain People, unacquainted with critical Learning, round Assertions pass for Proof; and in this manner, beyond Question, the *Chinese* have frequently imposed upon credulous unskilful *Europeans*.

A. D. 618. began the Reign of the Emperors of the Race of *Tang*; and about this time other Western Strangers came into *China* (l). From them therefore the *Chinese* might learn what farther Improvements we may chance to meet with in their *Astronomy*, besides those for which they are assuredly indebted to the *Jesuits*.

It was observed but now, that in computing the Places of the heavenly Bodies, the *Chinese* at best knew nothing but their mean Motions: But in such Computations it is necessary to begin from some *Radix*, or other: *European* Tables generally begin with the Commencement of the Christian *Aera*; the *Chinese* appear never to have known any. One *Epoch* indeed they have, but intirely imaginary, called *Chang-Yuen* (m), and which began some time or other at *Midnight*, at the *Moment* of the *Winter Solstice*, when the *Sun*, *Moon*, and 5 Planets, *Saturn*, *Jupiter*, *Mars*, *Mercury*, and *Venus*, were all in Conjunction, and the *Moon* without any Latitude.

This extraordinary *Epoch* began, according to these able Astronomers, 143127 Years before the *Winter Solstice*, in the Year before *Christ* 104 (n). What time this *Epoch* came first into Use is not known; but the *Fathers* think, and it must be acknowledged with

(l) *Oisf. ut sup.* Tom. 2. p. 71, 72, 96.
(n) *Ibid.*

(m) *Ibid.* p. 16.

with great *Probability*, that it is not older than the burning the Books under *Tsin-chi hoang* (o), or, as we have already seen, the Year before *Christ* 246. Should we place it however many Years later, or say that it never served any real Use at all, we may perhaps come much nearer the Truth.

For the *Chinese* Astronomers, as the *Fathers* observe (p), have spent an infinite deal of Time and Pains, in searching out this *Chang-Yuen*; and which has been carried up, they say, by some *two*, by others *three* Millions of Years beyond the Time it was above fixed at. But this shews to a Demonstration, that it is an *Epoch* purely fictitious; that, if it was real, it could only be of an *astronomical* Nature; and that they must be *sottishly stupid*, that should from thence collect, that the *Chinese* had any historical Memoirs of so ancient a Date. For the *Fathers* themselves allow, that the Opinion which ascribes to the World a Duration of some Millions of Years, is neither the general Opinion of the *Chinese*, nor of any ancient standing among them (q).

From what has been here offer'd, I think it is pretty evident, that, how ingenious soever the *Chinese* may be in Works of Art, their Talents do not lie towards *Mathematics* and *Astronomy*: For, was not this the Case, must it not be surprising, that having, as they say, so long a Series of Observations in the one Science, and of Professors in the other, they should never have been able to get beyond the first Elements of either?

It

(o) *Obs. ubi sup.* Tom. 2. p. 18. (p) *Ibid.* p. 17. (q) *Ibid.* p. 17.

It is not my Design to enter into any Controversy with the *Learned Fathers* of the *Society of Jesus*; the World hath been frequently indebted to them for their Philosophical Labours; and will be so again, when they shall have considered the *Chinese* History with proper Accuracy, and told us in what manner they have been able to preserve Accounts and Observations of so ancient a Date. Public Libraries, it is allowed (r), they have none; nor doth it appear they ever had. Where then could Things so usefess, as the Generality must have thought *astronomical Observations*, be repositèd? When intrusted to private Hands, they must have run great Risque of being destroy'd by Wars, by Fires, and in popular Commo-tions; which must frequently have happened in so long a Course of Ycars.

Let us suppose Things of this sort are of more Value to the *Chinese Commonalty*, or, if you please, their *Nobility*, than they are to the *European*; and that they would lay Hands on every thing they could meet with of the kind; and, when once in their Possession, would preserve it with a religious Exact-ness: But whence then comes it to pass, that it is *so difficult a Matter* in *China* to meet with Books upon these Subjects (s), to understand them when found, or to get any Assistance from the Natives to-wards understanding them?

But besides, are not Writings thus kept in private Persons Custody, unless carefully laid by, apt to be scribbled

(r) *Observ. ut sup.* Tom. 2. Pref.

(s) *Ibid.*

scribbled on by the Sciolists; so that it may be hard to distinguish many times the Text from what may be called the Comment? Is not this, in Fact, according to the *Learned Fathers* own Account (t), very frequently the Case? May not, by this means, a *Calculation*, if it must be so called, be mistook for an *Observation* made many hundred Years before? It is confessed (v), that *Martini* was imposed upon in this very manner; and it is much to be suspected that he hath not been the only one.

You see, Sir, that I have produced the *Jesuits* own Authority for every thing here offered. I designed to have cited their Words at Length, but that I found would have swell'd these Papers above the Size of a Letter. I am not conscious to myself of having misrepresented them; I am sure I have not done it wilfully; for I have nothing in my View but Truth. I am,

S I R,

Your most obedient

Humble Servant,

G. Costard.

P. S. The Title of the Work I have here cited, is, at length, *Observations Mathématiques, Astronomiques,*

(t) *Obs. ut sup.* Tom. 2. Pref. p. 103.

(v) *Obs. ut sup.* Tom. 2.

miques, Geographiques, Chronologiques, & Physiques, tirees des Anciens Livres Chinois, ou faites nouvellement aux Indes, à la Chine & ailleurs, par les Peres de la Compagnie de Jesus. It consists of three Volumes, printed at Paris, 1729, 1732.

XIV. *Part of a Letter from Mr. Turberville Needham to James Parsons M. D. F.R.S. of a new Mirror, which burns at 66 Feet Distance, invented by M. de Buffon F.R.S. and Member of the Royal Academy of Sciences at Paris.*

Dear Sir,

Read April 30. 1747. **Y**OURS of *December* came so late to hand, that I could not answer it till this Occasion. * * * * I have been at the King's Garden, and am just returned: I there learned, that this Morning they have been trying some Experiments with a new-constructed reflecting Mirror or Mirrors with Success: I knew indeed some time ago, that they had been upon the Design; and *M. de Buffon* had acquainted me with the theoretical Part of the Whole. I had even seen a Part of it executed; but as they had not then essayed it, I would take no notice of it: In one Word, it is *Archimedes* revived; and the Credit of Antiquity, in this Point, is

S f f 2

in