

The Challenges of Preservation and Conservation of Chinese Ancient Books

保护中国古籍面临的挑战

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刘家真

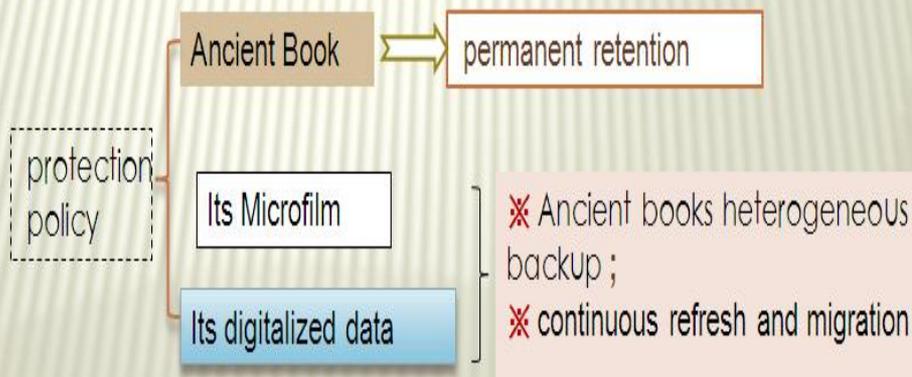
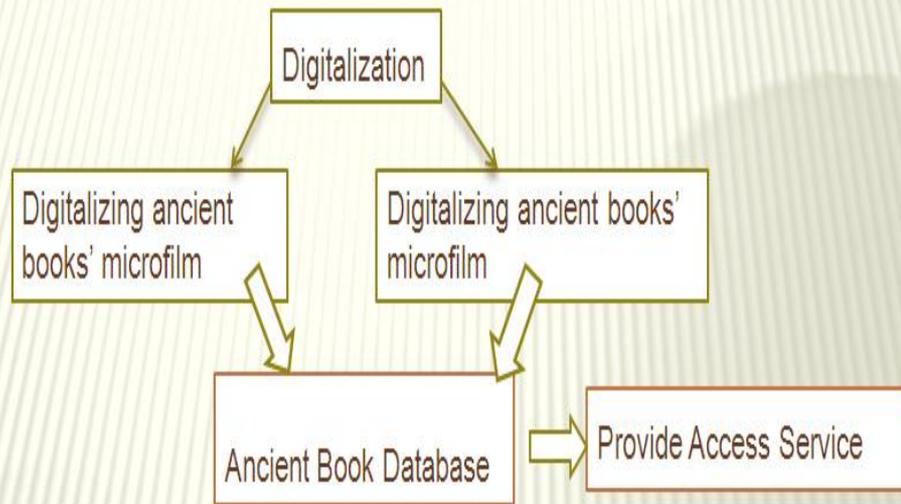
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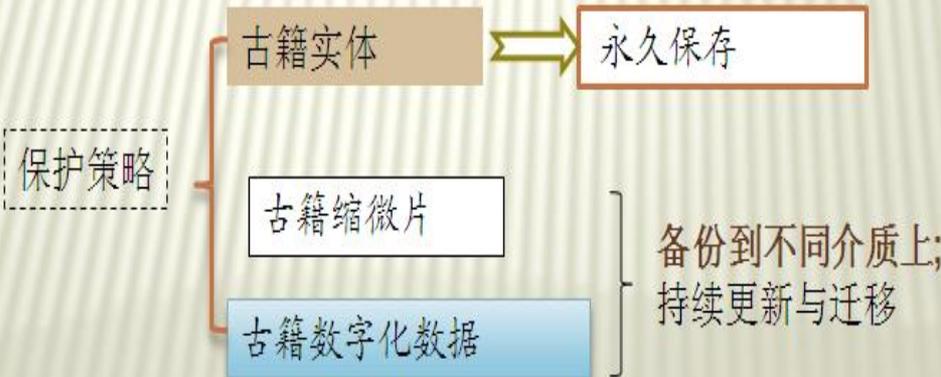
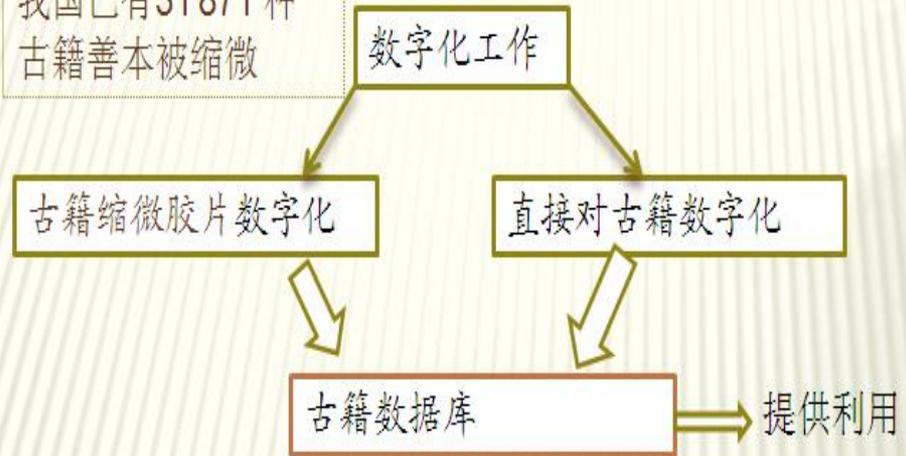
1. Preservation Strategies for Ancient Chinese Books

保护中国古籍的策略

About 31871 kinds of ancient rare books have been microfilmed from 1996 to 2010 in China.



