THE DEVELOPMENT OF SAWAH CULTIVATION IN ANCIENT JAVA

by

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In memory of my father
William Albert Betts
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# TABLE OF CONTENTS

Acknowledgements vii
List of abbreviations vi
Introduction vii

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>SAWAH CULTIVATION IN ANCIENT JAVA</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The antiquity of sawah cultivation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hazards of sawah cultivation in ancient Java</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Principles of irrigation used in ancient Java</td>
<td>24</td>
</tr>
<tr>
<td>TWO</td>
<td>SAWAH CULTIVATION UNDER THE RAMAS</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Village organization</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Village bureaucracy</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Land and water rights</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>The Balinese sākaha subak</td>
<td>67</td>
</tr>
<tr>
<td>THREE</td>
<td>SAWAH CULTIVATION UNDER THE INDIANIZED RAKAS</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>The adoption of Indian principles of kingship</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>The Indianized raka</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>The structure of the Indianized kingdom</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>The bond between the village and the kraton</td>
<td>98</td>
</tr>
<tr>
<td>FOUR</td>
<td>RELIGIOUS ASPECTS OF AGRARIAN LIFE IN ANCIENT JAVA</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Rice-growing ceremonies</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Religious festivals of the agricultural year</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Land grant ceremonies</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>The religious significance of cock-fighting</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>Temples and bathing sanctuaries</td>
<td>136</td>
</tr>
<tr>
<td>FIVE</td>
<td>RAKRYAN MANGIBIL'S INSCRIPTION</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>Women in Old Javanese agrarian society</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>Who was Rakryan Mangibil?</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>The Bakalan (Wulig) inscription</td>
<td>150</td>
</tr>
<tr>
<td>Sketch</td>
<td></td>
<td>172</td>
</tr>
<tr>
<td>Conclusions</td>
<td></td>
<td>173</td>
</tr>
<tr>
<td>Selected Works Consulted</td>
<td></td>
<td>177</td>
</tr>
<tr>
<td>Glossary</td>
<td></td>
<td>191</td>
</tr>
</tbody>
</table>
LIST OF ABBREVIATIONS

BKI  Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indië uitgegeven door het Koninklijk Instituut voor Taal-, Land- en Volkenkunde

BEFEO  Bulletin de l'École française d'Extrême-Orient

De Casparis I  Casparis, J.G. de, Inscripties uit de Cailendra-tijd. Prasasti dari zaman Cailendra, Bandung, 1950

De Casparis II  Casparis, J.G. de, Selected Inscriptions from the 7th to the 9th Century A.D., Bandung, 1956

Feestbundel  Feestbundel uitgegeven door Koninklijk Bataviaasch Genootschap van Kunsten en Wetenschappen bij gelegenheid van zijn 150-jarig bestaan

MKAW-L  Mededeelingen van het Koninklijk Nederlandsch Akademie van Wetenschappen, afdeeling Letterkunde

MNZG  Mededeelingen vanwege het Nederlandsch Zendinggenootschap

OJO  Krom, N.J. (ed.), Oud-Javaansche oorkonden: Nagelaten transcripties van wijlen Dr J.L.A. Brandes, VGB, LX, 1913

OV  Oudheidkundig verslag, Oudheidkundige Dienst in Nederlandsch-Indië

Publ. Oudh. Dienst  Oudheidkundige Dienst in Nederlandsch-Indië, Publicaties

TAG  Tijdschrift van het Nederlandsch Aardrijkskundig Genootschap

TBG  Tijdschrift voor Indische Taal-, Land- en Volkenkunde uitgegeven door het Bataviaasch Genootschap van Kunsten en Wetenschappen

VGB  Verhandelingen van Koninklijk Bataviaasch Genootschap van Kunsten en Wetenschappen
NOTE ON SPELLING

As this thesis includes material which applies to the present as well as to ancient Java difficulties arise in the use of a spelling system. Many geographical names, and some anthropological terms used herein, are still current today. Therefore, to conform to present day usage, where these occur the Indonesian and in certain cases the Modern Javanese spelling system is used. Where the work concerns material which is drawn from Old Javanese sources, an appropriate spelling system is used. The most frequent variations are:

Old Javanese e = Modern Indonesian é

ζ = s

δ = d

a = o in some positions
Apart from the fact that there was no active part taken by the Netherlands Government in agrarian matters in Bali, even after direct government was introduced after 1880, the Balinese sawah farmers' success appears to stem mainly from their efficient independently-organized irrigation associations known as sekaha subaks. These guild-like co-operations of sawah farmers who share the same water supply have existed for many centuries in Bali, but nowhere else in Indonesia's wet-rice areas does there appear to be a similar organization, although one operates in Northern Luzon and another in Madagascar. Writers of the previous century and early years of the present one were surprised to find no traces of an indigenous system of irrigation management in Java to compare with the Balinese subaks, but nevertheless considered it likely that a type of subak system had once existed in Java.

Van Eck and Liefrinck\(^2\) considered the possibility of a Javanese origin for the Balinese subak associations in the kingdom of Majapahit, arguing from their assumption that Balinese law-books came from Majapahit and on the fact that the Balinese collections of adat and subak regulations were in Old Javanese. However, this theory must now be revised, since there is evidence for the existence of subak associations in Bali as early as the eleventh century A.D., during the reign of Airlangga's parents. There is yet earlier evidence of advanced hydraulic management in a ninth-century inscription which refers to tunnel-building.

Included in the collections of Balinese adat (customary law) are kerta sima desa and kerta sima subak, i.e. village laws and subak regulations. As part of sacred archives, usually kept in the kraton, these kerta simas were preserved in the community concerned although in 1876 five from major agrarian centres were discovered which were subsequently translated and published. If similar collections of rules and regulations exist in private collections in Java, they have not been discovered. Since the same factors necessitating constant recopying operate in Java as in Bali, one may perhaps assume that it is unlikely that much has been preserved which would throw light on rural organization in ancient Java. The Balinese kerta sima subaks were written on lontar leaves and therefore did not last for any length of time before becoming illegible or disintegrated, due to the ravages of insects and the humidity. They have therefore been copied by countless generations of scribes but, unfortunately, only the date of re-writing the charter is recorded in this process, not the date of the original issue. Thus, the actual age of subak laws and regulations is unknown. Most of them, in Liefrinck's opinion, originated in remote times but additions and amendments were made by subsequent rulers. As these regulations concerning irrigation farming may indeed date from a remote period, they help to throw light on the type of irrigation management which may have existed in ancient Java.

The aim of the present work is to investigate various aspects of the development of sawah cultivation in ancient Java, mainly through the only primary sources available: the inscriptions issued by the rulers of Central and East Java, with the intention of seeking evidence, however provisional at this stage of present-day knowledge.
of Old Javanese epigraphical material, of the nature and extent of irrigation systems in this period.

Much information lies hidden within the inscriptions of the Indo-Javanese period, information which could help fill the gaps in our knowledge of the social, economic and administrative life of Java and Bali during the period of Indianization. As so many of these inscriptions concern land transactions for various purposes, such as the acquisition of agricultural land for the upkeep of sanctuaries, or the granting of tax exemption to certain villages in return for specific services, some insight into village administration and organization, taxation systems, the legal aspect of land tenure and so on, could be gained from them.

Unfortunately, by far the greater part of Indonesian epigraphical material has yet to be transcribed, translated and published. Until this formidable task has been accomplished the wealth of information many of these inscriptions contain will lie beyond the reach of students unable to read Sanskrit, Old Javanese or Old Balinese. Gaps in our knowledge of ancient Javanese and Balinese history and culture, and doubts concerning the correct interpretation of certain passages of old records, must remain for the time being, mainly due to a lack of epigraphists in this particular field. According to Damais'  

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3 See Buchari 'Epigraphy' in Soedjatmoko (ed.) in An Introduction to Indonesian Historiography, 1965, 48-73, concerning Indonesian epigraphy. Buchari reports that several thousand inscriptions still await detailed study (p.48).
list of inscriptions of Java, Bali, Sumatra and Madura, of the total of 290 listed, only eighty-one complete transcriptions and translations with commentaries have been published, 134 have been published in transcription only, and seventy-five have not been published at all.

Although still useful as a basis for further study of Old Javanese epigraphical material, the 125 collected transcriptions of Old Javanese inscriptions by Brandes, and the thirty transcriptions by Cohen Stuart contain errors and omissions. Neither volume contains translations, nor do they provide commentaries, index or glossary. They have now been replaced to a great extent by two volumes published recently by Sarkar, containing 112 transcriptions and eighty-seven translations, with notes and glossaries, of Old Javanese inscriptions dating from around the fifth century to the early tenth century A.D. Besides Sarkar's work there are the two volumes by de Casparis, containing transcriptions and translations, with very detailed notes


6 A.B. Cohen Stuart, Kawi Oorkonden in Facsimile, met Inleiding en Transcriptie, 1875.


and commentaries, of eighteen inscriptions from Central Java, and Stutterheim's valuable contribution to this field of study. 9 Old Balinese epigraphy has been studied by Goris 10 and van Stein Callenfels. 11 Transcriptions, in some cases with translations, of single Old Javanese inscriptions have been published by Krom, van Naerssen, Bosch, Poerbatjaraka and others, but these are scattered through Dutch academic journals. 12 Some Old Javanese charters are included in Pigeaud's work 13 concerning the Nāgarakṛtāgama, and in van Naerssen's doctoral thesis. 14 Although all these works are of great value they represent a comparatively small percentage of the total and even concerning these Buchari warns that:

9  Stutterheim's works include, besides his Inscripties van Nederlandsche-Indië, I, 1940 (unavailable to the present author), a large number of translations of Old Javanese inscriptions with notes and commentaries. For further information concerning Stutterheim's work see J.G. de Casparis, 'Historical Writing on Indonesia (Early Period), in D.G.E. Hall (ed), Historians of South-East Asia, 19 , 138-41.


11  P.V. van Stein Callenfels, Epigraphica Balica, VGB LXVI, 3, 1926.

12  Appearing mainly in TBG and BKI. Details of each inscription known at the time of publication are given in Damais' 'Liste', together with author and whereabouts of transcriptions and translations, if any.


14  F.H. van Naerssen, Oudjavaansche Oorkonden in Duitsche en Deensche Verzamelingen, 1941, and other works.
...with the advancement of our knowledge of old languages, existing translations and transcriptions will have to be continually revised. Correspondingly, all conclusions derived from these translations will have to be re-examined.  

Royal edicts were mostly engraved on stone, generally in oblong form with a shaped base and top which was sometimes crowned with a lotus. Several early inscriptions were incised on rock and some on statues. More detailed inscriptions were engraved on both the front and the back, and sometimes the sides, of larger upright stones and on copper-plates. These stone and copper-plate inscriptions, tangible evidence of the royal spoken word, were revered as sacred objects.

The earliest Javanese inscriptions, written in Sanskrit, are undated but considered to belong to the fifth century A.D.; the Canggal inscription of 732 A.D. from Central Java is the earliest dated inscription. The earliest known example of the Old Javanese, or Kawi, script appears on the Dinaya stone of 760 A.D. from East Java, although the language used is still Sanskrit. Also from East Java

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15 Buchari, 'Epigraphy', 50.
16 See Chapter Four below. Copper-plate inscriptions were kept within families as sacred heirlooms. Of inscriptions belonging to the first half of the Indo-Javanese period so far found and published the majority are on stone. Sarkar's volumes include thirty-five stone and twenty-two copper-plate charters issued before 900 A.D. and eighteen stone and thirty-two copper-plate charters issued between 900 A.D. and 928 A.D.
17 Issued by the Central Javanese ruler Sañjaya.
18 OJO I. Issuing from the earliest known kingdom in East Java, Kañjuruhlan.
comes the earliest inscription using both Old Javanese script and Old Javanese language, the Hariñjing A inscription, which is also the oldest recording of an irrigation project, established in 784 A.D. The last stone edict written in Old Javanese was issued in 1486 A.D., at the close of the Indo-Javanese period. During the millenium in which Old Javanese epigraphy flourished, from the fifth to the fifteenth century, four dual language inscriptions have been issued, two major charters and two shorter ones. Attention is drawn to these inscriptions for the fact that the first part of each, the part which refers to the ruler and to the deities, is written in Sanskrit whereas the second part, concerning rural matters at village level, is expressed in Old Javanese; both the Sanskrit and the Old Javanese parts, concerning the court and the village respectively, use purely Indonesian personal and place-names.

The language used in Old Javanese inscriptions is terse to the point of understatement. Sarkar remarks that the engravers of Old Javanese charters did not 'indulge in flamboyant and exaggerated eulogy of many ancient Indian inscriptions. Here the problem is not one of exaggeration

19 According to van Stein Callenfels' dating. Damais gives the date as 804 A.D. ('Liste', 25).
20 Damais, 'Liste', 46, 80-81 (inscription No.210).
21 Karangtengah of 824 A.D.; Šivagĕrha stone of 856 A.D.; Pereng of 862 A.D.; 'Calcutta Stone' of 1041A.D. See Damais' 'Liste'.
but of excessive abbreviation.' It is this economy of detail which gives rise to difficulties in translating the text, especially where titles, personal names and place-names may be confused. To add to the translator's problems are the many obscure Old Javanese terms found in the lengthy lists of both court and village officials. Familiarity with literary Old Javanese does not always provide an answer to the many problems of interpretation, as the language of inscriptions differs from that used in literature. Terms for agricultural measurements, land tax and rural administration do not occur in kakawins!

The existence of copies, made either around the time the original charter was issued or some centuries later, has contributed to the problems which beset the epigraphist, especially when endeavouring to place material in chronological order. Confusion arose in the past when scholars mistook copies for original inscriptions. Brandes was the first to discover that some inscriptions he had been studying were actually copies of older edicts. The purpose of copying previously issued inscriptions may have been to fulfil a desire for continuity and permanence or to establish


23 Brandes realized that an inscription of 840 A.D., which he included in his edition of the Pararaton was a copy. See N.J. Krom, Hindoe-Javaansche geschiedenis, 1931, 4.
a definite link with former dynasties in order to provide a usurper with a 'legitimate' genealogy. A notable number of copies of earlier edicts were made during the Majapahit period which may reflect a certain instability and unease within the kingdom. There are examples of copies of edicts, made by later rulers or high court dignitaries, to lend weight to their claim over land, or to proclaim the ruler's benevolence. In respect to Balinese copies Goris found that generally the copy of an original inscription was followed by a second edict or additional information, with the word punah or muwah, (in addition to) added. Sarkar remarks on cases where some copper-plate inscriptions had been copied onto stone with tinulad (copied) added below, but this was more an exception than the rule, leading to errors in dating.

Old Javanese inscriptions, with few exceptions, adhered to a certain formula during the centuries in which they were issued. Generally, they began with a record of the precise year and day of issue, followed by the full title of the ruler or high dignitary issuing the decree. The royal order was then transmitted to high-ranking officials through whose hands it would pass down to the person, religious body or secular guild in whose favour the grant was to be made. The reason, sambhanda, for issuing the decree was given, followed by usually detailed provisions for exempting the freehold from taxes, and for their protection from trespassers. The often extensive list of persons

25 Sarkar, I, xii.
forbidden to trespass on the freehold land provides us with many terms for ranks and occupations within the ancient Javanese rural administration, but unfortunately the meaning of many of these words remains obscure.\(^26\)

The foundation ceremony, confirming a royal grant, is recorded in detail in many inscriptions and throws some light on the indigenous religious beliefs as distinct from the adopted elements of Indian ritual and attributes of Hindu deities. Participants in ceremonial proceedings, including both court and rural secular and religious officials, are listed. Their titles of rank are, with very few exceptions, purely Old Javanese. Traditional ceremonial gifts, of special cloth presumably for ceremonial wear, and measures of gold or silver, presented to the various officials taking part, are carefully enumerated. The commemoration ritual, performed to sanctify the inscription stone or copper-plate in order to endow it with mystical power, is described in some detail in the more elaborate inscriptions.\(^27\)

Ninety percent of Old Javanese inscriptions concern the investiture of land grants, made for the purpose of erecting sanctuaries or funerary temples thereon, and the granting of sawah fields assigned for the upkeep of the freehold domain concerned. Only a few inscriptions refer specifically to irrigation projects such as dam construction

\(^{26}\) Long lists of the various officials forbidden to enter the freehold estates are found in inscriptions as early as the Kuti charter of 840 A.D. and continue to the end of the Indo-Javanese period.

\(^{27}\) See Chapter Four below for the ritual connected with land grant ceremonies.
or the excavation of canals to carry irrigation water. 28 A number of charters issued in the second half of the Indo-Javanese period contain regulations for water distribution and the dues to be paid for the use of irrigation water supplies. 29 A few inscriptions are jayapattras, legal documents recording for all time the judgement of a dispute, usually over agricultural land, and the names of the party in whose favour the case is settled. There are very few jayapattras inscribed on stone or copper-plate; they were probably committed to lontar leaves only.

The majority of land grants were made in favour of religious bodies although freehold land was also assigned to individual loyal subjects and certain guilds by a ruler who desired to reward faithful service. Generally, the establishing of a freehold, a sima, was the ruler's prerogative, but there are recorded instances of land grants having been made by high court dignitaries who apparently possessed sufficient authority to dispose of land to favoured persons. Apart from the Bakalan inscription two other inscriptions, recording land grants for sawah cultivation, were issued by a ruler's consort, the earliest one issued by the chief queen of the ruling monarch in 884 A.D. and the second issued by a secondary queen in 1015 A.D. 30

28 With the exception of the fifth century Tugu inscription which records the diversion of a river, the earliest records of irrigation installations have issued from East Java. Early charters from Central Java, however, refer to sawah cultivation and reflect a well-established centre of wet-rice farming.

29 See van Naerssen, 46, Inscription No.III and Brandes, OJQ, XCIV-V, for example.

30 Brandes, OJQ XVII, and van Naerssen, Inscription No.VII.
Inscriptions recording land grants usually contain exact details of the 'marking out', or surveying, of the land, in which the boundaries are designated either by landmarks such as hills, rivers or mountains, or by lineal measurements together with a record of place-names of the bordering village territory. Names of the representatives or 'witnesses' to the actual measuring of the fields, elders of the surrounding villages who were present at the ceremony to verify the legality of the land transaction, are recorded; also the place where the engraved stone recording these details was erected and consecrated, or the copper-plate deposited, as the case may have been. The act of consecrating the stone or copper-plate recording the sima, gift of land, and the details of the transfer, made the deed legal and binding for all time and was a valid 'document' for the recipient family for generations to come. Because a magico-religious relationship has always existed between the Indonesian people and the land on which they lived, worked and died, the changing status or ownership of any land was regarded as highly significant by all inhabitants of the immediate neighbourhood. 31

The information contained in many Old Javanese inscriptions concerning newly-established sawah lands, such as border delineations and instructions on the distribution and payment of irrigation water, may give some idea of

31 Mallinckrodt refers to the close attachment the farmers felt for their land. (J. Mallinkrodt, 'Grond en Waterrecht in de afdeeling Boetoek', Het Koloniaal Tijdschrift, No.1, 15 January 1924, 66. See also Peter Suzuki, The Religious System and Culture of Nias.)
when the districts concerned were opened up. For example, the Trailokyapuri charters of 1486 A.D.\(^{32}\) give detailed border limits from which it can be seen how the population of East Java must have increased and the number of villages multiplied. Nearly all of the listed villages supplying witnesses are in the immediate neighbourhood of the freehold religious domain, according to Maclaine Pont over a distance of only thirteen kilometres. Five and a half centuries earlier, during Sinđok's reign, an entire district area had been scarcely sufficient to provide the number of witnesses required to attend the consecration ceremony connected with a land transfer.\(^{33}\)

Indonesian land and water rights are very complex, even in comparatively modern times and in earlier periods the picture is not made any clearer by the lack of source material. There are only the epigraphical records and the \textit{Nāgarakārtāgama} in which to search for any reference which may throw some light on the subject. The \textit{Nāgarakārtāgama} contains a mine of information concerning rural life in the fourteenth century in East Java which can be applied to a certain extent to the periods prior to the fourteenth century: this work as well as the Balinese kėrta sīma subaks have been drawn upon, supplemented by reports of customs

\(\text{Brandes, }\text{OJO, }\text{XCIV-V.}\)

\(\text{H. Maclaine Pont, 'Eenige Oudheidkundige Gegevens Omtrent de Middeleeuwschen bevloeingstoestand van de zoon- genaamde 'woeste gronden van Trik'. }\)

\textit{Oudheidkundig Verslag}, 1926, 103, and \textit{P.V. van Stein Callenfels, 'Bijdrage tot de Topographie van Oost Java in de Middeleeuwen, II', Oudheidkundig Verslag, Bijlage E, 82f.}
applying to the present times but which may have persisted from ancient times. Apart from van Vollenhoven's work on the subject of adat, which covers all facets of Indonesian customary law, including rights of inheritance and the right of possession and disposal of land, there are the reports and writings of Dutch colonial civil servants who worked in Indonesia. These works are to be found in various journals published in the Netherlands. The only work concerning Indonesian adat to appear in English translation to date is the useful work of ter Haar. Some statements by various colonial officials appear to be in contradiction, possibly because the writers reported on conditions as they appeared to them, which may not always have been a complete or objective view, or a correct interpretation of the evidence. Certain misunderstandings are reflected in some of these sources and they should therefore be used with caution. These works have been consulted for their wealth of information on Javanese and Balinese adat and methods of agriculture and village administration of recent times, which provides a background for the elucidation of material gleaned from Old Javanese and Balinese inscriptions.

The inscriptions used are those available either in transcription only or in Dutch and English translation. Quotations from inscriptions, unless otherwise stated, have been taken from Sarkar's volumes and are Sarkar's translations.

34 C. van Vollenhoven, Het adatrecht van Nederlandsch Indië, I, 1931.

Of the small number of inscriptions dealing specifically with irrigation works in ancient Java, a revised transcription and translation of the Bakalan decree, issued in 934 A.D. by a ruler's consort, Rakryan Mangibil of East Java, is presented herein, as an early example of epigraphical evidence for the existence of irrigation management in a particular region. The inscription is not a long or an elaborate one, but rather one of understatement; yet even with its economy of words it reflects within its framework not only a picture of a prosperous agrarian district and a Rakryan's provision for her peoples' well-being but also of clusters of villages headed by rāmas, experienced in the ways of village government, and of the anak thāni, the farmers, tilling their own fields of rich, wet soil. This inscription has been translated only once, by Kromodjojo Adi Negoro (into Dutch and New Javanese) but not all Kromodjojo Adi Negoro's readings have been followed in this thesis. A transcription made by the present author is included for classification: Brandes' transcription appears to contain some errors.

36 The inscriptions Harijing A of 784 A.D., transcribed and translated by P.V. van Stein Callenfels, 'De Inscriptie van Sukabumi', MKAW-L, LXXVIII, 1934, 116-17, 120f; Kēlagyan, (OJO, LXI) transcribed into New Javanese and translated into New Javanese and Dutch by Kromodjojo Adi Negoro, Oud-Javaansche Oorkonden, III, 1923; translated into Bahasa Indonesia by Sutjipto Wirjosuparto, Apa sebabnya Kediri dan daerah sekitarnya tampil kemuka dalam sedjarah, 1958, 75-9; Kandangan (Kusmala) of c.1350 A.D. transcribed and translated by P.V. van Stein Callenfels, 'De inscriptie van Kandangan', TBG, LVIII, 1919, 339.

37 Kromodjojo Adi Negoro, Oud-Javaansche Oorkonden op steen uit het afdeeling Modjokerto, 1923(?). Damais does not record this work in his 'Liste'. 
To interpret ancient inscriptions a conscious effort must be made to bridge the gap between modern man and the anak thāni who faced the trials of pioneer rice cultivation and their descendants who continued to till the soil of their forefathers. It is through inscriptions, engraved records of a ruler's spoken word, that glimpses can be seen of another level of society, the rural community of ancient Java.
CHAPTER ONE

SAWAH CULTIVATION IN ANCIENT JAVA

THE ANTIQUITY OF SAWAH CULTIVATION IN JAVA

Wet-rice cultivation in Southeast Asia is of acknowledged antiquity but its place of origin, whether, for instance, it may have been in Yunnan\(^1\) or in Northwest Thailand,\(^2\) is a subject of debate among scholars at the present time. There are also diverging opinions concerning the question of when wet-rice farming was introduced to island Southeast Asia, or even whether it evolved as a matter of course independently in certain regions within the island world and subsequently spread further eastwards. Spencer, for example, considers that wet-rice cultivation was transmitted at a very early date to the islands of Southeast Asia, for example northern Luzon, western Sumatra, Java and the southern part of Suluwesi, as well as offshoots to Ceylon (Sri Lanka) and Madagascar.\(^3\)

Fisher states that in Southeast Asia during the Neolithic period there already existed a culture not inferior to that of India - a culture with a matrilinear

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social structure, pile houses, highly developed seamanship - and irrigated rice cultivation.⁴ Lekkerkerker, although he concedes that dry-rice cultivation was probably brought to Indonesia from the mainland at a very early point in time, considers that wet-rice cultivation was discovered independently in Java.⁵ Sutjipto Wirjosuparto advances the theory that bearers of the Dong Song culture, arriving from the mainland of Southeast Asia during the centuries just prior to the Christian era, made their way slowly along the Brantas valley, probably reaching as far as Kediri, where they settled down to dry-rice farming, a practice they had brought with them from their homeland, but that year after year the periodic flooding of the Kali Brantas would have ruined much of these crops, until by trial and error, the farmers learnt to contend with the situation by building small dams and levies.⁶ Perhaps thus, by the dictates of nature, the long history of sawah cultivation in this part of East Java began.

Groslier considers that irrigation techniques used in Indo-China were introduced from India and were India's 'most important gift to Indo-China'.⁷ Certainly it

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⁵ See C. Lekkerkerker, Land en Volk van Java, 1928, 258-9.
⁶ R.M. Sutjipto Wirjosuparto, Apa sebabnya Kediri dan daerah sekitarnya tampil kemuka dalam sedjarah, 1958, 86.
is considered by many scholars that the Indians introduced more advanced forms of irrigation management; for example an Indian-type hydraulic system operated in Cambodia. Schrieke remarks that the Indians probably brought certain improvements for irrigation and methods of fertilizing, and he mentions the introduction of the water-wheel and the sickle, but Lekkerkerker points out that in Java there was no water-wheel and the irrigation system of India was never used there. Fisher also maintains that although all the main rice growing areas of Southeast Asia acquired basic methods of irrigation management from India, Java was the exception. Pigeaud writes that the laying out of sawahs and the regulation of water supplies by dams, canals and so on date from Java's primeval civilization before Indian influence. Archaeological evidence in the form of tool finds might give a more precise indication of the period when wet rice cultivation began; the tools concerned are the pacul and the ani ani. Finds of stone adzes such as the pacul indicate that wet-rice farming was practised at a very early period in Java. Sutjipto Wirjosuparto draws attention to the discovery of

8 Groslier, Angkor et le Cambodge au XVIe siècle d'après les sources portugaises et espagnoles, 1958, 107-12.

9 B.J.O. Schrieke, 'Eenige Opmerkingen over ontleening in de Cultuur-ontwikkeling', Djawa, VI, 2, 1927, 93.

10 Lekkerkerker, 'Verbetering en vermeerdering van cultuurgrond op Java', De Indische Gids, LI, 1, 1929, 536.

11 C.A. Fisher, South-East Asia, 1965, 75.

paculs over a wide area in Java which, as the pacul is obviously not an implement for ladang use, bears witness to the practice of sawah cultivation in Java as early as the Neolithic period. Recent finds from New Guinea, as well as contemporary practice there, suggest that many farm implements may have been of wood, and therefore not likely to show up in archaeological excavations.

The name Yawadwpa, used by Indian writers suggests that they saw much grain growing there in the second century A.D. The Canggal inscription, written in Sanskrit in 732 A.D. records that 'There is a great island called Yava, abundantly supplied with rice-grains and other seeds and rich in gold-mines....' Veth considers the use of the word yawa, in Dyak yawae, in Batak yaba urê, (urê having the same meaning as Javanese awut grain) is proof that rice was cultivated in Java before the coming of the Indians and by the time they were visiting the island.


in quantities large enough to attract their comment, which might indicate the double cropping which sawah cultivation allows. Veth endeavours to prove his theory by linguistics and ethnology; he notes that the Filipinos from the interior, who never had contact with Indians and had no plough, were sawah cultivators.

Wheatley, in his monograph concerning agricultural terracing, gives an interesting account of a form of irrigation used in ancient times in Indo-China which appears to have parallels with that practised in some parts of ancient Java and for that reason a passage from Wheatley's work is included. He writes:

...there is indisputable evidence of a local terracing tradition of a very distinctive kind. It occurs in association with numerous villages on the Gio-Linh uplands in Quang-Tri province, .... It comprises discrete series of stone-embanked terraces for both farming and ritual purposes, each series being combined with one or more tanks and an irrigation system. The significant point is that each of these systems - and they are rather numerous - was designed as a complete regional scheme. Although the units involved, whether terrace, basin or flume, were of simple construction, they were combined into a complex series in such a way as to facilitate the management of an entire socio-economic unit,

16 P.J. Veth, Java, 1, 20.

namely the territory and persons constituting a group of families or even a whole village. A representative system would include, at decreasing elevations, the following elements: (i) one or more dry-field terraces constructed at the highest point of the village territory; (ii) an upper tank serving as a reservoir for the collection of water from stream or spring; (iii) a lower tank to serve domestic needs of the village or family, particularly washing and bathing; (iv) and one or more fairly extensive wet-field terraces. Below the upper tank water is led from level to level by a series of flumes and channels, the whole system being the expression of a preconceived and carefully executed plan. 18

Wheatley goes on to point out that each complex was so integrated as to suggest that 'it did not develop piecemeal'. Bridges, causeways and staircases were found, and 'cult objects such as menhirs, stone seats, earthen pyramids and circular mounds sited at various points within the system.' There are analogous systems of terracing among the Angami Nagas, in North Cahar, Nias, and in Java and Bali, Wheatley adds. 19 Wheatley has been quoted at length because it may be that similar irrigation complexes in Java await the archaeologist.

The earliest centres of sawah cultivation in Java developed steadily over a long period of time towards the formation of small centres of growing influence, certain of which became more powerful as time went on. These small irrigation centres did not arise with the coming of Indian


19 Wheatley, 139.
influence, although they had their most glorious blooming during the middle period of the Indo-Javanese era. As van Leur writes:

The pattern of the states as they came to the fore in the Hindu-Javanese period - a central royal authority with a sacral significance and a patrimonial bureaucracy, based on a population strictly domesticated, in the villages and carrying on sawah farming on the plains; a political and social life determined by the harvest and a taxation system of crop tithes in kind - can only have arisen in a formative process of ages and ages and can only be viewed as the outgrowth of the Indonesian civilization of the new stone age and bronze age. It is technologically impossible for any colonization by Hindus, whether of traders or Brahmans, to have been able to accomplish anything in this field in the short period their presence there is proved by documents. The complex of governmental technique and sacral organization can only have arisen slowly on an indigenous Indonesian basis.

According to Adams the growth of irrigation societies follows two stages which he considers as: 1) the Formative to the Florescent, from the beginnings of irrigation and sedentary farming to a rapid growth wherein the surplus is largely in the hands of a priestly hierarchy, with consequent building of monumental religious structures in urban centres and the beginnings of warfare; 2) the Dynastic, with a separation and institutionalising of

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20 J.C. van Leur, *Indonesian Trade and Society* (2nd ed.), 1967, 256-7. Van Leur refers to Krom's opinion concerning Purnavarman's inscription of the fifth century and the fact that it mirrors a level of civilization which could not have developed during the twenty-two years of Purnavarman's reign but which must be conceived in terms of decades and centuries. (Van Leur, 255-6.)
secular-political and religious-economic controls in true urban centres. Collier divides the development of irrigation societies into four categories as: 1) Early Formative, a period where some form of irrigation existed; 2) Late Formative, a period of expanding irrigation systems; 3) Regional Florescence, full exploitation of the technology which was developing in the formative period, with intensive agriculture based on elaborate irrigation systems and an increasing importance of the warrior class; and 4) Empire, with land controlled by the state, taxation in the form of labour on state agricultural lands and on public works, as well as service in the army, personal service to the ruler and the nobility. The surpluses of the state are used to support the state religion, the government hierarchy, the army and the nobility, and for redistribution to the commoners.

The earliest centres of wet-rice cultivation in Java would certainly have been on a small scale, consistent with Adams' and Collier's theory of development. The nuclear village settlements, administered by a head and a council of elders, would, over a long period of time, have developed into irrigation centres administered by a central authority. As revealed in early inscriptions


these centres, with outlying rural branches managed by
court officials, flourished in Central and in East Java.
The early village administration would have organized
the construction of small dams, made of bamboo and branches,
across streams, and simple embankments around natural
depressions, which would have served as tanks for village
use. This simple hydraulic technology developed and
progressed to the large-scale irrigation complexes of
dams, reservoirs, bridges and canals which must have
existed at least by the time of the Çailendras of Central
Java and contemporary kingdoms in East Java, and certainly
by the reign of Balitung. Even if irrigation technology
originally developed independently of India, Indian
principles of kingship and administration undoubtedly gave
impetus to the further development of larger irrigation
centres, at a time when Java was ready to pass to the
florescent stage of development, if we adhere to Adams'
and Collier's theories. The ultimate development of
irrigation organization in Java took place in East Java
in the thirteenth century with the bringing under control
of the forest lands of Trik, which became the great
kingdom of Majapahit.

