

**The Evolution of the Printed Bengali Character  
from 1778 to 1978**

by

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Thesis presented for the degree of  
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## The Evolution of the Printed Bengali Character from 1778 to 1978

### Abstract

The thesis traces the evolution of the printed image of the Bengali script from its inception in movable metal type to its current status in digital photocomposition. It is concerned with identifying the factors that influenced the shaping of the Bengali character by examining the most significant Bengali type designs in their historical context, and by analyzing the composing techniques employed during the past two centuries for printing the script.

#### *Introduction:*

The thesis is divided into three parts according to the different methods of type manufacture and composition:

#### *1. The Development of Movable Metal Types for the Bengali Script*

Particular emphasis is placed on the early founts which lay the foundations of Bengali typography. Part 1 is subdivided into three sections, viz. *Europeans in India, European Ventures, and Indigenous Ventures.*

#### *2. Mechanical Typefounding and Composition of Bengali*

In assessing the adaptation of the Bengali script for mechanical composition, attention is paid to those developments which precipitated the transition of printing in India from a craft to an industry.

#### *3. Photocomposition of the Bengali Script*

The advantages of photocomposition are appraised in relation to new technical constraints imposed on type design. The description of the latest stage in the evolution of the printed Bengali character relates the practical implementation of this study's findings, viz. a new typesetting scheme and typeface design for the Bengali script.

The *Conclusion* considers the new methodology adopted for the development of digital Bengali founts and its relevance to the production of all vernacular typeforms.

The *Epilogue* discusses Bengali typewriter characters and low-resolution character shapes. It also considers the implications of new technology that places the design and production of founts in the hands of the non-professional designer.

The thesis is intended to be of interest to the indologist, printing historian, type designer and type manufacturer. It comprises 11 chapters and includes 178 illustrations.

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
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N.B. the typeface samples are reproduced at their original size unless otherwise stated. However, the majority comprise photocopies of original settings and therefore some distortion is inevitable. I am indebted to the St Bride Printing Library for providing me with a great number of samples.

Plates 13, 14 and 29 are reproduced by courtesy of Mr Trilokesh Mukherji.

Plates 177 and 178 are reproduced by courtesy of Dr Clinton Seely.

## Scheme of Transliteration

a	अ	dha	ट	ठ
ā	आ	na		ण
i	इ	ta		त
ī	ई	tha		थ
u	उ	da		द
ū	ऊ	dha		ध
r̥	ऋ	na		न
e	ए	pa		प
ai	ऐ	pha		फ
o	ओ	ba		ब
au	औ	bha		भ
ka	क	ma		म
kha	ख	ya	य	य
ga	ग	ra		र
gha	घ	la		ल
ña	ङ	va		व
ca	च	śa		श
cha	छ	ṣa		ष
ja	ज	sa		स
jha	झ	ha		ह
ña	ञ	ṁ		ॠ
ṭa	ट	~		ॡ
ṭha	ठ	h		ॢ
ḍa	ड			

## Abbreviations and Conventions

BFBS	British and Foreign Bible Society
BL	British Library
BMS	Baptist Missionary Society
EIC	East India Company
IOL	India Office Library and Records
LMS	London Missionary Society
MLCo	Mergenthaler Linotype Company
OUP	Oxford University Press
SOAS	School of Oriental and African Studies
SPG	Society for the Propagation of the Gospel

Designations giving Bengali typeface provenance:

(Identification is to be found within the text and in the list of plates)

BC1	Bishops' College Press
BM I-BM V and BM VII	Baptist Mission Press
CW1-CW4	Charles Wilkins
CP1	Chronicle Press
GV1-GV3	Giriśa Vidyāratna Press
IR1	Imprimerie Royale
KKB	K.K. Hof- und Staats-Druckerei
RW1	Richard Watts
SB1-SB4	Serampore Mission Press
VF1	Vincent Figgins

Names:

The scheme of transliteration given on page 13 has been used for Bengali names except where an alternative spelling is more common (e.g. Serampore). Where variations in the spelling of missionaries' names have occurred in BMS publications and manuscripts, the most common forms given in the latter have been used.



## Introduction

Two hundred years after the production of the first successful fount<sup>1</sup> of movable metal Bengali types by Charles Wilkins (1749-1836), there arose a demand to produce the first fount of digital Bengali typeforms.<sup>2</sup> In 1978 preliminary investigations for this project<sup>3</sup> confirmed the unsatisfactory state of current Bengali typography.<sup>4</sup> It also revealed the lack of material available on the history of the printed Bengali character.

Until 1978, the introduction of faster processes of fount production, composition, and printing,<sup>5</sup> in comparison to handcutting and handsetting, had resulted in the degradation of Bengali typeforms. Newspaper typography, in particular, had suffered. Since the mid-1930s a limited range of characters, or character elements, was employed to represent all the required Bengali letterforms. New typographic conventions emerged, as instanced by vowel signs that were no longer subscribed but situated beside their host characters.<sup>6</sup> Such practices became accepted for more than half a century, gradually spreading to numerous magazine and book publications.<sup>7</sup> Unless a new approach was adopted, the printed Bengali character seemed destined to remain in this condition, or become further degraded, due to the predilection of fount

1. A definition of the term fount (font) that is applicable to all technologies is given by Charles Bigelow: "font" means a concrete rendering of a typeface in a particular character set for a particular size-range for a particular imaging system'. *Principles of Type Design for the Personal Workstation*, A [privately circulated] keepsake prepared by Bigelow & Holmes for members at the ATypI Congress in Kiel (September, 1985), p. 1.
2. By Ananda Bazar Patrika Ltd; see chapter 11. In this study, the common practice of using the term 'type' will be adhered to even in connection with technologies that do not use metal.
3. Undertaken by Fiona Ross.
4. In this thesis the term 'typography' is used according to the definition, 'the design of printed matter' given in *A Dictionary of Printing Terms* published by Linotype & Machinery (London, 1962), p. 43; also see below, p. 63.
5. Since the advent of mechanical composition and rotary printing.
6. See below, chapter 8 and pl. 129.
7. e.g. Cittaranjana Bandyopadhyaya, ed., *Dui Śatakera Bāṃlā Mudraṇa o Prakāśana* (Calcutta, 1981).

manufacturers for adapting existing typefaces<sup>8</sup> to new technologies instead of creating original designs.

A new approach necessitated research into the evolution of the printed Bengali character to appreciate the origins of current typeforms: to discover the historical reasons behind the shaping of printed characters which contradict their calligraphic antecedents; to trace the origins of stylistic features and to assess their relevance in the last quarter of the twentieth century; to determine the criteria that distinguish good Bengali typeface designs and to note the factors conducive to their production.

Studies on Bengali type history have hitherto concentrated on the history of printing rather than on the development of printing types.<sup>9</sup> Bengali type designs have not been considered from a type designer's point of view. They have been viewed from the perspective of a reader<sup>10</sup> or, more rarely, an editor.<sup>11</sup> Founts have been discussed in isolation from the technology that produced them, i.e. divorced from the complexities or requirements of type manufacture.<sup>12</sup> Furthermore, there is little material on twentieth-century Bengali founts, and none regarding post hot-metal type designs. This work is an attempt to make good the deficiency.

8. Bigelow succinctly defines a typeface as 'a group of characters whose forms are shaped in accordance with a particular set of design principles which share certain design features'; Bigelow, *Principles of Type Design*, p. 2.
9. The most reliable of these are: Graham Shaw, *Printing in Calcutta to 1800* (London, 1978); Katherine Smith Diehl, *Early Indian Imprints* (New York, 1964); Anant Kakba Priolkar, *The Printing Press in India* (Bombay, 1958), pp. 51-70; S.K. De, *Bengali Literature in the Nineteenth Century (1757-1857)*, 2nd rev. edn (Calcutta, 1962), pp. 57-84;
10. e.g. Mofakkhur Hussain Khan, *History of Printing in Bengali Characters up to 1866* (unpublished Ph.D. thesis, 2 vols., University of London, 1976); it only covers one of the periods under discussion.
11. e.g. Nikhil Sarkar's introduction to the facsimile edition of *A Grammar of the Bengal Language* (Calcutta, 1980), Introduction, pp. 7-33.
12. This is not the case in Devanagari or Gujarati; see Bapurao S. Naik, *Typography of Devanagari* (Bombay, 1965). However, Naik's approach is more that of a compositor or engineer and is therefore not instructive to the type designer. Moreover, this work is primarily concerned with hot-metal composition. Naik also (in 1960) prepared for Linotype & Machinery Ltd a scheme for adapting the Gujarati script for mechanical slug-composing machines.

The present study therefore considers each significant development in Bengali type design<sup>13</sup> within its historical context. It seeks to identify the influences behind the styling of Bengali typefaces by appreciating the constraints imposed on previous founts by technical or artistic limitations, linguistic ignorance, misinformation, or typographic fashions. The different technologies of type production and composition form natural divisions within the thesis, namely movable metal types, mechanical typefounding and composition, and photocomposition. As the first part of this thesis covers a large and formative period in the development of the printed Bengali character (approximately one and a half centuries), it has been subdivided into three sections, namely 'Europeans in India', 'European Ventures', and 'Indigenous Ventures'.

Part I does not include xylographic or copperplate printing of the Bengali script, although interest in reproducing Bengali letterforms in print pre-dates founts of Bengali metal types. There are no examples or firm evidence of this script reproduced by xylography prior to 1778,<sup>14</sup> but the Bengali character had occasionally appeared in printed form by the means of copperplate engravings. The earliest known specimen is to be found in the 1692 Imprimerie Royale imprint,<sup>15</sup> *Observations Physiques et Mathematiques*.<sup>16</sup> In this specimen, the

13. It is therefore not intended as a check-list of all Bengali founts produced.

14. Reports, such as the discovery by Warren Hastings in Benares of a printing press and movable types of at least one thousand years' old, are too incredible and must be discounted: *The Gentleman's Journal*, 1 (March, 1870), p. 296. [reprinted from *The Printer* (New York), 3:6 (November, 1860), p. 139]; see Sajani Kanta Das, *Bānglā Gadya Sāhityera Itihāsa* (Calcutta, 1962), p. 26.

15. For further information regarding the Imprimerie Royale, see chapter 6.

16. *Observations Physiques et Mathématiques, Pour servir à l'Histoire Naturelle, et à la Perfection de l'Astronomie et de la Géographie: Envoyées des Indes et de la Chine à l'Académie Royale des Sciences à Paris, par les Pères Jésuits. Avec les Réflexions de Mrs de l'Académie et les Notes du P. Gouye, de la Compagnie de Jesus.* (Paris, 1692), plate facing p. 74. See pl. 1.

Après la page 74

Caracteres des lettres  
des peuples de Bengale

A ঙ ঞ য ঞ . trois a.  
 B ঙ ঞ . . . . . deux b.  
 C ঙ .  
 D ঙ ঙ ঙ ঙ . quatre d.  
 E ঙ ঙ . . . . . deux e.  
 F Ils n'ont point  
 G ঙ ঙ ঙ . . . . . trois g  
 H ঙ  
 I ঙ  
 L ঙ  
 M ঙ  
 N ঙ .  
 O ঙ ঙ . . . . . deux o  
 P ঙ ঙ . . . . . deux p  
 Q ঙ ঙ ঙ . . . . . trois q  
 R ঙ .  
 S ঙ ঙ ঙ ঙ . quatre s  
 T ঙ ঙ ঙ ঙ . quatre t  
 V ঙ ঙ . . . . . deux u  
 Y ঙ  
 Z ঙ ঙ . . . . . deux z

Chiffres  
de Bengale

1 ১  
 2 ২  
 3 ৩  
 4 ৪  
 5 ৫  
 6 ৬  
 7 ৭  
 8 ৮  
 9 ৯  
 10 ১০  
 Chiffres  
de Baramas  
 1 1  
 2 2  
 3 ৩  
 4 ৪  
 5 ৫  
 6 ৬  
 7 ৭  
 8 ৮  
 9 ৯  
 10 ১০  
 halui

Caracteres des lettres  
des peuples de Baramas

A ৬৭.  
 B ৩.৩. . . . . deux b.  
 C ৩.৩. . . . . deux c  
 D ৬.৭.৯.১০.৩.৬. six d.  
 E ৬. ৩. . . . . deux e.  
 F Ils n'ont point  
 G ৩.৬.৭ . . . . . trois g  
 H ৩. ৩. . . . . deux h  
 I ৩. ৩. . . . . deux i.  
 L ৩.  
 M ৩.  
 N ৩.৩. . . . . deux n.  
 O ৩.  
 P ৩. ৩. . . . . deux p.  
 Q ৩.৩. . . . . comme le d.  
 R ৩.  
 S ৩.  
 T ৩. ৩. ৩. ৩. . quatre t  
 V ৩. ৩. . . . . deux u.  
 halui (cest a dire fin)

1. Earliest extant copperplate engraving of Bengali characters; Thomas Göyze, *Observations Physiques* . . . (Paris, 1692)

extremely rudimentary Bengali characters are arranged according to the Latin alphabet, and the stroke contrast does not accord with panned Bengali letterforms.<sup>17</sup>

The one sample of the Bengali character printed from a copperplate engraving that approximates early Bengali typeforms is to be found in David Mills's *Dissertation<sup>es</sup> Selectae, Varia S. Litterarum et Antiquitatis Orientalis Capita Exponentes et Illustrantes* under the heading 'Alphabetum Brahamnicum' (Leiden, 1743).<sup>18</sup> It only shows the basic characters of the syllabary. The less skillfully-executed plate that illustrates the Bengali script in *A Code of Gentoo Laws* (London, 1776) supplies a little more information on the writing system by showing some combinations of consonants with vowels (ligatures).<sup>19</sup>

The copperplate impressions of the Bengali script in these European publications cannot be regarded as direct precursors of early Bengali founts, and for this reason form no part of this study of movable pre-fabricated Bengali letterforms.<sup>20</sup> A survey of Bengali printing types over a period of two centuries shows the first fount produced by Charles Wilkins as seminal to the development of the printed Bengali character. Particular emphasis therefore has been given to its genesis, styling, and structure. It has been necessary to include technical detail where appropriate, since methods of composition are inseparable from the design of a Bengali typeface.<sup>21</sup>

17. See chapter 1. A barely recognizable form of the Bengali script reproduced by copperplate engraving appeared under the heading *Bengalica* in John Chamberlayne's *Oratio Dominica in diversas Omnium fere Gentium Linguas Versa* (Amsterdam, 1715), which is reproduced in Johann Friedrich Fritz's *Orientalisch-und Occidentalischer Sprachmeister* (Leipzig, 1748), in 'ad pag. 84'; see pl. 2. M. Georgio Jacobo Kehr's work, *Aurenk Szeb* (Leipzig, 1725), contains a more intelligible specimen of Bengali characters (see pl. 3) and numerals, although Fritz's *Sprachmeister* contains a better example of Bengali numerals; see pl. 4.

18. See pl. 5.

19. Combinations with consonants (conjuncts) are not represented. See pl. 6, and below, chapter 1.

20. Although the pioneers of Bengali typefounding, who were principally European, may have had sight of them, the two disciplines are very different.

21. As shall be shown.



NUMERI MALBORUM INDIAE Orientalis, Europae, MOHREN vel MOORES dictorum  
Ex museo M. Georgii Jacobi Kehr, Lipsiae, anno 1725.

Handwritten numerals in Bengali script, arranged in rows. Each numeral is accompanied by a small number below it, likely representing its value. The numerals are: ১, ২, ৩, ৪, ৫, ৬, ৭, ৮, ৯, ১০, ১১, ১২, ১৩, ১৪, ১৫, ১৬, ১৭, ১৮, ১৯, ২০, ২১, ২২, ২৩, ২৪, ২৫, ২৬, ২৭, ২৮, ২৯, ৩০, ৩১, ৩২, ৩৩, ৩৪, ৩৫, ৩৬, ৩৭, ৩৮, ৩৯, ৪০, ৪১, ৪২, ৪৩, ৪৪, ৪৫, ৪৬, ৪৭, ৪৮, ৪৯, ৫০, ৫১, ৫২, ৫৩, ৫৪, ৫৫, ৫৬, ৫৭, ৫৮, ৫৯, ৬০, ৬১, ৬২, ৬৩, ৬৪, ৬৫, ৬৬, ৬৭, ৬৮, ৬৯, ৭০, ৭১, ৭২, ৭৩, ৭৪, ৭৫, ৭৬, ৭৭, ৭৮, ৭৯, ৮০, ৮১, ৮২, ৮৩, ৮৪, ৮৫, ৮৬, ৮৭, ৮৮, ৮৯, ৯০, ৯১, ৯২, ৯৩, ৯৪, ৯৫, ৯৬, ৯৭, ৯৮, ৯৯, ১০০, ১০১, ১০২, ১০৩, ১০৪, ১০৫, ১০৬, ১০৭, ১০৮, ১০৯, ১১০, ১১১, ১১২, ১১৩, ১১৪, ১১৫, ১১৬, ১১৭, ১১৮, ১১৯, ১২০, ১২১, ১২২, ১২৩, ১২৪, ১২৫, ১২৬, ১২৭, ১২৮, ১২৯, ১৩০, ১৩১, ১৩২, ১৩৩, ১৩৪, ১৩৫, ১৩৬, ১৩৭, ১৩৮, ১৩৯, ১৪০, ১৪১, ১৪২, ১৪৩, ১৪৪, ১৪৫, ১৪৬, ১৪৭, ১৪৮, ১৪৯, ১৫০, ১৫১, ১৫২, ১৫৩, ১৫৪, ১৫৫, ১৫৬, ১৫৭, ১৫৮, ১৫৯, ১৬০, ১৬১, ১৬২, ১৬৩, ১৬৪, ১৬৫, ১৬৬, ১৬৭, ১৬৮, ১৬৯, ১৭০, ১৭১, ১৭২, ১৭৩, ১৭৪, ১৭৫, ১৭৬, ১৭৭, ১৭৮, ১৭৯, ১৮০, ১৮১, ১৮২, ১৮৩, ১৮৪, ১৮৫, ১৮৬, ১৮৭, ১৮৮, ১৮৯, ১৯০, ১৯১, ১৯২, ১৯৩, ১৯৪, ১৯৫, ১৯৬, ১৯৭, ১৯৮, ১৯৯, ২০০.

ALPHABETUM BENGALICVM seu JENTIVICVM Indiae Orientalis.

১০০০০ ১০০০ ১০০ ১০ ১

ক vel ক Koo.  
খ - খ Gkoo.  
গ - গ Goo.  
ঘ - ঘ Gho.  
ঙ - ঙ Ona.  
চ - চ Sjo. [Scho]  
ছ - ছ Sjo. [Schoo]  
জ - জ Joo.  
ঝ - ঞ Sjo. [Schoo]  
ট - ট Eio.  
ঠ - ঠ Joo.  
ড - ড Tho.  
ঢ - ঢ Doo.  
ণ - ণ Dho.  
ত - ত Anno.

ড vel ড To.  
থ - থ Tho.  
দ - দ Do.  
ধ - ধ Dho.  
ন - ন Noe. (Nu)  
প - প Po.  
ফ - ফ Pho.  
ব - ব Boo.  
ভ - ভ Bho.  
ম - ম Moe. (Mu)  
য - য Joo.  
র - র Roo.  
ল - ল Loo.  
ল - ল Bo.  
শ - শ Soo.  
ষ - ষ Soo.

স vel স Soo.  
হ vel হ Loo.  
খ vel খ Khico.

Bengulenses legunt à sinistra versus dextram. Specimen. Lectionis Bengalicae

সেজেন্ট ভুবনেশ্বর  
Sergeant Wolfgang Meyer

Alphabeti et Syllabarii Mogolici (Mongalis) Tabulari pars e Mogalis singulas voces dextram, kriton l. versus dextram

Handwritten Mongolian syllables and characters in a grid format. The first column contains characters like 'a', 'na', 'ne', 'ni', 'no', 'nu', 'nū', 'nā'. The second column contains characters like 'an', 'ban', 'chan', 'wang', 'chang'. The third column contains characters like 'ana', 'wana', 'chana', 'ani', 'nuani'. The fourth column contains characters like 'chani', 'anu', 'chani', 'chani', 'nu', 'nu'. The fifth column contains characters like 'ba', 'ra', 'cha', 'yu', 'ta', 'da', 'za', 'ja', 'sa', 'chu'.

Mongalicis scriptura specimen, a sinistra versus dextram legendum

Bengalische Zahlen.

1	১	10	১০
2	২	30	৩০
3	৩	40	৪০
4	৪	50	৫০
5	৫	60	৬০
6	৬	70	৭০
7	৭	80	৮০
8	৮	90	৯০
9	৯	100	১০০
10	১০	1000	১০০০
11	১১		
12	১২		
13	১৩		

০

Japanis





## BENGAL ALPHABET

VOWELS . Plate II *Bengal Law's, register, page LXVI*

অ<sup>o</sup> আ<sup>a</sup> ই<sup>i</sup> ঈ<sup>ee</sup> উ<sup>u</sup> ঊ<sup>oo</sup> শ<sup>sh</sup> ষ<sup>sh</sup>  
 ঙ<sup>ng</sup> ঞ<sup>ng</sup> এ<sup>e</sup> ঐ<sup>ee</sup> ও<sup>o</sup> ঋ<sup>oo</sup> ঌ<sup>oo</sup> ঍<sup>ong</sup> ঎<sup>eh</sup>

## CONSONANTS .

ক<sup>ke</sup> খ<sup>kh</sup> গ<sup>ge</sup> ঙ<sup>ng</sup> চ<sup>che</sup> ছ<sup>che</sup> জ<sup>je</sup> ঝ<sup>zhe</sup> ঞ<sup>ng</sup>  
 ট<sup>te</sup> ঠ<sup>the</sup> ড<sup>de</sup> ঢ<sup>dhe</sup> ন<sup>ne</sup> ত<sup>te</sup> থ<sup>the</sup> দ<sup>de</sup> ধ<sup>dhe</sup> ব<sup>be</sup>  
 প<sup>pe</sup> ফ<sup>phe</sup> ব<sup>be</sup> ভ<sup>bhe</sup> ম<sup>me</sup> য<sup>ye</sup> র<sup>re</sup> ল<sup>le</sup> ব<sup>be</sup>  
 স<sup>she</sup> ষ<sup>she</sup> শ<sup>she</sup> হ<sup>he</sup> ঝ<sup>zhe</sup>

## CONNECTED VOWELS .

ক<sup>ke</sup> কা<sup>ka</sup> কি<sup>ke</sup> কী<sup>kee</sup> কু<sup>ku</sup> কূ<sup>ku</sup>  
 কে<sup>ke</sup> কৈ<sup>ke</sup> কো<sup>ko</sup> কৌ<sup>ko</sup> কং<sup>kung</sup> কঃ<sup>keh</sup>

6. 'Bengali alphabet...[with] connected vowels'; Nathaniel Brassey Halhed, trans., *Code of Gentoo Laws* ... (London, 1776)

Missionary printing also finds a place in the first section 'Europeans in India'. The volume of output from the missionary presses and their dominance in Bengali typography throughout the nineteenth century renders their typographic products worthy of notice. Detailed typeface analyses have necessarily been curtailed; assessments of Bengali types focus on salient features that were either of significance to future designs, or mark developments specific to Bengali fount requirements. In examining the roles of the Serampore Mission Press, the Baptist Mission Press, and the Bishop's College Press in Bengali type history, discussion has centered on Bengali text faces, i.e. those designed for continuous reading.<sup>22</sup>

Text faces comprise the bulk of composing matter and thus have always formed the chief requirement of printers.<sup>23</sup> However, it will be seen that a number of Bengali heading types influenced the design of text faces. Conversely, the advent of computerised typesetting in the 1970s and the dearth of non-Latin<sup>24</sup> display founts have also encouraged the use of text faces for heading or display purposes.

The types produced by foundries situated in Europe during the nineteenth century and the early part of the twentieth century reflect the rich heritage of typefounding and punchcutting skills at their disposal. The Bengali founts discussed in 'European Ventures' have been confined to those occupying a noteworthy place in Bengali type history;<sup>25</sup> those illustrating the inherent problems of designing vernacular Indian founts in establishments remote to the Indian subcontinent; and those reflecting particular attitudes to the development

22. Examination of imprints does not always reveal whether a display face was ever completed (and therefore if it would have functioned satisfactorily in a different context) or how it was produced (e.g. from wooden types, blocks, lithography etc.).

23. Display types have different design requirements and merit a separate study.

24. The terms Latin and non-Latin are used in this study in accordance with the 1958 and 1967 British Standards Institution definitions: '*Latin* . . . the term should be used to distinguish the letterforms in Western Europe from others, e.g. Cyrillic, Arabic, etc., which are referred to in the industry as "exotics" but would be more conveniently referred to as "non-Latin" '; B.S. 2961: 1958 and 1967, p. 9.

25. e.g. Figgins Pica Bengalee, see chapter 5.

of non-Latin founts. It is difficult to determine the precise motives behind the production of what must have amounted to costly enterprises for such foundries, and to gauge the strength of their commitment to producing true representations of vernacular scripts. The difficulties in establishing the origins and authenticity of the non-Latin founts produced in Europe illustrate the problems in protecting designs from plagiarism.

The Bengali founts of the indigenous type foundries are considered separately, for they show conspicuous divergencies in design from those of the European-owned foundries. The shortness of the section 'Indigenous Ventures' is symptomatic of the European dominance in this field during the formative years of Bengali type design; it is also indicative of the unfavourable circumstances of the native Bengalis both economically and politically.<sup>26</sup> Perhaps surprisingly, the mechanization of punchcutting, typefounding, and composing did not hinder the steady growth of native foundries.

Mechanical typefounding and composition, discussed in Part II, had a profound impact upon Indian typography. The Bengali script was particularly affected. The implementation of non-Latin scripts on the Linotype hot-metal machine transformed Indian vernacular newspaper-setting, creating readerships unaccustomed to, and at times unable to read, foundry typeforms. The Mergenthaler Linotype correspondence files relating to the development of the hot-metal Linotype Bengali founts are still extant and the information they contain forms the basis of chapter 9.

Whilst the discussion of typewriter forms of Bengali characters has been consigned to the 'Epilogue', keyboarding practices that evolved during the mechanization of composition became crucial to the design of the founts. The

26. As illustrated by Haji Mustapha's comment regarding printing in Calcutta: 'Printing in this country requires a young man and a rich one, and I am neither'; *Seir Mutaquarin*, (Calcutta, [1789-1790]), II, Appendix p. 31.

interdependence of keyboard layouts and type design is therefore first discussed in connection with the Linotype machine and is necessarily considered in all subsequent chapters. Systems of measurement, such as the relative-unit system introduced by the Monotype Corporation and the point system, are also taken into account where appropriate, for they still remain an integral part of type design.

The advent of photocomposition during the middle of this century represented the opportunity to redress the severe compromises inflicted upon vernacular Bengali composition by mechanization. Schemes for implementing Bengali founts for filmsetting, however, were either unsuccessful or failed to resolve problems inherited from previous technologies. Nonetheless, these attempts have been assessed (in chapter 10), since an appreciation of the potential advantages and deficiencies of filmsetting for non-Latin scripts underpin the scheme developed in 1978 for the digital photocomposition of the Bengali script.

In one sense, the final chapter, 'Digital Photocomposition', recounts the continuing history of the evolution of the printed Bengali character. At the same time, it forms the conclusion to this study by describing the findings of this work translated into practical terms, namely a new Bengali typesetting scheme and typeface design. More importantly, in describing the method adopted for what may be termed the typographic development of the Bengali script, this chapter demonstrates a new methodology that is applicable to all scripts of the Indian subcontinent.

The present study, prompted by the lack of typographic information both artistic and technical, is therefore intended to be not only informative to the indologist and printing historian, but also to be of some practical value to the designer and manufacturer of Bengali types. This thesis should fill one of the many gaps in non-Latin type history. It should stimulate new lines of approach to

non-Latin type design and composition. It is based on the premise that non-Latin typography can, and should, be of comparable quality to that of Latin.

**Part I****Development of Movable Metal Types for the Bengali Script**

**Section A**

**Europeans in India**



## Chapter 1

### Charles Wilkins

The publication of *A Grammar of the Bengal Language* in 1778<sup>1</sup> marks the inception of the printed Bengali character reproduced from pre-fabricated letterforms. This imprint, in which for the first time Bengali chirography was emulated in movable metal type, established a standard for the design of Bengali typefaces and a method for their composition. The design and manufacture of this first successful Bengali fount has been attributed to the printer of the *Grammar*, Charles Wilkins (1749-1836),<sup>2</sup> the renowned orientalist who has been described as 'India's Caxton' and the 'Caxton of Bengal'.<sup>3</sup>

Charles Wilkins, an Englishman who joined the East India Company as a Writer (junior clerk), arrived in Calcutta on 4 June 1770.<sup>4</sup> In 1774, having spent two years in Jehangirpore as Assistant to the Collector, Wilkins moved some 175 miles north of Calcutta to Malda<sup>5</sup> where he began to learn the languages then current in Bengal, namely Bengali and Persian.<sup>6</sup> 'About the year 1778', as Wilkins was to relate, with his 'curiosity excited by the example of ... Mr Halhed'<sup>7</sup> he also began to study the Sanskrit language.<sup>8</sup>

1. Nathaniel Brassey Halhed, *A Grammar of the Bengal Language* (Hoogly, 1778).
2. Some biographers give his date of birth as 1750, but see Mary Lloyd, 'Sir Charles Wilkins 1749-1836', *India Office Library and Records Report 1978* (1979), pp. 10-11.
3. George Smith, *The Life of William Carey* (London, 1885), p. 243; Samuel Pearce Carey, *William Carey* (London, 1923), p. 188; Khan, *Printing in Bengali Characters*, I, p. 78.
4. IOR: L/F/10/2 Records of Service, f. 118. Only biographical details bearing on his typographical activities will be mentioned here. For further biographical information refer to: E.H. Johnston, 'Charles Wilkins' in Muhammad Shafi, ed., *A.C. Woolner Commemoration Volume* (Lahore, 1940), pp. 124-132; and Lloyd, 'Wilkins', pp. 9-39.
5. As Assistant to the Superintendent of the Company's factory. He was promoted to Factor in 1776 and Junior Merchant in 1779.
6. Persian was the official language; see Henry Pitts Forster, *A Vocabulary in Two Parts, English and Bungalee, and Vice Versa*, Pt I, (Calcutta, 1799), pp. iv-v.
7. Nathaniel Brassey Halhed (1751-1818) entered the Company as a Writer in 1770. For biographical information see Dr J. Grant, 'Warren Hastings in Slippers', *Calcutta Review*, XXVI, pp. 59-141; also see Rosane Rocher, *Orientalism, Poetry and the Millennium: the Checkered Life of Nathaniel Brassey Halhed 1751-1830* (New Delhi, 1983)
8. Which culminated in the publication of a Sanskrit grammar; Charles Wilkins, *A Grammar of the Sanskrit Language* (London, 1808), pp. viii and xi. 'Halhed was apparently the first to call public attention to the affinity between Sanskrit words and "those of Persian, Arabic and even of Latin and Greek"': Leslie Stephen and Sidney Lee, eds., *Dictionary of National Biography* (London, 1890), XXIV, p. 41.

Under the governorship of Warren Hastings (1732-1818),<sup>9</sup> there existed an increasing conviction by the British of the need to learn the languages of their subjects in Bengal. Hastings, who had mastered some Persian and a little Bengali himself, actively encouraged the translation of British regulations into the vernacular languages and the compilation of grammars and dictionaries of these languages. He also selected Halhed to translate from Persian a digest of Hindu laws, entitled in Sanskrit *Vivādārṇavasetu*,<sup>10</sup> resulting in the publication, *A Code of Gentoo Laws, or Ordinations of the Pundits* in 1776.<sup>11</sup> In the preface to this work, Halhed claimed: 'From hence therefore may be formed a precise Idea of the Customs and Manners of these People, which, to their great Injury, have long been misrepresented in the Western World'.<sup>12</sup> At the 'advice and even solicitation' of Hastings,<sup>13</sup> Halhed undertook the task of writing *A Grammar of the Bengal Language* in order to promote 'the cultivation of a right understanding and a general medium of intercourse . . . between the Natives of Europe who are to rule, and the Inhabitants of India who are to obey'.<sup>14</sup>

Halhed intended that all the Bengali words given in the *Grammar* should be printed in their own characters, but no suitable font of types was available:

9. Governor in Bengal from 1772, the first Governor General from 1774 to 1778. See G.R. Gleig, *Memoirs of the Life of the Right Hon Warren Hastings* (London, 1841), I, pp. 399-404.
10. First compiled in Sanskrit by 11 brahmins, then translated into Persian by a *munśī* and thence into English in a summarized form by Halhed - hence the inaccuracy of the latter's translation: see letter of William Jones to Arthur Lee, 28 Sept 1788; in Garland Cannon, ed., *The Letters of Sir William Jones* (Oxford, 1970), II, p. 821.
11. *A Code of Gentoo Laws, or Ordinations of the Pundits*, translated into English by N.B. Halhed (London, 1776), p. vi.
12. *Code of Gento Laws*, p. xi.
13. Proceedings of the Governor-General (Revenue Dept), 20 Feb 1778, 'Extracts from Government Records' *Bengal Past and Present*, XXIX (Jan - June 1925), p. 213.
14. Halhed, *Grammar*, p. ii. It was not the first printed Bengali grammar, but was preceded by the *Vocabulario Em Idioma, Bengalla E Portuguez*, ed. Manoel da Assumpcam (Lisbon, 1743), printed in Latin types. Wilkins is known to have owned a copy which Halhed may have seen; William Marsden, SOAS MS 57002, *A Catalogue of Dictionaries, Vocabularies and Grammars of All Languages and Dialects*, f. 229.

the Bengali types prepared by the London punchcutter Joseph Jackson (1733-1792), were considered unsatisfactory.<sup>15</sup> Thus 'Warren Hastings, who was anxious that the Co.'s servants should have every facility for the study of the native languages, himself solicited Mr W[ilkins] to prepare a fount of Bengali types, as he was aware that he had, by way of amusement, made some successful experiments in that way'.<sup>16</sup> In the preface to the *Grammar*, Halhed wrote:

The advice and even solicitation of the Governor General prevailed upon Mr Wilkins . . . to undertake a set of Bengal types. He did, and his success has exceeded every expectation. In a country so remote from all connection with European artists, he has been obliged to charge himself with all the various occupations of the Metallurgist, the Engraver, the Founder and the Printer.<sup>17</sup>

Charles Wilkins can be credited with the production of four founts of Bengali type. They are designated for the purpose of this study as CW1 through to CW4. It is not known, however, which letterform models formed the basis of Wilkins's designs. It has been claimed that two manuscripts formerly owned by him, and now held in the India Office Library, were formative in the design of his first fount, CW1.<sup>18</sup> The manuscripts are copies of Mukundarāma Cakravarti's *Caṇḍīmaṅgala*<sup>19</sup> and Bhāratacandra's *Vidyāsundara*.<sup>20</sup> The claim seems unjustifiable, for the lettershapes of the *Caṇḍī* manuscript bear scant resemblance to those designed by Wilkins; and examination of the *Vidyāsundara* manuscript fails to reveal that it was written in 'a handwriting having distinct and separate letters . . . on the basis of which Wilkins drew the letters for his types'.<sup>21</sup> Conclusive evidence exists to show that Wilkins acquired the *Vidyāsundara* manuscript almost thirty years after the publication of Halhed's *Grammar*. The manuscript is signed by Wilkins and dated 29 January 1807.

15. Halhed, *Grammar*, p. xxiii (Jackson's Bengali types are discussed in chapter 4). *Gentoo Laws* only showed an engraving of Bengali characters, see pl. 6.

16. [G. C. Haughton], 'Sir Charles Wilkins', *Asiatic Journal: New Series*, XX (1836), p. 167.

17. Halhed, *Grammar*, pp. xxiii-xxiv.

18. Khan, *Printing in Bengali Characters*, I, pp. 369-70.

19. IOL BEN. MS S2846A; scribe unknown. See pl. 7.

20. IOL BEN. MS S2811A; scribe unknown. See pl. 8.

21. Khan, *Printing in Bengali Characters*, II, p. 812.

...গাথাবান্ ... কাপাহলশ্যবন্ধাঃ ... আকবিক ... বসগান ...  
 ...প্রাকবিক ... বিপ্রমা ... বসআঃ ... যোগব ...  
 ...সাকবিক ... আলবিক ... লমোন ...  
 ...বোনবোনা ... সোবান ... কামি ...  
 ...বালিব ... মাপ ...  
 ...কব ... কব ...  
 ...আগম ... জীব ...  
 ...মি ... ম ...  
 ...ম ... ম ...  
 ...ম ... ম ...

7. Bengali manuscript:  
IOL BEN. MS S2846A - Candimangala

ভাঙ্গিয়া কেলিলা কুচ কাহুলি ছিড়িলা ॥

দেখিয়া কাঠের কুচ চমকে কুমার ।

মুগ্ধ বুকি কোঠালে বদমায়ে বাবে বার ॥

ভাবথ কহিড়ে চোর চকুরেব চুয়া ।

কোঠালের দাঁদেতে গুমান হল্য গুচা ॥

কোত হাল দেন হাল খাচা হাল কাঁকে ।

ধরি বান গব মান হানহান ডাকে ॥

চোর ধরি হরি হার শ্বনি কবি কয় ।

যাও মোরে কেবা পারে যার কাঁকে কয় ॥

জয় জয় গালে গানি দত ছানি জাণী ।

দেয় লক্ষ ভূমিকম্প জাগম্প বাঁকে ॥

হাকে ২ ডাকে ২ কাঁকে ২ জাণী ।

Blumhardt places it in the nineteenth century, and there is no reason to dispute this date.<sup>22</sup>

There is no evidence that Wilkins modelled his type designs on any particular manuscript. There are, however, manuscripts collected by Halhed which pre-date the *Grammar*<sup>23</sup> that show some correspondence to the character shapes of Wilkins's types. The first item is another copy of the *Vidyāsundara* of a similar format to the copy owned by Wilkins.<sup>24</sup> This manuscript is written in a very clear and neat hand. It also shows interword spacing; an unusual device in eighteenth-century Bengali manuscripts, and one adopted by Wilkins throughout the *Grammar*.<sup>25</sup> According to Blumhardt, 'This copy corresponds with the text of the printed editions. The Sanskrit *ślokas* are written in red ink. The name of the scribe and date of copy are not given'.<sup>26</sup> Another item is a copy of the *Bāramāsyā* written in a hand whose characters share the same diagonal stress with Wilkins's Bengali types;<sup>27</sup> some of the *Bāramāsyā* lines, divided by Halhed into couplets, appear in the *Grammar* with slight alterations in spelling.<sup>28</sup>

Several items in Halhed's manuscript collection bear Charles Wilkins's initials,<sup>29</sup> suggesting Wilkins was their prior owner or, at least, that they passed through his hands. It is possible that Wilkins was aware of the specific Bengali

22. James Fuller Blumhardt, *Catalogue of the Bengali and Assamese Manuscripts in the Library of the India Office* (London, 1924), p. 12.

23. Acquired by the British Museum (now known as the British Library in 1775-1776; Rosane Rocher, 'Nathaniel Brassey Halhed's Collection of Oriental Manuscripts', *Annals of Oriental Research* (University of Madras), 25 (1975), pp. 1-10.

24. i.e. nine by six inches; a rare format for Indian MSS. BL MS Add. 5593, signed by Halhed; see pl. 9.

25. Wilkins even gives word breaks in the printed version of the petition on p. 209, although none occur in the original; see pls. 21 and 22.

26. J.F. Blumhardt, *Catalogue of the Marathi, Gujarati, Bengali, Assamese, Oriya, Pushtu, and Sindhi Manuscripts in the Library of the British Museum* (London, 1905), p. 15.

27. To be found in BL MS Add. 5660F (f. 14). This diagonal stress lends a dynamic effect to Wilkins's types. See pl. 10.

28. Numerous orthographical errors and mistranslations occur in the *Grammar*; see Muhammad Abdul Quayyum, *A Critical Study of the Bengali Grammars of Carey, Halhed and Haughton* (unpublished Ph.D. Thesis, University of London, 1974), pp. 92-102 and 81-89, regarding correspondences between the texts of the BL MSS and the *Grammar*.

29. BL MSS Add. 5581, 5595, 5596, and 5591.

যত বজাপুত্র । বাজবপানঙ্গবাথে মুক্কেমজবুত ॥ পঞ্চমগাভে  
 দেখে  
 যতকবাজুত । তরকাছে বেলেভাট যাতাযাতদূত ॥ যন্তগাভে  
 যত বোদানাবথানা । আটাআটা সেহগাভে থাকমানথানা ॥  
 সেহগাভে দেখে যত বেলেমহাজন । নক্ষ কোটি পদ্মশঙ্খ অঙ্গু  
 কাবধন ॥ কমে২ চুগত সকনদেখিয়া । প্রবেশেবীতব  
 গাভে হুগুয়াভাকিয়া ॥ সমুখে দেখে মে চকচাদনিহুতব । নক্ষ  
 ত বাজিছে বানাথানা বর্ডপব ॥ চকেবমাঝেতে কোহওয়ানি ২  
 চকুতবা । ফটকে আটক যত বাজেদাযধবা ॥ ডাকাতি ছিননি  
 চোবহজারে ২ । বেডিপায়মাগ্ৰাথামবজারে ॥ বসিয়াছে  
 কেতওয়ান ষ্ট্রমকেতনাম । যমানযসমান নাগাছে ষ্ট্রমধাম  
 ॥ চকচকিহুতবে কোভাবপটপটা । চমুর্ডে চমুপাছু  
 কাবচটচটা ॥ কেহোবোদোহুইদেয কেহোবনেহম । কে  
 হোবনেবাপ ২ মোবপ্রাগমায ॥ ছাতিহুপ্রায় <sup>ফাটে</sup> নাদেয কেহো  
 পান । দেখিয়াহুতব অ্যভারনভবানি ॥ তবতকহিছে  
 কেনভবহুথন । চেকিরযখনদায় জানিবেতখন ॥ ২  
 ॥ ০ ॥ ০ ॥ ষ্ট্রমাতন ॥ অছে বিনাদ্বায়সী রে ২ যাও । মষ্ট্রব  
 অধবেহাসি বানটা বাজাও ॥ নবজনবর্ডগনু নিহি পুছশক

পৌষ মাসে তিন নাক ভোগ থাকে  
 দিনমান ছাড়াই বাত্র মান বড়  
 সেহেই এসব ভোগ জানহ বিশেষ  
 এবার করহ ভোগ থাকিয়া এহেই

মেঘের বিক্রম সময়ে হিমালি  
 গুলের বাহিরে নহে জেই জ্বাবনি  
 সিসিরে কমন বোনে বর্ষায় পরানে  
 মনমন ফুল ধনু কামি উলহানে

বার মাস মধ্য মাস বিসমকাল  
 মনয়া পবনে জন মদন আউন  
 কোকিল ফুলার ধার অমর কাহার  
 সুফ তক মুক্তির কিবনিবহার

মরুর সময় বড় চৈত্র মরু মাস  
 জানাইব নানা মতে মদন বিলাস  
 গোপনার মরু ধার সসুরের মর  
 তাবিয়া দেখহ এহেই বিশেষ বিস্তর



passages (contained in Halhed's manuscripts of the *Mahābhārata* of Kāśīrāma Dāsa,<sup>30</sup> the *Rāmāyaṇa* of Kṛttivāsa,<sup>31</sup> and the *Vidyāsundara* by Bhāratacandra Rāya<sup>32</sup>) to be quoted in the *Grammar* prior to preparing the fount for their rendition in print. Evidence of Wilkins and Halhed working in close co-operation is to be found in a note preserved amongst the latter's personal papers at the British Library:

Dear Halhed,  
The above is my morning's work and contains all the most material writing upon ... [the] ... Hindoo System [of Astronomy]. E [errors] Excepted, C.W.<sup>33</sup>

One item in Halhed's own hand and headed 'Of the Bengal Arithmetic' amounts to a draft of Chapter VI of the *Grammar*.<sup>34</sup>

None of the scribes' hands, however, can be said to have formed the blueprint for the first fount Wilkins designed. Moreover, the Bengali lines printed in the *Grammar* deviate from the manuscript versions both textually and orthographically.<sup>35</sup> Nonetheless, such manuscripts as Halhed assembled, or had copied for him,<sup>36</sup> provided information regarding the characteristics of the Bengali script: the letterforms required; their frequency of occurrence in text; the relationships between characters and their relative proportions; the necessity to kern particular characters;<sup>37</sup> the positioning of the subscripts and superscripts; the need for compound characters and initial, medial, and final forms of certain vowel signs; and the amount of interlinear spacing. From close examination of

30. BL MS Add. 5595 copied by various scribes between 1773 and 1778, and Oriental 4741 f. 47 (incomplete) which previously belonged to Max Müller.

31. BL MS Add. 5590/5591, the latter initialled by Wilkins. The scribe is unknown, but it appears to be in the same hand (and is in the same format) as BL MS Add. 5593; see pl. 11.

32. Three copies BL MSS Add. 5593, Add. 5660A, and (incomplete) Add. 5660B.

33. BL MS Add. 5661B f. 1. [n.d.].

34. BL MS Add. 5661B ff. 36-38; see Halhed, *Grammar*, 'Of Numbers' and 'Of the Bengal Arithmetic', pp. 159-177.

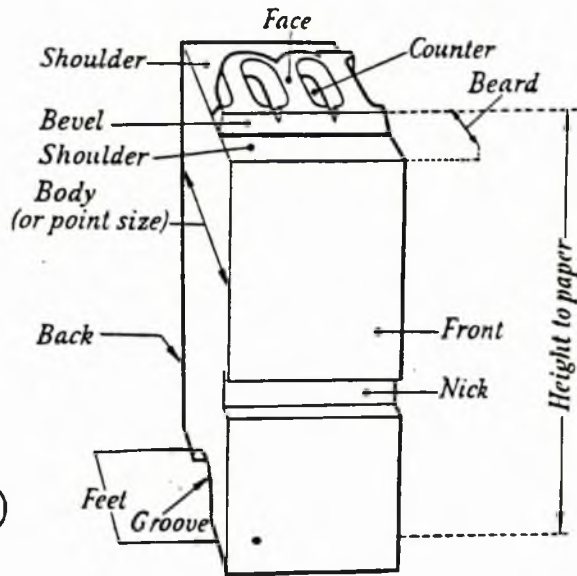
35. See above, p. 36, n. 28; and Graham Shaw, unpublished note, *Printing Interest in the British Library's Halhed Bengali Manuscripts* (London, n.d.), p. 2.

36. Rocher, 'Halhed's Collection', p. 3, and Qayyum, *Critical Study*, p. 109.

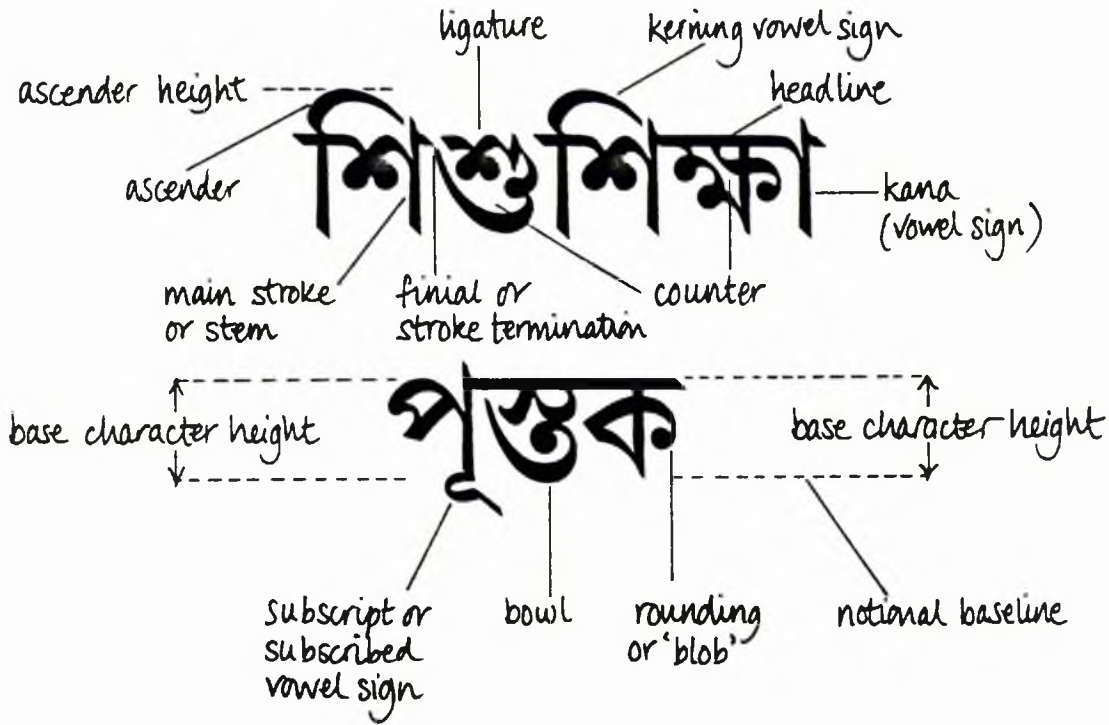
37. A kern is a part of metal type projecting beyond the body or shank designed to rest on the shoulders of adjacent types; see pl. 12 regarding basic typeface nomenclature.

অহাঙ্গী  
শকা

ত্রিশ্রী বামচন্দ্রায়নমঃ ॥ অথনক্কাঙ্কো নিখ্যাত ॥ প্রথম  
 বামদশবথৈবঙ্গমার । নক্ষত্রকানকুঠারগ্রন্থঅবতার ॥ জনক  
 নক্ষত্রীসীতানক্ষত্রী চুপ্রিমতী । তাহাবচণবন্দককিয়াপ্রকতি ॥  
 প্রকশক্ষম্ববন্ধুসহোদর । বামেবচণতরাজেরনিবত্তব ২ ॥  
 বন্ধিনবাবিকমুনিহাথেনেযাতন । শ্বেকছন্দবামামণবচিন  
 কমান ॥ অরতবহুতনমাটসম্বন্ধসব । উবিপ্রতবামামণ  
 কেনাবান্নিকহুনিবব ॥ সেসককবিত্তনোকেবুঝিতেবিষম ।  
 হুপ্রিবামবচিনাভাসাসত্তবমনোবম ॥ ফুনিয়াবহুখটীপপ্রিত  
 হুপ্রিবাম । যাহাবশসাদেবামামণহেনশকা ॥ অহাঙ্কোবাম  
 বঙ্গায়সীতাদেবীবিভা । বাজ্যহবইনবামঅযোপ্রাথাকিয়া ॥



(BSI 2961 : 1958)



such texts, Wilkins was able to establish the rudiments of Bengali typography<sup>38</sup> that were to become the norm.<sup>39</sup>

Native instruction in the Bengali script was not given in the style the letterforms assumed in the majority of the manuscripts under discussion.<sup>40</sup> The preface to the *Grammar* reveals that Halhed took considerable interest in the method employed in writing and teaching the Bengali script. He observed the nibs and the posture adopted by the scrivener,<sup>41</sup> and the sequence in which the characters of the syllabary are taught:

It is usual with the Natives . . . to defer all explanation of the first sixteen letters of the alphabet until they have thoroughly instructed their pupils in the nature and use of the subsequent consonants . . . .

The first elements of every science must be plain, simple and easy of perception: but more particularly those of letters; which, as they are generally taught in the early period of life, should be divested of every superfluity that may distract the attention, or clog the memory.<sup>42</sup>

In view of Wilkins's close association with Halhed, it is likely that he learnt the Bengali script in the same manner and made use of his compatriot's observations, for it is the character 'divested of every superfluity' that became fixed in metal, and not the running hand of the scrivener. This form was also considerably easier to translate into metal types than the hand of the lay manuscript copyist. The manner in which Charles Wilkins learnt the Bengali

38. For a definition of typography, see above, p. 4, see also below, p. 63.

39. Perhaps a difficult task since the Bengali script had not yet acquired a standard form; see Halhed, *Grammar*, p. 3.

40. MSS styles varied according to the region and to the nature of the text being copied, i.e. whether religious or secular.

41. Halhed, *Grammar*, p. 2.

42. Halhed, *ibid.*, p. 5.

characters would have determined his conception of the letterforms required to complete a fount of Bengali types.<sup>43</sup>

Material belonging to Charles Wilkins, but of a later date,<sup>44</sup> indicates that drawings would have formed the first stage in the production of a fount of types. Wilkins, or an assistant, would have prepared drawings of every character required, first in pencil and then in ink, to arrive at satisfactory designs for punchcutting.<sup>45</sup> The preparation of these patterns would have established the dimensions of the typeface as well as the structure of the letterforms and the spacing. It would have also determined the method of composition. Such drawings can thus be said to represent the first stage in the transition of calligraphy to typography. Since it is on the basis of these that the punches are cut, they must meet the technical requirements demanded by the process of typefounding. A summary of this process is given by John Ryder:

The reversed design of each character is cut on the end of a bar of steel to form a *punch* which is then driven into a slab of copper to make a *matrix*. This matrix forms the face of a mould into which molten metal is poured and a type cast. A single piece of type is called a *sort*.<sup>46</sup>

The designer when translating calligraphic letterforms<sup>47</sup> into type must be fully conscious of its limitations and peculiarities. In the words of the French typefounder Charles Peignot, 'A clear distinction must be made between lettering and type design. In lettering, fantasy is of the essence. In type design discipline is the first requisite. In both cases education and a proper sense of

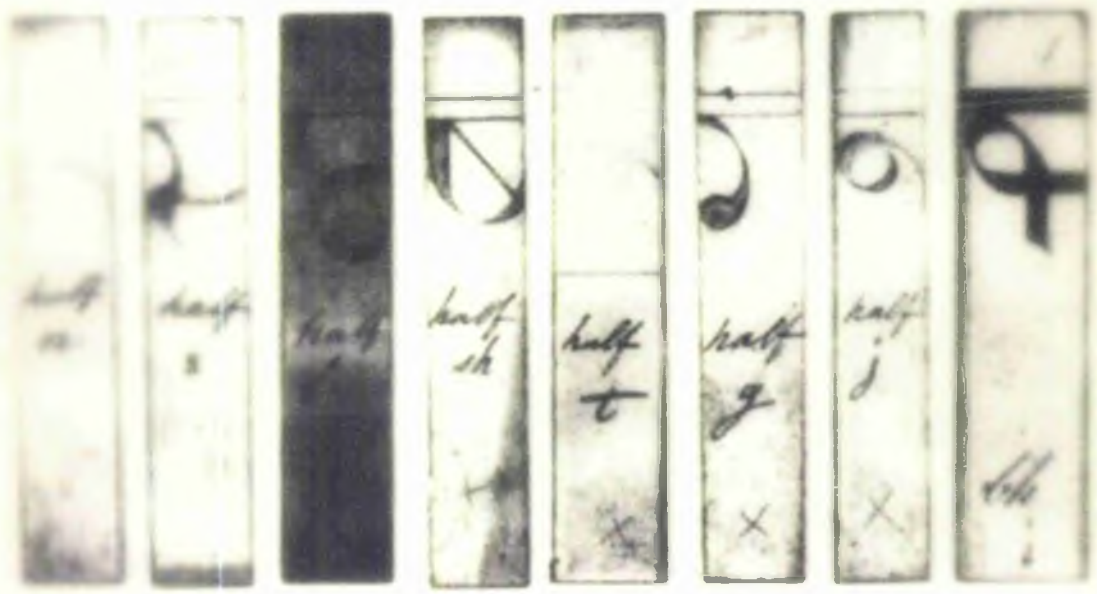
43. And also the method by which he proposed to compose the *Grammar* for printing.