从1996年至2010年，我国已有31871种古籍善本被缩微



2. THE CHARACTERISTICS OF ANCIENT CHINESE BOOKS

中国古籍的特点

The production methods and writing materials of Chinese ancient books

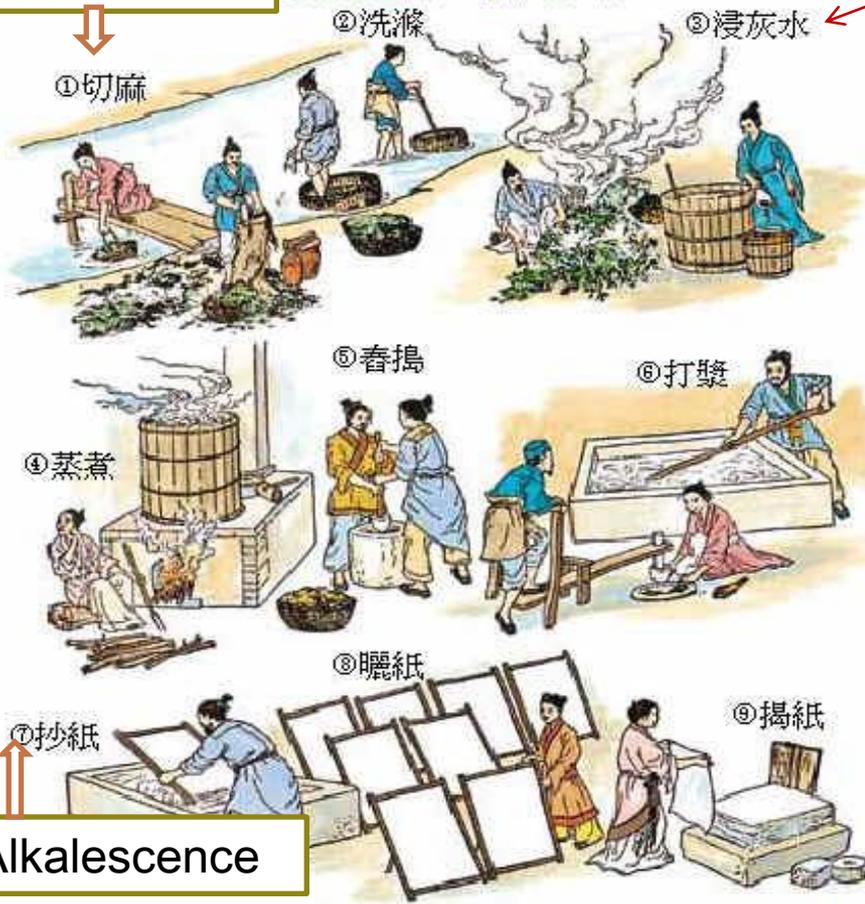
Production Method	feature	Method recording	of Final product	Writing/printing materials
Writing	unique	writing	manuscript, hand-made copies, letters, calligraphies	paper, Chinese ink
		drawing	drawings	paper, Chinese ink, mineral dyestuff
Print	batch	stamping	texts from stamps and seals	Paper, vermilion
		rubbing (<i>Ta yin</i>)	books of rubbings, reproduction of engraved texts	Paper, Chinese ink, vermilion or other mineral dyestuff
		woodblock printing	books and woodblock paintings	Paper, Chinese ink, vermilion

中国古籍的主要制成方式及主要的书写材料

形成方式	特点	方法	成品	主要书写材料
写	唯一性	书写	稿本 抄本 信札 题词 题字	纸, 中国墨
		绘画	图画	纸, 中国墨, 矿物颜料
印	批量性	铃印	印谱	纸, 朱砂
		拓印	拓本/拓片	纸, 墨, 朱砂或其他颜料
		刷印	雕版 活字	纸, 墨, 朱砂

Long - fibred
长纤维

漢代造紙工藝流程圖

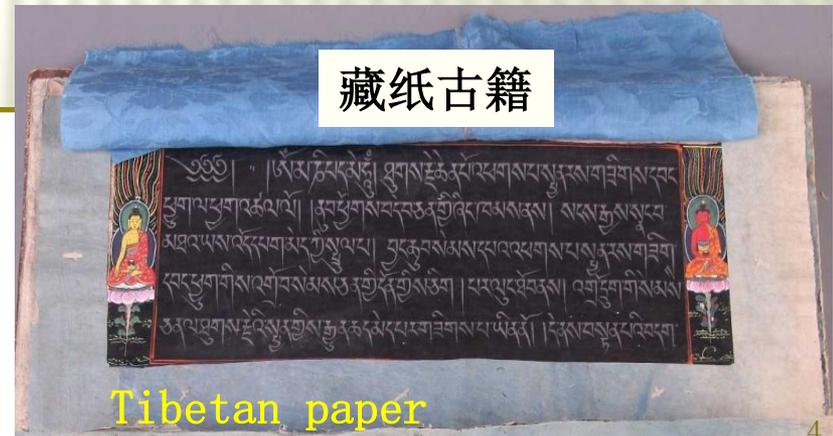


The paper was manufactured with lime water and natural alkali
石灰水与天然碱处理



Han' s paper

Alkalescence

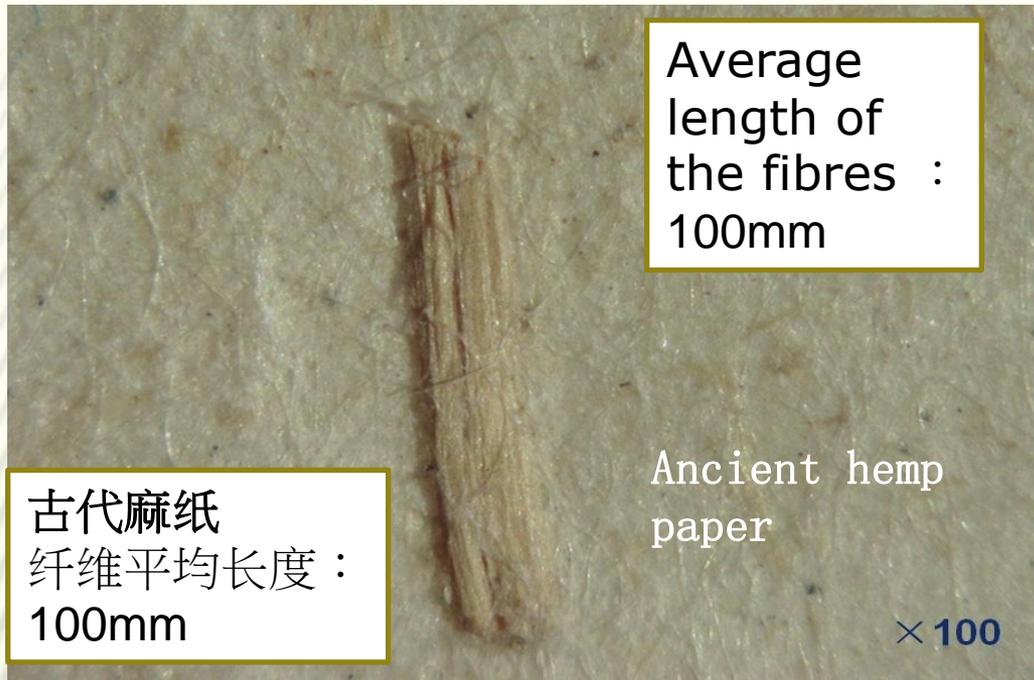


- ❌ Alkali was a common component of ancient Chinese handmade paper.
 - ❌ Different paper can be distinguished by color, thickness, flexibility and texture .
- 中国古代手工纸的共同特点：其最初都为碱性。
外观不同的是厚薄、颜色、柔韧度与纹理等