Wolters, recalling the finding of a Buddha image
dating from the fifth or sixth century at Jember in East
Java, says that:

In assessing the likelihood of thriving
settlements in eastern Java at least as old as
the first reference to P'o-li in the fifth
century, [in the Chinese annuals] one must
not forget the Brantas and Bengawan Solo
rivers, whose valleys probably developed a
wet-rice culture in very early times....
Nothing is in fact more likely than the
existence of an eastern Javanese principality
in the fifth, sixth, and early seventh centuries,
worthy of a visit by Ch'ang Chün, and capable of sending envoys to China.\textsuperscript{23}

The earliest recorded knowledge of systematic irrigation in East Java is found in the Hariñjing inscription of 784 A.D.,\textsuperscript{24} recording the building of a dam and the excavation of a conduit to connect the Kali Hariñjing to the larger Kali Konto north-east of Kediri. Van Stein Callenfels remarks that Brandes was incorrect when he presumed that in the Middle Ages only Central Java was developed to any extent and was familiar with Indian culture, and that East Java was little more than a wilderness, when in fact some forty-five years before the oldest dated inscription of Central Java there already existed an important irrigation work in East Java.\textsuperscript{25} The cultural development of East Java at that time is reflected in another inscription, the Dinayâ stone dating from 760 A.D.,\textsuperscript{26} which provides evidence of a kingdom well established by the eighth century. The region to the south-east of old Majapahit, where the Pikatan, Kromong and Landéan Rivers flow down from the Anjasmorô Ranges, was apparently an established rice-growing area by the beginning of the tenth century, as indicated in Mpu Sinđok's Çrawana\textsuperscript{27}


\textsuperscript{24} The Hariñjing A inscription (P.V. van Stein Callenfels, 'De inscriptie van Sukabumi', \textit{MKAW-L}, 1934, 116).

\textsuperscript{25} Van Stein Callenfels, 125.

\textsuperscript{26} Sarkar, I, 25-9.

\textsuperscript{27} Krom, J.N. (ed.), 'Oud-Javaansche oorkonden: Nagelaten transcripties van wijlen Dr. J.L.A. Brandes', \textit{VGB}, LX, 1913
inscription and the Bakalan inscription issued by Rakryan Mangibil.\textsuperscript{28}

THE HAZARDS OF SAWAH CULTIVATION IN ANCIENT JAVA

The environment in which early man struggled to establish sawah cultivation in East Java was governed by a harsh and unrelenting nature in the shape of the great turbulent Kali Brantas and its tributaries and restless volcanic mountains, particularly the Kelud. Judging by ancient records of dam building and irrigation control, as well as the archaeological remains of some of those hydraulic works still to be seen, the sawah farmers succeeded in overcoming great odds to gain a foothold in areas which were to become prosperous regions of sawah cultivation during the Indo-Javanese period.

As van Naerssen points out, the Kali Brantas and the Kelud volcano have over the centuries brought both prosperity and tragedy to East Java; prosperity in the form of rich volcanic soils suited to sawah cultivation, and tragedy in the form of periodic floods which create havoc in cultivated areas.\textsuperscript{29} These giants of nature, the Brantas and the Kelud, undoubtedly played a significant role in the development of agriculture in East Java from the earliest stages of sawah cultivation onwards.

\textsuperscript{28} The Bakalan inscription of 934 A.D. See Chapter Five below for a transcription and translation of this inscription.

\textsuperscript{29} F.H. van Naerssen, 'De Brantas en haar waterwerken in den Hindu-Javaanschen tijd', De Ingenieur, 7, 1938, A65.
The enormous amount of material ejected by the Kelud at every violent eruption directly affected the Kali Brantas, and still does.  

The Pararaton records nine Kelud eruptions in the space of less than 200 years, between the years 1311 and 1481 A.D. Historically, the most interesting of these eruptions occurred in 1334, an event which coincided with Hayam Wuruk's birth. Fortunately for historians the Pararaton record confirms an event which, had there only been the Nāgarakṛtāgama's reference to it, may have been treated as merely a literary myth. In the Nāgarakṛtāgama, canto 1, stanza 4. reads:

1. In the Shaka-year seasons-arrows-sun (1256 = 1334 A.D.), it is said, at his birth, the Prince has been inaugurated already as Prabhu,
2. as a porphyrogenetos Protector in Kahuripan; the tokens of His being superhuman, wonderful, were:
3. an earthquake, the earth rumbled, rain of ashes, thunder, flashes of lightning turning about in the sky,
4. the mountain Kampud collapsed, annihilated were the bad people, the rascals, dead without gasp.

Purbo Hadiwidjojo and I. Surjo report that during the last two eruptions in 1951 and 1966, an estimated amount of 282 million centimetres of material has been produced which, they say, will affect the hydrologic equilibrium, of the Kali Brantas. (M.M. Purbo Hadiwidjojo and I. Surjo, Volcanic Activity and its Implications on Surface Drainage: the case of the Kelut volcano as an example, July 1968, 2.)

Identified with the Kelud volcano.

Th. Pigeaud, Java in the 14th Century, III, 1960, 4. Maclaine Pont refers to an earthquake which apparently occurred about this time, affecting the Majapahit inland harbour of Canggu. (Maclaine Pont, 'Aantekeningen bij het artikel van Dr. van Stein Callenfels: "Bijdragen tot de Topographie van Oost-Java in de Middeleeuwen"', OV, 1926, 91.)
Prapanca's account of the supernatural omens surrounding his royal master's birth, even though composed for a different reason, still gives us some indication of the magnitude of the fearful, and historical, event of the Kelud eruption. Prapanca turned the Kelud catastrophe to Hayam Wuruk's advantage by interpreting it as a supernatural event, signifying that Girinātha, Lord of the Mountain, was incarnate in the infant prince, who thus was destined to attain the throne and rid the world of evil.

The Pararaton identifies the 1334 A.D. eruption as bañu pindah. According to Pigeaud, bañu pindah, moving water, is an apt description of the streams of hot water and lava that apparently flowed down from the Kelud crater lake, inundating and devastating the countryside, a phenomenon of so many Kelud eruptions in historic times. Van Hinloopen Labberton, on the other hand, maintains that bañu pindah signified a change in the course of the Kali Brantas caused by the Kelud eruption, a change due to blockage caused by volcanic material, deflecting the river westwards. Archaeological evidence points to fairly dramatic changes in the Brantas course during the latter part of the Indo-Javanese period, a phenomenon discussed below.

Besides the Kali Brantas and the Kelud volcano the part played by the Arjuno volcanic group and the Kali

33 The Pararaton, 28, line 16, reference by Pigeaud, IV, 8.
34 See D. van Hinloopen Labberton, 'Oud-Javaansche gegevens omtrent de vulkanologie van Java', Djawa, I, 3, 1921, 197.
Pikatan and her tributaries in shaping the course of economic and cultural history in East Java should not be overlooked. It is possible that the region around the Pikatan, Kromong and Landéan Rivers was already an area of sawah cultivation as early as the oldest known irrigated regions around Kédiri and Malang. Maclaine Pont, reporting on his field study of ancient irrigation systems in this part of East Java, emphasises the significance of the region south of ancient Majapahit, i.e. in the valleys of the Pikatan and the Kromong Rivers. This area will be further discussed below.

The Arjuno and at least two of her five craters were apparently active in very remote times and have since become dormant or extinct. There are no records of Arjuno eruptions and one can assume that with her Widadaren and Penanggungan craters she was dormant by the temple-building period of the Indo-Javanese era, as all three peaks have temple ruins on their high slopes or summits. Previous volcanic activity in the Arjuno, on a gigantic scale, must have forced a magma passage through to the Welirang, the youngest crater northwest of the mother volcano. This outlet in the Welirang was probably active during the Indo-Javanese period, possibly with dire results to settlements along the Pikatan, Kromong and Landéan Rivers. The long Anjasmoro Range runs westward from the Arjuna along the southwest slopes of the Welirang, the foothills reaching to the outer region of the old Majapahit kingdom. It is down from the Welirang slopes and along the Anjasmoro foothills that the Pikatan, Kromong and Landéan Rivers
run their course.

The question arises, to what extent was ancient Java affected by volcanic activity. In both Central and East Java the course of history must have been greatly affected by periodic volcanic eruptions. Old Javanese records, and geological evidence point to the occurrence of eruptions on a gigantic scale during the Indo-Javanese period. Archaeological evidence reveals that until the eighteenth century the Borobudur, Prambanan and Séwu temples were buried under volcanic ash deposits and apparently more than once the Mendut terrain has been submerged under mud and sand-flows moving southwards from Gunung Merapi. The entire lower levels of Candi Prambanan were found to be under the present ground level at the time of excavation and some three metres of volcanic ash had to be removed from the site of Candi Mendut in order to reach the old temple forecourt.

36 In Java there are 112 volcanoes, some active, others dormant. Since 1600 A.D. alone there have been nineteen known violent eruptions, bringing devastation to agricultural areas.

37 The Nāgarakṛtāgama and the Pararaton. It is possible that the inscriptions OJO LXI (Kēlagyan) and OJO LXII (Calcutta Stone) refer to the results of volcanic action.

38 See van Hinloopen Labberton, 192. The removal of the seat of government from Central Java to East Java in the tenth century as a result of volcanic activity need not be an untenable theory. Frequent volcanic eruptions must have taken their toll on the economy in ancient Java, as they have in more recent times. The 1462 and 1481 Kelud eruptions may have contributed to economic weakness in a declining Majapahit.
Volcanoes: There are several kinds of volcanoes. Some erupt once then become extinct, some erupt violently over a long interval of time, such as Krakatoa, causing enormous damage. Others, like the Kelud, erupt at regular and frequent intervals. A volcano is not necessarily a mountain but material ejected usually forms one; all the volcanic mountains in Java have been built up in this way, by 'explosion' layers of sand, stone and ash, and by 'effusion' layers of lava. These mountains are known as stratigraphic volcanoes. The material ejected during a volcanic eruption consists of hot gases in the form of steam, sulphur compounds and carbon dioxide, liquids in the form of water and molten rock (lava) and solids in the form of lava fragments which consolidate either before ejection or during their flight through the air. These fragments include frothy lava (pumice) and rounded masses of lava known as 'bombs', together with ash or very fine particles of molten lava which is blown into the air, to settle over the land sometimes hundreds of kilometres from the actual eruption.

Lava may vary in composition, being either acid or basic. The basic lava of the Javanese volcanoes is more fluid than the acid lava of Sumatran volcanoes which renders soil unfit for rice cultivation. Because of its mobility the lava flows quickly and spreads out evenly, depending on the amount ejected and the terrain over which it flows.

Krakatoa lay dormant for 200 years, then exploded in 1883 with such violence that two-thirds of the island were blown away. Ash remained in the atmosphere for several years, causing brilliant sunsets around the world.
These lava flows, consisting of scoriae, lapilli and ash etc., are known in Java as ladu. Such lava flows may have a temperature of 400 degrees Celsius on the surface, although lava may reach an interior temperature of 900 degrees Celsius. Often, large volumes of water flow with the ladu, either from the rainfall or from a crater lake, forming a muddy material known as lahar, mud flow. There are two kinds of lahar, a primary or eruption flow, which originates from volcanic eruption breaking through a crater lake, and a secondary or rain lahar, formed by rainwater falling on the slopes of the volcano and mixing with the ladu material. Primary lahars are hot but secondary ones may be either hot or cold. Heat may be preserved within the hot lahars for months or even years, depending on the thickness of the deposit. 

Both ladu and lahar streams flow quickly in search of any depression or river bed in the vicinity of the volcano. Sometimes a lava stream will fill an upper ravine and flow on to another on its downward journey. Because of the high density of the lahar stream it flows with increasing speed through the lava material, becoming a hot lahar through mingling with the hot masses of the ladu as it nears the lower mountain slopes. Both primary and secondary lahars are treacherous, causing extensive damage as they flow, and because of their high density and high

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40 Measured during the Gunung Agung eruption in 1963. The temperature of the Gunung Agung lahars after one year was as high as 70 degrees Celsius (Purbo Hadiwidjojo and I. Surjo, p.3.).
velocity and temperature they may destroy bridges, dams and other solid constructions or leave them buried as they flow on relentlessly.  

Ash and sand layers which settle on the volcanic cone are eventually carried downwards to become rich tuff deposits on the hill slopes and valleys. The crater wall is usually several kilometres long and the crater itself may be very deep. There is an ever present danger of the crater walls collapsing, thus releasing from the crater lake immense volumes of water to inundate the surrounding area, causing great loss of life and devastation to farming districts; as in the catastrophe of 1875, when the Kelud crater lake burst its walls resulting in a flood which destroyed 1,579 bahus of sawah, 788 bahus of dry-field farmland and 1,451 homes.  

Rainfall: Robert Ho, writing of the effects of rainfall, remarks that intense rainfall is directly responsible for floods and erosion. For example, in Java, one milimetre of soil over the entire catchment basin can be removed per hour by heavy rainfall. Such intensities, Ho points out, pose almost insoluble problems of accommodating large

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41 For example, in Bali the results of the violence of the Gunung Agung eruption in recent times is still visible. Purbo Hadiwidjojo and I. Surjo, p.3, note 'that primary lahars have an average velocity of 6-5 metres per second', estimated during the last Kelud eruption of 1966. Velocity in the upper course of a lahar flow is still higher, sometimes reaching twelve metres per second.  

42 Veth, Java, III, 1907, 752.
quantities of run-off and silt brought down from built-up or denuded areas. As Purbo Hadiwidjojo and I. Surjo observe, 'run-off waters are the most dominant geomorphic agency' in Indonesia, where an annual rainfall of 2,000 mm. is no exception. According to these geologists, although rainfall records have been kept and discharge measurements of major rivers have been made for a century or more these records were made for non-scientific use and therefore there is no data available concerning the distribution of rainfall over the entire area of volcanoes or the amount of annual erosion occurring. Consequently, very little is known for scientific purposes of the behaviour of Indonesia's rivers.

Rivers: The Brantas, East Java's major river, was also known as the Bangawan - Lord of the Water. This great river provided the irrigation water for the earliest sawahs established along her valley and plain. As sawah cultivation developed and spread, by cultivators moving ever further inland, the Brantas tributaries also played their part in the long history of wet-rice cultivation in East Java; it is the Brantas, however, that has dominated the fortunes and misfortunes of countless generations of


44 Purbo Hadiwidjojo and I. Surjo, 8.

45 In the Surodakan charter of 1447 A.D. the river still bore the name of Bangawan, which was in later times transferred to the Solo River. (Muhammad Yamin, Petulisan Widjava-Parakrama-Wardana dari Surodaken (Kediri), dengan bertarich sjaka 1368-T.M. 1447, Oct.1962).
rice farmers. Throughout history to the present day, the Kali Brantas has been notoriously uncontrollable. The river's course changed dramatically several times during the Indo-Javanese period, a factor we should not ignore when considering the development of sawah cultivation in East Java during this period. Over the centuries sand masses from the Kéïud volcano have been washed down to the Brantas and, carried along by the current, have at times blocked certain points along the river course causing the powerful current to seek a new direction and carve out a new bed. This creates difficulties even today, despite the greatly increased technical knowledge at man's disposal. That the ancient Javanese cultivators also were forced to overcome these formidable obstacles, threatening possible flood and famine, is certain.

The most dangerous flood points along the Brantas are at Karangrejo and Kertosono in the Kediri region and at Serbo in the Surabaya area. The bends in the river course at these points collect an enormous amount of volcanic material, especially during the first few years after an eruption. Between Kediri and Kertosono the river level is higher than the surrounding land and therefore must be diked. This is a notorious flood area at the present day and probably also at an earlier period.

The fourteenth century Trawulan inscription reveals a systematic listing of ferry places along both the Brantas and the Solo Rivers. Place-names along the Kali Solo are still to be found on the river's present course whereas many of those listed along the Brantas in the fourteenth century are now situated inland from its present course. (See P.V. van Stein Callenfels and L. van Vuuren, 'Bijdrage tot de topographie van de residencie Soerabaja in de 14th eeuw', *TAG*, XLI, Jan.1923, 67-81.)
By Kemiri the first branching of the river's course northwards occurs; the same northerly direction occurs again at Gedek, after which the river is forced back to the foothills again at Mojokerto, continuing along the foothills to Serbo. At this point a spur of hills causes the river to curve southwards sharply and it is here that a break occurred in 1037 A.D.\(^47\) causing much loss of farmlands and economic disruption.

The break in the river bank was obviously caused by a blockage at the sharp bend of the river course at Serbo, and must have occurred at the point where the Kali Mas now bends by the bridge at Waringin Anom, a little north of Waringin Pitu (old Waringin Sapta). The break caused the river to stream westwards, in the general direction of the present course of the Kali Porong. After the ruler, Airlangga, repaired the break by constructing dams at Waringin Sapta and at Kölagen, the river once again flowed to the north.\(^48\) The Kali Brantas which flowed past Waringin Sapta in the eleventh century A.D. now flows some two kilometres to the north of the old course.

Two hundred and fifty years after the river break in 1037 A.D. the Brantas again changed its course. According to the Pararaton, the town of Pamotan was situated north of the river in 1294 A.D.; thus the point where the

\(^{47}\) Recorded in the Kēlagyan inscription, OJO LXI, issued by King Airlangga.

\(^{48}\) Significantly, the break in the river bank at Waringin Sapta (Pitu) coincided with the earliest known Keiud eruption of 1000 A.D. (see van Stein Callenfels and van Vuuren, 79).
two Brantas arms, the Kali Mas and the Kali Porong, branch away from each other was at Serbo and not at Mojokerto as at present. The Kali Mas followed a different course from its present one; according to the Trrawulan inscription of 1365 A.D. it flowed from Jeruk Legi over Trung and Bangsri to Gedang, to finally reach the present mouth. The explanation of this given by van Stein Callenfels, is that material from the Welirang volcanic mountain and the Anjasmoro Range was carried into the Brantas from the Kali Pikatan and her tributaries, in the same way that volcanic debris is swept along the Brantas from the Kelud volcano. The material carried into the Brantas from the south, by the Pikatan, flowing into the Brangkal and thus northwards to reach the Brantas, was deposited, fan-shape, over the terrain thus steadily raising its level, forcing the Kali Mas against the foothills and directing the Kali Porong to flow from the west southwards. By the time of the Trrawulan inscription the build-up of sand had blocked the previous course to Segodogang, Tulangan and Pamotan, and displaced the branching of the Kali Mas and the Kali Porong back to Mojokerto.

The waters of the Kali Konto, a Brantas tributary flowing from the Kelud mountain, were used for irrigation as early as the eighth century. The Hariñjing inscription of 784 A.D. records the building of a dam and a conduit on the Hariñjing, a side river of the Konto. In 921 A.D.

49 Van Stein Callenfels and van Vuuren, 80.

50 Hariñjing A. inscription (P.V. van Stein Callenfels, 'De inscriptie van Sukabumi', MKAW-L, LXVIII, 1934, 116).
this irrigation installation was reconfirmed as a freehold by the ruler Tulođong, in favour of the descendants of the original founders of the dam and the excavated conduit. Near Kandangan, on the Kali Konto, a few kilometres from the inlet dam of the present major hydraulic work, the Srinjing conduit, is an inscribed stone of 1350 A.D., recording the restoration of the original dam of 784 A.D. which 'was now so solidly re-inforced that it would last for ever, for all the inhabitants of the valley east of Daha (Kēgiri)'. Unfortunately, this was not to be: the dam was washed away many times over the centuries. Even today this remains a problem area for hydraulic engineers. That control of the Kali Konto has posed problems for modern engineers is indicative of the extent of the achievements of irrigation engineers in ancient Java in their efforts to control and use the waters of the Brantas and Konto, and the Pikatan, Kromong and Landéan Rivers. The fact that they succeeded in harnessing these often turbulent rivers even for a time is impressive.

51 Hariñjing B inscription (van Stein Callenfels, 117).
52 P.V. van Stein Callenfels, 'De inscriptie van Kandangan', TBG, LVIII, 1919, 359.
53 Attention is drawn to the modern hydraulic works in progress, the Projek Selorejo, at the headwaters of the Kali Konto. See Kunthi, 3, Th.II, Sapar 1903, 18.
PRINCIPLES OF IRRIGATION USED IN ANCIENT JAVA

Large scale hydraulic works can be divided into two categories: 1) those for **productive purposes** using either terrace irrigation, where rainwater run-off is directed through flumes or conduits from one level to the next, or river or stream water which is controlled and conserved in dams or artificial lakes and from there is directed through canals or conduits to the fields to be irrigated; and 2) those for **protective purposes** where floodwaters threaten certain points along the course of seasonably turbulent rivers for instance, placing great stress on the river banks, the powerful river flow can be controlled by barrages or retaining walls which modify the volume of water surging past the weak river bends. While serving a protective purpose these dams can also serve a productive purpose, as reservoirs from which water can be diverted into diversion dams and irrigation conduits to ditches and channels leading to the fields under cultivation.

Archaeologists have uncovered remains of impressive irrigation works of the past in China, India, Mesopotamia, Central America, Ceylon (Sri Lanka), Israel and Egypt. In Southeast Asia there is evidence of extensive water works in Burma, South Thailand and especially in Cambodia, where traces of the achievements of ancient Angkor remain. Unfortunately, less evidence is available concerning the existence of what may have been extensive hydraulic works in ancient Java. It is clear that in Java farmers of the early centuries of the Christian era, and possibly earlier, were familiar with the basic science of irrigation and later during the Indo-Javanese period,
this science was developed to a comparatively high degree of efficiency. Early evidence of flood-control is found in King Purnawarman's inscription of the fifth century, recording the excavation of a channel to divert the Kali Cakung in West Java from its northwards direction. In Central and East Java remains of ancient dams and traces of tunnel work, and the spider's web of old channels and ditches spreading out over areas long since fallen into unproductivity, point to the existence of an organized irrigation system in those areas.

As far as we can determine from the available sources the methods used in ancient Java to control and conserve water for agricultural use ranged from simple constructions of weirs and dikes across small rivers and streams, erected by farmers, using bamboo, stones and tree trunks, to great stone dams, bridges or causeways, and sluices, constructed by the ruler and his legion of workers. The smaller projects, managed at village level by the farmers themselves, were more easily damaged or destroyed by floodwaters, necessitating constant repairs or rebuilding; the ruler had more manpower and resources at his command to build larger and more permanent irrigation works. The two levels of irrigation technology, however, existed side by side during the entire Indo-Javanese period.

The terminology of irrigation

Dawuhan: The term dawuhan, dam, probably applied to

reservoirs, diversion dams and other means of water conservation on a large scale. Irrigation projects at this level were constructed at the ruler's command and the supervision of such installations was in the hands of the king's rural representative for such projects. However, inscriptions reveal that the irrigation engineers and officials who carried out the actual work of building and maintaining the dams, as well as taking charge of the water distribution from these dams, were experts from the village, not from the kraton.

The term dawuhan is used in several royal edicts, the contents of which clearly indicate that the dam was part of a royal irrigation project, requiring the deployment of a large force of manpower. An example of such a construction is found in an inscription of 1037 A.D. recording the building of a dawuhan and a tambak. Apart from this inscription, issued by King Airlangga, only two others actually record the building of a dawuhan, but several other edicts refer to the reinforcement of such dams, and to regulations concerning the upkeep of dams which had been created freehold. We do not know the dimensions of these dams; they are not recorded by the Javanese, as the Indian, Burmese or Cambodian inscribers

55 The Kēlagyan inscription of 1037 A.D. (OJO LXI) lines 10-12. Work involved on such projects would have constituted buat haji, service to the king.

56 The Hariñjing A inscription records the building of a dam and a canal; the Bakalan inscription of 936 A.D. records the building of three dams. See Chapter Five herein.

57 Such as the Hariñjing B of 921 A.D., the Kandangan stone of 1350 A.D. and the Trailokyapuri inscriptions of 1480 A.D. (OJO CXIV-CXV).
recorded the measurements of similar projects. However, Maclaine Pont refers to one reservoir in the Pikatan area with the comparatively large dimensions of 175 metres by 350 metres and estimates that the dam must have held a volume of approximately 350,000 cubic metres of water. 58

Dams were also used for defence purposes in certain developed areas in ancient times. Located outside the city limits, they could be opened to allow the water to inundate the access roads to the city, thus holding back the approaching enemy. Maclaine Pont draws attention to the fact that, not only was old Majapahit city strategically sited against a backdrop of rugged terrain, the Anjasmoro Ranges, intersected by Welirang lahars, but inner and outer defence lines protecting the northern and eastern approaches were apparently constructed as well. Part of this defence system consisted of dams sited at strategic points to allow the surrounding area to be inundated in an emergency. Maclaine Pont also found evidence that outside the city defence lines in the southeast the terrain appears to have been artificially dissected by man-made ravines which could be flooded by opening the dams in the area and thereby narrowing the access route of advancing troops, thus weakening their assault by forcing them to become divided into smaller units. Within the inner city defence line there appears to be evidence that a temple was situated where it could be inundated so that an enemy who may have succeeded in penetrating the outer defences could only reach the inner city with difficulty. Canals also seem

58 H. Maclaine Pont, 'Eenige oudheidkundige gegevens omtrent de Middeleeuwschen bevloeingoestand van de zoo-genaamde "woeste gronden van de Lieden van Trik'", OV, 1926, 110.
to have been included in the defence system of Majapahit.  

What appear to be similar ancient defence systems have been found in Arakan and other parts of Burma where extensive use of water was carried out in times past. Although cities could be defended in this manner, on the other hand, an advancing army could attack both the city and the entire kingdom at one blow, by damaging or destroying the irrigation system and thus rendering useless the surrounding agricultural land, on which the city's population depended. The well-being of the kraton city depended on the smooth running of the surrounding irrigated farmland. Ruthless vandalism or the natural disasters mentioned above could bring about partial or even total destruction of a thriving agrarian centre. Such disasters undoubtedly occurred periodically in ancient times and may explain the eclipse of certain once prosperous kingdoms in Java.

Dams built by the farmers across streams and smaller rivers would have been similar to the simple constructions of the present day, consisting of the material


to hand such as bamboo, trunks of coconut-palms and stones. Often baskets of woven bamboo, filled with heavy stones, are used to dam smaller streams; if there are very large stones in the vicinity these are simply built up across the river. Where larger dams are required two tree-trunks are laid across the river and the space between the trunks filled with reeds, bushes, leaves and stones, with an opening left at the side as a prise d'eau. From here the water is directed through bamboo pipes or open channels to smaller ones from which the sawahs are irrigated. The disadvantages of these simple constructions lie in the fact that they are easily washed out in times of heavy rainfall or, even if the dam holds, the floodwaters may escape through the outlet pipe and inundate the sawahs. On the other hand, for small-scale farming, the simple constructions of rock and bamboo may not be as impractical as they seem. They are inexpensive to make and comparatively easy to repair, an important factor when flooding comes at the height of the rice-growing season, when repairs must be effected quickly.

Wuatan (or wwatan): Of the three dawuhan built by Rakryan Mangibil two were named Wuatan Wulas and Wuatan Tamya. A wuatan appears to be the retaining wall of a dam used as a bridge or causeway. Juynboll gives the translation bridge but Sutjipto Wirjosuparto translates the word as reservoir. 62 De Casparis, when referring to the hulu wuatan,

considers him to have been the supervisor of bridges. Tambak (or tamwak): The word tambak occurs frequently in Old Javanese inscriptions and appears to apply not only to smaller dams but to dikes, tanks and ponds. Juynboll gives the meaning dam wall, fish-pond or flood-gate. In three Balinese inscriptions, written in Old Javanese, from the years 962, 975 and 1022 A.D. where the word tambak occurs Goris translates it as dike wall, wall and river bank respectively. According to Pigeaud, by the fourteenth century the term applied to ponds or tanks for fish breeding. De Casparis defines tambak as a dam across a river, designed to create a lake, which would ensure an adequate supply of water during the dry season and ensure protection against flooding at the beginning of the wet season. The tambak wall would have required constant surveillance in order to regulate the outlet of water and to carry out repairs where necessary. The lake itself would also require constant care, either to deepen or to dredge it from time to time against silting. Silting must have been an ever-present problem in ancient
irrigation systems, particularly in lake or pond conservation works.  

The word *tambak* was also used as part of a place-name, for example in Tambakrejo. Similar examples are found in Talang Air (water pipes), Wuatan Mas (golden bridge), Air Manik (or er or jha as in Ermanik or Jemanik). Place-names such as these, denoting the presence of water occur in Balinese inscriptions as well. If a study were to be made of the distribution of such place-names it may suggest that these particular areas were once important irrigation centres.

The term *tambaka* (*tamwaka*) was used in relation to dam building. In the Old Javanese metrical inscription of 856 A.D. the phrase *tamwaka ta istaka* occurs, which de Casparis translates as 'bricks to become a *tamwak*'. In the Old Javanese *Rāmāyana*, de Casparis further notes, the word *tamwaka* occurs, in the phrase *mangatōra parwata len watu tambaka*, which de Casparis in this case interprets as 'to carry mountains and rocks for the dam'.

*Tamēng* (and *tamya*): There is very little reference to this term. Kromodjojo Adi Negoro refers to *tamēng* as a dike and reports that at the place named Tameng on the Kali

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68 See Maclaine Pont, 125, for evidence of silting in ancient irrigation works in the Kali Pikatan area. Also V. Venkayya, 'Irrigation in Southern India in Ancient Times', *Archaeological Survey of India, 1903-04, 1906*, concerning silting in irrigation tanks in ancient India.

69 De Casparis, 303, and note 90, (inscription XI, line 14, p.313).

70 De Casparis, 322, note 49.
Pikatan he found ruins of an ancient dam.  

Maclaine Pont also refers to 'enormous rock layers' he found at Tameng, which he considered to be the remains of Wuatan Tamya, one of the dams built by the Rakryán Mangibil.

Suwak: Originally the term probably applied to sawah fields and the earthen walls around the fields, to contain the water. In Old Balinese inscriptions referring to the irrigation associations, the term kēsuwakan is used, (modern, subak). In New Javanese suwakan refers to the banked-up edges of a small pond on the side of a river, for the purpose of trapping fish. The present-day term for small dikes in rice fields is galēngan. The term also applies to the earthen walls of sawah tadahan, terraced fields dependent on rain-water, and to the walls of irrigation channels running through sawah sorotan, irrigated fields. The term suwakan or kēsuwakan has not been found in Old Javanese inscriptions but subaki occurs in the Trailokyapuri inscription of 1486 A.D. and has been translated by van Stein Callenfels as the place-name Subaki, one of the villages sharing irrigation water in the Penanggungan region.

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71 R.A.A. Kromodjojo Adi Negoro, Oud-Javaansche Oorkonden, I, 1921, 14, note 5.

72 Maclaine Pont, 124-5. See Chapter Five below for notes to the Bakalan inscription.

73 See Goris, I, 23 (Klungkung inscription).

74 P. Jansz, Practisch Javaansch Nederlandsch woordenboek, 1913, 863.

75 P.V. van Stein Callenfels, 'Bijdragen tot de Topographie van Oost Java in de Middeleeuwen II', OV, 1926, 83.
Talang: There are occurrences of the word talang in Old Javanese records but it is only used in place-names, such as Talang Air or Talangan. Talang are open pipes or small aqueducts, usually of bamboo, used for irrigation purposes. There is very little available information concerning talang in Old Javanese sources but the term is still in use. They may have served a similar use as the Ilocano aripit (small pipe). 76

Weluran: This term refers to conduits or irrigation channels. Reference is made in the Bakalan inscription to the flow of irrigation water along the irrigation channels, the weluran (in Bahasa Indonesia, saluran). The equivalent term in Balinese appears to be tlabah. It is not known whether canals were also known as weluran or whether there is another Old Javanese term not yet recognized. In Ilocano large conduits or canals are known as kali. 77 In the Hariñjing inscription the phrase gawainira kali i hariñjing occurs, which refers to the original Hariñjing conduit, now the Srinjing conduit.

Arung: In Bali the term for tunnel is aungan, derived from arung. 79 In the Old Balinese inscriptions, Bebetin A of 896 A.D. 80 and the Batuan of 1022 A.D., 81 undagi pangarung,

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76 Lewis, 144, note 2.
77 Lewis.
78 Van Stein Callenfels, 'Sukabumi inscription', 16, line 4.
80 Goris, I, 55 (Bebetin AI, IIb, line 1).
81 Goris, II, 169 (Batuan, IIIa, line 1).
tunnel builders, are mentioned along with other craftsmen and skilled workers (undagi). Swellengrebel remarks that if there were tunnel builders in Bali as early as 896 A.D. 'it may be assumed that wet-rice farming on Bali is significantly older than that.' As yet, no reference to arung, or a word which may designate irrigation tunnels in ancient Java has been found but the New Javanese term for tunnel is urung. As the two Balinese inscriptions mentioned above were written in Old Javanese this fact may point to the possibility that tunnel building was also carried out for agricultural purposes in ancient Java at a very early period. There is archaeological evidence in Java pointing to the existence of tunnel-work for irrigation use but no date has been given to these remnants. The Encyclopaedia of the Netherlands Indies states that in various places in Java 'covered waterworks' (tunnels) of the Indo-Javanese period have been found embedded in padas. During the flood of 1861, when the Kragilan conduit in the Regency of Purworejo was destroyed, an ancient underground channel was uncovered. According to the Encyclopedia this covered channel is considered to date from the 'Buddhist' period. Unfortunately, the Encyclopedia does not give the source of this supposition or any further details.