44. Now housed at the India Office Library; see pls. 13, 14 and 29.

45. It is reasonable to surmise that a pundit, such as those known to have assisted Halhed (see Qayyum, *Critical Study* p. 65), produced the models of 'characters divested of every superfluity' for Wilkins to follow; see below.

46. John Ryder, *Printing for Pleasure* (London, 1976), p. 31; see also pls. 14 and 15 showing a hand mould and a matrix of Bengali type.

47. As distinct from engraved letters; see below, chapter 7.

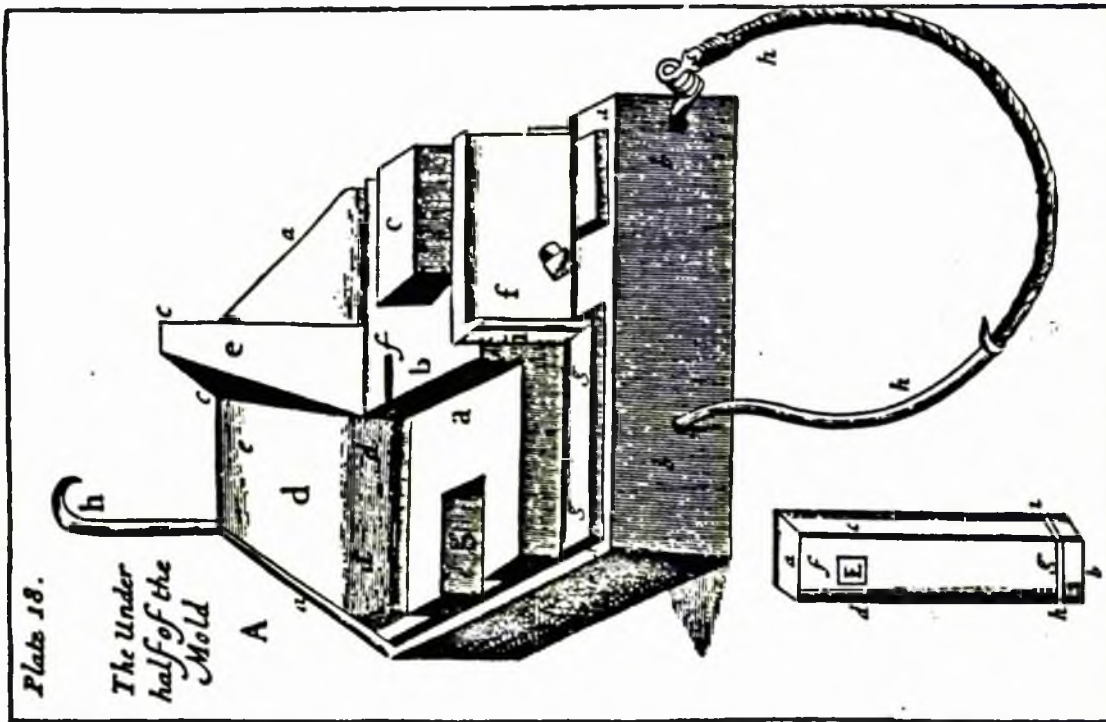


13. Modi Drawings from the IOL collection of Charles Wilkins's materials

73  
ক  
gdh

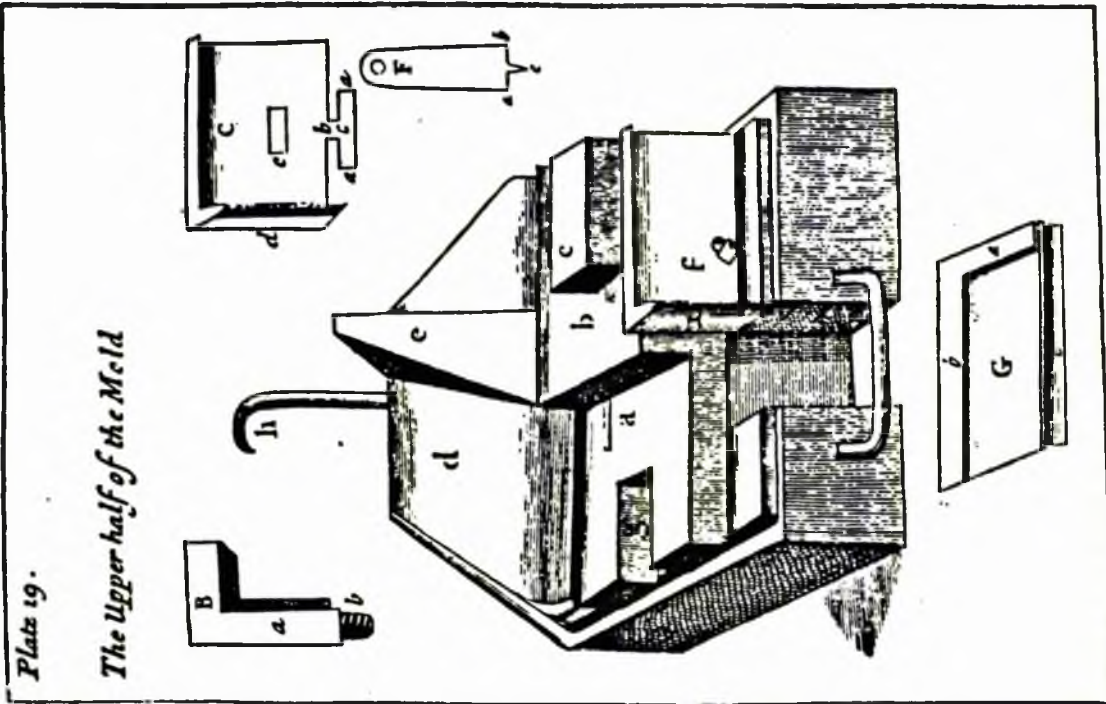


14. Bengali matrix from the IOL Wilkins collection (CW4)



A The under part of the Mould  
 (pp. 135 and 138)

E The Matrix (p. 150)



(B) The upper part of the Mould  
 (pp. 135 and 138)

B The Male-gage (p. 140)

C The Register (p. 143)

F The Beard-gauge (p. 155)  
 G The Composing-stick (p. 147)  
 or Lining-stick (p. 156)

15. Illustration of a hand-mould; Joseph Moxon *Mechanick Exercises* ... (rpt London, 1958)



tradition are all important'.<sup>48</sup> It is still an open question as to how Charles Wilkins obtained this education and sense of tradition in the arts of type design, punchcutting, and type casting.

With regard to the *Grammar*, it is scarcely credible that Wilkins 'with the exception of the paper and Roman type, not only formed every article requisite for the work but literally printed it, with no other assistance or advice than the directions for the several branches in Chambers's Cyclopaedia'.<sup>49</sup> Not only has Wilkins been credited with the achievement of cutting, casting, and printing with the Bengali types for the *Grammar* within one year single-handed, but he is also reputed to have designed a fount of Nasta'liq types in as short a time<sup>50</sup> by 'the labour of his own hand, from the metal in its crudest state, through all the different stages of engraving and founding'.<sup>51</sup> A report published by the Royal Society of Arts in 1819 casts doubt on such claims:

Caslon, the letter-founder, thinks . . . it would be scarcely possible for one person to complete a fount of letters from first to last.<sup>52</sup> In the ordinary course of business the mere preparation of the types after the punch cutter has finished his process,<sup>53</sup> goes through the following eight different hands; 1st, the justifier, who strikes the matrices; 2nd, the mould maker; 3rd, the caster; 4th, the breaker off; 5th, the rubber; 6th, the kerner; 7th, the setter up; 8th, the dresser. Two of these are boys; and although the work might no doubt be executed by fewer than eight different hands . . . ; yet that the whole could be gone through by one person he [Caslon] thinks barely

48. Ruari McLean, *The Thames and Hudson Manual of Typography* (London, 1980), p. 52 taken from *Dossier A - Z 73* ed. Fernand Baudin, Association Typographique Internationale, 1973, p. 18.

49. IOL MS EUR 30, A.J. Keily, *A Memoir of Sir Charles Wilkins*, f. 48.

50. IOR: H/207/2 *Home Miscellaneous Series*, Extract of Bengal Revenue Consultations, 13 Nov 1778, p. 467: 'everything necessary for printing in the Bengal and English Character have been provided, and a fount of Persian Types is nearly completed [*sic*]'.  
 51. Francis Balfour, *The Forms of Herkern* (Calcutta, 1781), p. 7.

52. Although he is referring to Latin diamond type, Bengali would have been no simpler, and would have comprised a greater number of sorts.

53. According to the letter-founder Vincent Figgins (1766-1844), the greatest number of punches that an artist can cut in a day is two; see below, chapter 5.

2 contemporary  
of

and scarcely possible, he has himself never heard an instance of such having been the case.<sup>54</sup>

In several biographies of Charles Wilkins, emphasis has been placed on his relationship to the gem engraver Robert Bateman Wray,<sup>55</sup> a maternal great-uncle, in order to explain Wilkins's pronounced skills as 'Metallurgist', 'Engraver', 'Founder', and 'Printer', which he allegedly demonstrated most ably at least seven years after leaving England. Graham Shaw has pointed out that there is no evidence of their association with each other prior to Wilkins's departure for India.<sup>56</sup> It is more probable that another gem and seal engraver named Joseph Shepherd (Shepperd) aided Charles Wilkins in India in designing and punchcutting, despite Warren Hastings's apparent contention that Wilkins was 'unaided by models and imitations, and by artists for his direction ...'.<sup>57</sup>

Only recently has information revealing the career of Joseph Shepherd come to light and offered evidence of his association with Charles Wilkins. Part of this evidence is contained in the preface to the first part of *A Dictionary, English and Hindoostanee*<sup>58</sup> by John Borthwick Gilchrist (1759-1841), who wrote of Shepherd:

I had the good luck to engage Mr Shepherd, an ingenious artist, who died some ten years ago, to cast an elegant fount of Persian types for my Dictionary. He was the man who according to his own assertions ... assisted Mr Wilkins from the first, and through the whole process of forming his Bengal and Persian founts, for which that Gentleman assumed or received the exclusive merit, with its consequent profit and praise. ...

54. This is likely to be Henry Caslon II (1786-1850) of the Chiswell Street Foundry; Royal Society of Arts, *Report of the Committee of the Society &c. Relative to the Mode of Preventing the Forgery of Banknotes* (London, 1819), pp. 68-69.

55. Johnston, 'Charles Wilkins', p. 128; and Khan, *Printing in Bengali Characters*, I, p. 83.

56. Graham Shaw, *Printing in Calcutta*, p. 70.

57. Charles Wilkins, [trans.], *The Bhāgavat-Gēetā* (London, 1785), p. 11. A piece often quoted in this context (see Khan, *Printing in Bengali Characters*, I, p. 86); however, Hastings was not referring to the types but the printing and the typography.

58. The end of the preface is dated Calcutta, '1 August 1798', although it is bound with Part I of the *Dictionary* printed in 1787.

and I have since from enquiry in Calcutta here been more confirmed in the truth of what he declared. . . .<sup>59</sup>

There is little reason to doubt Gilchrist's statement. The Persian types alone testify to Shepherd's skill in producing a fount of 'exotic' letterforms. That Shepherd was well qualified to assist Wilkins is further endorsed by Graham Shaw's sketch of the former's career. Advertisements from 1782 placed by Shepherd in the *India Gazette* suggest that he was adept at producing 'visiting cards and other devices, engraved and printed, cyphers and Persian characters neatly cut on stone seals and engravings on silver and gold. . .'.<sup>60</sup> In 1784 he entered into partnership with a jeweller, Mr Young; a partnership that continued until shortly before his death in 1787.<sup>61</sup>

An indirect link has been established between Shepherd and Wilkins through the discovery of a bookplate belonging to John Andrews's circulating library. The bookplate, dated 1774, bears the artist's signature 'Shepperd SC'. Katherine Smith Diehl, in a short article relating this discovery by a post-graduate student A. M. Fazle Kabir, maintains that during this period Shepherd was a '21 year-old engraver for the English East India Company's (EEIC) Mint situated at Hoogly', while Charles Wilkins was 'mint superintendent . . . responsible for munitions, carriage, other metal products, and, later, types'.<sup>62</sup> But Diehl provides no references in her article to substantiate her statement of their apparently allied professions.<sup>63</sup> The possibility of their association is strengthened by the likelihood that John Andrews was the owner of the press used to print Halhed's *Grammar*.<sup>64</sup> According to John Marshman, a contemporary of Wilkins, 'the first book in which Bengalee types were used was Halhed's Bengalee Grammar, printed at Hooghly at the press established by Mr Andrews, a

59. J.B. Gilchrist, *A Dictionary, English and Hindoostanee*, Pt I (Calcutta, 1787), p. xlii.

60. Shaw, *Printing in Calcutta*, pp. 70-71.

61. He died aged thirty-four.

62. Katherine Smith Diehl, 'The Cover', *The Journal of Library History*, 16, no. 1 (Winter, 1981), pp. 4-5.

63. A statement which merits further investigation.

64. And, presumably, the bookplate.



bookseller, in 1778'.<sup>65</sup> This has remained unconfirmed by other sources, but no proof to the contrary has yet emerged. Thus current evidence points to the acceptance of Gilchrist's information regarding Shepherd:<sup>66</sup> Wilkins had the opportunity to avail himself of the assistance of a skilled engraver who was on hand at the right time and had also proved himself as a type designer.

Although it is not possible to determine the precise working method adopted by Charles Wilkins for producing the commissioned types, nor to discover at what stage he made use of local assistance, there is no doubt that an Indian, named Pañcānana Karmakāra,<sup>67</sup> was employed by him in some capacity. According to John Marshman, Wilkins 'gave instruction in the art [of punchcutting] which he had acquired, to an expert blacksmith of the name of Panchanon, through whose labours it became domesticated in Bengal'.<sup>68</sup> Pañcānana was later engaged by the Serampore Missionaries for precisely this purpose. It can be assumed that he assisted Wilkins in punchcutting and striking matrices, and that he probably undertook the casting of the types, since he was the better qualified for the task. On the evidence of the Serampore typefaces,<sup>69</sup> it is doubtful that Pañcānana was active in the design of Wilkins's types, which display a quality superior to the initial efforts of the Serampore Missionaries.

The composing technique developed by Wilkins for CW1 was fundamental to its design and laid the basis for the composition and design of succeeding Bengali typefaces. In order to determine the method he used, it is necessary to identify the sorts employed in the fount, that is, to establish the fount synopsis.

65. John Clark Marshman, *The Life and Times of Carey, Marshman, and Ward* (London, 1859), I, p. 159.

66. As it has been by the *East Indian Chronologist* (Calcutta, 1801).

67. The surname 'Karmakāra' [(literally, 'an actor of an action')] signifies 'blacksmith' in Bengali.

68. Marshman, *Carey, Marshman, and Ward*, I, p. 70.

69. See below, chapter 3.i.

It has been suggested that the Bengali types required for setting the *Grammar* comprised some 488 sorts:<sup>70</sup> '16 vowels, 34 consonants, 8 vowel signs, 374 phelas, 29 contractions of letters, 10 figures, 15 arithmetical figures and 2 punctuation marks.'<sup>71</sup> A close examination of the *Grammar* does not confirm these figures.<sup>72</sup> The true number of sorts designed for CW1 is closer to 200.

In the first instance, the vowel characters number, at the most, twelve sorts:<sup>73</sup>

অ ই ঈ ঊ ঋ ঌ ঍ ঎ এ ঐ ঑ ঒

although আ, অ°, অঃ and ঞ appear as individual characters,<sup>74</sup> they are made up from two sorts; the first being common, and the second parts ৷, °, ঃ and ্ respectively. Secondly, it would be erroneous to assume that the thirty-four consonants printed in the first chapter of the *Grammar*, under the heading 'Second Series',<sup>75</sup> constitute the complete set of consonantal sorts. The typeform ন̄, for example, is used as an alternative to ন and does not appear until page 12. Furthermore, variant designs of certain characters make their appearance throughout the book.<sup>76</sup> Examples of this phenomenon are the different versions of the consonants ড and ঙ̄.<sup>77</sup> Since there is clear evidence of such variations in design, it is possible that these characters are not alone in having alternative forms. The typeforms ড̄ and ঙ̄, for instance, do not appear consistent in design throughout, but it is difficult to determine all the alternative

70. 'Sorts' have been defined as 'any particular matrices or types as distinct from a complete fount'; Linotype, *Printing Terms*, p. 39; also see above, p. 43.

71. Khan, *Printing in Bengali Characters*, I, p. 371.

72. No account appears to have been taken of the means by which a representation of all the characters has been achieved.

73. It is possible that ঐ is also made up from two sorts, see below. The Bengali characters inserted in the text of this thesis represent typeforms, not handwritten forms.

74. Halhed, *Grammar*, p. 4; also see pl. 16.

75. Halhed, *Grammar*, p. 4.

76. Therefore entailing different punches, matrices, and types.

77. See pl. 18.

## 4 A GRAMMAR OF THE

FIFTY letters, in the following order.

## FIRST SERIES.



অ o	আ aa	ই ee	ঈ ee
উ oo	ঊ oo	ঋ ree	ঌ ree
ঌ lee	঍ lree	এ a	ঐ i
ও o	ঔ ou	অ° ung	অঃ oh

## SECOND SERIES.



ক ko	খ k,ho	গ go	ঘ g,ho	ঙ ngoo-o
চ cho	ছ ch,ho	জ jo	ঝ j,ho	ঞ gnee-o
ট to	ঠ t,ho	ড do	ঢ d,ho	ণ aano
ত to	থ t,ho	দ do	ধ d,ho	ন no
প po	ফ p,ho	ব bo	ভ b,ho	ম mo
য jo	র r	ল lo	ব wo	—
শ sho	ষ sho	স so	হ ho	ঝ khy-o

It

## A GRAMMAR OF THE

The twelve P, H O L A A S.

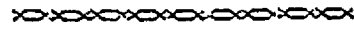















Figure	Name	Power
𑌀	ky-o	ky-o
𑌁	koro	kro
𑌂	kono	kno
𑌃	kolo	klo
𑌄	koo-o	kwo, or sometimes koo.
𑌅	komo	kmo
𑌆	kirree	krze
𑌇	killee	klce
𑌈	arko	rko
𑌉	ungko	ungko
𑌊	shko	shko
𑌋	sheedd,hee	—

forms which occur under the conditions available for studying the *Grammar*.<sup>78</sup> A slight inconsistency in the quality of the printing can be mistaken for a new character shape; an example of this is the character  , whose hairline stroke does not always reproduce well in print. The purpose of employing two sorts for the same character is hard to ascertain, particularly if the difference is barely noticeable and appears to serve no special function. In the case of  , Charles Wilkins perhaps found the original design too heavy and decided to improve its weight and modify its curve. This explanation is more plausible than the possibility of both the punch and matrix of  being lost.<sup>79</sup> Moreover, Wilkins is known to have revised some characters of his later founts.<sup>80</sup>


The case of  is similar, but there is a greater disparity between the two versions. Although  appears to be an earlier version,<sup>81</sup> it continues to make its appearance alongside that of  , even on the same page,<sup>82</sup> and in similar circumstances, i.e. as initial and medial consonant of a word. Perhaps Wilkins was not fully satisfied with either attempt, and thus both designs shared the same typecase compartment and were used indiscriminately. In a Bengali fount of a later period Wilkins also has two sorts for the character  <sup>83</sup>; it is not an easy letterform to engrave at the end of a punch.

The characters  ,  , and  ,<sup>84</sup> however, are neither extra sorts nor variations in design but are the original sorts for the letterforms  ,  , and  . The types for the latter group would have been cast as dotted letterforms;

78. Owing to its age and rarity, it has not been possible to borrow the *Grammar* for analysis; facsimile editions are not sufficiently accurate.

79. As in the case of some of his Devanagari types; Charles Wilkins, *Grammar of the Sanskrit Language*, p. xii.

80. See below.

81. On account of its earlier appearance and the use of  in the Errata pages.

82. See Halhed, *Grammar*, p. 132, and pl. 18.

83. Namely CW4; see below, pl. 28.

84. These are not listed in the 'Second Series': Halhed, *Grammar*, p. 4.



ছাদ	ছাদিন°	ছাওন	to cover.
জি	জয়ন°	জিনন	to conquer.
জপ	জপন°	জপন	to recite the bead-roll.
অন	অনন°	অনন	to burn. (intrans:)
জাগ্	জাগরন°	জাগন	to be awake.
জু	জরন°	জরন	to be sick.
জীব	জীবন°	জীবন	to live.
ঝ	ঝরন°	ঝরন	to ooze out.
তাড়	তাড়ন°	তাড়ন	to beat.
থেক	থেকন°	থেকন	to renounce.
ত	তরন°	তরন	to be ferried.
দহ	দহন°	দহন	to burn.
দংশ	দংশন°	দংশন	to bite.
দুহ	দোহন°	দোহন	to milk.
দুঃখ	দুঃখন°	দুঃখন	to be distressed.
দুন	দোনন°	দোনন	to swing.
দা	দান°	দেওন	to give.
ধ	ধরন°	ধরন	to take, to seize.
ধু	ধুনন°	ধুনন	to bow cotton.
ধো	ধ্যান°	ধেয়ান	to meditate.
নিস্ত	নিস্তারন°	নিস্তারন	to be blessed.

the dots being subsequently filed off to produce their undotted counterparts. The same holds true for the characters  $\text{॒}$ ,  $\text{॑}$ ,  $\text{॒}$ ,  $\text{॑}$ , and  $\text{॒}$  whose connecting headline was removed for these consonants to appear in isolation and not in text.<sup>85</sup>

Alternative sorts are employed in CW1 for some of the vowel signs which require different designs depending on their position in a word. The sign  $\text{†}$  has three sorts:  $\text{‡}$  for a final position,  $\text{†}$  and  $\text{‡}$  for medial positions.<sup>86</sup> Both styles of the medial form were commonly used in the manuscripts available to Wilkins, but there is no obvious reason to have both forms in the fount. At first sight, it could be thought that the central vertical stroke which rises above the headline (of the former version) at times fails to print properly, but close examination reveals two different designs. There seems to be no logic behind their application in the text of the *Grammar*; the two kinds already appear in the first chapter in similar situations. The form  $\text{‡}$  may have been designed to be used in conjunction with the sign  $\text{e}$  (*candrabindu*), since correct positioning of the *candrabindu* over the alternative sort  $\text{†}$  would not have been possible. But this does not explain why Wilkins did not confine himself to using the typeform  $\text{‡}$  throughout the work, or to employing it only in combination with superscripts. Moreover, the position of the *candrabindu* over  $\text{‡}$  is by no means perfect,<sup>87</sup> and the final form  $\text{‡}$  is sometimes used instead with very poor results.<sup>88</sup>

The vowel sign  $\text{†}$  also appears to have two forms with very similar design: one possessing a higher and shorter curve than the other to facilitate kerning over

85. See pl. 16.

86. Halhed, *Grammar*, p. 19.

87. See Halhed, *ibid.*, p. 35.

88. Halhed, *ibid.*, pp. 71, 170, etc; although Wilkins has been named as the printer of the *Grammar*, it cannot be assumed that he was the compositor.

characters which extend above the headline.<sup>89</sup> It is possible that in such cases the metal curve of the ascender is forced back by use of compositor's tools to accommodate the additional height of the consonant it modifies. On page 39 of the *Grammar*, it seems that the ascending stroke of  $\text{ḥ}$  has also been filed down to fit under the curve of this vowel sign. On the other hand,  $\text{ḥ}$  employs for its vowel sign two quite disparate designs to perform identical functions, for although one possesses a better kern, they both appear to be used indiscriminately in medial and final positions.<sup>90</sup>

The signs  $\text{ḥ}$  and  $\text{ḥ}$  each exist as a separate sort; whilst for  $\text{ḥ}$ , the forms  $\text{ḥ}$  and  $\text{ḥ}$  are used in initial and medial positions respectively. Similarly, the sign  $\text{ḥ}$  occurs in two designs, viz.  $\text{ḥ}$  and  $\text{ḥ}$ ; although the latter is rarely needed and at times is erroneously printed in an initial position.<sup>91</sup> Lastly, the vowel signs  $\text{ḥ}$  and  $\text{ḥ}$  occur as medial and final forms. It can therefore be concluded that Wilkins employed at least fourteen vowel signs in printing the *Grammar*.<sup>92</sup>

Halhed disclosed the method employed for printing compound characters (conjuncts):

I have already mentioned, that by the original structure of this language every consonant inherently possesses the short vowel on which its utterance depends; it is plain therefore on this principle, that no two consonants could have been joined together, and successively pronounced in the same syllable; but that a vowel must necessarily have intervened. As an expedient to remedy this inconvenience, a set of distinct characters were invented, called  $\text{ḥḥ}$  P'holaa, or adjuncts. They are certain subordinate and subsidiary figures, that may be attached to each of the consonants in the alphabet respectively, to

89. e.g.  $\text{ḥ}$ ; See Halhed, *Grammar*, pp. 57, 60, 91, 140, 163, etc.

90. See Halhed, *Grammar*, p. 146, where both sorts modify the consonant  $\text{ḥ}$ .

91. e.g. on pages 31, 32 and 197 of the *Grammar*.

92. Excluding p. 209 which is discussed below.

provide against the too frequent recurrence of the internal vowel.<sup>93</sup>

The term *phalā* normally pertains to the signs which represent the characters य, र, ल, and व as the final member of a conjunct; whereas Halhed used the term to signify 'eleven subservient marks or signs.'<sup>94</sup> Whether Halhed misapplied the word 'P'holaas' is not of concern here, rather the pertinence of his remark lies in the fact that Wilkins, for typographical purposes, expanded the notion of having reduced forms of certain characters which could be attached to any consonant for the creation of conjuncts. This technique obviates the necessity of designing a sort for every combination required. Thus it reduces considerably the size of the fount, although it necessitates the inclusion of *phalās* as well as extra sorts comprising reduced forms of those consonants forming the first member of a conjunct. Both *phalās* and reduced initial forms are cast on a smaller body than the main characters of the syllabary, so that two sorts can fit together to generate one character and still align with the rest of the fount. If well designed, the resulting conjunct has the appearance of being one integral character; the specific intention is to dupe the reader.

There are several means of ascertaining whether the conjuncts printed in the *Grammar* comprise one or two sorts. Firstly, a break in the compound character can frequently be observed.<sup>95</sup> Not only is this division between the two elements visible, but often the same combination of sorts may conjoin less happily elsewhere in the *Grammar*. Secondly, some conjuncts have been created by different means for no particular reason. An example of this is the conjunct  $\text{क़}$  which appears as  $\text{क़}$  on page 10 and as  $\text{क़}$  on page 97. A break is at once discernible to the naked eye in the former version, and there is no reason for the latter version to be restricted to this form unless a subscript follows.<sup>96</sup> It therefore confirms the suggestion that the conjunct  $\text{क़}$  was not readily




93. Halhed, *Grammar*, pp. 16-17.



94. Halhed, *ibid.*, p. 17, see pl. 17 showing 'The twelve PHOLAAS.' Regarding 'the twelfth word of the


95. With the aid of a magnifying lens.

96. As in the case of  $\text{क़}$  (p. 27), but  $\text{क़}$  (p. 61).

Series', see *ibid.*, pp 17 and 24-26.

available as one sort in the fount,<sup>97</sup> but had to be produced with the use of one or two reduced letterforms, i.e. from two types. Further verification of this method of composition employed by Wilkins is exemplified by the conjunct , which occurs frequently in the *Grammar*.<sup>98</sup> On page 15  is made up from two reduced letterforms, as it is on page 61, but both differ considerably. The most striking difference is that in the latter case, the reduced form of , i.e. the superior component, is very much larger.

Whilst such cases illustrate Wilkins's typesetting technique, there is no explanation for holding two reduced forms of the same character in one fount. Some seem to have the function of forming a second fount of smaller types to print the petition appearing on page 209, but it cannot be established beyond doubt<sup>99</sup> that the types appearing on this page were cast from the same matrices as those used to generate the initial parts<sup>100</sup> of conjuncts, particularly with regard to their stroke weight, which appears different. Moreover, a number of reduced consonants possessing two designs, as in the previously cited example of , were not required for the petition. As in the case of  mentioned above, it is possible that new, perhaps improved, designs were added to the fount as the printing of the *Grammar* progressed, without superseding their earlier forms. This would explain the presence of two versions of one character on the same page.

Not all conjuncts were formed by the method just outlined. Some were cast as whole characters, usually due to the peculiarities of their formation, but sometimes due to their exceptionally frequent occurrence, e.g. . The majority of these ligatures and special sorts are listed by Halhed on pages 33 to 35 of

97. Wilkins could hardly have run short of type.

98. Halhed, *Grammar*, pp. 15, 28, 30, 54, 56, 61, 69, 95, 103, 118, 143 and 181.

99. Without photographically enlarging the relevant characters; see above, n. 78.

100. 'Initial' due to the presence of a headline. CW2 is discussed below.

the *Grammar*. It is not possible to determine in each case the method whereby a conjunct has been printed in this work. Therefore in calculating the number of sorts held in the fount, a conjunct has been identified as one sort where any doubt exists as to its formation. On this basis, it appears that the reduced forms of characters number forty-eight, the ligatures and special sorts number thirty-two. Including numerals, punctuation and additional signs, the total fount of Bengali types comprised approximately 170 sorts. Thus Charles Wilkins succeeded, as one of his contemporaries related, in 'casting a complete fount of Bengal characters so currently united as not to leave their junctions visible but on very minute examination; as you [John Nichols] may see in Halhed's *Bengal Grammar*'.<sup>101</sup>

CW1 was also used in the separate publication, *Preface to a Grammar of the Bengal Language*, to print in Bengali characters a Bengali ode 'composed ... by an inhabitant of Hoogly'<sup>102</sup> which does not appear in the *Grammar*. Another item printed with this typeface was recently discovered amongst Halhed's papers<sup>103</sup> and is the earliest extant example of blank-form printing in the Bengali language at Calcutta.<sup>104</sup> It is not known when this form, which is accompanied by a Hindustani version, was printed, except that it must have taken place prior to Halhed's departure from India in 1785. The choice of types does not help to establish its date, but it is interesting to note the consistency of the forms  $\text{ঐ}$ ,  $\text{ঊ}$ ,  $\text{ঋ}$  and  $\text{ঌ}$  throughout the piece, which gives the text a uniformity lacking in the *Grammar*. The item provides a better appreciation of the capabilities of Wilkins's first typeface for text-setting than is demonstrated in *A Grammar of the Bengal Language*.<sup>105</sup>

101. Letter from George Perry, Calcutta 1 Oct 1783: John Nichols, *Literary Anecdotes of the Eighteenth Century* (London, 1812), 6, pt I, p. 638.

102. Nathaniel Brassey Halhed, *Preface to a Grammar of the Bengal Language* (Hoogly, 1778), p. xxv; see also pl. 19.

103. BL MS Add. 5660F, and see pl. 20.

104. See Shaw, *Halhed's Manuscripts*, p. 3.

105. As the *Grammar* takes most of its examples from Bengali translations of Sanskrit epic poetry.

## গীত

বুঝিতে নাপারি পুনরাথ এহার কেমন পিরিত্তি ১১১  
 জাতি মজাইয়া জুগিণি করিয়া তেজিনা মন  
 বতী ১২৫

কনক তরঙ্গে ভাসাইয়া তরি ছাড়িয়া দিন। হানি  
 হয়া কাণ্ডারি নাপাইয়া মন অমনি তুরিন কেন  
 বৈশাছে এমতি : ১৩১

সব্ব ভবম যে কিছু ছিল তরঙ্গি সহিত তথিয়া  
 গেন এইসে করিনা স্ববনার মনে রাখিনা থেয়া  
 ত্তি ১৪১

দুখে ঘরে বন্ধি করিয়া অনঙ্গ আনন ভ্রমাইয়া  
 দিয়া কোন অভিলাসে বিরহ রচনাসে আবাইয়া  
 জুবতী ১৫১

সুপথ দেখাইয়া ভুলাইয়া নারী মপথে ফেনাইনা  
 করিয়া চাতুরি যাবত বাচিব তাবত ঘুমিব তো  
 মার এডাকাতি ১৬১

নানচন্দ্র নাগে কহিছে বানি মিছা থেদ আর কি  
 ফল ধনি জান্যা সুন্যা কেনো নবনান মনে আণে  
 মজাইনা মতি ১৭১

ইন্দুক সন পৰ্গনা মজুম্ভৰ বন্দোবস্ত তোমাকে মকৰ হইল বন্দোবস্ত মজুম্ভৰ আমানত ও দেয়ানত বাস্তি ও দকান্তি থাকিয়া পূজালোককে আপন নেক সনূকে বাস্তি বাথিয়া আবাদ ও ঠৰদুদ বৰ ওক্ৰ কৰিবে জে পূৰ্ব্ব হইতে আবাদি অধিক হয় সৰকাৰেৰ মালগুজাৰি মাফিক বন্দো বস্ত তাহাৰ কিন্তুবস্তি আপন দস্তখতে আপন পেষকাৰেৰ দস্তখতে জেমত দজ্জৰে দিয়াছ মাহ বমাহ বৰ ওক্ৰ দাখিল কৰিবে দৰি মাগ্গন ও গ্ৰদ বাষ্টা ও গয়বহ আবোয়াব পূজাৰ স্থানে লইবেনা আসল ও আবোয়াব সৰকাৰেৰ মাখলি লাগাদি সন জে আমলে আসিয়াছে তাহাৰমত ও সুল তহসিল কৰিবে তাহা হইতে জেয়াদা কিছু লইবেনা সাবেক আমলেৰ সনয়াত বাকি পূজা স্থানে লইবেনা সৰকাৰেৰ হুম্ম মতে মাফুল ইজাৰদাৰেৰা হাজিৰা পূজা স্থানে বে ওজৰি জে বাকি যকাবিলা কৰিয়া দিবেক তাহা ও দুলকৰিয়া জেখানে হুম্ম হয় দাখিল কৰিবে জমিন ও বাগাত ও তালাব ও দেবস্তৰ ও বুদ্ধোস্তৰ ও মহোস্তবান ও আয়মা ও মদদমাশ ও পিৰপাল ও ফকিৰান ও লাখেৰাজ ও দেহাত ইত্তমবাৰ হফৰেৰ হুম্ম বিনা বাজেয়াপ্ত কৰিবেনা এব হফৰেৰ হুম্ম বিনা দৰি কাহাকে দিবেনা আপন সৰহদেৰ পুলবস্তি মাফিক ইত্তমবাৰ বৰওক্ৰ কৰিবে তাহাতে গাফিল হও জে নোকসান হয় তোমাৰ জিফা আপন সৰহদেৰ সাহৰাহ নিয়া বানিতে এমত খবৰদাৰ থাকিবে জে যসাফ্ৰেৰ লোক খাতিৰ জমাতে আমদ ও বপ্ত কৰেচোৰ ডাকাতিকে আপন সৰহদে জায়গা দিবেনা ৬ নাকৰেন জাদি কাহাৰ মালিয়ত চুৰি কিয়া নুট জায় চোৰ ও ডাকাতিকে বজনিয মাল সমেত পয়েদা কৰিয়া মালিককে মাল ও চোৰ ও ডাকাতিকে হফৰে প'হছাইয়া দিবে বাজেজমা মাদোচা ও গয়বহ সৰকাৰে মানা ও বন্দোবস্তে যফৰা হইয়াছে পূজাস্থানে লইবেনা পূজালোক জে ঠাকা কিস্তি বকিস্তি দাখিল কৰিবেক তাহাৰ দাখিলা এব আথিৰে সনে হিসাব বহা কৰিয়া সালিয়ান দিবে নজৰ ও সল্যামশু তেহোয়াৰি পূজা স্থানে লইবেনা এব কাহাকে ও দিবেনা জাদি মালগুজাৰি বাকি পড়ে তাহাৰ আমাজ জায়দাৰি নকম বিফয় কৰিয়া সৰকাৰে দাখিল কৰিবে এই সকল দহাতে তাকিদ জানিবে ইতি



The structure of CW1's characters does not accord with manuscript letterforms, for the strokes join in a manner contradicting the stroke sequence of penned Bengali forms.<sup>106</sup> Despite the disposition of CW1's strokes, its design achieves a calligraphic quality by the slight weight differential of the thin and thick strokes and the diagonal stress which adds movement to the typeface.

Inconsistencies in design, and the crude fashioning of strokes or curves such as ৩, ২০, and ১ do not seriously mar the typeface, but add to its calligraphic charm. Its elegance, however, is impaired by clumsy conjunctions resulting from the *phalā* method of composition. The consistently open counters, which are well balanced by the intercharacter spacing, contribute to the harmony of the design, as does the regularity of the oblique downstrokes. The legibility of the typeface is assisted by its large type size which was probably intended to benefit the students of the *Grammar*, and perhaps reflects Wilkins's inexperience in punchcutting.<sup>107</sup> As a pioneer fount of Bengali types, Wilkins's first fount represents a remarkable achievement.

The quality of the types used to print the *Grammar* was matched by the high standard of typography it exhibited.<sup>108</sup> Typography has been defined 'as the art of rightly disposing printing material in accordance with specific purpose; of so arranging the letters, distributing the space and controlling the type as to aid to the maximum the reader's comprehension of the text'.<sup>109</sup> It has been established that Halhed modelled his *Grammar*, and Wilkins its typography, on the Persian *Grammar*<sup>110</sup> of William Jones.<sup>111</sup> Wilkins's skill in Bengali typography developed as he gained more experience in the art of printing. On 13 November 1778 the Governor-General submitted to the Council an application

106. See below, chapter 3ii.

107. It is easier to cut at this size; type sizes are discussed below, see chapter 10.

108. For an early Indian imprint.

109. Stanley Morison, *First Principles of Typography*, 2nd edn (Cambridge, 1967), p. 5.

110. In so far as the English content (in Latin types) is concerned.

111. Sir William Jones, *A Grammar of the Persian Language* (London, 1771). For a detailed comparison, see Qayyum, *Critical Study*, chapter V.

by Wilkins for the establishment of the East India Company's own press<sup>112</sup> for printing documents. The request to draw up such a proposal came from Warren Hastings, who perceived the advantage of having a press under the Company's control. In a letter to the Court of Directors, Hastings wrote:

Mr Wilkins having informed us that he had completed the construction of a set of Type of the Bengal language, and the printing of the Grammar of that language, and the Governor General having reported to us that much expense had been incurred in bringing this art to its present degree of perfection, that it might be applied to public use and preserved from being lost; we resolved as a further encouragement to the labours of Mr Wilkins, to establish a printing office under his direction for the purpose of printing such papers as are confined to settled forms whether in the Persian, Bengal or English character.<sup>113</sup>

The number of staff Wilkins considered necessary to operate the two presses advocated in his petition comprised two compositors in Bengali and Persian, one compositor in English, one pundit, one munshī, one porter, eight pressmen, one hand pressman, four peons, one jamadar (sweeper), and one bookbinder.<sup>114</sup> Wilkins was appointed to the post of Superintendent of the Honourable Company's Press in December 1778, in addition to his other duties as Superintendent of the Company's factories. The Company's Press was situated at Malda, but was moved to Calcutta in 1781 when Wilkins was transferred there as Persian and Bengali Translator to the Revenue Committee. He remained Printer to the Company until 1784 when he was granted leave through ill-health; he never resumed office.<sup>115</sup>

112. IOR: H/207 *Home Miscellaneous Series*; Extract of Bengal Revenue Consultations, 13 Nov 1778, pp. 463-74.

113. IOR: *Bengal Letters Received*, Feb 1779 to Mar 1780, pp. 39-40; the letter is dated 9 Feb 1779.

114. IOR: H/207 *Home Miscellaneous*; Extract of Bengal Revenue Consultations, 13 Nov 1778, p. 468.

115. Francis Gladwin succeeded him to this post.

One of the first items printed by the Honourable Company's Press may have been the form recently discovered amongst Halhed's papers at the British Library.<sup>116</sup> This form, printed with CW1, displays a higher standard of typography than is to be found in the *Grammar*.<sup>117</sup> The Bengali text has been carefully justified<sup>118</sup> and bears testimony to the skill of the typographer, who has succeeded in demonstrating the homogenous quality of the typeface.

The inclusion in the *Grammar* of an engraved reproduction of a Bengali petition accompanied by its translation into type affords an example of the distinction between calligraphy and typography.<sup>119</sup> The copperplate engraving reproduces very accurately the cursive Bengali hand of the scribe who copied for Halhed's reference<sup>120</sup> the collection of documents described by Blumhardt as 'bonds, leases and other documents in use by landlords and tenants'.<sup>121</sup> Although numerous petitions are included in these documents, the one given in the *Grammar* is not extant. Existing material, however, suggests that Wilkins's accomplished engraving is a true representation of the original; the manuscript hand differs mainly in the formation of the vowel signs. The version printed from type faithfully follows the layout given by the calligraphic hand of the engraving, including end-of-line rules to justify the text.<sup>122</sup> The shapes of the characters, however, bear no similarity.

116. Mentioned above, see p. 60.

117. See pl. 20.

118. In accordance with the definition of 'Justification' as 'the even and equal spacing of words or blocks to a given measure'; Linotype, *Printing Terms*, p. 23.

119. Halhed, *Grammar*, p. 209 and facing plate. These are noteworthy for other reasons, see below, pp. 17, 20-21, and pls. 21 and 22.

120. See Shaw, *Printing Interest*, p. 2.

121. Blumhardt, *Bengali ... Manuscripts in ... the British Museum*, p. 37: Add. 5660E, ff. 27-38. See pl. 23. The cursive hand is quite distinct from the more formal style of what may be termed the decorative hand of the MSS discussed above. The cursive hand is characterized by the abandonment of the headline and, unlike its decorative counterpart, not all the limbs of the basic characters are fully formed; for some examples see H.M. Lambert, *Introduction to the Devanagari Script* (London, 1953), 'Bengali Section', pp. 177, 186, 188, 192 and 194.

122. Except for interword spacing, as mentioned above.



## ৭শ্বরায়

গরিবনেওঁজ শেনামত

আমার জমিদারি পরগনে কাকজোন  
 তাহার দুই গুম দরিয়াশিকিশ্তী হইয়াছে  
 সেই দুই গুম পয়শ্তী হইয়াছে চাকলে একবরপুরের  
 শ্রী হরেকুম চৌধুরি আজ রায় জবরদস্তী দখল করিয়া  
 ভোগ করিতেছে আমি মানগুজারির শরবরাহতে  
 মারাপতিতেছি ওমেদওয়ার জে শরকার হইতে আমিন  
 ও এক চোপদার শরজমিনতে পহুচিয়া তোরফেনকে  
 তনব দিয়া নইয়া আদানত করিয়া হকদারের হক দেনায়া  
 দেন ইতি শন ১১৮৫ শান তারিখ ১১ শুবন

হিদবি  
 জগতবির রায়

Bb

Tranflation.

১.  
৭ ক্রম

# An Obligation

আপাতোলাসম্মানদক্ষমত্ব আলে যাদেই  
*concedit conceditque civilitatem in confectis, nonnulli offensa*

বিসেসক্ষমত্বদায়ক বিশেস ছোদাত্মা যাদেই  
*defensum offensa*

মহুগরমহুতমী আমাফে বদসবহজানিদিয়াই  
*interdictum, Tu mihi illegitimum utpessum adist.*

আমী একতগাবদক্ষবিবহুদিগাবদক্ষমী  
*Ex decessum prohibitionem faciam si prohibitionem faciendo*

বাপাতিতরহাসিমবত্বজাব স্কষ্যদায়  
*non valiam bene bene sedie peccatus (non) minus defendens*

মহুতমী স্কষ্যক্ষমত্বসবহহুদিআমী ভোগাফ  
*ait, Tu quidem aisti, et non est. Tu Ex sibi*

জানিদিয়াথালীতমী একতগাবদক্ষবিবহুগাবোই  
*utpessum utpessum, Tu bene in meum prohibitionem facere habes*

তবে বিশেষতমী মেবত্বজাব হুস্বাভোগা  
*Qua veniendo. Sedie peccatus (Ex) habet habitus in ventis*

স্বাদিগমরোচ ১৪৪৭১২৮ — ২৪৪৪৪ —  
*libram de*

The characters that appear on page 209 of the *Grammar* form a separate typeface, CW2, even though not every character of the syllabary has been represented. It is possible that some of the typeforms had a place in Wilkins's first Bengali fount,<sup>123</sup> but the majority of the sorts used to print the petition are unique to this page: the vowel signs, conjuncts, and numerals were all designed to appear only at this type size.<sup>124</sup> This fount appears incomplete, but there is no pre-determined size of a fount of Bengali types.<sup>125</sup> The range of characters is wholly dependent on the typesetting technique devised by the type designer, who must take into account the job for which his designs are intended. In this case, the sorts of CW2 were conceived as a second fount, compatible with the principal Bengali fount employed; both typefaces appear on page 209.<sup>126</sup>

CW2, whose appearance on page 209 is dominated by the strong headline extension, is a legible, but inelegant, typeface. The openness of the intercharacter spacing and internal counters assist its readability; but the unevenness in stroke weight, the different angles of the oblique strokes, and the inconsistent handling of common elements (compare হ , ঙ , and ঝ ) disturb its rhythm. Such defects appear indicative of the inexperience of the punchcutter, or type designer, at handling such complex character shapes at this small type size.<sup>127</sup>

123. See above, p. 59.

124. And were not simply reductions of the first fount.

125. The phrase 'a complete fount of Bengali types' gives no indication of the number of sorts required; also see below, chapter 3iii.

126. It has been assumed here that CW2 was cut after CW1, since the latter was urgently required for the *Grammar* and its size was more appropriate. On the other hand, CW2 could have comprised the experimental types referred to by Hastings (see above.). It is interesting to note that not all copies of the *Grammar* include the engraving, e.g. it is shown in the SOAS edition CWM D3/4, but not in EB 77.91 310093.

127. In comparison to John Lawson's superior efforts 15 years later at the Serampore Mission Press; see below, chapter 3i and pl. 47.

The design of Wilkins's third Bengali fount (CW3), which was employed by the Company's Press for printing translations, regulations, forms, and other sundry items including the first work ever printed in Sanskrit,<sup>128</sup> is manifestly different <sup>from</sup> that of CW1 (and CW2).<sup>129</sup> This typeface, whilst retaining a diagonal stress achieved by such characters as **ব**, **ব**, and **দ**, is characterized by its heavy headline and the strong vertical strokes emphasized by the tight intercharacter spacing and the relatively narrow counters of characters like **ক** and **ব**. The main characters of the syllabary have been reduced in height as well as width, although when set with subscripts and superscripts the size of the typeface has remained much the same. This modification renders it more suitable for mixing with Latin types;<sup>130</sup> it therefore also begins to approximate the height of the script in manuscript form.

The most striking change in the design of the types is the alteration in character to character relationships. Proportions have altered considerably. For instance, the character **ন**, which in CW1 was of similar proportions to **স**, has been so condensed in CW3 as to render it hardly comparable to its precursor; it is very poorly designed. The sort **ঙ** also suffers from the excessive reduction of its internal counter, and the narrow typeform **ঙ**, whilst kerning skilfully under the character it modifies, has become stiff and angular, losing the flow of its earlier design.<sup>131</sup> Variations in the design of one sort, as in CW1, no longer appear: the medial **ঙ** has returned to its form **ঙ**, but discrepancies exist in the stroke weight of certain characters, which are not wholly attributable to unevenness in the printing.

128. Kālidāsa [Rtusamhāra]. *The Seasons: a Descriptive Poem, by Cālidās, in the Original Sanscrit*, ed. Sir William Jones (Calcutta, 1792). A Sanskrit work in Bengali characters. The first regulation to be printed in Bengali characters by the Honourable Company's Press was the *Translation of the Regulations for the Administration of Justice in the Courts of the Dewanny Adawlut* by Jonathan Duncan (Calcutta, 1784).

129. See pls. 24-26.

130. For which purpose it was often employed by the East India Company.

131. See Halhed, *Grammar*, p. 23.



# BENGAL TRANSLATION

OF

EXTRACTS FROM THE REGULATIONS,

FOR THE CONDUCT OF THE

COLLECTORS,

IN THE

REVENUE DEPARTMENT,

*Passed in COUNCIL, the 8th June, 1787.*

CONTAINING,

*All such parts as in any degree have relation to the Zemindars, Farmers,  
and other Natives, under the Authority of the Revenue Collectors.*

সন ১৭৮৭ ইঙ্গিৰেজি তাৰিখ ৮ জুন পুনৰ পুতাপ শ্ৰীহুং গবনৰ জেনৰেল  
সাহেব কোম্পানী বন্দিনা মানসুজাৰিৰ সকল কাৰ্য্যেৰ বিসয়ে দফাওৰিয়ে  
ছন্দন কৰিবলৈ একাৰণ যে২ দফা জমিদাৰ ও ইজাৰদাৰ দিগেৰ এব°  
যে নকৰ জিন্দাৰ সাহেবানেৰ তাৰেখাকে ইহাদিগেৰ স্থানে এনাকাৰাখে  
তাহাখোলানা দিকাৰিলা জংলে দিখাআইবেছে

C A L C U T T A :

PRINTED AT THE HONORABLE COMPANY'S PRESS,  
M,DCC,LXXXVII.

23. How is the present tense of the subjunctive mode formed, and in what does it differ from the indicative ?
24. What is the rule for forming the potential mode of verbs ?
25. How is the optative mode formed ?
26. Why are the verbs পাওন or ফেলন added to other verbs ? And are they conjugated with an infinitive mode, or with a present participle ?
27. Why is the verb থাকন joined to the present participle ?
28. What enclitics are usually affixed to verbs, and how are they used ?
29. What is the difference between the use of the participles in লৈ and ইয়া ?
30. Can the agent of a Bengalee verb be in any case except the nominative ; if so, in what case ? Give an example of that peculiar kind of construction.

## SECOND EXERCISE.

To be translated into English.

শুদুক নামে এক ৰাজা ছিলেন তাহাৰ কাছে এক ৰাজপুত্ৰ বীৰবৰ নামেতে কোন দেশ হইতে আঙ্গিয়া ৰাজাকে কহিতেছেন আমি চাকৰিৰ জন্য আঙ্গিয়াছি যদি আপনকাৰ ইচ্ছা তবে ৰাখুন । ৰাজা জিজ্ঞাসা কৰিলেন তোমাৰ মাহিনা কত । তিনি বনিলেন দিন পাচ শত খান মহৰ । ৰাজা বনিলেন আমি এত মাহিনা দিতে পাৰি না । এ কথা শুনিয়া সে ফিৰিয়া যায় তখন ৰাজাৰ মন্থীগণ বনিলেন মহাৰাজ তাহাকে চাৰি দিনেৰ কাৰণ ৰাখিয়া আনুন সে কি কৰিতে পাৰে তাহাৰদিগেৰ কথায় এক দিনেৰ মাহিনা দিয়া ৰাখিলেন । বীৰবৰ দিবা ৰাত্ৰি ৰাজ দ্বাৰে থাকেন এক দিন ৰাত্ৰিতে ৰাজা ফন্দনৰ শব্দ শুনিয়া বনিতোছেন দ্বাৰে কে আছে । বীৰবৰ বনিলেন আমি । ৰাজা কহিলেন কে ফন্দন কৰে দেখিয়া আইস । ভাল বদিয়া চলিলেন তাৰপৰ বীৰবৰ বনেৰ মৰ্যে গিয়া দেখেন এক যুবতী শ্ৰী বীৰবৰ জিজ্ঞাসা কৰিলেন তুমি কেন ফন্দন কৰ । তিনি কহিলেন আমি এ ৰাজাৰ লক্ষ্মী ছিলাম এখন অন্য স্থানে যাইব তাহাৰ কাৰণ ফন্দন কৰি । বীৰবৰ বনিলেন কি হইলে তুমি থাকহ তাহা বন । লক্ষ্মী কহিলেন তোমাৰ

ছাৰিতে সৰকাৰেৰ বাকী আদায়  
কাৰণ পুৰান স্থানে নিলামে বিকী  
হইবেক

উপৰি ক্ৰম

পৰগণে বনগুামথালিগা

পৰগণে বনগুাম আণিৰ

পৰগণে উজিৰপুৰ গোমাস্তাপুৰ

মোহৰদেবপুৰ

উফৰ দক্ষিণ জোয়াৰ

পৰগণে ধোয়াৰি

পৰগণে মহম্মদপুৰ

পৰগণে বাসডোল পনতাপুৰ

নৌদা গোপালপুৰ

বাজা বামপুৰ কালিগা

উৰপশীপুৰ

পৰগণে কাসিমনগৰ

তাৰিখ ৭ মাহ নবম্বৰ সন ১৭৯৪

সাল ইং মোতাবেকে ২৫ মাহ

কান্তিক সন ১২০১ সাল বাঙ্গলা

**N**OTICE is hereby given, that such of the  
Dewry Mchauls, the property of the Ra-  
nce of Burdwan as were advertised for sale  
on the 23d September last, but have not been al-  
ready disposed of, will be sold at this Office, on  
Monday the 22d December, or 10th of Po se  
next, with an exception to the Village or Vil-  
lages in which the Rance's principal Dwelling  
Houses are situated, which are to be separated  
together with the Jumma annexed to them from  
the Hoodab in which they lie.

Further Information respecting the Villages  
above alluded to, may be obtained on application  
at this Office, or at the Catchery of the Collector  
of Burdwan, where every Particular regard-  
ing the Lands ordered for sale may be likewise  
ascertained.

By Order of the Board of Revenue,  
G. DOWDESWELL, Sec.

