Fig. 2
Top graph: *Hellfire, Ruggedy Mt., Stewart Island pink pine chronology.*
Bottom graph: *actual and estimated gridded warm-season temperature and tree-ring data prewhitened to account for effects of autoregression.*

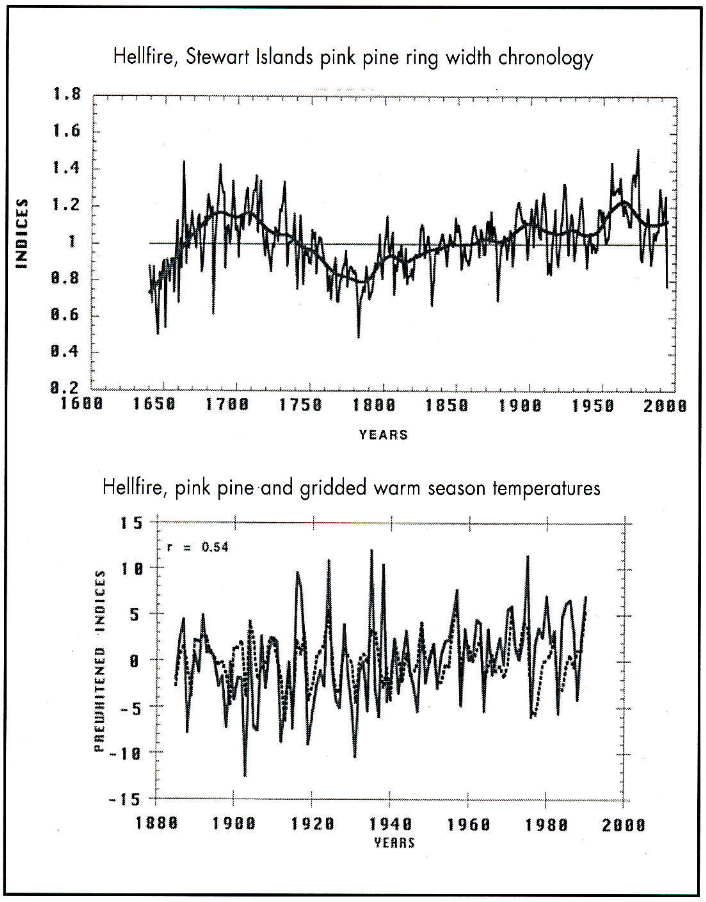
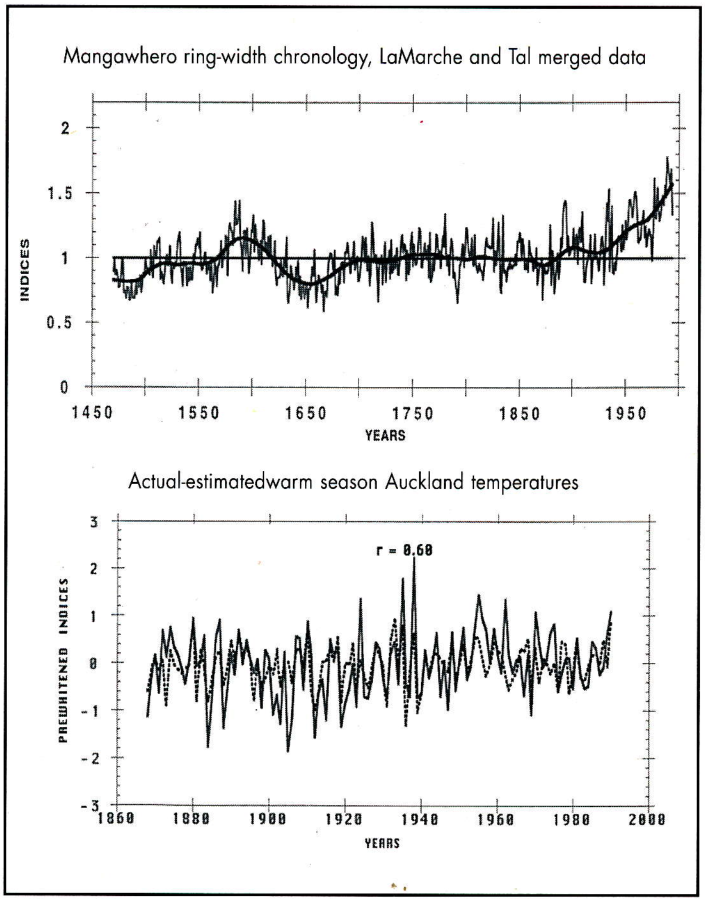