Maclaine Pont refers to tunnels he found in the region of old Majapahit and notes that in the city layout

82 Swellengrebel, 11.
83 Jansz, 1184.
84 Encyclopaedié van Nederlansch-Indië, I, A-G, 1917, under the subject 'Bevloeing' (irrigation) 89-90.
itself a tunnel seems to have been used to divert water from a small river to flow through the temple complex which, in MacLaine Pont's opinion, could have easily been inundated for defence purposes. Other tunnel remnants were found by MacLaine Pont and his colleagues, one of which is still used to conduct water from the Slawe dam near the confluence of the Pikatan and Kromong Rivers to sawah fields nearby. According to MacLaine Pont's report there are at least eight other water tunnels or remnants of them, to be found in the region. He refers to tunnel remnants at Tameng, Wates and Pandan and describes a ruined tunnel which he considers was constructed to direct irrigation water northwards from the Kali Pikatan area to the drier Penanggungan region. This underground irrigation channel is estimated by MacLaine Pont to have been two and a half metres in width and three metres in height, and to have been cut through hard padas.

Tambuku: Three Balinese inscriptions, written in Old Javanese, refer to a tambuku in connection with sawah cultivation. Goris translates the word as distribution block. In Bali at the present day the distribution block is known as a têmbuku or têmuku. Made from concrete or wood, usually the latter, the têmbuku consists of a beam with two or more notches at the top, placed across the main conduit at a point where irrigation water is to be

85 MacLaine Pont, 119.
86 MacLaine Pont, 121-8.
87 Goris, II, 317 (Glossary). Tambuku is mentioned in inscriptions numbered 436, 438 and 1008.
directed into secondary channels and ditches. According to Dutch writers of the previous century a tembuku or distribution block was not used in Java in their time. Gorkom, however, notes that the Javanese rice farmers did have a certain means of allocating water to each sawah; the men spoke of 'one, two or more feet of water' which, Gorkom says, applied to the volume of water. The speed of flow was not taken into consideration. Lekkerkerker also remarks that the Javanese farmers, unlike the Balinese who use a distribution device, work by the 'feel' or by estimation of what is a fair and just amount of water required by each farmer. Jay writes, with regard to the present-day Javanese sawah cultivators, that water is apportioned to each farmer according to the size of his fields, by two methods of estimating the quantity required, neither method employing a tembuku. The first method is known as jam—jaman, 'measured by the clock', the second method is marén—marénan, 'to sufficiency'. Although there


89 See K.W. Gorkom, 'Het water op Java, in betrekking tot den landbouw', Indische Gids, I, 1, 1879, 559-60. Gorkom recounts that while living in the inland agrarian regions for years he had frequently found that suddenly the entire area was drained dry, due to a farmer having blocked off the irrigation water-supply or drawn it off for his own use. No one seemed to know of any means of redress for such anti-social acts.

90 Lekkerkerker, 532-3.

appears to be no apparatus such as the těmbuku used in Java it seems significant that this means of allocating each farmer's, or each group of farmers share of irrigation water should be known as a těmbuku in Bali, a word stemming no doubt from the Old Javanese word tambuku. It is possible that this is an indication, however tenuous, that some Old Javanese methods and techniques of irrigation farming fell into disuse while yet continuing to exist in Bali.

Rice cultivation

The type of soil and the topography of the area to be brought under cultivation determine the type of rice cultivation. There are two methods of cultivation, dry-field and wet-field, both of which are referred to in Old Javanese inscriptions. 1. Dry-field cultivation: in ancient Java this method was referred to as těgal and gaga. Těgal land mainly refers to unterraced fields or fields on open plains or flat ground; the term remains in use to the present. Těgal land is not considered as valuable an asset as sawah land. Gaga, a term also in use at present, refers to permanent unterraced dry fields on hilly slopes or in the mountains. They are less intensively cultivated than těgal land but more intensively so than ladang (swidden). Unlike ladang, gaga is permanent farmland. Gaga is mentioned in charters together with sawah and rěněk (see below). There are references in inscriptions to changes having been made from těgal cultivation to sawah cultivation. 93

92 For example, in OJO LXI, line 4, for gaga and rěněk

93 The Ngabean II inscription of 879 A.D. (OJO XII) line a:2.
which we may take as an indication of the extension of an existing irrigation system in the neighbourhood, where the ṭegal land would have been required as extra acreage for sawah. 2) Wet-field cultivation: where rice, during the course of many centuries, became adapted to growing in water, cultivation on a more intensive scale could be carried out, on land dependant on rain-water run-off or by means of artificial irrigation. This is known as sawah cultivation in Indonesia, and the rice grown in sawahs is referred to as padi. Fields dependant on rain-water are sawah tadahan, hillside terraces. Fields which are irrigated by directing water through pipes, ditches and channels to flow over the fields under cultivation, are known as sawah sorotan. Inscriptions reveal that in ancient Java rice was also cultivated in morass or swampland and known as rēnēk or rawa. Both Siṇḍok and Airlangga appear to have carried out reclamation in the marshes along the Brantas delta; according to Airlangga's Kēlagyan inscription, produce from rēnēk land was also liable for tahil, taxation. 94

Little is known about agricultural tools used for sawah cultivation in ancient Java. There are references in several inscriptions to certain implements which were presented as gifts at foundation ceremonies, some of which cannot be translated. Others include iron tools such as an adze, crowbar, pick-axe, mattock, chisel and a chopper-knife. 95 The fact that these iron implements were

94 OJO LXI, line 4.

95 J.G. de Casparis, Inscripties uit de Čailendra-tijd, 1950, 48. (Karangtēngah) and Sarkar, I, 222 (Ngabea II, B.I, lines 8-9).
symbolically presented to the sacred foundation stone is an indication of the high value placed on items made from iron at that time. Although not mentioned in inscriptions, there are two agricultural implements used for sawah cultivation which have survived since Neolithic times until the present day, the pacul, hoe, and the ani ani, reaping knife.

The pacul is a broad flat hoe with a straight cutting edge, used in the soft wet soil of the sawah fields. The ani ani has a wide distribution in Southeast Asia and known under various names. Like the pacul it has a very long history in Java but is now giving way to the sabit, the sickle. The ani ani has a flat blade of about 5-7 cm., attached to a wooden handle by a wooden pin. The rice, which is cut in the direction in which it bends, is drawn towards the knife-blade and the rice-stalks are swiftly severed, several at a time. The reaper proceeds until he has a handful, which is called an agēm. Five agēms are bound together to form a sheaf, a pēncar. Fast workers can cut 10-12 pēncars per day.

Land and water measurements

The earliest (indirect) reference to surveyed land is found in the Plumpangan inscription of 752 A.D., wherein it is recorded that a piece of ground was made over as a 'gift to the god' to become the village of Hampra. The earliest record of actual measurements used for agricultural land appears in an inscription of fifty-seven years later, the Dieng stone of 809 A.D.

96 De Casparis, I, 9-11.
97 Sarkar, I, 49.
used specifically for sawah land in ancient Java are referred to, i.e. the lamwit, the tampah and blah (bĕlah, half) and reference is made to the surveying or 'marking out' of the land for sawah fields. Most Old Javanese inscriptions give evidence that fields intended for sawah cultivation were carefully measured and the measurements recorded.

Land marked out at the instigation of the ruler or a high court dignitary for the purpose of establishing freehold sawah land was recorded permanently, on stone or copper plates; records would first have been made on lontar leaves and afterwards committed to stone. Records of the surveying of villages and the farmlands of the farmers when they cleared and settled on the land would have been committed to lontar leaves and kept in the village or hamlet. In the case of a sīma grant of sawah land the surveying or measuring out was always 'witnessed' by representatives from the neighbouring villages, the tpi sering, whose land bordered on the newly surveyed land. The surveying of land seems to have been carried out by a high-ranking official, such as a nāyaka, where sīma land was concerned, and in many inscriptions it is

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98 According to Sarkar I, 109, note 79, the nāyaka, who had an administrative position, had a definite say in land surveying, as evidenced in the Palepangan inscription (Sarkar II, 57, lines 2-4). Sollewijn Gelpke in his report on government re-distribution of agricultural land in Java in the nineteenth century, notes that the village head did not survey the land; this was done by the pēnyarikan, 'scribe. (Sollewijn Gelpke, 'Het desabestuur op Java. Een bijdrage tot de kennis van Land en Volk', De Indische Gids, I, 1, 1879, 284.
recorded that a raka or rakryan, or priest, arranged the 'marking out' of the land, but it was usually a samégat who carried out this work. Boundaries were usually identified by natural landmarks such as rivers, hills or mountains. Stone columns were also used, as 'boundary pegs', sometimes inscribed with a record of the status of the land, if the land happened to have been awarded freehold rights. The boundaries of neighbouring sawahs were strictly observed and where a freehold estate adjoined peasant land a 'fence' of bamboo, a watër, was erected or a sawi used, a demarcation cord of fibre and bamboo poles with streamers attached, which is still in use to the present. 99

In ancient Java two methods of measuring sawah fields were in use, the lineal measurement and measurement by volume. These measurements are still used in rural areas. The first method was apparently used when virgin land was cleared and surveyed for the cultivation of wet rice (which is referred to as manusuk sīma Īmah) and evidence for it is found as early as the Dieng stone of 809 A.D. An area measurement used frequently in Old Javanese inscriptions is the tampah, which seems to have been used especially to define the size of sawah fields. The tampah is first mentioned in the Dieng stone, 100 and in subsequent records appears to have been used in connection

99 According to Pigeaud entrance to an estate which has a sawi suspended over the road or pathway is forbidden. (Pigeaud IV, 460). See Pigeaud III, 176 concerning land measurements.

100 Sarkar, I, 50-1. See also the Palępangan inscription, and de Casparis, II, 316.
with sawah land which was freehold, for the income of temples and other sima property. The area of such sawah land seems to have ranged between 2 and 6 tampahs. However, it seems that two tampah measurements were in use, one of which it could be said was a standard tampah and the other a royal tampah, tampah haji. Sarkar suggests that the second measurement was probably introduced to avoid possible disputes or abuses in surveying, such as had occurred and been recorded in the Palepangan inscription of 906 A.D. According to this inscription a tampah haji, the measurement used to re-survey the rāmas' land, was 100 dēpa sihwa in length by 30 dēpa sihwa in breadth.

A dēpa, according to Liefrinck, is the span of a man's outstretched arms, approximately two metres. A Balinese measure, a dēpa agung, appears to be a square measure equalling one pacēraken, or nine square metres. The Old Javanese dēpa appears to have been used from very early times until the fifteenth century where large

101 Sarkar II, 59, note 18.

102 Tampah haji sātus dpa sihwa pañjangnya singkrēnnya tlung puluh dpa (Sarkar II, 56, line 5 [Palepangan]). A difference of opinion between the rāmas of Palepangan and the nāyaka Bhagawanta is recorded, concerning the size of the rāmas' sawah fields, for which they had to pay six silver dharana, more than they could afford. The rakryān mapatih Hino agreed to their request to have their fields re-measured according to the 'royal' tampah, which reduced the overall total 'acreage' while the tax assessment remained the same.

tracts of land were involved. In the Cṛī Manggala
inscription of 874 A.D.\textsuperscript{104} the pambogat of Hino marked
out a freehold for his own funerary temple, measuring
44 dēpa by 67 dēpa. The Ngabean I copper plates\textsuperscript{105} record
the surveying of 'extensive lands' for a freehold domain
measuring 72 dēpa by 63 dēpa. In the Surodakan Charter of
1447 A.D.\textsuperscript{106} the dēpa is the only measurement referred to
in the record of the size of the extensive freehold domain
grounds. Thus, it seems as if a dēpa applied when large
tracts of land were involved and a dēpa sihwa was used in
connection with sawah fields for farmers or for garden land.

A term used in connection with rural land
measurements, but whose precise value is not known, is
the katik, which in inscriptions usually follows the
measurements lamwit or tampah, for example, 'the sawah
fields under the united body of the tajis to be taken care
of by the rāmas measured 6 lamwit, 3 tampah and 28 katik.'\textsuperscript{107}
The term lirih also occurs in old records and is interpreted
by Pigeaud as a sawah measurement, probably originally
meaning 'track'.\textsuperscript{108} Other area measurements are the lattir
and the barih. In the Wanua Tengah inscription of 863 A.D.
the barih occurs as 'the sawah land of Kasugihan measures

\textsuperscript{104} Sarkar, I, 195.
\textsuperscript{105} Sarkar.
\textsuperscript{106} Muhammad Yamin, 11-13.
\textsuperscript{107} Brandes, OJO XXVI, lines 5-6.
\textsuperscript{108} Pigeaud III, 153 and IV, 397. See also F.H. van
Naerssen, Oudjavaansche Oorkonden in Duitsche en
Deensche Verzamelingen, 1941, 73 (Inscription VI).
3 barih yielding 1 hamat'. 109 (for hamat, see below). According to de Casparis a barih equalled six lattir. 110 Unfortunately it is not yet possible to give a precise equivalent for all measures.

Measurements were taken by the limbs of an average man, one of the farmers. Tangan, for example, is the length between the lower arm and the tip of the middle finger, which seems to compare with the Balinese measurement siku, reported to be based on the distance between the elbow and the tip of the outstretched middle finger. Other smaller Balinese measurements are langkat, the span of an outstretched thumb and middle finger and dēpa, the span of a man's outstretched arms. The bahu (bau) is a standard Indonesian measurement today, equivalent to approximately 1 3/4 acres; the original meaning of bahu signified a man's 'strength', his shoulder and upper arm. One wonders whether originally it could have represented the amount of produce from a certain acreage, that could be carried by one man. Four bahus equalled one jung, or seven acres, and one kikil equalled half a jung, 3 1/2 acres. 111 The jung is referred to quite early in Old Javanese epigraphy. 112 From ancient times the rice yield from a certain area of sawah land was the basis for fixing land tax. In Java a piece of land producing sufficient

109 Wanuah Tēngah II, line 3 (Sarkar, I, 180). See also de Casparis, I, 72.

110 De Casparis, I, 59.

111 The kikil occurs in the Karem Bogēm charter of 1387 A.D. (Pigeaud IV, 450).

112 Van Naerssen, 73, note 6.
rice for one family was known, for the purpose of taxation, as a karya or 'farmer's field'. Five karyas amounted to one jung for taxation estimates; the jung, being a complex of karyas, was probably a more practical measurement to use when estimating the amount of tax to be paid, or for estimating the size of an estate. However, the jung, consisting of five karyas is an equivalent from later times; it may have consisted of a lesser number of karyas in earlier times.112a

The second method used for measuring sawah fields, by volume estimates, appears in inscriptions recording a change in ownership of sawah land already established, which was to become a freehold property either by gift or deed of sale. The size of the field already under cultivation was given according to the amount of rice grain it was estimated to produce, and this amount was expressed in a unit of weight called a hamat,113 the weight of the rice. Through long experience the farmer knew how much seed grain would be required to produce a certain yield from a sawah field of a certain size. The field was said to have a yield of, for example, 8 hamats - sawah winiḥnya hamat 8.114 In the Karangtėngah inscription of 824 A.D., concerning the gift of sawah lands by Raka Patapan and his wife, the size of the fields, five in all,

113 The unit hamat is still used; it first appears as a unit of measure in the Karangtėngah inscription of 824 A.D. and therefore gives some evidence of the antiquity of sawah cultivation in Java.

114 See the Çri Kahulunan II inscription (de Casparis, I, 86, 91.

112a For karya and bahu see J.F.C. Gericke and T. Roorda, Javaansch-Nederlandsch handwoordenboek, 1901.
pressed by their hamat yield, '...the grounds of ungan, their yield was 1 hamat 1 wha.' (1\(^{1/2}\) hamat).

In Java, as in Bali, the tēnah was a volume element used to estimate the production capacity of fields of varying size. The tēnah measurement is used in Bali, not only to express an estimate of the of a certain field but also to express the volumeigation water required for the field. To quote bach:

ţnah is a term Balinese use to establish land productivity via an input-output formula. A ţnah is a variable unit which relates water, and, rice seedlings planted and harvested field. A tēnah of water is the amount of water needed to irrigate a tēnah of land to its optimum growing level. A tēnah of land produced a relatively fixed amount of padi from a variable number of seedlings.

The term tēnah winih is applied to a certain area planted with a quantity of rice seed, the normal amount for a certain number of rice sheaves. Tēnah also appears to represent an area measurement consisting of 800 pacēraken of nine metres each, i.e. 1 tēnah = 7,200 square metres.

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115 Karangtēngah inscription, line B27, '...winihnya ha l wha l...', de Casparis, I, 40. According to de Casparis the word wha is probably an abbreviation of wēlah, half, and ha(mat). (See de Casparis, 48, note 6.)

The village life of Indonesia holds the key to Indonesian society: throughout her long history of economic and cultural development the basic unit, the Indonesian village, remains a stable core in the centre of all surrounding change that occurs with the passing of time. Van Vollenhoven, in his monumental work on Indonesian adat, customary law, refers to what he calls the 'old style' village in Java, unchanged since ancient times, which he likens to the Achenese gampong, the dusun of Palembang and the Minahasan negorij.¹

These early autonomous settlements consisted of a single village unit or a village with an attached hamlet, a dukuh, which may be likened to small islands, surrounded by their sawah fields and gardens. As the population increased, more land was brought under cultivation, and in this way the settlements began to spread. In time, since the hamlet had its own borders, it could become a separate village, while still adhering to the adat and religious practices of the mother village, and eventually attain independent status, a fact recorded in some inscriptions.

Each village was governed by its own adat, through a council of elders, the tuha wanua, presided over by one of their number, the rama, who was considered not to be above

his fellow elders but 'first among the equals'. The villagers were known as anak wanua, 'children' of the village; the farmers in particular were anak thāni, 'children' of the land. Each village possessed its own communal rice barns, seedbeds for the bibit, rice seedlings, and communal work animals and so on. Land, water and buildings were under joint care. The communal needs of each village could be provided by the mutual assistance of the people within its borders. The village, in short, was a small self-supporting community living like one close-knit family: the basic family unit within the larger familial community structure, the village as a whole. However, as more land was brought under sawah cultivation it became increasingly necessary for neighbouring villages to combine their efforts and to share the available water supply and labour.

Van Akkeren, writing of ancient Javanese village societies, remarks that:

Wet rice-cultivation encourages very much all activities directed at restraining the wild forces of nature; it stimulates the population to achieve a high degree of mutual co-operation and aid; peace must be maintained with neighbouring villages. Technical ability, organizational skill, special care for the preservation of social peace and the harmonious development of the community and the other social virtues have in the course of two or three thousand years formed the special character of the Javanese people...in Java the village evolved as an autonomous institution, on the one hand, in dependence on co-operation with neighbouring villages in the irrigation area, on jurisdiction,

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2 The Old Javanese term thāni (or tāni) applied to cultivated farmland. However, the word thani without the addition of anak does appear to have been used to denote farmer in some instances. (Personal communication from P.J. Zoetmulder, Dec. 1973)
etc., and in some cases on the rulers, but on the other hand, in loyalty to its own autonomy and organization.³

Village organization

There appear to have been three types of village structure in ancient Java.

1. **The nuclear village**, the *wanua*, with autonomous administration.

2. **A federation of villages**, the *mancapat* and *mancalima*, bound by common interests such as the construction and maintenance of irrigation systems, and mutual defence. Intervillage administration would only have operated for these specific purposes.

3. **Regional village communities**, probably *karamān*, (in the fourteenth century, *dapur*), with each village possessing autonomy, under its own *rāma*, but all being subdivisions of a larger community structure, with its own boundaries.

Living within the *wanua* were three classes of villagers: those who possessed *sawah* land and their own house or compound; those who owned a house only, perhaps with some *tēgal* land but no *sawah*; and those without property.

The owners of *sawah* fields, the free farmers or core villagers as Dutch writers designate them, being descendants of the original village founders who had cleared the land and laid out the first *sawah* fields in the area, were the village 'elite', known as the *anak thāni* or *kulina*. This exclusive membership was passed down from father to son, or other legitimate heir where there was no son to inherit the *sawah*.⁴ According to van Vollenhoven the *anak thāni* must always have


⁴ There is evidence that women owned land in their own right. See below.
been a closed class, enjoying full rights and privileges from the earliest times. Even today sawah owners are considered to possess higher status than tegal owners. Within this class of free farmers were the sawah owners who had retired and handed over their farmlands to their heirs during their own lifetime. These older men, the kaki, 'grandfathers', continued to play an important role in village affairs as advisers on matters of adat.

The second group, those villagers without the status of sawah ownership, were, in the previous century and at present, home owners whose house was on someone else's land. Farmers of tegal fields are included in this group. In modern times they enjoy only partial rights and privileges. Nowadays widows and elderly invalids are included in this category but it is not known where these people belonged within the social scheme of the ancient Javanese village. They are probably mentioned in inscriptions but as so many Old Javanese terms are still obscure they cannot be identified.

The third group of villagers, those without property, at the present time includes unmarried children of sawah owners, newly married couples and newcomers to the village. These people have no rights and privileges at all. It is not known what their status would have been in ancient Javanese society. Children are mentioned in inscriptions as being present at foundation ceremonies, and even receiving ceremonial gifts, but they would have been children of village dignitaries.

There were bondmen living within the rural communities, as farm labourers and servants. Many of them

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5 Van Vollenhoven, I, 527f.
may have been farmers who had mortgaged their land and been unable to redeem it or who had fallen into debt to their masters for some other reason. However, little is known about this group of people; some probably worked for the free farmers in their fields and others for the members of the aristocracy on religious domains and estates.

Wet-rice cultivation demands a well-organized irrigation management and Indonesian farmers in the developing sawah areas early learnt to adjust their pattern of life in accordance with these demands. Agricultural techniques, ritual and philosophical outlook were all closely interwoven and adjusted to a special cosmological pattern of daily life. The Javanese and the Balinese arranged their entire social system in relation to the cosmic classification of the four cardinal directions and the centre. This classification they also applied to their rural organization.

The cosmic concept was manifest in the grouping of four villages around the mother village, situated according to the points north, south, east and west, with the core village in the centre. Inscriptions reveal this system of village grouping whenever reference is made to the rāma tpi sering, the rāmas from the neighbouring villages who attended a village ceremony. The villages are mentioned in clockwise order. Pigeaud suggests that the Biluluk charter contains a possible key to ancient village organization in its reference to the social structure of four clans plus an outside clan. It may be possible that this fifth clan was represented by the as yet unidentified kalima, mentioned in inscriptions.

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6 Pigeaud, IV, 420-21 (Biluluk charter).
concerning village gatherings. The grouping of five villages was known as the mancapat. Kartahadikoesomo writes that there are places where the old mancapat system is still preserved, and in certain regions the system has been revived for the purpose of solving present irrigation problems. Generally speaking, however, the old mancapat system of co-operation among villages for irrigation management no longer exists. Van Akkeren considers that with the introduction of administrative divisions and subdivisions introduced by the Netherlands colonial government, the mancapat system was destroyed.

There is evidence from as early as the ninth century A.D. that the mancapat village grouping was, in some areas, extended to the cosmic classification of eight compass directions plus the centre. This village grouping was known as the mancalima, whereby eight villages were clustered around the central village in a concentric grouping of the four cardinal points and the four intermediary points. In a Central Javanese inscription of 840 A.D., an even wider village complex is recorded, consisting of twenty-four villages grouped in concentric fashion, representing the eight points multiplied by three symbolizing, de Casparis suggests, the three worlds, heaven, earth and the underworld. In this

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7 See W.F. Stutterheim, 'Inscriptie op een zuiltje van Papringan', TBG, 1933, 96-101. Stutterheim suggests that the kalima was the equivalent to the pengliman of Bali, assistant to the sédahan, and fulfilling duties as subak police.
8 Soetardjo Kartahadikoesomo, Desa, 1953, 66.
9 Van Akkeren, 7. Van Akkeren considers that there must have been irrigation co-operatives in ancient Java.
extended village complex the central unit was a religious domain instead of the core village.  

The third group of village organizations mentioned above, the regional communities, Pigeaud considers to represent the oldest form of territorial organization of rural communities. Each village was free and independent within the larger structure. These communities were probably the karamān, the lands of the rāma deça, the 'fathers' or leaders of the district, and the sawah owners, the kulinas. In the fourteenth century these were known as dapurs but Pigeaud considers it possible that the dapurs and the karamān were the same. However, unfortunately, very little is known of either. Apart from the regional agricultural communities of rāmas and kulinas the various religious communities held land in agrarian regions. Also outside the city limits were the appanages or estates belonging to the aristocracy. These are discussed in the following chapter.

Village bureaucracy

Old Javanese inscriptions give evidence of a highly organized village bureaucracy. Judging by the large number of village authorities and minor officials listed in many of the inscriptions there appear to have been many degrees of rank. The largest group of officials mentioned in the charters, always at the end of the list of officials present, following the court representatives, belongs to the village administration; in the Perot inscription there are about

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11 Pigeaud, 301 and 495.
nineteen different officials listed among the villagers at the ceremony recorded. Sarkar, discussing both court and village officials, remarks:

The most interesting, if not surprising, thing in respect of these official titles is that their number is very large and the majority of them are non-Indian and non-Sanskritic. The titles of rāja, mahārāja, mantri, mahāmantri, pati(h), bhagavanta, likhitapatra, nāyaka, variga and perhaps one or two others are of Indian origin, but the overwhelming majority of the titles are of Indonesian or Austronesian origin. This implies that before the arrival of the Indians in Java, the original population of Central Java [and East Java] had a political organization, whose origin cannot be satisfactorily traced at present, but if the meanings of these Old-Javanese titles be any guide they seem to point to a well-regulated tribal organization, in which the officials had a distinct role to play. Apparently the fine distinction of officials belonging to similar categories and having similar significance - e.g. tuha(n), juru, rama, etc. who are apparently some kind of village-chiefs or elders - is hard to determine at present, but the multiplicity of village officials itself indicates that there existed a tribal organization of efficient type in the villages.

Prominent among the various officials mentioned in inscriptions are several whose specific function was connected

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12 See J.G. de Casparis, Selected Inscriptions from the 7th to the 9th Century A.D., 211-43, concerning the Perot inscriptions.

with irrigation. These officials appear quite early in Old Javanese epigraphy. Among the irrigation officials mentioned are the matamwak, the hulu wuatan and the hulair or huler (the latter term being a contraction of hulu-air and hulu-er). The function of the matamwak was probably that of a village elder in charge of irrigation installations such as the construction of dams and artificial lakes or other conservation works. The term, derived from tamwak (tambak) occurs fairly frequently in inscriptions. Other references in connection with the word tambak are patih tambak, the head of the Princess of Lasém's fisheries, mpu tambak, and matamwak mula, perhaps a dam surveyor. In the Candi Perot inscription the phrase ...si layar matamwak si tamuy mula... which de Casparis translates as ... Si Layar; the surveyor of the dams: Si Tamuy; the mula.... De Casparis observes here that the term mula is not clear but probably refers to someone connected with irrigation. The word mula occurs elsewhere in connection with irrigation, for example, in the Hariñjing A inscription it is used in relation to a dam and a canal, '...bhagawanta bāri i wulaggi sumsakgyakan simaniran mula dawuhan gawainira kali i hariñjing...'.

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14 See de Casparis, II, 230.
15 Pigeaud, 451.
16 De Casparis, II, 234, line 23.
17 De Casparis, 241.
18 De Casparis, 241, note 186.
confirmed their good works, (or foundation), the dam and the Hariṅjing canal (artificial river)....'. It is not clear, however, whether mula applies to the sīma or to a certain kind of dam. For the present mula must remain untranslated.

There are many references in inscriptions to the official called hulu wuatan. The term occurs early in inscriptions and in no less than seven between the years 863 A.D.-918 A.D.\textsuperscript{20} The hulu wuatan was probably an engineer supervising the construction of bridges and causeways. Together with the hulair this official seems to have occupied an important place in the agricultural community. Stutterheim refers to the hulu wuatan as a bridge supervisor.\textsuperscript{21}

The hulair appears to have been an irrigation official of some standing in ancient Java. In several inscriptions he follows immediately after the tuha wanua, a senior village elder, and the wariga, the village astrologer, who held an important place in village affairs. There may be some significance in the words found in the Palĕpangan inscription concerning the three men, '...nāhan kveh nira mangagam kon...'\textsuperscript{22} 'now all of them, having powers to pass orders...'. According to de Casparis the hulair was probably in charge of the maintenance of the irrigation system, including the distribution of the irrigation water supply


\textsuperscript{21} W.F. Stutterheim, 96-101.

\textsuperscript{22} For example, in the Palĕpangan inscription of 906 A.D. (Sarkar, II, 57, lines 14-15) Sarkar points out that these three had executive functions (59, note 32).
to the sawahs. It is possible that the hulair could have performed the same function as the klian subak of Bali.

In several inscriptions, recording the presence of village officials, both secular and religious, at the sima foundation ceremony, the hulair was the only official connected with irrigation to be included. On the other hand, in some inscriptions two hulairs are mentioned together in attendance at the ceremonial function.

Closely connected with the hulair is another term frequently mentioned in inscriptions, the pangulu bañu, a term over which scholars are not entirely in agreement. Van Naerssen considers pangulu bañu to be probably a later form of hulair and translates both as 'head of the irrigation system' (hoofd van de irrigatie). De Casparis also considers the pangulu bañu and the hulair to be the same irrigation official. Stutterheim, writing of the Papringin inscription of 882 A.D., in which the hulair and the hulu wuatan appear together, suggests that the hulair had the same function as present-day ulu ulu, officials who maintain the irrigation system. Pigeaud, on the other hand, considers pangulu bañu to signify 'irrigation-water retribution' where the term occurs in the Sarwadharmā charter. In one of the Trailokyapuri

23 De Casparis, II, 230.
24 F.H. van Naerssen, Oudjavaansche Oorkonden in Duitsche en Deensche Verzamelingen, 1941, 50, note 5.
26 Stutterhim, 100, note 2.
27 Pigeaud, IV, 383, 387; Pigeaud, III (plate 3, recto, line 2). By the term 'retribution' Pigeaud is referring to compensation, or an impost, payable by farmers whose source of irrigation water either flows through, or is located on, someone else's property.
inscriptions the phrase pangulu baṅu pisis 8400... appears, which could perhaps be taken to mean 'water payment (levy) of 8400 pisis'. However, some two centuries earlier the ruler Kērtanagara issued a charter wherein is stipulated the various amounts to be contributed by the villagers of the area where the source of the irrigation water was located, towards the upkeep of the previous king's sanctuary.

Van Naerssen translates the phrase as 'the head of the irrigation must pay 1 mā sū, 9 mā and 1 ku.' The term baṅu, as also air, er and jha, means water. However, it has been noted that wherever the word baṅu appears in inscriptions it applies to irrigation water, or is mentioned in connection with sawah cultivation. Pangulu is usually translated as 'head' or supervisor. It appears then that the translation of pangulu baṅu as 'supervisor of the irrigation system' might be more acceptable than in connection with payments for water. The term is still used at the present time (pengulu baṅu) and applies to an irrigation inspector, or supervisor of the irrigation works.

An irrigation official referred to in Balinese inscriptions written in Old Javanese, is the nāyaka air, which Goris translates as 'supervisor of the irrigation water supply'. As nāyakas were usually court officials, or officials under the rakryāns in ancient Java, the nāyaka air may have been the equivalent of the present-day sēdahan tēmbuku in Bali, the government (in former times, court) official connected with the subak associations. (See below.)

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28 Trailokyapuri inscription, OJO XCV, lines 8-10, for example.

29 Van Naerssen, 46 and 48, line 3, ...pangulu baṅu, mā sū 1, mā 9, ku 1....

30 Roelof Goris, Prasasti Bali, II, 278.
Also connected with sawah cultivation in ancient times was the hulu wras, according to de Casparis probably the official in charge of the communal rice supplies. De Casparis remarks that the hulu wras is often mentioned with the rāmas. He also notes that van Vollenhoven referred to similar functionaries in the villages of his time and concluded that the office dated from recent times. However, van Vollenhoven's observation appears to be incorrect. In ancient Javanese society the hulu wras appears to have been an official of some importance; in the Kamalagi inscription of 821 A.D., for example, he follows the hyang guru, dapunta Dahana, an ecclesiastical person, and he precedes the various patihs mentioned in the list of witnesses to the foundation of freehold sawah land and gardens. In view of the apparent importance of this village official it may be possible that his function was more than that of being in charge of the village rice (wras-bēras) supply. He may have also been in charge of rice supplies for export.

Land and water rights

A certain amount of supposition must be used where the study of ancient Javanese land and water rights is concerned. Pigeaud's work on the Majapahit period is of great value for an insight into conditions existing in the fourteenth century. By using this information together with Old Javanese inscriptions it is possible to reach some tentative conclusions concerning the earlier Indo-Javanese period. T.C. Lekkerkerker maintains that the Indians upon their arrival in Java early in the Christian era found a purely Javanese rural organization.

