



Embracing the pitfalls and triumphs in  
interdisciplinary research

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# What are the Astronomical Diaries?

Series of clay cuneiform tablets containing data pertaining to the movement of stars and planets, meteorological data with sub-daily resolution in places, monthly summaries of market prices for six commodities (barley, dates, mustard, sesame, cress and wool), historical events, and river heights for the Euphrates River.

British Museum  
78942

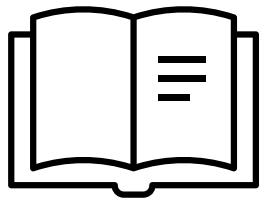
Scientific endeavour written with precise language for precise observations by scribes who spent their whole lives training for the role.

Key to this data is the fact that it was written in clay and has therefore survived. It is one of the few mediums that benefits from fire, a common way we have lost countless other documents in our history.

It provides us with a unique window into the past, allowing modern scholars to explore the past in great detail.

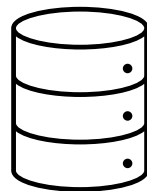


| Volume                          | Content  | Published |
|---------------------------------|--|-----------|
| Diaries from 652-262 BCE        | Systematic daily observation of lunar, planetary and meteorological phenomena along with monthly river heights, economic data for six commodities, and historical information for the years 652-262 BCE. | 1988      |
| Diaries from 261-165 BCE        | Systematic daily observation of lunar, planetary and meteorological phenomena along with monthly river heights, economic data for six commodities, and historical information for the years 261-165 BCE. | 1989      |
| Diaries from 164-61 BCE         | Systematic daily observation of lunar, planetary and meteorological phenomena along with monthly river heights, economic data for six commodities, and historical information for the years 164-61 BCE.  | 1996      |
| Undated Diaries and Addenda     | Additions & corrections to Vols. I-III & undated diaries   | 2022      |
| Lunar & Planetary Texts         | Monthly observations of lunar and planetary data from 747-10 BCE.  | 2001      |
| Goal Year Texts                 | Contains "raw materials for the prediction of planetary and lunar phenomena for a given year" (Sachs, 1948, p.282).  | 2006      |
| Almanacs & Normal Star Almanacs | Contains astronomical almanacs from the 3rd to the 1st century BCE.  | 2014      |



1342 pages of data  
671 in English translation  
671 in transliteration text

236,596 rows of data



Spread over 40+ columns



Encompassing 52 unique key variables, including 22 meteorological variables

### Keys and variable names

| Key | Variable                | Key | Variable                       |
|-----|-------------------------|-----|--------------------------------|
| 1   | Overcast                | 29  | Cloudbank                      |
| 2   | Haze                    | 30  | Earthquake / Quake*            |
| 3   | Cold                    | 31  | ZI IR*                         |
| 4   | Rain                    | 32  | PISAN DIB*                     |
| 5   | Clouds                  | 33  | Mud*                           |
| 6   | Fog                     | 34  | Tornadoes*                     |
| 7   | Corona                  | 35  | Fall Of Fire*                  |
| 8   | Rain Shower             | 36  | Locusts*                       |
| 9   | Wind                    | 37  | (shooting star)                |
| 10  | Mist                    | 38  | Box (sun setting / rising in)* |
| 11  | Rainbow                 | 39  | Garment of the sky*            |
| 12  | Thunder                 | 40  | River*                         |
| 13  | Lightning               | 41  | Historical information*        |
| 14  | Bright                  | 42  | Date justification*            |
| 15  | Halo                    | 43  | Comments (explanatory text)*   |
| 16  | Sirius Phenomenon       | 44  | ...                            |
| 17  | Eclipse (Lunar / Solar) | 48  | ...                            |
| 18  | Meteor / Comet          | 49  | Misc. (miscellaneous)          |
| 19  | Missing Data            | -   | COMMODITIES                    |
| 20  | Equinox / Solstice      | 50  | Barley                         |
| 21  | Planets & stars         | 51  | Dates                          |
| 22  | Cloudburst              | 52  | Mustard                        |
| 23  | Disk                    | 53  | Cress                          |
| 24  | Hail                    | 54  | Sesame                         |
| 25  | Earthshine              | 55  | Wool                           |
| 26  | Dew                     | 56  | Unknown Commodity*             |
| 27  | Storm                   | 98  | Missing Days*                  |
| 28  | Famine                  | 99  | No Data*                       |