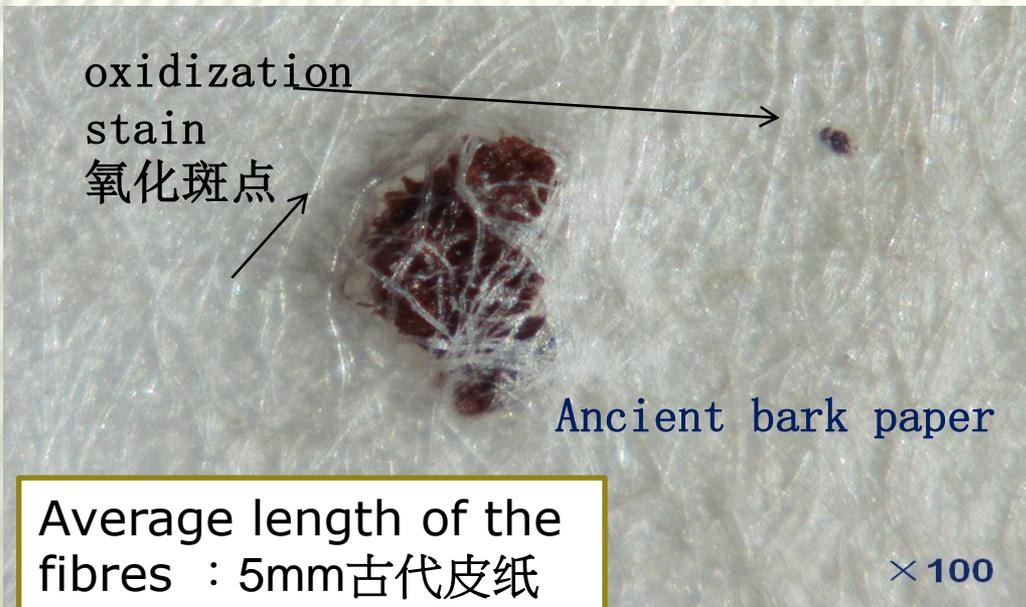
Changes in Raw Materials Used for Paper Making as Reflected in Ancient Books

古籍纸张变化历程

Time	Raw Material	Other Information		时代	原料	备注
the Western Han Dynasty (B.C.206-A.D. 24)	ramie, bark of paper mulberry	origination epoch	The ancient books before Song Dynasty were produced by ramie and bark, so the shelf life is very long	西汉 (B.C.206-A.D. 24)	苧麻、构皮	宋代以前的古籍多用麻纸与皮纸，保存寿命长久
Three Kingdoms Period (AD.220-280)	ramie, bark of paper mulberry			三国时期 (AD.220-280)	苧麻、构皮	
The Southern and Northern Dynasties (420-589 AD)	Ramie , bark of paper mulberry , bine bark	Paper is widely used to replace bamboo or silk book		南北朝(420-589 AD)	苧麻、构皮、藤皮	
Sui and Tang Dynasties (581-907 AD)	Ramie , bark of paper mulberry , bine bark , mulberry bark			隋唐时期(581-907 AD)	苧麻、大麻、构皮、藤皮、桑皮	
Song And Yuan Dynasties (960-1368 AD)	ramie, bark of paper mulberry, bine bark, mulberry bark bamboo , cotton	The ancient books after Song Dynasty were produced by bamboo paper mostly which content lignin, whose shelf life is short.		宋元时期 (960-1368 AD)	苧麻、大麻、构皮、藤皮、桑皮、 竹子 、棉	竹类木素含量高，纸张寿命短。宋代以后的古籍多用竹纸
Ming and Qing Dynasties (1368--1911 AD)	Ramie , bark of paper mulberry , bine bark , mulberry bark , sandalwood bark , haulm , straw , bamboo , cotton	Haulm, straw and bamboo used in paper making shorter (shorten) the shelf life, now the majority of which have been acidified.		明清时期 (1368--1911 AD)	苧麻、大麻、构皮、桑皮、青檀皮、 稻草 、 麦草 、 竹子 、棉	稻草、麦草、竹子，使纸张保存寿命缩短；明清时期的古籍，现在大多已经酸化。



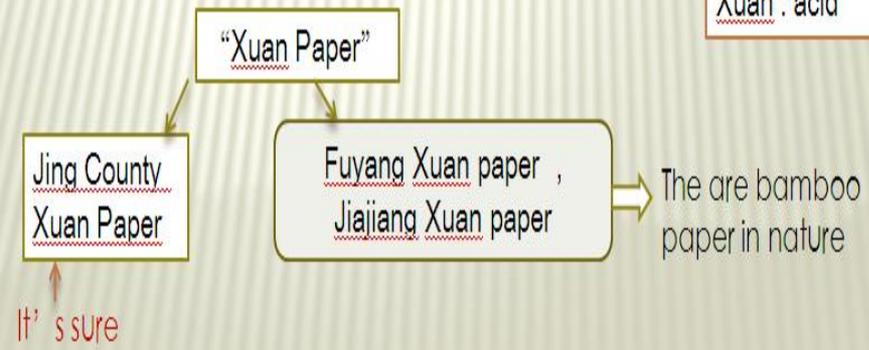
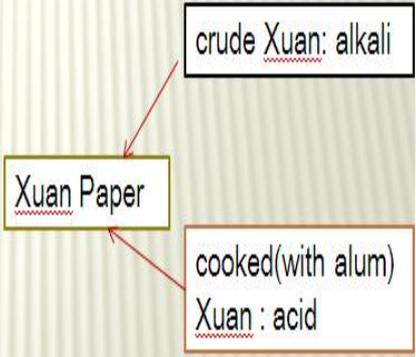
Average length of the fibres : 1.5-2.0mm
宋代竹纸纤维平均长度：1.5-2.0mm



“Dun Huang Yi Shu” made of bark paper
“敦煌遗书”使用皮纸

traditional hand making paper

Paper types	characteristic
Han Paper	Alkalescence, Light and thin, partial white, fine, soft and flexibility, longer storage time, damaged by moth easily
Tibetan paper	Thicker, mostly in khaki color, flexible, folding and wearing endurance, insect resistance, long lasting.
Naxi Dongba paper	Very thick and heavy; ivory color; strong and very flexible; wearing endurance, insect resistance, long lasting.

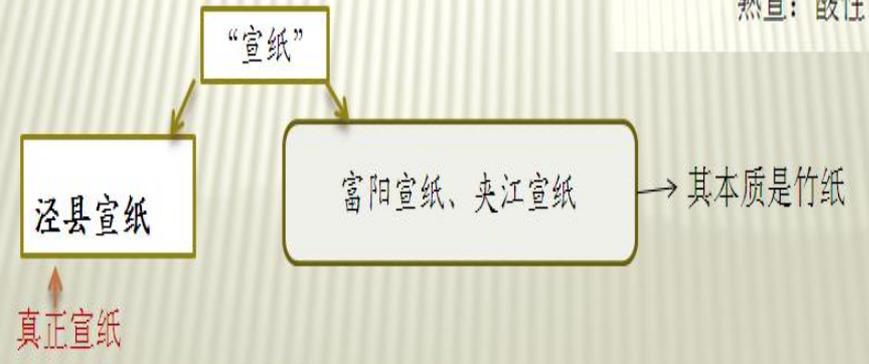
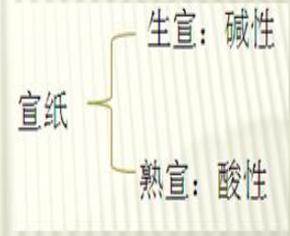


中国手工纸 (举例)

纸张	特点
汉族书写纸	碱性, 轻薄; 偏白; 细密, 绵韧; 易被虫蠹
藏纸	碱性, 较厚; 一般为土黄色, 也有其他颜色; 坚韧、耐折叠、耐磨损、不遭虫蛀, 保存时间长
纳西东巴纸	碱性, 非常厚重, 象牙色, 非常柔韧, 坚韧耐用, 耐磨损、不遭虫蛀, 保存时间长