31 De Casparis, 243, note 205.
32 Sarkar, I, 58, 61, note 22.
with indigenous land rights already laid down.\textsuperscript{33} Van Vollenhoven remarks that in the Kedu region in Central Java, in the original 'core' areas or free lands, he found that the old \textit{adat} concerning land rights was still remembered.\textsuperscript{34}

The right to occupy virgin land stemmed from the act of clearing the forest or uncultivated land. This right corresponds to the rights of possession of running water which the act of laying down irrigation pipes gave (see below). Cleared virgin land was known as \textit{bakalan} (\textit{bakal}, to clear, to begin). \textbf{Individual ownership} rights applied to a single pioneer farmer; when he had cleared new ground he was given three years in which to develop and establish \textit{sawah} fields before he became liable to tax payments. The clearing of land and the establishing of \textit{sawah} fields by several farmers together led to \textbf{joint ownership}. If the entire population of a village worked together to establish fields for the mutual benefit of every member of the community the land was held in \textbf{collective ownership} as village \textit{sawah}. Exemption from tax for the three years it took to develop the land probably applied in all cases. There appears to have been a limit set on the amount of individual land holding, as in Bali, in order that \textit{sawah} land did not fall into too few hands. In Bali a ruling was enforced on the maximum number of \textit{sawah} fields any one farmer may own, in order to ensure that the possession of agricultural land did not fall into the hands of a minority. A farmer could not exceed the maximum 'acreage'; if he did so the amount of land in excess of his permitted

\textsuperscript{33} T.C. Lekkerkerker, \textit{Hindoe-Recht in Indonesië}, 1918, 31.

\textsuperscript{34} Van Vollenhoven, I, 604.
holding had to be given to a farmer who had less than the allowed amount and the exchange was executed by a correct legal transaction.\textsuperscript{35}

The bond existing between the farmer and the land he had himself carved from the forest was indeed deep and lasting; ownership was considered permanent, to be passed on to the next generation and the next, to be valued and tilled with care, as the soil inherited from one's own ancestors. An example of the importance placed on the right to land ownership, and the close attachment existing between the family and the land they owned, is seen in the Jaya Song jayapattra of about 1350 A.D.\textsuperscript{36}, concerning a dispute between two families over ownership of an estate. The claimant in the case maintained that the estate rightfully belonged to his family, although he admitted that the land had been in the defendant's family's possession for a hundred years or more, due to the fact that his great-great-grandfather had borrowed a sum of silver from an ancestor of the defendant, giving the estate as security. The defendant, on the other hand, claimed ownership by inheritance. His family, he claimed, had owned the land for seven generations but, as it dated from such a remote period of time, there was no written evidence of ownership. The defendant's claim also hinged on the antiquity of ownership, reaching back over 360 years to the tenth century, which he was able to prove to the satisfaction of the court. It seems that either written records or local knowledge (probably the latter, since the defendant's evidence consisted of the testimony of three witnesses) kept track of the ownership of land over a very

\textsuperscript{35} See F.A. Liefrinck, 'De Rijstcultuur op Bali', \textit{De Indische Gids}, VIII, 1886, 1217.

\textsuperscript{36} Jaya Song decree, c.1350 A.D. (Pigeaud, IV, 391-8).
long period. The fact that the plaintiff could bring forward a claim to land which he said his great-great-grandfather had in some way mortgaged or pawned a hundred years ago, suggests that the consideration of original ownership would weigh heavily with the court.

The village head appears to have had absolute rights of disposal of agricultural land which had remained unredeemed from debt, land which had belonged to a farmer who had died without heir, and land which had been abandoned for some reason. If land was neglected or allowed to lay fallow for three years it apparently reverted to the village head. However, it is not clear whether the disposal was decided by the village head alone, or in consultation with the village community as a whole. Land was rarely sold; Pigeaud writes that 'according to Javanese (and generally Indonesian) customary law (adat) selling of land was almost inconceivable: the owner and his land were so closely bound up one with another that they could not be severed for ever and ever.' However, there are recorded instances that in ancient times the ruler, and sometimes princes, rakryâns, purchased agricultural land which they may have desired to create as a sima estate or religious domain. In the Lintakan inscription of 919 A.D., for example, it is recorded that the ruler Tuloçang, the 'illustrious great king':

...marked out the forest at Lintakan...and the forest at Tunâh.... Moreover, there was also the marking out (of the region) at Vru.... These were in connection with the foundation of a freehold. There were also irrigated lands at Kusugihan (measuring) tampah 1, in the east of the lands of Tunâh and of Lintakan. These were now bought

37 Pigeaud, IV, 52.
by the illustrious great king from the rāma of (the village) of Kasugihan for silver 1 kara 13 dharana 6 māsa.  

Garden land was also purchased in some instances, for example when the Rakryan of Sirikan bought for one gold kara the garden land belonging to the guild of rāmas of Mamali, for the purpose of making it freehold, the produce from which land would then benefit the temple of Gunung Hyang.  

Because it contains details, in common with many Old Javanese inscriptions, of land measurements and the manner in which the exact location of sawah fields belonging to the various farmers was carefully recorded, the following modern example of a deed of sale of sawah fields is of interest. It is a deed of sale of sawah fields belonging to a villager of Blora in 1877 A.D.

Ngawen, September 23d 1877.  
I, called Pak Bedru from the hamlet of Wangil, a hamlet of the village of Kendajaken, in the district of Ngawen, Blora, have sold indeed my own sawah bakalan, to the extent of 1½ bahu, divided into three parts, situated northwest of the hamlet of Wangil, in the range of fields called Tike, limited to the north by the river, to the west by the kebayan's fields, to the south by the modin's fields, to the east by the kamituwa's fields, - for fifty guilders. The sawah is bought by the man called Asnawi modin of the village of Punggurreja, in the district of Ngawen. 
The contract reads that it is performed for ever,
from generation to generation. As to the land revenue, Asnawi pays it. I have received the purchase money in its entirety.

Here follows my sign:

Pak (X) Bedru

Witnesses in cognizance of the transaction:

1. Setrajaya, village chief.
2. Ranatruna, kamituwa

Known to me:

district chief of the district of Ngawen

(s) the clerk.

(The foregoing is a quotation from an English translation published in *Adatrechtbundel 33*.)

Except for the instances where ownership of agricultural land was relinquished by sale to another, if a farmer found himself in financial difficulties, the usual practice was to mortgage the land, which he could subsequently redeem. An inscription issued in 966 A.D. concerns the mortgaging of certain sawah land which was subsequently redeemed by the owner for one and a half times the mortgage price. There is also a record of mortgaged land having been redeemed by other than the owner. In the second part of the Kembang Arum inscription of 902 A.D., according to Sarkar's translation, it states that the Rakryän of Wantil, his wife and three sons, purchased the mortgaged land of the rāmas of Panggumulan, and also purchased garden land and sawah

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40 *Adatrechtbundel 33*, 1930, ("Ontwerp voor een verzameling van adatoorkonden", p.16).

41 N.J. Krom, *Hindoe-Javaansche geschiedenis*, 225.
fields from the dapuntas Prabhu and Kaca for three kati of silver. Bosch, in his translation of the passage, considers that the rakryan and his family redeemed the rāmas' land by handing over to the mortgager (whose identity is not disclosed) the gardens and sawah fields they had purchased from the two 'honourable gentlemen'. A hypothetical explanation of this transaction is that the Rakryan of Wantil and his family probably wished to obtain the rāmas' land in order to include it in the lands in Panggumulan which they had created as a sīma domain for religious purposes the previous year (first part of the inscription); the rāmas' land may have adjoined it. The rakryan, who is also referred to as raka, and his wife dyah (princess) Prasada and their sons were in a position to redeem the mortgaged land, and to purchase the gardens and sawah fields as well; it would have been a pious act on the rāmas' part also to relinquish their land to a religious domain.

No doubt many farmers became involved in debts they were unable to meet, and in this manner they probably lost their land to someone else, who could afford to redeem it. Regulations dating from the eighteenth century in Bali may throw some light on the subject of land mortgage in ancient Java. By-laws issued by the ruler, and said to be based on ancient decrees, include the rights of both mortgager and mortgagee and rulers for the settlement of debts; the ruler's permission to mortgage land had to be obtained. Share-cropping

42 Panggumulan I and II (Kembang Arum) of 902 A.D., IIIb; lines 9-11 (Sarkar, II, 38).


44 F.A. Liefrinck, Landsverordeningen van Inlandsche Vorsten op Bali, 1917, 185.
Paron or maron, is another custom of ancient origin. Share-cropping on a farmer-landlord basis involved halving the produce of a given sawah field. In the case of communal village land there was a five-part division of harvested produce; one-fifth to the village authorities, two-fifths to the ruler and two-fifths to the farmer who produced the crop. The paron system exists to the present. 45

As far as rights to irrigation water in this period of Javanese history are concerned, there is even less evidence available than for land rights. According to observations made by Dutch writers of the nineteenth and early twentieth centuries, there did not appear to be any definite ruling on water rights during the colonial period, from which we could possibly have drawn conclusions for earlier periods. There are inscriptions which give direction concerning water distribution and payment. 46 The Sarwadharma charter of 1296 A.D. contains the instructions which read, following Pigeaud's translation, 'as to the case that there is buying of (irrigation) water by the lands of those Royal servants that form their support, they shall join in the buying in accordance with (6) the irrigated rice-fields they have.' 47 Pigeaud suggests that the obligatory compensation payments for irrigation water was 'particularly effective for blackmailing purposes' during the fourteenth century; landowners downstream, if they were 'unwilling to pay up', could


46 Van Naerssen, 46.

47 Sarwadharma charter, plate 4, verso, lines 5-6 (Pigeaud, III, 147).
have their supply cut off by neighbours upstream. 48

An inscription of 1060 A.D. issued by one of Airlangga's
successors in Janggala, who had taken over the Dharmawangsa
title and the Garuda symbol he used, refers to the care
Airlangga had devoted to establishing irrigation works.
The inscription goes on to record that an irrigation channel,
constructed by 'mpun Bhatara Guru' (Airlangga's posthumous
title) ran through the territory of the freehold of Sumenkka
and that provision had been made for the inhabitants to use
the channel to conserve water in the wet season, to use in
the dry season. 49 The place Sumenkka, which occurs several
times in the inscription, is in the district of Mojokerto.

THE BALINESE SÉKAHA SUBAK

The Balinese subak consists of a complex of
individually owned rice fields receiving water from the same
irrigation system, either from a major conduit or through a
network of smaller channels. 50 All phases of management and
cultivation within the sawah complex are carried out by the
farmers themselves in a sèkaha subak, an irrigation association.
Subaks, as noted in the introduction, have existed in Bali
for many centuries but the system appears to be unknown

48 Pigeaud, IV, 383. Pigeaud remarks that the mention of
irrigation water in the charters is proof of the
agricultural character of most religious domains.

49 N.J. Krom, 'Epigraphische aantekeningen I II III',
TBG, LV, afl.4,5,6, 1913, 596-8.

50 See C.J. Grader, 'The Irrigation System in the Region
of Jembrana', Bali: Studies in Life, Thought, and
Ritual, 1960, 276-88; Aubrey Birkelbach, Jr, 'The Subak
Associations', Indonesia, 16, 1973, 153-69, for modern
subak associations.
elsewhere in Indonesia. Outside of Indonesia, according to Korn, similar systems are found only in Madagascar and in the Philippines, in Northern Luzon. The Ilocano have irrigation associations which they call *pasayak*, but it is not known whether these date from pre-Spanish times, although Lewis considers it likely; all technical and operational terms are Ilocano, not Spanish.

There is proof that in Bali *subak* systems were in operation at least 300 years before the Majapahit era. Inscriptions issued in 1022 A.D. by Anak Wungçu, the younger brother of the East Javanese king Airlangga, refer to *kesuwakan*. The charters refer to particular *sawah* land within the *subak* complex, the *sawah Kadangan i kesuwakan Rawas*. *Suwak* is an Old Javanese term for a dike or earthen wall around a *sawah* field. Unfortunately, there seem to be no similar references to *kesuwakan* in Old Javanese epigraphy, which may lead to a negative conclusion regarding the possible existence of a similar organization in ancient Java. Groothoff considers the *subak* system to be typically Balinese, having developed as an entirely indigenous Balinese concept, due, he considers, to the Balinese inherent spirit of co-operation and partly as a natural development arising from ground and

51 V.E. Korn, *Het adatrecht van Bali*, 1924, 47.

52 H.T. Lewis, *Ilocano Rice Farmers. A comparative study of two Philippine barrios*, 1971, 133, 144. Lewis remarks that the head of the *pasayak* is known as the *pangulu*, reminiscent of the Old Javanese title for irrigation official.

water rights which Groothoff again maintains, are peculiar to Bali. However, the present concern is not with the possible origin of Balinese subak associations as with the function and purpose of the organization. Furthermore, a closer look at the subak system in Bali may provide some indication as to whether a similar system of irrigation management may have existed in Java prior to the close of the Indo-Javanese period.

The basis of the subak system is its complete independence of village administration. Although the farmers have certain obligations to their village, all matters pertaining to their rice fields, such as setting a limit on the acreage any one member may possess, planting and harvest times, water distribution, maintaining and policing the irrigation system, finance, and religious obligations, in fact all facets of irrigation farming, come under the sole charge of the sekaha subak of each particular irrigation area. The sekaha subaks are a very significant part of rural life in Bali. The advantages of belonging to such an association are not only its material benefit to the farmers, as a group as well as individually, but social and religious enrichment as well. Membership, generally of no more than a hundred members, strengthens the social ties between the farmers, who not only work in close co-operation but meet regularly at subak meetings.

As Balinese subaks have always been closely associated with ground and water rights fixed rules have applied to both since early times. Such rules and regulations

54 A. Groothoff, 'Studie over het inlandsche waterschapwezen (soebakwezen) op Bali en Lombok', Adatrechtbundel 15, 1918, 372. Groothoff maintains that Balinese land and water rights are unique.
were laid down by subak officials, in consultation with all members of the subaks in less important areas and by the ruler in key regions. Records of land and water rights and regulations pertaining to agricultural management were carefully preserved, becoming part of the sacred collection of kertas referred to in the Introduction above. Van Eck and Liefrinck point out that there were formerly two kinds of village and subak regulations: 1) awig awig, laws and regulations transmitted orally at village level; and 2) kerta sima, rules and regulations issued by the ruler and kept in the kraton archives. Kerta sima subak are a type of praçaasti, a charter or edict, recording the setting out of new sawah land and the foundation ceremonies and feasts held to mark the occasion.

The majority of kerta sima subak begin by recording a newly formed subak association, or by defining the borders wherein a particular sekaha subak was to exercise control. Then follow explicit rules and regulations which apply to every subak member, from those of the brahmin caste to the lowliest sudra. Members are urged to live in peace and

55 See R. van Eck and F.A. Liefrinck, 'Kerta-sima of Gemeente en Waterschappenwetten op Bali', TBG, XXIII, 1876, 161-5.

56 It is an accepted fact in Bali that where agriculture is concerned no privileges are accorded to rank or caste. Liefrinck remarks that no one, however high his caste, was ashamed to take part in rice cultivation. A brahmin never minded being asked to repair a water conduit or to work with spade in hand by the side of a sudra, who as a fellow subak member, was his equal. (F.A. Liefrinck, 'De Rijstcultuur op Bali', De Indische Gids, II, 2, 1886, 1054.) See Birkelbach for the place of the brahmin caste within subak associations of today (Birkelbach, 157).
harmony with each other and with neighbouring subak members with whom they share the irrigation water, to work diligently and to choose a klian subak, a head, with care, having regard to the attributes required of a subak head. The klians themselves were instructed to maintain good relations with the village administration and to weigh all questions and complaints by subak members without bias or favour. They were also to see that the rules regarding offerings to be made to the agricultural deities were performed faithfully, whether the harvest happened to be a good one or a failure. Further regulations contained in kerta sima subaks concern the organization of the subak, rules for various duties to be fulfilled, the klians' obligations to members and vice versa, as well as regulations concerning water distribution, taxes, fines, and the conducting of religious feasts and yearly subak cock-fights.

Subak officials

At the present time the three government officials connected with subaks are the sedahan agung, the klian sedahan and the sedahan tambaku (nowadays sedahan tembuki or sedahan jeh). In pre-Colonial times these three offices were part of the court structure. The sedahan agung, the district head, was accountable only to the ruler. This office appears to be the equivalent of pembékêl or punggawa in Java. The klian sedahan is the link, as it were, between the sedahan agung and the sedahan tambaku. The sedahan tambaku has charge of all subaks within the boundaries of one village, or within the territory covered by several villages situated close together. They pass on to the subak heads any instructions from government level issued through the sedahan agung. They also decide on the allotment of irrigation water to each subak, where several
subaks are drawing water from the one source. Birkelbach considers that the present function of the sêahan tambaku or sêahan jêh, as tax collector for the Indonesian government and also as liaison officer between the government and the farmers, is essentially the same as in pre-Dutch times.

The klian subak is the permanent head of the sekaha subak, assisted by his juru arah, scribes or criers, who are chosen by him with the other subak members' approval. In pre-Dutch times there were assistants at a lower level known as savas. The pêkasih are those subak members who perform, in turn, duties such as repairs to dikes and conduits or the construction of new small-scale conduit systems. The pêmaningku, the subak priest, holds a semi-official position within the sekaha subak. He is responsible for the care and maintenance of the subak temple. He supervises any repairs to the temple and performs the dedication of offerings made by subak members and their families to the subak deities and guardian spirits of dams and irrigation systems.

Forming a subak

Whenever a new subak is to be established the preliminary organization is carried out by one of the group of farmers who have decided to form the association. The man chosen is the one considered most competent to supervise the initial work of laying down the irrigation system, i.e. excavating the conduits and so on. He must be a man with outstanding ability in organizing a work force and he must be


58 Birkelbach, 160.
honest in handling the finance necessary for the new irrigation project. When the initial work of establishing the new sawah area is complete, the leader steps down and a meeting is held to choose the klian subak, the permanent head. A kerta sima subak from Buleleng, said to be extremely old, instructs the subak members to choose a klian with care. When the choice has been made - and it is often the man who has just stepped down - a report is drawn up for the sédahan tambaku, who passes it on to the sédahan agung for his approval.

The position of klian subak is an onerous one which calls for a man with an impeccable character and one who has had sufficient education to enable him to read and write. He must not at the time hold a position within the village administration nor within the village temple, and he must not be childless. He should be experienced in farming and water-distribution, and he must be able to represent the sékaha subak in dealings with the village officials and with the sédahan agung, and must strive to maintain good relations with both. His duties are extensive and demanding, as every facet of irrigation work is under his direct control. He also organizes the regulation of water allowance to each subak member's sawah, although this is done in close consultation with all members of the association.

The klian subak's first duty in a newly formed sékaha subak is to draw up a sawah register, a pipil, or pémariik, a collection of lontar leaves on which is recorded the name of every sawah owner, his address and the size of his fields.

59 As de Casparis points out (II, 216, note 24), adult men without children do not count in basically agricultural societies.
(Of interest here is the report in Eindresumé II, which states that in Pasuruhan, in East Java, the use of a pipil, given out by the village head was noted, on which was recorded the names of the sawah owners, the size of their fields, the amount of tax payable and so on.)

**Subak duties**

**Subak** members, in pre-colonial and early colonial times, were expected to fulfil the following duties:

1) those directly affecting the subak and the members; and

2) those duties ordered by the ruler, to be carried out by subak members for the ruler's benefit, and for the benefit of the state in general. To the first category belong the following duties, as set down in *kerta simas*:

1. **Maintenance of dams, conduits and sluices, and the making of ponds and other smaller irrigation works.**

2. **Guarding the conduits and the irrigation water supply.** Regulations state that irrigation installations containing only a limited quantity of water shall, as soon as the water level becomes low, be guarded day and night by a number of subak members, to prevent fishing or damage to the installations and particularly to prevent stealing of precious water by sawah owners further downstream. The *klian subak* must personally check that the guards attend to their duties.

3. **Maintenance of roads and culverts.** Roads that are used by the *sêkaha subak* must be maintained by the members. These roads, which are open to the public, are used by subak members when transporting their harvested rice to the rice barns, and by their womenfolk, who pass to and fro to the subak temple.

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60 *Eindresumé van het onderzoek naar de rechten van den Inlander op den grond*, II, 253, quoted by Liefirinck, 'De Rijstcultuur', 1043, note 1, concerning an investigation into ground rights for the indigenies of Java and Madura.
to present their offerings. Culverts must be maintained where the irrigation conduits cross a roadway.

4. Police surveillance within the subak.

5. Construction and maintenance of the subak meeting house and temple. No subak association is without a temple wherein the agricultural deities are worshipped and called upon to protect and ensure the fertility of the rice fields.

The second category, that of service to the ruler, includes maintenance of the kraton, which was carried out jointly by the subak members and other villagers. The subak members were expected to provide raw materials such as straw for wall linings, atap for roofing and firewood and cooking ingredients for the kitchen. 61

Water regulations

In Bali the ruler, as earthly representative of the gods 'owned' all water flowing naturally, therefore his right to tax the rice yield hinged on his indirect right to the water flowing in the rivers and larger streams, used for irrigating the farmers' sawah fields. Van Eck and Liefrinck observed that the water tax, suwinih, was considered by the people to be a small fixed fee for which the ruler 'hired' river water to his subjects; they, by paying suwinih to the ruler, were making an offering to the river god. 62

The ruler delegated the responsibility for irrigation management at court level to his representative, the sedahan agung. The sedahan agung in turn entrusted to the sedahan tambaku


62 R. van Eck and F.A. Liefrinck, 'Vertaling van de Kerta Sima Subak of waterschappenwetten', TBG, XXIII, 1876, 216. Also Groothoff, 315f.
the duties of water distribution to the subak complexes. At the subak level, distribution to individual fields was in the hands of the klian subak. Conversely, in the case of dam construction, if members of a newly established sekaha subak wished to site their dam on a river where dams already existed they had first to obtain the ruler's permission by appealing through their klian subak to the sedahan tambaku, who in turn passed the appeal to the sedahan agung. The sedahan agung, being the ruler's representative, commenced action by first investigating the site to ensure that the dam would not be too close to existing dams, thus possibly affecting the water supply of the established subaks. After these subak groups have signified their agreement to share the water source, the river, with the new subak, permission is granted to construct the new dam.

It is also determined at the time of building the dam how much water will be allowed to the new subak in times of low water level, and in which month they will receive their share of water from the river. From then on the new subak members are free to dispose of their joint share of irrigation water amongst themselves, providing that they observe the rules of water restrictions in times of drought, and providing that they pay their suwinih to the ruler.

The Gede kerta sima subak, number 108,\(^{63}\) provides an example of regulations which apply to a group of subaks sharing the same water source. Regulations for water distribution between the Gede subak and three others include instructions stipulating the width of the opening of the main conduit, to ensure that

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\(^{63}\) Groothoff, 347. The first few pages of this kerta sima are written entirely in Old Javanese.
each subak in its turn receives the allotted amount of irrigation water. The size of the opening is expressed in tampahs. The kerta sima also records that ten tembukus, distribution blocks, were in use in the main conduit to divert the water to secondary channels.

Fines and penalties

According to Liefrinck, guarding subak property was a duty of the highest importance. Very heavy penalties were imposed on members who had transgressed the laws laid down in kerta sima subaks. Damage to sawahs or to dike walls caused by someone's animals, for example, led to severe punishment for the owner. Some subak regulations contain directions concerning guard duty, in order to protect the sawah from damage or to discourage theft from the rice crop. Fines imposed were to be paid by the following subak monthly meeting, otherwise the fine was to be doubled and the farmer given three days in which to pay. If he still failed to settle the fine the fact was brought to everyone's attention by the placing of a bamboo pole, with dry leaves and a bundle of straw attached, in the transgressor's sawah, and at the same time cutting off his irrigation water supply. The farmer is given a further three days in which to settle his fine; during this time his fields are mortgaged for the amount of the fine, often to the sédahan himself. 64

Infringement of any sèkaha subak rules was dealt with at the monthly meeting. Those who refused to submit to assembly decisions were fined. Before this occurs, however, the recalcitrant member has a right to present his case to the sédahan tembaku, or to the sédahan agung.

64 Liefrinck, 'De Rijstcultuur', 1056-8.
In *kērta sima subaks* fines are stipulated for loss of work animals, the stealing of *padi* and *bībit*, and other offences, as is the compensation fee or impost payable to the farmer over whose land another lays his irrigation pipes. Water stealing appears to have been the most heavily punishable crime in Bali and in Java.
CHAPTER THREE

SAWAH CULTIVATION UNDER THE INDIANIZED RAKAS

The development of sawah cultivation in ancient Java has been discussed from its early beginnings through the growth of small village settlements practising simple irrigation farming under the administration of the village rāmas or council of elders, to the emergence of the raka and the nucleus of a kraton society. With the adoption of Indian principles of kingship the simpler hydraulic technology employed in the earlier period of development progressed, in certain regions of Java, to large-scale irrigation projects consisting of stone dams, bridges, canals and eventually tunnels, which were in existence by at least the eighth century under the Cailendras of Central Java and the Kanuruhan kingdom of East Java. As mentioned elsewhere it is generally conceded unlikely that the Javanese received their basic knowledge and techniques of irrigation management from India but the principles of kingship and priestly administration, which undoubtedly gave impetus to the development of large-scale irrigation centres, came from India at a time when Javanese agricultural development was ready to pass to the florescent stage of development, if we apply Adams' and Collier's theories on the development of irrigation societies.

1 This development did not replace sawah cultivation at village level; this would have carried on outside and independently of the more developed areas under Indianized administration.

The emergence of the raka

Raka is apparently a title of great antiquity. According to Pigeaud the terms for ruler, raka or ratu and haji, have their counterparts in kindred languages of the Indonesian archipelago, which indicates a very early concept of indigenous rulership. Van Naerssen remarks that haji was a term used in Java during the Indianized period for both the Indianized ruler and the non-Indianized raka who had his own hierarchy of officials, and that, although it can only be surmised, the raka was probably originally chosen from among the rāmas, 'fathers', of the villages involved to be the 'older brother' among them, which is the original meaning of the term raka. Thus, the earliest rakaship was a pre-Indianized institution, arising from the need for an authoritative leader as sawah cultivation increased and villages began to combine, to share their agricultural activities. A system of management involving mutual co-operation between several villages dependent on the same water source for their fields required a leader whose authority could reach beyond his own village to encompass all the villages working in co-operation.

In order to carry out his function effectively, the raka would necessarily have the right of disposal of labour and surplus produce resulting from more intensive cultivation. These rights to disposal of labour and surplus naturally involved sovereign authority over the federated villages. The need to organize the growing surplus of agricultural

3 Th. Pigeaud, Java in the 14th Century, IV, 1962, 470.

4 F.H. van Naerssen, Oudjavaansche Oorkonden in Duitsche en Deensche Verzamelingen, 1941, 3.
produce and all it entailed would have required a central bureaucracy, separate from the village bureaucracy, which in turn would have led to the appearance of the nucleus of a court structure, centred around the raka at his seat of authority, the early kraton. Van Naerssen maintains that before the adoption of Indian principles of kingship and court administration in Java a dual social structure already existed, consisting of villages governed by rāmas and a council of elders, and a centralized administration headed by the raka, the former functioning as producers and the latter as distributors of produce and services, with an equilibrium of power between them, adjusted to mutual needs. The adoption of Indian principles of kingship

Increased sawah cultivation would have brought with it a desire for political expansion, as certain rakas gained greater power and authority over their neighbours, probably due to a greater rice yield and perhaps an increased volume of petty trade. However, an ambitious raka would also have been aware that his position was vulnerable; he would have been one chieftain competing against others, all of similar rank. His position, therefore, would have required strengthening and enhancing in such a way as to lift him in status above that of his rival rakas. In order to gain the desired authority over neighbouring rural areas the raka would need to have access to more agricultural land. The earliest inscriptions issued in ancient Java before those recording land grants were eulogies to the Indianized rulers,

written in Sanskrit; subsequent charters record a significant distribution of land by such rulers, which could imply a 'take-over' by these Indianized rakas from non-Indianized rakas, and from rāmas and village communal lands.

Scholars are generally in agreement that Java was in contact with India at least by the first century of the present era, if not earlier. The fact can be accepted that Javanese rakas learnt of the enhancing aspects of Indian kingship, and the influence of the priesthood in strengthening the ruler's position. Fisher, writing of early irrigation centres in South-East Asia remarks that:

...the sailors of South-east Asia had already made contact across the seas with India, and this explains why, although Indian traders and adventurers played their part in the subsequent Indianization of South-east Asia, that process which was about to transform the region, was not simply the result of Indian initiative. For less advanced peoples often have the wit to imitate others who have progressed farther, and it was for this reason that, as Van Leur has shown, early South-east Asian chieftains, having learned by such contacts that the princes of southern India employed trained Brahmans to legitimize their rule and to organize their states according to the Hindu code, began to do the same.6

The Indian concept of kingship included a mystical charisma which gave the ruler superhuman status. Belief in the magico-religious powers of the tribal chief existed in

the Indonesian world long before the arrival of Indian influence, and this aura of divinity and magical power which surrounded the chief was essentially the same as that which set the Indian ruler above his fellow man. Therefore, the acceptance of the concept of the divine ruler, who would protect and maintain universal law and harmony, served to strengthen the position of those rakas who adopted the cloak of Indian kingship.

Kingdoms arose, developed and waxed powerful during the following centuries. New organizational structures were introduced, as small agrarian centres developed into Indianized principalities and kingdoms. New elements of law were introduced, borrowed from India and used side by side with traditional adat. Religious duties were taken over by brahmins who, in the Indianized kraton centres, replaced the village priests. Kraton officials, some of them adopting Sanskrit titles, gathered around the divine ruler who, while adopting the exalted title of Çrã Mahãrãja, the Illustrious Great King, retained his raka title as well. Throughout the Indo-Javanese period, however, independent rulers, the rakas and rakryãns, governed their own small territories, but all of them paid allegiance to the paramount ruler, the mahãrãja.

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7 See, for example, R. Heine-Geldern, Conceptions of State and Kingship in Southeast Asia, 1956.

8 Indian law never usurped Indonesian indigenous adat, according to T.C. Lekkerkerker, who points out that earlier scholars wrongly interpreted many aspects of law in Indonesia as being Indian. Although elements of Indian law were included, Lekkerkerker says, there was never a complete body of Hindu law in Java. (T.C. Lekkerkerker, Hindoe-Recht in Indonesië, 1918, 26, 29.)
Beyond the kraton the villagers continued to live according to their age-old traditional ways. As Fisher continues:

...intensive irrigated paddy cultivation supported a core of population large enough to form the nucleus of a major kingdom, extending also over the peoples of less advanced cultures inhabiting the peripheries of the basin in question. Thus by a process of mutual adjustment between the incoming Indian culture and the rice-roots traditions of the deep interiors, away from the constant coming and going of the coastal zone, the historic kingdoms of Burma, Siam, Cambodia and Mataram in east-central Java gradually crystallized out.9

The Indianized raka

Between the ruler and his subjects there was thought to exist a mystical bond, which meant that everything affecting the ruler affected his people also. If the ruler himself did not abide by the rulers of behaviour laid down by the principles of Indian kingship, his subjects suffered as a consequence and the entire kingdom was likely to be brought to ruin. The Old Javanese Râmâyana which, in the third chapter, sets down the guiding principles of kingship advises the ruler:

You the King are like a great mountain and your subjects the trees upon it.
It is the balance of harmony between the highest and the lowest that maintains prosperity and happiness.10

According to the concept of ideal kingship the ruler was obliged to protect his subjects and keep them content by

9 Fisher, 7.

10 Old Javanese Râmâyana, third chapter, stanza 77. (Translated from Hendrik Kern, Het Oud Javaansch Ramâyâna, 1900.)
establishing 'good works' such as civic amenities and irrigation works. The Rāmāyana again advised:

In order to protect the whole kingdom
You must care for the monasteries, maintain holy domains and temples of the gods,
Roads, resthouses, fountains, lakes, dams and fishponds,
Markets, bridges, all that which benefits the people you must take care of.\textsuperscript{11}

Care of the farmlands is always the king's responsibility,

for from them come all the produce for the kingdom's welfare.\textsuperscript{12}

In an agrarian kingdom, dependent on an efficient irrigation system, careful control of this system is of paramount importance. If firm and vigilant leadership is lacking the irrigation system is rendered ineffective. The welfare of the entire kingdom, if it is to survive, depends on successful productive farming which only the control of a higher authority endowed with resources and power can successfully maintain. The royal seat, the kraton city, was the centre of the kingdom and upon its efficient function rests the prosperity of the kingdom. However, the Javanese rulers could only exert their influence over a fairly limited area, due to natural environmental fragmentation and to the primitive means of communication. Therefore certain court officials were delegated to oversee the outlying agrarian regions of the kingdom, the manca nāgara.

\textsuperscript{11} O.J.R.3, stanza 70.

\textsuperscript{12} O.J.R.3, stanza 78.
The ruler's rights

The ruler possessed three basic rights, those of:

1. **drėwya haji** - the rights to a percentage of the produce from the agricultural regions.

2. **buat haji** or **gawai haji** - the right to employ corvee labour for kraton maintenance, temple building, large-scale irrigation works, etc.

3. **anugraha** - the right to grant rewards of gifts of land, gold, silver and textiles to favoured subjects.

Besides these three basic rights the ruler possessed the right to 'enjoy' his kingdom, which means that he could live a life of comfort and ease within his kraton, that he was assured of his income from his subjects and as the main link with the supernatural forces of nature he held a general though qualified right to land and water within the kingdom (see below).