এম্ভুহাৰ দেওয়া আইভেছে জে  
মহানাত দেওড়ি মিলকিয়াতে বাণী  
বৰ্দমান পূৰ্ব নিলামেৰ কাৰণ  
বতৰিখ ২৩ মাহ সেন্তেম্বৰ ১৭৯৪  
ইং মতাবেকে ১০ আশ্বিন সন ১২০১  
বাঙ্গলা এস্তলা দেয়াগিয়াছিল এই  
ক্ষণতক বিকী হয় নাই সপ্ততি  
বতৰিখ ২২ মাহ দিসেম্বৰ সন  
হাল মতাবেকে ১০ মাহ পৌষ সন  
হাল বাঙ্গলা বোজ সোমবার  
বোবড বিবনুৰ ঘৰে সৰুৰটৰ  
সাহেবেবহহৰে পুৰান স্থানে নিলামে  
বিকী হইবেক কিন্তু জেথানে বানীবি  
বাটী হয় সেই গুাম অথবা  
গুামহায় মমজমা জে সকল খুদা  
বিকী হইবেক তাহা হইতে খাৰিজ  
হইবেক এই গুাম অথবা গুাম  
হায়েৰ জমাৰ কেফিয়ত বোবড  
বিবনুৰ সৰুৰটৰি কাচাৰিতে অথবা  
জিলা বৰ্দমানের কানেকটৰি কাচা  
ৰিতে মানুম হইবেক এবং এই  
খুদা হায়েৰ হকিকত যাহা বিকী  
হইবেক এই দুই কাচাৰিতে দাবি  
যাশু কৰিতে পাৰিবে ইতি সন  
১৭৯৪ ইং মতাবেকে ১৮ নবম্বৰ  
৫ অগুহায়ন ১২০১ সাল

C. BULLER,

Per. & Sec. Tr.

Changes in design are not due to any alteration in the method of composition; conjuncts are still generated in the same manner. It would seem, however, that the designer was at pains to maintain a uniform baseline, at times to the detriment of combined letterforms, whose separate elements were further reduced to align with the rest of the character set, e.g. ঞ . The overall appearance of CW3 is one of greater uniformity, and perhaps sophistication, than is to be found in previous Bengali founts, but it is marred by the misalignment of the strong headline. The 'choppy' effect may be the result of poor casting, or simply that the condensed nature of the typeface sets more words to the line, thereby increasing the potential number of breaks to be observed. The fount can be criticized for possessing a somewhat static appearance and lacking the dynamism of CW1. The extent to which Wilkins, Shepherd, and Pañcānana participated in the design of this typeface is not known.

Although the fourth and last fount of Bengali types (CW4) reputedly designed by Charles Wilkins was produced outside India, it will be discussed here, since the previous fount (CW3) apparently formed its basis. Wilkins returned to England in 1786, where his typographical endeavours continued.<sup>132</sup> But it was not until 1811 that his final Bengali typeface appeared in the first Bengali book printed in Europe in Bengali characters:<sup>133</sup> *Mahārāja Kṛṣṇacandrarāyasya Caritraṃ* by Rājīvalocana Mukhopādhyāya, printed in 1811 at East India House under Wilkins's supervision.<sup>134</sup> One copy of this book held in the Library of the Indian Institute at Oxford has a note on the flyleaf, which mentions that 'The types were cut by the late Dr (after Sir Charles) Wilkins. Several of them, being large and uncouth, were thrown away, and others smaller and

132. By 1808 he had completed his Devanagari fount.

133. Presumably in response to the urgent need of text books for teaching oriental languages at the East India Company's Haileybury College. Only two Bengali imprints are known to have been printed at East India House (London).

134. This followed an Indian edition published in 1809.

neater substituted in their place'. The note bears the signature of F[rancis] Johnson, professor at Haileybury College.

Johnson's statement is borne out by the works printed in this typeface:<sup>135</sup> certain letterforms belonging to Charles Wilkins's final Bengali fount do share the same design as those of CW3, whose punches, it is thought, accompanied him on his return to England. His note, however, understates the extent of the revisions carried out, and which therefore accords the fount the status of a new typeface.<sup>136</sup> It is possible that Wilkins was now sufficiently experienced to cut the punches of the modified sorts without the aid of new drawings or a skilled punchcutter, but by engraving new designs or revisions onto new punches whilst using the old ones as models. The two designs, old and new, could be quickly compared by the customary and effective method of smoke-proofing.<sup>137</sup> He may, however, have been assisted<sup>138</sup> by William Martin, 'the ingenious mechanic' who had cut the punches designed by Wilkins for Richardson's *A Dictionary, Persian, Arabic and English*.<sup>139</sup> Matrices struck from the punches of CW4 still exist, and are now housed in the India Office Library together with drawings of Modi characters, matrices, and assorted punches.<sup>140</sup>

The discovery of this collection at the India Office Library provided the unique opportunity of casting types from the matrices in order to print from them for

135. William Savage, *A Dictionary of the Art of Printing* (London, 1841), is the last work known to have employed this typeface: pp. 33-37.

136. See below, chapter 6.

137. A 'smoke proof' has been defined as 'an impression from a punch obtained by putting the punch into the flame of a flaring gas-burner until its face is covered with soot, and after breathing repeatedly on a piece of paper to moisten it, firmly pressing the punch on the paper'; Linotype, *Printing Terms*, p. 34.

138. Refer to Caslon's comments above, pp. 47-48.

139. John Richardson, *A Dictionary, Persian, Arabic and English*, A new edition, with numerous additions and improvements, by Charles Wilkins (London, 1806-1810), I, p. xciv. Martin had his own foundry in Duke St.

140. See Lloyd, 'Charles Wilkins', p. 39, and Fiona Ross and Graham Shaw, *A Specimen of Bengali and Modi Types* (Andoversford, 1987).

the purpose of this research.<sup>141</sup> Galley proofs<sup>142</sup> taken of these types reveal the typeface to correspond to the fourth fount of Bengali types ascribed to Charles Wilkins, CW4, which was used to print *inter alia* Graves Chamney Haughton's *Rudiments of Bengali Grammar* (London 1821). It was from this imprint that a text was chosen, followed by a fount synopsis,<sup>143</sup> to produce a specimen of the newly-cast types.

No true facsimile of Haughton's original text could be made, since any peculiarities due to each matrix were unknown before the types were cast at the Oxford University Press. Consequently, the reduced forms of certain characters were cast on the same body-size as the rest of the types, as were any subscripts and superscripts. Thus it was not possible to reproduce conjuncts made up of two reduced elements, nor correctly position 'floating' signs. In Wilkins's system of composition a 'floating' vowel sign is cast on a separate piece of metal, normally a quarter or a third of the body height, and positioned over, or under, the character it affects; typeforms designed to kern with another character require painstaking and skilful filing in order to produce the desired results; and dots and connecting strokes are removed from some types to create other forms.

Furthermore, the India Office Library collection of matrices does not contain all the characters employed in Haughton's text. The fount synopsis also shows some numerals to be missing. Nonetheless, the exercise of composing the specimen confirms the assumptions made with regard to Wilkins's method of composition devised for the *Grammar*;<sup>144</sup> a method he subsequently adhered to, and which was emulated by successors in this field. The type specimen unequivocally demonstrates the common origin of both CW4 and the newly-cast

141. The types were cast with great skill by Don Turner. The full results of which are being published separately.

142. See pl. 27.

143. Arranged according to the case lays, not 'alphabetically'; see pl. 28.



144. See above, p. 50 ff.









types. It cannot be said that the matrices found in the India Office Library are those which produced the types for Haughton's *Rudiments of Bengali Grammar*, although the same punches must have created both founts of type;<sup>145</sup> and some of these punches originated from Wilkins's third Bengali fount.

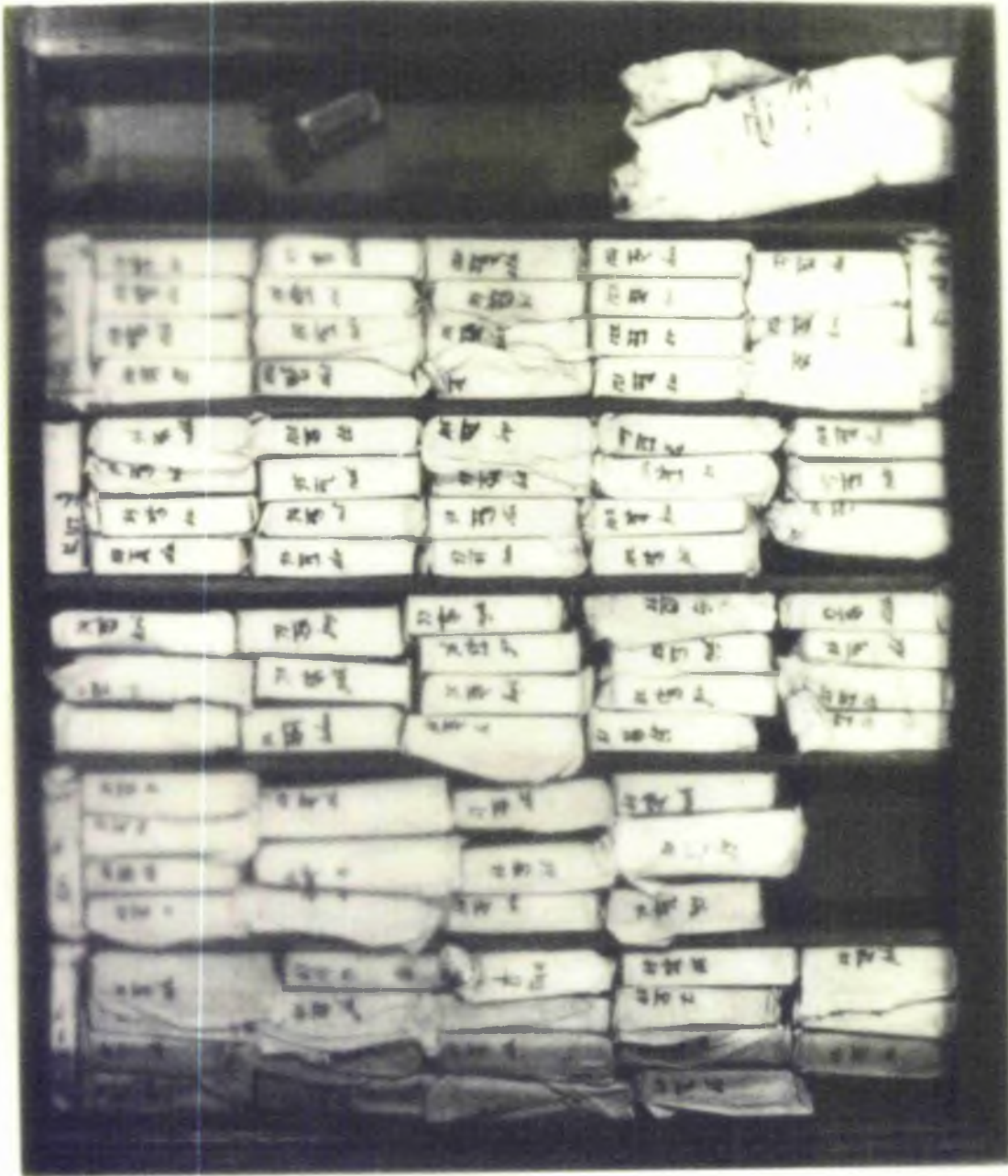
In spite of sharing some punches with its precursor, CW4 is intrinsically different from any previous fount produced by Wilkins and his associates. The number of sorts has been extended in order to reduce the frequent occurrence of conjuncts made up from two types. This has resulted in the design of conjuncts as integral characters which do not suffer distortion from being created out of common components. The compound characters which benefit from this development are those that appear on page 4 of Haughton's *Rudiments of Bengali Grammar*,<sup>146</sup> and those whose second element is the lettershape , usually termed *raphalā*. In some cases, the second element may appear identical from one conjunct to another, but it is the skill of the designer that creates this optical illusion. In this manner, all characters possessing the stroke  now appear balanced and add to the homogeneity of the character set.<sup>147</sup> The conjuncts thus designed are no longer larger than the basic characters of the syllabary and therefore do not obtrude and break up words in which they occur. This feature has also enabled the designer to reduce the height of the typeface, since large discrepancies in the depth of the letterforms do not persist and, unlike CW3, clumsy combinations are obviated.

CW4 distinguishes itself from its precursor in other ways: the alignment of characters has greatly improved; the vertical mainstroke of some lettershapes has at times been shortened; the shape of the vowel sign  and letterform  have

145. With their original wrappers intact, the India Office Library matrices have the appearance of a reserve set; see pl. 29.

146. See pls. 30 and 31.

147. See pl. 32.



29. The IOL Wilkins collection

# RUDIMENTS

OR

## BENGALÍ GRAMMAR.

### OF ORTHOGRAPHY.

1. THE Bengalí alphabet, like those of all languages of the *Hindu* class, is read from left to right.

#### THE ALPHABET.

অ *õ*, আ *ā*; ই *i*, ঐ *ī*; উ *u*, ঊ *ū*; ঋ *ri*, ঌ *rī*; লি *li*, ঊলি *lī*;  
এ *e*, ঐ *oi*; ও *õ*, ঔ *ou*; ঞ *õng*, ঞ্ *õh*.

1 Gutturals	ক <i>kõ</i>	খ <i>khõ</i>	গ <i>gõ</i>	ঘ <i>ghõ</i>	ঙ <i>ngõ</i>
2 Palaticks	চ <i>chõ</i>	ছ <i>chhõ</i>	জ <i>jõ</i>	ঝ <i>jhõ</i>	ঞ <i>nyõ</i>
3 Cerebrals	ট <i>tõ</i>	ঠ <i>thõ</i>	ড <i>dõ</i>	ঢ <i>dhõ</i>	ণ or ণ <i>ñõ</i>
4 Dentals	ত <i>tõ</i>	থ <i>thõ</i>	দ <i>dõ</i>	ধ <i>dhõ</i>	ন <i>nõ</i>
5 Labials	প <i>põ</i>	ফ <i>phõ</i>	ব <i>bõ</i>	ভ <i>bhõ</i>	ম <i>mõ</i>
6 Semi-vowels	য <i>yõ</i>	র <i>rõ</i>	ল <i>lõ</i>	ব <i>võ</i> , or <i>wõ</i>	
7 Sibilants and the aspirate }	শ <i>shõ</i>	ষ <i>shõ</i>	স <i>sõ</i>	হ <i>hõ</i>	

The short vowel *õ* is inherent in every consonant.

B

Read

## RUDIMENTS OF

### Examples.

গ grō	জ jō	চ ch'chhō	ট ntō	ঠ nthō	ড tnō
ত tmō	দ ddō	ন dnō	দ্য dmō	ড drō	ধ dwō
ড dru	ব drū	ন ndō	ন nnō	ব nwō	প pnō
ঐ pwō	ব bhō	ম mbhō	ম mmō	ম mlō	ল lpō
ল llō	শ schō	ষ swō	ষ smō	শী srī	শ ru
শ shkō	ষ shtō	ষ shthō	শ শhpō	শ spō	হ hwō

### OF ANOMALOUS FORMS OF COMPOUND LETTERS.

4. By the practice of writing quick, some compounds of consonants and vowels have been contracted into a form peculiar to themselves.

### Examples.

ক kri	ক ktō	ক krō	ক kshō	ক kshmō	ক ngkō
গ gu	গ gdhō	গ nggō	জ jnō	জ jyō	জ nichō
ট ttō	ট ntō	ট ndū	ত ttō or tu	ত t'thō	ত tyō
ত্র trō	ত্র tru	ত্র ttrō	দ d'dhō	ড ntō	ড ntu
ড ntrō	ড ndhō	ড ptō	ড bdō	ড bhrō	ড bhrū
র ru	র rū	র su	র shnō	র stō	র stu
স strō	স sthō	স hu	স hri	স hnō	স hmō

5. No vowel can follow the letter ৳; it is a silent ৳ t, and is called অর্ধত *ordhō-tō*, half-to.

6. ৳

তুমি এক রত্নুর্বে আমার গলা বন্ধন করিয়া আমাকে দশরীরে সেই রাজার নিকট লইয়া যাও এবং তাহাকে কহ যে তুমি যে ব্যক্তির মস্তকের ত্রন কহিয়াছিলি তাহাকে আনিয়াছি তোমার সাক্ষাতে তাহার মস্তক ছেদন করিয়া দিব । ইহা শুনিয়া রাজা যদিও কবুল করেন তবে তৎক্ষণাত্ আমার শরীর হইতে মস্তক পৃথক করিয়া দিবা । যদি মস্তক না লইয়া আর কোন কিছু চাহেন তাহা আমি আয়োজন করিয়া দিব ॥

*Do you, having bound my neck with a rope, take me personally into that King's presence, and say to him ; " The person about whose head you spoke, him I have brought unto you ; in your presence I will cut off his head. On hearing this, if the King should approve of it, that instant cut off my head from my body ;"—but if he, not having taken my head, should require any other thing whatsoever, that having made ready, I will give unto him.*

279. When the verb যাইতে is conjugated with the Conjunctive Past Participle, the compound verb has very much the same force as an English verb followed by the words *off*, or *away* ; as, লইয়া যাও *carry off*, in the foregoing passage, and in লইয়া গিয়া in the following one.

*Example.*

কিন্তু তুমি আমাকে রাজার নিকট লইয়া গিয়া আমার বিদ্যার পরিচয় দেও ।

*But do you, having carried me away into the King's presence, try my medical skill.*

280. The

been completely revised. The anomalous form of *ন* in the previous fount has been expanded, and the stroke weight in this typeface is more consistent, particularly with regard to the flared vertical strokes. The intercharacter spacing has been opened up, as have the counters of *ক*, *ব*, and similar sorts, thereby diminishing the condensed appearance of CW3. The thickness of the headline also appears to have been reduced, but this may be the result of lighter inking of the imprints inspected. Some of the inherent liveliness of Wilkins's first Bengali fount has returned to CW4, which can be described as a legible and elegant typeface.

Wilkins's ability as an engraver has been demonstrated in Halhed's *Grammar* by the reproduction of a hand-written petition.<sup>148</sup> Haughton's *Rudiments of Bengali Grammar* also dispels any doubts of Wilkins's putative skills as a letterer. Three of the four plates in the 1821 grammar were designed by Wilkins,<sup>149</sup> whose skill and knowledge of Bengali letterforms had undoubtedly increased since his first attempts at Bengali typography. These plates engraved by J. Swaine bear, for the most part, the style of lettering that Wilkins strove to imitate in metal, rather than the cursive lettering penned in documents of the eighteenth and nineteenth centuries.

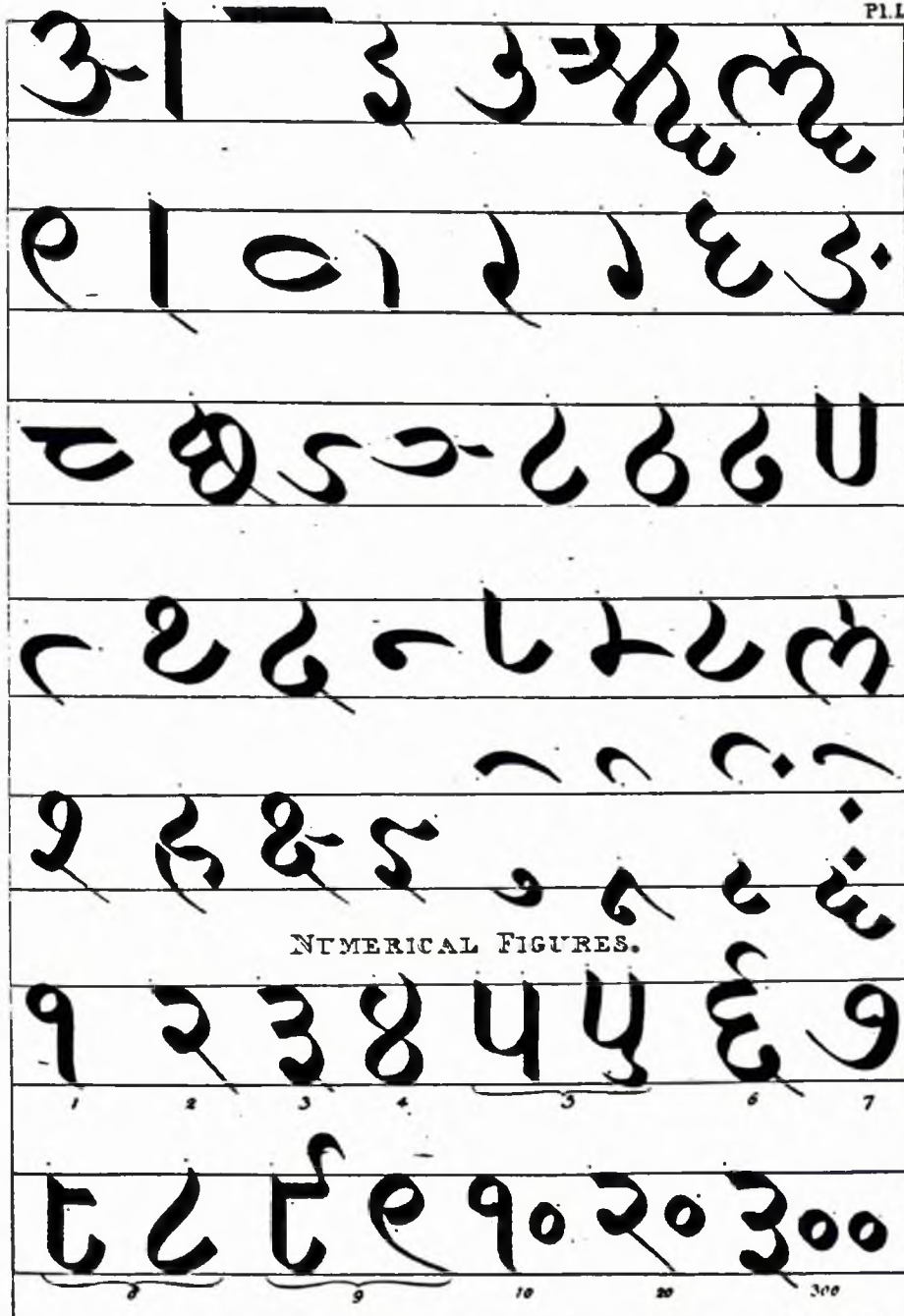
As already stated, the exact measure of Wilkins's involvement in the production of any of the Bengali founts ascribed to him is unknown. Despite the numerous laudatory remarks regarding Wilkins's typographic successes, scant information is available on the actual procedures he employed to manufacture the founts. It must be assumed that he was aided in his typographic activities, which by no

148. See above, pl. 23, see also pls. 33 and 34 of Devanagari characters; yet Wilkins maintained they were 'designed by a mere amateur in the art of writing'; Wilkins, *Grammar of the Sanskrit Language*, p. xiv.

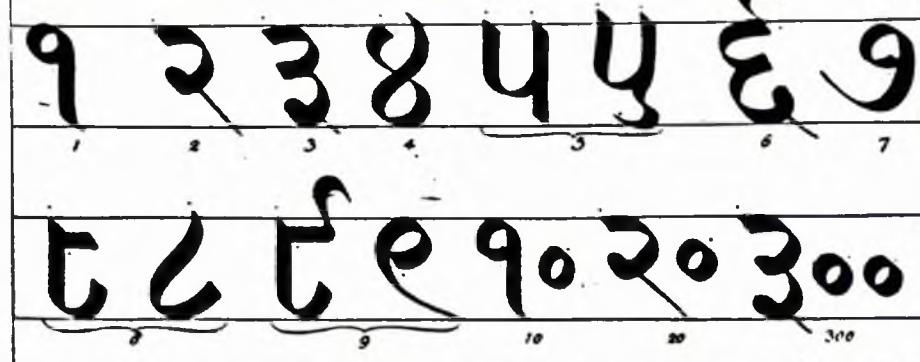
149. Presumably after Shepherd's death (see pl. 36), although the characters designed by J.H. Patton shows greater skill (see pl. 35). These plates were reproduced by Stephen Austin in Duncan Forbes's *Grammar of the Bengālī Language* (London, 1861).

THE ELEMENTS  
OF THE DEVANAGARI CHARACTER.

PL. I



NUMERICAL FIGURES.



© Wilkins L.L.D. 1884 from "The dots show the beginning." Engraved by J. Swain.

33. Engraving of 'The Elements of the Devanagari Character' drawn by Charles Wilkins; C. Wilkins, A Grammar of the Sanskrit Language (London, 1808)

## COMPOUND CONSONANTS

## Double Letters

Pl. 31

क्क क्क्व क्क्ख क्क्ख क्क्क क्क्क क्क्क क्क्क क्क्क क्क्क  
 k k kv k kh k k k k k k k k

क्फ क्न क्य क्क क्क क्क क्क क्क क्क क्क क्क क्क  
 kf kn ky kk kk kk kk kk kk kk kk

क्म क्व्य क्ख क्ख क्ख क्ख क्ख क्ख क्ख क्ख क्ख  
 km kvv kkh kkh kkh kkh kkh kkh kkh kkh

क्ग क्ग क्ग क्ग क्ग क्ग क्ग क्ग क्ग क्ग क्ग क्ग  
 kg kg kg kg kg kg kg kg kg kg kg

क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च  
 kc kc kc kc kc kc kc kc kc kc kc

क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च क्च  
 kc kc kc kc kc kc kc kc kc kc kc

क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ  
 kñ kñ kñ kñ kñ kñ kñ kñ kñ kñ kñ

क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ क्ञ  
 kñ kñ kñ kñ kñ kñ kñ kñ kñ kñ kñ

क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ क्ङ  
 kṅ kṅ kṅ kṅ kṅ kṅ kṅ kṅ kṅ kṅ kṅ

क्ण क्ण क्ण क्ण क्ण क्ण क्ण क्ण क्ण क्ण क्ण क्ण  
 kṇ kṇ kṇ kṇ kṇ kṇ kṇ kṇ kṇ kṇ kṇ

क्ल क्ल क्ल क्ल क्ल क्ल क्ल क्ल क्ल क्ल क्ल क्ल  
 kl kl kl kl kl kl kl kl kl kl kl

© Wilkins 1950 FMS Script

Engraved by G. S. Ghosh



THE BENGALI ALPHABET.

Vowels

Consonants.

Initials

Med & Fin

Pl 1

অ <sup>o</sup>	আ <sup>a</sup>	।	ক <sup>k</sup>	খ <sup>kh</sup>	গ <sup>g</sup>	ঘ <sup>gh</sup>	ঙ <sup>ng</sup>
ই <sup>i</sup>	ঈ <sup>ī</sup>	ি	ট <sup>ṭ</sup>	ঠ <sup>ṭh</sup>	ড <sup>ḍ</sup>	ধ <sup>ḍh</sup>	ণ <sup>ṇ</sup>
উ <sup>u</sup>	ঊ <sup>ū</sup>	ু	ত <sup>t</sup>	থ <sup>th</sup>	ড <sup>ḍ</sup>	ধ <sup>ḍh</sup>	ন <sup>n</sup>
ঋ <sup>ṛi</sup>	ঌ <sup>ṛī</sup>	ৃ	প <sup>p</sup>	ফ <sup>ph</sup>	ব <sup>b</sup>	ভ <sup>bh</sup>	ম <sup>m</sup>
এ <sup>e</sup>	ঐ <sup>ī</sup>	ে	য <sup>y</sup>	র <sup>r</sup>	ল <sup>l</sup>	ব <sup>v</sup>	।
ও <sup>o</sup>	ঔ <sup>ū</sup>	ৌ	শ <sup>ś</sup>	ষ <sup>ṣ</sup>	স <sup>s</sup>	হ <sup>h</sup>	॥
<i>Initial and Final Vowels with a Consonant.</i>							
অক	আকা	ইকি	ঈকী	উকু	ঊকু		
ঋক	ঌক	ঋক	ঌক	একে	ঐকে		
ওকো	ঔকো	॥	°	°	°	°	°
ক <sup>kū</sup>	খ <sup>khū</sup>	গ <sup>gū</sup>	ঘ <sup>ghū</sup>	ঙ <sup>ngū</sup>	ক <sup>kū</sup>	খ <sup>khū</sup>	সু <sup>sū</sup>

Without LL & PMS & P

১৯০৫

\* 1. Anusvara . 2. Visarga or silent 3. 4. Stroke of Gāndhā . 5. Chandra - bindu .

or nasal sign . 6. Isvara, or symbol of God



means detracts from his achievements.<sup>150</sup> Wilkins's types, unlike Caxton's, were not originally intended to supply the indigenous population with vernacular imprints. Halhed's *Grammar* was 'ফিরিঙ্গিনামুদ্রাকারার্থ':<sup>151</sup> Wilkins's brief being to design types for teaching foreigners to read Bengali - a language of which he had merely a rudimentary knowledge. Subsequent imprints in the Bengali script bear witness to the importance of *A Grammar of the Bengal Language* in terms of Bengali typefounding history; the forms assumed by the Bengali phonemes in this imprint determined the shapes of successive fonts and created the basis for the evolution of the printed Bengali character.

150. e.g. He was the first European to translate the *Bhagavadgīta*; he was a pioneer in Indian epigraphy. In recognition of his literary achievements, he was elected FRS in 1788. He was also created DCL Oxon in 1805, awarded the 'princeps litteraturae Sanscritae' medal by the Royal Society of Literature in 1825, knighted in 1833, and he was also an associate of the Institute of France; *Dictionary of National Biography*, LXI, ed. Sidney Lee (London, 1900), p. 260 [entry compiled by Cecil Bendall].

151. Meaning, 'for the benefit of the foreigner'; Halhed, *Grammar*, title page.

## Chapter 2

### The Chronicle Press

In the context of Bengali typefounding history, the importance of the types initially designed for Halhed's *Grammar* is incontrovertible. These Bengali letterforms successfully cast in metal for the first time even adumbrate the Bengali character shapes emerging from typefoundries a full century later. Due to a variety of factors, little recourse was made to current Bengali chirography in the production of Bengali typefaces subsequent to CW1: their mainly European designers preferred to imitate Wilkins's first fount with regard to its design as well as its composition. The imprints of the Chronicle Press in Calcutta were the first to demonstrate the legacy of Wilkins's initial typographic venture in the Bengali script.

Prior to setting up the Chronicle Press (1786-1797) for the publication of the *Calcutta Chronicle*, Daniel Stuart and Joseph Cooper were employed for a short time at the Honourable Company's Press<sup>1</sup> in printing the *Calcutta Gazette*. Their departure resulted in the establishment of their own letterfoundry where they proceeded to cast types, including Bengali,<sup>2</sup> for their own use as well as apparently supplying other printers.<sup>3</sup> The earliest known extant imprint featuring their Bengali fount (to be termed CP1) was not published until 1793;<sup>4</sup> several years after Stuart's return to England,<sup>5</sup> and about one year after Cooper had been forced to relinquish his share of the *Calcutta Chronicle*, the foundry, and types.<sup>6</sup> Advertisements regarding its publication, however, had appeared in the

1. Until January 1786.

2. *Calcutta Chronicle*, 12 Apr 1787 (II, 64, 2).

3. See below, pp. 95 and 101.

4. Advertisements employing the Bengali types had appeared in the *Calcutta Chronicle* prior to this, e.g. 26 Apr 1787 (II, 61, 4), and 1 Jan 1789 (III, 154, 4).

5. In 1788/89 following the dissolution of their partnership in October 1788; *Calcutta Chronicle*, 27 Nov 1788 (III, 149, 3).

6. *The World*, Saturday 7 July 1792. Here Cooper also advertised that he had established another foundry and had begun casting Bengali types of a smaller size than CP1.

*Calcutta Chronicle* some five years earlier.<sup>7</sup> The precise authorship of this imprint, *Ingrājī o Bāngālī Vokebilāri*,<sup>8</sup> is unknown, but it may be attributable to Anthony de Souza in preference to Aaron Upjohn, the one time co-printer of the *Calcutta Chronicle*.<sup>9</sup>

The Bengali types with which the *Vocabulary* was set are remarkably similar to CW1, particularly in comparison to the contemporary Bengali cursive script. The letterforms of CP1 appear to have been modelled on the earlier fount which possesses the same relative proportions of character height to character width and counter size. None of the character shapes have been altered radically, although there are indeed variations. The height of ঞ, for instance, has been reduced so as to align it with other characters bearing no headline.<sup>10</sup> ঞ has generally been improved, for the angle of its lower counter is more in keeping with the diagonal stress of the typeface. ঞ still collects a great deal of colour and has a less graceful finial, whilst ঞ does not gain at all from the opening out of its counter. On the other hand, ঞ, a character with which the designer of CW1 evidently had difficulty,<sup>11</sup> receives an altogether new approach: its terminal stroke behaves rather like an Arabic descender.<sup>12</sup> The limitation of the vowel signs to merely one form in the case of ৗ and ৙ reveals either an oversight on the part of the Chronicle Press regarding the typesetting requirements for Bengali, or a desire to reduce the number of sorts in the fount.

7. *Calcutta Chronicle*, 24 Apr 1788 (III, 118, 2), and 1 Jan 1789 (III, 154, 4). It was advertised as 'just published' in the *Calcutta Chronicle* on 16 Apr 1793, (VIII, 378, 3).

8. *Ingrājī o Bāngālī Vokebilāri, An Extensive Vocabulary, Bengalese and English* (Calcutta, 1793). See pls. 37 and 38.

9. See Shaw, *Printing in Calcutta*, pp. 158-9. There is also some doubt as to who was the printer of this work; see Shaw, *ibid.*, p. 159.

10. Compare pls. 16 and 38.

11. See chapter 1.

12. e.g. ঞ.

ক

**T**HIS letter has the sound of *k*, in King.

---

কণাব	—	roast meat
কবাব কবাসিক	—	a spit
কাবিবাজি কবিত্তে		to omit, to forbear
বাবু	—	power, sway
বাবু কবিত্তে		to use power
বাবু তে আছে		it is in my power
বাবু নহে		it is not in my power
বাবু তে পড়িয়াছে		he fell into my hands
কাটা কাটি		a mutual cutting
কাটামটি		any thing cut in small pieces

B.

	চ	
চেলিয়া ফেলিতে		to kick down
চেমবাই কবিত্তে		to refuse, to deny
চৈঙ্গ		a foot
চৈঙ্গা		a stick, staff
চেস পাতিতে	to pick a quarrel with one	
চেসচোসলাগিত্তে	to touch one another	
চিক	a sum, it, exact, right	
চিক দিত্তে	to sum up,	
চিক কৰিয়া ঙ্গিত্তে	to adjust, to settle an	
চিক্যা	an hireling [account	
চিস্বামারিত্তে	to ridicule, to mock	
চহইতে	to be convinced	
চক ২ কৰিত্তে	to beat, to knock	
চক কৰিয়া ঙ্গিত্তে	to rebound	
চগমানুষ	a traitor	
চগাইতে	to deceive	
চগামো কৰিত্তে	to betray, to accuse	
চগিত্তে	to cheat	
চনচন	the ringing of bells	

Deviations in the design of CP1 from CW1 can be regarded neither as innovatory nor, on the whole, as beneficial. The most dramatic and pervasive deviation of CP1 from its precursor is the alteration in weight distribution. The thick downstrokes, which characterize CW1 and lend it a calligraphic quality, have not been emulated by the Chronicle Press. The reasons underlying the adoption of a more monolinear approach to the script are not clear and may not have been strictly intentional. The punchcutter may simply have been less adept at the task, or had poor artwork<sup>13</sup> upon which to model the typeforms. Nevertheless a comparison of plates 20 and 37 reveals that a shift in the distribution of weight necessarily alters the stress and colour of the typeface.

The question remains as to why the Chronicle Press and manufacturers of subsequent Bengali founts chose to imitate existing designs rather than initiate their own. Stuart and Cooper during their time at the Honourable Company's Press would have become acquainted not only with the character shapes of CW1 but also with the method for its composition; the method that was fundamental to the successful employment of such a relatively small fount of types<sup>14</sup> to generate all the requisite Bengali letterforms. Hence the founders of the Chronicle Press would have been aware of the main feature of Wilkins's composing technique: that of using subscribed consonants, *phalās*, to create conjuncts. Furthermore, any complexities, such as the 'floating' of the subscript vowel signs, the *repha*, the *raphalā*, and the *candrabindu*, in conjunction with the interlinear spacing<sup>15</sup> this demanded, had already been resolved successfully by Wilkins.

Wilkins's first Bengali fount could therefore be imitated in steel with greater facility than the running hand of the Bengali scrivener, which was not readily

13. Which may have been proofs of CW1.

14. c. 170 sorts; see above, chapter 1.

15. i.e. leading; see below, chapter 8.



comprehensible to non-native speakers like Stuart and Cooper. Moreover, CW1 had by this time gained acceptability both for composing grammars and printing documents, perhaps due to the lack of a suitable alternative.<sup>16</sup> Since its design was credited to Charles Wilkins, who was fast becoming an eminent orientalist, it seems inevitable that CW1 should have become the prototype Bengali fount to be copied by other European typefounders in India.<sup>17</sup> It has been suggested that Pancanana was employed in casting the types for the Chronicle Press.<sup>18</sup> If this was the case, he too, presumably, would have advocated employing the same methods for casting and setting Bengali as he had known whilst working for Wilkins, which prescribed a similar character set to that cast for Halhed's *Grammar*.

A typeface which has been described as an imitation of CW3<sup>19</sup> is that allegedly designed by John Miller for *The Tutor*<sup>20</sup> and subsequently employed to print Forster's *Vocabulary*<sup>21</sup> at the press of Ferris and Co. of Calcutta. Close examination of this typeface reveals it to be identical to that produced by the Chronicle Press. Any apparent discrepancies in style from CP1 are, in fact, peculiar to the imprints themselves, rather than to the actual fount, and are probably attributable to differences in the quality of printing, paper, or casting. There is no evidence that Cooper supplied other printers with this fount of Bengali types, or other foundries with the matrices, but it would not have been

16. See Halhed, *Grammar*, p. xxiii.

17. The pattern of imitation rather than innovation is repeated throughout the history of Latin and non-Latin types; see below, chapters 6, 9 and 10.

18. By Khan (*Printing in Bengali Characters*, I, p. 365), but he gives no evidence to support his claim. Pancanana was unlikely to have influenced the design, see above, chapter 1 and below, chapter 3.

19. Khan, *Ibid.*, p. 377.

20. John Miller, *The Tutor, or a New English and Bengali Work, Well Adapted to Teach the Natives English* (Calcutta, 1797); see pls. 39-41.

21. Henry Pitts Forster, *A Vocabulary in Two Parts, English and Bungalee, and Vice Versa* (Calcutta, Pt I 1799, Pt II 1802); see pls. 42 and 43.

THE  
**TUTOR,**  
 OR A  
*New English & Bengalee Work,*  
 WELL ADAPTED TO TEACH  
 THE NATIVES ENGLISH.

IN THREE PARTS.



দিক্কা ওঁক

ক্কা এক নৈতন ইংৰাজি আৰ বাঙলাৰহি  
 ভালো ওপহুস্ত আছে বাঙালি দিগেৰকে ইংৰাজি  
 দিক্কাৰাইতে তিনখণ্ডে

COMPILED, TRANSLATED, AND PRINTED,

By JOHN MILLER.

1797.

## অক্ষর

## উচ্চারণ

শ্রেণী	আক্ষর	বাঁকা	উচ্চারণ
A	a	A a	এ
B	b	B b	বি
C	c	C c	ছি*
D	d	D d	ডি
E	e	E e	ই
F	f	F f	ফে*
G	g	G g	জি*
H	h	H h	ইচ
I	i	I i	আই
J	j	J j	জে
K	k	K k	কে
L	l	L l	এল
M	m	M m	এম
N	n	N n	এন
O	o	O o	ও
P	p	P p	পি
Q	q	Q q	কিউ
R	r	R r	আর
S	s	S s	এস
T	t	T t	টি
U	u	U u	ইউ
V	v	V v	ভী
W	w	W w	ডবলইউ
X	x	X x	এক্স*
Y	y	Y y	ওয়াই
Z	z	Z z	যেডু*

উচ্চারণ	
α	জি-টি
fi	এফ-আই
fi	এফ-আই
th	এন-এইচ
f	এফ-এল
n	এন-এল
ff	ডবল-এফ
f	ডবল-এন
ft	এন-টি
ff	ডবল-এফআই
ff	ডবল-এফআই
ff	ডবল-এফএল
fk	এফ-কে
fb	এফ-বি
æ	এই æ ওই
&c.	ওগ্যবহ

শব্দ বন্ধ	
a	এ e ই i আই
o	ও u ইউ y ওয়াই

ব্যবধান	
,	কমা
:	দ্বিমিকোলন
:	কোলন
.	পিরিঅন্ট
!	ইন্টারগেশন

### বাংলাদিগেরকে

আমি এই অবিধি বুকিয়াছি বিষয়ের সহিত। জেকো  
নো কেতাব না আদ্যাবধি পুকাশ পাইয়াছে সিখাইতে  
তোমাদিগেরকে ইঙ্গবাতি কথা সহজে আর অনাগা  
সে। তাহাতেলওয়েছে আমারে সাংগুহ করিয়া তবজ  
মাকৰিতে এই কেতাব। এইওমেদকৰে জেএ তোমা  
দিগের সাহসের দ্বাৰায় মঞ্জুর হয়।

আমার মনস্থাজিলো "সপৰোবি কৰিতে এই কেতাব  
সমস্ত ততে। কিন্তু আমি এক্ষেত্রে দেখিলাম জে অতি অ  
ল্পলোক আছে জে আমার এবিশয়বন্ধে। অতএব আ  
মি বিবচনাকরিয়া এ তরজমাকরিয়াছি চলতি কথার  
দ্বাৰায়।

মনু ৪। পৰোপৰিচিৎগনু ৪ মন্যথা য় ৪ পুকাশযেৎ।  
স্ব য়শোর্থ° নব ৪ সৌহি রৌব° নরক° বুজেত

অন্যের কৃতগনু কেহোজদি গনুকাৰেব জেমত ধাৰা  
জেজেঅভিমত তাহা অন্য পুকাৰকৰিয়া আপনখোম না  
মেরজন্যে কিমানভেরজন্যে করে সে রৌব নামে নর  
কে জায় ইতি মনু লিখেন

ব্যাস ৪। পৰনিষিত শাস্ত্রাদীন সু নান্না সু সখায় বা।  
যোন্যথা কুকতেমুত ৪ সবিষ্ণ্যা° কৃমি ভবেত।

অন্যেকেহোকৰিয়াথাকে এমন শাস্ত্রাদি জেকিছু জদি

## A

## V O C A B U L A R Y,

## English and Bungalowee.

## A B A

**A**, or **An**, is sometimes expressed by এক *ék*, one, or is implied in the word itself thus, এক জন *ék jon*, or জন *jon*, a person, এক *ék*, may either precede or follow the noun, as above, or জনেক *jonék* (some one) কেহ *kéhu*. (কেও *keo* (proportion) so much a year প্রতি বৎসর এক *protibotlor éto* বৎসরে এক *botloré éto* বৎসর) এক *botlor éto*.

**Abate**, পাজা *pachha*.

**Abandon**, i (to) ত্যাগ-ক *tyag-k*. ত্যজন *tyajon* বর্জন *borjon* মচুন *moouchon* ছাড়ন *chharon* (of) পলায়ন *polayon* বিমুখ-হ *bimook h-b*. বিবর্ত-হ *birot-b*.

**Abandoned**, (as a place) উজ্জ্বল *ooj-j* ওজর *oojor* আচোট *achot* শূন্য *shoonyo* পতিত *potit* পড়া *para* (vicious) পাপী *papee* নিতান্তপাপী *nitanto papee*.

**Abate**, (to) খাট-ক *khatok*. হ্রাস-ক *hrasok*. লঘু-ক *loghok*. অবিঃ পাতন *aboh paton*.

## A B L

**Abash**, (to) লজ্জা-দে *lojja-de* ব্রূপান্বিত-ক *tropanit-k*. লজ্জিত-ক *lojjit-k*. লজ্জান *lojjano*.

**Abate**, (to) *v. a.* ঘাটান *ghatano* কমান *komano* ছাটন *chharon* আশা-ক *ashra k*. সুলভ-ক *shoolobho-k*. *v. n.* ঘাটন *ghaton* কমন *komon* (as a disorder) ছুটন *sooton* উপশম-হ *ooposhom-h*. বিশেষ-হ *bishésh-h*. হ্রাস-হ *hras-h*.

**Abatement**, ঘাইট *gha-it* কম *kom* কমী *komee* উপশম *ooposhom* বিশেষ *bishésh* হ্রাস *hrash*.

**Abbreviation**, সংক্ষেপ *songkhyep*.

**Abhor**, (to) নিতান্ত মন্দ বাসন *nitanto mendo bashon* কদাচিত ভালনা বাসন *kodachit bhalo nabashon* ঘৃণা-ক *ghrinak*.

**Ability**, সাধি *hadhyo* শক্তি *shokti* ক্ষমতা *khyamota* সামর্থ্য *shamorthyo* পুত্ত *probhoto* বল *bol* (capacity) বুদ্ধি *bood-dhi* বোধ *bodh* জ্ঞান *gee-au*.

**Able**, পারক *parok*. নিপুন *nipoon* পাঠ *paton* তৎপর *totpor* শক্তি *shokto* সমর্থ *shomorth* (fit) উপযুক্ত *oopojokto*

## B

জাগাইয়া বিজালে মেসকল আখ্যান  
 Jaga-ya bichhale she shokolo akhyan,  
 কহিল ভুল্ল কবৰ জাগাইয়া জান ।  
 Kohilo bhoolook boro jenma-ya gee-an,  
 এখন জাগহ তুমি আমি নিদ্রা যাই ।  
 Ekho no jagoho toome ami nidra ja-i,  
 শাদুল বাকেতে কতু নাভুলিহ ভাই  
 Shardool bakete kobhoo nabhooliha bha-i,  
 এ তেক কহিয়া স্বক্ষমনে বিবেচিয়া ।  
 Etek kohiya rikhyo mone bibechiya,  
 নিদ্রাগোন বক্ষতালে সূন্য বিদ্বিয়া  
 Nidra gelo brikhyo dale shonakho bindhya,  
 পুনৰপি সেইস্থানে শাদুল আশিয়া ।  
 Poonoropi she-isthane shardoolo ashia,  
 পূৰ্বমতে কহিলেক বিজালে চাহিয়া  
 Poorbo mote kohilek bichhale chahiya,  
 ভূপতি তনয় তাৰ বচনে ভুলিল ।  
 Bhoopati tonoyo taro bochone bhoolilo,  
 ফেলিতে ভুল্ল কেচেলা বলেতে মাৰিল  
 Phelite bhoolookke ibela bolete marilo,  
 স্বক্ষনাপতিল বিহুজিল ন্যতালে ।  
 Rikhyo naporilo biddho chhilo nokh dale,  
 সসেমিৰা বলিচত মাৰিলেক গালে ।  
 Shoshemira boli chor marilek gale,  
 ক্ষিপ্ত হইল নৃপাঙ্গক চপেটাঘাতেতে ।  
 Kipto hoilo nripanggojo chopeta ghatete,  
 নাবাইয়া দিল স্বক্ষ বজনীপুতাতে ।  
 Naba-ya dilo rikhyo rajonee probhate,  
 নগৰমুখেতে ক্ষুপা বালক চলিল ।  
 Nagero mookhete khyopa balok cholilo,  
 সসেমিৰা শব্দমাশ্রু বলিতে লাগিল ।  
 Shosemira shobdo matro bolite lagilo,  
 অনূচৰ সৈন্যস্থানে শুনিয়ানুপতি ।  
 Onoo choro shynyo sthane shoonya nripoti.

অনাগত তনয়ার্থে হেয়াশ্রুমতি  
 Onagoto tonoyartho hei-ya trostamoti,  
 যুজীতে তাহাৰেলোক কৰিলপেৰন  
 Khojete tahare lok korilo preran,  
 চলিলসকলে তথা যথাসেইবন ।  
 Cholilo shokole tatha jotha she-ibon.  
 কঁতদৰে পাইয়া বালকে হতজান ।  
 Koto doore paiya baloke hato geean,  
 সসেমিৰা শব্দবই অন্যনাহিব্যান ।  
 Shoshe mira shobdo bo-i onyo nahi dhyan,  
 অনিল ভূপাল আগে কৰিয়া যতন ।  
 Anilo bhoopal age koriya jatan.  
 দেখিৰাজা হেলহৰ্ষ বিসাদিতমন ।  
 Dekhi raja heilo horsho bisha dito mon,  
 ঘোষণাদানেতে জানাইলসবা কাৰে ।  
 Ghoshona danete jana-ilo shoba kare,  
 বালকেৰে যোভাল কৰিবাৰেপাৰে ।  
 Balokere jeba bhalo koribare pare.  
 নানাবিনবন্ধে তাৰে তোষিব বিস্তৰ ।  
 Nana dhano rotne tare toshibo bistor,  
 যোপাৰহ ৰাজাপুৰে আসিবে সত্বৰ ।  
 Jeparaho raj poore ashibe shotor,  
 ভানুমতীপুৰুষ তিলেৰ বিবৰন ।  
 Bhanoo motee ooroostho tiler bibaron,  
 জানিপদ চ্যুতচক্ষুৰূপ যেইজন ।  
 Jani poda chyootochhodon roop-je-ijen,  
 ৰাজেন্দু বিক্রমাদিত্য সভাৰতনয় ।  
 Rajendro Bikramadityo shobha ratnonoy,  
 মৰ্য্যেয়স্য নামকবি বৰঝাটকয় ।  
 Madhye jeshyo nam kabi boro roochikoy,  
 মতভেদে কহেলোকে তাম নামেই ।  
 Moto bhede koheloke tam nam-e-i.

unusual for a typesetter to do so, particularly for one such as Cooper who was experiencing financial difficulties.

The activities of the Chronicle Press contributed to the establishment of CW1 as the blueprint for future Bengali typesetting enterprises, which continued to remain in the hands of Europeans for a considerable period of time.<sup>22</sup> Through its imprints, CW1 was confirmed as the prototype Bengali font, creating a precedent to be emulated, remodelled, rescaled, and otherwise improved upon without the cumbersome necessity of deciphering indigenous manuscripts. The standard of typography set by Wilkins, which in effect found European solutions to the typographic problems posed by Indian writing systems,<sup>23</sup> became the norm and remained essentially unchallenged until the twentieth century.

22. See below, chapter 7.

23. This is discussed in greater detail in chapters 7 and 8.

## Chapter 3

### Missionaries in Bengal

#### 3.i. The Serampore Mission Press.

The largest contribution to the development of Bengali vernacular typography during the nineteenth century was made, albeit unintentionally, by the missionary bodies who were active in India during this period. In biographies and histories relating their typographic achievements, William Carey has consistently received undue prominence. Paradoxically, however, there is some justification for Carey to appropriate Charles Wilkins's epithet of 'India's Caxton',<sup>1</sup> for the following statement concerning William Caxton is equally descriptive of the missionary:

But with him printing was not the sole aim; and this explains in part why his printing was not so remarkable as his reputation might lead us to expect. He was a great Englishman, and among his many activities, was a printer. But he was not, from a technical point of view, a great printer.<sup>2</sup>

According to Steinberg, 'Caxton's real importance lies in the fact that among the 90-odd books printed by him, 74 were books in English.<sup>3</sup> Some 20 of them were in the publisher's own translations which, together with the prologues and epilogues which he contributed to his other publications, secure Caxton a lasting place in the history of English prose writing'.<sup>4</sup> Similarly, William Carey's persistent efforts<sup>5</sup> to see the Scriptures, religious tracts, and other prose works composed in the Indian vernacular languages and printed in their own characters

1. See above, chapter 1, p. 31.

2. Daniel Berkeley Updike, *Printing Types, Their History Forms and Use*, 2nd edn (London, 1937), I, p. 113.

3. Rather than Latin.

4. S.H. Steinberg, *Five Hundred Years of Printing*, new edn (London, 1959), p. 74.

5. Supported by equally zealous colleagues and assistants.



for the ultimate purpose of 'the Conversion of the Heathen'<sup>6</sup> to Christianity, form a significant landmark in the history of Indian printing and literature. Numerous Indian languages and scripts previously neglected by the Honourable Company's Press and other presses attained printed form for the first time at the hands of the missionaries. During the years 1800 to 1838 the Serampore Mission Press unwittingly determined the standard of typography for many Indian scripts which was to last for a considerable period of time.<sup>7</sup>

Under the auspices of the Particular Baptist Society for Propagating the Gospel Among the Heathen, William Carey (1761-1834), cobbler, schoolteacher, preacher, and author of the now-called 'Charter of Modern Missions',<sup>8</sup> sailed for India on 12 June 1793 in the company of John Thomas (1757-1801)<sup>9</sup> and their respective families. It was during the voyage of some five months that Carey began to learn Bengali from Thomas who by his own account could 'converse freely'<sup>10</sup> in that language. Thomas's work of rendering 'Matthew, Mark, James, some part of Genesis, and the Psalms, with different parts of the prophecies, in Bengali manuscript'<sup>11</sup> inspired Carey to continue with the translation of the Bible into Bengali and other languages of the Indian subcontinent. The first *Memoir Relative to the Translations of the Sacred Scriptures* records:

6. William Carey, *An Enquiry into the Obligations of Christians, to Use Means for the Conversion of the Heathens in which the Religious State of the Different Nations of the World, the Success of Former Undertakings, and the Practicability of Further Undertakings, are Considered* (Leicester, 1792), p. 14.

7. Until the advent of mechanical typesetting in the mid-twentieth century.

8. Properly entitled as n. 6.

9. An ex-East India Company surgeon; see C.B. Lewis, *The Life of John Thomas* (London, 1873).

10. *Periodical Accounts Relative to the Baptist Missionary Society* (Clipstone, 1800 [1792]), I, no. I, p. 31.

11. *Ibid.*, p. 21. Later re-worked by Carey, although imperfectly.

Justice to the memory of our deceased brother, Mr *John Thomas*, requires us to mention, that the idea originated with him; and that, though more particularly calculated for other parts of Missionary labours, he had actually translated Matthew and James before Mr Carey's arrival.<sup>12</sup>

Since the prime objective of the Baptist Missionaries amounted to the Christianization of India, the means of realizing this vocation necessarily comprised the learning of the vernacular languages and the printing of the Scriptures in their characters. To this end, Carey employed Rāma Rāma Vasu as his tutor upon arrival in India:<sup>13</sup> the *munṣī* who had worked with Thomas on the translations and had composed the Bengal hymn sent to the Baptist Missionary Society by Thomas in 1793.<sup>14</sup> Rāma Rāma Vasu worked with William Carey until 1796, when he was discharged for adultery.<sup>15</sup> He was later re-employed at the College of Fort William by Carey, but he left shortly after this appointment.

The hostile attitude of the East India Company towards missionaries, and the necessity for discovering a means of self-support along the lines of the Moravian missionaries,<sup>16</sup> prevented the two families from remaining in Calcutta. Eventually, in 1794, Thomas and Carey accepted posts offered to them by George Udny of superintending indigo factories in the Malda district. The seasonal nature of indigo farming allowed the Brothers time for their missionary activities and studies. Alongside preaching, work continued on the translation of the Scriptures into Bengali, and investigations were made into the practicalities

12. *Memoir Relative to the Translations of the Sacred Scriptures* (Dunstable, 1808), p. 5, n. 1.