\* Variables added after the pilot study





# Interdisciplinary research – pitfalls & triumphs

## Historical Climatology

- Methodology
- Content analysis

## History

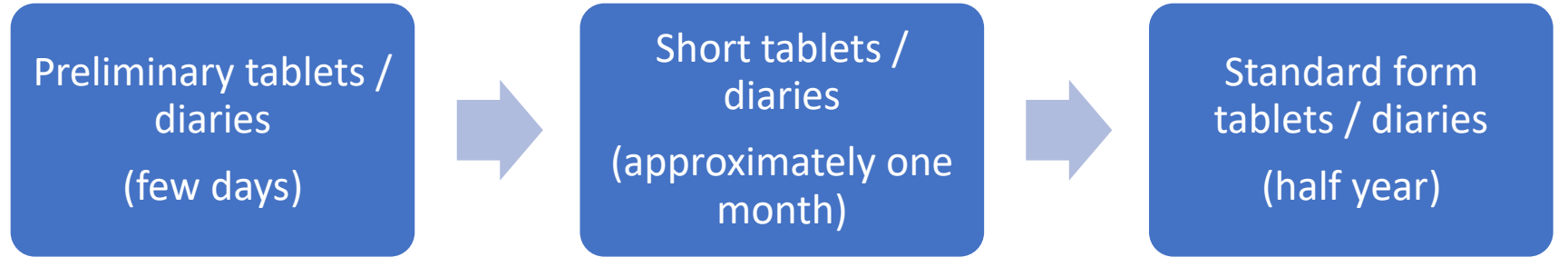
- Source analysis
- Source criticism

## Climate Science

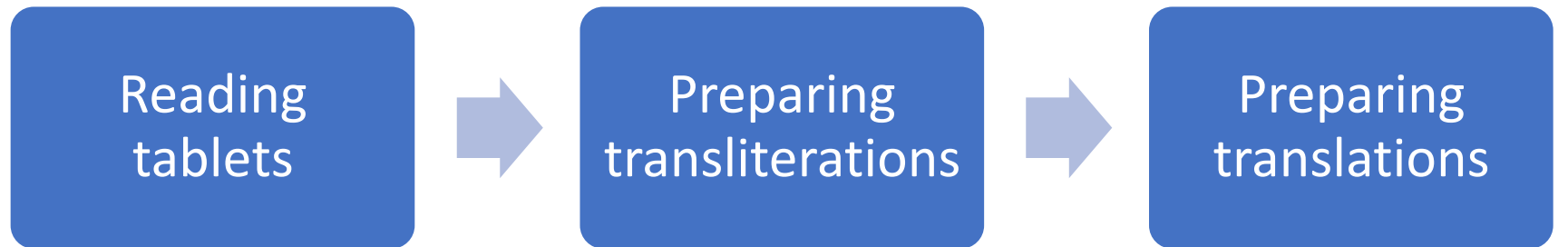
- Reproducibility
- Transparency

# Potential for the introduction of errors.

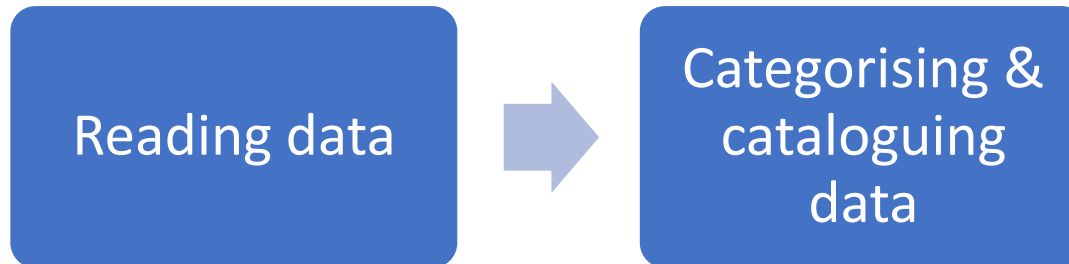
Ancient scribes  
652 – 61 BCE



Series editors  
1980s-2022



Researcher (Me!)  
2019-2024



# Climate-Modellers Historical-Linguistic-Experts

Historians

# Geographers

# Palaeoscientists

Classicists

Climate-Scientists

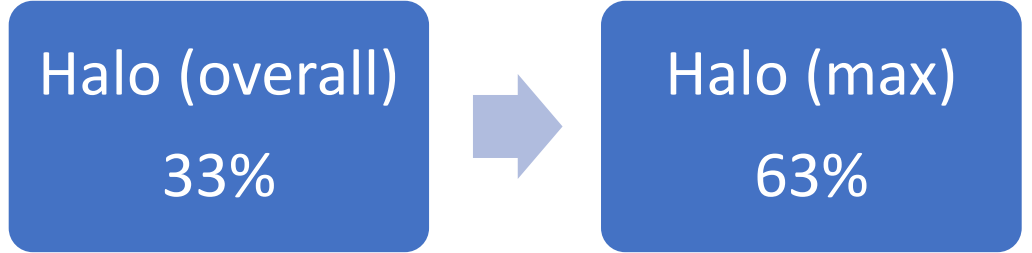
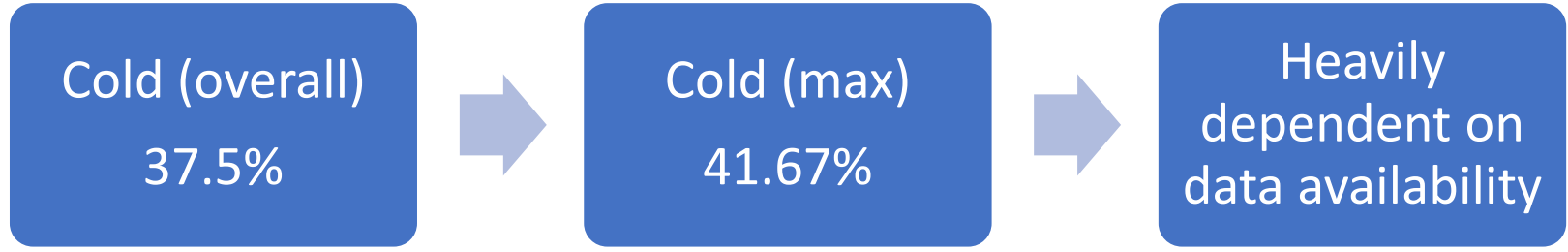
## Pitfalls

- Common Language
- Effective Communication
- Full understanding of the lexicon involved in each research field
- Time required to find an effective method of working

## Triumphs

- Learning to work in diverse environments
- Accessing specialist knowledge
- Gaining interpersonal skills
- Broadened knowledge of theoretical principles underpinning different disciplines and methodologies





Precipitation:  
Overall higher than average frequency values in volcanically active years 68% of the time.

**Tropical**

- 72% of all frequency values are higher than average in tropical eruption years (or lag years → 1:3 years post eruption)