Fig. 3
Top graph: *update of silver pine chronology for Mangawhero River Bridge, North Island, merged with raw data from chronology (LaMarche et al., 1979).*
Bottom graph: *actual and estimated Auckland warm-season temperatures based on Mangawhero chronology. Temperature and tree-ring data prewhitened to account for effects of autoregression.*



These chronologies supplement previously published tree-ring data from New Zealand (LaMarche et al. 1979, Norton et al . 1989), Tasmania (Cook et al. 1991, 1992, 1994), and southern South America (Lara and Villalba 1993, Villalba et al., 1994).
Together these tree-ring archives improve our geographical coverage and long-term perspective of climatic variability for data-sparse regions of the Southern Hemisphere.

Rosanne D. D'Arrigo, Edward R. Cook, Brendan M. Buckley and Paul J. Krusic
Full references can be obtained from the first author at:
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CHINA

Paleoclimate records available from Chinese historical documents

Historical documents are a major resource of paleoclimate information in China, They contain the records on drought, floods, rain, snow, freezing, frost, wind, dustfall, atmospheric physical phenomena such as twilight, sky-color, etc., and past records of crops, famine, and insects pests etc.. The earliest one dated from 780 BC.. A systematic study has been conducted on 8128 sources including government history books, local gazetteers, and literature etc.. After detailed proof-reading, cross-checking and establishing the chronology of events, a Chinese historical climate database has been established in the NCC (National Climate Center, China).
A map locating all the sites of records can be obtained from the author.

The records have been employed in reconstructing regional climatic series mapping the real conditions of extreme climate cases and compiling a chronological table of some rare paleoenvironmental events.

Table 1.
Overall percentages of the paleoclimate records mentioning different items in Chinese historical documents

Item	drought	flood	rain	snow	storm	hail	frost	wind
Percent %	18	22	9	3	2	5	1	5
Item	dust	cold	hot	locust	epidemic	famine	harvest	other
Percent %	2	2	1	6	3	11	7	3

The table shows some statistics for major items of the database. In addition, ther are the daily weather records extracted from some private diaries, and government weather reports in historical times.