13. 'Brother Carey pays Moonshi twenty rupees per month, which takes almost half his income'; *Periodical Accounts*, I, no. 1, p. 79.

14. *Periodical Accounts*, *ibid.*, pp. 82-83.

15. Carey to Pearce, Madnabati, 19 Nov 1796; *Periodical Accounts*, IV, no. 1, p. 325, and Carey to Mr N--, London, Madnabati, 16 December 1796; *Periodical Accounts*, *ibid.*, p. 342. According to Potts, he was dismissed for procuring an abortion; E. Daniel Potts, *British Baptist Missionaries in India, 1793-1837* (Cambridge, 1967), p. 82, n. 1.

16. Which gave rise to dissent from the London Baptist Society.

of reproducing the work in print. In 1793 Thomas had written: 'I should be very happy to see a Bengal bible in any degree of forwardness before I die, and have been talking with a printer to-day (in whose hands are the Bengal types which are used here) on the expence [*sic*] of such a work'.<sup>17</sup> The cost of printing with existing types was later estimated as some ten times greater than what it would have been in England.<sup>18</sup> In 1795, however, Carey felt that the cost was justified:

This will, however, be much more than compensated by the reflection, that we have put into the hands of many heathens a treasure greater than that of diamonds, and, by multiplying copies, made a probability of those scriptures being preserved in the Bengal tongue.<sup>19</sup>

A letter from William Carey to Andrew Fuller,<sup>20</sup> dated 16 November 1796, shows a reversal of this decision in favour of having the punches cut and the types cast in England by Caslon at a total cost of £500.<sup>21</sup> Carey felt that 600 characters would be required:

Mr T. has had letters written near two years for types, by a native, a very good writer; but they require examining, which are proper for types to be cast to. He has not done that in all this time, and is so backward, I fear he never will. He talks of making all the letters himself, but I fear it will never be done. I will try to get those written by the native, and send them, if he will part with them.<sup>22</sup>

Another entry in Carey's journal indicates his appreciation of the skill and difficulty involved in preparing specimen letters for typefounding,<sup>23</sup> realizing that 'It is a considerable work, and requires much care and attention'.<sup>24</sup>

17. *Periodical Accounts*, I, no. I, p. 79.

18. Carey to the Society for Spreading the Gospel Among the Heathen, Madnabati, 13 Aug 1795; Eustace Carey, *Memoir of William Carey, D.D.* (London, 1836), p. 239. Graham Shaw considers this rather excessive; *Printing in Calcutta to 1800*, p. 24.

19. Carey to the Society, Madnabati 13 Aug 1795; E. Carey, *Memoir of William Carey*, p. 239.

20. Secretary to the BMS.

21. Carey to Fuller, Madnabati 16 Nov 1796; E. Carey, *Memoir of William Carey*, p. 277.

22. E. Carey, *ibid.*

23. See above, chapter 1 regarding the process of typefounding.

24. E. Carey, *Memoir of William Carey*, p. 227.

The establishment of a letterfoundry in Calcutta at the beginning of 1798<sup>25</sup> appeared to dispense with the need of sending to England for types. It has been suggested<sup>26</sup> that the foundry must have been that set up by Charles Wilkins, at which Pañcānana Karmakāra worked as typefounder.<sup>27</sup> However, Wilkins left India in 1786, whereas the letterfoundry mentioned by Carey was clearly established more than one decade later; besides, there is no doubt that the first Bengali fount employed by the Baptist Missionaries was cast by Pancanana who had worked for the Honourable Company's Press. In April 1799 Carey wrote to Ryland:<sup>28</sup>

I have succeeded in procuring a sum of money sufficient to get types cast. I have found out a man who can cast them, the person who casts for the Company's press; and I have engaged a printer at Calcutta to superintend the casting. The work is now begun, and I hope may be compleated [*sic*] in less than six months, by which time the copy will be in forwardness to begin upon.<sup>29</sup>

That same year George Udny felt compelled to close his indigo works owing to the heavy floods which prohibited the already unprofitable indigo factories from recouping any losses. Thomas had left Udny's employ and 'his relation even to the Mission became vague'.<sup>30</sup> Rāma Rāma Vasu had previously been dismissed, taking the schoolteacher 'Mohun Chund' with him, thus leaving William Carey and John Fountain to continue with the translation work.<sup>31</sup> Despite Fountain's complete unpreparedness for life in Madnabati upon his

25. Carey to Fuller, Madnabati, 1 Jan 1798; E. Carey, *Memoir of William Carey*, pp. 318 and 327.

26. By M. Siddiq Khan, 'William Carey and the Serampore Books, (1800-1834)', *Libri* (1961) II, no 3, p. 216; and by Dinesh Chandra Sen, *History of Bengali Language and Literature* (Calcutta, 1911), p. 851.

27. See above, chapter 1; see also Shaw, *Printing in Calcutta*, p. 33.

28. Dr John Ryland, President of the Bristol Academy and founder member of the Baptist Missionary Society.

29. Carey to Ryland, 1 Apr 1799, *Periodical Accounts*, II, no. VII (Clipstone, 1801), p. 24.

30. Pearce Carey, *William Carey*, p. 180.

31. Carey to Sutcliffe, Madnabati 22 Nov 1796; E. Carey, *Memoir of William Carey*, pp. 282-3. Carey obtained further native assistance which increased; E. Carey, *ibid.*, p. 308.

arrival in November 1796, his capacity for quickly picking up the Bengali language enabled them to prepare the Bengali New Testament for printing.

George Udny also proved to be an invaluable friend who strongly supported the idea of setting up a printing press at Madnabati. In 1795 Carey had requested the Society to send out a press; however, in 1797 he informed Fuller of their intention to construct their own press: 'Mr Powell . . . is now going to undertake the making of our printing-press'.<sup>32</sup> Powell began work on the press,<sup>33</sup> but apparently did not complete it because Carey acquired a wooden printing press for the sum of 400 rupees through a newspaper advertisement.<sup>34</sup> Udny made a gift of it to the Mission. The press arrived by boat at Madnabati in September 1798, but it never saw professional use, since the Missionaries still lacked Bengali types and an experienced printer.

The closure of the Madnabati indigo works forced the Brothers to move with their printing press to the Khidipur indigo station purchased by Carey. Their stay there was brief, for in January 1800 the pair moved again; this time to the Danish territory of Serampore to join the eagerly awaited new missionaries who had been refused residence in Malda by the East India Company. Among their number were John Marshman and William Ward,<sup>35</sup> the latter being 'the serious printer' whom Carey had requested Fuller to send.<sup>36</sup> A month later Carey was to reflect, 'the setting up the press would have been useless at Mudnabatty [*sic*], without Bro. Ward, and perhaps might have been ruined, if it had been attempted'.<sup>37</sup>

32. BMS Records (IN/13): Carey to Fuller, Madnabati 22 June 1797 (entry of 9 Jan 1798).

33. BMS Records (IN/13): Carey to John Sutcliffe, 16 Jan 1798.

34. BMS Records (IN/13): Carey to Baptist Society, Hoogly River, 10 Jan 1799.

35. Also Brunsdon and Grant who, like Fountain, died a few years later, leaving the Trio.

36. Carey to Fuller, Madnabati 16 Nov 1796; E. Carey, *Memoir of William Carey*, p. 277.

37. BMS Records (IN/13): Carey to Fuller, Serampore 5 Feb 1800.

Shortly after Carey's arrival with the wooden printing press<sup>38</sup> a printing office was established under William Ward's superintendence and with the assistance of Daniel Brunsdon and Felix Carey.<sup>39</sup> An entry in Ward's *MSS Journal* on 5 March 1800 related, 'This day I have been composing in the office; our first job was a card for ourselves & the next a bill of Mr Dexters'. Ward recorded that Carey took an impression of the first page of Matthew in Bengali types (*Mātiugra Racita*) on 18 March, and that on 16 May 1800 they were in the process of printing 500 copies of 'Matthew to give away immediately'.<sup>40</sup> The printing of the whole of the New Testament, the *Dharma Pustaka; Maṅgala Samācāra*, was finished on 7 February 1801 and bound five days later.<sup>41</sup>

It has not been possible to view the *Maṅgala Samācāra; Mātiugra Racita*, but it can be inferred from Ward's *Journal* and the chronology of events at Serampore that the same fount of types was used to compose<sup>42</sup> the first Gospel of the New Testament as the whole of this work.<sup>43</sup> This fount comprised the Bengali types cast in Calcutta for William Carey by Pañcānana Karmakāra.<sup>44</sup> Copies of the first edition of the <sup>complete</sup> *Maṅgala Samācāra*, published in 1801 by the Serampore Mission, are held at SOAS and the British Library, thereby enabling an assessment of the typeface to be made.

38. The Mission later acquired four more modern English-made printing presses.

39. The latter being William Carey's eldest son.

40. BMS Records (IN/18): 'William Ward. His own copies of his journal sent to Fuller, 26.1.1800 - 10.8.1800': 18 Mar 1800 and 16 May 1800. Additional copies of Matthew bound with some Old Testament prophecies were printed in August that year.

41. BMS Records (IN/16): Ward to Fuller, 2 Apr 1801.

42. And that native Bengali compositors assisted Ward in its composition.

43. And a number of other works, e.g. Rāma Rāma Vasu's *Rāja Pratāpāditya Caritra* (Serampore, 1801), the 'first prose book' (Siddiq Khan, *William Carey*, p. 234); see pl. 44.

44. Supplemented by a few 'Pholas' cast at Serampore; Leighton and Mornay William, eds., *Serampore Letters ... 1800-1816* (New York; London, 1892), p. 46.

# ধর্ম প্রস্তাব

তাহা ঈশ্বরের সমস্ত বাহ্য।

যাহা পুরুশ করিয়াছেন মনুষ্যের জ্ঞান ও কার্য

শোধনায়।

তাহার অর্থাৎ ভাগ।

তাহা আমারদের পুত্র ও কন্যার্তা যেরূপ খ্রীষ্টের

# মঙ্গল সমাচার

ওজ্জ্বল হইল গীক ভাষা হইতে।

ক্রীষ্টমধুরে জাগা হইল।

১৮০৭।

৪ পুণ্যম পঞ্চম মাস্তিওর রতি

- ১০ তারিখ ফ্রিডল্যান্ড তন্ন দিল মনমাকে ও মনসী তন্ন দিল আয়োনে ২৪০. আয়োন তন্ন দিল ফ্রান্সীসে ২৪০ ফ্রান্সীসে ও তন্ন দিল ফ্রিডল্যান্ড ও তাহার ভূতরি দিগিকে যে কালে তাহার দিগিকে বাবেলে লইয়া গিয়া ছিল তাহারের বাবেলে ওতরনের পরে ফ্রিডল্যান্ড তন্ন দিল শালভীমল ২৪০. শালভীমল তন্ন দিল জর রাবলকে ও ওতরবল তন্ন দিল আর্ভীডকে ২৪০. আর্ভীড তন্ন দিল আলীকিমাকে ও আলীকিমাকে ২৪০. আলীকিমাকে ২৪০. আতোর তন্ন দিল ছাটোকে ২৪০. ছাটোকে তন্ন দিল আখিমাকে ২৪০. আখিম তন্ন দিল আলিওয়েহে তাহার আলিওহে তন্ন দিল আলি য়েতরকে ও আলিযেতর তন্ন দিল যতনকে ও যতন তন্ন দিল য়ীককে য়ীক তন্ন দিল যুমকে তিনি মারিয়ার দুইয়া তাহার ওদরে তন্মিলেন য়েত য়াহাকে বলে গুটি
- ১৭ অতম মঙ্গল পুণ্য আদেহায় অর্থাৎ দাওদ পুণ্য তন্ন পুণ্য ও দাওদাধি বাবেলে লইয়া যাওন পুণ্য তন্ন পুণ্য ২৪০. বাবেলে লইয়া যাওন অর্থাৎ গুটি পুণ্য তন্ন পুণ্য
- ১৮ য়েত গুটির তন্ন জিল ২৪০। তাহার মতা মারিয়া যুমকে বলে হইয়া তাহারদের মনসীর পুণ্য তিনি গুটিবতি জিনেন ধর্মিয়া হইতে। তাহার দুইয়া যুম পুণ্যতর্গিত হইয়া ২৪০. তাহাকে অপঘনি করাইতে না
- ১৯ তাইয়া য়েত তাগা করিতে ইয়া করিলেন। কিন্তু

It is disappointing to find that in comparison to the earlier founts of Wilkins and the Chronicle Press, the fount of Bengali types first used by the Baptist Missionaries has to be deemed the inferior, both with regard to the design of its letterforms and to its poor alignment.<sup>45</sup> It is predictable that the method of composition differs little from that employed in the production of Halhed's *Grammar of the Bengali Language*; a book with which Carey was well conversant,<sup>46</sup> and for which Pañcānana Karmakāra had cast the Bengali types. The range of characters in the first Serampore fount (to be termed SB1) thus corresponds quite closely to Wilkins's first fount of Bengali types: the fount comprising the main characters of the syllabary, vowel signs, selected conjuncts, a number of reduced consonants, modifiers, numerals, and punctuation.

Although Wilkins's typesetting technique, as used in Halhed's *Grammar*, may have been adopted by the Missionaries, SB1 cannot be said to be modelled on any of Wilkins's founts. The typeface bears the closest resemblance to its contemporary, CW3;<sup>47</sup> but the persistence in preserving the contrast in stroke weight, so adroitly employed in all founts attributed to Wilkins, is detrimental to the overall homogeneity of the first Serampore typeface. This is partly<sup>48</sup> due to the reduced type size of the main characters of the syllabary, the principal *akṣaras*, which renders the stroke contrast only perceptible as unevenness in print quality, and any affinity to pen strokes is lost. These *akṣaras* constitute the most important sorts of the fount, since it is from them that the typeface takes its style owing to their frequency of occurrence. With regard to these, it is evident that the concept of a baseline for Bengali letterforms, which perhaps

45. Presumably not the fault of the experienced printer, but due to deficiencies in matrix making or type casting.

46. As evinced by Carey's *A Grammar of the Bengalee Language* (Serampore, 1801), which strove to emulate the earlier work. See Qfayyum, *Critical Study*, chapter IX.

47. See chapter 1, pl. 25.

48. For it is achieved by the Serampore Missionaries at a later date; see below, pp. 63-64 and pl. 47.



first emerged in CW3, has not been adhered to in SB1. In the latter fount, the discrepancy in the final stroke length of the characters  $\text{𑂔}$  and  $\text{𑂕}$ <sup>49</sup> exemplifies this point; as do the vowel signs which are shorter in depth than the main characters of the syllabary. Neither are the proportions of the counters homologous to those of CW3, although some of the problems found in the first fount of Wilkins, viz. the oversized counters of  $\text{𑂑}$  and  $\text{𑂒}$  and the opacity of  $\text{𑂓}$ , reappear in this fount completed at Serampore.

It is curious to find in SB1 inconsistencies in the design of letterforms which have the same basis. In the case of  $\text{𑂔}$  and  $\text{𑂕}$ , the inexplicably smaller counter of the latter indicates that these characters originate from two quite different sorts where one matrix for both forms would have been expected. Similarly, when  $\text{𑂉}$  and  $\text{𑂊}$  are set next to each other, the flow of the script is broken; for not only is the latter much shorter in depth, but its final stroke is at quite a different angle to the former. Other instances can be cited which demonstrate that uniformity in design, i.e. consistency in counter size, stroke length, and so forth, was not an important criterion in the cutting of this typeface.

With regard to the vowel signs, SB1 also avails itself of initial, medial, and final forms where required. The sign for  $\text{𑂛}$  has three forms in this fount:  $\text{𑂛}$  for final position,  $\text{𑂛}$  and  $\text{𑂛}$  for medial positions.<sup>50</sup> Both medial forms are used from the first and in the same context, thus offering no apparent reason for the existence of two sorts. But in the later publications employing SB1, the medial form  $\text{𑂛}$  is used virtually to the exclusion of  $\text{𑂛}$ ; which may indicate that the former was a later design. The vowel sign  $\text{𑂜}$  has two forms:  $\text{𑂜}$  for initial position, and  $\text{𑂜}$  for medial position; the latter being surprisingly short. There appears to be only one sort for  $\text{𑂝}$ , the flourish of which prints quite darkly but whose design is nevertheless superior to that of  $\text{𑂝}$ . However, the

49. See pls. 44 and 45.

50. As in CW1.

এ কথা শুনিয়া সোখালে ঘাইতে সে ভীত হইল কিম্বা স্বপ্নে ঈশ্বরকর্তৃক পুত্যাঙ্গিষ্ হইয়া গেলিলির এক পুত্রদেহে ১৩ ফিঙ্গিয়া গেল। এবং আচার্যের দ্বারা যে কথা কহা গেল যে তিনি নাজরেন গ্যাত হইবেন সে কথা পূর্ণ হওনের জন্য নাজরেনে নামধেয় এক নগর ঘাইয়া বসতি করিলেন।

পর্ব স্বগর্ভাতা নিকটবর্তী তত্ত্বের পরামর্শন কর এ কথা

৩ ঘোষণা করত যোহন তবকে সে কালে যিহুদাহ দেশের

৩ অরণ্যে আইল। এই তিনি যাহার বিষয়ে যিশাজিয়াহ

আচার্যের পুত্র্যাহ এই কথা কহা গেল যে অরণ্যে

৪ গী-কারকারী এক জনের এ রব যিহুদাহের নয় পুত্রত কর

৪ তাঁহার নয় সোজা কর। সে যোহন গুটের লোয়ের বন্ধ

৫ পরিয়ান করিত ও কহয়ে চম্বের পুত্র্যাহ ও তাঁহার ভ্রাতা

৫ পুত্র্যাহ যাকিগ ও বন্য রুই। তখন যিরোনাম ও

৬ যিহুদাহ দেশের মব্ব লোক ও যরদন দেশের নিকটস্থ

৬ পুত্র্যাহ মকলে তাহার নিকটে ঘাইয়া পান স্বীকার করিয়া

৭ তাঁহার করণক যরদনে ভূরিও হইল। তাহার ভূরিও

আগিত আলক ঋষিনি ও শাদুফিরদিকাকে দেখিয়া তিনি

তাঁহারদিকাকে বলিলেন আর মর্শের হংশ ভরিয়া

৮ শেধিহইতে পলাইতে কে তোমারদিকাকে পরামর্শ দি

৮ য়াকে। তত্ত্বের পরামর্শনের গুচিত ফল ফলাও এবং

৯ আবিবহায় আয়ারদের পূর্বপুত্র্যাহ এই কথা কহিতে

৯ যলে করিত না কেননা তোমারদিকাকে আমি এ কথা

১০ কহি যে ঈশ্বর এ পুত্র্যাহলাইতে তাঁহারহায়ের মজান

১০ গু-পন করিতে পারেন। এখনও কতালি গাডের

মূলে লগান যয় অত্তর যে পুতি গাছ ভাল ফল ফলে

১১ না সে কাটা যয় ও অগাতে ফেলা যয়। পরাম

শের কারণ আমি বলে তোমারদিকাকে তুব দেখ্যাই

বটে কিন্তু যিনি আমার পরে আমিতেলেন তিনি আমি

হইতে পরাক্রান্ত আমি তাঁহার তত্ত্ব; বহিওও যোগ্য নহি

১২ ধর্মাত্মা এবং অগিতে তিনি তোমারদিকাকে ভুয়াইবেন।

১২ তাঁহার হাতে কলা আছে এ তিনি আপন নামার কাঁড়িয়া

ফেলিবেন ও গৌম আপন গৌলয় একত্র করিবেন কিন্তু

অনিবর্ধানলে ভূষি পোড়াইবেন।

১৩ সে কালে যিহু গালিলিহইতে যরদনে যোহন

১৩ করণক ভূরিও হইবার জন্য তাহার নিকটে গেলেন।

১৪ কিন্তু যোহন এ কথা কহিয়া তাঁহাকে মানা করিল যে তো

১৪ মার হাত ভূরিও হওনের আবশ্যক আমার আছে

১৫ এবং তুমি কি তাঁহার নিকটে আসিতেছ। যিহু

১৫ তত্ত্বের করিয়া তাঁহাকে বলিলেন যে এখন এখন হইতে

১৬ দেহ কেননা মরল ধর্ম পূর্ণ কর; আয়ারদের গুচিত

১৬ বাণ আছে তখন তাঁহা করিতে তাঁহাকে দিল। ত

১৭ পরে যিহু ভূরিও হইয়া তলহইতে গুলিলেন এবং

১৭ বেগ স্বগর্ভীয় তাহার দক্ষিণে মুত্র হইল এবং তিনি

১৮ ঈশ্বরের আত্মা পূর্ণ তাঁহার পতিয়া তাঁহার গণের বসিয়া

১৮ দেখিলেন এবং দেখ স্বগর্ভহইতে এক রব হইয়া বলিল

১৯ যে এ আমার পুত্র পুত্র যাহাতে আমি বস তুমি।

১৯ পরে তাঁহার পুত্র্যাহলাইতে পরীক্ষিত হইবার কারণ যিহু

২০ আআকরণক আকর্ষিত হইয়া বনে গেলেন এবং চন্দ্র

২০ দিব্য হান্তি গণরাম বরিয়া মথিত হইলেন। পরীক্ষক

flourish of 𑂣 is barely discernible and at times renders this vowel sign indistinguishable from 𑂣 .

At first sight, the vowel sign 𑂣 gives the impression of possessing two alternative designs, one bearing a higher and shorter curve than the other, presumably in order to prevent clashes with succeeding ascending characters. But this letterform has been designed with a good kern, and slight discrepancies in shape might be due to hand-finishing of the projecting type, or simply normal wear and tear on such kerning types. In this fount, the vowel sign 𑂣 , which hardly kerns at all, tends to give two impressions, viz. 𑂣 , and 𑂣 , but since the bottom of the loop is such a hairline, they may be derived from the same matrix.

The design of the subscript vowel signs 𑂣 and 𑂣 are unsatisfactory. They are far removed from the character they affect, as is the *raphalā* 𑂣 , and therefore necessitate copious leading. Yet the *candrabindu* 𑂣 fits very neatly over the character it modifies. The form 𑂣 is also found in this fount, rather than 𑂣 employed by the Honourable Company's Press.<sup>51</sup>

It is evident from Carey's *Grammar of the Bengalee Language*, that the missionary adopted wholesale Halhed's list of 'the most common contractions of letters',<sup>52</sup> and subscribed to the latter's concept of the term *phalā*.<sup>53</sup> This is borne out by the method of composing conjuncts with this fount. A prescribed number of combined consonants exist in their own right as individual sorts. The remainder are generated in the same manner as all previous Bengali founts; only, in SB1 the breaks are quite visible.

51. Both sorts are current in MS form since the twelfth century.

52. Halhed, *Grammar*, pp. 33-34.

53. See also Carey's MS version, 'Grammar of the Bengalee Language by William Carey, D.D.', pp. 34-39, preserved at the BMS.

As mentioned above, some confusion exists over the typefoundry from which this fount originated, yet there is even greater confusion over the means by which Carey succeeded in employing Pañcānana Karmakāra to establish a typefoundry at the Mission itself.<sup>54</sup> For the purpose of this thesis, it is sufficient to know that Pañcānana founded the first fount of Bengali movable metal types used by the Serampore Mission Press. The Mission's first *Memoir Relative to the Translations of the Sacred Scriptures* stated:

Soon after our settling at Serampore, the providence of God brought to us the very artist who had wrought with *Wilkins* in that work, and in a great measure imbibed his ideas. By his assistance we erected a letter foundry; and although he is now dead, he had so fully communicated his art to a number of others that they carry forward the work of type-casting, and even of cutting the matrices, with a degree of accuracy which would not disgrace European artists.<sup>55</sup>

The first major work undertaken by Pañcānana at the Serampore Mission was a fount of Devanagari types required primarily for printing the Sanskrit grammar then in preparation by William Carey: 'The fount required seven hundred separate punches of which half had been completed at the beginning of the present year [1803]'.<sup>56</sup> To assist him in this enterprise Pañcānana took on an apprentice of the same caste and trade, Manohara, who was to become his son-in-law and eventually his successor as the master typefounder at the Mission.<sup>57</sup>

Whilst cutting the Devanagari punches, Pañcānana is said<sup>58</sup> to have completed another fount of Bengali types of reduced size and greater elegance than that used for the first edition of the *Maṅgala Samācāra* (New Testament in

54. See M.S. Khan, *William Carey*, p. 249; and S.C. Sanial, 'Extract from Sambhu Chandra Mukherjee's Note Books in the Secretary's Notes', *Bengal Past and Present*, XIII (July-Dec 1916), p. 140.

55. *Memoir Relative to the Translations* (1808), pp. 18-19.

56. Marshman, *Carey, Marshman, and Ward*, I, p. 178.

57. Manohara was to work at the typefoundry for over 40 years.

58. Marshman, *Carey, Marshman and Ward*, I, p. 178.

Bengali). Apparently this new fount was employed for printing the second edition of this work.<sup>59</sup> There is no doubt that upon completion of the Devanagari fount, the typefoundry at Serampore prepared a new fount of Bengali types whose smaller type size would enable the Mission Press to produce Bengali translations of the Scriptures at a quarter of their original size without impairing legibility.<sup>60</sup> A study of the second edition of the *Dharma Pustaka, Maṅgala Samācāra* (1803 [1806]) however, does not reveal the introduction of such a fount but the continuing use of SB1. This edition, whose publication pre-dates the *Memoir* recording the work on a smaller type size, certainly differs from the original version produced at Serampore, but this is largely due to the reduction in the size of the paper and improvements in translation and orthography. Furthermore, the entire work has clearly been reset, since the interword spacing has been altered. Some conjunct forms have been changed, notably  $\text{ঋ}$  and  $\text{ঋ}$ , but this does not constitute a new design.

A 'new fount of Bengali types' is said to have been cut by Manohara Karmakara in 1810. According to M.H. Khan, this typeface was used to print five poetical tracts by John Chamberlain allegedly held at the Baptist Missionary Society in London. Khan lists these works as: 'Cautriśā', 'Maṅgala samācāra [A poetical work on Christianity ...]', 'Dharmapustakera nāmera Uttara Pratyūttara', 'Manera Cetanā', and 'Uttara pratyūttara Vālakera kārana'.<sup>61</sup> Repeated searches of the BMS archives have failed to trace these imprints. Moreover, from Khan's information alone, it seems very doubtful that this fount was produced by the Serampore typefoundry. The design of the letterforms illustrated by Khan<sup>62</sup> displays little affinity to the Mission's founts of that period, but shows a closer relationship to the products of the indigenous

59. Khan, *Printing in Bengali Characters*, I, p. 379.

60. *Memoir Relative to the Translations* (1808), p. 19.

61. Khan, *Printing in Bengali Characters*, I, pp. 379-380 and II, pp. 466 and 467.

62. Khan, *ibid.*, II, p. 818.

typefoundries.<sup>63</sup> Furthermore, these imprints do not bear the hallmarks of the Serampore Mission Press: (according to Khan) not one has a title page; three lack the name of the printer, and the place and date of the printing; and two make use of a colophon<sup>64</sup> - a device favoured by native printers but uncharacteristic of Serampore imprints.

The reliance of the Missionaries on local assistants in translating, composing, casting, and printing in order to fulfil their intention 'to evangelize the poor, dark, idolotrous Heathen'<sup>65</sup> is undisputed. Carey from the first made use of local pundits;<sup>66</sup> and the Serampore Trio continued this practice whenever feasible, even for their proselytizing activities. Daniel Potts writes, 'It has been sufficiently verified that most if not all of Serampore's translations, and these made up the preponderance of early translations, were initially made by Indians and then corrected by one or the other of the Trio acting in conjunction or separately'.<sup>67</sup> The publications themselves give little credit to Indian translators, but this did not concern William Carey who received most of the credit himself:

*We do not want the vain name of the Men who have translated the Scriptures into this or that language, - but we do want the thing to be done.*<sup>68</sup>

Carey's statement epitomizes the prevailing attitude of the Serampore Baptists towards their work in India. Their one objective, 'the spread of true religion throughout the East'<sup>69</sup> prompted all their activities. Even the appointment of William Carey as teacher of Bengali<sup>70</sup> at Fort William College, in May 1801, was viewed by the Missionaries as a means of funding their missionary

63. See below, chapter 7.

64. But it is not stated if the colophons give any information apart from the title of the work.

65. W. Carey, *An Enquiry*, p. 2.

66. See Quayyum, *Critical Study*, chapter VIII.

67. Potts, *British Baptist Missionaries*, p. 83.

68. BMS Records (IN/13): Carey to Sutcliffe, 4 May 1808.

69. *A Memoir of Serampore Translations for 1813* (Kettering, 1813), p. 23.

70. He was later to become Professor of Sanskrit and Marathi.

enterprises. In his position at the College,<sup>71</sup> Carey keenly felt the paucity of teaching aids, for any grammars and vocabularies which had been published had become hard to obtain.<sup>72</sup> Carey's response was to initiate a programme of composing text books, and compiling grammars and dictionaries. His action made a significant contribution to the development of Bengali literature - a fact of secondary importance to the missionary:

I have been obliged to publish several things and can say that nothing but necessity could have induced me to do it.<sup>73</sup>

These text books were printed at the Serampore Mission Press, as were a number of works for the Calcutta School Book Society<sup>74</sup> and the British and Foreign Bible Society<sup>75</sup> (of which Carey was a founder member). The College of Fort William subsidized their publications by buying a hundred copies of each title at the published price.

Carey was aware of the providential circumstances in which the Missionaries at Serampore found themselves. In a letter to Sutcliffe, dated 4 November 1813, Carey wrote:

Indeed had I not been in a more favourable situation than any other person in the world for commanding the help of learned men who speak these different languages, and are natives of the countries where they are spoken, I could not possibly have succeeded to the extent I have already done.<sup>76</sup>

It was this situation which enabled the Missionaries to embark upon their ambitious programme of translating and publishing the Scriptures in over forty

71. And in relation to Serampore College itself, founded in 1818.

72. BMS Records (IN/13): Carey to Sutcliffe, 8 April 1801, entry of 13 Apr 1801.

73. CSBC MS letter: no. 12, 17 March 1802; quoted in Qayyum, *Critical Study*, p. 165.

74. Founded in 1817.

75. Established in 1804.

76. *Periodical Accounts*, V, no. XXVII (Kettering, 1813), p. 353.

different languages for the sole reason of promulgating their faith.<sup>77</sup> Most of the work naturally fell to the printing office under William Ward's superintendence. In December 1811 Ward described the printing office in a letter to his cousin:

As you enter the office, you see your cousin, in a small room ... looking over the whole office, which is 174 feet long. The next persons you see, are learned natives translating the Scriptures into different languages, or correcting the proof-sheets. You walk through the office, and see laid out in cases *types* in Arabic, Persian, Nagaree, Talinga, Sikh, Bengalee, Mahratta, Chinese, Orissa, Burman, Carnata, Keshemena, Greek, Hebrew, and English. Hindoos, Musselmans, and converted Natives are all busy: Some composing, others distributing, others correcting. You next come to the presses, and see four persons throwing off the sheets of the Bible in different languages; and on the left are half a dozen Musselmans employed in binding the scriptures for distribution .... [The] ... Storeroom ... is 142 feet long .... [In] ... a Room adjoining to the office, are the Type-casters, busy in preparing the types in the different Languages.<sup>78</sup>

On 11 March the following year it seemed as if the Mission's great plans were to be thwarted: the printing office caught fire destroying all but five<sup>79</sup> of the presses, founts of type in fourteen scripts, as well as English founts, cases, chases, and more. The great losses incurred were well recorded by the Missionaries, who also inferred in their writings that the cause of the fire was not above suspicion.<sup>80</sup> Despite the excessive damage, estimated to be at a cost of between nine and ten thousand pounds sterling, a remarkable recovery was achieved. Amongst the remains were the presses and the steel punches for the Indian scripts.<sup>81</sup> The matrices of all the founts were also saved, for they had been stored in a different area; thus type casting could begin the next day from

77. Marshman, *Carey, Marshman, and Ward*, I, pp. 192 and 193.

78. Ward to Revd W. Fletcher, Serampore 5 Dec 1811; *Baptist Magazine for 1812*, IV, pp. 413-4.

79. Six, according to some sources.

80. *The Baptist Magazine for 1812*, IV, pp. 414-6 and 492.




81. According to Ward, 40000 punches of Indian languages had been spared, which he valued as being equivalent to ten years work; *Periodical Accounts*, V, no. XXIV, pp. 501-2.




the three and a half tons of molten metal that had been collected.<sup>82</sup>

Furthermore, the recent expiry of a lease on an adjacent warehouse let by the Mission provided suitable premises for establishing a new and larger printing office. The publicity given to the fire at Serampore generated a tremendous response, particularly from Britain, in the form of donations and subscriptions to the extent that the loss was made up in 'two months'.<sup>83</sup> The Brethren reckoned on casting a fount or so every fortnight in order that the printing of the scriptures would 'not suffer a month's interruption'.<sup>84</sup> Indeed, a year later Carey was able to write to Fuller,

The Mission notwithstanding its heavy losses, has been supported, and we have been enabled, within one year from a very desolating calamity, to carry on printing to a greater extent than before the calamity took place.<sup>85</sup>

In Bengali publications subsequent to this event, minor alterations in SB1 can be observed: the conjunct  has been improved.  also joins the vertical stem in a different manner. The most striking change is the introduction of the dot in the character . In the preface to his *Dictionary of the Bengalee Language*, which employs this fount (SB1R), Carey wrote:

The Bengalee alphabet being defective in one or two instances, such as the want of distinct characters to express b, v, and w, a dot has been inserted in the middle of the letter  when it either has or should have the sound v or w.<sup>86</sup>

Conjuncts formed with this phoneme were also 'dotted'.<sup>87</sup> This innovation did not last long, but the practice was continued in the next fount of Bengali types which was to emerge from the Serampore type foundry.

82. *Periodical Accounts*, V, no. XXIII, p. 465. Reports vary as to what was saved: see *Baptist Magazine for 1812*, p. 526; Marshman, *Carey, Marshman and Ward*, I, p. 469; and Diehl, *Indian Imprints*, pp. 48-59.

83. Pearce Carey, *William Carey*, p. 291.

84. *Periodical Accounts*, V, no. XXIII, p. 467.

85. BMS Records (IN/13): Carey to Fuller, 25 March 1813.

86. William Carey, *A Dictionary of the Bengalee Language* (Serampore, 1815), I, p. x.

87. See pl. 46.

রাজাবলি।—

ব্রহ্মপুত্রী কীট পর্যন্ত জীবলোকের ও ঐ জীবলোকেরদের  
 জুলোকাদি মতালোক পর্যন্ত ওদ্ধৃতন মণ্ডলোক অতলাদি  
 পাতাপ পর্যন্ত অধিন্তন মণ্ডলোককন নিবাস স্থানের এবং  
 অমৃত ঘর ব্রাহ্মি ডালাদিবন ওংবহোমি রস্তু মহলের ও স্বস্ব  
 কর্মানুসারে স্বর্গ নরক রক্ষ যোক্ষ ব্যবহার ও ক্রম মনুন্তর  
 মুখাদিকন কান বিভাগের কর্তা পরমেশ্বর মহলের মঙ্গল  
 করন।—

৪ নিত্বলাদি ত্রিংশৎ কল্পের মধ্যে ঘণ্টী যত্নর নাম্য কাল  
 ক্রমের ভূমণ বলাতো বর্তমান শ্বেতবারাহ কল্প ঘাইতেছে এ  
 কৈককল্পেতে চতুর্দশ চতুর্দশ মনু হয় ওহাতে শ্বেতবারাহ  
 কল্পের মধ্যে বৈবস্বত নামে মস্তম মনু ঘাইতেছেন। এইক  
 মনুতে ২৮৪ দুই শত তৌরালি যুগ হয়। তাহা মবে  
 বৈবস্বত নামে মস্তম মনুতে ৪৪ এক শত বার যুগের যুগ এই  
 কালি যুগ ঘাইতেছে। ইহার পরিমাণ ৪৩১০০০ চারি লক্ষ বত্রিশ  
 হাজার বৎসর ইহার মধ্যে ৪৭৬ মতের শত জাবিবশ  
 শকাব্দা পর্যন্ত গাও ৪৯০৩ চারি হাজার নয় শত পাঁচ বৎসর।

৫

The manufacture of the second Serampore Bengali typeface (SB2) was, in terms of the development of Bengali typography, perhaps the most important product to emerge from the Mission's typefoundry. The plan of reducing the type size of all the existing non-Latin Serampore founts, whilst maintaining clarity of imprint, had been in the minds of the Trio for some time<sup>88</sup> but could only be executed by John Lawson who proved to be an extremely dextrous punchcutter:<sup>89</sup>

It seems an important question, how the greatest number of clear and legible copies can be furnished at the least expense . . . . A great occasion of expense has hitherto been, the largeness of the oriental types, which is such, that although the low price of labour in Bengal enables us to print the same quantity of letterpress in the Sacred Scriptures cheaper than can be done in any other part of the world, . . . the expense of a whole New Testament amounts to a large sum . . . . The reducing of the types in size, therefore, so as fully to preserve their legibility, is now under consideration . . . the types thus improved, will greatly exceed in beauty the large types of the first fabrication: and the reduction in respect of quantity will enable us to print on better paper than formerly . . . . For the attainment of this object we are endeavouring to avail ourselves of every means with which the Lord has been pleased to furnish us; and we find the skill of our highly-esteemed Brother Lawson in cutting the types, of peculiar value in this work . . . .<sup>90</sup>

SB2, a fount begun by Lawson, but completed by native artists,<sup>91</sup> which was used to print the fourth edition of Carey's *Grammar of the Bengalee Language* (1818) is remarkable for its legibility despite the smallness of its size.<sup>92</sup>

Contrast in stroke weight is still maintained and the weight distribution has been far more successfully handled than in previous Serampore Bengali founts.

The typeface displays greater harmony in the design of its letterforms:

88. F.A. Cox, *History of the Baptist Missionary Society from 1792 to 1842* (London, 1842), I, p. 243.

89. Lawson cut the punches for the first fount of movable metal Chinese types.

90. *A Memoir of the Serampore Translations for 1813*, pp. 20-22.

91. *Periodical Accounts*, VI, no. XXXIII, p. 322.

92. See pl. 47. It is considerably smaller than CW2.



all the vertical strokes are flared, perhaps too much in the case of  $\text{ফ}$ , and the uniformity in the depth of the characters lends a neat appearance to the script. Such alterations signify that SB2 is not merely a reduction of SB1R.

Furthermore, the relative proportions of all the sorts have not been retained, for instance  $\text{ঋ}$  is now comparable in design to  $\text{ঋ}$ , and its finial has been lengthened.

The method of composition has not been altered, the *raphalā* is still set separately and some contracted consonants continue to be formed by two sorts. Complex conjunct characters have not suffered from the restricted type size and reproduce exceptionally well in print. On the other hand, the subscript vowel signs appear awkward, being too large in comparison to the rest of the character set. The result is the production of a carefully designed and legible, albeit unexciting, typeface. The cutting of this fount was of great import, revealing possibilities of variation and experimentation in the design of Bengali letterforms previously reserved for Latin types.

The significance of Lawson's accomplishment was recognized by Ward,<sup>93</sup> although the Missionaries did perceive that the type size was in reality too small to function satisfactorily as a text typeface:

While these reduced types bring both the Old and the New Testament into a volume so portable and so well suited to the young among the population of Bengal, . . . there are many among those of middle age, as well as those older, who cannot read this small type with pleasure . . . . For the sake of these, a larger type has been prepared, which, while it presents to the eye a character much larger, will, by reducing the body of the type and economizing the space, increase the number of pages only about a fourth; so that the New Testament in octavo will not exceed four hundred pages, even in this large type.<sup>94</sup>

93. Ward to Sutcliffe, 9 Oct 1813; *Periodical Accounts*, V, no. XXVI, pp. 287-8.

94. *Tenth Memoir Respecting the Translations of the Sacred Scriptures into Oriental Languages* (Edinburgh, 1834), pp. 13-14.

The Missionaries thus continued their practice of producing new type designs which effectively improved the standards of Bengali typography. Their reluctance to be satisfied with only one fount for each non-Latin script is to their credit, for it set a precedent to be followed by the increasing number of typefoundries established in the Indian subcontinent.

After 1820 the Serampore Mission produced two additional Bengali text faces worthy of mention.<sup>95</sup> These founts demonstrate the experience their punchcutters had acquired in a period of twenty years. The earlier typeface (SB3), to be found in the 1829 edition of the *Dharma Pustaka* (Holy Bible in Bengali),<sup>96</sup> can be regarded as a step towards designing a fount possessing a suitable type size, both for the sake of economy and legibility, combined with a greater consistency in stroke weight. The face exhibits an attractive diagonal stress which creates a lively effect. The treatment of the 'blob' (or rounding) also adds nice points of colour to such characters as ন, হ, ল, ড, ম and ক.

Experimentation in design was clearly encouraged, for a modified version of this fount (SB3R) was also used to print works during this period, namely the Bengali *Dharmapustakera Antabhāga* (New Testament) of 1832.<sup>97</sup> The modifications which radically alter the impression of the face are the new form of † and the improved positioning of the *raphalā* and the subscript vowel signs. Other characters have also been refined, e.g. ফ and ঙ, which result in a considerably more even colour than the first version. The neater appearance, however, is not entirely commendable, for it shows a digression from Bengali calligraphy and the products of indigenous Bengali punchcutters,<sup>98</sup> thereby conforming rather to European perceptions of good typographic design.

95. The imprints of the Serampore Mission Press show the foundry to have produced about nine Bengali founts.

96. See pl. 48.

97. See pl. 49.

98. See below, chapters 3ii and 7.

১৭৭।

মোশহেতে রচিত আদিপুস্তক।

৫

হিত হইলে কইন্ উচ্চিয়া আপন ভাইকে  
 ১০ বধ করিল। তখন যিহুহ কইন্কে বলি  
 লেন তোমার ভাই হাবেল কোথায়। সে  
 বহিল আমি জানি না আমি কি আমার  
 ১১ ভাইর রক্তক। তিনি বলিলেন তুমি কি  
 করিয়াছ তোমার ভ্রাতার রক্ত মৃত্তিকা  
 ১২ হইতে আমার পুতি টেঁচাইয়া ডাকে অত  
 এব তোমার হস্তহইতে তোমার ভ্রাতার  
 রক্তপান করিতে আপন মুখ বিস্তার করি  
 য়াছে যে পৃথিবী তাহার উপরে তুমি শাপ  
 ১৩ গুস্ত। তুমি ভূমির কৃষি করিলে সে আপন  
 ফল তোমাকে দিবে না তুমি পৃথিবীর  
 ১৪ উপর সর্বধারী ও ভ্রমণকর্তা হইবা। তখন  
 কইন্ যিহুহকে বলিল আমার শাস্তি  
 ১৫ আমতে অসহ। দেখ তুমি অদ্য পৃথি  
 বীর মুখহইতে আমাকে খেদাইয়া দিয়াছ  
 ১৬ তোমার সম্মুখহইতেও আমি লুকায়িত  
 এবং আমি পৃথিবীর উপর সর্বধারী ও  
 ভ্রমণকারী হইব অতএব এইমত হইবে  
 ১৭ যে আমাকে যে কেহ দেখে সে আগাকে  
 বধ করিবে এবং যিহুহ তাহাকে বলি  
 লেন যে কেহ কইন্কে বধ করে তাহার  
 সাতগুণ দণ্ড হইবে এবং যিহুহ কইন্নের  
 উপরে চিহ্ন দিলেন পাছে কেহ তাহাকে  
 ১৮ দেখিয়া বধ করে। তৎপরে কইন্ যিহু  
 হের সম্মুখহইতে যাইয়া এদেনের পূর্ব  
 ১৯ দিগে নোদদেশে বসতি করিল। পরে  
 কইন্ আপনকারার সহিত সর্গ করিল  
 তাহাতে সে গর্ভবতী হইয়া ঋনোককে  
 পুসবিল ও সে এক নগর বসাইল ও  
 তাহার নাম আপনার পুত্রের নামানুসারে  
 ২০ ঋনোক রাখিল। তাহার পরে ঋনোক  
 হইতে ইরাদ জমিল এবং ইরাদ মিথুয়া  
 এলকে জন্ম দিল এবং মিথুয়াএল্ মিডু  
 ২১ শাএলকে জন্ম দিল এবং মিতশাএল্  
 লানেকে জন্ম দিল। লামেক দুই স্ত্রীর  
 বিবাহ করিল পুথমার নাম আদাহ্  
 ২২ এবং দ্বিতীয়ার নাম সীলাহ্। আদাহ্  
 ঋমানকে পুসবিল সে টোলে বাসকা

রিরদের ও পত্নগালকেরদের গোত্রজনক  
 হইল। তাহার ভ্রাতার নাম যুবাল্  
 সে বীণা এবং অরগানবাদকেরদের গো  
 ১১ ত্রজনক হইল। এবং সীলাহ্ ও তুবল্  
 কইন্কে পুসবিল সে কাস্যকার ও লোহ  
 কারেরদিগের গোত্রজনক ছিল ও তুবল্  
 কইন্নের ভগিনী নআনাহ্। তখন লামেক্  
 আপনার দুই স্ত্রী আদাহ্কে ও সীলাহ্কে  
 বনিল যে হে লামেকের জায়ারা আমার  
 কথা তন আমার বাক্যেতে অবধান কর  
 আদি আপনার ব্যথার নিমিত্তে এক  
 মানুষের ও আপনার পুহারের নিমিত্তে  
 ১৩ এক যুবামনুষের বধ করিয়াছি। কইন্  
 যদি বধের পুতিকল সাতগুণ পায় তবে  
 লামেক্ সাতাত্তরগুণ অবশ্য পাইবে।  
 ১৪ তারপর আদাম্ আপন স্ত্রীর সহিত সর্গ  
 করিল তাহাতে সে পুত্র পুসবিল ও  
 তাহার নাম শেৎ রাখিল কেননা সে  
 বলিল কইনেতে হত হাবেলের স্থানে  
 ঈশ্বর আমাকে আর এক বংশ দিয়া  
 ১৫ ছেন। শেতের এক পুত্র ছিল সে  
 তাহার নাম এনোশ্ রাখিল। তখন  
 লোকেরা যিহুহের নামে পুর্নামা করিতে  
 লাগিল।

১৭৮।

এই আদামের পুরুষাবলি পুস্তক।  
 ঈশ্বর যে দিনে মনুষ্যের সৃষ্টি করিলেন  
 সে দিনে ঈশ্বর আপনার পুতিমূর্তিতে  
 তাহার নিষ্ঠাণ করিলেন পুরুষ ও স্ত্রী  
 করিয়া তাহারদের সৃষ্টি করিলেন।  
 পরে তাহারদগকে আর্শাধ্বাণ দিয়া সৃষ্টি  
 দিনে তাহারদিগের নাম আদাম্ রাখি  
 লেন।

আদামের বয়সক্রম এক শত ত্রিশ বৎ  
 সর হইলে সে আপনার পুতিমূর্তিতে  
 আপনার মূর্ত্যনুযায়ী এক পুত্রকে জন্মা  
 ইল এবং তাহার নাম শেৎ রাখিল।  
 শেতের জন্ম দেওনের পর আদাম্ অষ্ট  
 শত বৎসর বাঁচিয়া পুত্র কন্যারদিগকে

## ১৪ পর্ষ।

আমাকে তোমরা অবধি আর দেখিতে  
পাইবা না।

## ২৪ পর্ষ।

[১] পরে মন্দিরহইতে যিহুর পুস্তানক  
রূপনময়ে তাঁহার শিষ্যেরা সে ঘরের গাঁথ  
নি তাঁহাকে দেখাইতে আইল। [২] সে  
সময়ে যিহু তাহারদিগকে কহিলেন তো  
মরা এ সকল কি দেখে না তোমারদিগকে  
মত্তা আমি বলি যাহা ডাক্তা যাইবে না এ  
মন পুস্তর পুস্তরের উপরে থাকিবে না।  
[৩] তারপর যিহু জিতবৃক্ষপর্ষতের উপ  
রে বসিলে তাঁহার শিষ্যেরা তাঁহার নিক  
টে গুপ্তে আসিয়া বলিল আমারদিগকে  
কহ যে এ সকল বিষয় কখন হইবে ও তো  
মার আসিবার চিহ্ন এবং জগতের শে  
ষের চিহ্ন কি হইবে। [৪] যিহু পুস্তান্তর  
করিয়া তাহারদিগকে কহিলেন সাবধান  
কোন মনুষ্য যে তোমারদিগকে না ভাঁড়ায়  
[৫] কেননা অনেকে আমার নামে আসি  
য়া বলিবে যে আমিই খ্রীষ্ট এবং অনেক  
কে ভাঁড়াইবে। [৬] কিন্তু যখন তোমরা যুদ্ধ  
বিবরণ ও যুদ্ধের জনশ্রুতি শুনিবা তখন  
সাবধান হইবা ভাবিত হইও মা কেননা  
এ সকল অবশ্য হইবে কিন্তু শেষকাল এ  
খন হয় নাই। [৭] কেননা দেশীয়েরা দে  
শীয়েরদের বিরুদ্ধে ও রাজ্যেরা রাজ্যের  
দের বিরুদ্ধে উঠিবে ও দুর্ভিক্ষ ও মারী ও  
ভূমিকম্প নানা স্থানে হইবে। [৮] এ স  
কল দুঃখের আরম্ভ। [৯] তৎকালে লো  
কেরা তোমারদিগকে দুঃখ পাইবার কা  
রণ সমর্পণ করিবে ও তোমারদিগকে বধ  
করিবে। [১০] এবং আমার নামহেতুক  
তোমরা সকল দেশীয়েরদের যুগিত হই  
বা। [১১] তখন অনেকে ব্যাঘাতপ্রাপ্ত  
হইবে ও এক জন আর এক জনকে পর  
হস্তগত করিবে ও এক জন আর এক জন  
কে ঘৃণা করিবে অনেক মিথ্যা আচার্য্যও  
উঠিবে এবং অনেকের ভ্রান্তি জন্মাইবে।  
[১২] এবং অধর্মবৃদ্ধির দ্বারা অনেকের  
প্রেম শীতল হইয়া যাইবেক। [১৩] কিন্তু  
যে জন শেষকালপর্য্যন্ত সহিষ্ণুতা করে  
সে উদ্ধৃত হইবে। [১৪] এবং রাজ্যের  
এ মঙ্গলসমাচার সকলদেশীয়েরদের প্রতি  
প্রমাণ হইবার জন্যে সমস্ত জগতে যা  
[৩৩]

বণা করিতে হইবে তার পর শেষকাল  
হইবে। [১৫] অতএব যে বিনাশকারি  
বস্তুর বিষয়ে দানিয়েল আচার্য্য কহিল যে  
জন পাঠ করে সে বুকুক। [১৬] তোম  
রা সে বস্তু পবিত্র স্থানে স্থাপিত যখন  
দেখ তখন যাহারা যিহুদাহদেশে আছে  
তাঁহারা পর্ষতে পলাউক। [১৭] যে জন  
ঘরের ছাতের উপরে থাকে সে ঘরহই  
তে কোন বস্তু লইতে নানামুক। [১৮]  
যে কেহ ক্ষেত্রে থাকে সে আপন বস্ত্র লই  
তে না ফিরুক। [১৯] কিন্তু যাহারা গভ  
বতী ও যাহারা সে কালে স্তনপান করায়  
তাঁহাদের সস্তাপ হইবে। [২০] ও প্রা  
র্থনা কর যে তোমাদের পলায়ন বর্ষাকা  
লে কিয়া শাবত দিনে না হয়। [২১] কে  
ননা যেমত জগতের আরম্ভাবধি একাল  
পর্য্যন্ত হয় নাই এবং কদাচও হইবে না  
এমন বড় দুঃখ সেকালে হইবে। [২২]  
সে কাল সঙ্কীর্ণ না হইলে কোন প্রাণির  
জাণ হইতে পারিত না কিন্তু মনোনীত লো  
কেরদের কারণ সে দিন সঙ্কীর্ণ করা যাই  
বেক। [২৩] যদি কেহ তোমারদিগকে  
কহে যে দেখ এই স্থানে খ্রীষ্ট কি ও স্থানে  
তবে তাহাতে প্রত্যয় করিও না। [২৪]  
কেননা মিথ্যা খ্রীষ্ট ও মিথ্যা আচার্য্যেরা  
উঠিয়া মহাচিহ্ন ও আশ্চর্য্য কর্ম্ম দেখাই  
বে ইহাতে যদি শকা হয় তবে তাঁহারা  
মনোনীতেরদিগকেই প্রত্যয় করিবে।  
[২৫] দেখ আমি তোমারদিগকে পূর্বে  
কহিয়াছি। [২৬] অতএব যদি কেহ  
তোমারদিগকে কহে যে দেখ তিনি অরণ্যে  
তবে যাইও না দেখ তিনি অপকাশ কু  
ঠরিতে তবে প্রত্যয় করিও না। [২৭]  
কেননা যেমন বিদ্যুৎ পূর্বেদিগ্ ছাড়িয়া  
পশ্চিম দিগে দীপ্তি করে সেই মত মনুষ্যের  
পুলের আগমন হইবে। [২৮] কেননা  
যে স্থানে শব সে স্থানে শকুনি একত্র হই  
বে। [২৯] সে কালের দুঃখের পরে সূর্য্য  
অন্ধকারময় হইবেক ও চন্দ্র আপন রশ্মি  
দিবে না ও তারা স্বর্গহইতে পতিত হইবে  
ও স্বর্গের সকল পরাক্রম লভিবে। [৩০]  
সে কালে মনুষ্যের পুলের চিহ্ন স্বর্গে প্র  
কাশিত হইবেক তখন পৃথিবীর সমস্ত গো  
ষ্ঠী রোদন করিবে এবং তাঁহারা স্বর্গের  
ও



The fount employed to print the 1832 *Dharma Pustaka* (Holy Bible in Bengali) (SB4)<sup>99</sup> which reverts to the form † for medial ঙ, reflects the large improvement in typography that the Mission Press had achieved in three decades. This face is smaller than SB3, and has lost its diagonal stress. The design is dominated by the relatively thick headline strokes and the evenness of the baseline,<sup>100</sup> but the thick downstrokes of such characters as ক and ঞ relieve this effect. The result is a clean, crisp typeface.<sup>101</sup>

Other notable products of the Serampore typefoundry were the metal heading types. From the title page of the 1830 edition of the *Rāmāyaṇa*,<sup>102</sup> it can be observed that the Missionaries had abandoned the rather crude titling fount, used in such imprints as the 1801 edition of the *Mahābhārata*, in favour of a more elegant, smaller heading type. This face displays closer affinity to penned Bengali letterforms; and the use of woodcuts for titles in the later imprints reveals a recognition of the distinction between the current written hand and the printed characters created by punchcutters. This distinction was not recognized in *The First Report of the Institution for the Encouragement of the Native Schools in India* produced by the Serampore Mission in 1818:

On Penmanship as a distinct article, there is perhaps less to be said in Bengalee than in most other languages. The printed alphabet has been so recently formed from the written character, that the variations are far less than in those countries where the two characters have been separated for any length of time. The written alphabet indeed had not yet assumed a difference of position; when formed correctly, it is as fully rectangular as the printed character. The indistinctness observable in writing, therefore, arises much more from the carelessness and inaccuracy of the writer, and the corrupt forms of letters introduced, than from any real discrepancy between the printed and the current character: which indistinctness is

99. See pl. 50.

100. Which now accomodates the *raphalā* ঞ .

101. The design of this typeface may have been influenced by Vincent Figgins; see below, chapter 5.

102. See pl. 51.

:১। ১১ পর্ক ]

মোশহেতে রচিত আদিপুস্তক ।

দুঃ করিল কিন্তু অবরাহাম তখনও যিহুহের সাক্ষাৎ দাঁড়াইয়া রহিল ।

[২৩] পরে অবরাহাম নিকটে আইল ও কহিল তুমি কি পাপিরদের সহিত ধার্মিকেরদিগকেও সংহার করিবা । [২৪] যদি নাগরের মধ্যে পঞ্চাশ জন ধার্মিক থাকে তবে কি সংহার করিবা ও নগরের মধ্যবাসি পঞ্চাশ জন ধার্মিক মনুষ্যহেতুক কি সে স্থানকে রক্ষা করিবা না । [২৫] এরূপ করা তোমাহইতে না হউক অর্থাৎ অধার্মিকেরদের সহিত ধার্মিকেরদের নাশকরণ এবং তোমার সাক্ষাৎ ধার্মিকেরা যেমন সেমত অধার্মিকেরা না হউক সকল পুত্রিয়ার বিচারকর্তা কি ন্যায় করিবেন না । [২৬] পরে যিহুহ কহিলেন যদি সদোমের নগরমধ্যে ই পঞ্চাশ জন ধার্মিক মনুষ্যেরদিগকে পাই তাহাদের হেতুতে সকল স্থান রক্ষা করিব । [২৭] পরে অবরাহাম প্রত্যুত্তর করিয়া কহিল দেখ ধূলা ও ছাইমাত্র যে আমি আমি যিহুহের সহিত কথা কহিতে লাগিয়াছি । [২৮] পঞ্চাশ জন ধার্মিকেরদের মধ্যে যদি পাঁচ জন ন্যূন হয় তবে তুমি কি পাঁচ ন্যূনহেতুক সকল নগর সংহার করিবা পরে তিনি বলিলেন যদি পূঁরতা লিশ জন ধার্মিককে পাই তবে তাহার সংহার করিব না । [২৯] পরে অবরাহাম তাঁহাকে কহিল দেখানে যদি চল্লিশ জন পাওয়া যায় তাহাতে যিহুহ কহিলেন চল্লিশ জনপ্রযুক্ত আমি তাহা করিব না । [৩০] পরে অবরাহাম কহিল প্রভু ক্রুদ্ধ না হউন তবে ত্রিই সেখানে যদি ত্রিশ পাওয়া যায় তাহাতে যিহুহ কহিলেন দেখানে যদি ত্রিশ পাই তবে করিব না । [৩১] পরে অবরাহাম বলিল দেখ এখন আমি যিহুহের সহিত কথা কহিতে উদ্যত হইয়াছি দেখানে যদি বিশ পাওয়া যায় তাহাতে যিহুহ কহিলেন বিংশতি জনহেতুক আমি সংহার করিব না । [৩২] পরে সে কহিল হয় ২ প্রভু ক্রুদ্ধ না হউন আমি কেবল এই একবার কহি দেখানে যদি দশ পাওয়া যায় তাহাতে তিনি কহিলেন দশহেতুক আমি সংহার করিব না । [৩৩] পরে যিহুহ অবরাহামের সহিত আলোপ সমাপ্ত করিয়া প্রস্থান করিলেন এবং অবরাহাম সেখানে ফিরিয়া আইল ।

১১ পর্ক ।

[৩৪] পরে দুই মৃত সদোমে সন্ধ্যাকালে আইল এবং লোট সদোমের দ্বারে বসিয়াছিল পরে লোট তাহারদিগকে দেখিয়া তাহারদের সহিত মিলিবার নিমিত্তে উঠিল ও ভূমিপতি হইয়া তাহারদিগকে প্রণাম করিল । [২] পরে

[১৫]

সে কহিল দেখ আমার প্রভুরা আপনাদের দাসের ঘরে প্রবেশিয়া রাত্রি প্রবাস করুন ও আপনাদের পাদপ্রক্ষালন করুন পরে প্রাতঃকালে উঠিয়া পথে প্রস্থান করিবেন তাহাতে তাঁহারা কহিলেন যে না কিন্তু আমরা রাত্রি রাত্নাতে প্রবাস করিব । [৩] পরে লোট তাহারদিগকে বিস্তর আগ্রহ করিল তাহাতে তাহারা তাহার ঘরে তাহার নিকটে আইল । পরে সে তাহারদিগের কারণ ভোজ্য প্রস্তুত করিল ও বেখমির রুটি পাক করিল ও তাহারা তাহা খাইল ।

[৪] কিন্তু তাহারদিগের শয়নের পূর্বে নগরের মনুষ্যেরা অর্থাৎ সদোমের মনুষ্যেরা আবার বৃদ্ধ সকল অঞ্চলের সকল লোক ঘর ঘেঁরিল । [৫] পরে তাহারা লোটকে ডাকিল ও তাহাকে কহিল যাহারা অন্য রাত্রিতে তোমার নিকটে আনিয়াছে সে লোকেরা কোথা তাহারদিগকে আমায়দিগের নিকটে বাহির করিয়া আন যে আমরা তাহারদিগকে দেখি । [৬] পরে লোট দ্বারের বাহির হইয়া তাহারদিগের নিকটে গেল ও আপনাদের পরেতে দ্বার রুদ্ধ করিল ।

[৭] পরে বলিল হে আমার ভাইরা এমন দূষ্ক্রিয়া করিও না । [৮] দেখ অজ্ঞাতপুরুষা আমার দুই কন্যা আছে তাহারদিগকে আমি তোমাদের নিকটে বাহির করিয়া আনি ও তোমাদের দৃষ্টিতে যেমন অভীষ্ট ভেমন তাহাদের প্রতি কর কেবল এ লোকেরদের প্রতি কিছু করিও না কেননা এইকারণ তাহারা আমার চালের ছায়ায় আশ্রয় লইয়াছে । [৯] পরে তাহারা কহিল সরিয়া দাঁড়াও পুনর্বার তাহারা বলিল এ একজন প্রবাস করিবার নিমিত্তে আনিয়া বিচারকর্তা হইতে চাহে এখন তাহারদের অপেক্ষা তোমার অধিক মন্দ করিব তাহাতে তাহারা লোটের উপরে ঠেলাঠেলি করিল ও কপাট ভাঙ্গিবার কারণ নিকটে আইল । [১০] পরে সে দুই জন আপন হাত বাহির করিয়া ঘরে আপনাদের নিকটে লোটকে টানিয়া লইল ও কপাট বন্ধ করিল । [১১] পরে তাহারা ঘরের দ্বারের নিকটস্থ মনুষ্যেরদিগকে বালবৃদ্ধ পর্যন্ত অন্ধ করিল তাহাতে তাহারা দ্বার অশ্বেষণে অতিশয় পরিশ্রান্ত হইল ।

[১২] পরে সেই দুই জন লোটকে বলিল এখানে তোমার আর কে আছে তোমার জামাতাকে ও তোমার পুত্রেরদিগকে ও তোমার পুত্রেরদিগকে ও নগরে তোমার যাহা ২ থাকে সে সকলেরদিগকে এ স্থানহইতে বাহির কর [১৩] কেননা আমরা এস্থান সংহার করিব যেহেতুক যিহুহের সম্মুখে তাহারদিগের ধনি অতিবড় হই

রামায়ণ ।

THE

RAMAYUN ;

TRANSLATED INTO BENGALIE.