**Drėwya haji**, the 'ruler's due' consisted in the main of a percentage of produce from the farmers' lands. According to ancient adat, however, land used for agrarian purposes was never actually the ruler's possession. **Buat haji** or **gawai haji**, corvee or statute labour, provided the second most important source of royal income. **Buat haji** applied to work done by the villager for the ruler or service which the ruler was entitled to receive from the villagers; this included forced labour used to construct the great temples and sanctuaries. Part of **buat haji** consisted of maintenance work within the kraton city, also probably providing transport

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13 The first known reference to **drėwya haji** occurs in the Dieng stone of 809 A.D., line 8. (H.B. Sarkar, Corpus of the Inscriptions of Java, I, 1972, 50.)
for the ruler and his family and large retinue of officials, when on tour through the provinces or manca nāgara. Part of buat haji, according to some inscriptions, included the making of 'flower baskets' for presentation at funeral sanctuaries of departed rulers at the time of certain festivals. Large-scale irrigation works were provided by the ruler for his subjects, but maintenance and guardianship were carried out by the farmers as buat haji, supervised by the ruler's agricultural officers.

Anungraha, the ruler's right to award favours to whomsoever he saw fit is sanctioned by the Old Javanese Rāmāyana:

Those who are diligent and law-abiding
you must reward with favours,
For it is the Ruler's prerogative to award favours or mete out punishment.\(^{14}\)

As mentioned in the notes on epigraphy, grants were made by rulers to various subjects and usually consisted of land, gifts of gold or silver, or of precious cloth. Through the system of anugraha the ruler could also extend temple building and public works for the benefit of his subjects, thereby accumulating more merit for himself and fulfilling his kingly duty of 'pleasing' his people and keeping them content at the same time.

The ruler's land and water rights

Ownership of agricultural land, including the right to inherit and the right to mortgage, remained within the farmer's jurisdiction, the ruler possessing only the right to undeveloped land such as forest land, and probably swampland.

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\(^{14}\) O.J.R., stanza 75.
The ruler also appears to have 'owned' the neutral land between villages; in Bali the ruler acted as arbitrator between disputing villages and at the same time, by creating a neutral strip of land between them, gained a hold over the area, by 'ownership' of that land.\textsuperscript{15} It seems that rakas gained agricultural land through marriage to the daughters of landowners, as they appear to have done in later times. The whole question of land and water rights in Java and Bali is very complex, even for present-day conditions. Judgements concerning the ruler's rights in ancient times would be simply guesswork. However, it appears that the ruler possessed only restricted rights, even over domain ground.

There seems to be very little known, and probably very little evidence remains, of the ruler's rights to water in Java. There is reference in the Nāgarakārtāgama to the purchase of irrigation water 'by the lands of the royal servants'.\textsuperscript{16} In Bali it was considered that the ruler had ownership rights to running water, rivers and streams, and this gave him the right to tax his subjects for the water they used on their sawahs. The ruler's rights to land therefore depended on the water used to irrigate the land, water which the ruler taxes for a small fee. Interest in his subjects' welfare appears to have justified the ruler's supervision over water supplies for sawah use in Bali, and the fact that the ruler was considered to be the 'owner' of the water was because of

\textsuperscript{15} See T.C. Lekkerkerker, \textit{Hindoe Recht van Indonesië}, 1918, 31. Lekkerkerker remarks that it seems that in this way the ruler usurped land rights in ancient Java and Bali. See also V.C. Korn, \textit{Het adatrecht van Bali}, 1924, 415.

\textsuperscript{16} Pigeaud, III, 147.
his identification with the river god. As the ruler in ancient Java also appears to have been identified with the river god the same conditions may have applied. In Java well or spring water was considered to be the property of the owner on whose land the well or spring was located. Liefrinck writes that in Bali ownership of water from wells, besides that from rivers and streams, was vested in the ruler who may dispose of it as he wished.17

Taxes and fines

According to Gonggrijp the ruler in ancient Java levied heavy taxes, a fact revealed in Chinese sources of the period 960 to 1279 A.D. For example, Chinese sources of Airlangga's time, from 1037 A.D., claim that a tax of one-tenth on rice was levied. A Chinese source of the Sung dynasty of 960-1279 records the levying of one ch'ien (one-tenth tael or Chinese ounce) of gold for every measured quantity of rice of two and one-fifth picul (which is about 3-8 grains of gold from every 135 kilograms), an unbelievably heavy tax according to Gonggrijp.18 What tolls and other forms of tax the people had to pay awaits a thorough study of the sources still to be examined.

Pigeaud is also of the opinion that royal taxes placed a heavy burden on the cultivators; and that the royal progress, the tours made by the Majapahit kings, must


have depleted the rice supplies and other foods in sparsely populated districts. 19

In Bali the ténah winih basis for taxation was the same as in ancient Java. Observing by long experience that a given area of farm land of a given level of fertility requires an estimated number of sheaves of rice for seedgrain, a ténah winih so called, the court taxation officials assessed each sheaf of rice at a fixed amount, payable in kind. Tax levied on rice production, payable in cash instead of kind was known as tiga sana in Bali and was similar to the water tax, the suwinih, in this respect. Tiga sāna, cash payment, was explained as tax paid to the ruler 'who cannot live on rice alone'. 20 Liefrinck remarks that sawah tax was the most important form of taxation. Special allowances were evidently made for mishap by flood damage to fields along the river. 21 Mortgaging of sawah fields is mentioned in Chapter Two; there is, however, a notable example of a ruler having approved a contract to mortgage sawah land. 22

The cost of measuring out sawah fields are recorded, for example in the Ngabean II inscription, where it states that the total sum of expenses for marking out the free-hold land was measured in gold totalling 1 süwarna kārsa, 11 süwarna.

19 Pigeaud, IV, 304.


22 The contract was signed by the ruler of Karangasem in 1874 A.D.
5 gold māsa and 3 gold kupang. Inhabitants of the royal domains were exempt from taxes but instead they were allotted duties towards the sanctuary; for example, they may have been charged to provide a sheep or a certain amount of rice for the yearly sacrifice. In Majapahit times coins were used, while in the ninth, tenth and eleventh centuries, according to the charters, payments were made to the ruler in gold and silver, by weight.

The structure of the Indianized kingdom

One of the indigenous complexes carried over more or less intact from pro-Indianized times was the concept of communal leadership, the council of rāmas, which was adapted to Indo-Javanese conditions. Social rank was based on proximity to the king; the nearer the subject was in relationship, the higher his rank in the hierarchy of the court. The court structure as a whole was based on the pre-Indianized concept of the universe, consisting of concentric circles (which, as noted above, was the indigenous Javanese concept also, applied to the village grouping). The inner circle represented the ruler, as the divine centre, surrounded by the kraton as intermediary between the ruler and the outer administration. The second circle represented the nāgara, the capital city, seat of the outer administration and residence of princes and other members of the royal family. The third circle was the nāgara agung, the greater capital, or the lands outside the city limits held in appanage by princes and nobles, the rakryāns. The fourth or outer

24 See J.G. de Casparis, Selected Inscriptions from the 7th to the 9th Century A.D., 1956, 225, note 59.
circle represented the manca nāgara, the 'foreign' land administered by headmen appointed by the ruler.

Within the area outside the kraton city there were several kinds of agricultural holdings. Sima land, or freehold estates and domains, was created by the ruler, and sometimes by rakryāns, who wished to grant an anungraaha to loyal officials or priests in their personal service. An early example is found in a decree issued by King Lokapala in 860 A.D. concerning a dharmasima lēpas, a freehold domain, he wished to create. He commands his three Chief Ministers of Hino, Sirikan and Halu to put into effect:

...the sacred royal command of the edict that has received the ratification (seal) of Lokapala. They are to protect this rigidly and mark out a free pērdikan desa. The Rev. gentleman at Bodhimimba (accordingly) obtained lands against the payment of gold 7 kati 12 suvarṇa (and) 10 māsa to the paravargga-s of Bungur South.... The measurement of their savah-fields is tempah 20, including gardens, compounds, low and high places [hills and plains], all! Moreover, there is the ground of (the village of) Kuryyak.... (This) was taken possession of by the Rev. gentleman for gold 2 kati 10 māsa.... These then should be marked out into a free pērdikan desa by the Rev. gentleman at Bodhimimba. The free-hold shall be inherited by his children...[who] shall have the sole authority over the pērdikan desa.25

A later inscription, the Surodakan charter of 1447 A.D., 26

25 Kancana (Gedangan) copper-plates, from Pl.I,B:6 to Pl.III,B:6 (Sarkar, I, 143-5).

recording the foundation of a freehold deça, district, at Waringin Pitu in East Java gives an indication of the expansion of freehold districts and domains during the period since Lokapala issued his decree in the ninth century. The Waringin Pitu freehold agricultural lands are referred to in the charter as sang hyang dhārmma, which Yamin translates as perdikan-darma in Bahasa Indonesia. Exact measurements of the area of sawah fields and other agricultural land to be included in the perdikan-darma are given.

Sima land was exempt from đrēwya haji and gawai haji. The ruler's tax collectors, the mangilala đrēwya haji, were forbidden to enter the sima estates. Being free from royal taxes the sima estates used the surplus from the land for their own purposes. Apart from freehold domains and estates, villages were also given sima status; in return for the privileges that accompanied sima status the villagers were obliged to apply themselves to a certain project. For example, the villagers of Kamalagyan were required to settle by the sima dam built by Airlangga at Waringin Sapta, in order to 'take care' of the dam, to guard it against damage or destruction. Most simas appear to have been created in favour of religious communities; they were probably awarded by the ruler with a view to gaining merit or enhancing his position as a just and magnanimous ruler.

In the nāgara agung, the rakryāns, princes, and other nobles held administrative provinces, watēks (sometimes watak), over which they held authority but which were under the jurisdiction of the ruler. The rakryāns held

27 Yamin, 26.
28 OJQ LXI, Kēlagyan inscription of 1037 A.D., lines 15-16.
rights to the produce from the land but, unlike *sima* land, *waték* were subject to *dréwya haji*. Clustered within these regions, which the Dutch writers referred to as appanages, were villages over which the *waték* held jurisdiction. In Çri Kahulunan's inscription of 842 A.D. the phrase *wanwa i tru i tpussan watak=kahulunnan*... appears, which reads 'the village of Teru i Tepusan under (the jurisdiction of) the Queen Kahulunan...'.

The earliest reference to *waték* is found in the Dieng stone of 809 A.D. wherein it states that, *hana sima i panulingan vatak [waték] pikatan savah...*, 'there is a freehold at Panulingan under Pikatan, of savah fields...'.

**The rakryâns**

The title of *rakryân* was usually applied to princes

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30 Sarkar, I, 50 (verso, lines 2-3).

31 Sarkar suggests that the term *raka* may have been an abbreviation of *rakryân* which he derives from the Sanskrit *karya* or *kriya* with the Indonesian honorific prefix *ra* and the suffix *an*. (H.B. Sarkar, *Survey of Some Aspects of Old-Javanese Inscriptions of Central Java* in Buddha Prakash (ed.), *Studies in Asian History and Culture*, 1970, 48. Van Naerssen maintains that the word *raka* is an ancient Indonesian word meaning elder brother in its original sense. (F.H. van Naerssen, *Some Aspects of the Hindu-Javanese Kraton*, *Journal of the Oriental Society of Australia*, II, 1, 1963, 17.)

Goris notes that the title *rakryân* appeared in Balinese inscriptions for the first time during the reign of Udayana, Airlangga's father. (Roelof Goris, *Prasasti Bali*, II, 295.) The usually accepted explanation for *rakryân* is that it derives from *ra-kriyân* (Balinese, *kliyan*, modern *klian*).
who ranked next to the king at court, probably his younger brothers. Rakas and rakryâns seem to have held much the same degree of rank and some are referred to as both raka and rakryân in the same inscription. Both held positions of the highest authority in ancient Javanese kraton society, such as mahâmantri, chief minister, and a ruler could rise from the ranks of either the rakas or the rakryâns. Apart from their duties within the general administration of the kingdom, the rakryâns exercised authority over their own principalities or appanages. However, Stutterheim points out that they did not hold such an extensive authority over their agricultural lands as the village administration or the villagers themselves held over their land. Rather, in Stutterheim's opinion, the rakryâns and the rakas stood in a magical relationship with the ground, connected with their choice of what was to be their burial ground. Their names were mostly identified with stones of various shapes or forms, or trees of various kinds. In this respect, Stutterheim notes the similarity between the rakryâns of Java and the karaengs of Makassar, who also held an 'ornament' or symbolic rank of a magical nature, who, as in Java, also could rise to the rank of ruler of a kingdom, and whose power was connected with magical objects such as stones, and other things of an animistic nature. 

The rakryâns and rakas maintained contact with the land through the mangilala drêwya haji, a group of people who appear to have performed special functions in court society, perhaps with some magical overtones.


33 Stutterheim, 166.
Both the ruler and the rakryāns employed mangīlala drēwya haji, to collect the taxes and dues. Rakryāns were entitled to receive drēwya haji and gawai or buat haji from their own subjects, and they had their own officials and servants on their appanages to attend to agrarian matters, the most prominent among whom were the nāyakas (nowadays bēkēls). In a copper-plate of unknown origin dating from 924 A.D. the rakryāns' 'servants' are specifically mentioned. The inscription contains a long list (although by no means the longest in inscriptions) of officials and servants who were forbidden to enter freehold grounds. Rakryāns apparently had authority to grant anugraha to favoured subjects; in the copper-plates of Panggumulan it is recorded that the rakryan of Wantil, pu (mpu) Palaka, his wife dyah (princess) Prasada and his three sons gave land to 'the god and goddess of Kinawuhan'. Rakryāns apparently wielded considerable authority in ancient Java. The three Chief Ministers, the mahāmantris of Hino, Sirikan and Halu, the highest officials in the kingdom, were always rakryāns or rakas.

Samēgats (pamēgats)

Apparently samēgats were also of noble birth and bore a rank of considerable importance within the structure of kraton administration, although Pigeaud translates the term, in the context of fourteenth century Majapahit, as

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34 See de Casparis, II, 240, note 171.
35 Sarkar, II, 209-10, lines 9-16.
36 Sarkar, II, 31, lines 2-4.
37 In Malay the title mēgat occurs as a princely title, for example, Megat of Trengganu.
'a gentleman'. From Balitung's reign to at least Sindok's time the title seems to have ranked just under that of raka and rakryan. In the lists of those high dignitaries to receive ceremonial gifts at foundation ceremonies the samégats are generally listed with the rakryanş. In Balitung's charter of 907 A.D. this is found to be the case. In the same charter there is a reference to the Samegat of Kalangwunkul who was accompanied by his four wives, each of whom bore the rank of samégat, whether because of their husband's title or as their own right is not known. The priest who conducted the ceremony, administered the oaths and so on, was also entitled Pamegat Makudur. Some samégats bore the honorific sang before their title and probably belonged to the priestly class. In the Bakalan inscription the two samégats mentioned appear to be the only court officials involved in the execution of Rakryan Mangibil's decree, besides mpunta (Reverend) Pakatuppan and possibly the patih mentioned in the list of those receiving ceremonial gifts. 38

Other court officials

Long lists of officials appear in inscriptions, following after the rakryanş and samégats. 39 Further down the ranks of court hierarchy were the officials classified as

38 See Chapter Five below.

39 It is apparent from the Perot inscription of 850 A.D., for example, that Rakryan Patapan had a very large number of personnel at his disposal. See the two inscriptions from Candi Perot (de Casparis, II, 211-43). De Casparis (p.220) points out that this inscription is the earliest known example containing a regular list of court dignitaries following reference to the king.
wadwa who, although the term implies 'servant', apparently were entitled to the honorific predicate sang. These officials in turn had their own representatives, pawuwus or parujar, who probably represented them at foundation ceremonies and other matters in outlying agrarian regions. The persons heading the lower group of court dignitaries who always appear first on the list of those officials forbidden to trespass on freehold agricultural lands are the pangkur, tawan and tirip, the three 'honourable gentlemen', who had the authority to collect royal taxes. They are first mentioned in charters as early as the Kalasan inscription of 778 A.D.; at that time they seem to have had spiritual functions which later changed to those of tax collectors, though perhaps for religious dues only. However, these officials retained their position of importance throughout the Indo-Javanese period.

The bond between the village and the kraton

As far as agrarian development in ancient Java was concerned, the pattern of kingship and priestly authority was the most significant element of Indian culture to be superimposed on the Indonesian way of life. The village, which until the principles of Indian kingship were introduced and a royal centre of authority established, had needed to produce only sufficient for its own needs, now had to produce

40 See de Casparis, II, 224.
41 See Sarkar, I, 35, also 39, note 39.
42 De Casparis, II, 221, note 48. De Casparis says they were court officials; van Naerssen considers them to have been notable village heads. (F.H. van Naerssen, 'The Cailendra Interregnum', India Antiqua, 1947, 250.)
enough to contribute to the support of the king and his court, and the army. The villages filled a dual role, that of suppliers of rice for the kraton within their district, to be used for both consumption and export, and as a source of manpower for the construction and maintenance of temples and court buildings.

Sawah cultivation on an intensive scale demands a high degree of co-operation, not only between villages, but between the village and the court. Economic growth and power depend on a stable organization at both levels. During the entire Indo-Javanese period there appear to have been two distinct forms of government, one purely indigenous, at the village level, and the other at court level. As van Naerssen says:

...before the coming of Indian influence Javanese society consisted of a large number of small exclusive adat societies who each had their own history, adat and customs, their own government and administration. Then a royal government was introduced, but the ruler of this administration saw to it that the various social groups, or village settlements under his jurisdiction remained undisturbed as far as possible, to follow their own pattern of life. Because of this, during practically the entire period of Indo-Javanese history there were two forms of government existing side by side, the village government and the court government as a 'mantle of protection' over the various villages under its care. The first was represented by the rama and the second by the Indianized raka and his staff of high ranking officials.43

43 Van Naerssen, 'Twee Koperen Oorkonden van Balitung', 447 (translation).
Both the kraton and the village depended on each other in a situation of expanding agrarian economy: the village was dependent on the rulers for public works such as bridges, roads, irrigation works, and other amenities including protection; the kraton was dependent on the village for food supplies, manpower for military service and corvée labour. Irrigation works on a large scale were established by order of the ruler; the rural population lacked both the facilities and the workforce required for such large-scale projects. Construction and maintenance of such projects was carried out in accordance with rules and regulations issued by the ruler's agrarian officials.

The Nāgarakṛtāgama sums up the interdependence of wanua and kraton in canto 89, stanza 2, lines 2 and 4:

2. If destroyed be the peasants' cultivated lands (as a matter of course) will accompany them, that (area) which has a shortage of means of subsistence; now that is the town.

4. ...Therefore equally they must be taken care of: stable will be both,... 44

44 Pigeaud, III, 105.
CHAPTER FOUR

RELIGIOUS ASPECTS OF AGRARIAN LIFE
IN ANCIENT JAVA

In no study concerning agrarian life in Indonesia can the religious aspect be omitted, for we are, as Zoetmulder points out, 'observing a culture which has to a high degree been formed by religion'. In Java, and in fact everywhere in Indonesia, there exists an inherent belief in spirits, both divine and malevolent; there is also a belief in the power of various spirits to protect or to punish those who earn their blessing or displeasure. A vast system of ritual and taboo govern the life of the agricultural community and every farmer endeavours to control the vengeance of evil spirits who might bring disease and misfortune to his household, animals and crops.

Belief in *semangat*, the vital force which is thought to inhabit things both animate and inanimate, is widespread among rural folk, especially those from the more isolated regions. This vital force is considered to dwell in soil, plants, rocks, rivers, trees and mountains as well as in man himself. Winstedt wrote of early man's animistic search for identity thus:

Casting about for an image of the personal soul, the Malay noted the flutter of the heart, the vital spark in the fire-fly, the

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stridulous telegraphy of the cricket in the camphor-tree, the uncanny likeness of the stick-insect to the rattan. So he found the soul of a camphor-tree in the cicada, the soul of rice in the grass-hopper, the soul of the rattan in the stick-insect, the souls of men and the coconut-palm in a bird.²

Living as they do close to nature, the inhabitants of the villages of Java have retained many of their animistic beliefs. Each village possesses its own particular rural spirits, guardians of the soil, of water and of crops. Hamlets attached to villages worship the spirits of the mother village, the dang hyang desa; only freehold hamlets possess their own agricultural guardian spirits.³

An important aspect of the Indonesian's world view in ancient times was the concept of harmony between the two worlds, heaven and earth, based on the belief that his world is but a reflection of the cosmic world beyond. Belief in the inseparability of heaven and earth found expression in all aspects of his daily life and his aim was continually directed towards maintaining harmony between his own small world and that of the gods. This world view, particularly among the rural communities, persists to the present. As Moertono expresses it:

The activities of man within and thus towards this society in which he lives are mainly directed to maintaining this harmony within his sphere of life. He must take preventative

and repressive measures against all possible disturbances of his social order and, because of the assumed mutual dependency between the micro- and the macro-cosmos, of the universal order also. In this sense social organization is not involvement in the members' daily routine but in maintaining adherence to established social patterns, the main manifestation of harmony.... In agrarian countries where man's life depends so much more on the steady flow of seasonal change, where the concept of harmony is viewed more in terms of regularity and familiarity with the pattern of community life, any interference in the life of society may disturb the balance of the universe.4

Rice growing ceremonies

For the rice farmer and his family every phase of rice cultivation has a religious significance and special rituals apply to each stage of the rice plant's life. These rituals are a blend of indigenous animistic beliefs and Hinduism, with later additions from Islamic influence. Van Akkeren, writing of rites considered necessary for the successful cultivation of rice, notes that:

...these must create the highest possible level of harmony and solidarity between the mood of the spirits and the frame of mind of the farmers. The powers of heaven and earth, especially those of the chthonic side of the cosmos, must be coaxed into a mood of extreme good will.5

Everywhere in the sawah regions of Indonesia the rice plant is considered as a living person, requiring

4 Soemarsaid Moertono, State and Statecraft in Old Java, 1968, 3-4.

attention and care from birth to death. The development of rice, from the seedling to the grain ripe for harvesting, is likened to the physical process of human growth and the plants are treated accordingly. The life of the rice is believed to be constantly dependent upon the guardianship of spiritual forces and, providing the necessary ritual is observed, the rice is protected by the deities, the foremost of which is Sri the rice goddess. Dewi Sri is looked upon as the embodiment of all semangat, the life force which generates, nourishes and watches over each and every rice plant. Sri represents the whole field of rice; as van Akkeren expresses it '...it is she who keeps the rice from the whole field together during the terrible period (terrible for the rice which is seen as a person) when the rice is cut, pounded, cooked etc...' and furthermore '...as a concentration of the spirit of the rice, Sri calls her rice-folk together and lures the lost rice-souls towards her.'

The name Sri is said to have been borrowed from an Indian goddess, Visnu's consort, although Quaritch Wales does not agree on this point. He considers that Sri is to be identified with the Bengal rice goddess Devi. Sri and her partner Sedana, identified with Sardhana, another name for Visnu, are the divine couple linked with the remote ancestors of the Javanese and Balinese people. Grader draws attention to the apparent relationship between the worship

6 Van Akkeren, 18 and 20.

7 H. G. Quaritch Wales, The Making of Greater India, 1961, 111.
of ancestors and the worship of Sri and Sadana (Sedana) in Bali. In Java and Bali the couple are associated with the fertility of both man and rice.

The fertilizing of the rice plants is considered to be brought about by contact of the grain with water, flowing either from irrigation channels or descending from the mountainside to the rice field. The union takes place within the sacred earth when Sri, as the rice seed, meets Visnu, the water. Sri here represents the concept of death, rebirth and growth. She becomes incarnate in the rice by the process of dying, and as seed grain she is buried in the earth. There she meets with Visnu, himself reborn in the water, and their marriage takes place, the joining of the rice seed and the water, the ovum and the semen. Thus begins the life cycle leading ultimately to the yellowing grain, after which it enters the earth again and the never-ending cycle continues.

Sri, under her Indian guise, is the primeval Earth Mother. In this guise she is the Goddess of Death, from whom springs all life anew, for man, animals and plants. Can Sri the Rice Goddess be identified with Durga, who is also the Goddess of Death? Krom has recorded the large number of Durga statues found in Java, and also many which appear to represent Sri, and unidentified female

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9 See R.M. Sutjipto Wirjosuparto, Apa sebabnya Kediri dan daerah sekitarnya tampil kemuka dalam sedjarah, 1958, 112-13 for his remarks on C.C. Berg's views on agricultural symbolism in the Calon Arang.
figures which may represent either goddess or both.  
A thorough investigation into the Durga-Śrī relationship  
may bring to light some interesting conclusions. In Bali  
Śrī has four other manifestations, Uma, Durga, Giriputri  
and Ibu Pertiwi, depending on when she makes her  
appearance. As Śrī herself, she is the goddess of the  
growing rice plants and the ripening ears of grain. As  
Uma, she is the deity of both sawah and tegalan, bringing  
to life the seed within the earth. She is Durga in her  
aspect of the goddess of the temple of the dead, supervising  
the demons who bring diseases and plagues of pests to  
the growing crops. Giriputri is her manifestation as  
goddess of the sacred mountain Gunung Agung, consort of  
the mountain god Mahadewa. Pilgrimages are made to Gunung  
Agung by the rural folk who come to ask of these two deities  
holy water from their sacred slopes, water to sprinkle on  
the sawah fields and in the irrigation channels. When the  
deity of the soil, the Earth Mother herself is venerated,  
Ibu Pertiwi is her name.

Kruyt remarks on the similarity of customs and  
beliefs concerning rice cultivation in all parts of  
Indonesia where rice is grown, and especially in regions  
untouched by Indian influence. Van Erde, writing of  
ancient customs and beliefs among the Sasaks of Lombok,

10 N.J. Krom, Inleiding tot de Hindoe-Javaansche Kunst,  
II, 295-410.

11 See Grader, 166-7.

12 A.C. Kruyt, 'Gebruiken bij de rijstooogst in enkele  
streken op Oost-Java', MNZG, XLVII, 1903, 47. See  
Parsudi Suparlan, 'Upatjara panenan padi', Manusia  
Indonesia, nomor 1-6, 1969, 49-52 for present-day  
rice harvest ceremonies.
describes planting and harvesting rituals observed by the rice farmers. When the rice seedlings are ready for transplanting the owner of the field first selects nine seedlings and plants them near the irrigation inlet to the field, the most important part of the field. Each seedling must consist of a certain number of stalks, ranging from one to nine, and must be planted in a fixed order. One plant is placed in the centre with the remaining eight around it, representing the eight points of the compass plus the centre. Later, from this plot of specially selected and carefully tended rice plants the ripened ears will be harvested to become the 'bridal pair', the inan paré or nini pantun. The significance of this ritual planting of the first nine seedlings is long forgotten; the farmers have no explanation for it other than that it is an ancient custom which they never fail to observe.

When the rice ears begin to swell they are treated as pregnant women. Rice pap or eggs are placed by the irrigation inlet and daun lègo-lègo, or lègundi, are burnt there to ward off evil spirits. This is seen as the 'drying out' period, the pendédedeng, which is likened to the several days when a woman, after giving birth, is placed close to a fire kept continually stoked. The rice plants are also offered sour fruits to appease their craving, as a pregnant woman may crave sour food. Sometimes water is sprinkled over the 'pregnant' plants after the water has either had cooling mendicaments added or has stood for a time in a sacred place, such as an ancient grave

or seat of the gods. This is to ensure a full harvest. Van Eerde notes that the Baduys of Java have the same customs concerning 'pregnant' rice.¹⁴

When the rice is ripe, before harvesting commences, the farmer cuts the ears from the nine plants and from these two bundles are made, each consisting of 108 stalks with the leaves left on, to represent the inan paré, the divine pair. One bundle is bound with white cord until the leaves are no longer visible; this represents the bridegroom. The 'female' bundle is bound so that the leaves form the shape of a woman's hairknot. The two bundles are then bound together and placed near the irrigation inlet, to remain there whilst the rest of the rice crop is harvested. During harvest the reapers may not make any undue noise, as this might disturb or upset the rice goddess Sri who has descended and entered the grain.

The harvesting must be executed with care so that no grains fall to the ground, otherwise the rice goddess in these lost grains will grieve for her sister grains, from whom she will be parted forever when the harvest is taken to the rice barn. While the reaping is in progress the severed ears with a part of the stalk attached are placed on the ground, never on the sawah dikes. If this precaution is not observed it is believed that mice will attack the rice when it is stored in the barn. Likewise, the pole used to carry the rice away from the field is never placed on the dike, for fear that evil spirits will later devour the rice in the barn. If the

¹⁴ Van Eerde, 556, note 1.
harvest is not completed by evening the leaves on the remaining plants are looped over so that malevolent spirits cannot commence harvesting the rice for themselves during the night.

When the harvested rice is taken from the fields to the rice barn the nini pantun, or the inan paré, is carefully carried by a woman who guards it against any upset during transit. The Sasak custom is to lay the nini pantun on a cushion of rice straw placed on the floor of the rice barn. In some regions of Lombok the 'bridal pair' rests on half a coconut shell in which are nine kemiri nuts and nine small black stones. Mantras are recited at this time; in fact, mantras against plague and pest are recited at all significant phases of rice growing; at seed planting time and again when the owner of the field transplants the bibit to the inan paré plot, Sri is called upon. Sri is again invoked when the young plants develop new leaves and when the swollen ears of grain are finally cut. Some mantras are in Sasak or Balinese but, according to van Eerde, most mantras are uttered in Old Javanese. 15

In his article concerning customs and ritual observed during the rice harvest in parts of East Java, Kruyt gives the following details. When the rice begins to yellow the farmer seeks a dukun, either man or woman, who chooses an auspicious day on which to commence harvest. Tuesday-Kliwon is considered a day most suited to Dewi Sri for her descent to the rice field. The dukuns, Kruyt

15 Van Eerde, 574.
remarks, have a saying:

**Paing** is a good day to begin work in the field.

**Pon** is a suitable day to sow the rice seed.

**Wage** is the best day to plant out the rice seedlings.

**Kliwon** is an auspicious day to begin harvesting.

**Legi** is the best day to take home the padi.

When the day has been fixed the *dukun* rises very early, goes to the *sawah* and plants in each of the four corners of the field a bamboo cylinder containing *badeg*, a liquid made from fermented black rice and *janur*, young palm leaves or coconut tops. This is called 'belabar janur kuning' and a sign that from now on no one may enter the field. The *dukun* must remain awake during the night before he performs the harvest ritual; sometimes the farmer arranges a *wayang* performance of the *Sri* and Sadana myth to help him keep awake. At daybreak a *slametan* is held when special dishes are provided, one for *Sri* and one for the god of vegetation.

Around 7 a.m. the *dukun* goes to the field accompanied by neighbouring farmers, each carrying offerings to leave in the field for Dewi *Sri*. The *dukun* chooses a place in the centre of the field and proceeds to burn incense. He turns his face to the house of the *sawah* owner and recites 'I feed you with fragrant rice. I call you, Mbok *Sri*, to your dwelling-place here. May you give strength and prosperity' and similar speeches. The *dukun* then commences to cut the rice, as many ears as the total numerical value of the day chosen for the commencement of harvesting, eleven if it happened to be Tuesday-Kliwon (the numbers three - Tuesday - and eight - Kliwon - totalling eleven). The bundle of ears is tied together, interlaced with flowers and smeared with a fragrant ungent, kembang boreh, and placed on a new mat. When taken home, it is placed on
a pillow and covered with a fine cloth until the time comes for it to be dried and carefully preserved. After taking the bundle, the nini or Rice Mother, home, the farmer returns to his field and cuts sufficient rice for one sheaf. Whilst doing this he must not speak or be spoken to. The sheaf is taken home immediately, dried, pounded and cooked as a séga-polong, rice-ball, to be used with other dishes in a slamétan séđêkah bumi, to pay homage to the earth and water, without which the rice could not grow. The field is then open to everyone to help with the harvest.

Kruyt remarks that no religious significance is attached to the harvested rice during the period when the sheaves are being distributed among the harvesters as payment, and the balance, the sawah owner's sheaves, is taken home. The day the rice harvest is taken to the barn must be an auspicious day, usually a Friday-Léqi, and a dukun is on hand to consecrate the rice barn as the sheaves are stacked inside. The 'bridal pair' have been made and placed on the rice sheaves. The dukun then invokes Sri and Sêdana. 'MBok Sri', he calls, 'I have brought you home. I have prepared your home for you in the gêdong si lara Denok. Sleep well in this very pleasant place Mbok Sri and Sêdana. You are now with jaka tani (the owner). Allow jaka tani to live a life free of all worry and care. May Mbok Sri's fortune continue to flow out from this very pleasant place.'

When all the rice is in the barn the dukun utters further incantations to Sri, Uma and Kali, and threatens

16 The above translations are from Kruyt, 125-39.
any lurking evil spirits who may disturb the slumbering Sri. The dukun then walks around the rice sheaves three times, carrying a bottle of consecrated water. On the fortieth day after harvest a slametan is held and dishes are offered to Dewi Sri and other deities. Not until after this day may the rice be used. Several sheaves from the harvest are held out to tide the family over this period.

Geertz writes that nowadays crop slametans are still held but only for sawah, not for dry-rice crops. As in Kruyt's time, and probably for untold generations earlier, the farmer enlists a dukun to work out the most auspicious day on which to commence tilling the soil. A small slametan called wiwit sawah is held in the field during midmorning, to celebrate 'beginning the rice field' and another is held in the farmer's home. At the time of sowing the rice seed in the pesemaian, the seedbed, and again before transplanting the bibit to the sawah fields slametans may be held, although Geertz notes that these are often omitted today. Towards the end of the growing period, and again after the first weeding, when the rice plants begin to bend with the weight of the grain a 'rice pregnancy' slametan is held in the owner's home.