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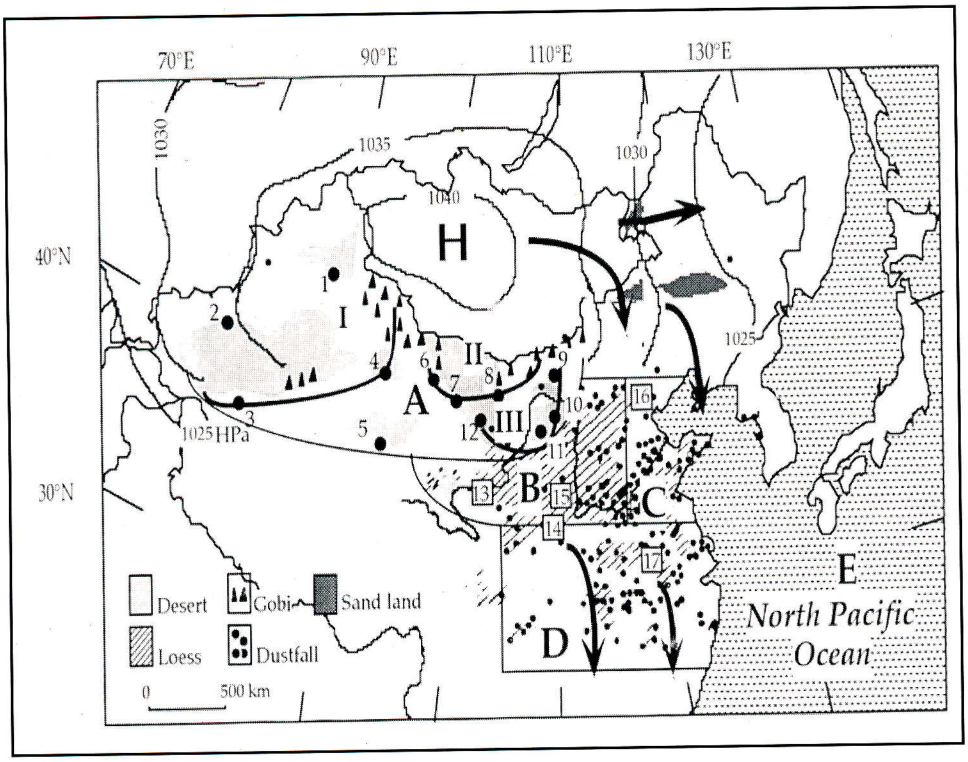
References:
Zhang De'er, 1995, Paleoclimate and Enviromental records available from Chinese historical documents In: Paleoclimate and Environmental Variability in Austral-Asian Transect during the Past 2000 Years. (eds. T. Mikami, E. Matsumoto, S. Ohta and T. Sweda) Nagoya University, Japan, P.20-26.

CHINA

Dust emission from Chinese desert sources linked to large-scale variations in atmospheric circulation



1. Fukang (44° 17'N, 88°7'E), 2. Aksu (41°22'N, 80°43'E), 3. Qira (37°6'N, 82°34'E), 4. Dunhuang (40°16'N, 94°10'E), 5. Golmud (36°62'N, 96°64'E), 6. Jiayuguan (40°38'N, 98°31'E), 7. Heiquan (40°26'N, 100°16'E), 6.Jiayuguan (40°38'N, 98°31'E, 8. Jartai (40°34'N, 106°34'E), 9. Dalad Qi (40°63'N, 110°6'E), 10. Yulin (38°37'N, 109°46'E), 11. Dingbian (37°37'N, 107°34'E), 12. Minqin (39°17'N, 103°10'E), 13. Lanzhou, 14. Xian, 16. Luochuan, 16. Beijing, 17. Hefei.

Source Regions:
I-Western deserts (2, 3, 4); II-Northern high-dust deserts (6, 7, 8); III-Northern low-dust deserts (9-12).

Depositional Regions:
A: Chinese desert regions (1-12), excluding three sandy lands in northeastern China;
B: Chinese Loess Plateau (13, 14),
C: Historical NE dustfall region, 34.3—41°N, to the east of 114°E (16);
D: Historical SE dustfall region, 27.3—34.3°N, to the east of 104.7°E (17); E: North Pacific Ocean

The map shows the winter monsoon regimes of eastern Asia, aerosol sampling locations (1-12) in Chinese deserts, the sites (open squares with numbers) for the data cited, source regions (Sources I, II, III) and depositional regions (Regions A, B, C, D, E) for Asian dust. The prevailing northwesterly winds (arrows) associated with the Siberian High (HPa) and westerly winds from central Asia entrain the bulk of the Chinese desert dust delivered to the depositional areas.

The major sources for Asian dust lie in deserts of northern and northwestern China, but little information is available on the quantity of dust produced or the distribution of source regions. Dust pulses are evident in Chinese loess, but it has not been possible to apportion the contributions among source regions or even pinpoint the source areas. Data from five Asian/Pacific regions indicate that ~800Tg of Chinese desert dust is injected into the atmosphere annually; about 30% of this is re-deposited onto the deserts, 20% is transported over regional-scales, and 50% is transported to the North Pacificic and beyond.
Elemental tracers reveal high-frequency variability in Chinese loess related to dust inputs from western desert sources vs. northern high-dust and low-dust desert sources. These shifts in Asian dust source regions are synchronous with large-scale variations in atmospheric circulation over the last glaciation.