汉民族纸张 (宣纸)



Writing Ink 书写字迹



Ancient Chinese Ink= carbon + bone glue



中国古墨= 碳 + 骨胶

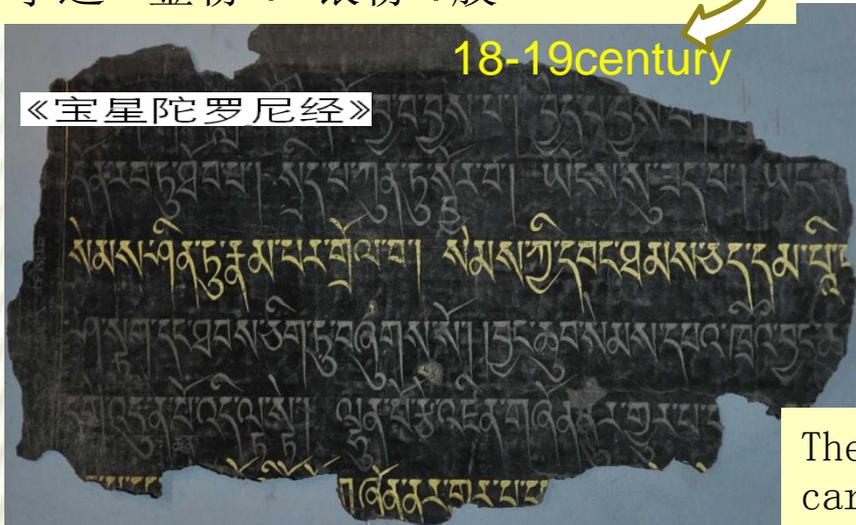


Vermilion (HgS + castor oil)
朱砂 (HgS) + 蓖麻油

清稿本《导引图》

Composed of a variety of mineral pigments
用多种矿物颜色绘制而成

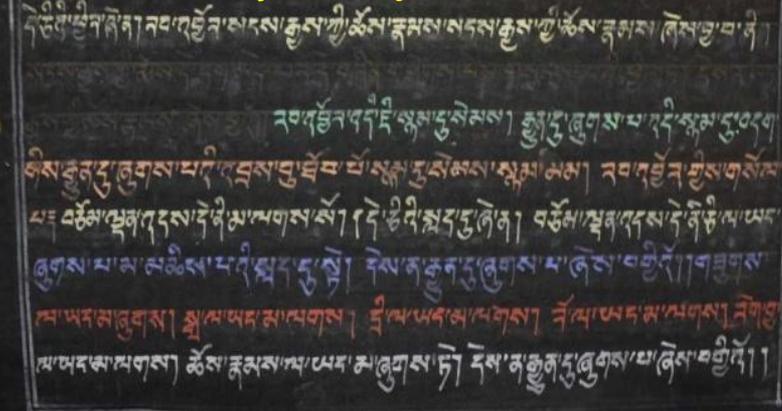
The Ink = Gold + silver + glue
 字迹= 金粉 + 银粉 + 胶



18-19th century

《宝星陀罗尼经》

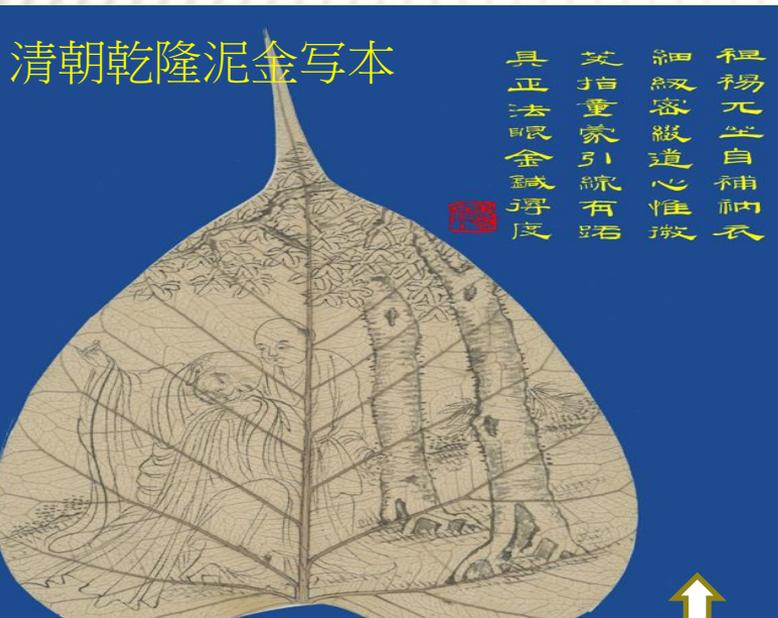
19th century, Vajracchedika-sutra



The Ink = Gold + silver + pearl+ jade + Coral+ carnelian + glue, called "babao juice"

字迹= 金粉 + 银粉 + 胶+ 珍珠+ 翡翠 + 珊瑚+ 玛瑙 + 胶, (八宝汁)

清朝乾隆泥金写本



祖 禡 元 坐 自 補 衲
 細 緜 密 綴 道 心 惟 微
 艾 指 童 蒙 引 練 有 跡
 具 正 法 眼 金 鐵 淨 度



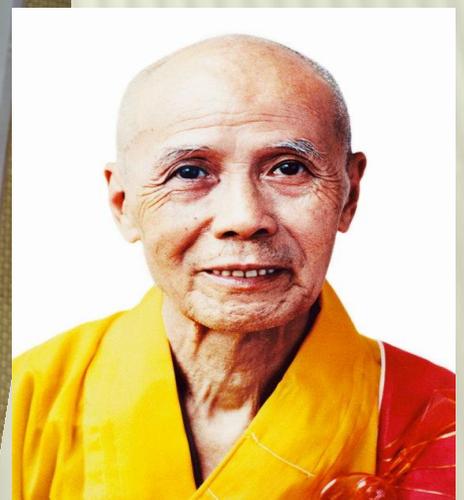
《松赞干布遗训》

The Ink = silver + glue, a Nijin manuscript
 字迹= 银粉 + 胶, 泥银绘制

Xue Jin 血经



Buddhist sutra transcribed by eminent monks, written with their blood
佛教高僧用本人鮮血写成的佛经



3. The challenges of choosing materials for the conservation of ancient books 古籍书写材料对修复的挑战

The guidelines for conservation treatment to ancient books:

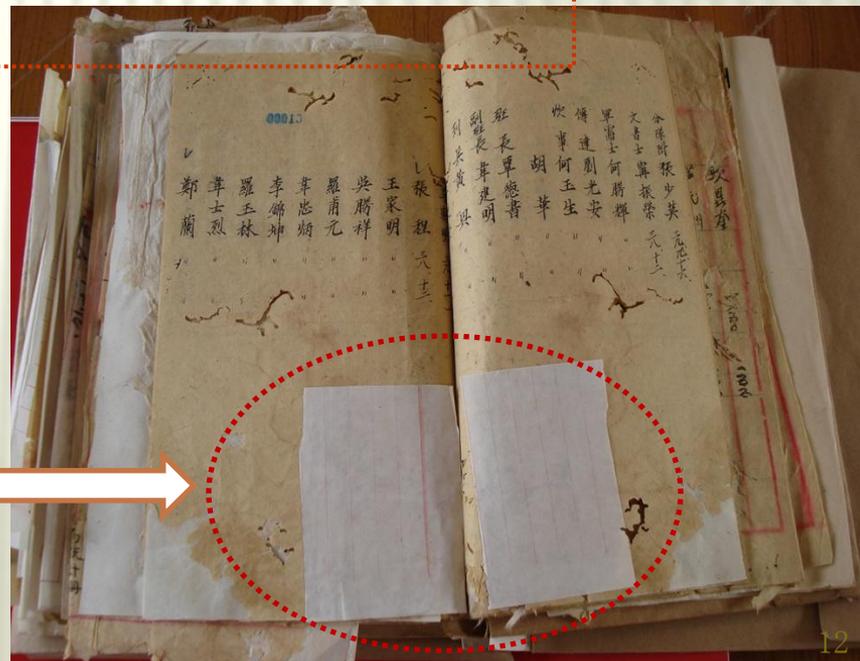
- a. The materials selected for treatment should not contain any harmful elements to the ancient books, especially those elements that may affect the color of the papers in future.
- b. Preserve the information on the original paper. Avoid any damage to the original paper as well as the content on in the original paper in the treatment.
- c. The paper (or other materials) added/used for the treatment of ancient books should be removable when necessary.
- d. The paper used in treatment should be similar in color to the original paper but should have identifiable difference in shade so that it can be differentiated from the original if needed in future.
- e. Retain the information of previous treatments if any.
- f. Minimize the treatment area if possible and minimize additional materials used for treatment if possible.
- g. Retain the original look of the book being treated if possible.

修复中国古籍需要注意以下问题:

- ① 选用的修复材料不应含有对古籍有害的成分,今后也不会使纸张变色;
- ② 保留古籍原有的文献信息。修复过程中或修复后,都不会给文字或书页带来损伤;
- ③ 在需要的时候,可以比较容易地把修复材料从古籍上取下来;
- ④ 用于修复的纸张,应和古籍原件的纸张类似,其颜色与古籍原件协调并应有一定的色差,以便今后可判断添加修复材料的位置;
- ⑤ 保存各个时代修复的历史信息;
- ⑥ 把修复的面积控制在尽可能小的范围,添加的修复材料要尽可能的少;
- ⑦ 尽可能保持古籍原貌。

The main challenges 主要的挑战

- 1) The selection of paper used for repair 修补用纸张的选择
- 2) The use of adhesive 粘合剂使用
- 3) Preservation of inks 墨迹的保护
- 4) Conservation of ancient books produced with special writing materials. 书写材料特别的古籍修复



Serious errors !

严重错误!

The first: the selection of paper used for repair 修补用纸的选择

Ancient Xuan Paper 古宣纸

×50

Ancient bark paper 古皮纸

×50

The paper used for repair must be carefully selected in order to assure the fastness, smoothness, and natural looking to the original book.

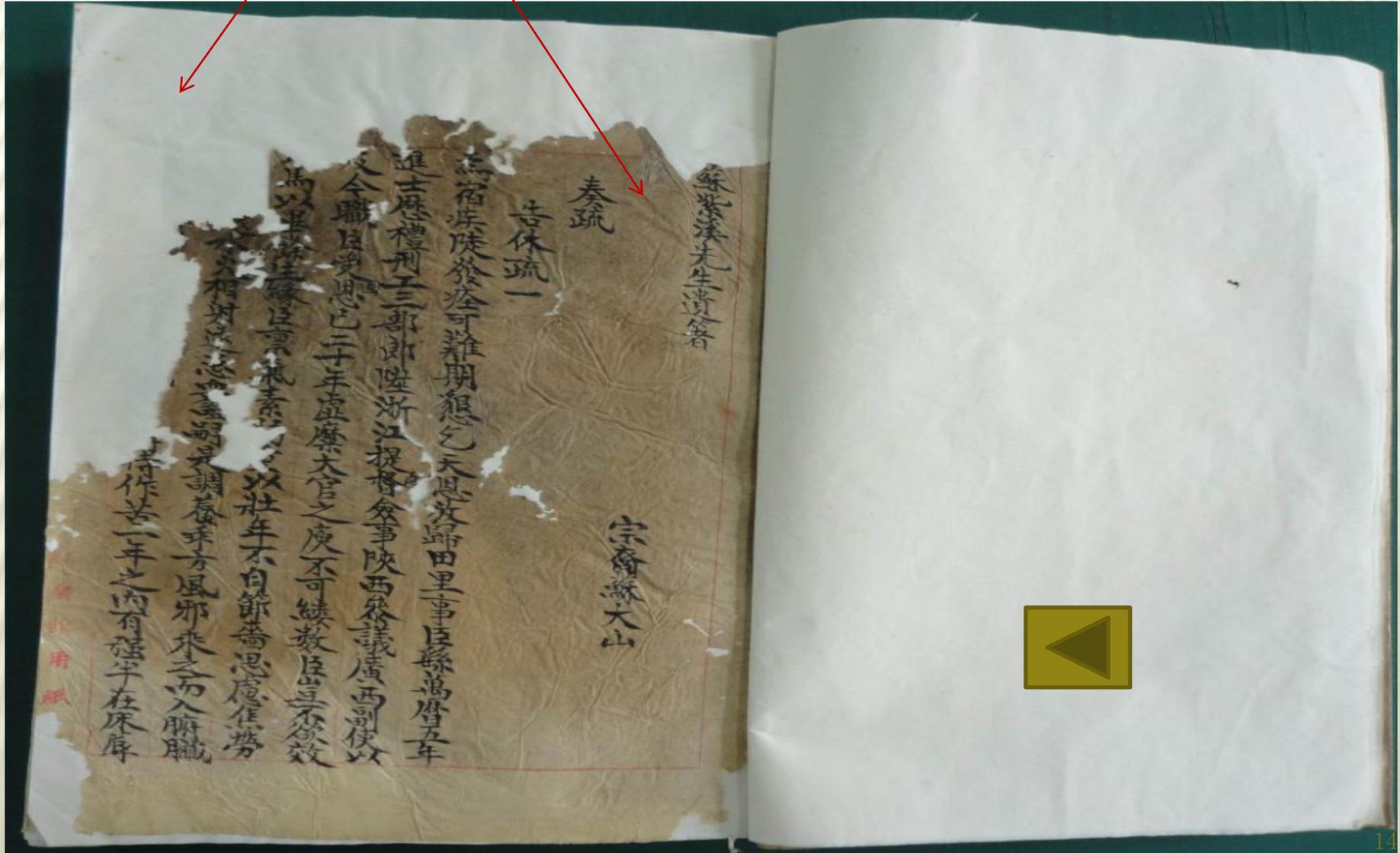
竹纸 (清代)

bamboo paper
(The qing dynasty)