**NH**

- 63% of all frequency values are higher than average in northern hemisphere eruption years (or lag years → 1:3 years post eruption)

**SH**

- 70% of all frequency values are higher than average in southern hemisphere eruption years (or lag years → 1:3 years post eruption)

ARTICLE

nature  
doi:10.1038/nature14565

# Timing and climate forcing of volcanic eruptions for the past 2,500 years

M. Sigl<sup>1†</sup>, M. Winstrup<sup>2</sup>, J. R. McConnell<sup>1</sup>, K. C. Welten<sup>3</sup>, G. Plunkett<sup>4</sup>, F. Ludlow<sup>5</sup>, U. Büntgen<sup>6,7,8</sup>, M. Caffee<sup>9,10</sup>, N. Chellman<sup>1</sup>, D. Dahl-Jensen<sup>11</sup>, H. Fischer<sup>7,12</sup>, S. Kipfstuhl<sup>13</sup>, C. Kostick<sup>14</sup>, O. J. Maselli<sup>1</sup>, F. Mekhaldi<sup>15</sup>, R. Mulvaney<sup>16</sup>, R. Muscheler<sup>15</sup>, D. R. Pasteris<sup>1</sup>, J. R. Pilcher<sup>4</sup>, M. Salzer<sup>17</sup>, S. Schüpbach<sup>7,12</sup>, J. P. Steffensen<sup>11</sup>, B. M. Vinther<sup>11</sup> & T. E. Woodruff<sup>9</sup>



Thanks for listening!



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Dr. Francis Ludlow, Dr. Conor Kostick,  
Dr. Selga Medenieks



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Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



Trinity  
Centre for  
Environmental  
Humanities

SCHOOL OF HISTORIES AND HUMANITIES