By KRITTEE-BAS.

BOOK I.

SECOND EDITION.

বাণীকিক্ত

রামায়ণ

কৃত্তিবাসঃ কর্তৃক গৌড়ীয় ভাষায় রচিত

দ্বিতীয়বার ছাপা।

প্রথম কাণ্ড।

SERAMPORE: প্রিন্সিপাল

1830. ১৮৩০।

ত্রিকৃষ্ণচন্দ্রায় নমঃ।

অথ আদ্যাকাণ্ডমভিলিখাতে।

গোলোক বৈকুণ্ঠ পুরী সভাকার পর।  
নগ্নীসহ তথায় আছেন গদাধর ॥  
তথায় অঙ্কিত বৃক্ষ দেখিতে সুচারু।  
যাহা চাই তাহা পাই নাম কল্পতরু ॥  
দিবা নিশি সদা চন্দ্র সূর্য্যের প্রকাশ।  
তার ভনে আছে দিব্য বিচিত্র আবাস ॥  
নেতপাট সিংহাসন উপরেতে জুনি।  
বীরাসনে বসিয়া আছেন বনমালী ॥  
মনে প্রভুর হইল অভিনায।  
এক অংশ চারি অংশে ইইব প্রকাশ ॥  
ত্রিরাম ভরত আর শত্রুঘ্ন লক্ষ্মণ।  
এক অংশ চারি অংশে ইইল নারায়ণ ॥  
নক্ষত্রীনির্ভী নীতা দেবী বসেছেন বামে।  
যগ ছত্র ধরিয়াকে লক্ষ্মণ ত্রিরামে ॥  
চামর চুল্লার তারে ডরত শত্রুঘ্ন।  
যোড়হাতে সুর করে পবননন্দন ॥

increased by the omission of the few diacritic points the alphabet possesses, and not seldom by many words being idly written in continuous succession with scarcely any space between them, as well as by an orthography in which scarcely two natives agree.<sup>103</sup>

The Missionaries' transition from this stance was probably assisted by their association with Kālikumāra Rāya, the writing-master<sup>104</sup> of the College of Fort William. Rāya was commissioned to design 'a large and beautiful Exemplar of the Bengalee Alphabet in the Writing character' which was 'cut by the artists at Serampore in large models formed of that preparation of metal<sup>105</sup> used in casting types; the native type-casters not having yet arrived at that skill in the art which would enable them to cast types of so large a size'.<sup>106</sup> Neither a copy of the writing exemplar nor a copy of the three spelling tables, printed in supposedly another 'fair and large type',<sup>107</sup> is extant. But there is good reason to deduce a posteriori that a fount of heading types employed by the Baptist Mission Press, and displayed in their 1826 type specimen book,<sup>108</sup> was that designed by Kālikumāra Rāya. It is known that the Calcutta Baptists acquired types from Serampore<sup>109</sup> and that this fount (BM I) was used in their School Book imprints (*varṇamālās*) for teaching the basic syllabary of the Bengali script - for which purpose Rāya's face was intended. BM I, with its strong characteristic of the reed pen, was particularly suited for use as a titling fount;

103. (Reprinted and published in London, 1818), pp. 21-22.

104. *Second Report of the Calcutta School Book Society* (Calcutta, 1819), p. 7; [spelt Calee Coomar Ray].

105. *The Second Report of the Institution for the Support and Encouragement of Native Schools* (Serampore, 1818), p. 17. Khan (*Printing in Bengali Characters*, I, p. 383), erroneously states that they were made of wood, confusing these types with those 'cut in wood, about four times as large as our largest types, that the letters may be seen at a distance'; *First Report . . . Native Schools*, p. 22.

106. *Second Report . . . Native Schools*, p. 17.

107. *Hints Relative to Native Schools, Together with the Outline of an Institution for their Extension and Management* (Serampore, 1816, London rpt, 1817), p. 33. See below, chapter 3ii regarding this typeface.

108. See below, pl. 52.

109. See below, chapter 3ii.

it is to be found in numerous publications of the Baptist Mission Press and clearly influenced the design of later display types such as BM I.<sup>110</sup>

Progress in type design was naturally enhanced by improvements in the quality of printing and paper. In 1823 Ward died suddenly of cholera and the post of the printing-office superintendent fell to John Clark Marshman. The publications subsequent to Ward's death indicate Marshman's suitability for this task which he had, in fact, performed during Ward's two and a half year absence abroad.

Between 1801 and 1832 the Serampore Mission Press is known to have published 'over two hundred and twelve thousand volumes in forty languages'.<sup>111</sup> This vast figure reveals the continual emphasis placed by the Missionaries on the volume of matter they wished to disseminate in great quantity amongst the indigenous population. Their translations have been subject to much criticism since their first publication, although the quality of their typography has never been seriously questioned. The Missionaries realized their objective of producing readable imprints at the least expense with great speed, but they were not unduly concerned with the refinements of type design. It has been seen that improvements were always contemplated from the point of view of increased legibility<sup>112</sup> and, or, greater economy. Advances in the design of their text faces were minimal considering the time span in which they occurred and the high repute of the Serampore type foundry. The overall impression gained from a critical analysis of their Bengali imprints is one of mediocrity in design, reflecting the fact that the Brethren's concern with typography arose from necessity. This does not, however, detract from their considerable achievements in the field of printing.

110. There is also the possibility that Rāya was the designer of the heading typeface mentioned above; see p. 127.

111. G.A. Grierson, 'The Early Publications of the Serampore Missionaries: a Contribution to Bibliography', *Indian Antiquary*, XXXII (June, 1903), p. 241.

112. Rather than readability.

The genesis of Bengali literature, concomitant with the creation of a prose genre in this vernacular, cannot be attributed to the Serampore Missionaries.<sup>113</sup> Yet the first publication of Bengali prose literature printed in indigenous characters and the resulting impetus given to the production of Bengali compositions is due to their exertions. Moreover, the Missionaries were responsible for the publication of the first Indian language journal, the *Digdarśana*, and the prototype Bengali newspaper, the *Samācāra Darpaṇa*,<sup>114</sup> which in turn stimulated the rapid growth of a native press.

In addition to other accomplishments,<sup>115</sup> William Carey is reputed to have translated and supervised the printing of the following Scriptures:

Bengali, Oriya, Hindi, Marathi, Sanskrit and Assamese-whole Bibles.  
 Panjabi New Testament and Old Testament up to Ezek. xxvi.  
 Pashto and Kashmiri New Testaments, and Old Testaments up to 2 Kings.  
 Telugu and Konkani New Testaments, and Pentateuchs.  
 Eighteen other New Testaments, and Five one-or-more Gospels.<sup>116</sup>

Such statements, prevalent in biographies of this missionary, merit little credence, for it has been established that Carey freely availed himself of any assistance at hand. In 1828 the 'Junior Missionaries' felt bound to comment:

The credit which accrued to the three Senior Missionaries for attempting such achievements, and the unbounded confidence reposed in them by the managers of the Institution at home, gave rise to some painful consequences abroad. Their praises were so loud, and so often iterated, that the labours of others equally indefatigable . . . were yet deemed worthy of little notice, and their names never pronounced . . . except in tones very subdued. The three Seniors were hardly conceived to be fallible . . .<sup>117</sup>

113. See Potts, *British Baptist Missionaries*, pp. 97 and 99.

114. First issue 23 May 1818 - there is some dispute as to whether this was the first Indian language, or at least Bengali, newspaper; Potts, *ibid.*, p. 102.

115. e.g. he was founder of the Agricultural and Horticultural Society of Bengal.

116. Pearce Carey, *William Carey*, p. 410.

117. Eustace Carey and William Yates, *Vindication of the Calcutta Baptist Missionaries* (London, 1828), pp. 39-40. Carey was the only Senior Missionary still respected by the Junior Missionaries; Carey and Yates, *ibid.*, p. 40.

Native pundits worked on the translations. Native compositors, printers, and proof-readers staffed the printing office which Ward, succeeded by Marshman, superintended. The type-casting and punchcutting based on the designs of anonymous local scribes, whilst benefitting from Lawson's expertise, were the responsibility of the Karmakara family. But the journals and correspondence of the Serampore Brethren indicate that Carey was indeed the pioneering spirit behind their typographical enterprises. Just as England was indebted to William Caxton for initiating the production of English prose in printed form, so must William Carey, rather than Charles Wilkins, be credited with laying the foundation of printed vernacular prose literature in India. It can be said that the programme devised by Carey, and executed by others, for promulgating his faith in Bengal inadvertently established the course of Bengali typography<sup>118</sup> for the whole of the nineteenth century.

118. Typography, as distinct from type design.

### 3.ii The Baptist Mission Press.

The moulding of the printed Bengali character during the nineteenth century did not reside solely within the province of the Serampore Mission Press.<sup>119</sup> Other missionary bodies active in Bengal during this period were also influential in determining the shaping of Bengali letterforms in metal, both by their typefounding activities and their choice and use of typestyles. The modest beginnings of the Baptist Mission Press, which belie its significant role in the development of Bengali vernacular typography, are perhaps the cause for the scant recognition it has received in this area. In histories of the Calcutta Brethren, attention has mainly focused on the 'Serampore Controversy' which culminated in the establishment of the Calcutta Baptist Missionary Society. The dispute has been well documented, both by the protagonists and their biographers,<sup>120</sup> and is not of concern here.

The Calcutta Baptist Missionary Society, founded in 1817 by 'the Junior Missionaries', William Yates, Eustace Carey, and John Lawson,<sup>121</sup> was reluctant to rely on the Serampore Mission Press for its printing, and established its own press in 1818:

It was designed to extend the usefulness of the mission by furnishing facilities for the printing and publication of the Scriptures, religious books, school books, and tracts....

Its commencement was very humble: one wooden press alone, with two founts of type, being first purchased.<sup>122</sup>

119. Contrary to the impression given by many historians, e.g. Anant Kakba Priolkar, *The Printing Press in India* (Bombay, 1958), pp. 55-70.

120. See Carey and Yates, *Vindication*, and Pearce Carey, *William Carey*, pp. 339-51.

121. Carey and Yates, *Vindication*, p. 8. They were joined by William Hopkins Pearce, another 'Serampore deserter' in June 1818, who had been trained as a printer at the Oxford Clarendon Press.

122. James Hoby, *Memoir of William Yates; With an Abridgement of His Life of W.H. Pearce* (London, 1847), p. 399.



Despite initial opposition from the Serampore Brethren, William Pearce set up the printing office using Bengali types that originated from Serampore.<sup>123</sup> During its existence, the Baptist Mission Press acquired types and other materials from various sources to cope with the demand for printing by such bodies as the Calcutta Bible Society and the Calcutta School Book Society.<sup>124</sup> References to articles obtained from Figgins and other typefoundries are to be found in the archives held at the Baptist Missionary Society in London.<sup>125</sup> But soon after the Press's establishment 'a typefoundry was found necessary to its usefulness'.<sup>126</sup> After some hesitation,<sup>127</sup> for fear of incensing the Serampore Trio, Lawson reapplied his punchcutting skills and supervised the production of founts at the Baptist Mission's typefoundry. In 1826 the Calcutta brethren published a *Specimen of Printing Types in use at the Calcutta Baptist Mission Press* containing seven founts of Bengali type, the majority being of their own manufacture.<sup>128</sup>

The founts possess quite individual designs; the differences they display are not merely those modifications customary to alterations in type size.<sup>129</sup> Of the Bengali types acquired or created by the Calcutta Baptists, specimen nos. I, II, III, and IV<sup>130</sup> illustrate a desire to bridge the gap, initially overlooked by their Serampore colleagues,<sup>131</sup> between Bengali chirography and typography. The formation of the letterforms contained in these founts follow the usual stroke sequence of panned forms, in contrast to such faces as SB1, SB2, and SB3, as

123. Hoby, *ibid.*, p. 398.

124. In 1822 Pearce was elected printer to the latter; Calcutta School Book Society, *Fifth Report* (Calcutta, 1823), p. 2.

125. See, for example, BMS Records (IN/43):letter of C.B. Lewis to Trestrail, Calcutta 21 September 1859.

126. Hoby, *William Yates*, p. 399.

127. See Carey and Yates, *Vindication*, pp. 64-65.

128. See the preface to this work and pls. 52-58, see also below, pp. 176-9.

129. See below, chapter 6, regarding criteria that characterize original designs.

130. Henceforth to be identified by the prefix BM.

131. See above, pp. 127-30.

## SPECIMEN OF PRINTING TYPES.

## BENGALEE, No. 1.

ক খ গ ঘ ঙ।

চ ছ জ ঝ ঞ।

ট ঠ ড ঢ ণ।

ত থ দ ধ ন।

প ফ ব ভ ম।

য র ল ব শ

স ষ হ ঙ্গ।

মঙ্গলসমাচারদূত।

SPECIMEN OF PRINTING TYPES.  
BENGALEE TYPE. No. II.

I. BENGALIEE LANGUAGE.

এক ভদ্ৰ লোকের সম্ভানের যাত্রা দর্শনে, ও  
কবিতা শুবণে, বড় আমোদ ছিল. এক রাত্রি  
এক বাটীতে কবিতা শুনিতে গিয়া অলস লো-  
কেরদের সহিত বসিল; সেই দিকে বড় গোল  
হইলে বাটীর কর্তা সেই দিকের লোককে বেত্র  
মারিতে লাগিল. তখন সে মনে করিল, দেখ  
অন্যের সঙ্গে বসিলে অলসের সহিত গণিত  
হইতে হয়, ও তাহারদের দশাধীন হইতে হয়.  
অতএব এমন কবিতা শুবণেছাকে দমন করিয়া  
ভাল জ্ঞান চেষ্টা করা আমার উপযুক্ত.

2. SANSKRIT LANGUAGE.

উদয়স্যাপরাহস্য চ পরস্পর° বিবাদো বভূব,  
তত্র চ পরস্পর° জগাদ, অহমেব শরীর° বহামি  
রক্ষামি চ। তত্রাহ° পুনরেবেদমবদত্ নিজ-  
শক্ত্যহ° শরীর° বহামি তত্রাপু°দরমেবমবদৎ  
যদ্যহ° নাশ্যামি তদা ত্ব° গন্ত° কিঞ্চিৎ কর্তৃষ্য  
ন শক্যসীতি ॥ যথা  
সহায়েন বিনানৈব কার্য° কিমপি সিধ্যতি।  
একেন চরণেনাপি গতিঃ কস্য পূবর্ততে ॥

## SPECIMEN OF PRINTING TYPES.

## BENGALÉE TYPE, No. III.

*Designed to serve as Italic.*

## I. BENGALÉE LANGUAGE.

এক কৃষক মরণ কালে আপনার সন্তানেরদিগকে কহিল,  
যে আমার দুঃস্বপ্নে গুপ্ত ধন আছে পরে তাহার মৃত্যু  
হইলে, তাহার অস্ত্যেষ্টি ক্রিয়ার পর, তাহার পুত্রেরা একত্র  
হইয়া গুপ্ত ধন পাইবার কারণ ক্ষেত্রের স্থানে খনন করিল.  
কোন স্থানে ধন পোতা ছিল, তাহারদের পিতা তাহা নিরূপণ  
করিয়া কহেন নাই; তন্নিমিত্তে সন্মুদায় ক্ষেত্র কক্ষদেশ পর্য্যন্ত  
গম্বীর করিয়া খনন করিল, তত্রাপি ধন পাইল না; অতএব  
সেই গম্বীর পুরাইয়া দুঃস্বপ্ন রোপণ করিলে, সেই বৎসর বি-  
শতি গুণ ফল ফলিল; তাহা বিক্রয় করিয়া সৎসারের ভরণ  
পোষণাদি করিয়া অনেক মুদ্রা উত্তীর্ণ হইল. তখন তাহারা  
বুঝিল, যে তাহারদের পিতা যখন এই কথা তাহারদিগকে  
কহিয়াছিলেন, যে দুঃস্বপ্নে গুপ্ত ধন আছে, খনন করিলেই  
পাইবা, তাহার অভিপ্ৰায় এই, যে শ্রম করিলে অর্থলাভ  
হইবে, কেননা যত্নে রতোৎপত্তি.

## 2. SANSKRIT LANGUAGE.

উদ্যোগিনং পৃথগসিংহমুপৈতি লক্ষী  
দৈবেন দেযমিতি কাপৃথগা বদন্তি ।  
দৈববিলজ্জ্য ক্ব পৌকথমাশক্ত্যা  
যত্তে কৃত্তে যদি ন সিদ্ধ্যতি কোত্র দোষঃ ॥

## SPECIMEN OF PRINTING: TYPES.

## BENGALEE TYPE, No. IV.

## 1. BENGALÉE LANGUAGE.

এক কৃষক মরণ কালে আপনার সন্তানেরদিগকে  
কহিল, যে আমার দুকাকোক্তে গুপ্ত ধন আছে. পরে  
তাহার মৃত্যু হইলে, তাহার অস্ত্যেষ্টি ক্রিয়া পর,  
তাহার পুত্রেরা একত্র হইয়া গুপ্ত ধন পাইবার কারণ  
ক্ষেত্র স্থানে খনন করিল. কোন স্থানে ধন পোতা  
ছিল, তাহারদের পিতা তাহা নিকপণ করিয়া কহেন  
নাই; তন্মিমেতে সমুদায় ক্ষেত্র কক্ষদেশ পর্য্যন্ত  
গহুর করিয়া খনন করিল, তত্রাপি ধন পাইল না;  
অতএব সেই গহুর পুরাইয়া দুকাকোক্তে রোপণ করিলে,  
সেই বৎসর বিংশতি গুণ ফল কলিল, তাহা বিক্রয়  
করিয়া সংসারের ভরণ পোষণাদি করিয়া অনেক মুদ্রা  
উদ্ধৃত হইল. তখন তাহারা বুঝিল, যে তাহারদের  
পিতা যখন এই কথা তাহারদিগকে কহিয়াছিলেন,  
যে দুকাকোক্তে গুপ্ত ধন আছে, খনন করিলেই পাইবা,  
তাহার অভিপায় এই. যে শ্রম করিলে অর্থ লাভ  
হইবে, কেননা যত্নে রত্নোৎপত্তি.

## 2. SANSKRIT LANGUAGE.

উদ্যোগিনং পুরুষসিংহমুপৈতি লক্ষ্মী  
দৈবেন দেয়মিতি কাপুরুষা বদন্তি ;  
দৈবংবিলঙ্ঘ্য কুরু পৌরুষমাত্মশক্ত্যা  
যতে কৃতে যদি ন সিদ্ধ্যতি কোত্র দোষঃ ॥

## SPECIMEN OF PRINTING TYPES.

## BENGALIEE TYPE, No. V.

## I. BENGALIEE LANGUAGE.

এক জন ধনী অতি পুত্ৰাবে অখারু হইয়া নগর পুদক্ষিণ করিতে ছিলেন; তৎকালীন তাঁহার অজ্ঞাতসারে জেবহইতে কাগজ মড়া বোলটা স্বর্ণ মুদ্রা পথে পড়িল. এক দরিদ্র তাহা কুড়াইয়া পাইয়া বিচারকর্তার স্থানে সমর্পণ করিলে, তিনি ঘোষণাধারা এই কথা নগর ব্যাপিয়া পুচার করিলেন; তাহাতে এই ধনী বিচারাসানের সম্মুখে আইল, ও বিচারকর্তা তাঁহাকে মোহরের মোড়ক সমর্পণ করিলেন. ধনী কহিলেন, যে আমার আর ও অধিক মুদ্রা ছিল, অতএব যে জন ইহা পাইয়াছে তাহার স্থানে অবশ্য তাহা ও পাওয়া যাইবে. ইহাতে সেই দরিদ্র ত্রাসযুক্ত হইয়া, বিচারকর্তার স্থানে এই নিবেদন করিল, যে আমি যাহা পাইয়াছিলাম সে সমুদয় আপনার স্থানে উপস্থিত করিয়াছি, আমার স্থানে আর কিছুই নাই. অনন্তর যে কাগজ মোড়ক করা ছিল বিচারকর্তা সেই কাগজ আনাইয়া তাহাতে পুনর্বার মোড়ক করিয়া দেখিলেন, যে বোল মুদ্রার অধিক তাহাতে ধরে না. তখন ধনিকে বলিলেন, যে এই বোল স্বর্ণ মুদ্রা ও তোমার নহে, কেননা ইহাতে আর ধরে না; তবে তোমার স্বর্ণ মুদ্রা অন্য কেহ পাইয়া থাকিবে, ও তুমি অন্যত্র অন্বেষণ কর. তখন দরিদ্রকে কহিলেন, এই বোলটা স্বর্ণ মুদ্রা তবে তোমারই হইল, তুমি ইহা লইয়া গৃহে গমন কর.

## 2. SANSKRIT LANGUAGE.

যে বালকা মুখা বাক্য° কথয়ন্তি চোরযন্তি বিবদন্তি দুর্বচো বা বদন্তি তৈঃ সার্দ্ধমালাপান্ মা কুরুত। যন্মাত্তেষা° সহচারেণ যুয়° তক্রপা ভবিষ্যথ। এবমন্যে জনান্ন্তৈঃ সার্দ্ধ° যুয়ান্ দুষ্টা চেদ° বুধ্যন্তে যুয়° হি তৈঃ সমাঃ। যস্মিন্ গৃহে যুয়° নিবসথ তত্র চেৎ কেপি মন্দমাচার° কুর্ত্তি তদুষ্টা যুয়° মন্দ° মাচরত যদি তে পশ্যন্তি যুয়° ভদ্রতরা ইতি তদা তেপি ভদ্র মাচরিত্যন্তীতি। দুষ্টাচারশিক্ষা নোত্তমানামুচিতা কিন্তুুতমাচার শিক্ষা দুষ্টানামপ্যাচিত্তি ॥

## SPECIMEN OF PRINTING TYPES.

## BENGALEE TYPE. No. VI.

## I. BENGALÉE LANGUAGE.

দেখ আরং বস্তুর স্বরূপাংশ করিলে দান সিদ্ধ হয়, কিন্তু বিজ্ঞাতে সে রূপ নয়; যে হেতুক দাতার স্বরূপাংশ প্রতিরেক দান সিদ্ধ হয় ও গ্রহীতার গ্রহণ হয়. বাশীকৃত স্বর্ণ রূপাদি দান করিতেই জ্ঞান হয়, কিন্তু দানদ্বারা বিজ্ঞার জ্ঞান চণ্ডীয়া ছরে থাকুক, বরং প্রতিদিন হ্রাস হয়. ধনের ঘায় বিজ্ঞার অপচয়, অপচয়, অপহরণ কোন মতে হয় না. এবং বিজ্ঞা স্বমন্ত্রির ন্যায় বিপদের আগে সাবধান করে ও পরিণাম দর্শায়; এবং যতপি কৃষ্ণটনাদ্বারা কখন সঙ্কট উপস্থিত হয়, তাহাতে বিজ্ঞা স্বমুক্তি দেন. বিদ্যা অভেদ সঙ্গী ও অন্তরঙ্গ.

যেমন অক্ষকাবে দীপ শোভা পায়, তাহাশ মঘষের মখে বিদ্যার জ্যোতি; আর যাহাশ এক দীপহইতে অন্য দীপ স্থালিয়া লইলে সে দীপ নির্বাণ হয় না, সেই রূপ এক জনের স্থানে বিজ্ঞা শিক্ষিলে অন্যের মানসাজ্জকার ছর হয়, এবং যে জন শিক্ষা করায় তাহার ও ক্ষতি হয় না.

## 2. SANSKRIT LANGUAGE.

যজ্ঞাকং শুরবো যজ্ঞদাষ্টাপমুক্তি তদেব কুরুত। জিখনং পঠন-  
মম্বদপি চ যং কিঞ্চিৎ মাতাপিতৃছ্যা° নিরুপিতং যুগ° শিক্ষিতু° চেষ্টধ°।  
পিতৃতো মাতৃতো বন্ধুছ্যা° যজ্ঞাকমধিকং জ্ঞানমিতি ম্য° বুধ্যধ°।  
যজ্ঞাক° বয়সন্তেষা° বয়োহ্যধিক° তেহিবহ্বী° বিজ্ঞা° পঠিতবস্তো হৃষ্ট-  
বস্তঃ প্রতবস্তশ্চ যাসা° কিমপি যুগ° ন জানীথ। কিন্তু যুগ° নবীন  
শিক্ষ্যেছ্যা° জ্ঞানীথ যতো যজ্ঞাক° বয়সন্তেষোহ্যধিক°। পরস্ব  
জ্যেষ্ঠ° বালকা যজ্ঞেছ্যা° জ্ঞানস্তি। জ্যেষ্ঠ° বালকেছ্যা° জ্ঞান-  
তর° মানবা জ্ঞানস্তি। যজ্ঞ° পুস্তকং পিতা মাতা শুরবশ্চ দদতি  
তদ্বিনা নাশ্চত° পুস্তক° পঠত। কেযাঞ্চিৎ পুস্তকানা° পাঠোহুচিতঃ  
এব° তানি চ হৃষ্টসঙ্গা ইব হৃষ্টতা° বোধয়স্তি। পরস্ব মনুপুস্তক-  
পাঠাত° পাঠবিরহোপি স্তথা° শ্রেয়ান্ ॥

## SPECIMEN OF PRINTING TYPES.

## BENGALEE TYPE, No. VII.

## 1. BENGALIEE LANGUAGE.

ব্যবহারাবিক্ত স্তব করে যেই জন,

অবশ্য তাহার আছে কিছু পুয়োজন.

যে জন স্তব ও মিথ্যা পুশ্যনাত্তে ভুল হয়, সেই ভিন্ন অন্য কেহ তাহাতে পুতা-  
রিত হয় না; তাহার ওদাহরণ.

এক শূণাল কুচিত হইয়া আহারাদ্বেষন করিতেছিল, টেবান্ সম্মুখে এক  
বৃক্ষোপরি এক কাঠবিড়ালী দেখিল; সে কোমল জন্তু, ও শূণালের সুতারাং  
ওপাদেয় খাদ্য; কিন্তু তাহাকে বরিবার কোন ওপায় না পাইয়া শূণাল তাহাকে  
কহিল, যে তোমার পিতা পিতামহ অতিশয় যোগ্যতাবন্ত ও ক্ষয়তাপন ছিলেন,  
তঁাহারা এক বৃক্ষহইতে অন্য বৃক্ষে লক্ষ্য দিতে পারিতেন. সেও তাহা করিল.  
পরে শূণাল বলিল, তঁাহারা বৃক্ষের ডালহইতে এক লক্ষ্য দিয়া মূলে আসিতে  
পারিতেন; কাঠবিড়ালী শূণালের স্তবে মগ্ন হইয়া মূলে লক্ষ্য দিয়া, নামিবাশ্রিত  
শূণাল তাহাকে গুন করিল.

দেখ, স্তাবক কেবল স্বকারণ্য সাধনায় ব্যতিরিক্ত অন্য হেতু স্তব করে না,  
অতএব স্তব যাহার কর্ণে কষ্টকের ন্যায় বাজে, সেই সুবোধী, স্তবের দ্বারা সে  
কখন পুতারিত হয় না; কিন্তু বাসকেরদিগের কর্ণে অল্পলি দেওনের ন্যায় মিথ্যা  
স্তবে ও পুশ্যনাত্তে যাহার সুখ বোধ হয়, সেই সিহৌবী, তাহাতে অবশ্য কতি  
হয়.

## 2. SUNSCRIT LANGUAGE.

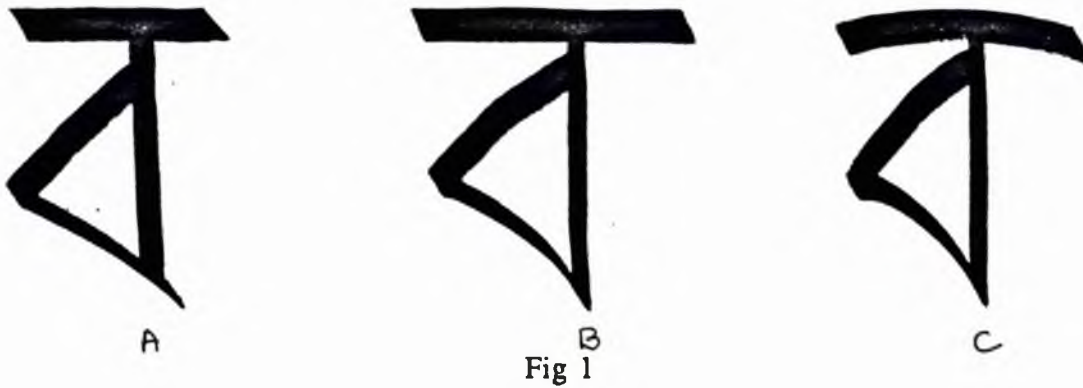
একো জলাশয় আসীৎ যত্র বহবো ভেকা অবসন্ একদা তজীরে শিশবঃ ক্লীড়-  
তুয়ুপাতিক্চন্ । তত্র শর্করাভিঃ ক্লীড়াশক্তান্তে জলে বারং বারং শর্করাশ্চি-  
ক্ষিপুঃ । তেন চ সগীনাং ভয়াকুলানাং ভেকানাং যহান্ কৌশোজায়ত ।  
তদনন্তরং তেষাং ভেকানাং মাধৈ একঃ সাহনিকো ভেকো জলাশয়ানুশ্চমুভুল্য  
কাণ্ডভিন্ম । হা ভোঃ পুিয়বালকাঃ কথং সত্বরা যুগ্ নিজজাতীয় নৈক্ষুৰ্য্য  
শিক্ষন্তে । অহং ব্যগুতয়া বিনয়ং করোমি যৎ যুগ্মাভিৰ্বিবেচনীয়মিতি । যদ্যপোষ্য  
যুগ্মাকং ক্লীড়া ক্ৰিষ্টস্মাকং যরনহেবেতি ॥ যথা

পরদুঃখং সমুৎপাদ্য যঃ স্বীয়সুগ্রহীহতে ।

ন যদি স্যাশ্চক্ষরশীলো নরকে কো গমিষ্যতি ॥



well as BM V, and BM VII<sup>132</sup> which require the pen to be lifted prior to the formation of the upright stroke.<sup>133</sup> These two styles are illustrated below, where A can be described as a 'constructed' letterform, and B and C are written letterforms in that they do not contravene the customary stroke sequence of the penned hand.



Whilst it has been stated above that BM I's design may be attributable to Kālikumāra Rāya,<sup>134</sup> and it is reasonable to suppose that BM II was the 'fair and large fount' designed to print spelling tables of 'nearly a thousand words'<sup>135</sup> for the Calcutta School Book Society,<sup>136</sup> there is no evidence to suggest that they possessed common authorship. It is more pertinent to note from the records available that the 'Khooshnuveesh of the College of Fort William'<sup>137</sup> initiated the style of type design whose salient feature was to capture in metal the principles of Bengali calligraphy, and which was emulated in such founts as BM IV and by other type foundries.

132. And specimen no. VI designed by Vincent Figgins (see below, chapter 5), henceforth designated as VF1; see pl. 57.

133. In fact, the vertical strokes in these founts appear to be downstrokes.

134. See above, p. 130.

135. *Hints Relative to Native Schools*, p. 33.

136. Khan states that it was used to print J.D. Pearson's spelling book held at the India Office Library, of which he gives an illustration, unfortunately this copy cannot be located; Khan, *Printing in Bengali Characters*, I, p. 384 and II, p. 486.

137. *Second Report ... Native Schools*, p. 17.

## শ্রীশ্রীপরমেশ্বরো জয়তি ।

এতদেশি বিষয়ি লোকেরা স্বকীয় ভাষার শূদ্র কপে লিখনে ও শব্দার্থবোধে ও নানা দেশীয় বিবরণ জানে পায় অনেক অপটু হিলেন। তাঁহার কারণ এই যে সংস্কৃত অসংস্কৃত লোকের দিগের শূদ্র লিখন ও শব্দার্থবোধ দুইট এবং বালক কাল-বধি স্বয়ং শিক্ষকের নিকট শূদ্র লিখন পাঠনাদি হইলে ও তৎসংস্কার বশতঃ লোকেরা শূদ্র লিখনাদি ক্ষম হইতে পারেন পূর্বে তাহা ও অত্যাঙ্গ ছিল এবং বঙ্গ ভাষাতে দেশ বিভাগ বিবরণার্থে কোন পুস্তক ও রচিত হিল না সুতরাং এতদেশীয়েরা শূদ্র লিখন ও শব্দার্থবোধ ও অন্য দেশবৃত্তান্ত জানে অপটু পায় এবং জন্মান্ত সদৃশ হইয়া অর্থকরী কিকিদ্ভিদ্যোপার্জন দ্বারা ধনোপার্জন করিয়া কাল ক্ষেপ করিতেন।

এবং এতদেশীয় পণ্ডিত কর্তৃক শূদ্রীকৃত মুদ্রিত পুস্তক ও মুদ্রিত হিল না যে তত্ত্বমুদ্রিত পুস্তক বর্ণানুসারে তাঁহার শূদ্র লিখনাদিতে ক্ষমতাপন্ন হইলেন। পরে শ্রীযুক্ত ইংলণ্ডীয় লোকেরা মুদ্রিত পুস্তকের পুচার করিলে ও এতদেশীয়েরা তৎপথপুঞ্জ হইয়া কামসংবর্ধক নানাবিধ রতিমঞ্জরী বিদ্যাসুন্দর কামশাস্ত্র পুচার করিয়া বালকের-

Certainly the most striking and innovative of the Bengali typefaces produced by the Baptist Mission typefoundry is BM III,<sup>138</sup> which dispenses with the horizontal headline that had become the norm for Bengali printed characters. This is replaced by a curved stroke, akin to that of the written hand, which produces a dynamic effect and is enhanced by a simultaneous alteration in stroke direction as described in fig. 1. Although BM III was designed in recognition of the fact that 'printing confessedly cannot rival good Bungla writing, or form a good model for the imitation of scholars',<sup>139</sup> the original reason behind its conception was expressed by E.S. Montagu:

To students in Bengalee it is well known, there are no artificial helps in the characters of the language by which proper names, quotations, or peculiarities of expression or thought can be marked so as readily to catch the eye . . . . The nature also of the Bengalee type does not readily admit of Capitals, though this is by no means impracticable.

From frequent communications on the subject with Mr PEARCE, the Superintendent of the Baptist Mission Press, . . . it appeared to the Secretaries, that the easy curvilinear method of writing in use among the natives was imitable to a sufficiently useful extent to answer the purpose required; and Mr PEARCE is ably superintending their execution . . . . By the varied use of the curvilinear and rectilinear type together, it is obvious the whole effect produced by Roman and Italic in the English character, may be attained in the Bengalee, the contrast between the two kinds of *matro* or running line at the head of the letters as readily catching the eye.<sup>140</sup>

The design of the majority of the conjuncts as one sort, possessing approximately the same depth as the other characters, contributes to a well-balanced face. Despite the careful construction and uniqueness of this curvilinear fount, it does not appear to have enjoyed popular usage. This is possibly due to the variation in colour, produced either by loose printing or poor justification in casting, which creates a more uneven impression on paper than the typeface

138. See pls. 54 and 59.

139. *Report of the Provisional Committee of the Calcutta School Book Society* (Calcutta, 1817), Appendix, p. 3.

140. *Ibid.*, p. 50.

deserves. The bad positioning of the subscript vowel signs also detracts from the merits of this typeface, necessitating generous leading and thereby rendering the fount unsuitable for use as a regular text face. This last feature is also an indication of the Calcutta Brethren's acceptance of existing composing techniques.<sup>141</sup>

Whilst no further innovations were to emerge from the Calcutta Baptists in terms of Bengali type design or composition, during the nineteenth century they continued to extend and refine their range of Bengali typefaces. In order to achieve optimum results the number of sorts was increased. In founts such as VF1,<sup>142</sup> the range of characters was extended to include manuscript style ligatures<sup>143</sup> that served to eliminate the frequent and clumsy combinations of simple consonants with subscribed vowel signs. Additional conjuncts containing ঞ as the second element were also designed: ঞ and ঞ , although some like ঞ remained. This feature does not appear entirely successful, for in some cases the upward swing of the ঞ is too pronounced and renders these conjuncts obtrusive.

The imprints of the Baptist Mission Press, notably the 1868 edition of the *Hitopadeśa*, the *Nūtana Dharmaniyama* (New Testament in Bengali) of 1865, and the *Saiñka Susamācāra Catuṣṭaya* (Four Gospels) published in 1872,<sup>144</sup> reveal a higher standard of typography than that normally exhibited by Serampore publications. The type designs of the Calcutta Missionaries, their choice of founts from other foundries, and their arrangement of type-matter on the page all indicate a move towards a typography closer to Bengali

141. See below (chapter 8) for a discussion on the *Akhand* and *Degree* systems of composition.

142. i.e. specimen no. VI; pl. 57.

143. Unless otherwise specified, in this study the term 'ligature' denotes the combination of a consonant with a vowel, whereby another character shape (i.e. sort) is produced.

144. See pls. 60-64, and also Bibliography of Bengali publications.

সুলেমানের

## হিতোপদেশ।

১ অধ্যায়।

- ১ ইশ্রায়েলবংশীয় দায়ূদ রাজার পুত্র সুলেমানের এই হিতোপদেশ
- ২ প্রজ্ঞা ও উপদেশ দিতে,  
ও ধর্ম ও সুবিবেচনার বাক্য জানাইতে,
- ৩ এবং বুদ্ধির উপদেশ  
ও ধর্ম ও সুবিচার ও যথার্থতা গ্রাহ্য করাইতে,
- ৪ এবং অবিভ্র লোককে সতর্কতা  
ও যুব লোককে জ্ঞান ও পরিণামदर्শিতা দিতে যোগ্য।
- ৫ ইহাতে মনোযোগ করিলে বিদ্বান লোকের পাণ্ডিত্য বৃদ্ধি পাইবে,  
ও সুবোধ লোক প্রবীণতা লাভ করিবে।
- ৬ এবং হিতোপদেশ ও তাহার অর্থ  
ও পণ্ডিতগণের বাক্য ও তাহাদের গুঢ় কথা বুঝিতে পারিবে।
- ৭ পরমেশ্বর বিযয়ক যে ভয়, সেই জ্ঞানের আরম্ভ;  
কিন্তু অজ্ঞানের প্রজ্ঞা ও উপদেশ তৃচ্ছবোধ করে।
- ৮ হে আমার পুত্র, তুমি নিজ পিতার উপদেশ শ্রবণ কর,  
ও নিজ মাতার আজ্ঞা অগ্রাহ্য করিও না।
- ৯ কারণ সে বাক্য তোমার মনোহর শিরোভূষণ  
ও গলদেশের হারস্বরূপ।
- ১০ হে আমার পুত্র, পাপিগণ তোমাকে কুপথে লওয়াইলে  
তুমি সন্মত হইও না।
- ১১ এবং তাহারা যদি কহে, আমাদের সহিত আইস,  
C. A. B. H.] B I

- আমরা রক্তপাত করণার্থে লুকাইয়া থাকি,  
ও নির্দোষদিগকে অকারেণে ধরিতে গুপ্ত থাকি;  
১২ এৰং পরলোকের ন্যায় ত্রাহাদিগকে জীবন্ত গ্রাস করি,  
ও খাতে পতিত লোকের ন্যায় বলবানদিগকে গ্রাস করি;  
১৩ ভাহাতে সর্বপ্রকার বহুগুণ্য দ্রব্য পাইব,  
ও লুচি ত্রব্যেতে আপন ২ গৃহ পরিপূর্ণ করিব;  
১৪ আইস, তুমি আমাদের মধ্যে এক জন অংশী হও;  
আমাদের সকলের এক তোড়া হউক;  
১৫ হে আনার পুত্র, তাহাদের সহিত সেই পথে যাইও না,  
তাহাদের মাগহইতে ভোগার চরণ ফিরাও;  
১৬ কেননা তাহাদের চরণ কুক্ৰিয়া করিতে দোড়ে,  
ও রক্তপাত করিতে বেগে ধাবমান হয়।  
১৭ পক্ষির দৃষ্টিগোচরে জাল পাতা নিত্য রুখা হয়।  
১৮ তাহারা আপনাদেরই রক্তপাত করিতে লুকাইয়া থাকে,  
ও আপনাদেরই প্রাণ ধরিতে গুপ্ত থাকে।  
১৯ পরধনগ্রাহী সকলের এই গতি,  
সেই ধন গ্রাহকেরই প্রাণ নষ্ট করে।  
২০ প্রজ্ঞা রাজপথে থাকিয়া ডাকে,  
ও চকে দাঁড়াইয়া উচ্চৈশ্বর করে।  
২১ সে লোকদের প্রধান সমাগমস্থানে আস্থান করে,  
এবং নগরের মুক্ত ঘাটে এই ২ কথা বলে,  
২২ হে অজ্ঞানেরা, তোমরা কত দিন অজ্ঞানতা ভাল বাসিবা?  
হে নিন্দকেরা, তোমরা কত দিন নিন্দাতে সন্তুষ্ট হইবা?  
হে নির্দোষ সকল, তোমরা আর কত কাল জ্ঞানকে অবজ্ঞা করিবা?  
২৩ আমার অনুযোগেতে মন ফিরাও;  
তাহাতে আমি নিজ আত্মাধারা তোমাদিগকে আপ্যায়িত করিব,  
ও আপন কথা তোমাদিগকে জ্ঞাত করিব।  
২৪ আমি ডাকিলে তোমরা আসিতে সম্মত হইলা না,  
ও হস্ত বিস্তার করিলে তোমরা কেহ মানিলা না;  
২৫ কিন্তু আমার তাবৎ পরামর্শ তুচ্ছ করিলা,

- ও আমার অনুযোগ গুনিতে ইচ্ছা করিলা না;  
২৬ এই নিমিত্তে তোমাদের বিপদকালে আমিও হাসিব,  
ও তোমাদের ভয় উপস্থিত হইলে গরিহাস করিব।  
২৭ যখন বজ্রার ন্যায় তোমাদের আশঙ্কা উপস্থিত হইবে,  
ও ঘৃণায়ুর ন্যায় তোমাদের বিপদ আসিবে,  
ও যখন দুঃখ ও ক্লেশ তোমাদের প্রতি ঘটবে;  
২৮ তৎকালে সকলে আমাকে আস্থান করিবে,  
কিন্তু আমি উত্তর দিব না;  
তাহারা আমার অযেয়ণ করিবে,  
কিন্তু আমার উদ্দেশ্য পাইবে না।  
২৯ কারণ তাহারা জ্ঞানকে হেয়জ্ঞান করিত,  
ও পরমেশ্বর বিষয়ক ভয়কে মনোনীত করিত না;  
৩০ এৰং আমার পরামর্শ গ্রহণ করিত না,  
ও আমার অনুযোগবাক্য সকল তুচ্ছ করিত।  
৩১ অতএব তাহারা আপন ২ কন্ঠের প্রতিফল ভোগ করিবে,  
ও আপন ২ কুপরামর্শের সম্পূর্ণ ফল পাইবে।  
৩২ অজ্ঞান লোকদের বিপথগমন তাহাদিগকে বিনষ্ট করিবে,  
ও মূর্থদিগের নিশ্চিত্ততা তাহাদিগকে বিনাশ করিবে;  
৩৩ কিন্তু যে জন আমার কথা শুনে,  
সে নিরাপদে বাস করিবে,  
ও অমঙ্গলের ভয়হইতে বিশ্রাম পাইবে।

২ অধ্যায় ।

- ১ হে আমার পুত্র, তুমি যদি আমার কথা গ্রহণ কর,  
ও আমার আজ্ঞা মনে রাখ;  
২ এৰং যদি প্রজ্ঞাতে মনোযোগ কর  
ও বুদ্ধিতে নিবিষ্টমনা হও;  
৩ এৰং যদি সুবিবেচনাকে আস্থান কর  
ও বুদ্ধির জন্য উচ্চৈশ্বর কর;  
৪ এৰং যদি কপার ন্যায় তাহার অযেয়ণ কর  
ও গুপ্ত ধনের ন্যায় তাহার অনুসন্ধান কর;

কাপে ইব্রাহীম্ অবধি দায়ুদ্ পর্য্যন্ত সর্বশুদ্ধ চৌদ্দ পুরুষ; এবং দায়ুদ্ অবধি বাবিলে নীত হওন পর্য্যন্ত চৌদ্দ পুরুষ; এবং বাবিলে নীত হওন অবধি খ্রীষ্ট পর্য্যন্ত চৌদ্দ পুরুষ।

যীশু খ্রীষ্টের জন্ম এই কাপে হইয়াছিল। তাঁহার মাতা মরিয়ম যুষফের প্রতি বাগদত্তা হইলে তাহাদের নন্দ হওনের পূর্বে সে পবিত্র আত্মাদ্বারা গর্ভবতী হইল। ইহাতে তাহার স্বামী যুষফ্ ধার্মিক হওয়াতে তাহার কনক প্রকাশ করিতে অনিচ্ছুক হইয়া তাহাকে গোপনে ত্যাগ করিতে মনস্থ করিল। সে এমত ভাবিতোছিল, ইতিমধ্যে পরমেশ্বরের দূত স্বপ্নযোগে তাহাকে দর্শন দিয়া কহিল, হে দায়ুদের সন্তান যুষফ্, তুমি আপন স্ত্রী মরিয়মকে গ্রহণ করিতে ভয় করিও না, কেননা তাহার গর্ভ পবিত্র আত্মা হইতে হইয়াছে। সে পুত্র প্রসব করিবে, এবং তুমি তাঁহার নাম যীশু (জ্ঞানকর্তা) রাখিবা; কারণ তিনি আপন লোকদিগকে তাহাদের পাপহইতে জ্ঞান করিবেন। এই রূপ হওয়াতে ভবিষ্যদ্বক্তাদ্বারা কথিত পরমেশ্বরের এই বাক্য সফল করা গেল, বথা, “দেখ, এক কন্যা গর্ভবতী হইয়া পুত্র প্রসব করিবে, ও “তাঁহার নাম ইম্মানুয়েল, অর্থাৎ ‘আমাদের সহিত ঈশ্বর’ “হইবে।” পরে যুষফ্ নিদ্রাহইতে উঠিয়া পরমেশ্বরের দূতের আজ্ঞানুসারে আপন স্ত্রীকে গ্রহণ করিল; কিন্তু যে পর্য্যন্ত সে আপন প্রথমজাত পুত্র প্রসব না করিল, তাবৎ যুষফ্ তাহাতে উপগত হইল না; পরে পুত্রের নাম যীশু রাখিল।

২ অধ্যায় ।

অনন্তর হেরোদ্ রাজার অধিকারসময়ে যিহূদা দেশের বৈৎলে-হম্ নগরে যীশুর জন্ম হইলে পর, কএক জন জ্যোতির্বেত্তা পূর্বদিগহইতে যিক্শালম্ নগরে আসিয়া কহিল, যিহূদীয়দের যে রাজা জন্মিয়াছেন, তিনি কোথায়? আমরা পূর্বদিগে থাকিয়া তাঁহার তারা দেখিয়াছি, অতএব তাঁহাকে প্রণাম করিতে আইলাম। এ কথা শুনিয়া হেরোদ্ রাজা ও তাহার সহিত যিক্শালম্ নগরস্থ সকল লোক উদ্ভ্রম হইলে সে তাবৎ প্রধান যাজক ও লোকদের অধ্যাপকগণকে একত্র করিয়া জিজ্ঞাসা করিল, খ্রীষ্ট

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প্রভু যীশু খ্রীষ্টের

জীবনচরিত্র

অর্থাৎ

সত্যিক সুসমাচারচতুষ্টয় ।

THE

FOUR GOSPELS

ANNOTATED

IN BENGALI.