The most important crop ceremony, Geertz reports, is the slametan metik held to celebrate the harvest and still carried out on a fairly elaborate scale, especially in the villages. The harvest ritual enacts the marriage of Batara Guru's daughter Tisnawati to a mortal, Jakasudana. The Tisnawati and the Sri myths have here become syncretized.

17 C. Geertz, The Religion of Java, 1964, 80-81.
About one month before the crop is ripe for harvesting a tukang metik, one who is qualified to divine an auspicious day on which to begin the harvest, is called in. If he decided, for example, that Sunday-Kliwon it is to be, then four consecutive Sunday-Kilwons later the harvest ceremony takes place and the harvest begins the following day. The ritual from this point on is essentially the same as that described by Kruyt.

In Bali there appear to be only very slight variations in the harvest ceremonies as compared with those held in Java. Liefrinck, writing of rice cultivation in North Bali, remarks that three to five days before harvesting begins a few of the best ears of rice are cut, leaving some stalk and one leaf on each. These are bound together to form the nini, the Rice Mother, who is thereupon entered by Sri. When the rice has been gathered in, it is handed over to the women, who attend to all further arrangements. The men are no longer concerned, Liefrinck says, and in general do not even know how much rice is stored, or for what price some may later be sold in the village. When the rice is stored in the barn the nini is placed on top of the sheaves, in order that Sri will diffuse her blessing over them.

Grader, writing of rice cultivation in South Bali, notes that in Jembrana, in particular, the period of the New Moon is considered a favourable time to commence

18 Geertz, 81.

the rice harvest. A suitable day on which to make the nini is Monday. A handful of unthreshed rice of a certain kind becomes the nini, Sri's temporary resting place, and another handful serves as the nini's seat, when she is placed on an offering platform of bamboo in the centre of the rice field and presented with fragrant offerings. Harvesting may not begin until two days later, when offerings are again made to Sri within the nini, and when she is informed of the farmer's intention to cut the rice.²⁰ It has already been pointed out elsewhere that to the Javanese farmer, and to the Balinese farmer also, Sri represents the entire rice crop, which is about to suffer the pain of severance by the ani-ani, the rice knife. The nini, as in Java and other rice-growing areas, is placed with the rice sheaves in the barn after the harvest. A mantënin ceremony, a 'rice marriage', is then held for the 'bridal pair', corresponding to the temantën pari slamëtan in Java.²¹ The rice barn is decorated with young leaves of the coconut palm, plaited and clipped into elaborate decorations formed with typical Balinese artistry, together with festive poles and coloured cloth. Under no circumstances must the rice be used or sold before the mantënin.²²

It appears from the foregoing that present-day rice ceremonies vary little from the ritual and ceremony

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²¹ Geertz, 81.
²² Grader.
observed by Kruyt some fifty years ago, or by van Erde and others a century or more ago. It is probably safe to say that this ritual, which may be only the surviving remnants of former rituals, is very ancient indeed, probably handed down through countless generations of rice farmers in Java, Bali and other areas of sawah cultivation. The fact that Old Javanese was used in mantras uttered at some of these ceremonies, as well as in the ancient regulations of the ritual cock-fight in Bali, may suggest some original influence stemming from Java, and passing to Bali, Lombok and other places.

Religions festivals of the agricultural year

In ancient Java there were two major agrarian festivals, the Crawana-Bhadra festival in the month of August-September and the Phalguna-Caitra festival held six months later in the month of March-April. Both festivals are mentioned in the Nāgarakṛtāgama23 but there are much earlier references to be found in Old Javanese inscriptions.24 These ancient religious festivals were probably originally connected with chthonic community feasts. The name of the goddess worshipped during the Crawana-Bhadra festival in Majapahit times is unknown but Pigeaud identifies her with the Southern Ocean goddess, Ratu Lara Kidul, who is also the Goddess of Death. Her prototype in primeval times


24 For example, the copper-plates of Taji, 901 A.D. (H.B. Sarkar, Corpus of the Inscriptions of Java, II, 1972, 12.)
may have been the Earth Mother, who ruled over the Land of the Dead. In Tantrism, which was also practised in the Majapahit kingdom, Kali, the wife of Śiva, was worshipped as the Mother. Kali is another name for Durgā, the Goddess of Death.

Unlike the Črawana-Bhādra festival, which marked the death or end of the agricultural cycle, before new life is born, the Phālguna-Caitra festival celebrated the harvest, and was a time for venerating the rice goddess Śrī, whose bounty had just been gathered in. Caitra was also a time for the farmers to pay their taxes to the ruler; it is mentioned in inscriptions as a time for collecting the 'Lord's due'. In Bali also it was a time for both tax payments and for major festivities from early times. Apart from Śrī, the sun god Sūrya still plays a prominent role in the Caitra festival in Bali today, and probably did in ancient Java also; Sūrya was worshipped in Majapahit times and therefore presumably earlier. In former times in Java, and in Bali, the ruler took an active part in the harvest festival celebrations. Court officials and commoners alike played their parts and attendance was compulsory. In more remote rural areas each village celebrated its own festivals, including

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25 Pigeaud, IV, 211. In Hayam Wuruk's reign the Črawana-Bhadra festival was connected with the cult of deifying the Rajapatni, the Great Royal Lady, the King's grandmother.

26 See Sister Nivideta, Kali the Mother, 1953.

27 Both annual festivals were held in Bali. Liefrinck notes that Cornelis de Houtman referred to them in his account of Bali in 1598. (F.A. Liefrinck, 31.)
the harvest celebration, and they continue to do so to the present day.

Apart from the two major festival months of the year, other months of the year also seem to have been occasions for special ceremonial offerings to be presented by the agricultural communities to the ruler or to some deity of the sanctuaries. The Taji inscription states that in the month of Asuji, at the time of the festival, gold must be offered to the king; the month of Asuji was a month for payment of royal taxes. Kartika was the month in which the image of Buddha in the freehold of Kancana was to be worshipped by the people, and at each full moon in the month of Asadha silver and other offerings were to be delivered to the place of purificatory rites. A triennial festival was held in the month of Margasira, at which time one tahil of unpolished rice as well as various kinds of fruits were offered to the god Haricandana, and a rice cone, anna liṅga, to the god Brahma. In the month of Magha festivals were held at which tributes of silver and sacrificial goats were offered to Bhatara.

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28 Taji copper-plates issued by Balitung in 903 A.D., plate (Sarkar II, 12) and the Kēlagyan inscription, OJO LXI, 4 and 17.

29 Kancana inscription of 860 A.D., plate V,A:line 4 (Sarkar I, 137).

30 Kancana, plate V,A:line 5.

31 Bintang Mas inscription of 878 A.D., lines 5-6; Bintang Mas B of 919 A.D., line 4 (Sarkar I, 202, 204, and II, 194).

32 Palēpangan (Borobudur) copper-plate of 906 A.D., line 11 (Sarkar II, 58).
There was also a festival in the month of Julung, when flowers were presented to the 'patihs' and carū offerings were made. The annual festival of pūja was also closely connected with the agricultural communities. It appears to have been an occasion on which pamūja, 'worship contributions', were collected from the religious residents of a domain by the secular members, as contributions towards the cost of celebrating the festival of pūja. References to pamūja are found in inscriptions, for example in the Sarwadharma charter issued by the Singasari ruler, Kertanagara.

The caru offering mentioned above was apparently the offering of rice strewn on the ground 'to satisfy the lower classes of demons lest they should interfere with the ceremonies.' The earliest reference to caru is found in the Dinaja inscription of 760 A.D. wherein we find that caru offerings were made during the worship of Agastya, the sage for whose worship the king had an image made 'beautifully prepared... in black marble.' In the Lintakan copper-plates it is written that King Tulodang purchased sawah fields and made them freehold in order to furnish the rice for the caru offerings to his father's

33 Inscription on a Ganeça image from Singasari dated 891 A.D., line 13 and the Rubukubu Bhadri copper-plate of 905 A.D., line 3 (Sarkar, I, 306 and II, 54).

34 Sarwadharma charter of 1269 A.D. (Pigeaud, IV, 381-3).

35 See J.G. de Casparis, Selected Inscriptions from the 7th to the 9th Century A.D., 1956, 242, note 189. Also Sarkar, I, 124, note 131.

36 Dinaja stone, OJO I, line 7 (Sarkar, I, 27-8).
funerary sanctuary. On the occasion of the foundation ceremony connected with land grants, another specific type of offering, the saji offering, was made to the deities. This fact is not mentioned in all inscriptions but occurs in many where details are given of the amount offered. For example, in the Taji inscription a list is given of saji offerings to the sacred foundation stone, sang hyang kulumpang, and to the Fire God Brahma, which include ceremonial cloth and gold. Saji offerings appear to have consisted of various foodstuffs as well as gold and silver. Portion of the Kuti inscription reads 'There is also the desa named Hni which will present for saji offerings seven bundles (?) of salt, silver 2 māsa, 2 kupang with the appearance of Full Moon in each fourth month.' The Sangguran stone records the presentation of saji offerings to sang makudur, the officiating priest at the ceremonies.

Details are lacking of the sacrificial offerings made at the time of laying the foundation of irrigation works. In Bali, a chicken is buried in the foundation of a new dam, as a sacrifice to the river god, and it can be presumed that a similar sacrifice was made on these occasions in Java; there are no references, in the few


38 Taji inscription of 903 A.D., plate 3 (Sarkar, II, 9).

39 Kuti inscription, 7B, 3-4 (Sarkar, I, 88).

40 Sangguran (Minto) stone of 928 A.D., verso, 19-20 (Sarkar, II, 240).
inscriptions concerning irrigation works, to any ceremony attached to the laying of the dam foundation. Even in records of the ceremony marking the foundation or confirmation of the establishment of irrigation works, such as the three dams built by the Rakryân Mangibil or Airlangga's Kêlagyan dam, the inscriptions lack details of offerings made on those occasions. However, there is in the Hariñjing B inscription a reference to 'canal ceremonies' to be held regularly every third day of Caitra, the costs of which must be borne by the village of Wulak.41

Land grant ceremonies

As has already been remarked, the ties binding the ancient Javanese peasant to his own land were strong indeed. Likewise, a bond existed between a group of farmers and the communal land they owned and worked, or the land on which communal buildings were erected.42 Therefore, any alteration in the status of land, whether by change of ownership or by gift deed, usually for religious purposes, was regarded by the rural community as highly significant, especially from a religious point of view.

41 Hariñjing B inscription, lines 17-18 (van Stein Callenfels, 'De inscriptie van Sukabumi', MKAW-L, 1934, 118).

42 In Duyvandak's account of the Mentawi Islanders he draws attention to the relationship between these primitive people and their land. For them the act of building a new communal house, an uma, has a religious significance; it binds with a mystical bond the people, the material and implements used, and the earth upon which the uma stands. The act of building the uma is seen as the building of a new world. The uma standing on hallowed ground represents to them the centre of the cosmos. (P.Th. Duyvandak, Inleiding tot de Ethnologie van de Indonesische Archipel, 1955, 116-17.)
From Old Javanese charters there is evidence of land having been donated to religious bodies and, less frequently, to guilds who were pledged to donate proceeds from this land to temples and funerary sanctuaries. Tégal land was converted to sawah fields; forests were hewn for new sawah land; dry plains, gaga, marshlands, rênêk, and sirih, areca plantations, in fact all kinds of agricultural land, changed hands at some period of time during the Indo-Javanese era, in both Central and East Java. The first known gift of land for religious purposes is recorded in the Plumpangan inscription of 752 A.D. In the second oldest known record of land transaction, the Dinaja stone of 760 A.D., the ruler made not only a gift of land but of 'well-fed cows and herds of buffalos, with male and female servants...' for the worship of the sage Agastya.

Not only was tégal land redeveloped for sawah, or new sawah fields established, but entire districts were changed in status, becoming freehold districts, or desa pérdikan as they are designated, for the upkeep of the religious institutions to which they were assigned. There are charters recording the transfer of land belonging to guilds, such as the 'united body of smiths' or the 'united body of kalangs' from its original status to that of a freehold estate. In 907 A.D., for example, the ruler Balitung instigated an interesting land transaction when he

44 The Dinaja inscription, line 7 (Sarkar, I, 26-7).
45 See the Ngabean inscription of 879 A.D. and Ngabean V of 881 A.D., for example (Sarkar, I, 217 and 272).
when he decreed that:

...the village at Mantyāsīh shall be recipient of savaḥ-fields...and the forests at Munḍuān (and) at Kayu pānjang along with dwelling places. The village of Kuning Kagunturan shall be in possession of the savaḥ-fields of Vunut...[and] all the savaḥ-fields of the united body of the nāyaka-s and the forests at Susundara (and) at the mount of Sumving. All are under Patapān. (These) were marked out into a free-hold for the united body of patih-s to serve as a 'rotation-property' among the patih-s of Mantyāsīh (and their) relatives, to each for three years.... The occasion of their being (so) favoured arose from the amount of royal obligations they discharged for the illustrious great king at the time of the royal wedding, as also for (their) worshipping the deities...in each year, and also for (their) saving from fear the village of Kuning...when these patiha(s) were charged to protect (its) road.46

Stone and copper-plate charters were treated as tangible evidence of the royal spoken word, which was considered to be the very breath of magical and spiritual power.47 These inscribed records of land transactions were revered as sacred objects long after their original consecration and even to the present day they were treated with awe and reverence.48 Goris, writing of a decennial festival in Bali, gives a very good example of the religious

46 The copper-plate of Mantyasih I (Sarkar, II, 70-71).

47 See Selosoemardjan's remarks concerning the Sultan of Yogyakarta and the mystical significance attached to his spoken word. (Selosoemardjan, Social Changes in Jogjakarta, 1962, 22f.) Each word the Sultan utters is considered by his people not merely 'spoken by a human tongue, but is divinely inspired and therefore law.'

48 See Pigeaud, IV, 483.
significance attached to inscriptions. He writes:

After the placing of the offerings the ritual of wangsuh, the purification of certain objects regarded as gods, was performed. The deified objects were two inscriptions. One, called Batara Ngārati Bumi, written on seven copper sheets, is kept in the Pura Sakti. The other, a more recent text called Ida (or Batara) Ratu Putra, or Ratu Piagēm, ("Lord Charter"), is kept in the Pura Sakti for the ceremony. During the washing of the inscriptions I was permitted to read the older of the two. It was...an edict issued by the famous King Jayapangus, all of whose recorded pronouncements are, with one exception, identically dated the ninth day after the new moon in the month Crawana...of the Çaka year 1103 (1181 A.D.).

Goris further remarks:

It is again apparent that the charter accorded by King Jayapangus is regarded not only as a sacred village relic, but also as a royal, and consequently divine validation of the established system of rights and obligations. The inscription is a tangible proof of divine...authorization for the village community to exercise the entitlements thereby implied...there is a general belief that the duties and prohibitions operative in the village were long ago imposed by divine sanction.

With a few exceptions, the terms used in inscriptions where the actual ceremony of land investiture and the consecration ceremony attached to the inscribed stone or copper-plates are concerned, are purely Old Javanese. The exceptions apply to court officials, monetary


50 Goris, 226, note 62.
values, and references to Hindu and Buddhist deities.

As Sarkar points out:

The number of Hindu accessories [used during the foundation ceremony] would not be large even if we include the gift of cloths and gold or silver and cooking pots as parts of the Hindu ritual. No Hindu would however present buffalo-heads and fowls in a religious ceremony. These are often presented, along with other native accessories, and described in pure Javanese terms.  

In the Karangtengah inscription recording a grant of land on which a Buddhist sanctuary was to be erected, and sawah land for its upkeep, the language recording the actual land grant ceremony is Old Javanese. The names of all participants in the ceremony, including court officials as well, are Indonesian in origin. However, where the establishment of the religious sanctuary itself is described the record is written in Sanskrit. Likewise, in the Pereng inscription, which is also a dual language record, the details of the gift of sawah land are recorded in Old Javanese whereas the opening section of the inscription, in praise of Ciwa, and the closing four stanzas concerning a religious building, are written in Sanskrit.

There can be little doubt that land grant ceremonies held a religious significance for all those who attended—and the rural community appears to have attended


52 The Karangtengah inscription of 824 A.D. (de Casparis, I, 24-50).

53 The Wukiran (Pereng) inscription of 862 A.D. (Sarkar, I, 171).
in full force. It is recorded that everyone attended the proceedings:

...according to rank, all the patih-s, wahuta-s, rama-s, kabayan-s, and all the rama-s of the neighbouring places, the old and the young, males and females, of the lowest, mediocre (and) highest position, without anybody remaining behind, went to take food in a circle,....

The Panggumulan inscription records that, after taking part in the ceremonial procedure and the entertainment to mark the foundation of a religious sanctuary,

The Hon. patih-s, wahuta-s and rāmanta-s, matrons and all the residents of the village - men (and) women, old (and) young - ate, drank (and then) returned to (their) living places: nobody remained behind at that time to eat, drink (and) dance.

The order of the foundation ceremony consisted of solemn consecration formulae and the uttering of lurid curses against would-be transgressors of the freehold property then being invested, preceded by gift-giving to those taking an official part in the ceremony, and by feasting and entertainment. The ceremonial feasting and the entertainment which followed is often described in detail. The Taji copper-plates, for example, enumerate the various dishes offered and the number of lontar leaves distributed to each group of people to place their food upon. An astonishing variety of dishes are mentioned in many

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54 The Sangguran Stone, verso, line 40 (Sarkar, II, 242).

55 The Panggumulan I and II (Kębąng Arum) copper-plates, IIIb, lines 3-4 (Sarkar, II, 37).

56 Sarkar, II, 124.
inscriptions but, unfortunately, many of the dishes and ingredients listed are unknown to scholars at the present time. However, we can certainly assume that, as sacramental offerings, the dishes would have been prepared with care and elaborately presented and arranged around the sacred stones. Fragrant woods and incense would be burned to waft the 'essence' of the food upwards to the divine spirit of the sacred foundation stone and to the Fire God. The material part of the offering, the actual food, was afterwards eaten by all participants in the ceremony.

After the ceremonial feast everyone joined in the entertainment, which might include dancing for the women, gambling for the men, wild boar and cock-fights, performances by masked players, music and singing, wayang performances and recitals of the Rāmāyana. This should not be thought of merely as entertainment in the modern sense of the word, but as possessed of religious significance as well, in the same way as the ceremonial feasting. Just as the food would have been beautifully arranged as an offering to the sacred stone and to Brahma, so may the dance have been for the pleasure of the deities. The blood spilt at the cock-fight was a symbolic sacrifice, perhaps to guard against evil spirits attempting to interfere with the solemnity of the consecration ritual which followed

57 See the Kembang Arum charter, IIIA, 18-19 (Sarkar, II, 37).
58 The Ngabean copper-plate of 879 A.D. (Sarker, I, 223).
the entertainment. Mask dances not only portray acts of magic and comedy but divine intervention as well. The religious significance of the wayang and the role of the Ramayana in the instruction of moral codes and behaviour is well-known.

Following the entertainment, the participants in the ceremony of land investiture turned their attention to the solemn ritual of the consecration of the foundation or inscription stone. According to some inscriptions both men and women first prepared themselves with ceremonial dress, flowers, and paint, before taking up their appointed positions, then they 'sat on the ground in a circle, with the face turning to hyang kudur [the officiating priest] and the sacred sima watu kulumpang [the foundation stone], which was placed under the canopy in the middle of the ground.'

When all were seated 'sang makudur uttered the oath formula, cut off (the neck) of the hen which was crushed on the sacred kulumpang, threw off the egg on the watu sima, and uttered oaths....' He called upon the gods and the various spirits, both indigenous and Indian, to witness the foundation of the sima, the freehold land, and to protect it for time everlasting, tka dlaha ning dlaha. The spirits invoked at this time included ancestors:

60 See below concerning cock-fighting.

61 Kembang Arum inscription, 11-12 (Sarkar II, 36).

those who are formless (?) in the light, those who are incarnate, and (those) dead (and) deified beings of earlier times who have lived in villages, erected (?) temples, built Kratons, made dwelling-houses with galagah-reeds, arranged the fight (of cocks and boars) in the foundation-regions, arrived in villages like demi-gods (gapa kadi) rushing through the ways of the firmament.63

The god Brahma was also invoked and, before the makudur uttered the curses against those who might trespass or interfere with the sima in any way, Brahma was placed on the sacred stone. The foundation stone was revered and valued far above Brahma; the Taji inscription records that the stone was presented with offerings of four sets of ceremonial cloth and four gold māsa, whereas the god Brahma only received one set of cloth (a kain and a headcloth) and one māsa.

The curse formula was a significant part of the ceremony attached to land investiture, dating from early times; the earliest occurrence of the oaths and curses which featured in most charters thereafter is found in Čri Kahulunan's inscription of 842 A.D.64 Sarkar draws attention to the fact that in the Kalasan charter of 778 A.D. and the Kelurak of 782 A.D. future kings were requested, by way of the words inscribed on the stone, to protect the domains and institutions for posterity. These two inscriptions

63 The Mantyasih copper-plate I of 907 A.D., 6-7 (Sarkar, II, 75).

64 The Inscription of Čri Kahulunan (de Casparis, I, 79-95). The Kuti copper-plates dated 840 A.D., two years earlier than Čri Kahulunan's inscription contain lengthy curse formulae; however, this inscription is considered to properly belong to the Majapahit period, since Majapahit is mentioned. The inclusion of no less than twenty-eight lines of curses may suggest troubled times (Sarkar, I, 82-3).
seem to be the last ones to place reliance on the protection of future rulers alone. For the protection of freeholds against trespassers and unauthorized tax collectors additional measures were apparently considered necessary. Thus, a curse formula was inserted into subsequent charters, calculated to strike terror into the hearts of those who would defy the prohibitions set down therein.

Curses uttered by the officiating priest, who was neither Hindu nor Buddhist, were designed to deter the most intrepid wrongdoer, and were apparently considered so efficacious that they were carried on down through the centuries. Some must have indeed been terrifying for the listener as, for example, the curse hurled by the makudur at the Sangguran ceremony:

...whoever disturbs the village at Sangguran... he may be brought to destruction.... He may be killed by all the gods in such a way that he may not (find time to) turn behind, he may not (find time to) look behind: he may be pushed in the front-side; struck on the left side, his mouth may be struck, his forehead may be battered, his belly may be ripped open, his intestines may be rooted out, his entrails may be drawn out, his heart may be plucked out, his flesh may be eaten, his blood may be drunk up, then he may be trampled upon, lastly he may be killed!66

Some of the curses uttered included threats aptly applicable to an irrigation society as, for example, a curse that the wrongdoer may be overtaken by the fate of being 'dipped in

65 See Sarkar, I, 111, note 96.

66 The Sangguran inscription, lines 29-33 (Sarkar, II, 241).
the waters of the dam' - surely an understatement - or the horrifying end to be brought about by being crushed between the stones of the dike. It may be assumed that the culprit was to replace the sacrificial chicken at the base of a new dam. Although expressed with typical Old Javanese economy of words, these threats may possibly have caused a would-be transgressor to have second thoughts. However, apparently in later times even curses were found insufficient as a deterrent, and fines too were laid down.

Sarkar remarks that:

It is not easy to explain why the foundation ceremonies present a mixed pattern of Hindu and Indonesian rituals.... If a guess can be hazarded, the mixture of rituals in the foundation-ceremonies is due to the susu-kulumpang, which outwardly looked like a liṅga, but was in reality a descendant and representative of the prehistoric menhir. Obviously, it has to be pacified and worshipped with Indonesian accessories, to which Indian elements were added as Indian gods were also invoked. The spirits of ancestors, who used to descend on the pre-Hindu menhirs, descended on the susu-kulumpangs, and their traces have been left over in the curse-formulae for the protection of the freehold and, in some cases, of the kingdom.

67 The Sugih Manik charter (Sarkar, II, 156).
68 The Wuatan Tija inscription, 1., (Sarkar, I, 258).
69 Sarkar, 'Survey of Some Aspects of Old-Javanese Inscriptions of Central Java', in Studies in Asian History and Culture, 1970, 63. The stone lingga in conjunction with the yoni, the symbolic female element, served in other forms of agricultural ritual. Water poured over the lingga-yoni symbol flowed down into the earth, thereby fertilizing it.
The prevalence of menhirs and similar stone shafts which were widely revered as the seats of ancestral spirits when they were invoked facilitated the adoption of Siwa linggas. Wheatley, writing of similar stone shafts in Vietnam, says that:

There can be little doubt that the menhir was originally a spirit-stone, a material manifestation of a chthonic god who was himself a divinization of the energy of the earth...and in some areas was eventually transformed, under Sivaite influence, into the linga that symbolized the permanent and imperishable principal of the Hinduized state.

The watu sima, the stone mentioned with the kulumpang, was apparently in the form of a lingga. Buchari, writing of the inscribed lingga of Rambianak, remarks that these small columns or linggas were used as 'boundary posts', to mark the borders of freehold sawah fields. The Rambianak inscription contains the phrase sinusuknya ya watu sima sradi, 'It [the sawah] was afterwards marked with sima stones at all corners.' An inscribed lingga recently found in

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72 The exact difference between the foundation stones watu sima, sima watu kulumpang and susu kulumpang is not clear. In the case of susu kulumpang the k is dropped from susuk (see Sarkar, II, 41, note 83).

73 M. Boekari, 'An Inscribed Linga from Rambianak', BEFEO, XLIX, 1959, 408.
Central Java, which records a sima sawah of four tampahs, is probably one of four originally serving the same purpose. Besides the stone linggas used to denote border limits Ganeça images were placed at certain points, apparently as 'guardians', to protect places considered to be dangerous, such as the confluence of two large rivers or open tégal fields subject to trespassers. An example in the latter case is found in the inscribed Ganeça from Singasari.

The religious significance of cock-fighting

Cock-fighting is mentioned in Old Javanese inscriptions among the various forms of entertainment held before the consecration of the sacred foundation stone at landgrant ceremonies. In one inscription, recording the invocation to ancestral spirits, the priest calls upon '...deified beings of earlier times who...arranged the fight (of cocks and boars) in the foundation region....' Apparently cock-fighting was also a source of royal revenue. It is stated in the Kélagyan inscription that 'from the proceeds of the cock-fight, amounting to one māsa and two kupang, one māsa shall be deducted for the king's revenue.' In Majapahit times, when during the dry season the King and his Court went on pilgrimages to sacred places an

74 M. Soekarto Kartoatmodjo, 'The Discovery of Three New Inscriptions in the District of Klaten (South Central Java)' in Bulletin of the Archaeological Institute of the Republic of Indonesia, No. 8, Djakarta, 1969, 18-22.

75 Inscription of Balingawan of 891 A.D. (Sarkar, I, 305).

76 The Mantyasih I copper-plate of 907 A.D., B7 (Sarkar, II, 75).

77 OJO LXI, line 6.
important item on the itinerary were the cock-fights. In the Nāgarakṛtāgama it reads:

2. There is a cultivated area called Sima, south of Jalagiri, going eastward from the Royal compound,
3. pleasantly lively, for it is a place for vows of the public, at the time of the cock-fights; therefore it is (visited) uninterruptedly.\textsuperscript{78}

In Bali, cock-fighting is still included in ceremonial affairs, for whereas the colonial period saw the end of cock-fighting in Java, the government did not succeed in suppressing it there. Although cock-fighting appears to have been a popular pastime from ancient times, a pastime in which the Court and the rural communities both took part, it had on the other hand, a religious significance. Originally cock-fighting served as a preliminary to temple feasts. Liefrinck, discussing the subak harvest festival in Bali, refers to the cock-fight held in the courtyard of the temple. It was compulsory for each rice farmer to attend with a certain number of birds, proportionate to the number of his sawah fields. Those farmers who failed to attend the contests, and the unfortunate ones whose cocks refused to fight, were fined. The fines and the percentage levy on stake money helped to defray the costs of the subak festival.\textsuperscript{79}

Van Eck has translated and published an old Sima tetajen, a document of rules and regulations relating

\textsuperscript{78} The Nāgarakṛtāgama, canto 17, stanza 4, lines 2-3 (Pigeaud, III, 21).

\textsuperscript{79} Liefrinck, 'Rice Cultivation in Northern Bali' in Bali: Further Studies in Life, Thought, and Ritual, 37.
to the cock-fight. The document, although found in Bali, was written in Old Javanese with a sprinkling of Balinese words, and includes the words 'this sima is a gift from the King of Wilatikta (Majapahit)' which van Eck considers proof of the Old Javanese origin of this sima têtajen. The regulations contained in the sima têtajen are not arranged in any order or sequence which van Eck remarks, is usually the case with genuine adat documents. The contents are expressed in a style of typical Old Javanese understatement, and points which were probably considered obvious are omitted altogether. Van Eck has filled in the details of the contest from actual eyewitness accounts and a brief summary of his account follows.

To outsiders the religious significance of cock-fighting seems to have been little known or understood. The participants in a contest feel that the gods will descend and be present if the contest is held in the immediate vicinity of a temple. The participants never neglect to present their offerings to the various gods in the cock-fight arena. Offerings are in the form of an ampilan, a box bound around with unspun cotton, and filled with rice, sirih, coins and so on, as a humble gift to the gods in order to gain their blessing on the contest. The cocks, fighting to the death, are seen as atonement offerings to the gods as their blood is shed upon the soil.

Cock-fighting was organized not only at the

80 R. van Eck, 'Schetsen uit het volksleven in Nederlandsch Oost-Indië', De Indische Gids, I, i, 1879, 102-18.
local level, but at the state level by the ruler. Tëtajën lëwih were held in the kraton and participation in these contests was seen as buat haji, a duty to the ruler. Besides providing fighting cocks each participant was required to have a certain sum of money to enable him to place bets. The only persons not permitted to take part in these bouts were the priests. Attendance for others was compulsory but seldom did the ruler compel his subjects to attend. Enrolment to attend the tëtajën lëwih was usually made with the district head and the contest continued for at least two months, beginning each day at midday and finishing at nightfall.

Contests at district level took place at the district centre, under local government control. Instead of permission to hold the fight issuing from the ruler it came from the punggawe, the district head. The same rules and regulations applied but fines were less severe and the contests continued only for one month. Cock-fighting at the village level, tëtajën desa, was held annually, the major rule being that it must be held in the immediate vicinity of the village temple. Temple servants shared the taxes and proceeds of the fines with the village head. Every villager was required to attend with two fighting cocks and was fined if he failed to do so. The tëtajën subak took place after the rice harvest and only members of subak associations were permitted to take part. The contest was held next to the subak temple. Van Eck was told by subak members that they participated in the contest not so much for pleasure as for the purpose of offering a

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81 Van Eck was writing in 1879.
small measure of thanks and gratitude to the deities who had filled their rice barns with valuable grain.

The juru kêmong, the 'head of the arena', who was in charge of the contest, uses a kêmong, a metal drum, to control the fight. Every stroke of the kêmong represents one or other of the sima têtajên rules or regulations, whichever might apply to the fight at that moment. Van Eck gives a translation of the forty-five articles of rules contained in the sima têtajên. They not only give some indication of the importance of the pastime for the Balinese, but also some indication of the religious significance cock-fighting must have held for the ancient Javanese rural community as well. The sima closes with the utterance of a curse, 'all those who violate this sima têtajên shall bring down upon their heads the wrath of the gods, and they shall be visited by all manner of grievous ills and misfortunes.'

Temple and bathing sanctuaries

On the summits and slopes of extinct volcanic mountains in Central and East Java ruins of ancient terrace sanctuaries have been found. There are traces of terrace buildings in the Kali Pikatan area on the slopes of the Welirang mountain and the Anjasmoro Ranges, which appear to belong to a pre-Indian period, and which can probably be compared with the ancient terrace complex in the Gio-Linh province of Vietnam, discussed by Wheatley.

Wheatley considers it possible that the upper terraces of the Gio-Linh complex may have been connected

with the cult of the mountain god. He also remarks that
'The water seeping down from the sacred hill and carrying
the subtle energies of the divinity to the villages and
fields below also finds analogues in other parts of
Southwest Asia...and there are numerous Javanese examples...'.
Stutterheim similarly describes the Jalatunda bathing place
noting that the water appears to have flowed from the top
of the sacred mountain Penanggungan, through a system of
channels and basins, to finally flow out over the land.
Stutterheim sees Jalatunda as a terrace sanctuary for the
worship of ancestors as well as of the mountain god. It
is possible, however, that it was closely connected with
irrigation.

Rivers are considered sacred and in ancient Java
were referred to as sang hyang, holy or sacred; in
Balitung's Wanagiri charter the Kali Solo is called sang
hyang Mahawan and Sinodok's inscription of 943 A.D. refers
to the river as luaḥ prasiddha, the sacred river. De Casparis
points out that in both cases the inscriptions are referring
to the river in connection with a religious sanctuary or
temple, a dhārma kamulān. There are actual records of
rivers having been diverted to flow past, or through, the
temple. Raka Pikatan of Central Java directed that the

83 Wheatley, 137.

84 According to Palerm there are still great irrigation
works in Mexico which are thought to have been the
ruler's resort. (Angel Palerm, 'The agricultural
basis of urban civilization in Mesoamerica' in Julian
Steward and others, Irrigation Civilizations, 1955,
36.) This may apply to Jalatunda, and Candi Rejo in
the Kali Pikatan area.