White hemp paper of printed book in Song Dynasty

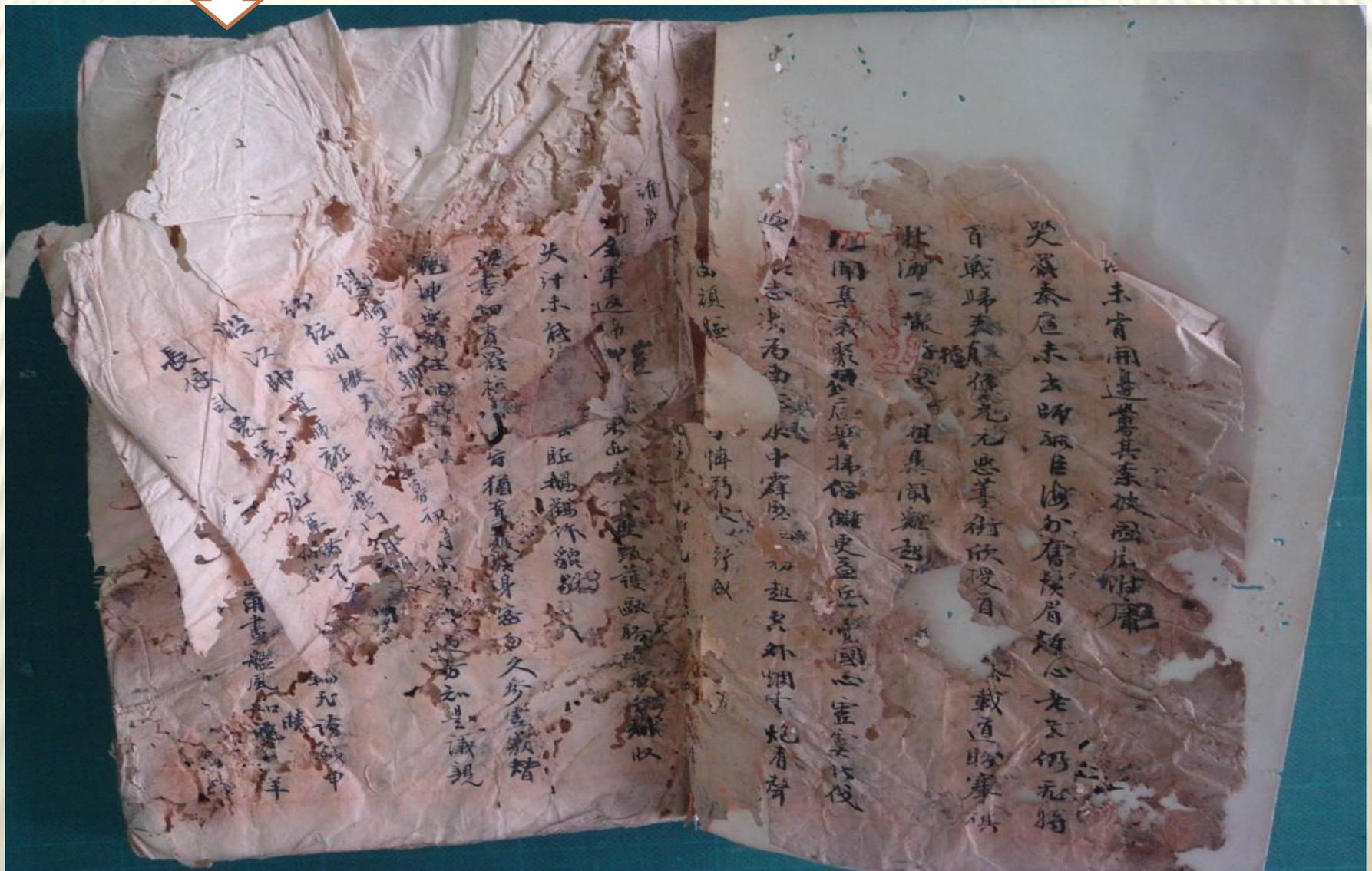
宋代印书用白麻纸

Different paper properties of
the two types of paper 两类纸张性质不同



The improper use of adhesive led the repairing pages fallen off and broken
使用胶粘剂不当，造成修复后书页脱落与破损

The second : adhesive 胶粘剂





The ingredients of the paste is wheat flour without gluten and water 浆糊并非是用小麦面粉加水就可以制成，而必须去掉面筋

Paste can be made of starch and water
浆糊也可用淀粉与水调成



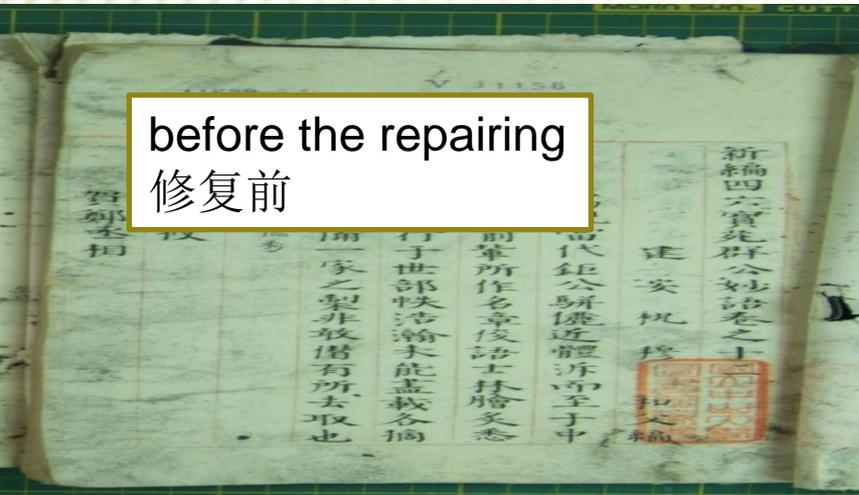
The adhesive capacity of paste is related with its thickness. In order to ensure the quality of repairing, proper paste must be prepared according to the thickness and texture of the paper. Therefore, the paper should be analyzed carefully before repairing to determine the kind of paste it may need for its repair. 浆糊的粘度大小，是与其浓度相关的。为保证修复质量，就得依据纸张的厚薄、纸性的不同调配成相宜粘度的浆糊。