CALCUTTA :

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1872.



## মুখি ৫; ১৮-২১।

১৮ কিন্তু পূর্ণ করিতে আসিয়াছি। কেননা আমি সত্য করিয়া তোমাঙ্গিকে কহিতেছি, যে পর্যন্ত আকাশ ও পৃথিবী লুপ্ত না হইবে, তাবৎ সমস্ত সফল না হইলে যবহার এক মাত্রা কি

১৯ এক বিম্বুর লোপ হইবে না। অতএব যে কেহ এই ক্ষুদ্রতম আঙ্গুর মধ্যে কোন এক আঙ্গুর লোপ করে, ও লোকদিগকে সেই রূপ শিক্ষা দেয়, সে স্বর্গরাজ্যের মধ্যে ক্ষুদ্রতম বলিয়া বিখ্যাত হইবে; কিন্তু যে যুক্তি তাহা পালন করে ও তক্রপ শিক্ষা দেয়, সে স্বর্গরাজ্যের মধ্যে মহান বলিয়া বিখ্যাত হইবে।

২০ কেননা আমি তোমাঙ্গিকে কহিতেছি, শাস্ত্রাধ্যাপক ও ফরীশ লোকদের অপেক্ষা তোমাদের ধার্মিকতা প্রচুর না হইলে তোমরা কোন মতে স্বর্গরাজ্যে প্রবেশ করিতে পাইবা না।

২১ আর 'তুমি নরহত্যা করিও না; আর যে নরহত্যা করে, সে বিচারস্থানে দণ্ডযো্য হইবে;' এই যে কথা পূর্বকালীন

২৩; ১৪। ইব ১০; ৩-১২।

৩ ২৪; ৩৫। লু ১৩; ১৭।

৪ নিদি. বি ২৭; ২৩। যাক ২; ১০।

৫ বি ১২; ৩২। লু ১১; ৪২।

৬ রো ২; ১৩-১৫। ১০; ২, ৩।

৭ নিদি. মা ২০; ১৩।

পুস্তক সকল; ভূতীয়তঃ পীতাদি ধর্মগ্রন্থ সকল, অর্থাৎ বায়বেদ গীতা, শলোমনের রচিত গ্রন্থত্রয়, ইয়েব, রুৎ, বিলাপ, ইষ্টের, দানিয়েল, ইয়া, নহিমিয় ও বংশাবলির দুই গ্রন্থ। দানিয়েল ভবিষ্যৎকার অর্থাৎ ধর্ম-প্রচারকের পক্ষে নিখুঁত না হইয়া রাজমন্ত্রী ছিলেন বলিয়া মিছুরি সোকেরা তাঁহার রচিত গ্রন্থ দ্বিতীয় শ্রেণীতে না রাখিয়া এই ভূতীয় শ্রেণীতে রাখিয়াছে। ব্যবস্থা ও ভবিষ্যৎগ্রন্থ ও গীতপুস্তক, তিন ভাগের এই তিনটি নাম অত্রভাগের এক স্থানে (লুক ২৪; ৪৪) পাওয়া যায়; অন্যান্য স্থানে ব্যবস্থা ভয়ে এই তিন নামের মধ্যে কেবল একটি কিংবা দুইটি নাম লিখিত হইয়াছে। এই স্থলে "ব্যবস্থা ও ভবিষ্যৎগ্রন্থ" এই দুই নামে ধর্মপুস্তকের আদিভাগ বুঝায়। প্রভু যীশু খ্রীষ্ট তাহা পূর্ণ করিতে আসিয়াছেন। "পূর্ণ করা" এই শব্দের তিন প্রকার প্রয়োগ হয়। কখন ২ তাহা কোন বিধির প্রতিপালন, কখন ২ বা কোন প্রতিজ্ঞাকে সফল করণ, কখন ২ বা শিক্ষার অসম্পূর্ণতার প্রতিকার করণ-পূর্বক সম্পূর্ণ শিক্ষা দেওন বুঝায়। যীশু ঈশ্বরীয় আঙ্গুর পালন করিতেন, এবং অনেক ঈশ্বরীয় প্রতিজ্ঞা সফল করিলেন বটে, তথাপি বোধ হয় এই স্থলে তিনি সম্পূর্ণ শিক্ষা দেওনদ্বারা ব্যবস্থাকে পূর্ণ করিতে অঙ্গীকার করিতেছেন। আর তিনি কেবল মৌখিক শিক্ষা দিতেন না, বরঞ্চ ক্রিয়া ও আচরণদ্বারাও শিক্ষা দিতেন। যে পূর্ণতার কথা হইতেছে তাহার মধ্যে বিশেষতঃ ইহা গণনীয় যে যীশুর শিক্ষানুসারে কেবল বাহ্য ক্রিয়াদ্বারা তাহা নয়, বরঞ্চ আন্তরিক ভাবদ্বারাও মনুষ্যের ধোঁষাধোঁষ নিরূপিত হয়।

১৮। "মাত্রা" ও "বিশ্ব" এই দুই শব্দদ্বারা অর্থ ল্পট হয়, কিন্তু বাস্তবিক ভুলভাবে "ইয়দু" ও "অতি সুন্দর দেখা" এই শব্দ আছে। ইহী ভাষার বর্ণমালার মধ্যে "ইয়দু" লক্ষ্যপেক্ষা ক্ষুদ্র অক্ষর, এবং "অতি সুন্দর দেখার" বাঙ্গালা রেকের সমূহ আকৃতি, কিন্তু প্রায় মাত্রার সমূহ প্রয়োগ আছে। ঈশ্বরীয় শিক্ষার মধ্যে অতি ক্ষুদ্র যে অংশ তাহাও বহুদূর এবং বহু-পূর্বক রক্ষণীয়।

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এই স্থলে ধর্মপুস্তকের আদিভাগের অলোপ্যতা বিষয়ক যে সাক্ষ্য প্রভু যেন তাহা অতি ল্পট ও অতি দৃঢ়; আর তাহার তাহার এই সাক্ষ্য অগ্রাহ্য করে, অর্থাৎ ধর্মপুস্তকের আদিভাগ ঈশ্বরপ্রণীত নয় এমন কথা বা-হারা বলে, তাহার একেবারে প্রভুকে হয় তো ভ্রাত নয় তো প্রবন্ধক কেন বলে না? ব্যবস্থা অলোপ্য ও অস-জ্ঞানীয়, এই কারণ পাণের দওরপে প্রভু যীশু খ্রীষ্টকে অসম্মানিত করা করিতে হইল। পাণের দও বিষয়ক ঈশ্বরীয় প্রতিজ্ঞা যীশুতে সফল হইয়াছে, এই কনো বিশ্বাসি লোক পাণের দও আর পাইবে না। কিন্তু অধ্যাপি ব্যবস্থাদ্বারা কর্তব্যকর্তব্যের জ্ঞান ও পাণ বিষয়ক চেতনা হয়।

২০। তৎকালীন যিহুদি লোকদের মধ্যে এই প্রবাদ প্রচলিত ছিল, যে পরমেশ্বর যদি কেবল দুই জন ব্যক্তি-রেকে আর কোন মনুষ্যকে স্বর্গে স্থান না দেন, তবে অবশ্য এক জন শাস্ত্রাধ্যাপককে ও এক জন ফরীশি লোককে মনোনীত করিয়া স্বর্গের অধিকারী করিবেন। কিন্তু সর্বসাধারণে এমন প্রশংসার পাত্র হইলেও তা-হার প্রভুর অতিমত ধর্মশিক্ষা দিত না, এবং আচার ব্যবহারেও সকলে সরল ছিল না। এই স্থলে প্রভু তাহা-দের শিক্ষার মধ্যে চারি বিষয় উল্লেখ করিয়া তাহার কুটি দেখান। সেই চারি বিষয়, ১ নরহত্যা, ২ ব্যক্তি-চার, ৩ দিব্য, ৪ টবরনির্ঘাতন অর্থাৎ প্রতিহিংসা।

২১। "পূর্বকালীন লোকদ্বারা" কিংবা "পূর্বকালীন লোকদের নিকটে উক্ত কথা," এই কএক শব্দে পুস্তক-পরম্পরাবিধি চলিত শিক্ষা বুঝায়। তাহার মধ্যে সত্য অন্তত দুই প্রকার কথা অর্থাৎ ঈশ্বরদত্ত ব্যবস্থার বচন ও মনুষ্যকল্পিত টীকা মিশ্রিত ছিল। ব্যবস্থার অস-ম্পূর্ণতা প্রযুক্ত টীকার অনেক ক্রম সফল ছিল। "তুমি নরহত্যা করিও না," এই বচন বহু আঙ্গুর মধ্যে একটা আঙ্গুর। "যে নরহত্যা করে সে বিচারস্থানে দণ্ডযোগ্য হইবে," এই বচন মনুষ্যকল্পিত টীকা, আর এই টীকা মূল নয়। যিহুদীয়দের প্রায় প্রত্যেক নগরে সমাজগৃহের সভার অধীন "বিচারস্থান" ছিল, বি. বি. ১৬; ১৮। কেহ ২ বলে তাহার তেইশ জন, কেহ ২ বলে কেবল সাত

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chirography. This tendency, which recognized the limitations of the current typefounding and printing technology, was influential in shaping the developing Bengali printed character: Bengali vernacular printing came under the domination of their press after 1838.<sup>145</sup>

145. Subsequent to their reunion with the Serampore Mission in 1837 and the death of Joshua Marshman in 1838, the last surviving member of the Trio.

### 3.iii The Bishop's College Press

Another press and typefoundry attached to a missionary establishment was that set up by the Bishop's College; an institution founded by Bishop Thomas Fanshawe Middleton at Sibpur in 1820 and superintended by the Society for the Propagation of the Gospel.<sup>146</sup> The first printer to the College, Henry Towns~~w~~end, had left England in 1823<sup>147</sup> equipped with a printing press, types, and miscellaneous printing materials requisite to setting up a printing house for the College. On 26 July 1824 he remarked in a letter to Revd A. Hamilton:

The Bengali types, ordered by me in your name, were not among those types brought by me, in consequence of not being finished when I left England. But as they are procurable [and] here better suited to the exact work they are required for than perhaps would be if procured from England, I accordingly ordered, by the direction of the Rev. Principal, a fount of Bengali type of 240lbs from a printer who has the apparatus ready for casting.<sup>148</sup>

Townsend's letters, his work, and the reception given to his efforts by contempor<sup>ar</sup>ies are evidence of his commitment to the production of high quality vernacular imprints, irrespective of their contents or purpose. This characteristic, not shared by his peers at the other mission presses, who saw their printing activities solely as a vehicle for conveying their faith to the 'Heathen', was inherited by his successors<sup>149</sup> and became the hallmark of the Bishop's College Press. William Morton's *Dvibhāṣārthakābhidhāna, or A Dictionary of the Bengali Language*,<sup>150</sup> printed by Townsend in 1828, bears testimony to this, for here the printer's use of VF1<sup>151</sup> surpasses that of the Baptist Mission Press in its 1826 type specimen book. Particularly laudable is the careful handling of the awkward subscripts. The dictionary, necessarily comprising Bengali types mixed

146. Julius Richter, *A History of Missions in India*, trans. Sidney H. Moore (Edinburgh, [1908]), p. 156.

147. On 9 September.

148. SPG Records C. Ind. I (6)-37B.

149. He died in 1828 and was succeeded by James Sykes, W. Risdale, H.A. Haycock and T. M'Arthur respectively.

150. See pl. 65.

151. See above, chapter 3ii and below, chapter 5.

অধগার, ছেদবাক্য, an ellipsis.  
 অধুগিত, অধুগিত, inhabited.  
 অধুগ, প্রথম বিবাহিতা স্ত্রী, the first married of several wives.  
 অধুগী, অধুগী; হাব, a student, one who reads.  
 অধুগণ, আবেদন, earnest request, solicitation, prayer.  
 অধ, গাধ, a road, way, path.  
 অধীন, অধন্য, -পথিক, a traveller, messonger.  
 অধ, বসি; যজ্ঞ, a sacrifice.  
 অধকর, অপরিচিত, অজ্ঞ, unlettered, ignorant.  
 অধবাণ্ড, ডাল, the beating of time in music.  
 অধবুধী, অধবুধী, -গাধ, a cow.  
 অধবান, বৃষ, a bull.  
 অধব, মটর প্রবৃত্তি, coarse grain, as pease, tares, &c.  
 অধব, অধব; নিভ, endless, eternal, boundless, numberless.  
 অধবভার, নিভতা, endlessness, eternity.  
 অধব, অধবহিত; গাধ, afterwards; succeeding, incessant, only, unequalled.  
 অধব, ডিম্ব বাই, identical, the same, not different.  
 অধবপথিক, অনুপম, unprecedented, not experienced by others, not preceded.  
 অধব, নিভ, বন্ধ, own: an appellation of Brahma.  
 অধবভ, যারার বিরাম বাই, incessant, perpetual, constant.  
 অধবগাধ, দৃঢ়তা; দৈব, continuance or stability of a state, a not running to ruin.  
 অধব, দ্রষ্টব্য, want, need, adversity; infinite (in logic.)  
 অধব, নিষ্কৃত, useless, answering no purpose.  
 অধব, অগ্নি, fire, a species of reed.  
 অধব, গাড়ী, a cart, carriage. [to a close, not finished,  
 অধব, অনভবিত, -অনভবিত, not set (as a star), not brought  
 অধবিত, িসক, injurious, disadvantageous.  
 অধবগত, ভবিষ্যৎ, not come, not arrived, future.  
 অধবগ, নিশাপাণী, sinless, free from transgression.  
 অধবগাধ, অনভবিত, improper conduct, impurity.  
 অধব, গাধ; ভরকারী, corn, edible vegetables.  
 অধব, গুণ; দ্রষ্টব্য, secret, not easily discovered.  
 অধবগণনা, জড়তা, inactivity, dulness, stupidity.

অগাধী, গভ; অচেতন, inactive, dull, stupid, motionless.  
 অগাধ, অধিক, forlorn, orphan, without a protector.  
 অগাধি, অগাধিত, without beginning, eternal.  
 অগামা, অগামিকা, -চতুর্থঙ্গী, the fourth finger.  
 অগাধ, অগামিন, disagreeable to the sight, unwelcome.  
 অগাধক, অগামিন, without an owner or leader, unapproved, unclaimed.  
 অগামগ, অগাম, ease, facility; easy.  
 অগাধ, নিভ, অগামিত, incessant, perpetual.  
 অগাম, নাশভংগ, অধিক, non-destruction; harmless.  
 অগামিত, নিভ, অগামিত, incessant, perpetual, constant, undetermined, unregulated, not resolved.  
 অগিন, বায়ু, the wind. [unnatural state of mind.  
 অগিনগ, অগামিত, unnatural, excited, depressed; angry, অগামিন, -অগাম, an army, forces.  
 অগাম, অগামিন, not thus, unlike, dissimilar. [pendant.  
 অগাম, অগামিনী, without right or authority, subject, dependent.  
 অগাম, যিনি কেবল নয়, that which is not God.  
 অগামবদ, নাথিকতা, atheism, denial of God.  
 অগাম, অগাম, inactive, indolent.  
 অ, অগাম, prof. following, agreeing, according to.  
 অগাম, দয়া, কৃপা, pity, compassion, tenderness.  
 অগাম, অগাম, imitation; imitative.  
 অগাম, অগাম, a drawing, attraction, repetition.  
 অগাম, অগাম, an alternative, consequential step or measure, secondary injunction.  
 অগাম, অগাম, an imitation.  
 অগাম, অগাম, coinciding, friendly, cooperating, assisting.  
 অগাম, অগাম, a series, succession, method, order.  
 অগামগণিকা, সূচী, an index, table of contents.  
 অগামগ, কৃপা, pity, compassion, tenderness.  
 অগাম, অগাম, at every instant, perpetually, continually.  
 অগাম, অগাম, gone after, dependent on, attached to.  
 অগাম, অগাম, a following, a consequence.  
 অগাম, অগাম, grace, favour, kindness.

with Latin, is a neat and legible work, revealing Townsend's potential skills as a master printer of vernacular texts. His early death cut short a promising career at the Bishop's College Press.

Henry Townsend was also responsible for the establishment of the College Press's own typefoundry in 1826. He had discovered that the fount of Arabic types he had brought from England lacked certain required letterforms, and he further realized that time prohibited ordering the missing characters from London.<sup>152</sup> Townsend noted that all the printing establishments he encountered in India possessed a foundry 'for casting all Eastern types which may be deficient'. Whilst preparing for William Morton's Bengali dictionary, Townsend surmised that unless a vast range of characters was cast, the number of sorts, 'however well they may be calculated, can never be made to answer for every species of work'.<sup>153</sup>

The importance of Townsend's observation cannot be over-emphasized and is of greater consequence than the College's small undertakings in Bengali typefounding.<sup>154</sup> The requirement, peculiar to non-Latin fonts, for having the facility of generating new letterforms to cope with deficiencies in the range of sorts is equally pertinent today. This need necessarily grew with the expansion of trade and communication with other nations. The development of a native vernacular press in Bengal that commented on international affairs, coupled with the increasing trend towards transliteration of foreign words and names, verified

152. SPG Records: letter to A. Hamilton, 26 July 1824.

153. Letter to A. Hamilton, *ibid.*

154. By 30 June 1826 it had 'completed a large fount of Bengali type'; C. Ind. I (6) 40: *Report of the Printing Department at Bishop's College* (from 1st July 1825 to the 30 June 1826). However, the only fount of interest produced by the foundry is a heading face (termed here BCI) which appears to be a less graceful interpretation of BM I; see pl. 66.

১ গীত।

১

- ১ শুভংয ঐ মনুষ্য,  
যে দুষ্টদের পরামর্শে চলে নাই,  
এবং পাপিদের পথে দাঁড়ায় নাই,  
ও অবজ্ঞাকারিদের আসনে বসে নাই।
- ২ পরন্তু পুত্র নিয়মেই তাহার সম্ভাষ,  
এবং সে দিবানিশি তাহার নিয়ম ধ্যান করে।
- ৩ অপর সে জলস্রোতের নিকটে রোপিত বৃক্ষের  
সদৃশ হইবে,  
যে স্বকালে আপন ফল উৎপন্ন করে,  
ও যাহার পত্র ম্লান হয় না:  
এবং সে তাহার সকল কার্যেতে কৃতার্থ হইবে।

২

- ৪ দুষ্টেরা তাদৃশ নহে,  
কিন্তু পবনে বিকীর্যমাণ তুষের তুল্য।
- ৫ অতএব দুষ্টেরা বিচারে উঠিবে না,  
অথবা পাপিরা ধার্মিকদের সমাজে।
- ৬ কেননা পুত্র ধার্মিকদের পথ জানেন,  
কিন্তু দুষ্টদের পথ বিনষ্ট হইবে।

THE

PSALMS.

গীত সংহিতা।

Townsend's recognition of the difficulties in defining a finite list of sorts for composing Bengali.<sup>155</sup>

To some extent, this problem, first expressed by Townsend, had been overcome by Charles Wilkins with the use of *phalās* to supplement fonts with conjuncts that were lacking. The large character size of CW1 enabled Wilkins to achieve this, although it resulted in distorted forms and clumsy combinations.<sup>156</sup> With the increasing desire for a reduction in type size, particularly for the purpose of Bible translation, it became harder for the *phalā* system to be implemented. Wilkins himself increased the number of 'contractions' for CW4, as the *phalās* became too small to handle satisfactorily, and when used looked extraneous to the typeface. Moreover, presses like the Bishop's College Press, which prided itself on high-quality typography, elected to employ founts containing a large number of conjuncts and such manuscript ligatures as  $\overline{\text{इ}}$  and  $\overline{\text{ए}}$  in preference to building up letterforms from more than one element. This predilection for large founts close to calligraphic tradition prevailed until the introduction of mechanical typesetting.

It is curious to note that the converse is true when considering the evolution of Devanagari typeforms.<sup>157</sup> The first fount of Devanagari types from Serampore necessitated 700 punches in its founding, and claims have been made that it possessed almost a thousand combinations.<sup>158</sup> In Carey's Sanskrit *Grammar*, the missionary's list of combined characters<sup>159</sup> far exceeds those listed in his *Bengalee Grammar*, even though equivalents did exist in the Bengali script. An Indian named Thomas Graham, of the American Baptist Missionaries, introduced

155. Not only due to the introduction of new conjuncts for transliteration purposes, but forms of characters vary according to the style of the typeface, the nature of the work, current fashion, and the method of composition, e.g.  $\overline{\text{इ}}$  or  $\overline{\text{इ}}$ .

156. See above, chapter 1.

157. Which falls outside the scope of this thesis and merits a separate study.

158. Marshman, *Carey, Marshman, and Ward*, I, p. 179 and *Memoir Relative to the Translations* (1808), p. 19.

159. William Carey, *A Grammar of the Sungskrit Language* (Serampore, 1804).

the notion of *phalās* (later known as *degrees* or *half-forms*) for the Devanagari script.<sup>160</sup> The combined letterforms of the inherently less cursive Devanagari script were more suited to division into separate components than their Bengali counterparts, since many were still intelligible when composed laterally as well as vertically.<sup>161</sup> The American Baptist Mission in Assam also had a typefoundry which cast Assamese types, but in contrast to its Devanagari founts founded in Bombay, these types cannot be deemed to have had a significant impact on vernacular typography in terms of type design.

Economic difficulties curtailed the typefounding and printing activities of the Bishop's College Press owing to the increasing number of commercial presses able to supply imprints at more competitive prices. The precise number of its Bengali imprints is unknown, but is thought to exceed seventy.<sup>162</sup> Despite its relatively short life (1824-1870), the Bishop's College Press succeeded in introducing the art of fine printing in the Bengali script to the reading public. *Gīta Samhitā, The Book of Psalms* in Bengali and English,<sup>163</sup> printed by T. M'Arthur in 1858, still ranks as one of the best exhibits of fine Bengali typography.

160. This fount appeared in 1836.

161. For further information regarding this method of composition, see below, chapters 7 and 8.

162. Khan, *Printing in Bengali Characters*, I, p. 337.

163. See pls. 66 (showing BC1) and 67 (showing BM IV).



- 12 His likeness is as a lion thirsting to rend,  
And as a young lion lurking in covert.
- V
- 13 Stand up, O Lord,  
Take him by surprise, cast him down,  
Deliver my soul from the wicked man (who  
is) Thy sword:
- 14 From men (who are) Thy hand, O Lord,  
From men of this world, whose portion is in  
life,  
And with Thy hid treasure Thou fillest  
their body:  
They are satisfied with children,  
And leave their residue to their babes.
- 15 As for me, I shall behold Thy face in righte-  
ousness;  
I shall be satisfied on awaking with Thy  
image.

PSALM XVIII.

I

*To the Precentor: (A Psalm) of David, the  
servant of the Lord, who spake to the Lord the  
words of this song in the day the Lord de-  
livered him from the hands of all his enemies,  
and from the hand of Saul; and he said:—*

- 1 I will love Thee, O Lord, my strength:

- ১২ বিদারণ তৃষিত সিংহ,  
এবং যঁটিতে গুপ্ত সিংহ শাবকের ন্যায় তাহার  
আকৃতি।
- ১৩ হে পুভো উঠ,  
ঝটিতি ধর তাহাকে নিক্ষেপ কর,  
তোমার খড়্গীভূত দৃষ্টইহতে আমার পুণ্যকে  
উদ্ধার কর।
- ১৪ হে পুভো তোমার হস্তীভূত মনুষ্যইহতে,  
জীবনে অংশ পূর্ণ এই সংসারস্থ মনুষ্যইহতে,  
যাহারদের শরীর ভূমি তোমার গুপ্ত ধনে ভরণ কর,  
তাহারা সন্তানেতে তৃপ্ত,  
এবং তাহারা নিজ শিশুরদের নিমিত্ত আপনার-  
দের অতিরিক্ত রাখিয়া যায়।
- ১৫ কিন্তু আমি আপনি ধাৰ্মিকতায় তোমার মুখ  
দর্শন করিব,  
আমি জাগুং হইনে তোমার সাদৃশ্যে তৃপ্ত হইব।

—  
১৮ গীত।

প্রধান বাদকের প্রতি। প্রভুর দাস দাবীদের গীত, যিনি শত্রুগণের ও  
শত্ৰুদের হস্তইহতে প্রভু যে দিন তাহাকে উদ্ধার করেন সেই দিনে  
এই গীত বাস্তব প্রভুর উদ্দেশে কহিয়াছিলেন। তাহার উক্তি এই:—

- ১ আমি তোমাতে অনুরক্ত হইব, হে পুভো আমার বলা

**Section B**

**European Ventures**

## Chapter 4

## William Bolts and Joseph Jackson

The earliest recorded serious attempt to manufacture a fount of movable Bengali types for hand composition merits attention, notwithstanding the vociferous condemnation it received from Nathaniel Brassey Halhed in the preface to his *A Grammar of the Bengal Language*.<sup>1</sup> The proposed fount cut by the renowned punchcutter Joseph Jackson<sup>2</sup> (1733-1792) at the behest of William Bolts (1735-1808) affords printing historians additional insight into the difficulties encountered by pioneers in vernacular typefounding.

Harry Verelst,<sup>3</sup> a principal adversary of William Bolts, portrays the so-called Dutch adventurer<sup>4</sup> as follows:

Mr Bolts arrived in India in the year 1760, and we soon find him a principal figure amongst the groups of traders. The extent to which this gentleman engaged, and the moderation with which he conducted himself, will be best known from his fortune of ninety thousand pounds, gained within six years, together with the extreme eagerness with which he endeavoured, upon all occasions, to degrade the authority of the government, and prevent any effectual protection being given to the natives.<sup>5</sup>

The difficult relations of William Bolts with the East India Company in Bengal have been much publicized, not least by himself,<sup>6</sup> and must have constituted an obstacle to his typographic ambitions.<sup>7</sup> Nevertheless, the Appendix to Part II of *Considerations on India Affairs* contains a letter from Bolts addressed to one of

1. Halhed, *Grammar*, p. xiii.

2. Pl. 68 shows Jackson (2nd on left) working at William Caslon I's foundry.

3. Governor of Bengal 1767-1769.

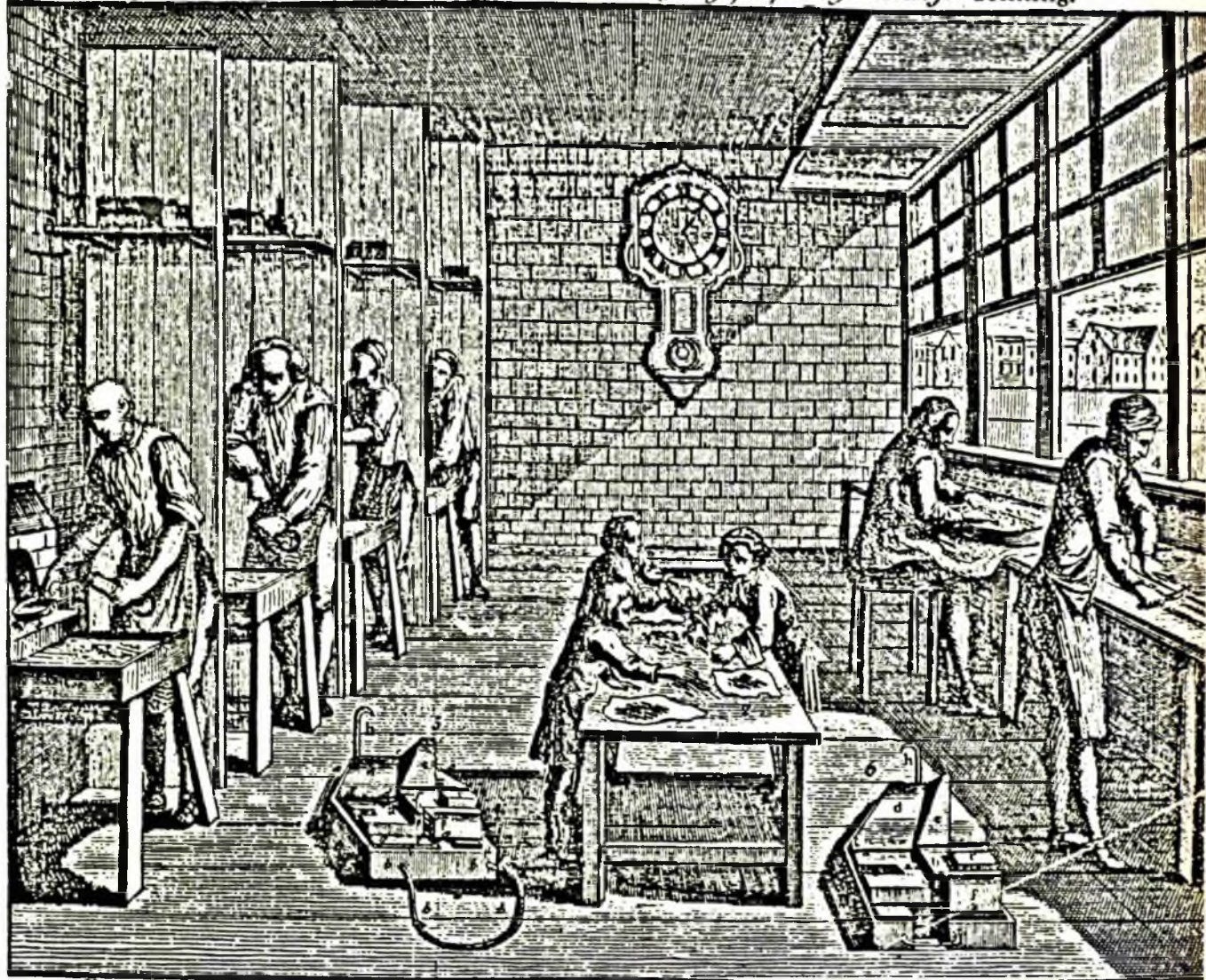
4. N.L. Hallward, *William Bolts A Dutch Adventurer under John Company* (Cambridge, 1920).

5. Harry Verelst, *A View of the Rise, Progress, and Present State of the English Government in Bengal* (London, 1772), p. 38.

6. See William Bolts, *Considerations on India Affairs; particularly respecting the present state of Bengal and its dependencies*, (London, 1772); and Part II, *Containing a Complete Vindication of the Author, from Malicious Groundless Charges of Mr Verelst*, Vols. I and II (London, 1775).

7. Bolts's advertisement for the establishment of a printing press was used against him by the Company as 'proof of . . . his attempts to sow seeds of discontent'. *Bengal Letters Received*, 26 August 1767 to April 1769 IOR E/4/28.

*A true & exact Representation of the Art of Casting & Preparing Letters for Printing.*



*Engraved for the Universal Magazine 1750. for J. Hinton at the Kings Arms in St. Pauls Church Yard LONDON.*

58. Interior of Caslon's Foundry in 1750. From the *Universal Magazine* (The mould is described, p. 106).

68. Engraving showing Joseph Jackson working at Caslon's foundry in 1750; T.B. Reed, *History of Old English Letter Foundries* (London, 1887)

the Company's Directors soliciting financial assistance in order to complete a fount of Bengali types. The letter, which is accompanied by the only known extant specimen of the typeface, is dated 23 September 1773; five years after his forcible deportation to England<sup>8</sup> and about five years before Halhed and Wilkins undertook a similar venture under 'the patronage of Governor Hastings'.<sup>9</sup> No such patronage, however, was accorded to Bolts, whose project was further jeopardized by the fact that he 'spent so much money in his litigation with the Company and its servants, and over the publication of his two volumes of "Considerations," that . . . he became bankrupt'<sup>10</sup> in October 1773.

Some time after his deportation to England,<sup>11</sup> Bolts commissioned Joseph Jackson to produce a fount of Bengali types. A specimen sheet issued by Jackson in 1773 is said to have included these types cut 'for Mr Will. Bolts Judge of the Mayors's Court of *Calcutta*, for a work in which he was engaged at the time of his sudden departure from *England* about the y. 1774'.<sup>12</sup> By this time Joseph Jackson had established himself as a typefounder of some repute, having earned the title 'first mechanick in the kingdom'.<sup>13</sup> He had learnt the art of punchcutting during his apprenticeship to William Caslon I by spying through a hole in the wainscot. Ample evidence exists of his typefounding skills which culminated in a successful facsimile of the *Doomesday Book*; a project that took ten years to print and for which he became renowned.<sup>14</sup> A Devanagari fount, cut for William Kirkpatrick of the East India service,<sup>15</sup> exhibits Jackson's ability to capture in metal the fine calligraphic strokes of the non-Latin character shapes supplied to him. Proofs of these Devanagari types

8. Even in 1770, after his deportation, Bolts applied to the EIC for financial assistance; Hallward, *William Bolts*, p. 115. n.1.

9. *East Indian Chronologist*, p. 68b.

10. Hallward, *William Bolts*, p. 131.

11. He was deported in September 1768.

12. E. Rowe Mores, *Dissertation upon English Typographical Founders and Foundries* ([London] 1778), p. 83.

13. John Nichols, *Literary Anecdotes of the Eighteenth Century* (London, 1812), II, p. 360.

14. Talbot Baines Reed *A History of the Old English Letter Foundries* (London, 1887), pp. 315 and 320-1.

15. Persian Secretary to the Commander in Chief for India. The fount was cut circa 1785.

are still extant in the form of type specimen sheets and in Kirkpatrick's Persian, Arabic and English *Vocabulary*.<sup>16</sup> The letterforms, which have the appearance of copperplate script, possess an elegance and delicacy of stroke rarely found in nineteenth-century vernacular imprints. Paradoxically, the main criticism that may be levelled at Jackson's Devanagari typeface is its close adherence to the original scrivener's hand. For no obvious aesthetic or historic reason, variations occur in the design of the basic *akṣaras* when forming ligatures, which distract the eye and impede readability. It can be speculated that such design variations existed in the original models from which Jackson cut the punches, and are unlikely to represent his own interpretation of the script. Charles Wilkins must have found Jackson's Devanagari fount unsatisfactory: in 1787 he mentions 'a want of Sanskreet types',<sup>17</sup> and for the *Grammar of the Sanskrita Language*,<sup>18</sup> he cast his own.

Halhed's testimony suggests that the fount of Bengali types proposed by Bolts was never completed. The underlying cause of the Dutchman's failure to produce a good working fount of Bengali types was not solely due to his acrimonious relationship with the East India Company<sup>19</sup> and the consequent financial difficulties. Neither was the fount flawed by any incompetence with regard to punchcutting or typefounding; a <sup>shortcoming</sup> which had threatened Wilkins's early ventures in typography.

The ability to perceive the unsuitability of certain designs for type manufacture is essential to the successful creation of a typeface. It was this facility which, whilst not expected of Joseph Jackson with regard to Indian scripts, was

16. See pls. 69 and 70; see also Bibliography for full titles.

17. Charles Wilkins, [trans.] *The Heetopadesha of Veeshnoo-Sarma* (Bath, 1787), Preface p. xvii.

18. Wilkins, *A Grammar of the Sanskrita Language*, p. xii.

19. Who, at one point [1771], reinstated him as Alderman to the Mayors Court in Calcutta; see Bolts, *Considerations*, Pt II, vol. II, pp. 626-7.

S P E C I M E N

OF THE

DEO NAGRI OR HINDVI TYPE,

CUT FOR THE PURPOSE OF PRINTING

A GRAMMAR AND DICTIONARY

OF THAT LANGUAGE,

UNDER THE INSPECTION OF

WILLIAM KIRKPATRICK,

CAPTAIN IN THE SERVICE OF THE HONOURABLE EAST-INDIA COMPANY, AND PERSIAN SECRETARY TO THE COMMANDER IN CHIEF IN INDIA,

By JOSEPH JACKSON, LETTER FOUNDER,  
SALISBURY COURT, FLEET STREET.

The ALPHABET,

क	ख	ग	घ	च	छ	ज	झ	ञ	ट	ठ	ड	ढ	ण	त	थ	द	ध	न	प	फ	
ब	भ	म	न	ल	ळ	स	र	श	ष	उ	ऊ	ऌ	ॡ	इ	ई	उ	ऊ	ऌ	ॡ	उ	ऊ

The CONSONANTS combined with the several VOWELS.

का	के	कै	कि	की	कु	कू	को	कौ	कं
खा	खे	खै	खि	खी	खु	खू	खो	खौ	खं
गा	गे	गै	गि	गी	गु	गू	गो	गौ	गं
घा	घे	घै	घि	घी	घु	घू	घो	घौ	घं
चा	चे	चै	चि	ची	चु	चू	चो	चौ	चं
छा	छे	छै	छि	छी	छु	छू	छो	छौ	छं
जा	जे	जै	जि	जी	जु	जू	जो	जौ	जं

का	के	कै	कि	की	कु	कू	को	कौ	कं
खा	खे	खै	खि	खी	खु	खू	खो	खौ	खं
गा	गे	गै	गि	गी	गु	गू	गो	गौ	गं
घा	घे	घै	घि	घी	घु	घू	घो	घौ	घं
चा	चे	चै	चि	ची	चु	चू	चो	चौ	चं
छा	छे	छै	छि	छी	छु	छू	छो	छौ	छं
जा	जे	जै	जि	जी	जु	जू	जो	जौ	जं





conspicuously absent in William Bolts and undermined the latter's only known typographic exercise. Talbot Baines Reed noted:

It appears, however, that although Mr Bolts was supposed to be in every way competent for the fabrication of this intricate character, his models as copied by Jackson, failed to give satisfaction, and the work was for the time abandoned . . . .

Mr Bolts's failure in this particular reflects no discredit on Jackson, who faithfully reproduced the models given him . . . .<sup>20</sup>

Bolts is known to have 'wholly applied himself to the acquisition of the Bengal dialect'.<sup>21</sup> But such an application would not necessarily have provided Bolts with an appreciation of Bengali calligraphy, nor with an insight into the intricacies of Bengali type-cutting. His ignorance is reflected in the typeface sample he submitted to the Court of Directors. An examination of this specimen,<sup>22</sup> which is unaccompanied by a commentary, reveals Bolts's poor understanding of the basic Bengali syllabary and an inability to differentiate between cursive and decorative styles of Bengali manuscript. Within this one sample three kinds of the *akṣara ja* are represented, of which one is the figure 4; two forms of ঞ ; and two of ঞ . Bolts's intention may have been to provide alternative forms of the one character, but there is no evidence of this. Furthermore, the choice of the cursive style for typographic purposes should have been recognized as inappropriate.

The cursive Bengali hand<sup>23</sup> contravenes two basic criteria required of good typography, namely that it should possess a high degree of legibility and be aesthetically acceptable, if not actually pleasing, to the reader. The cursive writing style of Bengali is by nature informal, retaining the personal

20. Reed, *Old English Letter Foundries*, pp. 318-9.

21. Bolts, *Considerations*, Pt II, vol. II, p. 9.

22. See pl. 71.

23. As distinct from the formal decorative hand; see above, chapter 1.

## NUM. LVIII.

*COPY of a Letter from William Bolts to William James, Esq; one of the East India Directors, containing a Proposal for the Introduction of Printing in Bengal, and a Specimen of the Bengal Alphabet in new-invented Types. Dated the 23d of September 1773.*

To William James, Esq;

S I R,

**A**T my leisure hours, I have sometimes employed myself in contriving a set of types for printing the *Bengal* language, which the present state of my finances will not admit of my finishing, on my own account. Inclosed you have a specimen of the letters of the alphabet, which are finished; but besides which, many compound and conjunctive characters are yet wanting.

As the introduction of printing with these types would be of eminent service in the Company's territorial dominions of *Bengal* and the adjacent provinces, particularly in your revenue-department, I should have no doubt but the Court of Directors would very readily contribute towards the completion of this desirable object, if the proposal did not come from me. But that the time which I have employed in this business may not, therefore, be thrown away, if I can help it, I take this method to know the determination of the Court, and request the favour of your proposing it to them, to take the types, on their own account, upon reasonable terms; and I will engage to complete all the compound and other characters in a manner fit for printing with the greatest ease. I am, with respect,

S I R,

Your most obedient,

humble servant,

(Signed)

WILLIAM BOLTS,

London;  
the 23d Sept. 1773.

*Specimen of the Bengal Alphabet.*

ক্ৰ ম গ ঘ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ ঙ  
 ল ঞ ত দ ধ ঞ ন প ফ ব ভ ম য ঞ ল ন শ ষ  
 ঠ ম হ ঞ

LETTER

characteristics of the writer, and thereby generating almost infinite varieties with no accepted standard. It is thus exceptionally difficult to transform into type, not solely because of its complex and cursive nature, but because the forms employed are often identifiable only in context and not in isolation. The separation of character elements into usable metal components would have created problems for the type designer or founder as well as the compositor. The number of sorts and ligatures would have been extensive, as the character shapes would vary according to their combinations,<sup>24</sup> rendering it difficult for the designer to achieve uniformity and harmony in design. In short, the resulting cursive typeface would have required complicated setting, printed poorly, and remained legible only to a minority.

In the light of the sample supplied by William Bolts, containing the decorative manuscript style interspersed with cursive styles, Halhed's assessment of this fount can be considered justifiable:

Mr Bolts (who is supposed to be well versed in this language) attempted to fabricate a set of types . . . with the assistance of the ablest artists of London. But as he has egregiously failed in executing even the easiest part, or a primary alphabet, of which he has published a specimen, there is no reason to suppose that his project when completed [*sic*], would have advanced beyond the usual state of imperfection to which new inventions are constantly exposed.<sup>25</sup>

Moreover, had Bolts received the financial and moral backing of the East India Company, which he felt was personally denied to him,<sup>26</sup> his chances of producing a viable fount of Bengali types would not have improved significantly. The technical skills of one of the ablest punchcutters were

24. Judging by Jackson's Devanagari fount, this may have been the intention - but Wilkins's Devanagari fount was also large.

25. Halhed, *Grammar*, p. xxiii.

26. 'I should have no doubt but the Court of Directors would very readily contribute . . . if the proposal did not come from me'; Bolts *Considerations*, Pt II, vol. II, Appendix, p. 285.

insufficient to overcome Bolts's inadequate knowledge<sup>27</sup> of the Bengali writing system. In turn, the relative success of the Bengali types which Halhed employed for his *Grammar* was not merely due to the patronage of the East India Company and Wilkins's dubious typefounding skills, but rather to the judicious choice of the stylized decorative hand from which to derive the typeface.<sup>28</sup> A comparison of the early non-Latin founts indicates that technical knowledge and skill in typefounding rarely compensate for deficiencies in the comprehension of the script concerned - as the Bengali types of William Bolts confirm. Conversely, poor designs and poor workmanship have not deterred printers from employing vernacular fonts of inferior quality when no alternative is available, provided the letterforms remain intelligible to the reader.

William Bolts's pioneering attempt to manufacture a typeface for the vernacular of Bengal was destined to fail. He was at odds with its rulers, and possessed neither a true appreciation of the writing system nor was conversant with type design. Yet his ill-considered venture was not futile, for it benefited his successors,<sup>29</sup> since it recognized the need for vernacular types, and illustrated the perennial difficulties encountered by non-native typefounders. His example has, however, not prevented the continued repetition of such errors.<sup>30</sup>

27. Which indicates inadequate research.

28. Apart from any incidental inscriptional influence; see chapter 7.

29. Halhed evidently took note of it.

30. See below, chapter 6.

## Chapter 5

## Vincent Figgins and Richard Watts.

Joseph Jackson's well-publicized failure to produce a satisfactory fount of Bengali types was not emulated by his one-time apprentice Vincent Figgins (1766-1844). The Bengali fount cut by Figgins, perhaps the first to be cut on a commercial basis, was employed by eminent printers from the first quarter of the nineteenth century. It replaced Charles Wilkins's fourth fount as the standard for Bengali composition,<sup>4</sup> and its use continued until the advent of mechanical composition for the Bengali script.

Vincent Figgins became apprenticed to Joseph Jackson at the age of sixteen and continued in his service for ten years, rising to the position of manager. Upon Jackson's death in 1792, Figgins was unable to purchase his master's foundry which he considered to be over-priced; the foundry was purchased by William Caslon III.<sup>2</sup> Encouraged by John Nichols, a close friend of Jackson's, and with 'a large order (two founts, great primer and pica, of each 2,000lb ...)',<sup>3</sup> Figgins set up his own foundry at the Swan Yard, Holborn.<sup>4</sup> He soon displayed his skills by the completion of an order, originally begun at Jackson's foundry, which required him to copy Jackson's fount of 2-line English Roman cut for Macklin's *Bible* - the original matrices having become the property of Caslon III. The replica fount which was displayed in an undated type specimen sheet issued in 1792 established 'his reputation as an excellent artist'.<sup>5</sup> Hansard

1. <sup>Principally in England.</sup>
2. Who removed it to Finsbury Sq. for a few years and then transferred it back to its old premises in Dorset St.; Reed, *Letter Foundries*, p. 325.
3. T.C. Hansard, *Typographia* (London, 1825), p. 360.
4. The foundry moved to West St., West Smithfield in 1801, and from there to Ray St., Farringdon Rd. in 1865; Reed, *Letter Foundries*, pp. 341 and 343.
5. Reed, *Letter Foundries*, pp. 336-7. The only known extant copy of the type specimen sheet is owned by Berthold Wolpe and reproduced in his facsimile reprint: *Vincent Figgins Type Specimens 1801 and 1815* (London, 1967), p. 14.

recorded, 'the fount . . . was put into use to begin 'Deuteronomy about the year 1793'.<sup>6</sup>

Similar projects initiated at Jackson's foundry devolved upon Figgins in preference to Caslon; one such project was a fount of Double Pica Greek purchased by the Oxford University Press. Original founts produced by Figgins also included non-Latin designs. According to Reed, his fount of Persian/Nastáliq types was completed under the supervision of Sir William Ouseley.<sup>7</sup> There is some uncertainty, however, as to whether it is the fount illustrated at the beginning of the first volume of *Oriental Collections* by Ouseley in an advertisement which reads:

I have employed a few leisure hours in superintending the execution of a new Persian Type, which will . . . exhibit as faithfull a representation of the true *Taleek* character, as can be effected by any imitative powers of the typographick art. But so very difficult, tedious, and, to an individual, so expensive is the performance of this undertaking . . . that the following line is the only specimen of the new letters, combined, which I am enabled to give in the present Number.<sup>8</sup>

The types illustrated are, however, not to be found in the second volume of *Oriental Collections* published in 1798, nor do they correspond to the skilfully executed Persian types (on Paragon body), shown in Figgins's type specimen books,<sup>9</sup> which possess a smaller ascender height.<sup>10</sup>

At the beginning of the nineteenth century Figgins was commissioned to cut a 'fount of English Telegu from a MS., for the East India Company',<sup>11</sup> for printing regulations by its Madras administration. In 1802 Figgins issued a

6. See Hansard, *Typographia*, p. 359. When it also appeared in his first type specimen book.

7. Reed, *Letter Foundries*, pp. 338-339.

8. W. Ouseley, ed., *Oriental Collections*, I (London, 1797). It is to be found at the beginning of the copy (held at the St Bride Printing Library) which was formerly the property of T.B. Reed. But Reed, (*Letter Foundries*, p. 339, n. 1) refers to the advertisement as being at the 'close of the 1st volume'.

9. The earliest known type specimen of Figgins's Persian fount appeared in 1833; see pl. 72.

10. Compare the height of the *alefs*.

11. Reed, *Letter Foundries*, p. 339; this information was probably taken from Hansard, *Typographia*, p. 403.

PERSIAN,  
ON PAROGAN BODY.

و بلا مشارکت غیري در تصرف مالکانه من بود  
بعوض مبلغ یک هزار روپيه شاه جهان، رایج  
الوقت بوزن یازده ماث بدست خواجہ محمد ولد  
خواجہ بایزید فرو ختم و مبلغ مذکور در قبض و تصرف  
ش خود اوردم پسایه باسم رجید و فتو کوا، داوند  
که ان خانہ ملکہ دا موروثہ بایع مذکور بود و  
شیخ عبداللہ ولد شیخ عبداللہ عمده نمود کہ  
اگر ثانی اسحال وارث دیگر پیدا شود و دعوی  
کند او از عہدہ جواب ان براید این چند کلمہ

PICA BENGALÉE.

পৃথিবী বারি ভাগে বিভক্ত আছে ইউরোপ ও আসিয়া  
ও আফ্রিকা ও আমেরিকা। ইউরোপ ও আসিয়া ও আফ্রিকা  
এই তিন ভাগ এক মহাদ্বীপে আছে ইহারা কোন সমদ্বারা  
পরস্পর বিভক্ত নয় কিন্তু আমেরিকা পৃথক এক দ্বীপে পৃথক  
দ্বীপহইতে দুই হাজার কোশ অন্তর। তিন শত ছাব্বিশ  
বৎসর ইহা এক হাজার চারি শত বিবানবই ইংগলীশ  
সনে ও আট শত আট বই বাঙ্গালা সালে আমেরিকা  
পৃথক জ্ঞান গেল তাহার পূর্বে আমেরিকা কোন লোককর্তৃক  
জ্ঞান ছিল না তাহার পৃথক দর্শনের অল্প বিবরণ এখান লিখি।  
যেহেতুক পৃথিবীর মধ্যে যে অল্পত কক্ষ হইয়াছে তাহার

V. FIGGINS.

*Specimen of a Fount of Telegu Types*<sup>12</sup> showing a commendable translation of complex manuscript letterforms into elegant types. The *Specimen* not only illustrates Figgins's typefounding abilities, but with its various tables of 'radical consonants', 'combined consonants' etc., it also displays an understanding of the complexities of the Telugu writing system and signifies that Figgins's appreciation of its nature was fundamental to his system of composition.

Although the Telugu manuscript used as his model has not been identified, the specimen suggests that Figgins entertained few compromises, but combined his technical knowledge, professional skills, and the linguistic information<sup>13</sup> imparted to him for the cutting of the fount. The sample of Telugu writing<sup>14</sup> bears testimony to this and it must have been encouraging to the East India Company, who commissioned the fount, that Vincent Figgins, a man palpably skilled in Latin typefounding, should have devoted so much effort to the interpretation of foreign letterforms in metal for what must have been a very limited reading public.

Figgins's professional skills and his familiarity with Oriental founts owe much to the training he received at Jackson's foundry which he was keen to acknowledge. In his first (undated) type specimen book published in 1793, Figgins described himself as 'having had the advantage of ten years instruction and servitude under the late ingenious Mr JOSEPH JACKSON (a great part of which time he had *the management of his Foundry*) . . .'.<sup>15</sup> His benefactor, Nichols, also remarked:

12. *Specimen of a Fount of Telegu Types Cast by Vincent Figgins* (London, 1802), see pl. 73.

13. Which he could not have deduced from mere observation of one manuscript. It is likely that he was assisted by Charles Wilkins in this respect, whose duties around this time included 'seeing through the press publications commissioned or supported by the Company'; Lloyd, 'Charles Wilkins', p. 36.

14. See pl. 73.

15. V. Figgins, *Specimen of Printing Types* (London, [1793]), [prefatory note].



## TELEGU WRITING.

ప ద్మ ల గొ ప ద్మ

యే తాలూక అదాలత్ యుక్త అధికారం సర

హద్దులొజమి దారింన్ని పాలిగిరింన్ని శ్రోత్రయయుంస్తు మరి  
 ంన్ని వెరెన్యాల గాని వ్యాజ్య గాడియి ల్లు గాని యెదు తు వ్యాజ్య  
 గాడువుం డైతావు గాని, వ్యాజ్యం ఆ రంభం చెశె ట ఘమ దువు  
 ం డ్డప దు సోపై న వ్రాశి న వివ హరముల ల్లొన ధుస్తువుం డైదిం  
 న్ని నడవ పా య్యే వి వ హర ముల సవి నెటం దుకుంస్తు వి చారిం చెప్పె  
 టం ద్దుకుం స్తు తీ ఫుం చెశెటం ద్దుకుంస్తు ఆయా తాలూక జ  
 డ్డివారి కి, స ర్వాధికారముంస్తు న్న దం త్రముం స్తు యి య్యే బ  
 దు తుం ది.

With an ample portion of his kind instructor's reputation, he inherits a considerable share of his talents and industry; and has distinguished himself by the many beautiful specimens he has produced, and particularly of Oriental types.<sup>16</sup>

Vincent Figgins was also receptive to new ideas as is evidenced by his production of founts designed specifically for newspaper composition.<sup>17</sup> His foundry has been described as 'one from which some of the most inventive designs originated, many of which still provide a basic vocabulary for the user of letters'.<sup>18</sup> Figgins's Bengali fount (VF1) alone shows a significant progression from his former master's efforts.

Contrary to the belief that VF1 only appeared as a specimen in England in 1833, and that it was first employed after his death by Stephen Austin in 1861,<sup>19</sup> a sample was published in India in 1826 and the fount saw use during Figgins's lifetime. As indicated above, VF1 appears under the designation 'Bengalee, No. VI' in *Specimen of Printing Types in Use at the Calcutta Baptist Mission Press*,<sup>20</sup> but it is not shown to best advantage owing to the poor quality of printing. A better example is afforded in *Lukalikhita Susamācāra (The Gospel by Luke)* published in 1831 by the Baptist Mission Press.<sup>21</sup> In neither imprint has this fount been attributed to Vincent Figgins,<sup>22</sup> yet it is the same fount as the 'Pica Bengalee' given in the 1833 *Specimen of Printing Types by Vincent Figgins*,<sup>23</sup> and there is no doubt of Figgins's authorship. The Calcutta Baptists are known to have acquired material from the Figgins foundry,<sup>24</sup> and the 'Advertisement', written by W. H. Pearce, at the beginning of the 1826 Calcutta *Specimen* stated:

16. Nichols, *Literary Anecdotes*, II, p. 361.

17. See Reed, *Letter Foundries*, p. 340, and James Mosley, 'The Typefoundry of Vincent Figgins 1792-1836', *Motif* No. 1, Nov 1958, pp. 29-36 for further information.

