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Dluwang, a Javanese/ Madurese tapa from the paper- mulberry tree. Writing material from Indonesia

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Dluwang is mainly known as a writing material from Java and Madura. Islamic manuscripts especially are written on this material. Unfortunately many of the manuscripts are in bad shape, they seem whet the appetite of insects and not seldom are severely affected by all kinds of moulds. Many experts on Javanese language and literature wonder what dluwang is. Is it just another name for paper; is it made of manioc and the same as *kertas telo*; is it a beaten treebark generally known as 'tapa'? At the instigation of the TCZOA, Leiden the research project *Dluwang, Culturo-Historical Aspects and Material Characteristics* was set up in order to answer these questions and to contribute to future conservation. The final report of the one-year study was submitted to the Dutch Secretary of Education and Science, who subsidized the project, in May, 1995.

The first aim of the study was to identify the raw material and other materials involved by means of botanical and chemical analysis. These results should then lead to a material characteristic. Secondly it was hoped to reconstruct the production process by studying primary and secondary sources, for which a three month field research was planned. At the same time it was necessary to sketch in the historical background.

The literature leaves no doubt that dluwang is a beaten treebark (tapa). To identify the plant material 16 reference sections were excised from four plants and compared with 25 dluwang samples from Dutch and Indonesian collections, ranging in time from 1875 till today. As the most probable possibility the Rijksherbarium, Leiden, identified the plant as the *Broussonetia papyrifera Vent.*, popularly known as the paper-mulberry tree. This plant is very well known as a raw material for paper-making and tapa production throughout East and Southeast Asia, and Polynesia. The *Broussonetia* is not a plant endemic to in Indonesia but originated in South China and probably found its way to Java via Taiwan, the Philippines, the Moluccas, and Sulawesi.

The Dluwang material

To arrive at a characterization of the dluwang material two methods of separation were tested. The Central Research Laboratory for Objects of Art and Science, Amsterdam, experimented with a method called Thin-Layer Chromatography (TLC). This method is meant to obtain a quick and clear answer regarding the properties of the sample. It had never been tested on bast materials before. In the case of the TLC for separation of natural resins the results were disappointing, but the TLC for

separation of colours was successful. It can be said, observing all due caution, that this method allows us to distinguish dluwang from tapas made of other plant materials. At the laboratory of the Conservation Department of the Royal Library, The Hague, dluwang was tested using the separation method of Iso Electro focusing (IEF). This method separates proteins and amino acids, and again had never been tested earlier on bast materials. The tests showed that dluwang can be distinguished from the bast of the *Artocarpus* and the *Gnetum* families. However, no distinction could be made between the dluwang samples and the bast of the *Ficus* family. It did make a distinction between the dluwang and the *Ficus* samples, but one that could not be explained. Further research on bast materials using IEF is needed to clarify this point.

Uses for tapa

Tapa is known to occur almost everywhere in the tropics. The main use of barkcloth is for clothing, ranging from plain loin-cloths to beautiful decorated jackets. As barkcloth was replaced by woven cloth its function was relegated more and more to ceremonials and rituals. Only in Java and in Central-America has tapa ever been used as writing material. The earliest proof of tapa production is the find of a stone tapa beater in Taiwan dated 4300 BC. Similar prehistoric proof has been found in Java. One tapa beater was found near Bogor, West Java, and another near Pakauman, East Java, both dating back to the Neolithic Era. Whether this tapa was made from the paper-mulberry tree or not, we do not know. In Old Javanese literature we find ample proof of tapa being used for clothing in Java. Dluwang is mentioned three times in the *Ramayana*, providing written evidence as far back as the 9th century. It is also mentioned in three texts from the time of the court of Kediri, 12th century: *Sumanasantaka*; the *Bhoma Kawya*; and the *Rama Wijaya*. From these and seven other Old Javanese texts we can conclude that in the pre-Islamic era clothes made from dluwang were worn by priests, especially ascetics. Moreover, these men of religion had the right to plant the necessary raw material and had the right to levy taxes on the trade in the final product. This is corroborated in a few Malay texts. In 1646 a Dutch travel journal refers to a people moving from East Java to West Java and clothed in '...white paper made from the bast of trees...' Finally dluwang was reported as a material used for clothing in 1817 and in World War II some Javanese, for want of better, resorted to barkcloth for clothing.