85 See de Casparis, I, 149, note 1.
course of the Kali Opak be diverted so that its waters should flow past the tirtha, the sacred bathing place; it is recorded that 'After the Īśa sanctuary had been completed in its divine splendour, the (course of the) river was changed so that it rippled along the grounds... [of the sanctuary].' 86

A fragment of bas-relief from ancient Majapahit depicts a river flowing through what appears to be a temple and thence to the nearby sawah fields. 87 There can be no doubt that the intention here was to divert water intended for irrigation of the sawah fields, to flow through a consecrated place, in order that the water should be endowed with life-giving qualities. It seems that a religious structure, a temple or a sanctuary of some kind, was always erected and a supporting freehold established, to commemorate the founding of an irrigation project, or the extension of an existing sawah complex. On the slopes of the Kelud, for example, there are remains of a sanctuary possibly built to commemorate the Harinjing dam. An investigation may bring to light other examples, but for the present the relationship between archaeological remains of sanctuaries and centres of sawah culture belonging to kingdoms long dead must remain supposition.

86 De Casparis, II, 328.
87 See A.J. Bernet Kempers, Ancient Indonesian Art, plate 288.
CHAPTER FIVE

RAKRYAN MANGIBIL'S INSCRIPTION

WOMEN IN OLD JAVANESE AGRARIAN SOCIETY

Takdir Alisjahbana, writing of the special place women hold in Indonesian society, remarks that:

It is not surprising,...that there are sociologists and historians who believe that women were the first agriculturists and regular workers, and that it was women who patiently and systematically sowed the crops and works at the handicrafts.... It was the matriarchal society which typically was the first to settle down permanently in a fixed area and gain its livelihood from regular agricultural and craft pursuits.¹

From many references in Old Javanese inscriptions it is clear that women held a comparatively high place in ancient Javanese society, either in various official capacities or as respected wives of both village and court officials. However, the women mentioned in old charters were of royal birth or were high dignitaries in rural society. There are records of women having held the exalted rank of māharāja and of raka while others bore the titles of rakryāns, samāgats and rāmas.² There is no direct evidence of the position

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held by women in other classes of Old Javanese society. De Casparis considers that women from the ranks of commoners probably possessed the same rights and privileges as those from the higher ranks but that they may not have exercised their rights.³

The number of inscriptions issued by queens ruling in ancient Java is very small. However, the few available reveal the fact that not only the principal consort of certain rulers but secondary queens also, were ruling independently over their own territory, with the authority to dispose of land for the purpose of establishing freehold sawah lands. The earliest reference to a ruling queen in Java is found in Chinese records of the New Tang Dynasty which report that in 674 A.D. the kingdom of Ho-ling was ruled so well by Queen Sima that 'a bag of gold could be left by the side of the road and no one would attempt to steal it.'⁴

The earliest inscription, and the only one from Central Java issued by a woman belongs to the Raka of Pikatan’s consort, Çri Kahulunan. Issued in 842 A.D.⁵ it records the donation of a certain number of sawah fields towards the upkeep of a funerary temple built for her late

⁴ W.P. Groeneveldt, Historical Notes on Indonesia and Malaya from Chinese Historical Sources, 1960, 14.
⁵ De Casparis, 86-7. De Casparis (107 and note 7) draws attention to Stutterheim's theories concerning the connection between women and groundrights in ancient Java; as women may not have used these rights, de Casparis considers that Çri Kahulunan's land transaction in 842 A.D. must have been of great significance.
father, Samaratungga, the last Cailendra ruler. Çri Kahulunan appears to have been a women of some considerable standing. She was probably one of several lesser independent rulers in Central Java at the end of the Cailendra period. From East Java comes a similar inscription nearly a century later issued in King Sinçok's time by Rakryân Binihaji Parameñwari Dyah Kēbi, recording the founding of a funerary sanctuary for her father and the granting of sawah lands made freehold for the upkeep of the sanctuary. 

Another East Javanese queen to record the granting of freehold rights to irrigated farmland, as well as hunting grounds, for the upkeep of a religious foundation, was the mysterious Maharaja Nari, also called Paduka Çri Mahadewi in the same charter. The latter title, according to van Naerssen, suggests that she was a secondary queen of an unnamed ruler, although she was herself ruling in Kediri, a fact stated in the inscription. As her decree was issued in 1015 A.D., only eight years before King Airlangga's earliest inscription, van Naerssen asks if she may have been Airlangga's mother or wife or daughter.

A further record of land disposal by a woman ruler is found in the Karang Bogèm charter of 1387 A.D., issued 

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8 Van Naerssen, 80.

jointly by the Princess of Lasem, daughter of the Majapahit ruler Hayam Wuruk, and her consort the Prince of Mataram. The ground released by order of the Princess for the newly created state of Karang Bogem, was to be used for terraced sawah cultivation. This land measured seven acres, one jung. A further three and a half acres, one kikil, of cleared land was to be set aside for the use of a Gresik fisherman and his family; this man was appointed by the Princess as steward in charge of the royal fisheries.10

There is ample evidence that women owned land in their own right in ancient Java. An inscription which throws some light on this aspect of women's rights to ownership, and disposal, of agricultural land is the Kinawe charter of 927 A.D.,11 issued by a woman ruler, the Raka of Gunungun, East Java. The inscription records that the raka, dyah Muatan, '...the mother of Bingah, marked out the village at Kinave under Kadangan. Now, the reason is that the marked-out free-hold shall be inherited by her grand-children through her (own) son, but shall not accrue to the half-brothers and sisters of dyah Bingah from the father's side(?). Because, this free-hold is not the free-hold of the rakryan, her husband.'12 The inscription indicates the sole rights the raka exercised over her own property, over which her husband had no control. There is indirect evidence of women's land

10 Pigeaud, IV, 450.
11 Sarkar, II, 224-6.
12 Sarkar, 225, lines 7-9. Sarkar draws attention to dyah Muatan's rank (note 20), which was above that of her husband who was a rakryan. (Although the distinction between the titles is apparently slight.)
rights in the Taji inscription of 901 A.D. Among the names of the owners of land purchased by the Rakryăn of Watu for the purpose of setting out sawah fields and garden land for the upkeep of the temple of Desawambha, were the names of two women, si Padas and si Mendut, the mothers of Sumag and Mangas.

Women were also represented in the legal field in ancient Java. The copper-plate inscription, a jayapattra of 907 A.D., concerns a law suit over a debt previously incurred by Si Campa, the deceased wife of Pu Tabwel of Guntur. A relative of the dead woman, to whom the gold was owed, had the widower brought to judgement before six persons, the Samėgat Pinapan, the samėgat's wife and four witnesses. Because Pu Tabwel had been unaware of his wife's debt, and because she had died childless (besides the fact that the claimant failed to appear at court) the case was dismissed. The relevance of the case here is the fact that wives were apparently able to conduct their own affairs, even to the extent of incurring debts, independently of their husbands. The husband on the other hand was not answerable for his wife's debt if he had been unaware of it, and if he was without an heir. Furthermore, the fact that a woman, Samėgat Pinapan's wife, sat in judgement at the trial is an indication of women's access to positions of authority in ancient Java.

13 Sarkar, 8.

14 Women were identified as 'the mother of--' in inscriptions where they are referred to specifically.

Besides records of women actually owning and disposing of land there is evidence that women took an active part in ceremonies connected with the granting of land for freehold domains. Wives of the village heads, elders and other officials from neighbouring villages who were attending the ceremony also took their appointed place. According to the Amsterdam II inscription wives sat facing the priestly officials, sang wahuta hyang kudur, and the sacred foundation stone placed in the centre of the official gathering.  

The women received ceremonial gifts according to their rank and in accordance with the importance of the freehold grant. Gifts usually consisted of either cloth (kain) for ceremonial wear, or cloth and a measure of gold or silver. The Taji inscription  records that in a large foundation ceremony attended by 392 officials the wives received kain and two measures of gold each, however, one woman, apparently of more importance than others, received a special length of 'eastern' cloth (buatan wétan) and a gold ring weighing eight māsa. In the Kembang Arum charter mothers and their children are listed, each woman and child by name, as recipients of gifts of cloth and silver. Older women and wives of young men are listed in separate categories.

16 Van Naerssens, 'Twee Oorkonden', 456.
17 Sarkar, II, 10.
19 Sarkar, II, 34-5.
WHO WAS RAKRYĂN MANGIBIL?

In 934 A.D., at the time when Rakryăn Mangibil issued her decree concerning the dams she had constructed for her people, Mpu Sindok was the ċri māharāja, the reigning monarch, of East Java. During the reign of his predecessor, King Wawa, Sindok had held the high office of rakryăn mapatih i hino, the Prime Minister of Hino. Prior to Wawa's reign he had served at the court of Wawa's predecessor Tuloçong as His Highness the Prime Minister of Halu, an office immediately below that of Prime Minister of Hino. Sindok's official title during Wawa's reign was rakryăn mapatih mpu Sindok ċri içanawikrama; the use of ċri before he attained the throne is an indication of his nobility and right to the throne.

In the first year of Sindok's reign, in 929 A.D., an inscription was issued by a chief queen, rakryăn binihaji ċri parameçwari dyah kēbi, recording the founding of a burial sanctuary for her father, Rakryan Bawang. In 935 A.D. the same queen issued a decree jointly with Sindok, under the name of rakryăn ċri parameçwari ċri warddhani kbi, just one year after rakryăn binihaji rakryăn mangibil.

20 Slametmuljana, *The Structure of the National Government of Madjapahit*, 1966, 18. See also the Blota stone of c.928 A.D. (Sarkar, II, 255). The three chief ministers, the mapatihs of Hino, Sirikin and Halu are ancient court dignitaries. Apparently a Minister of Hino could ascend the throne.

21 See Notes on the Translation, note 3 below.

22 The Suci stone of 929 A.D. (OJO XLI).

23 OJO XLV.
Her Highness the Chief Consort, Rakryān Mangibil, issued her inscription. Scholars agree to the likelihood that these three inscriptions were issued by the same person, but assume that she was Sinədok's chief consort. Although he too considers the inscription to have been issued by the one queen, Stutterhim casts doubt as to whether she was Sinədok's consort and suggests that she may have been the surviving consort of King Daksa, who reigned before Tulođong and Wawa, and was presumably Sinədok's grandfather. In support of his identification of dyah Kēbi as Sinədok's grandmother, Stutterheim suggests that binihajī means 'head of the royal wives' and not 'wife of the ruler', and he translated kēbi as 'grandmother' (using an example from the Wurudu Kidul jayapattra for his argument), thus arriving at the title of 'The Head of the King's consorts, Her Highness the Chief Consort, Cri Warddhani, Princess Grandmother' (in other words, head of the royal zenana). Stutterheim sees a parallel in Majapahit history when he likens the relationship of Sinədok and dyah Kēbi to that of Hayam Wuruk and the rājapati mātămāhā cri narendra, Hayam Wuruk's grandmother. Stutterheim adds that if this were the case, then Rakryān Bawang would have been Daksa's father-in-law, not Sinədok's, and Tulođong and Wawa Bawang's sons. This theory contradicts those of other scholars who consider that Bawang was Wawa, and that Wawa was therefore the father of dyah Kēbi.24

Another possibility is that Rakryān Mangibil was a different person from dyah warddhani Kēbi and in fact Sinədok's consort, with her own appanage or principality

24 Stutterheim, 458-61.
of Mangibil. The year following Mangibil's inscription dyah Këbi dropped the title of binihaji in her inscription: perhaps she was no longer the 'head of the royal wives'. The question of the queen's relationship to Siṅḍok, whether that of Chief Consort or 'Princess Grandmother', must remain unanswered for the time being. Suffice it to say that she was a queen with the authority to issue at least two inscriptions in her own right besides the one issued jointly with Siṅḍok. Stutterheim states that the title Mangibil was unknown to him; however, it seems clear that it refers to a principality. Maclaine Pont refers to the ancient regions of Mangibil, Purwareja and Sarangan as important areas of sawah cultivation in early times. The region of Mangibil was possibly an established rice-growing area, stable and prosperous, during Siṅḍok's reign. Siṅḍok's inscriptions, unlike those of later rulers, give no indication of wars and unrest. The importance of Mangibil is highlighted by the fact that places which can be identified here in Rakryān Mangibil's time, are also mentioned in the Nāgarakērtāgama as sacred places visited by Hayam Wuruk - places such as Wewė Pikatan, Pamanikan, Srangan, Pangikētan, Panghawaran and Candi Lima.

Ancient records refer to the region just north of the two rivers, the Pikatan and the Kromong. One inscription records the establishing of a freehold sanctuary in the

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25 H. Maclaine Pont, 'Aanteekeningen bij het artikel van Dr. van Stein Callenfels: "Bijdragen tot de Topographie van Oost-Java in de Middeleeuwen"', OV, 1926, 94.
26 Nāgarakērtāgama, cantos 17-4-4, 73-3-3, 76-2-2, 76-3-3, 78-4-1.
neighbourhood of Purworejo and dates from Sindok's time, 
929 A.D., another one, the Trailokyapuri inscription, 
concerns the irrigation area to the north of Sarangan. The Pama tpi sering came from the villages situated along 
the edge of the large uncultivated region of Trik, which 
was later to become the kingdom of Majapahit. The region 
to the south of the uncultivated area, the valley between 
the Anjasmororo foothills and the Welirang lahars, is the 
probable location of old Mangibil; this area was already under sawah cultivation by the tenth century A.D. Traces 
of former irrigation works are to be found and some of the 
old dams, perhaps even dating from Sindok's time, are still 
in use for irrigation. Remnants of conduits and tunnels 
have been found which suggest the existence of a once 
advanced irrigation system of dams and underground channels, 
some of which Maclaine Pont and his colleagues traced over 
a considerable distance.

According to Maclaine Pont, there can be no 
doubt that attempts were made to draw water from the Kali 
Kromong at a point above its confluence with the Pikatan 
and direct it along a channel to a large dam near Candirejo 
and thence to Wates, from where it could be directed 
northwards to drier areas. The formation of the terrain

27 Çrawana inscription, OJO XXXVII.
28 OJO, XCIV-V.
29 H. Maclaine Pont, 'Eenige oudheidkundige gegevens omtrent 
de Middeleeuwschen bevloeingstoestand van de zoo-genamaad 
"woeste gronden van Trik"', Ov, 1926, 104, 125.
between the increasingly steep slopes of the Welirang cone and the basin along the foothills of the Welirang and the Penanggungan, the line along which the Kali Cumpleng flows, for example, can be taken as a borderline between the Penanggungan and the Anjasmoro irrigation sectors. West of the line the terrain slopes to the northwest whilst east of the line it slopes to the north, creating a natural border between the two irrigation areas. The Penanggungan region, which originally depended on water from a low volcanic cone, would have been a drier area. It seems apparent that, because of this lack of sufficient water for irrigation, the 'borderline' has at some time in the past been artificially moved by a series of retaining walls across the rivers in the region, to divert their waters to the north. Maclaine Pont comments on the fact that nearly all the rivers flowing northwards to the Penanggungan region had been connected to various dams on the Pikatan and Kromong. At one place a very long major water tunnel was found, which could serve no other purpose than to force irrigation water to the north; it was noted that the natural terrain was against it. Irrigation engineers of the tenth century and later also made good use of natural lakes which were formed by spurs of the Welirang cutting across the Anjasmoro ravines. The construction of important underground irrigation tunnels under the spurs facilitated the regulation of run-off water. In the wet season the channels could be opened up to their full extent, to collect the water which would then be used in the dry season, relayed through the
irrigation system to the villages and sawah fields below. The three dams built by Rakryan Mangibil would have been of relative importance to the area below the Pikatan–Kromong confluence.

**THE BAKALAN (WULIG) INSCRIPTION**

The Bakalan inscription, now in the Mojokerto Museum as number 320, was found in the hamlet of Bakalan situated on the Kali Pikatan in East Java. Earlier reports state that the stone was found in the village of Bakalan in the neighbourhood of Jiyu in the Penanggungan region, to the north of the Pikatan and Kromong Rivers area. However, place-names referred to in the inscription indicate that the stone has always belonged to the hamlet Bakalan, which may in fact have formerly been the village of Wulig, the first village mentioned in the inscription. Damais lists the inscription under the name of Wulig.

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30 Maclaine Pont, 120-7.

31 P.V. van Stein Callenfels, 'Bijdrage tot de Topographie van Oost-Java in de Middeleeuwen II', *OV*, 1926, 85. Maclaine Pont, under the impression that the stone had been found in Bakalan in the Penanggungan region, (as reported in *Bataviaasche Genootschap van Kunsten en Wetenschappen. Notulen van de algemeene en directie vergaderingen*, 1888, xiii and 12; also *Oudheidkundige Dienst in Nederlandsch-Indie, Rapporten*, 1907, 86) suggested that it may have been removed from the Kali Pikatan region to the Trailokyapuri area when that part of East Java was established as an irrigation area around the fifteenth century. (Maclaine Pont, 97.)

The inscription, dated 934 A.D., is engraved on four sides of an upright rectangular-shaped stone of grey andesite, standing 1.05 metres high with a width of 63 centimetres and a thickness of 26 centimetres. The stone, which is in comparatively good condition, slopes to a pointed top crowned with a sculptured lotus. The inscription is composed of forty-four lines of Old Javanese script, eighteen lines on the front face of the stone, seventeen on the back, six on the right side and three on the apparently unfinished left side. Apart from Brandes' transcription, the former Regent of Mojokerto published a transliteration of the inscription into the New Javanese script in 1923 and a translation into both New Javanese and Dutch. 33

Contrary to the usual form of Old Javanese inscriptions, mentioned in the Introduction above, the Bakalan decree does not commence with the date of issue, or the name of the person issuing the decree, nor does it refer to any sima, or give any sambandha. Neither does it mention any village as being specifically assigned for the upkeep or maintenance of the dams mentioned therein as in, for example, the Kelagyan inscription. Instead, the first part of the inscription contains the Rakryan Mangabil's decree, directed to the heads of five villages, concerning the care and use of irrigation dams which had been constructed at

R.A.A. Kromodjojo Adi Negoro, Oud-Javaansche Oorkonden, I, 1923. The translation presented in the following pages differs from Kromodjojo Adi Negoro's translation. Reference to the Bakalan inscription can also be found in Krom, Geschiedenis, 214, F.A. van Naerssen, 'De Brantas en haar waterwerken in den Hindu-Javaanschen tijd', De Ingenieur, LIII, 7, 1938, A66, and van Stein Callenfels and Maclaine Pont (see note 31 above).
her command. Regulations and prohibitions pertaining to the use of the irrigation system are stipulated and the village heads are instructed to see that their people are fully cognizant of the regulations and that they abide by the rules applying to water distribution through the irrigation conduits. There is also a prohibition against fishing from the conduits.

The second part of the inscription concerns the foundation ceremony marking the founding of the three dams at Kahulunan, Wuatan Wulas and Wuatan Tamya. By comparison with many other inscriptions the foundation ceremony appears to have been on a modest scale, with only nine or ten officials receiving the usual ceremonial gifts. However, the actual gifts of cloth and measures of gold are of a value comparable with those presented at larger ceremonies on record. In many inscriptions recording the ceremony attached to sima foundations, an imposing list of court officials is given. In the Bakalan inscription only two higher court officials, the two samégats, are mentioned. No reference is made to the officiating priest or to the rites to sanctify sang watu, the inscription stone, and no curse formulae, usually found in most other inscriptions, has been recorded. Furthermore, the inscription does not contain any eulogy to the ruler, or in this case, to the founder of the dams, Rakryän Mangibil. In this respect it resembles the inscription of another ruler's consort, Čri Kahulunan.34

34 See de Casparis, I, 73 and 79.
BAKALAN (WULIG) INSCRIPTION

FRONT FACE

1. <Ef(m)ö£>n
2. Ef(m)ö£>n
3. Ef(m)ö£>n
4. Ef(m)ö£>n
5. Ef(m)ö£>n
6. Ef(m)ö£>n
7. Ef(m)ö£>n
8. Ef(m)ö£>n
9. Ef(m)ö£>n
10. Ef(m)ö£>n
11. Ef(m)ö£>n
12. Ef(m)ö£>n
13. Ef(m)ö£>n
14. Ef(m)ö£>n
15. Ef(m)ö£>n
16. Ef(m)ö£>n
17. Ef(m)ö£>n
18. Ef(m)ö£>n
SIDE 1
1 nāmaśyaktaraṃ.
2 ēśvarasyo bhūjaḥ.
3 tātāṁgarābhakṣyay.
4 svājāntāyaṃ. 
5 nāmokṣayaṁ.
6 sahaṁ tātāyaṁ.

SIDE 2
1 ṣaṅkārāḥ.
2 ṣaṅkārāḥ.
3 tātāyaṁ.
TRANSCRIPTION OF THE BAKALAN (WULIG) INSCRIPTION 934 A.D.

Front Face

1. // ujar rakryan biniha
2. ji rakryan mangabil\(^1\) umingsor
3. i samgat susuhan umajara\(^2\) ikang
4. rama i wulig mwang i pangiktan i pađi
5. pađi i pikattan i panghawaran i busuran pa
6. ṛṇnah nikang dawuhan kinonkēn\(^3\) rakryan binihaji
7. gaweyakna samgat susuhan tlas ta ya hinaɾēp
8. de samgat taplan kunang deyanikang rāma\(^4\) sahanany
9. kabaih rāminga ikana an kapratapā rakryan bini
10. haji warahēnyu anaknyu an tan bayya bayya\(^5\)
11. irikana dawuhan mwang\(^6\) umajara kamu tepangu
12. pullakna dawuhan telye\(^7\) a ikana wēluran
13. ri wēngi nguniwaih umalappa iwaknya i rahina kunang
14. yan hana mwang gumaweyakēn ikana senuhuttakē
15. n kinonnakēnnya\(^8\) anigrahan\(^9\) ingiman\(^10\) katiga
16. wēllas tangah kunang deya nikanang rama kabeh ka
17. yatnaknanyu raśānike tulis yajanya paḍa la
18. pamrinyu iyanakwanwa sakabaih nahan samgat

Back Face:

1. taplan kinon rakryā
2. n binihaji dumiyana i
3. kana punta pakatuppan\(^11\) deni
4. kana dawuhan kumayatnakna ika
5. na sang hyang ambrata\(^12\) i rahina i wēngi
6. // swasti sakawarṣatita 856 maghamasa tithi
7. pratipāda suklapakṣa tu ka vrhaspati wukir wa
8. ra irika diwasa rakryān binihaji rakryān mangibil
9. magēḥhakekēn\(^13\) ikang dawuhan katrini i kahulunan
10. i wuatan wulas i wuatan tamya samakangka ku
11. eh nika kali tlas mapageh manghanaken ta sira ku
12. renkurennan winkas i wulig baujut wi
13. neh ma 5 wdihan yu 1 i pikatan margigimwal
14. winaih ma 5 wdihan yu 1 i padipadi tuha kala kanbu
15. t anting winaihma 5 wdihan yu 1 i busuran hasti wi
16. neh ma 5 wdihan yu 1 i panghawaran anganten winaih
17. ma 1 wdihan hlai patih mangrapati manatang winaih ma 2 wdihan

Side 1:
1. sahlai samangka keh
2. nikanang rama tlas wi
3. nah paweh gananna ma
4. nadah t(s) praanya
5. likhita dang acarya
6. ambritta //0//

Side 2:
1. sagong ikangu i
2. talangan mangi
3. liwaten
NOTES TO THE TRANSCRIPTION AND CORRECTIONS TO BRANDES' TRANSCRIPT

1 mangabil: (Brandes, mangibil) There is no wulu present.

2 umajara: (Brandes, umajar(a)) There is no patén present.

3 kinonkën: (Brandes was in doubt here - kinonkën (?) ) The letter a is omitted.

4 rāma: Long a is used here but not where rama occurs in lines 3 and 16.

5 bayya bayya: (Brandes, ba(r)yya ba(r)yya) The layar is not apparent on the stone but it has been taken to be so. See note 16 to translation.

6 mwang: The script here differs from line 4. Brandes and Kromodjojo Adi Negoro read muang in both cases.

7 telye: (Brandes, telyenu).

8 kinonnakénnya: (Brandes, kinonnakén) Brandes has omitted nya.

9 anigrahān: Brandes was not sure of the n but it is clear in the script.

10 ingiman: There is slight damage to the stone here; it appears to be n not s. Brandes has omitted the letter.

11 punta pakatuppan: The suku is not apparent in the first word. Kern's note to Brandes' transcript suggests an alternative, pakatussan.

12 ambrita: (Brandes, ambrita) The script differs from that of line 6, side 1, which reads ambritta. There is no wulu apparent.

13 magēhhakēn: (Brandes, pagēhhakēn)

14 mā 5: (Brandes, ma 6) The script appears as the cipher in 856, line 6.

15 samangka: (Brandes, sama(ngka) ).

16 pawēh: (Brandes, pagēh).
17 gananna: (Brandes was not sure of the n).
18 manadah: (Brandes was not sure of the n).
19 Brandes has omitted this word. The reading is difficult; it appears to be (G) possibly twas - heart. (Gonda, Sanskrit in Indonesia, 1973, 134).
20 prananya: Brandes has omitted the nya.
21 The word appears to be sagong.
22 mangiliwatēn: (Brandes, madelēgaken).
TRANSLATION OF THE BAKALAN (WULIG) INSCRIPTION

Front Face:

These were the words spoken\(^1\) by Her Highness,\(^2\) the Ruler's Consort,\(^3\) Rakryān Mangibil, communicated\(^4\) to the Samgat\(^5\) Susuhan as a directive to the \(\text{[4]}\) elders\(^6\) of the villages of Wulig\(^7\) and Pangiketan,\(^8\) of Paći Paći,\(^9\) of Pikatan,\(^10\) of Panghawaran,\(^11\) (and) of Busuran.\(^12\) Situated near the dam.\(^13\) That which has been decreed by Her Highness, the Ruler's Consort, \(\text{[7]}\) was attended to\(^{14}\) by Samgat Susuhan (and) Samgat Taplan\(^{15}\) has been charged \(\text{[8]}\) with the supervision of putting it into effect; and it is the responsibility of all the village elders, every one of them, \(\text{[9]}\) to see that the command of the Ruler's Consort is obeyed. \(\text{[10]}\) You are to instruct your people, all of them without exception,\(^{16}\) concerning the use of the dam (or irrigation system) and that they must report anyone who uses the irrigation system\(^{12}\) unlawfully, allowing water to flow through the conduits\(^{13}\) at night\(^{17}\) or catching fish during the day,\(^{18}\) and \(\text{[14]}\) if there is anyone who breaks the regulations\(^{15}\) it is commanded that he be punished (fined),\(^{19}\) to appear before the council on the \(\text{[16]}\) thirteenth day, in the middle of the month.\(^{20}\) Therefore, it is the obligation of all the elders\(^{17}\) to pay careful attention to this written word,\(^{21}\) so that \(\text{[18]}\) its purpose may be made clear to all the villagers. Thus, under Samgat Taplan, the directive of the \(\text{[2]}\) Ruler's Consort is to be carried out, and \(\text{[3]}\) Mpunta Pakatuppan\(^{22}\) is charged with the supervision \(\text{[4]}\) of the dam (or irrigation system) and the guarding of \(\text{[5]}\) Sang Hyang Ambrita\(^{23}\) day and night. \(\text{[6]}\) Hail! In the caka year of 856, in the month of January,
on the first day of the month, [7] at Full Moon, on the day Tungle, Ka, W'haspati, during the wuku week Wukir, [8] at that time Her Highness, the Ruler's Consort, Rakryan Mangibil [9] founded three dams, constructed at Kahulunan, [10] Wuatan Wulas (and) Wuatan Tamya; thus was [11] the number of places where the river was dammed, (the 'good works') accomplished by her. The elders (and their families) [12] assembled (for the ceremony). The witnesses from Wulig, Bañjut, [13] received 5 māsa and one set of cloth; the witness from Pikatan, Margigimwal, [14] received 5 māsa and one set of cloth; the witness from Pañi Pañi, the Elder of the Kalangs, [15] Kandut Anting, received 5 māsa and one set of cloth; the witness from Busuran, Haṣṭi, [16] received 5 māsa and one set of cloth; the witness from Panghawaran, Angantēn, [17] received 1 māsa and one piece of cloth; the Governor Mangrapti Manatang [18] received 2 masa and

Side 1: one piece of cloth. Thus was the number of [2] village elders who [3] received the traditional ceremonial gifts and [4] partook of the ritual feast. This (prācاست) has been inscribed by Pāng Acaryya [6] Ambritta. //0//


NOTES ON THE TRANSLATION

1 ujar: In a ājapata of 860 A.D. the words ujar rakarayān mapatih i wka occur, which de Casparis (II, 335, 336) translates as 'such were the words of the Rakarayān Mapatih of Wēka...'. Ujar has the sense of 'the royal word' if the decree was issued by a raka or a rakryān, if issuing from the ruler then ajña was used.

2 rakryān: See Chapter Three concerning rakas and rakryāns.
bini haji: In East Java the ruling monarch's chief queen was entitled rakryan bini haji pri parameswari, sometimes followed by her personal name as in the case of Sindok's queen dyah Kebi. The title reaches back to the days of the ruler Balitung and persisted to the close of the Indo-Javanese period. In Central Java the chief queen bore the title of pri kahulunan, as did, for example, the princess Pramidawardhani, wife of Rakai Pikatan (de Casparis, I, 83f; Krom, Hindu-Jav. Geschieds, 193). In fourteenth century East Java the chief queen seems to have been styled pri parameswari without the rakryan binihaji. The secondary queen was known as the mahadewi, and bini hajis usually were the ruler's wives of lower rank (bini - bi with the infix in, one who is made wife of the haji - ruler). It also appears to be an Old Malay term for women of the royal quarters and is used for noble women in present-day Minangkabau. (De Casparis, II, 353, vini haji.)

umingsor: Royal decrees were communicated, or 'passed down', from the highest ranking dignitary below the king, a rakryan, to the next in rank, usually a samegat. In the case of the present inscription, issuing from a rakryan, the decree was communicated directly to the samegat Susuhan, and thence to the ramas, for whom it was intended. Sometimes the form i pingsoryajna pri maharaja, kumonak sang parngot..., 'the decree issuing from the Great King, for the benefit of Sang Pamegat...' occurs (van Naerssen, Oudjav.O., 39).

samegat: Sometimes pamegat, sang pamegat, or sang megat, abbreviated to samegat as in the present case. Samegat Susuhan may have come from the area around the village Soso, which is about 7-8 kilometres east of the hamlets Bakalan and Padi, a short distance east of Pacet (see sketch). According to Kromodjojo Adi Negoro (14, note 2), susuhan is a place-name meaning 'inland dam', which he identifies with present day Susu (Soso).

rama(s): See Chapter Two concerning ramas, village elders. See de Casparis, II, 216 f and notes 23 and 24 for his distinction between rama and rama.

wulig: The whereabouts of Wulig was unknown to Kromodjojo Adi Negoro. It is possible that Wulig was the present-day village of Bakalan.

1 Sarkar, II, 181, note 73
paniktan: The engraver has omitted the e from the standard reading, panikētan, a place-name which, according to Kromodjojo Adi Negoro, means 'a place to tie up cattle'. This village, he says (14, 4), was later named Panganan and is now abandoned. Panikētan is mentioned in the Nāgarakertāgama, canto 73-3-3, and is included in the list of Buddhist domains visited by Hayam Wuruk. The location was unknown to Pigeaud (Java, IV, 234). Maclaine Pont refers to Ketanan, situated to the north of the Kali Pikatan, in the Pugeran area where there are remains of ancient dams and ponds (O.V., 1926, 120). Can this be the old Paniketan? On the other hand, in the inscription the villages of Wulig and Panikētan are listed together, (i wulig mwang i paniktan) whereas the other four villages are mentioned separately (i padi padi i pikattan i panghawaran i busuran). A possible explanation is that Panikētan was a hamlet belonging to the village Wulig in 934 A.D. If this was indeed the case it is an example of the traditional Javanese grouping of five villages. The fact that, in the list of rāmas from the villages mentioned in the second part of the inscription as winekas (lines 12-16), Paniketan is not mentioned, may support this theory.

padi padi: The present-day village of Padi, located below the Pikatan-Kromong confluence and just below the dam Wuatan Tamya, mentioned in line 10, back face, (see Maclaine Pont, O.V., 1926, 104, 122 and van Stein Callenfels, O.V., 1926, 85). The original dam at Padi was converted into a 'permanent' one by the Irrigation Board during a later period (Kromodjojo Adi Negoro, 14, note 5). At the present time Padi, Bakalan and Tameng are hamlets of Slawe.

pikattan: The village of Pikatan. There are differing opinions concerning this place. Van Stein Callenfels notes that only the Kali Pikatan is known today and Kromodjojo Adi Negoro was unable to locate a place of this name. Sutjipto Wirjosuparto, on the other hand, considers that the inscription refers to the desa Pikatan in the Tulung Agung region, west of Blitar and south of Keṇdiri. An inscription issued by the king Çri Kameçwara of Keṇdiri in 1116 A.D. suggests that this Pikatan had some significance. However, it seems improbable that this is the Pikatan of the present inscription as most of the villages and dams mentioned in the Bakalan inscription can be identified in the
Pikatan-Kromong-Landean River area. Pikatan is mentioned in the Nāgarakṛtāgama, cantos 17-4-4 and 73-3-3, and is also listed among the domains of deified kings in canto 76-3-4. Among the places visited by Hayam Wuruk during the tour of his provinces was the sacred place Wēwē-Pikatan which, according to Pigeaud (IV, 44) was 'a village Wēwē on a rivulet Pikatan'. Wewe is also listed under the Buddhist domains in canto 17-4-4 of the Nāgarakṛtāgama. As Wewe-Pikatan is included in the group of four domains which includes Candi Limō, it is identified here as the Pikatan of the present inscription, located in the Kali Pikatan area. Candi Limō is situated on the Baureno lake, south of the Kali Pikatan where it nears ancient Majapahit to become the Kali Brangkal which, according to Maclaine Pont (O.V., 1926, 106) is the old man-made canal which took the Pikatan floodwaters northwards to the Brantas. Slametmuljana notes that the Wewe Pikatan was at Candi Limō (Government of Majapahit, 26).