18. Mosley, *ibid.*, p. 29.

19. See Khan, *Printing in Bengali Characters*, I, pp. 51 and 392.

20. See pl. 74.

21. See pl. 75.

22. And, to my knowledge, has so far escaped identification.

23. See pl. 72.

24. See above, chapter 3ii.

## SPECIMEN OF PRINTING TYPES.

## BENGALEE TYPE. No. VI.

## 1. BENGALIEE LANGUAGE.

দেখ আরং বস্তুর স্বভাবাগ করিলে দান সিদ্ধ হয়, কিন্তু বিদ্যাতে সে রূপ নয়; যে হেতুক দাতার স্বরূপেণ স্বভাবের দান সিদ্ধ হয় ও গ্রহীতার গ্রহণ হয়. রাশীকৃত স্বর্ণ রুথাদি দান করিতেই ক্রাস হয়, কিন্তু দানকারী বিচার ক্রাস চওয়া চুরে থাকুক, বরং প্রতিদিন ব্রাহ্ম হয়. ধনের খায় বিচার অপচয়, অপচয়, অপচুরণ কোন মতে হয় না. এবং বিদ্যা অমন্ত্রির ন্যায় বিপদের আগে সাবধান করে ও পরিণাম দর্শায়; এবং যত্বপি কৃষ্ণটেনাছারা কখন সঙ্কট উপস্থিত হয়, তাহাতে বিদ্যা অহুকি দেন. বিদ্যা অভেদ সঙ্গী ও অস্তরঙ্গ.

যেমন অক্ষকারে দীপ শোভা পায়, তাহাশ মনুষ্যের মতে বিদ্যার জ্যোতি; আর যাহাশ এক দীপহইতে অন্য দীপ স্থালিয়া জইলে সে দীপ নির্বাণ হয় না, সেই রূপ এক জনের স্থানে বিদ্যা শিক্ষিলে অন্যের মানসাক্ষকার চুর হয়, এবং যে জন শিক্ষা করায় তাহার ও ক্ষতি হয় না.

## 2. SANSKRIT LANGUAGE.

যুস্মাকং গুরবো ঘৃহদাঙ্গাপয়ন্তি তদেব কুরুত । লিখনং পঠন-  
মনাদপি চ যং কিঞ্চিৎ মাতাপিতৃশ্চানিরূপিতং যুয়ং শিক্ষিতুং চেষ্টধ্বং ।  
পিতৃতো মাতৃতো বস্তুশ্চ যুস্মাকমধিকং জ্ঞানমিতি মা বৃথধ্বং ।  
যুস্মাকং বয়স্শেষাং বয়োহ্যধিকং তেহিবহ্নী বিদ্যাঃ পঠিতবস্তো বৃষ্ট-  
বস্তঃ প্রতবস্তশ্চ যাসাং কিমপি যুয়ং ন জানীথ । কিন্তু যুয়ং নবীন  
শিশুশ্চোদিকং জানীথ যতো যুস্মাকং বয়স্শেষোদ্যধিকং । পরস্ত  
জ্যেষ্ঠ বালকো যুস্মাকোদিকং জ্ঞানস্তি । জ্যেষ্ঠ বালকেদ্যোদ্যধিক-  
তরং মানবা জানন্তি । যচ্ছৎ পুস্তকং পিতা মাতা গুরবশ্চ দদতি  
তদ্বিনা নাশ্যত্ পুস্তকং পঠত । কেযাঞ্চিৎ পুস্তকানাং পাঠোচ্চিতঃ  
এবং তানি চ দৃষ্টসঙ্গী ইব দৃষ্টতাং বোধয়ন্তি । পরস্ত মনুপুস্তক-  
পাঠাত্ পাঠবিরহোপি স্বপাং শ্রেয়ান্ ॥

গণিত হইবে। ও সোদাফারস কি সুরা কিছুই পান করিবেনা; আর মাতৃ গর্ভ হইতেই পবিত্র আত্মাতে পরিপূর্ণ হইয়া যিশরাজল বংশের ১৬ মঞ্চে অনেকে প্রভু পরমেশ্বরের পথে আনিবে। এবং সন্তানদের ১৭ প্রতি পিতৃগণের মন কিরাইতে এবং অনাজ্জাবহদিগকে ধম্মজ্ঞান প্রদান করিয়া প্রভু পরমেশ্বরের সেবার নিমিত্তে এক জাতি প্রস্তুত করিতে, সে এলীয় স্বরূপ আত্মা ও শক্তি বিশিষ্ট হইয়া তাঁহার আগে গমন করিবে। তখন সিখরীয় হৃতকে বহিল, এমত যে ঘটবে ১৮ হই। কি প্রকারে জানিব? কেননা আমি বহু, এবং আমার স্ত্রী ও বহু। তাহাতে হুত উত্তর করিল; শুন, ঈশ্বরের সাপগাছস্টী গব্বরী- ১৯ এল নামে হুত আমি তোমাকে এই স্বগনাচার দিতে এবং তোমার সাহিত বধোপকথন করিতে প্রেরিত হইয়াছি; অতএব আমার ২০ এই বাস্তব কালক্রমে সফল হইবে, কিন্তু তাহাতে তুমি প্রত্যয় করিবা না। এ নিমিত্ত গুমা হইয়া থাকিবা; অর্থাৎ যে পর্যন্ত এই সকল সিদ্ধ না হয় সে পর্যন্ত বাস্তব উচ্চারণের শক্তি পাইবা না।

এখানে যে সকল লোক সিখরীয়ের অপেক্ষাতে বাহিরে ছিল ২১ তাহার। মন্দিরের মধ্যে তাহার অনেক বিলম্ব দেখিয়া আশ্চর্য্য জ্ঞান করিতে লাগিল; কিন্তু বাহিরে আটলে পর যখন কোন কথা ২২ বলিতে না পারিয়া সে মস্তক করিয়া দীরব হইয়া থাকিল, তখন মন্দিরের মধ্যে সে যে দশন পাইয়াছে তাহা সকলেই বুঝিতে পারিল। পরে তাহার সেবার পাতা সম্পূর্ণ হইলে নিজ গৃহে ২৩ গমন করিলে পর কিছু দিন গত হইলে তাহার স্ত্রী এলীশাবা ২৪ গান্ত্বিনী হইল; কিন্তু সে পঞ্চম মাস সৎগোপনে থাকিয়া কহিল, লোকেবর আমায় প্রীতি হুগা করিয়া এমন কন্ম করিয়াছেন।

অপর তাহার ষষ্ঠ মাস গর্ভ হইলে গালীল দেশীয় নাসিরিত ২৬ নগরে দাউদ বংশোদ্ভব যযক নামক পুরুষের প্রতি মরিয়ম নামী যে কুমারী বাগদস্তা হইয়াছিল তাহার নিকটে গব্বরীএল হুত ঈশ্বর- ২৭ কথক প্রেরিত হইয়া আসিয়া কহিল, খগো ঈশ্বরের মহামুগহীত ২৮ কথ্য, তোমার কন্মাণ হউক। নারীগণের মধ্যে তুমিই ধত্মা, কারণ প্রভু পরমেশ্বর তোমার সহায়। তখন তাহার কথ্যে সে উচ্ছিন্ন হইয়া ২৯ ভাবিতে লাগিল, যে এ কেমন সম্ভাষণ। তাহাতে সে হুত কহিল, ও গুগো মরিয়ম, ভয় করিও না, তোমার প্রতি পরমেশ্বরের অহুপ্রহ আছে। অতএব তুমি গান্ত্বিনী হইয়া এক পুত্রকে প্রসব করিবা, ও তাঁহার নাম যীশু রাখিবা। তিনি মহামহিম হইবেন, এবং ও ২২ সর্ব প্রধানের পুত্র বলিয়া বিখ্যাত হইবেন; আর প্রভু পরমেশ্বর তাঁহার পিতৃ দাউদের সিংহাসন তাঁহাকে দিবেন; এবং যাহু- ৩৩

বের বংশের উপরে সর্বদা তিনি রাজত্ব করিবেন; ও তাঁহার রাজত্ব ৩৪ শিরকাল থাকিবে। তখন মরিয়ম এই হুতকে কহিল, আমি কখন পুরুষের সঙ্গে বাস করি নাই, তবে কি প্রকারে ইহার সম্ভব হইবে? ৩৫ তাহাতে হুত কহিল, পবিত্র আত্মা তোমাতে আশ্রয় করিবেন, এবং সর্ব প্রধানের শক্তি তোমার উপরে ছায়া করিবে। অতএব তোমার গর্ভেতে যে পবিত্র বাসক উৎপন্ন হইবেন তিনি ঈশ্বর- ৩৬ ষের পুত্র বলিয়া বিখ্যাত হইবেন। আর দেখ, তোমার স্কাতি এলীশাবা যাহাকে সকলে বন্ধগা বলিত সংপ্রতি সে বহু কালে ষষ্ঠ মাস ৩৭ হইল এক সন্তান গর্ভে ধারণ করিয়াছে; কেননা কোন কন্মই আমি আমার প্রতি তোমার বাস্তব সাহায্যে এই তাবদ্বিময় ঘটক। পরে হুত তাহার নিকটে হইতে প্রস্থান করিল।

৩৯ অনন্তর অল্প দিন পরে মরিয়ম তথাহইতে যিহদী দেশীয় যাজকের ঘরে প্রবিষ্ট হইয়া তাহার পত্নী এলীশাবাকে সম্বোধন করিল; কিন্তু মরিয়মের সম্বোধন বাস্তব এলীশাবার কণে ৪১ হুত হইবামাত্র তাহার গর্ভস্থ বাসক নাচিয়া উঠিল। তাহাতে এলীশাবা পবিত্র আত্মাতে পরিপূর্ণা হইয়া উচ্চৈঃশ্বরে বলিতে লাগিল, নারীর মধ্যে তুমিই ধত্মা, এবং ধন্য তোমার গর্ভস্থ ৪৩ বাসক; এবং আজি আমার একি সৌভাগ্য, যেহেতু প্রভু ৪৪ মাতা আমার বাগ্মিতে পাল্পণ করিল। কেননা তোমার বাস্তব আমার কণে প্রবিষ্ট হইবামাত্র আমার উদরস্থ সন্তান আমি ৪৫ স্ত্রীদে নাসিয়া উঠিয়াছে। আর যে স্ত্রী বিশ্বাস করিল সে ধত্মা, যে হেতু তাহার প্রতি পরমেশ্বরের উক্ত বাস্তব সকল সিদ্ধ হইবে।

৪৬ তখন মরিয়ম কহিল, আমার মন প্রভু পরমেশ্বরের স্তব ৪৭ করিতেছে, এবং আমার আত্মা জগৎস্তা ঈশ্বরেতে উচ্চাসিত হই- ৪৮ তেছে। কারণ প্রভু নিজ দাসীর নীচ গতির প্রতি দৃষ্টিপাত করিয়াছেন; অতএব অজ্ঞাবধি পুরুষ পরম্পর। সকলেই নিতান্ত আনাকে ৪৯ ধত্মা বলিবে। কেননা সর্বশক্তিমান যিনি, যাহার নাম পবিত্র, ৫০ তিনি আমার নিমিত্তে মহৎ কন্ম করিয়াছেন। এবং যাহারা তাঁহাকে ভক্তি করে তাহাদের সন্তান পরম্পর। প্রতি তাঁহার করুণা আছে। ৫১ আর তিনি নিজ বাহুল্য প্রকাশ করিয়া অহঙ্কারিদিগের অহঙ্কার চূর্ণ করিয়াছেন; এবং মহাবলবানদিগকে সিংহাসন হইতে নামা- ৫২ টায়া ক্ষুদ্র প্রাণিকে উচ্চ পদে স্থাপিত করিয়াছেন। ও ক্ষুধাত ৫৩ লোককে উত্তম সামগীরি দ্বারা হুগু করিয়া ধনবানদিগকে

Of the different specimens of type in the following pages, all those of the Oriental languages, with one or two exceptions, have been cast at the Type-Foundry attached to the Baptist Mission Press, as well as printed at its office.

One of the 'exceptions' was 'Bengalee No. VI' which exhibits the degree of professionalism usually associated with Vincent Figgins.

The exact source of the artwork for VF1 is not known, but the types indicate that Figgins, unlike Jackson, was in possession of good models, probably furnished by the missionaries. The style, which does not emulate the type designs of Charles Wilkins, bears strong affinity to the types of the Baptist Missionaries, in particular BM V.<sup>25</sup> Apart from the type size, there are many similarities: the relative proportions of the characters; the junctions of the principal elements of such letterforms as **ব** and **ন** to their stems; and the shaping and colouring of **উ** and **ল**. Despite significant differences between VF1 and SB4 (the Serampore typeface used to print the 1832 *Dharma Pustaka*),<sup>26</sup> notably the stroke contrast and the depth of some of the conjuncts, the degree of correspondence that exists between many of the sorts of both typefaces cannot be merely coincidental. It is highly probable that the Serampore face was influenced by the Figgins fount which, current evidence suggests, pre-dates the missionaries fount by a number of years.

In order to retain clarity at this small type size, Figgins has dispensed with any calligraphic emphasis, still adhered to in SB4. In so doing, he has succeeded in producing even the most complex conjuncts at this size without distorting their proportions or impairing their legibility. The repetition of the diagonal slant, to be found in such characters as **ব**, **উ**, **ই**, **হ** and **ও**, and the introduction of colour by the well-emphasized roundings of the frequent characters **ন** and **ম**

25. See above, chapter 3ii and pl. 56.

26. See pl. 76.

মার কথা শুনিয়াছি দেখে আমি তাহাকে বর দিব ও তাহাকে সম্বন্ধ করিব ও তাহাকে অতিশয় বা ডাইব সে দ্বাদশ রাজার জন্ম দিবে ও তাহাকে আমি বড় জাতি করিব । [২১] এবং শারাহ্ আগাগি বৎসরে এই কালানুসারে তোমার কারণ যে গিস্থাককে প্রনব করিবে তাহার সহিত আমি আপন নিরম স্থির করিব [২২] পরে ঈশ্বর তাহার সহিত কথোপকথন সমাপ্ত করিয়া অবরাহামের নিকটহইতে উঠিলেন ।

[২৩] পরে অবরাহাম আপন পুত্র যিশমাএলকে ও আপন গৃহজাত সকলকে ও ধনদ্বারা ক্রীত সকলকে অর্থাৎ অবরাহামের ঘরের মনুষ্যেরদের মধ্যে সকল পুরুষকে আনিল ও ঈশ্বর যেমন তাহাকে কহিয়াছিলেন সেইরূপ সেই দিনে তাহারদের পুরুষাচর্মচ্ছেদন করিল । [২৪] অবরাহাম নিরামকই বৎসরবয়স্ক হইলে তাহার অকুচ্ছেদ হইল । [২৫] এবং তাহার পুত্র যিশমাএল ত্রয়োদশ বৎসরবয়স্ক হইয়া আপন পুরুষাঙ্গে জিয়স্ক হইল [২৬] সেই দিনে অবরাহাম ও তাহার পুত্র যিশমাএলের অকুচ্ছেদ করা গেল । [২৭] ও তাহার ঘরের সকল মনুষ্যেরদের ও তাহার গৃহজাতসকলের ও বিদেশিহইতে ধনদ্বারা ক্রীতসকলের অকুচ্ছেদ তাহার সহিত করা গেল ।

১৮ পর্ক ।

[১] পরে যিছহ তাহাকে মমরের আলোন বনে দেখা দিলেন দিনের গ্রীষ্মসময়ে সে তাম্বুর ঘারে বসিয়া রহিয়াছিল । [২] এবং সে আপন চক্ষু উঠাইল ও দেখিল তাহাতে দেখি তিনি মনুষ্য তাহার নিকটে দাঁড়াইল পরে সে তাহারদিগকে দেখিয়া তাম্বুর দ্বারহইতে তাহারদের নিকটে দৌড়িয়া গেল [৩] ও ভূস্পৃহমুখ হইয়া প্রণাম করিল ও কহিল হে আমার প্রভু যদি এখন তোমার নিকটে আমি কৃপা পাইয়া থাকি তবে আপন দাসহইতে প্রস্থান করিও না । [৪] এখন কিষ্কিৎ জল আনা যাউক ও আপনারদের পাদপ্রক্ষালন করিয়া বৃক্ষের তলেতে বিশ্রাম করুন । [৫] এবং আমি কুটির এক খণ্ড আনিয়া দি তাহাতে তোমরা আপন২ অন্তঃকরণ আপ্যায়িত কর তারপরে প্রস্থান করিবা কেননা এই নিমিষে তোমরা আপনারদের দাসের নিকটে আসিয়াছ পরে তাহারা বলিল যেমত কহিয়াছ সেমত কর । [৬] তাহাতে অবরাহাম তাম্বুতে শারাহের নিকটে শীঘু যাইয়া কহিল তিন শের মরদা শীঘু করিয়া ছান ও তাহা দিয়া চূলাতে রুটি প্রস্তুত কর । [৭] পরে অবরাহাম গরুর পালে দৌড়িয়া যাইয়া কোমল এবং উৎসাহ

[১৪]

কৃষ্ণ এক বাছুর লইয়া আপন এক ঘূবা লোককে দিল তাহাতে সে তাহা পাক করিতে অরা করিল । [৮] পরে সে মাখন ও ক্ষীর ও যে বাছুর পাক করিয়াছিল তাহা লইয়া তাহারদের সম্মুখে রাখিল ও তাহারদের নিকটে বৃক্ষের তলেতে দাঁড়াইল পরে তাহারা খাইতে লাগিল ।

[৯] পরে তাহারা তাহাকে কহিল তোমার স্ত্রী শারাহ্ কোথায় সে কহিল দেখে তাম্বুতে । [১০] তাহাতে সে বলিল আমি অবশ্য এই কালানুসারে তোমার কাছে ফিরিয়া আসিব ও দেখে তোমার স্ত্রী শারাহের এক পুত্র হইবে এবং শারাহ্ তাম্বুর দ্বারে তাহার পশ্চাৎ থাকিয়া সে কথা শুনিবে । [১১] ঐ সময়ে অবরাহাম ও শারাহ্ বৃদ্ধ ও বহুবয়স্ক ছিল ও শারাহের স্ত্রী ধর্মসময় অজীত হইয়াছিল । [১২] পরে শারাহ্ আপন মনে এ কথা কহত হানিল যে আমার বার্ষিক্যসময়ে কি আমার আহ্লাদ হইবে আমার স্বামীও বৃদ্ধ । [১৩] পরে ঈশ্বর অবরাহামকে বলিলেন শারাহ্ এ কথা কহত কেন হানিল যে আমি বৃদ্ধা কিরূপে সন্তান জন্মাইব । [১৪] কোন কর্ম কি যিছহের দূঃসাধা নিকৃপিত সময়ে আমি কালক্রমে তোমার নিকটে ফিরিয়া আসিব এবং শারাহের পুত্র হইবে । [১৫] পরে আমি হাসি নাই এ কথা কহত শারাহ্ অপহব করিল কেননা সে ভীতা ছিল তাহাতে তিনি কহিলেন এমন নয় কিন্তু তুই হানিলি ।

[১৬] পরে সে মনুষ্যেরা সেখানহইতে উঠিয়া সদোমের দিগে মুখ করিল ও তাহারদিগকে পথ দেখাইতে অবরাহাম তাহারদের সহিত চলিল । [১৭] পরে যিছহ বলিলেন আমি যা করি তাহা কি অবরাহামহইতে লুকাইব [১৮] অবরাহাম বলবান ও বড় জাতি হইবে এবং পৃথিবীর সকল জাতিরা তাহাতে আশীর্বাদপ্রাপ্ত হইবে । [১৯] কেননা আমি তাহাকে জানি যে যিছহ অবরাহামের প্রতি যাহা কহিয়াছেন তাহা যে করেন তদর্থে সে আপনার পরে আপন ঘরে ও আপন সন্তানেরদিগকে আজ্ঞা করিবে ও তাহারা ন্যায় ও বিচারকরণার্থে যিছহের পথ পালন করিবে । [২০] পরে যিছহ বলিলেন সদোমের ও অমোরাহের শব্দ বড় ও তাহারদের পাপ অতিশয় অসহনীয় হইয়াছে [২১] সেহেতুক আমি নামিব ও যে শব্দ আমার নিকটে আসিয়াছে তাহারা সে শব্দ দানুসারে সর্বথা করিয়াছে কি না তাহা দেখিব ও যদি না তাহাও জানিব । [২২] পরে সে মনুষ্যেরা সেখানহইতে ফিরিয়া সদোমের দিগে

enliven the otherwise prosaic design. The subscripts do not merge successfully with the base characters, but their occurrence is restricted by the comprehensive number of ligatures and conjuncts available. The result is a polished, readable typeface suitable for book-work.

It is curious that Figgins's 1833 specimen of this fount does not make use of all the sorts available at the time of its publication; for instance, the *raphalā* 𑒗 is set separately to 𑒗, whereas in *The Gospel by Luke* the conjunct 𑒗 appears as one individual sort. The form of 𑒗 that Figgins employs has the appearance of a wrong sort and has the same structure as that found in BM V. An improved form is used in the 1826 'Bengalee No. VI' sample. Perhaps the 1833 specimen was composed by someone not proficient in the Bengali language or composition - note the inverted 𑒗 in line 6. Another, perhaps more likely, explanation is that this text may have been composed much earlier than 1833, before the fount had reached its final stage. Figgins, no doubt, took numerous proofs whilst cutting the fount. Typeface samples given in specimen books usually comprise a selection of samples printed at different times and collated into one volume. They are therefore extremely difficult to date and can be notoriously misleading; they should be regarded simply as 'ephemeral printing trade catalogues',<sup>27</sup> and not as reliable sources for establishing typeface chronologies.

In 1836 Vincent Figgins relinquished his business to his sons,<sup>28</sup> Vincent and James, who published their first type specimen book in 1838.<sup>29</sup> This does not include VF1, but the fount does appear in the *Epitome of Specimens* (1847) with both the length of the text and the measure reduced.<sup>30</sup> This specimen was

27. Wolpe, *Figgins Type Specimen*, p. 17; the same is true of typeface catalogues produced today.

28. Reed, *Letter Foundries*, p. 343.

29. V. & J. Figgins, *Specimen of Book and Newspaper Types* (London, 1838).

30. See pl. 77; also errors were introduced, eg. 𑒗 instead of 𑒗 .

# EPITOME OF SPECIMENS:

VINCENT & JAMES FIGGINS.

PERSIAN ON PARAGON BODY.

ان براید این چند کلمها در محکمہ شریف اہم ام کہ عند الحاجت، حجت باشد بتاریخ، بست  
 نم، شہر محرم الحرام سنہ ۱۱۸۰ ہجری نبوی صلائی اللہ علیہ و سلم اقرار کرد و اعتراف نمود

CC-0. F. & J. F. have also an *ARABIC* in progress, which, with the present, makes an English body, and it has the necessary modifications to make it serve for the TURKISH, PERSIAN, MALAY, POLISH, and HINDOSTANE Languages.

PARAGON SANSKRIT.

इयं व्याधायते बाला भूरुखाः कार्मुकायते  
 कटाखाच्च यरायन्ते मनी मे हरिणायते ॥

PICA BENGALEE.

পথিবী ব্যরি ভাগে বিতকা আছে হেউরণ ও  
 আনিরা ও আ কিকা ও আমিকিকা। হেউরণ  
 ও আনিয়া ও আকিকা এই তিন ভাগে এই মহা  
 হীরণ আছে হেহারী কোন সমুদ্বারা পরম্বর বিতক

PICA COPTIC.

ⲉⲓⲩⲱⲛⲓ ⲛⲁⲣ ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲛⲁⲣ ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ  
 ⲉⲣⲟⲕ ⲛⲉⲩ ⲛⲉⲕⲓⲛⲱⲛⲓ ⲛⲉⲩ ⲉⲧⲟⲩⲓⲛⲁⲩⲱⲛⲓ  
 ⲉⲕⲁⲕⲁⲩⲱⲛⲓ ⲉⲃⲟⲗⲁ ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲁⲓⲛⲁⲣⲉⲛⲁⲣ ⲉⲣⲟⲕ ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ

DOUBLE PICA SYRIAC.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

ENGLISH SYRIAC.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

LONG PRIMER SYRIAC, No. 1.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

LONG PRIMER SYRIAC, No. 2.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

ENGLISH HEBREW.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

LONG PRIMER HEBREW.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

BOURGEOIS HEBREW.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

SMALL PICA HEBREW.

ⲉⲓⲛⲁⲛⲁⲩⲱⲛⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ  
 ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ ⲉⲃⲟⲩⲓ

GREAT PRIMER GREEK.

ΤΟΥ δὲ Ἰησοῦ γεννηθέντος ἐν Βηθλεὲμ τῆς Ἰουδαίας ἐν ἡμέραις Ἡρώδου δαίαις ἐν ἡμέραις Ἡρώδου

ENGLISH GREEK, No. 2.

ΤΟΥ δὲ Ἰησοῦ γεννηθέντος, ἐν Βηθλεὲμ τῆς Ἰουδαίας, ἐν ἡμέραις Ἡρώδου τοῦ βασιλέως ἰδού μάγοι ἀπὸ ἀνατολῶν παρε

PICA GREEK, No. 4.

ΤΟΥ δὲ Ἰησοῦ γεννηθέντος ἐν Βηθλεὲμ τῆς Ἰουδαίας ἐν ἡμέραις Ἡρώδου τοῦ βασιλέως, ἰδού μάγοι ἀπὸ ἀνατολῶν παρεγένοντο εἰς Ἱερουσόλυμα, λέγοντες

SMALL PICA GREEK, No. 2.

HN δὲ ἠεθρωπος ἐκ τῶν φαρισαίων Νικόδημος ὄνομα αὐτῷ ἀρχῶν τῶν Ἰουδαίων. Οὗτος ἦλθε πρὸς τὸν Ἰησοῦν υικτός καὶ εἶπεν αὐτῷ· Παῖβι σὶδαμεν ὅτι ἀπὸ Θεοῦ ἐγγλυθας δι δάσκαλος· οὐδεις γάρ ταυτα τῷ σῆ

ΑΒΓΔΕΖΗΘΙΚΑΜΝΞΟΠ

ΑΒΓΔΕΖΗΘΙΚΑΜΝΞΟΠ

ΑΒΓΔΕΖΗΘΙΚΑΜΝΞ

ΑΒΓΔΕΖΗΘΙΚΑΜ



reproduced again in the publication *Epitome of Specimens* (c. 1870).<sup>31</sup> The Bengali typeface is also shown in *New Specimens; Oriental Types* produced by V. & J. Figgins,<sup>32</sup> a copy of which was sent to Messrs Reed and Son by James Figgins in December 1884.<sup>33</sup> This new specimen of Bengali types has been identified as a revised fount on a different body.<sup>34</sup> Yet its designation 'Bengali on Pica Body' clearly indicates that the body-size has not been altered.<sup>35</sup> The typeface is, in fact, the same as the 1833 specimen with additional ligatures (particularly those with  $\alpha$ , like  $\alpha$  and  $\alpha$ ) and combinations with *raphalā*, all of which appear in the earlier Calcutta imprints and assist in the reduction of the leading. The shorter 'repha' and the improved version of the character  $\alpha$  have been employed. It may seem as if some of the ascenders have been curtailed, e.g. the flourish on  $\alpha$ , in order to reduce interlinear spacing. However, this is probably due to the lighter inking of 1884 specimen, or simply wear and tear on the types, for  $\alpha$  still has a very high ascender.<sup>36</sup> As the title of the imprint suggests,<sup>37</sup> it is indeed a new specimen, but not a new typeface.

The variations in the interlinear spacing of the Bengali fount - viz. that used in the Figgins specimen books 1833, 1847, and 1870, in comparison to that employed in the *New Specimens* and Calcutta imprints - dramatically affect the texture of this typeface. The tighter setting reveals the inherent cohesion of the typeforms designed by Vincent Figgins. The result is very effective, providing more even colour to the printed page and thus rendering it more conducive to

31. See pl. 78.

32. Although Vincent II had died in 1860.

33. This is now housed at the St Bride Printing Library and contains a letter dated 5 Dec 1884 from James Figgins.

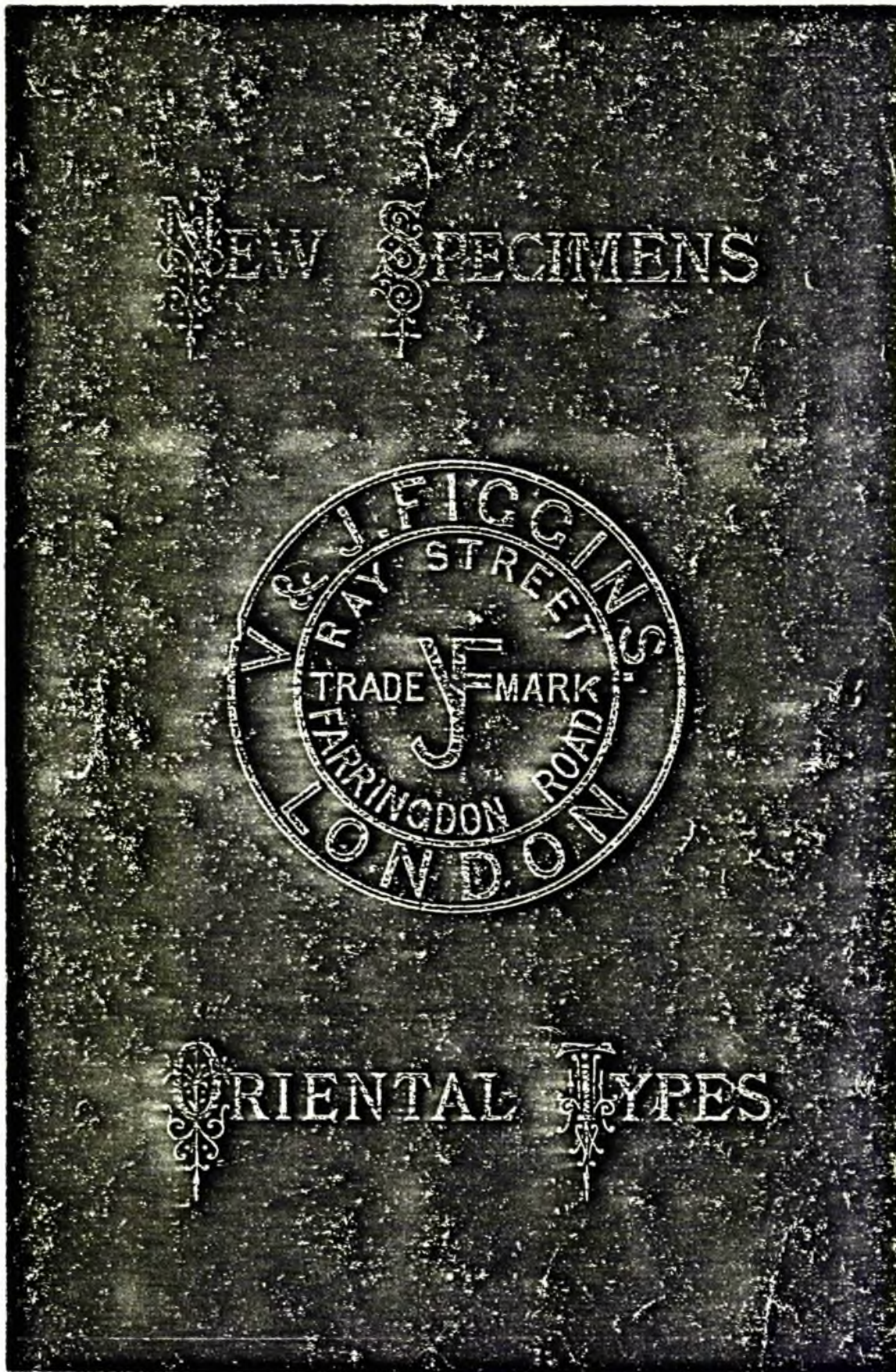
34. Khan, *Printing in Bengali Characters*, I, pp. 50 and 51.

35. See pl. 80.

36. See pl. 81 showing enlargements of the 1833 and 1884 specimens.

37. See pl. 79.





79. Title page; V. & J. Figgins, *New Specimens; Oriental Types* (London, 1884)

## SANSKRIT (Devanagari) ON PARAGON (Two-Line Long Primer) BODY.

अथ कदाचिच्चित्राङ्गनामा मृगः केनापि चासितसूत्रागत्य मिलितः ।  
ततः पश्चादायान्तं भयहेतुं सम्भाव्य मन्यरो जलं प्रविष्टो मूषिकश्च वि-  
वरं गत उड्डीयमानः काको वृत्ताद्यमाहूढः । ततो लघुपतनकेन सुदूरं  
निरूप्य भयहेतुर्न कोऽप्यवलोकितः । पश्चादागत्य पुनः सर्वे मिलितो  
पविष्टाः । मन्यरेणोक्तम् । भद्रं मृग कुशलं ते । स्नेह्या उदकाद्याहारो  
ऽनुभूयताम् । अत्रावस्थानेन वनमिदं सनाथीक्रियताम् । चित्राङ्गो ब्रूते ।  
लुब्धकत्रासितोऽहं भवतां शरणागतः ॥ रावणं रामेण जितः ॥

*This very perfect Fount contains 770 Characters.*

## HINDI ON PARAGON (Two-Line Long Primer) BODY.

हे मन्मथ मेरे ऊपर तुझे क्यों दया नहीं आती है । देख तेरा  
नाम तौ पुष्पशर है । तू ऐसा कठोर क्योंकर हुआ ॥ कुछ सोचकर ॥  
हां इस का हेतु मैं ने जाना । महादेव के कोप की कुछ आंच तुझ  
में और तेरे बाणों में अब तक ऐसे बनी है जैसे समुद्र में बड़वानल  
और जो यह हेतु न होता तौ तू भस्म हो चका था । फिर वियो-  
गियों के हृदय को कैसे जलाता । हे कुसुमायुध खेही जनों को

*A Fount of Hindi for Literature, containing the Compounds ordinarily met with, can be supplied,  
consisting of only 290 Characters.*

*A Fount of 75 selected Characters can be supplied, for Commercial purposes, Railway Notices, &c.*

## MAHRATHI ON PARAGON (Two-Line Long Primer) BODY.

काशिनाथ म्हणून एक पांच वर्षांचा मुलगा होता । त्याची आई  
एके दिवशीं बरणीतून गूळ काढीत असतां तो तिच्या अवळ पुष्कळ  
गूळ मागूं लागला । तेजां जंतांचा विकार न झावा म्हणून तो त्यास  
सुपारी एवढा गूळ देजं लागली । तो थोडा असें म्हणून तो घेईना  
आणि पुष्क । दे असें बोलून रडत रडत जमिनीवर गडबडां लोलूं  
लागला । मग तो पेरू येवढा गूळ देजं लागली तरी पुष्कळ दे हे

## BENGALI ON PICA BODY.

অনন্তর মার্থা যীশুর আগমনের সংবাদ পাঠেবামাত্র তাঁহার সহিত সাক্ষাৎ করিতে  
গেল, কিন্তু মরিয়ায় ঘূহে বসিয়া রহিল । অপর মার্থা যীশুকে কহিল, দে প্রভো, আপনি  
যদি এ স্থানে থাকিতেন, তবে আমার জাত মরিত না । কিন্তু এখনও আমি জানি,  
আপনি স্নেহের কাচ যে কিছু প্রার্থনা করিলেন, তাহা স্নেহের আপনাকে দিবেন । যীশু  
কহিলেন, তোমার জাত উঠিবে । মার্থা তাঁহাকে কহিল, শেষদিনে পুনরুত্থান সময়ে সে  
উঠিবে, তাহা জানি । তখন যীশু তাহাকে কহিলেন, আমি উত্থিত ও জীবিত । যে কেহ  
আমাকে বিশ্বাস করে, সে মরিবেও জীবিত হইবে ; এবং যে কেহ জীবিত হইয়া  
আমাকে বিশ্বাস করে, সে কখনো মরিবে না ; তঁহা কি বিশ্বাস কর ? সে কহিল, হাঁ  
প্রভো । এষ্ট স্নগতে যাহাকে অবতীর্ণ হইতে হয়, আপনি সেষ্ট স্নেহের প্রভু খ্রীষ্ট,  
এমন বিশ্বাস করিতেছি । তঁহা বসিয়া সে যাঠিয়া আপন ভগিনী মরিয়ায়কে গোপনে

V. & J. FIGGINS. LONDON.

# PICA BENGALEE.

আমেরিকা। ইউরোপ ও  
 এক মহাদ্বীপে আছে ইহ  
 নয় কিন্তু আমেরিকা পৃথ

BENGALI ON PICA BODY.

উঠিবে। মার্থা তাঁহাকে কহি  
 খন যীশু তাহাকে কহিলেন  
 সে মরিলেও জীবিত হই

continuous reading. It is perhaps less readable to the learner of Bengali (for whom most of the founts produced in England were intended),<sup>38</sup> but it demonstrates that the Figgins fount could be used as a text face for native consumption. Its precision, however, betrays its European origins. The previous failure to identify Bengalee No. VI, 'Pica Bengalee', and 'Bengali on Pica Body' as the same fount illustrates the different effects created by the manner in which type is used. It underlines the importance of the art of typography in deriving the maximum benefit from a fount of type.<sup>39</sup>

An undated broadsheet entitled *Pica Bengali; V & J Figgins* was issued separately<sup>40</sup> and gives the synopsis of the Figgins fount. 370 sorts are listed; considerably fewer than the customary 500 sorts of indigenous Bengali typefoundries,<sup>41</sup> hence the inclusion of subscripts and superscripts for use in less frequent combinations. A number of sorts marked *k* appear to be duplicates. These are sorts cast specifically to kern with others, as in the case of vowel signs with base characters. The repertoire of conjuncts, including those with *raphalā*, is impressive; it is also interesting to observe the range of ligatures (consonants with vowels) that have been designed in their more orthodox forms, thereby limiting the occurrence of the more unwieldy subscripts. Types cast of this fount by the Oxford University Press which still survive<sup>42</sup> show the sorts cast at different body-sizes to accommodate superscripts and subscripts, as the proofs of the packets of spare types confirm.<sup>43</sup>

38. See below, pp. 196-7.

39. As defined by Stanley Morison, see above, p. 63.

40. See pl. 82.

41. See below, chapter 7.

42. Some of which can be seen in pls. 83 and 84. These were obviously cast at a later date. OUP in its switch to photocomposition is disposing of the majority of the metal types; some non-Latin types have been preserved, and the larger part of the surviving founts are being transferred to the St Bride Printing Library.

43. See pls. 83 and 84.

1	33	100	146	193	242	290	339
2	34	101		194	243	291	340
3	35	102	147	195	244	292	341
4	36	103	148	196	245	293	342
5	37	104		197	246	294	343
6	38	105	149		247	295	344
7	39	106	150	198	248	296	345
8	40	107	151	199	249		346
9	41	108	152	200	250		347
10		109	153	201		297	348
11	62	110	154	202	251	298	349
12	63		155	203	252	299	350
13	64		156	204	253	300	
14		111	157	205	254	301	351
15		112	158	206	255	302	352
16	65	113		207	256	303	353
17	66	114	159	208	257	304	354
18	67	115	160	209	258	305	355
19	68	116	161	210	259	306	356
20	69	117	162	211	260	307	357
21	70	118	163	212	261	308	358
22	71	119	164	213	262	309	359
23	72	120	165	214		310	360
24	73		166	215	263	311	
25	74	121	167	216	264	312	361
26		122	168	217	265		362
27	75		169	218	266	313	363
28	76	123	170		267	314	364
29	77	124	171	219	268	315	
30	78	125		220	269	316	365
31	79	126	172	221	270	317	366
32	80	127	173	222	271	318	367
33	81	128		223	272	319	368
34	82		174	224	273	320	369
35		129	175	225	274	321	370
36	83	130	176	226	275	322	
37	84	131	177	227	276	323	
38	85	132	178	228	277	324	
39	86	133	179	229		325	
40	87	134	180	230	278	326	
41	88	135	181	231	279	327	
42	89	136	182	232	280	328	
43	90	137	183		281		
44	91	138	184	233	282	329	
45	92		185	234		330	
46	93	139	186		283	331	
47	94	140	187	235	284	332	
48	95	141	188	236	285	333	
	96	142	189	237	286	334	
49	97		190	238		335	
50	98	143		239	287	336	
51	99	144	191	240	288	337	
52		145	192	241	289	338	

82. VF1:  
(reduced by 20%)







There can be no certainty that Figgins cut the punches of VF1 himself. Vincent Figgins II's description of the difficulties in completing the Greek fount for the Oxford University Press indicates his father's dependence on others for punchcutting:

The then Delegates of that Press . . . suggested that Mr Figgins should finish the fount himself. . . . But when he had undertaken this work, the difficulty presented itself that he did not know where to find the punch-cutter. No one knew his address; but he was supposed to be a tall man, who came in a mysterious way occasionally, whose name no one knew, but he went by the *sobriquet* of 'The Black Man'. This old gentleman, a very clever mechanic, lived to be a pensioner on my father's bounty, - gratitude is, perhaps, a better word.<sup>44</sup>

The prolificacy of his work suggests that Figgins employed more than one punchcutter. His contemporary, Thomas C. Hansard wrote:

The number of punches necessary to complete a *fount*, or every sort used is very great . . . . An artist of the greatest industry could not cut more than two in a day. After they are completed for the ordinary number . . . it will take a founder six months in matrix-making, justifying, mould making, casting, dressing, &c before he could deliver anything complete for printing; but it should be remarked, that these materials being once perfected, are of everlasting duration.<sup>45</sup>

Moreover, a copy of the 1815 type specimen book issued by Vincent Figgins reveals the names of several punchcutters employed by Figgins: pencilled notes appear to be contemporary with its publication; and the provenance of the copy is most probably the Figgins foundry. But neither the identity of the 'Black Man', nor that of VF1's punchcutter has been established.<sup>46</sup> Nevertheless Vincent Figgins appears to have been responsible for the original designs which emerged from his type foundry. As Wolpe says, 'Even if Vincent Figgins




44. William Caxton, *The Game of the Chesse*, facsimile rpt. (London, 1855), 'Remarks' by Vincent Figgins II, p. 2, n. [1]. Jackson had to learn the art by spying through a hole in the wainscot; see above, chapter 4.

45. Royal Society of Arts, *Report of the Committee of the Society &c. Relative to the Mode of Preventing the Forgery of Banknotes* (London, 1819), pp. 28-29. Hansard was referring to the cutting of Diamond type (c. 3 point, see chapter 10), but the same holds true for most founts, and renders Charles Wilkins's claims all the more incredible (see chapter 1).

46. Wolpe, *Figgins Type Specimen* p. 30.

employed or commissioned other punchcutters to produce the types, his was the controlling spirit'.<sup>47</sup>

There is no evidence that the VF1 was cut for a particular purpose. Its earliest known use in England did not take place until seventeen years after Figgins's death.<sup>48</sup> In 1861 Stephen Austin III,<sup>49</sup> in his capacity as printer to the Company at Haileybury College,<sup>50</sup> employed this fount to print *A Grammar of the Bengali Language* by Duncan Forbes. In this imprint Austin has used generous leading - as is suitable for students of the Bengali language<sup>51</sup> - and has taken advantage of the quite extensive range of conjuncts and ligatures available to him. An interesting typographical note is given in the preface to the *Grammar* by Forbes:

The mark *rephaa*  or top *r*, is very liable to break off in the working of the press; and the same remark applies to the slender top of the long *i* , which then becomes long *ā* . The reader will, I trust, have the charity to hold the author blameless in such cases.<sup>52</sup>

Stephen Austin continued to use this fount for subsequent editions of Forbes's Bengali grammar. It was also employed for Forbes's *The Bengali Reader* (1862) which contains selections originally compiled by Haughton.<sup>53</sup> These selections which also employ the wider leading show up deficiencies in the Figgins fount that the tighter setting and shorter length type specimens fail to reveal. They primarily concern the weight distribution, the unevenness of which is well illustrated by the adjacent words *সায়ের* and *নন্দন* on page 36.<sup>54</sup>

47. Wolpe, *ibid.*

48. Vincent Figgins died in 1844.

49. Stephen Austin II died in 1845.

50. Formerly called East-India College.

51. Hence Khan's assumption that it was an earlier version; see pl. 85.

52. Duncan Forbes, *A Grammar of the Bengali Language* (London, 1861), page headed 'Errata'.

53. It being a new and revised edition of Haughton's *Bengali Selections* (London, 1822).

54. See pl. 86.

- them, or a Brāhman touching a Shūdra,—because, that person may take of the same dish after them. স্পর্শ করিলে হানি নাই—কারণ, ঐ ব্যক্তি তাহাদের প্রসাদ খাইতে পারে.
- The Hindūs do not eat any thing with their shoes on. হিন্দুরা জুতা পায় দিয়া কিছু খায় না.
- If boiled-rice or curry, etc. fall on their clothes, they must change the clothes, and wash with water. যদি তাহাদের কাপড়ে ভাত কিম্বা ব্যঞ্জন ইত্যাদি পড়ে তবে ঐ কাপড় লাগ করিতে ও মনে কাচিতে হয়.
- Persons dining together must commence and get up all at once, *i.e.* no one begins to eat and gets up before the others, but must wait for the others, though he may be very hungry; and though he may have done first of all. একত্রে আহারিরা এক কালে আহার করিতে আরম্ভ করে ও এক কালে উঠে, অর্থাৎ কেহ কাহারো আগে খাইতে বহিসে না ও কেহ কাহারো আগে উঠে না; কিন্তু কেহ অতি ক্ষুধিত হইলে অথবা কাহারো সকলের আগে খাওয়া হইলে ও অন্নের অপেক্ষা করিতে হইবে.
- Is there any rule as to the taking the eatables one after the other? আহারীয় দ্রব্য সকলের অগ্র পশ্চাদ্ খাওয়ার কোন নিয়ম আছে কি না?
- Certainly there is—The things somewhat bitter in taste are taken first, then the pungent, then the acid, and then at last the sweet: and after washing the hands and mouth, betels are chewed, and tobacco smoked by most. অবশ্য আছে,—তিক্ত স্বাদ দ্রব্য সকল প্রথমে খাইতে হয়, তৎপরে ঝাল রস, তার পর অম্লরস, শেষে মিষ্ট; এবং আঁচাইলে অধিকাংশ পান তামাকু খাইয়া থাকে.

## 7 AU 61

STEPHEN AUSTIN, PRINTER, HERTFORD.

তাহার পর সে কন্যার পিতার নিকটে ঘটকের দ্বারা বাস্তব প্রেরণ করিলেন, যে আমি তোমার কন্যাকে বেবাহ করিতে চাহি. ঘটক এই কথা পিতার নিকটে কহিলেক; কন্যার পিতাও তাহাতে সন্মত হইয়া, আপন জাতির ধারা আর শাস্ত্রমত রায়ের পুত্রের সহিত কন্যার বিবাহ দিলেন. পরে রায়ের পুত্র সে কন্যা স্বহা আপন বাটীতে যাইয়া, দুই জনে একত্র থাকিলেন. কএক দিবস পরে কন্যার পিতা কন্যাকে আর জামাতাকে আপন বাটীতে আনিবার নিমিত্তে সম্বাদ পাঠাইলেন. পরে রায়ের নন্দন এই সমাচার পাইয়া, সস্ত্রীক হইয়া, এবং আপন সভাসদ এক ব্রাহ্মণকে সঙ্গে লইয়া, শশুরালয়ে প্রস্থান করিলেন. যখন সে দেবতার প্রাসাদের নিকটে পহঁছিলেন, তখন রায়ের পুত্রের মনে হইল, যে আমি এই দেবতার নিকটে কবুল করিয়াছিলাম, যদি এই কন্যা আমাকে বিবাহ করে, তবে আমি আপন মস্তক বলি দিব; কিন্তু কন্যা আমাকে বিবাহ করিয়াছে, অতএব আমার মস্তক বলি দেওয়া উচিত.

ইহা বিবেচনা করিয়া, রায়ের নন্দন একাকী সে মন্দিরমধ্যে প্রবেশ করিয়া, আপন মূণ্ড ছেদন করিলেন, এবং সে মূণ্ড দেবতার পদে রাখিলেন. তারপর সভাসদ সে ব্রাহ্মণ গৃহমধ্যে যাইয়া, রায়ের নন্দনের মস্তক ছিন্ন দেখিয়া, বড় ভীত হইলেন; যে সকলে কহিবেক, এই ব্রাহ্মণ কন্যার লোভে রায়ের বাস্তবকে নষ্ট করিয়াছে; অতএব এখন পরামর্শ এই, যে আমিও আপন মস্তক কাটিয়া ফেলি. ইহা স্থির করিয়া, ব্রাহ্মণ আপন শিরঃছেদন করিয়া, সে দেবতার চরণের নিকটে পড়িলেন. মূণ্ডহস্তের পরে কন্যা স্বামির বাহির হওনের বিলম্ব দেখিয়া, আপনি দেবালয়ে প্রবেশ করিয়া, আপন স্বামির ও ব্রাহ্মণের মস্তক ছিন্ন দেখিয়া, চমৎকৃত হইলেন; যে এ কি আপদ পথমধ্যে আমার উপস্থিত হইল যে স্বামির এমত দশা? তবে আমার জীব-

It is interesting to observe that Stephen Austin did not make use of the Bengali types prepared by Richard Watts, his predecessor as printer to the Company. The reasons can only be speculative. Vincent Figgins I and Richard Watts were contemporaries,<sup>55</sup> so it would appear that both founts were available to Stephen Austin in 1861. Perhaps Austin considered Watts's Bengali fount ill-suited for his purpose. As a printer he was selective about his choice of founts: in 1847 he elected to use Figgins's Paragon Sanskrit types for printing his first Oriental book, the *Hitopadeśa*,<sup>56</sup> yet Watts's Devanagari types were employed for *The Baital-Pachisi*,<sup>57</sup> in the preface of which Forbes declared:

The work is printed in Mr Watts's large type, unquestionably the finest and most *Oriental* specimen of Devanagari yet cast in Europe.<sup>58</sup>

Austin's disinclination to use Watts's Bengali types may be indicative of his professionalism as a printer; a professionalism which gained him the first-class medal prize for 'Impressions Typographiques' in 1855 at the Paris exhibition, and 'the presentation . . . of gold medals by her Majesty the Queen and the Empress of the French'.<sup>59</sup> There is no evidence that Watts's Bengali fount was used for any Haileybury College imprint. From 1811 Charles Wilkins's fourth Bengali fount (CW4) had become the customary fount for printing Bengali in England until it was superseded by VF1 in 1861,<sup>60</sup> when Duncan Forbes noted:

Forty years ago, a Bengali Professorship was established at Haileybury College for the benefit of young Civilians destined for the Bengal Presidency. Some fifteen years

55. They died the same year: 1844.

56. Francis Johnson, [ed.], *Hitopadeśa. The Sanskrit Text . . .* (London, 1847).

57. Duncan Forbes, [ed.] *The Baital-Pachisi* (London, 1857).

58. Forbes, *ibid.*, p. viii.

59. Frederick Danvers, et al, *Memorials of Old Haileybury College* (London, 1894), p. 226 (quoting from the *Hertfordshire Mercury* 28 May 1892). These medals are shown in Stephen Austin & Sons [*Specimens of Oriental and Other Types*] (Hertford, [1885]).

60. No evidence of VF1's use in England prior to this has emerged.

later, Professor WILSON, the Oriental Examiner, substituted Sanskrit for the Bengali - a measure, the wisdom of which I never could perceive: hence, for the last quarter of a century, seldom, if ever, has a single Bengali book been written, printed, or read in any part of Europe.<sup>61</sup>

VF1 was adopted by the Oxford University Press,<sup>62</sup> until, due to the mechanization of typefounding and composition, it was replaced by the Monotype Series 470.<sup>63</sup> The Oxford University Press also acquired a number of founts produced by Watts<sup>64</sup> who has been described as 'one of the most important founders of exotic types, being responsible for Syriac, Irish and a number of Orientals'.<sup>65</sup> It is, however, difficult to establish which founts Richard Watts cut or designed himself.

Watts was appointed printer to the University of Cambridge in 1802. In conjunction with a London printer named Andrew Wilson, he was instrumental in implementing the stereotyping process, developed by Lord Stanhope, for the duplication of Bibles and prayer books at the University.<sup>66</sup> In 1808 charges were set out in a pamphlet entitled, *Facts and Observations Relative to the State of the University Press*, alleging that Watts as University printer had shown no profit for the previous five years in comparison to an average annual profit of fifteen hundred pounds several years prior to his appointment. Watts published a *Reply*,<sup>67</sup> but he resigned<sup>68</sup> at the setting up of an enquiry into the affair. It has been said that at Cambridge 'no books of great importance seem to have been printed by Watts'.<sup>69</sup>

61. Forbes, *Grammar of the Bengali Language*, p. vi.

62. e.g. for printing John Beames's *Grammar of the Bengali Language* (Oxford, 1891). See case lays: pl. 87.

63. See below, chapter 9.

64. See *List of Ancient and Modern Greek and Oriental Founts at the University Press, Oxford* (Oxford, 1959).

65. Moran, *Stephen Austin*, p. 26.

66. S.C. Roberts, *A History of the Cambridge University Press 1521-1921* (Cambridge, 1921), pp. 122-3.

67. Richard Watts, *Reply of R. Watts to the Report of Dr Milner and Mr Wood, Relative to the University Press Affairs* (Cambridge, 1809).