thirdly : Protection of the inks 字迹保护

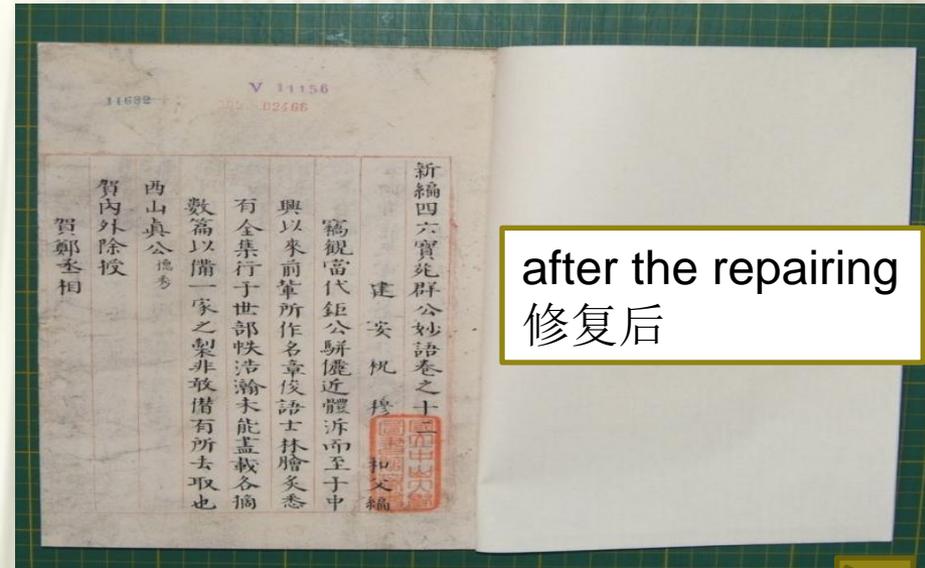


washing
book
洗书

put a piece of thick paper at the back of the repairing paper on the board, then lean the board in a basin and rinse the paper with clean water. 在摊平的书页下垫一张厚纸平置于木板上，将木板斜放在盆内，用清水冲洗



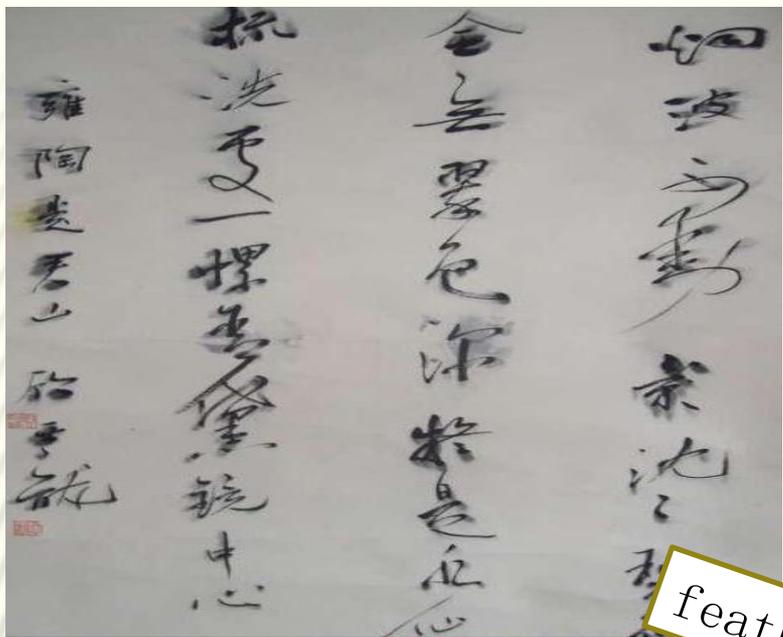
before the repairing
修复前



after the repairing
修复后

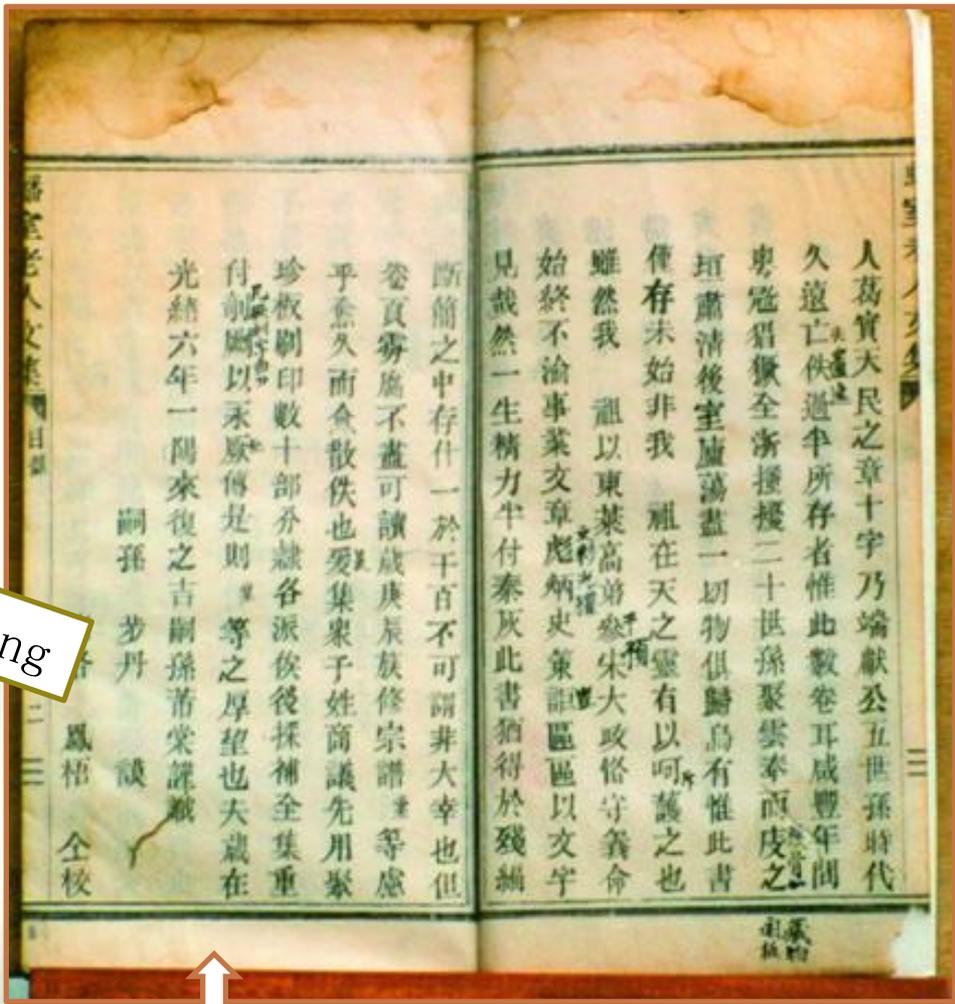
For rumpled or stained pages, washing is an effective way for conservation. After a wash, not only the rumpled papers get smoothed out, the stains removed, even the elasticity of the paper also gets recovered to some extent.