Full references are available from the authors who prepared the report.

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CHINA

Microbanding of stalagmite and its significance

Stalagmites are a kind of speleothem able to provide climate information with an annual resolution and much longer time span comparing to tree rings. Two aspects of annual banding of stalagmite have been reported: the luminescent microbanding which is only observed under a fluoromicroscope (Y. Shopov 1987, 1994 and A. Baker 1993) and the lamina which are visible to the naked eye (D. Genty 1996). Recently, the authors have studied a stalagmite from Beijing Shihua Cave within the East Asian monsoon zone and found under the polarizing microscope the transparent micro-banding is very clear. The preliminary results show that about 1100 continuously microbands are in the upper 45mm of the stalagmite *(Fig. 1)*.
Each band, taken as annual deposition, mostly tens of microns in thickness, consists of two parts:
- a light part at its bottom which may be deposed from the "old water" in the fissures displaced by annual rainfall,

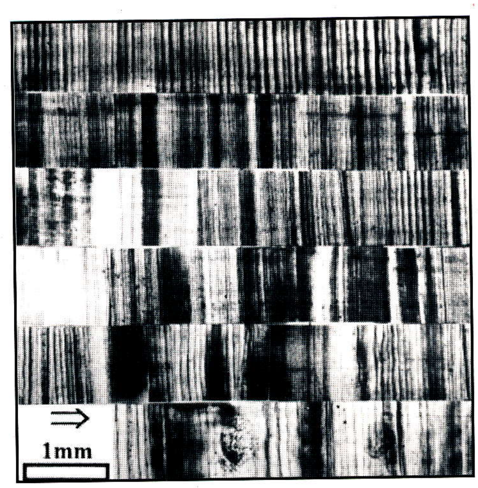

Fig. 1:
The 1100 annual transparent microbands of the stalagmite from Beijing Shihua Cave. The order from the top to the bottom and from the left to the right in the figure is in the direction from the top to the base in the stalagmite. The scale is I mm illustrating the size of the banding. The round dots in the first row of photograph are pen-marks.

- a dark one on the top which may be deposited from "fresh water" which comes from the overlying soil and contains more organic matter.

The cave was developed in Ordovician limestone. The stalagmite which is about 200mm high and columnar in shape, was taking in the drip water when it was cut. The AMS ^{14}C dating suggests that the stalagmite has an age less than 2000 years. It seems reasonable to suppose that the rythmic banding is comparable to the fluctuations in the annual precipitation which has only one annual peak value in most years in the monsoon zone and undergoes interannual changes in a wide range similar to the bands. Assuming this interpretation correct, the authors have developed the time series of band thickness and compared them with the index of drought and flood drawn from historical documents of the last 500 years (from 1470 to 1992 yr AD, *Fig. 2a*) and the instrumental record of precipitation from 1951 to 1980 yr AD (according to the data from National Climate Center, *Fig. 2b*). The coherence of these curves suggest once again that the banding has an annual resolution. Consequently, the light and dark parts for each band may reflect seasonal hydrological changes. With the curve of thickness change the authors reconstruct an annual resolution climatic history of the last 1100 years in the Beijing area (*Fig. 2c*). The precipitation was at its height in about 900 yr BP and after that time it was decreasing to the lowest in about 515 yr BP (start from 1980 yr AD), then gradually increasing up to its 20th century maximum in the 1950's. 136-year, 50-year, 18~16-year, 11-year and 5.8-year climatic cycles are observed.

Full references are available from the authors.