11 panghawaran: According to Kromodjojo Adi Negoro (Oudjay.O., 14, note 5), the word means a meadow or grazing field. The old village of Panghawaran, he says, is now the village Kebontunggal (the addition of tunggal, dike, being due to a later village federation). Maclaine Pont reports on the existence of old roads passing through the villages of Kebontunggal, Jemanik and Wanaploso, with ancient dikes over the Pikatan and the Judeg Rivers connecting Padi and Candiredja on the one hand and the abovementioned villages on the other. The dam across the Kali Pikatan at Tameng, used as a bridge on the road through to Kebontunggal, has been modernized. Ancient irrigation works, or remnants of them, are to be found in the area, especially at Jemanik (Emanik). (Jemanik is mentioned in the Nāgarakṛtāgama, canto 18-7 as Er-Manik, a Buddhist dependency. Its location was unknown to Pigeaud (IV, 62).) Kromodjojo Adi Negoro's identification of Panghawaran with Kebontunggal may not be correct: there is a similarity between the name Panghawaran and modern Pehngaron, situated on the Kali Pikatan north of Jetis but downstream from where the Pikatan flows into the Brankal. In his list of the dams which can be identified with those mentioned in the inscription, Maclaine Pont includes Pehngaron, presumably identifying it with ancient Panghawaran.

12 busuran: According to Kromodjojo Adi Negoro (14, note 5), the old village of Busuran, the name of which, he
points out, means dike (tamschläge), is now the village of Tameng where remnants of the ancient dam are still to be found. (Maclaine Pont considers that this dam was on the site of the present Waduk Tameng. See note 9 above.)

13 parnnah nikang dawuhan kinonken: Kromodjojo Adi Negoro translates the phrase as 'situated below the dam Kinonken' (gelegen beneden den dam Kinonken). In the present translation kinonken is read as kinonakken and translated thus: (the villages) 'situated near the dams. That which is decreed by Her Highness the Ruler's Consort...'. Kromodjojo Adi Negoro identifies the present-day dam at Nono with the 'dam Kinonken'. If the word did indeed refer to a dam the phrase should read parnnah nikang dawuhan i kinonken, as found in line 9 verso: dawuhan katrini i kahulunan i wuatan wulas i wuatan tamya (the three dams at Kahulunan, at Wutan Wulas (and) at Wutan Tamya); as occurs in OJO LXI: dawuhan i kamalagyan and tambak ring waringin sapta (lines 7, 15, 17, 22). The issuing of a royal proclamation referring to irrigation works and regulations pertaining to them indicates that the dams concerned were of direct significance to the elders and farmers of the villages specifically mentioned in the inscription. One would therefore expect the villages to be situated nearby the dams. The dam at Nono is at some distance upstream on the Kali Kromong, whereas all the place-names so far identified by Maclaine Pont begin with present-day Briti near Tameng, Padi and Bakalan, below the Pikatan-Kromong confluence. A new dam is being constructed at Briti at the present time.

14 gaweyakna: The word is used in various inscriptions to denote, for example, the cost of 'marking out' the village (to become freehold) - sumusuka ikanang wanua... gawai ku 2. (Sangsang, recto, 4); the construction of a sanctuary - ginawai kabikuan (Taji, Pl.1); in connection with irrigation works, to excavate a canal - gawai a kali i harïn̄jing (Harinjing A, 4). Samgat Susuhan's duties may have included arranging for the engineers to survey the dam sites and draw up plans and specifications.

15 tapian: This is now the village of Tampelan, north of Bakalan near Pugeran. As Tampelan is close to the other places mentioned in the inscription the Samgat from this area would have been the most likely one to
It is possible that Samgat Susuhan and Samgat Taplan may have been officials equivalent to the sedahan agung and the sedahan tembuku of Bali. See Chapter Two, Balinese subaks.

\[\text{an tan bayya bayya, or an tan baryya baryya:} \]
A problem presents itself here; the reading of this phrase is therefore tentative. Brandes was doubtful of the presence of a layar. In the photograph of the stone published by Kromodjojo Adi Negoro (Oudjav. O., I, 3-6) there are no layars visible and by personal examination of the inscription stone itself no evidence of the \[\text{r}\] in either word was found. Kromodjojo Adi Negoro translates the phrase as 'zieh zonder aanzien des persoons' (irrespective of persons, or 'including everyone').

Goris (I, 223) gives the meaning as probably \[\text{elk, alle, tegelijk, eider (every, all, together, each).}\]
However, Goris avoids translating the word wherever it occurs in duplication as in the following examples:

(1) Serai A II inscription of 915 caka, part IVb, line 1 (Goris I, 82): hentwa rgęp buru mahutang tani baryyan pakadahēn pabungsiran... - untranslated in Goris, II, 150.

(2) Buwuhan A, 916 caka, part IV, line 8 (Goris, I, 85): an tan hana deyan baryyabaryya sīla molahulah,... - untranslated in Goris, II, 154.

The word baryya also occurs in the Baru (Simpang) inscription issued by Airlangga in 1030 A.D. (OJO, LX) in verso 7-8: ...an kapwätasi rapamatēkyña tan baryyabaryya cīla irikang thāni ring baru tan pangalapa tēnamtēnamān salinarangnikeng ta nayan thāni hampyal pring ptung pucang sērēh kayu kayu sarwaphala... (Brandes, 131).

In the Sang Hyang Tapak inscription issued by Airlangga's contemporary, the Sundanese ruler Črī Jayabhupati, in 1030 A.D., the phrase mwang tan hanani baryya baryya cīla occurs, which Pleyte (TBG LVII, 206) translates as 'dat men dit niet met onverschilligheid behandelen' ('that men do not treat this lightly'). Goris notes that the word baryya often occurs in the phrase baryyabaryya cīla molah ulah and is usually connected with the cultivation of plants (II, 223). This seems to strengthen the case for reading 'every one without exception' which would apply to all the farmers in the vicinity of the dams, who must be informed of the Rakryan's decree, and who must observe the prohibitions and abide by the regulations concerning water distribution and so on. From the foregoing examples, from four different
inscriptions, it appears that a phrase including the words baryya baryya occurs in decrees before any stipulated prohibition. Kromodjojo Adi Negoro's reading of baryya baryya (thus including a layar which Dang Arcaryya may have omitted) and his translation of the phrase has been accepted tentatively.

umajara kamu tepangupullakna dawuhan telye a ikana wéluran ri wëngi: The rámās' responsibility was to see that the farmers who were to share the water were familiar with the irrigation system; how to regulate the flow of water through the conduits, and how much each farmer was entitled to. (See subak regulations, Chapter Two, 75f. above). If the dam was situated fairly close to another, used by other farmers, the amount of water drawn off for each sawah field was a matter of importance, especially to the farmers whose fields were below-stream from the dam. Abuse of water distribution was a crime, and if perpetrated by someone upstream the result for those below could be drastic. In Bali waterstealing is severely punished, judging by the many references to the crime and the extremely heavy fines levied (see Chapter Two above). The prohibition applied also to the use of the conduits at night; in fact the person who stole water at night was more heavily fined than one who was caught stealing during the day. The use of the word kamu is unusual.

nguniwaih umalappa iwaknya i rahina: According to Korn (Adat. Bali, 476, 479) the villagers were free to fish in the rivers and water channels providing care was taken not to cause damage to the rice plants, such as by using nets made from the poisonous atta plant. Fishing in the irrigation channels at night was forbidden. Liefrinch (Landsverord, 263), reporting on the same prohibition, remarks on the very heavy fines levied for breaches of the regulations pertaining to the use of the irrigation system. The Sundanese inscription of Çri Jayabhupati, 1030 A.D., forbids fishing in the river near the sanctuary (Pleyte, TBG LVII, 206). The prohibition on fishing in the present inscription could apply to a certain period of the year, to allow for fish breeding. Sutjipto Wirjosuparto ('Apa sebabhnysa', 72) suggests that not only were the dams to be used for irrigation purposes but for fishbreeding as well.

anigrahan: To punish, in this case probably to levy
a fine. There is an example in the Blota inscription of 928 A.D. (OJO XXXIV) to the effect that if a certain freehold were entered by unauthorized persons they were to be fined in gold: knana ya nigraha mā 5 su 1 (line 16). The rule is also contained in the Hariñjing B inscription of 921 A.D. where there seems to be a parallel with the present case, for example, 'if someone sins, as a result of negligence, indifference to, or infringement of, the royal decree, he is to be fined 1 gold kā and 2 su' (lines 21-2).

20 katiga wēllas tangah: The councils of rāmas (or in the case of sēkaha subaks, the members) was held at a certain time each month. The thirteenth day in the middle of the month applies to the three day period between the waxing and the waning moon, New Moon and Full Moon.

21 kunang deya nikang rāma kabaih kayatnaknnyu rañaniketulis...: The rāmas were the ones in authority where the sawah farmers were concerned: the rakryān could issue a decree but it was the rāmas who directed their people on matters relating to agriculture. Nyu is the second person possessive pronoun used for the lower ranks (as from a rakryān to rāmas).

22 punta pakatuppan: mpu-nta, an honorific title usually given to a member of a monastery or cloister (see de Casparis, I, 49f and II, 334f). Kromodjojo Adi Negoro translates mpunta as the Head of Pakatuppan (het hoofd van Pakatoepan). In the Sangguran inscription (Minto stone, line 6, back) it is recorded that the person who 'marked out' the village which was to be made freehold for the deity of the temple was punta Mananjung whose name was dang ācāryya, obviously a priestly person. In earlier times in the agrarian regions the priests were not merely men of religion but also took an active part in agriculture.

23 sang hyang ambrita: According to Kromodjojo Adi Negoro, Ambrita is the name of a deity or a holy person. Ambrita could be either the river or a dam temple, but possibly it could refer to a dam itself. In Airlangga's Kōlagyan inscription the dam is referred to as sang hyang dawuhan. As there is a Briti situated on the Pikatan River, below the village of Padi, with remains of an ancient dam, it is conceivable that 'Sang Hyang Ambrita' was in this vicinity a thousand years
ago and that Dang Açäryya Ambrita, who inscribed the Bakalan stone, may have been in charge of a temple which housed the guardian of the dams. Hyang applies to deities and spirits, sanctuaries and other sacred places, as well as rivers. Sacred places along the Kali Pikatan region are mentioned in the Nāgarakértagama, for example, Candi Lima, the five temples situated by the lake Baureno.

24 tungle, ka, wrhaspati, wukir: Tungle was the first day of the six-day week, ka - Kliwon, the fourth day of the five-day or market week, wrhaspati is Thursday, and wukir the third week of the Javanese cycle of wukus - thirty weeks of seven days each.

25 kahuluan and wuatan wulas: Unidentified, wuatan tamya, present-day Waduk Tameng.

26 kurēnkurēnan: The rāmas and other officials and their wives and children assembled for the foundation ceremony, to participate in the ritual feasting and entertainment as well as the solemnities of the official occasion.

27 winēkas: One who is sent with a mandate, a delegate or witness; in the case of a landgrant ceremony those attending the ceremony in the capacity of witnesses to the legality of the land transaction. These were the rama tpi sering, the elders of the neighbouring village. Winēkas can be translated as 'he who receives orders'. In this case, the winēkas were the rāmas of the villages mentioned.

28 mā: Māsa was a monetary weight, in silver or gold. In Central Java the māsa was usually of gold and expressed as mas māsa but apparently in East Java gold was in short supply (see Pigeaud, 'Jav.Gold', 195f). Gold is notably absent from records of ceremonial gift lists in East Javanese inscriptions. According to van Naerissen a māsa suwarna was a gold weight, as distinct from a māsa, a silver weight. (D. & D., 50f). 1 māsa equalled 6 kupangs, and 16 māsa equalled 1 gold suwarna (see Monier Williams, 793 and Macdonnell, 227). Originally the weight of gold or silver was based on the weight of a certain bean. During an archaeological survey in the Majapahit city ruins, a number of māsa pieces were found near Candi Tikus, together with a scrap of gold leaf, at a depth of 1.20 metres under the surface.
The amount of māsa given to the rāmas compares with amounts given to delegates at ceremonies which appear to have been on a much larger scale than the one recorded in the Bakalan inscription; the average amount recorded in inscriptions seems to be 5 māsa. This may indicate a certain affluence in the principality of Mangibil, despite the modest inscription. It is noteworthy that the member from Panghawaran only received 1 māsa and one length of cloth, not one set. It may denote lesser status for Panghawaran - a hamlet perhaps?

wĕdihan yu: Wĕdihan is a kain or length of cloth for men's wear (as distinguished from ken, a woman's kain), a piece of cloth given as part of the ceremonial gifts to the delegates and usually given as a set - wĕdihan yu. Yu may be an abbreviation of yuga - a pair, consisting of the kain and a headcloth of special quality, for ceremonial wear (sometimes a kain and breastband). Pigeaud translates the term as 'state loincloths' (IV, 123). In the Ngabean inscription of 878 A.D. sets of kain of various colours were presented to those of higher rank, for example, wĕdihan kalyaga yu - red cloth, wĕdihan rangga yu - coloured cloth (Kembang Arum) and wĕdihan bira - blue cloth (Ngabean, IV). As recorded in the Kĕmbang Arum, one woman of high rank was presented with a length of 'Eastern cloth with a coastal pattern' (presumably a design made in a coastal region) (Pigeaud, Jav.Gold, 194). De Casparis (I, 34), noting the occurrence in the Karangtĕngah inscription of the gift tukurang yu remarks that he considers yu to be an abbreviation of yugala, a pair or set, and suggests that because in later inscriptions wĕdihan was usually presented in pairs it is possible that takurang, a term later applied to a length (arm-span) may have been used to denote men's apparel of a certain colour. Pigeaud (Jav.Gold, 194) differs from others in his interpretation of yu, which he sees as an abbreviation of gayu. (In OJO CXII the phrase wĕdihan gayu occurs.) Kayu is used in modern Java as a measure for a piece of cloth of 8 kacus; one kacu is a square piece of material as long as the width of the Javanese loom, i.e. about 50 centimetres. Eight kacus (one kayu) can be made into a kain four times as long as its width, by cutting it into two and joining the two halves side by side. According to the evidence of charters, Pigeaud remarks, the women and some men of lower rank had to be content with one hlai (one length),
which was probably half of a kayuh (of 4 kayuhs in length). The winêkas of Panghawaran and the patih Mangrapti Manatang only received one hlai (note 27 above). Sahlai (sahelai) is, in New Javanese, selé - 'one of a pair'. Pigeaud (194) believes his interpretation of the abbreviation of _yu to be more satisfactory than that of van Naerssen's or Stutterheim's, by which he assumes they meant 'a set of two, presumably one kain and one shawl (sléndang).

30 tuha kala kandut anting: The term was used to distinguish a degree of standing between ramas, the tuha perhaps being the kaki, the elders of the village who had retired and handed their landholdings to their heirs. See also de Casparis, II, 226-7 and note 62. Tuha kalang and hyang kalang are mentioned in Ngabean I, line D.1. Sarkar (I, 214, note 33) suggests that this may denote a classification of kalangs into various grades. These tuha kalangs are mentioned in several inscriptions. There are also references in other inscriptions to pu anting (Taji Gunung, 34), to rasi kandut (de Casparis, II, 329, line 26), kaki kandu (van Naerssen, 'Twee Oork.', 444, line 1). Tuha kandut and rangga anting also occur.

31 patih mangrapti manatang: It is not clear whether there were two patihs Mangrapti and Manatang or one bearing two names. The name following the word patih can be a geographical name. There are other references to these names as, for example, in the Palêpangan charter, mangrangkpi pu kudhut (line 14) and in the Kêmbang Arum, mangrangkpi halaran, and the copper-plates of Barahasrama, line 17, wawaha mangrangkpi.

32 gananna manadah etc: See Chapter Four for ritual feasting at foundation ceremonies.

33 dang ācāryya ambritta: Kromodjojo Adi Negoro has translated the words likhita dangācāryya ambritta//0// agong ikangu i talangan... as 'written by the holy man Ambritta the Great, who at Talangan... (Geschreven door eerwaarden en Ambritia de Groote, de te Talangan...). The present work differs from this reading because of the //0// at the end of line 6, denoting the end of a sentence. Line 1, side 2, is therefore the beginning of another sentence.

34 talangan: Perhaps Tulangan of inscription OJO, XXVIII.
CONCLUSIONS

In this thesis attention has been directed to sawah cultivation in East Java, and in the Kali Pikatan region in particular. The development of East Java during the early part of the Indo-Javanese period appears to have been neglected by scholars in the past, commencing with Brandes who considered the region to be little more than a wilderness at this period. However, a study of the inscriptions has shown that in East Java an established kingdom, probably based on sawah cultivation, existed as early as kingdoms in Central Java. Also, it is from East Java that the earliest epigraphical evidence of irrigation management comes, providing not only evidence of irrigation organization on an advanced scale, but the earliest example of privately-owned irrigation works in the Hariñjing project of the Bhagawanta Bari. Thus East Java can be said to have played a prominent part in the development of sawah cultivation.

The development of sawah cultivation in Central Java during the earlier part of the Indo-Javanese period and in East Java during the entire Indo-Javanese period to the fifteenth century, can be traced through Old Javanese inscriptions. Indian influence is evident as early as Purnavarman's fifth century record of river diversion, the earliest example of flood control (referred to in Chapter One). It is possible to trace the development and extension of major rice-growing areas in ancient Java by i) the number and distribution of inscriptions concerning land grants, ii) the presence of temples and other sanctuaries in association with inscriptions, and iii) the duplication of place-names, a phenomenon which occurs not only within both Central and East Java but between the two regions, indicating
expansion by the court and by religious bodies into outlying undeveloped regions. It can be concluded that earlier migrations from established villages to nearby uncultivated areas also took place, due to population expansion beyond the village capacity; names of the mother villages were perpetuated in the new areas.

The pattern of development of sawah cultivation during the Indo-Javanese period appears consistent with Adams' and Collier's theories of hydraulic development referred to in Chapters Two and Three. Sawah cultivation, directed by the ruler or by religious bodies, was based on a foundation of purely Javanese irrigation organization, already established before the arrival of Indian influence. This conclusion is supported by the fact that all agricultural terms, as well as the titles of various rural officials, are indigenous and furthermore, occur in inscriptions dating from the earliest period of Indianization. The communal nature of the Javanese village, with its stress on mutual assistance, lent itself to the development of farming co-operation and village federation for the purpose of efficient irrigation management.

The Bakalan inscription reveals a link between the tenth century Mangibil region and the fourteenth century Majapahit kingdom, through the extension of the Kali Pikatan irrigation system to the previously unirrigated dry region of Trik, later Majapahit. It has also a certain significance, for the question of the possible existence of sawah associations and co-operations, since it may represent a type of early kerta sima subak; the first part possibly recording not only the establishment of a new dam, probably at Briti, but perhaps the actual establishment of a new sawah area, in the vicinity of Briti, Padi and Slawe. It is possible
that the contents of the first part of the inscription refer to an event which took place earlier than the founding of the three dams, commemorated in the second part, and may in fact have been taken from a collection of regulations pertaining to irrigation management kept in priestly or kraton archives. The samégats Susuhan and Taplan may have fulfilled duties in the capacity of 'sédahan agung' and 'sédahan tembaku', the court officials connected with the Balinese subaks, referred to in Chapter Two. Punta Pakatuppan, who was given the responsibility of supervising the care and protection of the dam (and the irrigation system) may have been the 'klian subak' of that particular irrigation area. There are parallels between the rakryāns decree and subak regulations concerning water distribution, guarding the dam against vandalism, and the punishment of those who defy the prohibitions set down or commit any other breach of the regulations. In both cases mention is made of the fines to be levied and the time of payment.

No specific term indicating the existence of irrigation associations in ancient Java has been identified in inscriptions. Although some type of organization must have existed, there is no conclusive evidence of co-operative irrigation management independent of the village bureaucracy as in Bali. There are some tentative indications of similar organization: for instance, in Bali sēkaha subaks are given names usually signifying a connection with water, which are similar to Old Javanese names (such as Talang Air) found in inscriptions, which denote the proximity of water and possibly the existence of irrigation works of importance. In nineteenth century Java, it was quite common that where sawah owners' fields were clustered in one area, this area of sawahs had its own name even though the landowners
belonged to different villages. A closer study may reveal that place-names in Old Javanese inscriptions may apply to areas belonging to irrigation associations and not to villages. Finally, the term hulair karamān, which occurs in some inscriptions, seems to indicate a council of irrigation heads, or an association of irrigation heads.

Further study may produce more concrete evidence of the existence of subak-type associations in ancient Java than has been found in the present study. On the other hand, it is possible that subak associations developed in Bali due mainly to the nature of the terrain. Great difficulties would have been encountered where new areas of sawah cultivation were being developed, which would have engendered a strong spirit of co-operation. In steep and rugged terrain only by a co-operative effort could sawah areas be established or extended. The fact remains that a well-managed system of irrigation organization, on whatever lines it may have been based, operated in Java, enabling the development of comparatively extensive sawah-based kingdoms during the latter part of the Indo-Javanese period. Why the situation apparently deteriorated is a subject for further investigation. Again, a closer study of the part played by the priesthood in agrarian affairs of ancient Java might produce some interesting results. Rakryan Mangibil's and Siṅḍok's irrigation works lie in ruins but, a thousand years later, in the present time, new hydraulic works are being established in the same places, at Briti and at Slawe, as well as on the ancient Hariṣṭjing site and at Karangkatas. Meanwhile, the Bakalan stone still exists to proclaim Rakryān Mangibil's irrigation works, which played their part in the long history of Javanese sawah cultivation.
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GLOSSARY OF INDIGENOUS TERMS USED

acāryya - priestly scribe
adat - customary law
agem - handful of rice-stalks
air, er, jha - water
ajña - royal word, order
pingsoryajña - ruler's command handed down
ampilan - box containing offerings for the cock-fight
anak - child
anak thāni - farmer
anak wanua - villager
ani ani - reaping knife used for harvesting rice
anugraha - grant, gift
aripít - small irrigation pipes (Ilocano)
arung - tunnel
aungan - tunnel (Balinese)
pengarung - tunnel builders (Balinese)
terowongan - tunnel (Bah. Indon.)
urung urung - tunnel (New Javanese)
asūḍī masa - September, usually time for collecting taxes
atak - land measurement
atap - reeds used for roofing
awig awig - regulations and laws transmitted orally
awut, uwé - grain, possibly rice
badeg - liquor, palm wine
bahu, bau - land measurement of 13/4 acres
bakal, bakalan - to clear virgin land
bahú - water
bānu pindah - flowing water
barīh - land measure, size unknown
bēkēl - official
pembekečel - official, usually in charge of taxation
bhāḍra - September-October
babit - rice seedlings
bini haji - ruler's wife, usually queens of lesser rank
blah, bélah - land measurement
brahmín - member of the priestly class in Bali
buat haji - service to the ruler, construction work
buatan wetan - 'made in the east'
cacah - piece of land owned by family
caitra - March-April
caka - era commencing 78 A.D.
carik - sawah land, dike
caru - rice offerings for chthonic spirits
çri - illustrious, deity; dewi çri, rice goddess

dadaptak - reeds

dang - honorific, usually for priestly class

dapunta - honorific title

dapur - rural community

daun légo légo - offering burnt in the sawah field at
    harvest time (Sasak)

dawuhan - dam, dammed

deca - district

dépa - land measurement of nine square metres

dépa agung - land measurement of nine square metres (Balinese)

dépa sihwa - probably for smaller fields and garden land

dharma - sacred domain

dharma kamulan - exact meaning not clear

dharmasima lepas - freehold domain

dréwya - property

dréwya haji - percentage of produce due to the ruler, ruler's
    share

duku - hamlet

dukun - shaman, village priest

dusun - village (Sumatra)

dyah - title of prince or princess

gaga - unterraced rice-fields in hills, unirrigated

galagah - a type of reed

galengan - small dikes in sawah (modern term)

gampong - village (Aceh)

gawai - work, also canal or artificial river?

gawai haji - corvee labour

gédong - shed

golongan - group or association of sawah farmers (Bah. Indon.)

haji - chief, ruler

hamat, ha (abbrev.) - certain weight or volume of grain

hulu - head

hulair, huler - head of irrigation works

hulu wras - official in charge of rice supplies

hulu wuatan - supervisor of bridgebuilding?

hyang - supernatural powers, divinity

hyang guru - spiritual master

inan paré - symbolic bridal pair made from rice sheaves (Sasak)

jaman jaman - measuring irrigation water by time

janur - young palm leaves

jawa - grain, possibly rice

jayapattra - record of a law case
julung - festival
jung - land measurement of seven acres
juru - official, expert
juru arah - scribe
juru kemong - head of cock-fight arena

kabayan - rural official
kain, ken - length of cloth, wearing apparel
kakawin - literary work
kaki - senior member, retired village elder
kalang - certain group of people in Java
kalangan - cock-fight arena
kali - river, canal (kali-canal, Ilocano)
kalima - mentioned with ramas, (possibly as pangliman, assistant, Bali)
karaeng - similar to rakryän (Macassar)
karya - small land holding, for a single family
kārsa, ŋā (abbrev.) - a certain weight of gold or silver
kati - a weight of gold or silver
katik - land measure, size unknown
kembang boreh - fragrant ungent
kerta sima - written laws and regulations (Balinese)
kerta sima desa - village regulations
kerta sima subak - subak regulations
kikil - land measurement of 3½ acres
kilala - a class of people
mangilala drēwya haji - group performing special functions for ruler or rakryan

klian - official
klian sēdahan - official between sedahan agung and sedahan tembuku
klian subak - head of the sekaha subak
kraton - centre of the kingdom, ruler's residence
kudur - priest officiating at ceremonies. Sometimes sang or hyang kudur
makudur - priest
kulina - sawah owner, village 'elite'
kulumpang, watu kulumpang - stone commemorating a land grant
kupang - weight of gold or silver, especially in Majapahit era
kurēn - spouse, marriage
kurēnkurēnan - assembling with wives at a celebration

ladang - slash and burn cultivation
ladu - lava flow
lahar - mud flow (of water and lava material)
lamwit - land measurement
langkat - measurement, span of outstretched thumb and middle finger
lattir - land measurement
legundi - see daun lēgo lēgo
liṅga - phallic symbol (Ciwa)
anna liṅga - rice cone for offering
lirih - land measurement
lontar - palm
luah prasiddha - sacred river

mahādewi - secondary queen
mahārāja - paramount ruler
mancalima - grouping of eight villages around the centre village
mancapat - grouping of four villages around the centre village

mantenān - harvest slametan or celebration (Balinese)
tēmantēn pari slametan - rice 'marriage' or harvest celebration (Javanese)

mantra - incantation
mantri, mahāmantri - high court official
mapatih - minister
māren-mārenan - means of allocating irrigation water
māsa, mā (abbrev.) - weight (of silver)
mas - gold
mas suwarna - weight (of gold)
mēgat - high court official, prince
pamēgat - high court official, prince
samēgat - high court official, prince
samgat - high court official, prince

mētik - 'to pluck'
slametan mētik - harvest or 'first fruits' ritual
tukang mētik - one who divines an auspicious day to begin harvesting

mpunta - honorific title
mūla - when used in connection with dawuhan meaning obscure (mula - root)
muwah - in addition to

nāgara - the town
nāgara agung - land outside the city limits, held by princes
manca nāgara - outer limits of kingdom
negoriṇ - village (Minihasa)
nāyaka - official employed by rakryans
nāyaka air - irrigation official
nini - rice 'mother'
nini pantun - see inan paré (Balinese)

pacērakan - land measurement, nine square metres
pacul - (stone) hoe used for sawah farming
padas - compact volcanic material
padi - rice in the field
pakarungan - part of cock-fight arena
pangkur - rural court official
pangulu buhu, pengulu buhu - irrigation official
paramecwari - title of the chief queen
paron, maron - dividing the products of the soil (share-cropping)
pasayak - association of sawah farmers (Ilocano)
pati(h) - official, steward, usually connected with the court
pati tambak - steward of royal fisheries
pawuwus - assistant to court official
parujar - assistant, or representative of, court official
pekasih - subak members who perform maintenance duties
pemangku - subak priest
pemarik - see pipil
pendedeng - 'drying out' period after childbirth
pencar - rice sheaf
perridakan desa - freehold district
perridakan darma - freehold religious domain
pesemaian - rice seedbed
phalguna - month of February-March
picul - a certain weight, to carry
pipil - record of sawah farmers' names etc. on lontar leaves
pirak - silver
pisis - monetary value in fifteenth century
pratasti - edict
püja - annual rural community celebration
pamüja - contributions to the festival of puja
punggawa - district head (sedahan agung in Bali)
punah - see muwah
punta - see mpu
raji yu (ga) - patterned cloth
raka, rakai, ratu - chief, ruler of principality
rakryan, rakaryan - chief, prince
rämä - village head, elder
rämä dega - district head or leader
rämä marata - apparently retired rämä
rämä tpi sering - rämäs of neighbouring villages
rämä tuha - probably as rämä maratä
karamän - council of elders, sometimes used for district
under a rama
rawa - marshland, morass
rënëk - marshland
sabit - sickle
saji - offerings
saluran - see weluran
sambandha - reason, purpose
sang - honorific
sapasuk - entire surrounding agricultural land
satak - a measurement
sawah - wet-rice fields
sawah tadahan - terraced fields dependant on rainwater
sawah sorotan - terrace irrigation by pipes
pasawahan - terraced fields
sawi - demarcation line or cord
sayung - fighting cock
saya - assistant to subak official
sayugan - flume (Ilocano)
sedahan - agricultural official
sedahan agung - court or government official, district head
sedahan jeh - modern sedahan tembuku
sedahan tembuku - subordinate to sedahan agung

sega polong - rice-ball
sekaha - association
sêkaha subak - irrigation association
sêkaha subak tlabah - association of sekaha subaks
sêlokan - ditch, channel (Malay)
semanqat - life force, spirit
sirih, sêrêh - betel, areca
siku - Balinese measurement
sima - grant, usually of land, freehold land or domain
slamêtan - communal feast
slamêtan sedaka bumi - feast to celebrate harvest
slamêtan mêtik - 'first fruits' celebration before commencing harvest

subak - irrigation association (modern Balinese)
subaki - appears to be a place-name (OJO, XCIV-V)
sudra - lowest caste (in Bali)
susuk, manusuk - to establish a freehold from virgin land
sus(k) kulumpang - foundation stone
suwak - probably earthen walls around sawah fields
kesuwakan - irrigation association (modern - subak)

tahil - measure of gold or silver, later applied to tax
talang - aqueduct, usually of bamboo
tameng - dike, dam
tamya - tameng
tambak, tamwak - dam, pond, lake
tamwaka - to build a dam
matamwak - official probably in charge of irrigation installations
tambuku - distribution block (tembuku, temuku - Balinese)
tampah - area measurement particularly for sawah fields
tampah haji - royal land measurement
tangan - measurement
tanggul - dam wall, barrage
thāni, täni - farmland, rarely applied to farmers
tawan - court official, see pangkur and tirip
tēqal, tēqalan - dry-rice land, open plain, untarred
țka (țēka) dlaha ning dlaha - to the end of time
tēnah - land measurement, water measurement by volume
tēnah winiḥ - estimated amount of seed grain
tpi (țēpi) siring - neighbouring villages
terowongan - tunnel (Bah. Indon.)
tētajēn - cock-fight (Balinese)
sima tētajēn - regulations for cock-fight
tētajēn desa - cock-fight at village level
tētajēn lewih - cock-fight arranged by the kraton
tētajēn subak - sekaha subak cock-fight
tiga sâna - tax on rice fields
tinulad - copied
tirip - official, see pangkur and tawan
tirtha - sacred bathing-place
tlabah - see weluran
turun turun - tithe, tax levied on bundle of rice
tuha, tua, tuwa - elder
tuha kalang - elder of the group of kalangs
tuha wanua - headman of village
matuha, rama matuha - elder
umah - probably farmhouse, communal house,
undagi, undahagi - skilled worker, craftsman, excluding metal worker (pande)
undagi pangarung - tunnel builder (Old Balinese)
ulu ulu - present-day group connected with irrigation. See golongan, perhaps formerly wulu wulu
upapatti - court priests, assessors
uluran - area supplied with irrigation water from same source. See weluran
wadihati - assistant at ceremony
waduk - reservoir, basin (Bah. Indon.)
wadwa - official, servant
wahuta, sometimes sang wahuta - priestly official at ceremonies
wanua, wanwa - village
wariqa - rural astrologer
watēk, watak - district under ruler's jurisdiction
water - 'fence' (not occurring before fourteenth century)
wayang - puppet performance
wedihan - ceremonial cloth for men's wear
wedihan yu - pair or set of cloth, kain and turban
weluran - channel, conduit
winkas, winékas - representative at ceremonial function
winih - rice seedgrain
pawinih - seedbed
suwinih - water tax (Balinese)
wha - unit of weight (of rice yield)
wras, beras - husked rice
wuatan, wwatun - reservoir, large dam, bridge

yawa, yawae (Dyak) yaba uré (Batak) - grain, possibly rice
yoni - female symbolic counterpart of linga
yuga - ceremonial cloth consisting of two pieces