In public Javanese manuscript collections, an average of 8% consists of manuscripts written on dluwang, for the large Dutch collection the percentage is only 2.6%. Dluwang was also used for some of the Malay and Madurese manuscripts. The oldest known manuscript on dluwang is a Javanese Islamic text from the end of the 16th century, the so-called 'Boek van Bonang'. The first Javanese Islamic works in the 16th century were written on palm-leaf. Soon the scribes were looking for other material as the palm-leaves were unsuitable for the typical Islamic bookform: the codex. Palm-leaf will break easily when folded, besides which the Arabic script is not easily engraved on the leaves. As all paper had to be imported, and thus was extremely expensive, the scribes had to resort to other material. Familiar with dluwang as an

artistic material and the fact that it had been used for a long time in a sacred sphere, probably led to the employment of dluwang as a substitute for palm-leaf. From the 18th century, when the import of Dutch paper rose, the Javanese royal courts started using paper in their scriptoria more often.

Dluwang was also used in other areas, one of them being the use as the material on which to depict the episodes of the *wayang beber*. At least from the late 17th century, but probably much earlier, these Indonesian scrolls have been painted on dluwang. Another example is the recourse to Javanese tapa as a bookbinding material. Simple booklets were bound in plain dluwang wrappers. When bound in leather the endpapers were sometimes made of tapa. Surprisingly the boards were also built up of thin stripes of dluwang, inscribed or blank. This phenomenon is known in Western codicology as *membra disjecta*, meaning parts of discarded vellum. These pieces can be left-overs but sometimes they originate from cut-up older manuscripts. Following Western codicology we can name the above phenomenon *liber disjecta*. The above applications can be found in manuscripts written on paper as well as on dluwang. At the beginning of the colonial era, dluwang was utilized by Dutch authorities who were faced with a big shortage of paper. The material was employed as wrapping paper and made into folders. Local authorities were still using these folders until 1960.

Dluwang production

By the end of last century it became clear to some scientists that the production of dluwang was on the verge of disappearance. They started to collect the bronze beaters and other tools. The interest of the colonial government grew when they heard of a fabulous Japanese paper made of the same raw material as that from which dluwang was made. As the export cost appeared to be too high, they dropped the idea of any further development. At the turn of this century the only production centres left were Tunggilis, *kecamatan* Garut, and Tegalsari, *kecamatan* Ponorogo. Under the Ethical Policy a final revival of governmental interest was noticeable. Some departments tried to arouse the interest of publishers and artists in the mother country. Although some Dutch books were bound in dluwang, the efforts were soon banished to oblivion. After World War II only one family in Tunggilis, near Garut, was still engaged in making dluwang. When the father of the family died in 1965 his wife took over till her death in 1980. Their sons earn a living by other means but still know how to make the material. At the end of 1994 they showed me how to make dluwang. Between 1968-1975 the Indonesian government experimented with afforestation and reforestation of the *Broussonetia* in order to set up a large-scale paper factory. The experiments in itself did not fail, but the economic possibilities were not promising enough so the project was stopped. In East Java three qualities of dluwang are distinguished, on Madura and in the rest of Java only two. The finest quality is used for the better manuscripts and letter writing; the medium quality for writing paper, simple books, account books, *wayang beber* and bookbinding material; the rough quality for wrapping paper, kites, wrappers and folders. For the best quality

the youngest branches are selected The bast will be fermented for as long as two weeks and finally both sides of the beaten bast are sanded with different leaves and polished extensively with a cowrie shell. For the medium sort the fermentation time is much shorter and only one side is sanded and polished. The other side is already more or less smooth because it has been pressed on a banana trunk to dry. The rough quality does not need much attention, the bast is not fermented and polished at all and usually it is ready within less than half an hour. While on Madura the sanding in first instance is done with a bamboo or rattan beater, on Java this is done with a carved piece of coconut shell. This shell leaves peculiar marks on the finished product, which can help us to identify the origin of the tapa. Local differences are also established in the kind of leaves and beans that are used in sanding and polishing. To lengthen the beaten bast two pieces are put together with an overlap of one centimetre. The overlap is beaten till one big piece is formed. This process can be repeated indefinitely. Often dluwang has been called treebark paper or Ponorogo paper. But the material is in fact not a paper. The raw material is not beaten to a pulp and there is no question of a mould dipped in fibrous water to form a felt sheet of paper. The best term is 'beaten treebark' or tapa. In certain instances dluwang has been called *kertas telo*, erroneously supposed to have been made of manioc. Analysis of samples of this material showed it is made of the paper-mulberry tree and no difference with dluwang could be detected. Today kertas telo indicates for imported cotton-rag paper from the Chinese province Kwang-si. Finally dluwang can be defined as a beaten treebark (tapa) of the paper- mulberry tree (*Broussonetia papyrifera* Vent.) from Java or Madura.

I hope this research will help to clarify some of the uncertainties about the indigenous native writing materials of Java. Maybe it will contribute to a better understanding of the history of Javanese literature.