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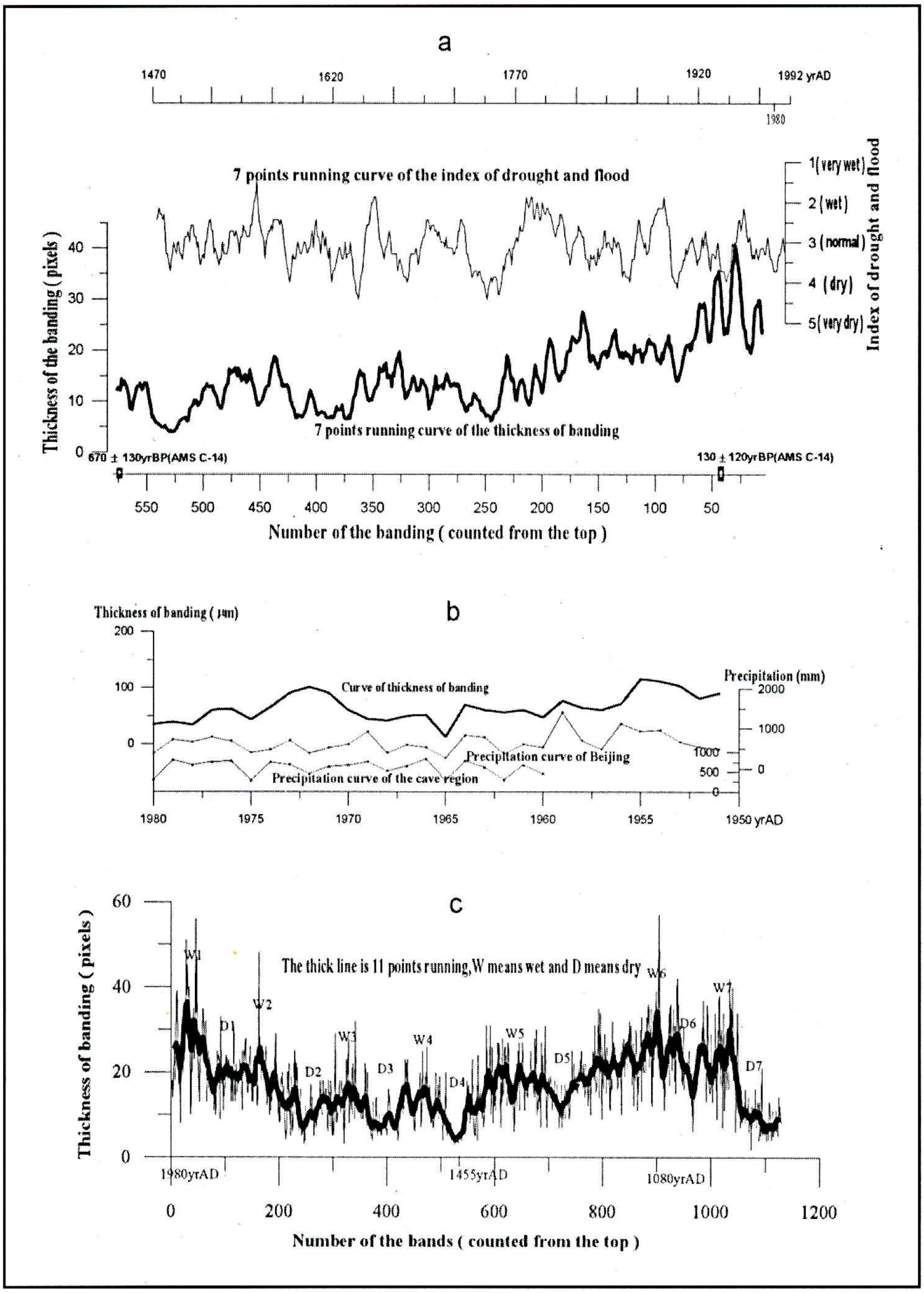

Fig. 2:
2a: Comparison between the variation of banding thickness and the index of drought and flood recovered from historical documents over the last 500 years.
2b: Comparing the change of banding thickness with the instrumental records of precipitation from 1951 to 1980 yr AD.
2c: The variation of the banding thickness in the last 1100 years, which may represent the change in precipitation.

A Chinese version of the PANASH-PEPII report has been produced and is available from Guo Zhentang at:
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e-mail: ztguo@mimi.cnc.ac.cn

A French version of the PANASH-PEP III report is in preparation.
Further details will be given in our next PAGES Newsletter.