经过水清洗，书页上的污迹基本消除，纸张也平整了



字迹扩散

feathering



Transcripts in Ming Dynasty(Blue lattice)明抄本 (蓝格)



Low quality print ink will make the writings in the printed book feathering. 油墨质量不佳，也会使印刷的书出现字迹扩散。



Fourthly: Ancient books of special writing materials 特别书写材料的古籍



Thick paper with characters on both sides 厚纸，双面有文字



minority ancient books

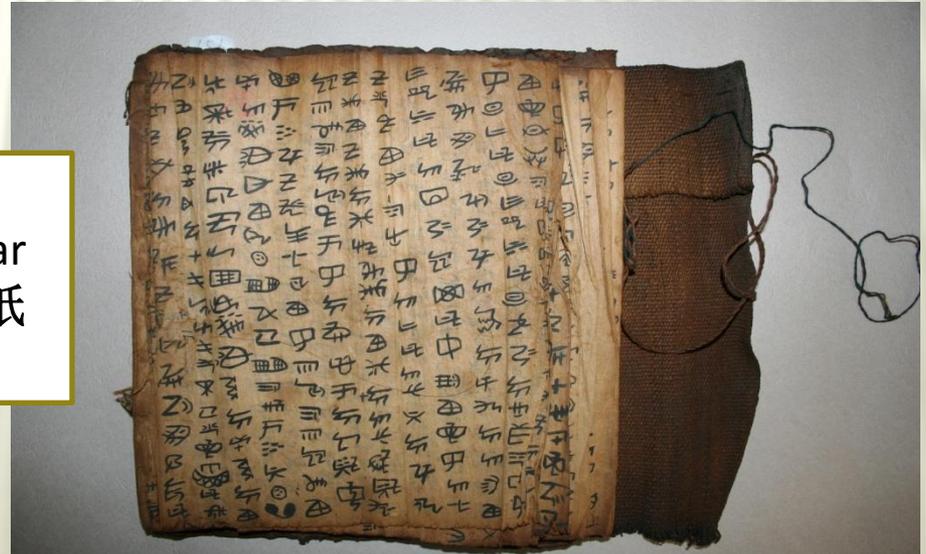
Blue Tibetan paper (thick), manuscript written with Nijin
蓝色藏纸（厚），泥金写本

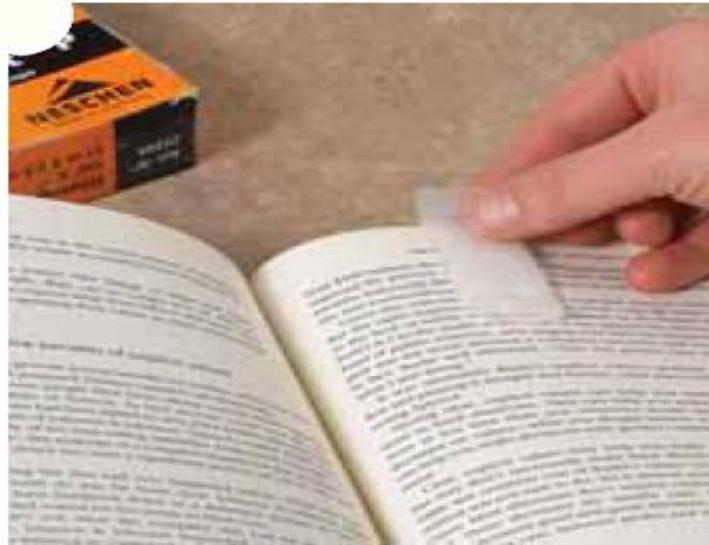
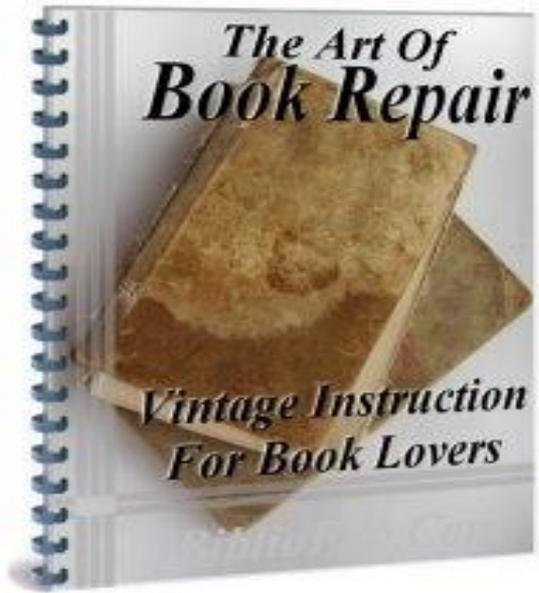


《如来起誓密咒》，Ming Dynasty

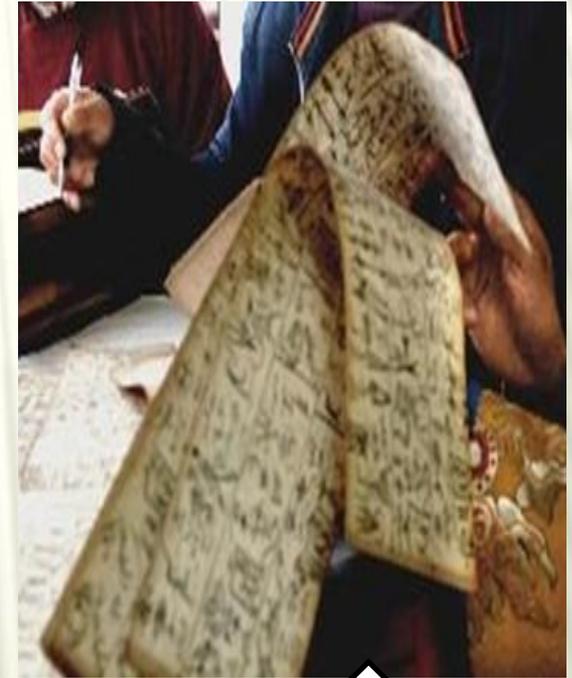
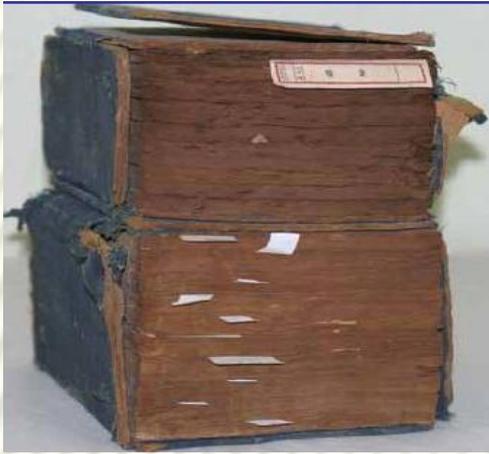


Special binding and layout and particular paper 特殊装帧与纸张





4 The Acidification and De-acidification of Ancient Books 古籍的酸化与脱酸



Dongba Paper changed to yellow but not brittle
东巴经发黄但未脆化



drying and rebinding
the books 干燥与重
新装订成册

Traditional deacidification
with water (warm alkali water)
传统的水洗脱酸 (热碱水)

大规模非水脱酸迫在眉睫

in urgent need of mass non-
aqueous deacidification

We expect: 我们的期望

1. To collect more information on non-aqueous de-acidification equipment to treat different types of Chinese ancient books, and
2. Some small sized de-acidification equipment that can be used in deacidifying a whole book thoroughly, which is non aqueous. The prices should be affordable for local libraries.

1. 希望更多的得到海外脱酸设备对中国各类古籍处理的相关信息;
2. 整本书的小型脱酸设备, 非水型, 价格可为地方图书馆承受。



There is a great need for a convenient and affordable device that could measure the pH value on a given paper quickly without leaving a mark on the paper being tested.

真希望有一种可以快速测量酸值而不在纸上留下痕迹的便携式工具。若价格便宜, 相信在中国也是会有市场。

Thank you!