68. With the hope of being re-appointed; R. Watts, *Supplement to R. Watts' Reply* [bound in the same volume].

69. Roberts, *Cambridge University Press*, p. 127.

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১৯০	১৭০	২০৭	১৫৬	৭০	১৮৮	১৮৫	১৯০	১৯৩	১৯৩	১৭৪	১৭৫	১৮০							
১৯১	১৭১	২০৮	১৫৭	৭১	১৮৯	১৮৬	১৯১	১৯৪	১৯৪	১৭৫	১৭৬	১৮১							
১৯২	১৭২	২০৯	১৫৮	৭২	১৯০	১৮৭	১৯২	১৯৫	১৯৫	১৭৬	১৭৭	১৮২							
১৯৩	১৭৩	২১০	১৫৯	৭৩	১৯১	১৮৮	১৯৩	১৯৬	১৯৬	১৭৭	১৭৮	১৮৩							
১৯৪	১৭৪	২১১	১৬০	৭৪	১৯২	১৮৯	১৯৪	১৯৭	১৯৭	১৭৮	১৭৯	১৮৪							
১৯৫	১৭৫	২১২	১৬১	৭৫	১৯৩	১৯০	১৯৫	১৯৮	১৯৮	১৭৯	১৮০	১৮৫							
১৯৬	১৭৬	২১৩	১৬২	৭৬	১৯৪	১৯১	১৯৬	১৯৯	১৯৯	১৮০	১৮১	১৮৬							
১৯৭	১৭৭	২১৪	১৬৩	৭৭	১৯৫	১৯২	১৯৭	২০০	২০০	১৮১	১৮২	১৮৭							



After his resignation from Cambridge, Watts moved to Broxbourne and then to London in 1816. By this time he had not only been appointed printer to the East India Company, but he also undertook work for the British and Foreign Bible Society. It was in this latter capacity that he appears to have developed most of his founts including one for Bengali composition. A broadsheet printed after his death by his son, William Mavor Watts, displays sixty-seven languages 'principally prepared by the late Mr R. Watts'.<sup>70</sup> A type specimen booklet issued circa 1862 by William Mavor Watts is equally ambiguous concerning the exact nature of his father's involvement in the production of the founts. Under the heading 'Oriental and other Types exhibited in class 28 of the International Exhibition, 1862, by W. M. Watts', he stated:

These Types were principally prepared by the late Mr R. WATTS, at a very considerable outlay, with a view more especially of printing the Scriptures and works of a similar nature.<sup>71</sup>

The origins of some of the founts are given, but not the Bengali which perhaps is intended to be encompassed by the statement:

Many other portions of the Specimens may claim originality, as they have generally been prepared by learned men in spreading the truth of God's Holy Book throughout the world.<sup>72</sup>

Claims to authenticity of design, however, are perhaps prejudiced by the unpleasant portrait painted by Charles Manby Smith of 'an externally and intrinsically dirty beast' who can be identified as Richard Watts.<sup>73</sup>

70. W.M. Watts, *Oriental and Other Types in Sixty-seven Languages or Dialects ...* (London, [1851]). See pl. 88.

71. W.M. Watts, *Specimens of Oriental and Other Types* (London, [1862]), p. 3. pl. 89.

72. Watts, *ibid.*, p. 4.

73. [Charles Manby Smith] *The Working Man's Way in the World* (London, 1857). See also Nowell Smith for a discussion as to whether Manby Smith was a 'witness of truth'; S. Nowell Smith, 'Charles Manby Smith: Family and Friends, His Fantasies and Fabrications', *Journal of the Printing Historical Society* No. 7, 1972, pp. 1- 28.

IN SIXTY-SEVEN LANGUAGES

PRINCIPALLY PREPARED BY T

AND NOW IN USE IN W. M. WATTS'S OFFICE, CROWN C

[And how hear we every man in our own

(L. P.)  
וְאִיכָה שָׁמַי

(L. P.)  
וְאִיכָה שָׁמַי

(E.)  
أَيْتَا سَمَاءِ  
كَلْمَاتُ

(P.)  
أَيْتَا سَمَاءِ

(P.)  
कयि कयि  
कयि कयि

(P.)  
كيف يسى  
كيف يسى

(G. P.)  
كيف يسى  
ال

(G. P.)  
كيف يسى  
ال

TURKISH, No. 2. (L. P.)  
وئجه بزهر برمز طوغدوغز كدولاسمزده انلري سويلر اشدرز

MALAY. (E.)  
انته بگمان کامي اين ماسخ ۲ دغر مریک ایت  
برکات ۲ دغن بهاس تانه کامي یغ خاص یغ  
دالمب کامي سده تقوانق

HINDUSTANI. (E.)  
یس کیونکر هر ایک هم مین سے اپنے وطن کی  
بولی سننا ہی

SANSKRIT, No. 1. (G. P.)  
तर्हि वयं प्रत्येकशः स्वस्वजन्मदेशीय-  
भाषाभिः कथा एतेषां शृणुमः किमिदं

SANSKRIT, No. 2. (E.)  
तर्हि वयं प्रत्येकशः स्वस्वजन्मदेशीयभाषाभिः कथा एतेषां  
शृणुमः किमिदं

MAHARATTA. (G. P.)  
आणि आमच्या ज्या बोलीत आही  
जन्मलो तीत आही प्रत्येक कसें ऐकतो?

HINDI. (G. P.)  
तो हम प्रत्येक जन अपनी २ जन्म  
देशीय भाषामें इनकी कथा सुंते हैं  
यिह क्या ?

BENGALI. (E.)  
উদ্যে আশ্রম প্রভৃৎ জন আশ্রমাদেয় জন্মদেশীয়  
ভাষাতে দেশাদেয় কথা শুনিতেছি, অ কি ?

URIYA. (E.)

MODERN ARMENIAN I  
Ե- Ինչպէս ինչպէս-ը Բն  
Ինչպէս-ը Բն-ը Բն ձն

GREEK, No. 1.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκασ-  
τοῦ διαλέκτῳ ἡμῶν ἐν ᾗ ἐγενε-

GREEK, No. 2.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστο-  
λέκτῳ ἡμῶν ἐν ᾗ ἐγεννήθη

GREEK, No. 3.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστο-  
λέκτῳ ἡμῶν ἐν ᾗ ἐγεννή-

GREEK, No. 4.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστος τ-  
ῶν ἐν ᾗ ἐγεννήθημε

GREEK, No. 5.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστος τῆ ἰδ-  
ἐν ᾗ ἐγεννήθημεν :

GREEK, No. 6.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστος τῷ ἰδ-  
ἐν ᾗ ἐγεννήθημεν :

GREEK, No. 7.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστος τῆ ἰδ-  
ἰγεννήθημεν :

GREEK, No. 8.  
Καὶ πῶς ἡμεῖς ἀκούομεν ἕκαστος τῆ ἰδ-  
ἰγεννήθημεν :

COPTIC, No. 1.

Οὕτως ἄνε

88. Specimen of Bengali types produced by Richard Watts (RW1); W.M. Watts, Oriental and Other Types in Sixty-Seven Languages or Dialects (London [1851])

10 ACTS II. 8.

(Tartars.) TARTAR. (Tartarisch.)  
وزیریه (سوز) ایشدورز هر بریز طوعدوغز خاص دلدہ

MALAY.

انته بکمان کلامی این ماسح ۲ دعر مریرک ایت  
برکات ۲ دشن بهاس تانه کلامی بیخ خاص بیخ  
دالمپ کلامی سده تفراتق

(Indostani.) HINDUSTANEE, No. 1. (Hindustan.)  
پس کیونکر هر ایک هم ان مین سے  
اپنے وطن کی بولی سنتا ہی

HINDUSTANEE, No. 2.

پس کیونکر هر ایک هم ان مین سے اپنے وطن کی  
بولی سنتا ہی

SANSKRIT, No. 1.

तर्हि वयं प्रत्येकशः स्वस्वजन्मदेशीय-  
भाषाभिः कथा एतेषां शृणुमः किमिदं

SANSKRIT, No. 2.

तर्हि वयं प्रत्येकशः स्वस्वजन्मदेशीयभाषाभिः कथा शतेषां  
शृणुमः किमिदं

ACTS II. 8.

11

(Indoi) HINDUWEE, OR HINDOOEE. (Hindi.)  
तौ हमारे अपने प्रत्येक देशके बोलोंसे उन्हींकी भाषा  
किस तरह सुनते हैं।

(Mahratia.) MAHRATTA. (Marathi.)  
आण आमच्या ज्यां बोलीत आहो  
जन्मलोतीत आहो प्रत्येक कोसे ऐकोतां?

HINDI.

तौ हम प्रत्येक जन अपनी २ जन्म  
देशीय भाषामें इनकी कथा सुंते हैं  
यिह क्या ?

(Nepal.) NEPALESE. (Nepal.)  
तब हमिहेर आफ्ना २ जन्मदेशका  
बोलीले उसका करा कस्तरह सुन  
दछां

(Bengalia.) BENGALL. (Bengalisch.)  
উত্তর আশ্রিত্রা উড়ঙ্গ জন আশ্রিত্রা জন  
আশ্রিত্রা উড়ঙ্গ জন আশ্রিত্রা জন  
আশ্রিত্রা উড়ঙ্গ জন আশ্রিত্রা জন

The Bengali fount attributed to Watts shows a move away from Wilkins's designs. It has not been possible to determine whether this fount was produced after Figgins's Bengali fount and, if so, whether Watts had sight of the latter. Nevertheless the style of Watts's Bengali (RW1) bears some resemblance to VF1, and to the products of his colleagues in Calcutta, who were also printing for the BFBS. Watts's attempt, however, is inferior to any of these, and to his Devanagari types.<sup>74</sup> The small type height of RW1 in comparison to CW4 is more suited to Bible and prayer book setting, but it possesses neither the rough but harmonious charm of Wilkins's fount nor the homogeneity and polish of Figgins's fount. Owing to the nature of the Bengali script, it is difficult to assess a typeface from just two lines of text as given in the 1851 broadsheet. Later samples of this fount reveal more of its nature.<sup>75</sup>

The difference of one decade between the 1851 broadsheet and the 1862 specimen book shows no change in the fount or the setting. The text is taken from Acts II. 8 of the Bible. On 15 January 1862 the Editorial Sub-Committee of the British and Foreign Bible Society suggested reprinting the specimen but substituting the text with John III. 16.<sup>76</sup> William Watts's response, recorded in the minutes of the Depository and Printing Sub-Committee of the BFBS, provides an indication of the status of Oriental founts in his type foundry and printing office:

In reply to your inquiry, I beg to observe that the texts in various languages were prepared by us principally for advertizing purposes, and we have given the Society the use of the forms,<sup>77</sup> the subject having been deemed interesting.

74. His 'Sanskrits were produced from drawings furnished for the express purpose by the late Professor Wilson'; Watts, *Specimens of Oriental and Other Types*, p. 4.

75. See below; although later samples probably show the work of different hands.

76. Noted by Kathleen Cann in her unpublished note, *The Gospel in Many Tongues* (Cambridge, [1986]), p. [1]; A copy is held at the St Bride Printing Library.

77. Probably means formes; 'forme' has been defined as 'typematter or type and blocks with its accompanying spacing material secured in the frame called a chase'; Linotype, *Printing Terms*, p. 17.

We had much difficulty to procure editors to the various dialects, at least such as to insure [*sic*] accuracy, and the expense of casting, arrangement etc. is unknown, as the specimen was in hand for months.

Many of the characters have been specially prepared; for although we possess the matrices etc., of most of the orientals, the founts of type have in some instances been sent abroad. Should therefore a fresh text be selected, new types must in some cases be cast.<sup>78</sup>

As a result, the same text continued to be used. Watts did publish *Our Lord's Prayer in One Hundred Different Languages* (c. 1869) for 'the benefit of the Poor Cretan Refugees now in Greece' giving a more comprehensive example of RW1 which is also employed with the addition of a few sorts for the Assamese translation. The uninspiring design of the RW1 does not improve upon further analysis. It shows itself to be lacking in direction, as if the designer took various unrelated elements from other typestyles and merged them into one fount producing a disjointed effect: compare the cramped 𑂔 with the confident and open 𑂒 . On the other hand, as suggested above in William Watts's response to the DPSC, the fount may simply reflect the combined work of more than one person undertaken at different times, additional sorts having been cut after his father's death for new compositions. Line three of the Bengali contains an orthographical error: 𑂒 instead of 𑂒 for 𑂒𑂣𑂤𑂥𑂦𑂧 . This specimen shows two versions of the character 𑂒 for no apparent reason.<sup>79</sup>

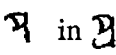






In March 1870 a fire broke out at William Watts's printing office. The fire, vividly reported in the *London, Provincial, and Colonial Press News*, destroyed his new premises comprising 'lofty buildings of five storeys' and, amongst other items, much of the type used to print *Our Lord's Prayer in a 100 Languages*. The entire stock of punches and matrices for reproducing them,




78. DPSC 10 February 1862: vol. 6, p. 190; quoted in Cann, *The Gospel in Many Tongues*, p. [1].

79. See pl. 90.

## BENGALI.

হে আমাদের স্বর্গস্থ পিতা :! তোমার নাম পবিত্ররূপে  
মান্য হউক। তোমার রাজ্যের আগমন হউক। তোমার ইচ্ছা  
স্বর্গে যেমন গৃথিবীতেও তেমন সফল হউক। আমাদের  
প্রয়োজনীয় আহাৰ আদ্য আমাদিগকে দেও। আর আগর  
যেমন আপন অপরাধিদিগকে ক্ষমা করি, তক্ষপ তমিও  
আমাদের অপরাধ ক্ষমা কর। এব° আমাদিগকে পরীক্ষাতে  
আনিও না, কিন্তু মন্দহইতে রক্ষা কর; যেহেতুক রাজত্ব,  
পরাক্রম ও মহিমা এ সকলই সদাকাল তোমার। আমেন্।

however, had been preserved.<sup>80</sup> Watts's business did not survive the destruction of the printing office: most of the surviving material was acquired by Gilbert and Rivington. Since the plates<sup>81</sup> for printing 'The Gospel in Many Tongues' had been destroyed in the fire, the Editorial Sub-Committee resolved to change the text,<sup>82</sup> as previously desired, to St John III. 16. The new setting appeared in 1872 and in a new specimen book issued by Gilbert and Rivington in 1873. Another specimen book was published in 1878 with the same setting of Bengali, but with the addition of 'Mussulman Bengali' and Assamese which show further idiosyncrasies of RW1.<sup>83</sup> One example is the reduced head of  in  in comparison to . Such treatment can be understood if the designer was constrained by the desire to maintain an optically uniform stroke length for  throughout the typeface, but this approach is contradicted by the character . The new sample suggests that the linguistic aspects of the script were not considered when completing the fount. It is curious that  should not number among the conjuncts designed as individual sorts, or at least exist in a form with a reduced stem to join with the oversized subscribed .

Gilbert and Rivington's 1880 imprint, *Specimens of Foreign Types*, uses the Lord's Prayer as its text for displaying the different scripts.<sup>84</sup> The Bengali translation is identical to that previously published by William Watts, but the orthographical error has been corrected and only the smaller version of  makes its appearance. The sort  has been remodelled and better spaced, as has the ligature . The imprint is prefaced with a notice revealing the

80. *The London, Provincial, and Colonial Press News* No. 52, vol. V for 1870: 16 Apr 1870, p. 28.

81. By this time stereo plates were normally used to reproduce already composed matter.

82. On 29 Mar 1871; Cann, *The Gospel in Many Tongues*, p. [1].

83. See pl. 91. Although this fount is in fact a revision, it will continue to be called RW1, since it is not possible to identify when revised or additional sorts were incorporated, nor who was their author.

84. See pl. 92.

138. SINDHI (*Gurumukhi character*).

ہا ہا اُتھی مگر جہاز پہ چڑھنے پیمارے رکھے جے پرنے  
 ریکھنے ہی جتھل پڑ ڈیٹا پئے ا تہے بے ا تہی ا تہے  
 ا تہے مے نامو ا تہے ڈیٹہ مہرا جتھل لہے ॥

## 139. HINDI, or Hindui.

کیونکہ ایشور نے جگت کو اسی پھار کیا  
 کی اسی نے اپنا اکلوتا پوتہ دیا کی  
 جو کوئی اسی پر ایشور کرے سو نام نہ  
 ہی اسی پر اسی نے اسی کو اسی دیا

## 140. HINDI (Kaithi).

کیونکہ اسی نے جگت پنے پنے کی، کی اسی نے اپنا  
 اکلوتا پوتہ دیا کی جو کوئی اسی پر ایشور کرے  
 سو نام نہ ہو اسی نے اسی کو اسی دیا

141. HINDUSTANI, or Urdu (*Arabic*).

کیونکہ اسی نے دنیا کو اسی پھار کیا ہے کہ اسی نے اپنا اکلوتا پوتہ دیا  
 تاکہ جو کوئی اسی پر ایمان لائے وہ اسی کے نام نہ ہو اسی نے اسی کو اسی دیا

142. URDU (*Persic*).

کیونکہ خدا نے جہان کو اسی پھار کیا ہے کہ اسی نے  
 اپنا اکلوتا پوتہ بخشا تاکہ جو کوئی اسی پر ایمان لائی  
 ہو اسی کے نام نہ ہو اسی نے اسی کو اسی دیا

143. URDU (*Roman*).

Kyūnki Khudā ne jahān ko isā piyār kiya hai, ki us ne  
 apnā āklūtā Bēṭā bakhshā, tāki jo koī us par imān lāwe, hālāki  
 na ho, balki hamusha kī zindagi pāwe.

## 144. DAKHANI, or Madras Hindustani.

اور خدا کھا کہ اسی نے جہان کو پیار کیا ہے، کی اسی نے  
 اپنے اکلوتا بیٹے کو بخشا ہے تاکہ جو کسی کو اسی پر ایمان لائے، حالانکہ  
 نہ ہو، بلکہ ہمیشہ کی زندگی پائے۔  
 (Gen. i. 14)

## 145. NEPALESE, or Parbutti.

कारण ईश्वरले दुनियालाई एकै पियारो गया कि उसले आफ्ना  
 एकैपैदा छोरालाई दियो कि जो हरेक मानिस उमापौ विश्वास  
 गर्दछन् सो नाम न होउन् तर अनन्त जीवन पाउन ।

## 146. BENGALI.

কেননা ঈশ্বর জগতের প্রতি এমত প্রেম করিলেন, যে আপনার  
 অদ্বিতীয় প্রসুতকে দান করিলেন; যেন তাঁহাতে বিশ্বাসকারি  
 প্রভুকে জন কিনতে না হয়, অথচ অনন্ত জীবন পায় ।

147. BENGALI (*Roman*).

Kenānā Ishwar jagater prati eman dayā karilen, je āpanār  
 adwitiya Putrako pradān karilen; tāhāto tāhār bishwās-kārī  
 pratyek jan nāchē nā haiyā ananta paramāyū pāibe.

## 148. MUSSULMAN-BENGALI.

করব খোদা দুনিয়ার তরফে অংশা যেহে করিলেন, যে তিনি  
 আপনার একমুত্বিতা বেটাকে বর্ণনা করিলেন, অংশা যে কোন  
 শব্দ তাঁহার উপরে ইমান আন সে হানাক না হয়, বরং  
 হানামার জন্মদান পাইতে পায় ।



## ENGLISH BENGALI.

হে আমাদেৱ স্বৰ্গস্থ পিতঃ! তোমাৰ নাম পবিত্ৰৰূপে মান্য হ'উক। তোমাৰ  
ৰাজ্যেৰ আগমন হ'উক। তোমাৰ ইচ্ছা স্বৰ্গে যেন পৃথিৱীতেও তেমনি সফল হ'উক।  
আমাদেৱ প্ৰয়োজনীয় আহাৰ আন্য অংগাদিগকে দেও। আৰ আমাৰা যেন  
আপন অপৰাধিদিগকে ক্ষমা কৰি, তৰুপ তমিও আমাদেৱ অপৰাধ ক্ষমা কৰ।  
এবং অংগাদিগকে পৰীক্ষাতে আনিও না, কিন্তু মন্দহইতে ৰক্ষা কৰ; যেহেতুক  
ৰাজত, পৰাক্ৰম ও মহিমা এ সকলই সদাকাল তোমাৰ। আমেন।

## ENGLISH ASSAMESE.

হে আমাৰ স্বৰ্গত থকা পিত্ৰি; তোমাৰ নাম পূজনীয় হওক, তোমাৰ ৰাজ্য  
হওক, জেনেকৈ স্বৰ্গত তেনেকৈ পৃথিৱীতে তোমাৰ ইচ্ছা পূৰ হওক। আজিৰ  
দিনৰ আহাৰ আমাক দিয়া। আৰ আমাৰ ধৰ্ম্মঅহতক, আমি জেনেকৈ খেমা  
কৰোঁ, তেনেকৈ আমাৰো ধাৰ খেমা কৰ। আমাক পৰিখাটৈ নিনিবা। কিন্তু দোসৰ  
পৰা ৰখ্যা কৰ। কিয়নো ৰাজ্য আৰ মহিমা প্ৰভাও এই সকলো সৰদাই  
তোমাৰ। আমেন।

92. Fig. 1. RW1: 'English Bengali'

Fig. 2. RW1: 'English Assamese'; Gilbert & Rivington, *Specimens of Foreign  
Types* (London, 1880)

competitive nature of Oriental typesetting prevalent in Europe during the nineteenth century.<sup>85</sup> The notice boasts that this catalogue 'represents the enterprises of a Firm which may fairly claim to be unrivalled in England, perhaps in the world, for its capability in executing Oriental Printing at home, and in supplying Oriental Types to Printers abroad'.<sup>86</sup>

In 1891 Gilbert and Rivington published *The Lord's Prayer in Three Hundred Languages* containing RW1 in Bengali and Assamese. The increase in the number of specimens of foreign-language setting suggests that Oriental printing and typefounding in Europe, or at least in England, was becoming more viable as a commercial enterprise. Reinhold Rost, on behalf of Gilbert and Rivington, made the point:

While in Russia, France, and Austria, the great Oriental Printing Establishments are largely subsidized by the respective Governments, Messrs Gilbert and Rivington have, unaided, brought together a profusion of type of almost any Eastern tongue: and they deserve the recognition of the public at large for the material aid they have for a quarter of a century been rendering in furthering the intercourse between this country and the East.<sup>87</sup>

A 'new and enlarged' edition of *The Lord's Prayer in Five Hundred Languages* printed by Gilbert and Rivington appeared in 1905, and it is from this point that the authenticity of the designs is open to question, for the introduction of the practices of electrotyping and stereotyping adopted in the nineteenth century invited plagiarism.<sup>88</sup> The showing of a new Bengali fount in this volume merits interest as an indication of Bengali type design tending towards the more indigenous style of founts.<sup>89</sup> The authorship of its design, however, remains unknown; it cannot be attributed to Gilbert and Rivington. Equally, the type face specimens published by the firm William Clowes & Sons, who took over

85. See below.

86. Gilbert & Rivington, *Specimens of Foreign Types* (London, 1880), p. 2.

87. Gilbert & Rivington, *Lord's Prayer in Three Hundred Languages* (London, 1891), Preface, [p. iv]; see pl. 93.

88. Discussed below, see chapter 6.

89. See pl. 94 and chapters 3ii and 7.

## BENGALI.

(Upper India.)

হে আগাদের স্বর্গস্থ পিতঃ ! তোমার নাম পবিত্ররূপে গান্য হউক । তোমার রাজ্যের আগমন হউক । তোমার ইচ্ছা যুগে যেমন পৃথিবীতেও তেমনি সকল হউক । আগাদের প্রয়োজনীয় আহাৰ অদ্য আগাদিগকে দেও । আর আগরা যেমন আপন অপরাধিদিগকে ক্ষমা করি, তরূপ তমিও আগাদের অপরাধ ক্ষমা কর । এবং আগাদিগকে পরীক্ষাতে আনিও না, কিন্তু গন্দহইতে রক্ষা কর ; যেহেতুক রাজত্ব, পরাক্রম ও মহিমা এ সকলই সদাকাল তোমার । আয়েন ।

## BERBER.

(N. &amp; N.-W. Africa.)

أَذْيَاسَن مَذِيلَ نَعَزَمَ انْفَسَ أَبَابَ اذْكَرَ اِنْمِكْ نَشِبَفَ  
 اَلْدَسَنَ اَمْلِيكَ اِنْكَ . اَنْغَرَمَ اَنْغَ اِشْطَعَ اَبْكَغَ اَسِي . اَعْبِيغَ  
 اَزِيَدَ اَنْغَ اَفْلَغَ ذَنْغَنِ اَنْعَبُ اَكْرَ اُونِ اِنِّ اَنْغَ اُرْغَسْكَسْمَ  
 . اَشْكَ .

## BIKANIRI.

(Province of Bikanir,  
India.)

হে স্বর্গম্বে রেণবালা ম্হাঙ্কা বাভা যারো নাংবো নির্মল হেঁ যারো রাজ আবেঁ যারা  
 মনমাফক স্বর্গম্বে নিস্যো তিস্যো সঁসারম্বে করযা জায় । ম্হান্বে নীৰণলায়ক পূহাক  
 আন ম্হান্বে দেবো জোর ম্হাঙ্কো জুয় ম্হান্বে মাফ করো নিস্যো ম্হে জায়কা লেঁণায়তান্বে  
 মাফ করাব । জোর পরম্বে ম্হান্বে মতলে লেঁর বোঁঠাইম্বে বুডাবো ক্যোঁস রাজ জোর  
 বল জোর মহাত্ম রোজোনোঁ যাঁকা হে । জামিন্ ।

## BOJINGIJIDA, or South Andaman.

(Andaman  
Islands.)

Hè maw'ró kóktár len yá'té móllárdú'ró ia Abmá'yola, ngia Ting'len  
 daij'i-múgú-en'inga itán'. Ngól'lalen móllárdú'ró met'a má'yola  
 ngen'áke abchá'nag ij'ila bé'dig. Maw'ró kóktár'len teg'ilútíná'lin  
 yá'té ngia ká'nik, káú'bada ar'lálen ar'lálen er'emlen itán'. Kawai'  
 móllárdú'rúlen ar'lá-nai'kan yát mau. Móllárdú'ró mól'oichiklen  
 tigrél' yá'té ol'oichiklen ártidú'bú, kich'ikan-nai'kan met' áryen'-  
 ami ártidú'bú. Móllárdú'rúlen ótigú'junga itán ya'ba ; Dó'na mól-  
 lárdú'rúlen abja'bagtek ótráj'. Ngól kich'ikan ká'nik yáp'ko.

Gilbert &amp; Rivington.



Gilbert & Rivington in 1908,<sup>90</sup> cannot be regarded as original designs, or even new settings. From 1903 the printing of *The Gospel in Many Tongues* for the BFBS was taken on by Oxford University Press, and thus RW1 was replaced by <sup>Figgins's</sup> Pica Bengalee<sup>3</sup> for representing the Bengali language in subsequent editions of this continually-expanding work. The 1965 edition of 875 languages still gives this fount.<sup>91</sup>

VF1 and RW1 show the emergence of non-Latin fount production undertaken in England on a commercial basis and the introduction of the professional hand to Indian vernacular typefounding.<sup>92</sup> The successful use of Figgins's fount at the presses of the Baptist Missionaries, Stephen Austin, and the University of Oxford, in the hands of trained compositors and printers,<sup>93</sup> indicate a recognition of the importance of linguistic knowledge in the field of non-Latin type design, typefounding, and printing. Unlike Jackson, Figgins succeeded in reconciling the linguistic demands of the Bengali script with the art of typefounding. The quality of VF1's printed image compensates, in part, for the design being somewhat less imaginative than other contemporary Bengali founts, and explains why this fount remained in use long after the death of its progenitor. Vincent Figgins's fount of Bengali types saw over one century of use.

90. See *The British Printer*, 20, 118 (Aug-Sept, 1920), p. 215 and pl. 95.

91. See pl. 96.

92. Charles Wilkins and William Carey had begun as amateurs.

93. One of Austins's employees, Napoleon Newton, spent more than ten years studying Sanskrit, Persian, and other languages at Haileybury College; Moran, *Stephen Austin*, p. 38.

## BENGALI.

(No. 1.)

[14 Point.

আসিয়াছ কি কার্য্য কর। সেই ব্যক্তি উত্তর করিলেক যে  
আমি তলোয়ার মারিতে আর ব্যাঘু ধরিতে পারি ইহা ব্যতি-  
রেক আর২ রূপ শিল্প কর্ম্ম জাত আছি এবং তীর এমত  
মারিতে পারি যে আমার তীর কঠিন প্রস্তরেতে ছিন্ন করিয়া  
নির্গত হয় এবং খজেন্দর নামা এক জন ধনবান আছেন  
আমি কিছু দিবস তাহার নিকটে চাকর ছিলাম কিন্তু খজেন্দর  
আমার কিছু গুণবিবেচ না করিয়া নুশিলেন না অত এ

(No. 2.)

[12 Point.

রাজা তেবরস্তান এক দিবস আপন সভা স্বর্গের ন্যায়  
সাজাইয়া উত্তম অন্ন ব্যঞ্জন এবং নানাপ্রকার মদ্য মাংস  
ভক্ষ্য দ্রব্য সভামধ্যে রাখিয়া ঐ দেশীয় রাজপুত্র ও মর্ঘ্যাদক  
ও পণ্ডিত ও শিক্ষাপুস্তকদিগকে সেই স্থানে উপস্থিত  
করিয়া রাজা তেবরস্তান সেই সব উত্তম দ্রব্য তাহারদিগকে  
ভোজন করাইতেছিলেন ইতি মধ্যে অকস্মাৎ সেই স্থানে  
এক জন বিদেশী উপস্থিত হইল। তদনন্তর রাজসভাস্থ  
প্রধানেরা তাহাকে জিজ্ঞাসিলেন যে তুমি কে কোথাহইতে

## ORIYA.

[14 Point.

ବନଝେରା ମାହାରଣ ନ କରେଇ ମରଝରଣ ସାସା ଧିରଇବେନ  
ରୋ ଅସ୍ମାକଂ ସ୍ଵର୍ଗସ୍ତ ପିତଃ ଇବ ନାମ ପବନ୍ତଂ ପୁରୁଷତାଂ । ଇବ  
ରାଜ୍ୟମାପାତୁ । ଯଥା ସ୍ଵର୍ଗେ ତଥା ମେଦିନ୍ୟାମପି ଚକେଚ୍ଛା ସିଧ୍ୟତ  
ପସ୍ତୁନଂ ରଞ୍ଜ୍ୟମଦସ୍ମାସ୍ମର୍ୟଂ ଦେହି । ବସଞ୍ଚି ଯଥାସ୍ତୁତପରାଧିନାଂ  
ଶମାମହେ ତଥା ହିମସ୍ମାକମପରାଧାନୁ ଶମସ୍ଵ । ଅସ୍ମାନ୍ତୁ ପରାଣାଂ  
ମା ନପ ଅପି ତୁ ଦୁରାଦୁତ ଉଦ୍ଧର । ଯତୋ ରାଜ୍ୟଂ ପରାତ୍ରମଃ  
ପ୍ରତାପସ୍ତୁ ସୁଗେ ସୁଗେ ଚକେଚି । ଆମେନ୍ ॥ ଅସାହାନ ନାରନା

76 BEMBA. N. Zambia. 1956

Pantu Lesa atemenwe aba pano isonde ukutenwa kwa kuti apēle Umwana wakwe uwafyalwa eka, ukuti onse uumutetekela conaika, lelo abe no mweo wa muyayaya.

77 BENA. NE. of Lake Nyasa, Tanzania. 1920

Ndivwene Nguluvi ajendile mbandu inī, kye alesile atavulage umuswamuve umuŋa-kimwinga, ukuta vonda, avakumufuvwa, vatanage ukujaga, nda hamu, vavedzage nuvūmi vwa mbēpali.

78 BENGA. Corisco Is., Gabon. 1929

Ikabojana nonanē ndi o Anyambē a tândākidi he, ka Mā-a vē Mwan' 'aju umbākā, na, uēhēpi a ka kamidē Mā, a nyange, ndi a na emēnā ya egombe yēhēpi.

79 BENGALI. W. Bengal, India.

Bengali char. 1937

কারণ ঈশ্বর জগৎকে এমন প্রেম করিলেন যে, আপনার একজাত পুত্রকে দান করিলেন, যেন, যে কেহ তাঁহাতে বিশ্বাস করে, সে বিনষ্ট না হয়, কিন্তু অনন্ত জীবন পায়।

Roman char. 1839

Kenaná I'shwar jagater prati eman dayá karilen, je ápanár adwitíya Putrake pradán karilen; táháte tánhár bishwáskári pratyek jan naṣṭa ná haiyá ananta paramáyu páibe.

BENGALI: Colloquial. 1910

টিক তেমনি, আমি তোমাংগকে বলিতেছি, এক জন পাপী মন ফিরাইলে, তাহার জন্ম ছুতদের মত্রে ঈশ্বরের আনন্দ হয়। *Lk.*

## Chapter 6

### European Typefoundries

The production of oriental or 'exotic' types by European typefoundries since the mid-fifteenth century has been documented in authoritative histories of printing.<sup>1</sup> Unfortunately, much of the material upon which the historians have based their writings is either no longer available or currently inaccessible. Furthermore, the reliability of some accounts is questionable,<sup>2</sup> and there is no assurance that the terms oriental or 'exotic' refer to types other than Hebrew, Arabic, or even Greek,<sup>3</sup> or whether the founts in question represent original designs, stolen matrices, or overt copies. The matter is further complicated by the fact that the histories of oriental founts issued by letterfoundries in Italy, France, and Austria are inextricably intertwined.

The press and foundry of the Sacra Congregatio de Propaganda Fide in Rome was established in 1626 expressly to foster missionary activities. As such, a large part of its enterprise was concentrated upon the acquisition and production of founts of foreign scripts. Thus it acquired some of the oriental types from the Stamperia Medicea<sup>4</sup> and also the 'exotic' founts of the Vatican Press,<sup>5</sup> which included Hebrew, Greek, Syriac-Serto, Arabic, and Cyrillic. A number of these founts are shown in the 1628 specimen book published in Rome: *Indice de Caratteri, con l'Inventori, & nomi di essi, esistenti nella Stampa Vaticana*,

1. For instance, by H.D.L. Vervliet, A. Jammes, S.H. Steinberg, D.B. Updike, Colin Clair, and others.
2. e.g. James Moran erroneously refers to Halhed's *Grammar* as having been printed with Sanskrit types: *Stephen Austin of Hertford* (London, 1968), p. 24.
3. In volume II of the 1818 edition of Giambattista Bodoni's *Manuale Tipografico* (Parma), exhibits over 60 Greek typesyles.
4. Which possessed a number of Arabic founts whose designs are attributable to Robert Granjon; see Hendrik D.L. Vervliet, *Cyrillic and Oriental Typography in Rome at the end of the Sixteenth Century* (Berkeley, 1981), pp. 23-39; and Harry Carter, ed., *Sixteenth Century French Typefounders: The Le Bé Memorandum* (Paris, 1967), p. 44, n. 38 and pp. 44-47, n. 42.
5. The Stamperia Vaticana was founded in 1587 by Sixtus V. It united with the Tipografia Camerale in 1609 (A. Bertolotti 'Le Tipografie Orientali e gli Orientalisti a Roma nei Secoli XVI e XVII', [Extract from *Revista-Europea*, and re-paginated] (Florence, 1878), p. 31); and with the Propaganda Fide in 1910 (*The Catholic Encyclopedia*, Vol. 15 (New York, 1912), p. 302).



& *Camerale*. Indian scripts, however, are represented only by a woodcut entitled 'Alphabetum Indorum'.<sup>6</sup>

It was under the direction of Ruggeri<sup>7</sup> and his successor Amaduzzi during the second half of the eighteenth century that the Propaganda Fide flourished. In Amaduzzi's time the Propaganda Fide is estimated to have possessed founts of forty-four languages, some of which are displayed in a 1773 publication entitled *Catalogus Librorum qui ex Tipographio Sacrae Congreg. de Propaganda Fide variis linguis prodierunt*.<sup>8</sup> It has not been possible to locate or view this imprint, but no account of it mentions the existence of Indian founts. One exception is the 'Malabarice'<sup>9</sup> fount displayed in *Parentalia in Anniversario Funere Mariae Clementinae Magnae Britanniae &c. Reginae*.<sup>10</sup> A type specimen book published much later by the press, *Specimen Characterum Typographi* (Rome, 1843), includes both a 'Brahmanica' and a 'Malabarica' fount but no Bengali designs.

The success of the Propaganda Fide was, however, curtailed at the close of the eighteenth century by the activities of the French Directory who sought to enrich France with the matrices of foreign types;<sup>11</sup> a practice continued by Napoleon, as Duprat described:

Toutefois, le vainqueur de l'Italie, usant du droit que donne la conquête, avait fait enlever, en 1798, de l'imprimerie de la Propagande, à Rome, et, en 1811, de celle des Médicis, à Florence, des collections de poinçons de caractères arabes, barmans, coptes,

6. Possibly of Portuguese origin; see pl. 97.

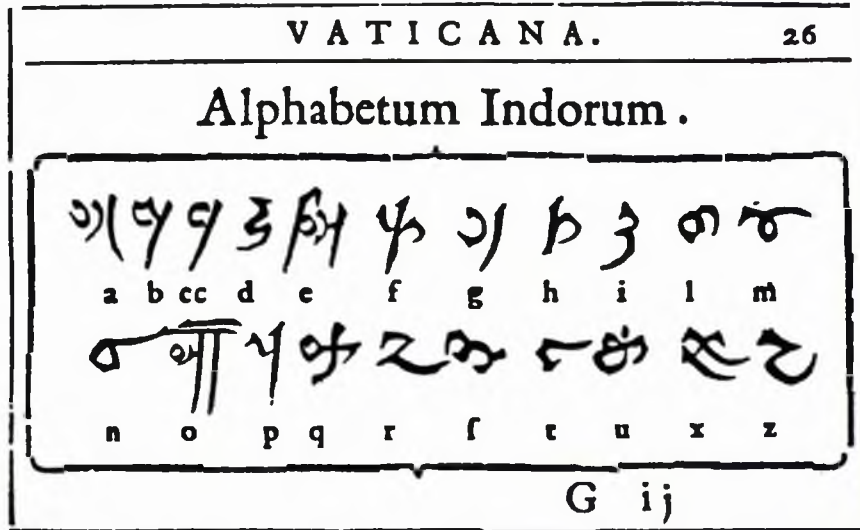
7. Stefano Paolini was its first director. Ruggeri, who trained Bodoni, committed suicide in November 1782.

8. Updike, *Printing Types*, I, p. 182.

9. Usually a quasi-Malayalam script, but in this case it is more akin to Syriac.

10. Of Filippo d'Azon (Rome, 1736), p. 34.

11. In 1798; Updike, *Printing Types*, I, p. 183.



éthiopiens, malabars, persans, samaritains, syriaques et tibétains, gravés au XVII<sup>e</sup> siècle par les soins de ces ardens propagateurs de la foi, et dont il enrichit le dépôt typique de l'Imprimerie impériale.<sup>12</sup>

The Imprimerie Impériale<sup>13</sup> was eager to utilize its collection of plundered matrices, electing to honour the visit of Pope Pius VII to Paris in 1805<sup>14</sup> by the publication *Oratio Dominica CL Linguis Versa, Et Propriis Cujusque Linguae Characteribus Plerumque Expressa*, edited by J.J. Marcel. This imprint contains 150 translations of the Lord's Prayer. Ironically, or perhaps deliberately, many of the items were printed with founts taken from the Pope's own foundry. Indian translations included Sanskrit, Gujarati, Marathi, and Bengali, but all were set in the Latin script. Furthermore, some of the texts printed in the vernacular scripts were not composed by means of single type but were copperplate impressions, as Giambattista Bodoni remarked in his work of a similar title published the following year.<sup>15</sup>

Bodoni's *Oratio Dominica*, printed at Parma was specifically designed to improve upon the earlier imprint,<sup>16</sup> but not with a view to improving the quality of the translations, many of which were taken from the same source and whose correctness he did not question:

Cependant, malgré tous ces avantages, l'édition de Paris ne contenant pas le Chaldeen, le Syriaque, le Phenicien, le Palmyrien, le Brachman, le Malabare ou Samskrete, le Thibetain, le Georgien, l'Etrusque, l'Illyrien, l'Hebraïque-Theutonique, le Gothique d'Ulphylas et le Punique, et me trouvant avoir tous ces caracteres exotiques . . . je concus l'idée d'en faire une plus complete, et me decidai a tenter cette entreprise aussi difficile que longue.<sup>17</sup>

12. F.A. Duprat, *Histoire de L'Imprimerie Impériale de France* (Paris, 1861), pp. 259-260.

13. Whose foundation dates back to 1640.

14. For Napoleon's coronation.

15. *Oratio Dominica in CLV Linguis Versa et Exoticis Characteribus Plerumque Expressa* (Parma, 1806), pp. xi-xii.

16. Supposedly at the suggestion of Pius VII; Colin Clair, *A History of European Printing* (London, 1976), p. 330.

17. Bodoni, *Oratio Dominica*, p. v.

Bodoni's ambitious work dedicated to Eugène Napoléon was set entirely in movable metal types all of his own design.<sup>18</sup> In this work, which also lacks Bengali types, he expresses 'le desir d'être utile aux amateurs et aux cultivateurs des langues exotiques'<sup>19</sup> despite the complexity of their scripts, which in the case of 'Malabare' demanded 1132 matrices in comparison to 400 for Latin founts.<sup>20</sup> Bodoni's ambitions in this direction reflect the increasing interest in Orientalism prevalent in Europe during this period aroused by voyages of exploration, imperial campaigns, and 'the desire to make up by missionary work in the East for the territories lost by the Roman Church in Europe'.<sup>21</sup>

After France's conquest of Italy, the Propaganda Fide was never able to regain its former status. In July 1812 'the office was suppressed',<sup>22</sup> and later that year it was ordered by the Prefect of Rome to send all its matrices to Paris. The press managed to conceal a few items presented by Bodoni and to retain some other articles, but most of the material was lost. According to Duprat,<sup>23</sup> Commissioners of the Tuscan Government reclaimed the Medici punches with menace in 1815. On 7 October that year they headed a detachment of Austrian troops in order to complete the task. Anisson of the Imprimerie Impériale was entreated not to offer any resistance to the removal of the punches if violence was to occur. The operation, however, was not well organized and was carried out by people lacking discernment with regard to the material they were to

18. 'die erste Sammlung mit beweglichen Lettern': Karl Falkenstein, *Geschichte der Buchdruckerkunst* (Leipzig, 1840), p. 29.

19. Bodoni, *Oratio Dominica*, p. viii. This desire had been aroused by his first task at the Propaganda Fide, viz. the renovation of the oriental types; Clair *European Printing*, p. 328.

20. Bodoni, *Oratio Dominica*, p. xi.

21. *The Type Specimen of the Vatican Press 1628; A Facsimile with an Introduction and Notes* by H.D.L. Vervliet, (Amsterdam, 1967), p. 18, n. 2.

22. Updike, *Printing Types*, I, p. 184.

23. Duprat, *L'Imprimerie Impériale*, p. 260. This account does not accord with Updike's, but it is certainly the better documented and therefore the more credible.

collect, which happened to be stored in the same place as the punches belonging to the Imperial collection and the Propoganda Fide. In consequence, some valuable Medici punches remained in the possession of the Imprimerie Impériale, whilst a number of the Propoganda Fide punches were taken in error.<sup>24</sup>

In November 1815 Anisson was authorized to return to Marini, the Prefect of the Secret and Pontifical Archives of Rome, all the punches and matrices of the Propaganda Fide press that the Imprimerie Imperiale still had in its possession. Prior to fulfilling this task, Anisson took the precaution of taking 'des frappes en cuivre'<sup>25</sup> of all the Italian punches which he felt he could not dispense with. As a result, the Imprimerie Impériale was still able to boast in 1815 the possession of le fonds de typographie orientale le plus riche, le plus complet et le plus précieux qui existât dans le monde.<sup>26</sup>

A specimen of Bengali types is given in the Imprimerie Royale's<sup>27</sup> 1819 type specimen book.<sup>28</sup> The text shown was taken from the first volume of *Recherches Asiatiques* published in 1805;<sup>29</sup> in fact, the settings are identical. The typeface, which is simply termed '14 points' (to be termed here IR1), possesses an elegance which owes more to its resemblance to European copperplate engraving than to any affinity with Bengali calligraphy.<sup>30</sup> The delicate thin strokes contrast well with the strong headline, from which the characters appear to be suspended, and with the spots of colour created by the

24. There is no precise record of what was returned. Duprat's allegiances naturally lay with the French accounts of the episode. Duprat continues to use the epithet 'imperiale' even after Napoleon's second abdication in June 1815, but see below, n. 27. For information regarding surviving typographic materials of the Typographia Medicea and Tipografia Poliglotta Vaticana, see James Mosley, *Typefounding Materials; A List of Locations* (Privately circulated London, 1987), pp. 13 and 14.

25. Duprat, *L'Imprimerie Impériale*, p. 261.

26. Duprat, *ibid.*

27. Depending on the government of the day its name varied between the appellations: Royale, de la République, du Gouvernement, Imperiale, and Nationale.

28. *Specimen des Caractères Vignettes, Armes, Trophées et Fleurons de l'Imprimerie Royale* (Paris, 1819). See pls. 98 and 99.

29. It being the French translation of *Asiatick Researches*, 1 (Calcutta, 1788).

30. Or Bengali engraving; see chapter 7. See also chapter 10 regarding the point system.

## CARACTÈRE BENGALI.

14 points.

মুচুজহীহিধনাগমতৃষ্ণা° দক্ষতনুবৃষ্ণিনঃসু বিতৃষ্ণা° ।  
 যজ্ঞতেনৈজকর্মোপাত্ত° বিত্ত° তেনবিনোদয়চিত্ত° ॥  
 কাঁতবকান্তাকন্তেপুত্রঃ স°সাবোয়মতীববিচিত্রঃ ।  
 কস্যস্ব°বান্নতআযাতস্তস্ব°চিত্তযতদিদ°ভ্রাতঃ ॥  
 মান্দক্ষণজনযৌবনগর্ভ° হরতিনিমেঘাৎকালঃসর্ব° ।  
 মায়াময়মিদমখিল°হিস্বা ব্রহ্মপদ°পুৰিশাশুবিদিত্বা ॥  
 নশিনীদলগতজলবত্তরল° তদ্বস্ত্রীরনমতিশয়চপল° ।  
 ক্ষণমিহসস্তনস°গতিবেকা ভবতিভবার্হবতৰণৌকা ॥  
 যাবস্তন°তাবগমণ° তাবস্তননীজচৰে°য়ন° ।  
 ইতিস°সাবেদৃষ্টতবদোষঃ কথমিহমানবতবসন্তোষঃ ॥  
 দিনযামিন্যৌনায়°প্রাতঃ শিশিবসন্তৌপুনরায়াতঃ ।  
 কাশঃফীড়তিগজ্জ্যাত্বন্দপিনমুষ্কৃত্যাশাবাযুঃ ॥  
 অঙ্গ°গলিত°পলিত°মুপ্ত° দত্তবিহীন°জাত°শুভ° ।  
 কৰ্হুতকল্পিতশোভিতদণ্ড° তদপিনমুষ্কৃত্যাশাতপ্ত° ॥  
 সুববরমন্দিরতরুতলবাসঃ শয্যাভূতলমজিন°বাসঃ ।  
 সৰ্ব°পরিগ্রহভোগত্যাগঃ কস্যদুখ°নকরোতিবিবাগঃ ॥  
 শত্রৌমিহেপুহেবদৌ মান্দক্ষয়ত°বিগ্রহনদৌ ।  
 ভবনমচিত্তঃসৰ্ব°ত্রয়° বাঙ্কস্যচিবান্ধুদিবিক্ষয়° ॥

অক্ষুণ্ণাচলনসমুদ্রা ব্রহ্মপুত্রবদ্বাদিনকবকদ্রাঃ ।  
 নস্বনাহ°নায়°নোকস্তুদপিকিমথ°ক্রিয়তেশোকঃ ॥  
 স্মিয়মিটান্যত্রৈকোবিকুব্যথ°দ্যপ্যসিমম্যনহিবুঃ ।  
 সৰ্ব°পশ্যন্যায়ান° সৰ্ব°হ্রোৎসজতেদজ্ঞান° ॥  
 বাসস্তাবৎক্রীড়াশক্তনুকাস্তাবৎতরু°বিত্তঃ ।  
 বৃহস্তুবৎচিত্তামদঃ পৰমেব্রহ্মণিকোপিনশনঃ ॥  
 দ্বাদশপহুচিকান্তিৰশেবঃ শিব্যাণ্য°কথিতোত্য়পদেশঃ ।  
 যেষা°নৈষকৰোতিবিরেক° তেষা°কঃকুরুতামতিৰেক° ॥

Extrait des Recherches Asiatiques, ou Mémoires de la Société établie au Bengale,  
 tom. I.<sup>er</sup>, pages lxxxij et suiv.

'roundings', vowel signs, and thickening of finial curves. The inherent fluidity of IR1 is emphasized by the repeated diagonals of such characters as **ب** and **م**, and also by the absence of regimented vertical lines: the upright strokes have been splayed, or, in the case of **ق**, slightly slanted.

Close inspection, however, gives the distinct impression that whilst some characters have been handled with confidence, the structure of others has eluded the designer or punchcutter. The sorts **و** and **ز**, number amongst those that have been more adroitly executed; perhaps because they possess characteristics which European engravers had previously encountered in the production of Arabic typefaces. One such characteristic is the treatment of the partial elliptical shape of the letterforms mentioned, as instanced by the *waw* **و** in Guillaume II Le Bé's 1599 Arabic typeface specimen.<sup>31</sup> The same can be said of the stroke **و** which is to be found in the *raphalā* **ا** and the cross-stroke of **ن**, and also the confident handling of the finial of **د** and **د**. Yet the treatment of **س** is rather heavy-handed and **پ** is a very curious shape.

Despite the undoubted aesthetic qualities of IR1, numerous faults are also apparent in its design. The proportions of the sorts one to another within the fount are unbalanced. The character **ن** is too narrow, the internal counters of **و**, and **ز** are too small in comparison to **م** and **ب**. The *akṣara* **ا** for no evident reason has two forms; one possessing a particularly narrow counter.<sup>32</sup> Restricting the depth of such conjuncts as **دو** and **ذو** has impaired their legibility. The character **و** appears condensed in comparison to the generous-sized **و**. The somewhat eccentric angle of **و**, previously encountered in CW1,<sup>33</sup> is probably designed to compensate for its right-hand curl, but other founts have coped satisfactorily with this element. The filling-in of the subscript vowel signs, however, is presumably calculated to add colour.

31. Reproduced in *The Le Bé Memorandum*; see pl. 100. Naturally, the sorts are not identical, but there is a similarity in their shaping and colouring.

32. See pl. 98, line 10.

33. See above, chapter 1, and pl. 16.





Characteres Arabici,  
*In Gallia nunc primùm incisi.*

بِسْمِ الْآبِ وَالْأَبْنِ وَالرُّوحِ الْقُدْسِ \*  
 وَهُوَ يُوْحِنَاءُ التَّمْلِيْدِ الَّذِي اِتَّكَوَّتْ  
 الْعَسَاءُ عَلَيَّ صِدْرَةَ هَذَا هُوَ التَّمْلِيْدِ  
 الَّذِي شَهِدَ بِهَذَا وَكْتَبَهُ وَنَحَنَ تَعْلِمِ  
 اِنَّ شَهَادَتَهُ هِيَ حَقٌّ \*

GVLIELMVS LE BE' Parisiensis  
 incidebat Lutetia anno  
 CIO IO IC.



A specimen by Guillaume II Le Bé of his Arabic  
 type, Paris, 1599 (Antwerp, Museum Plantin-Moretus)

The spacing is not well adjusted. Problems arise with characters preceding ৳, e.g. ক and উ.<sup>34</sup> The right side of ক also fouls with ঞ. Inconsistencies in spacing between the same letterforms, e.g. ন and ঞ, suggest poor justifying of the matrices that cast the type.<sup>35</sup> The very thin strokes and the tight space between the headline and the principal elements of such characters as ন, ল, and ঞ indicate that problems would arise in long printing runs, and the face would not translate well into a smaller type size without considerable redesign work to ensure legibility. However, within the context of the development of printed Bengali letterforms, the main defect of this typeface must be its overtly European appearance.

It is curious that subsequent specimen books issued by the Cabinet des Poinçons do not include IR1 or any other fount of Bengali types. The very informative *Notice sur les Types de l'Imprimerie Royale* of 1847 gives the origins of the Zend, Pehlevi, Telugu, and Burmese types, but the '14 points' Bengali is not alluded to, nor is there even an indication of its existence. A small showing of IR1 can be found in the 'Typenschau' appended to Falkenstein's *Geschichte der Buchdruckerkunst* in 1840.<sup>36</sup> Although Falkenstein was able to obtain settings of non-Latin founts in Germany,<sup>37</sup> he considered the founts of the Imprimerie Royale to be superior and therefore arranged for the 'Typenschau' to be both composed and printed in Paris.

The 1819 specimen book of the Cabinet des Poinçons refers to another set of Bengali characters in 16 point, 'dont il n'existait point de Fontes au I.<sup>er</sup> Janvier 1819'. The typeface is mentioned under the designation 'Samscrit' in the

34. See pl. 98, lines 8 and 16.

35. See Joseph Moxon, *Mechanick Exercises on the Whole Art of Printing* (1683-4), eds. Herbert Davis and Harry Carter, 2nd edn (New York: London, n.d), 'Justifying the Matrices', pp. 155 ff.

36. Falkenstein, *Buchdruckerkunst*, Appendix, see pl. 101.

37. Falkenstein, *ibid.*, p. xiii.

Aethiopicisch und Amharisch.

ቀ ከ ነ ገ ሃ ጠ ጨ ዘ ዠ ገ ተ ቸ ደ ጀ ነ ፒ ጳ ጠ ፈ ጦ ፆ ረ ለ ወ ስ  
 ሸ ግ ጸ ፀ ሀ ሐ

Sanskrit (Devānagari).

अ इ उ ऋ लृ आ ई ऊ ऋ लृ ए ऐ ओ औ  
 क ख ग घ ङ च छ ज ङ ज ट ठ ड ढ ण त थ द ध न प फ ब भ म  
 य र ल व श ष स ह ळ  
 १ २ ३ ४ ५ ६ ७ ८ ९ ०

Bengalisch.

মূৰ্ছা অহীহিধনাগামতৃষ্ণা° নকুতনুবৃষ্টিমঃনুবিতৃষ্ণা°।  
 যঞ্জতনেনিজকর্মোপাত্ত° বিত্ত° তেনবিনোদয়চিহ্ন° ॥

Gujarattisch.

અ ઝ ઙ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ  
 ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ ટ ઠ ડ ઢ ણ

101. IR1 specimen: 'Typenschau'; Karl Falkenstein, *Geschichte der Buchdruckerkunst* (Leipzig, 1840)

section 'L'Ancienne Typographie', and Fouquet is named as its engraver. He is also listed as the engraver of a number of other founts, including a 13 point Sanskrit Devanagari which he is recorded as cutting in 1805.<sup>38</sup> No showing of the 16 point Bengali fount has been discovered. In the later type specimen book of 1963 issued by the Cabinet des Poinçons, reference is made to '188 poinçons en cuivre de caractère bengali, gravés en 1805 par Fouquet'.<sup>39</sup> Again, no specimen of this fount is given, and there is no assurance that the characters were correctly identified as Bengali. It is likely that these were the 13 point Devanagari characters mentioned above. The confusion surrounding these founts is compounded by the fact that only 6 steel punches of the 13 point remain (in the possession of the Cabinet des Poinçons of the Imprimerie Nationale) but these are held in a box which has Fouquet's name crossed out and replaced by that of Hénaffe, who engraved a century later.<sup>40</sup>

No further information has come to light from the Imprimerie Nationale (or from other sources) regarding the career of Fouquet, the 16 point Bengali characters, or the origins of IR1. With regard to the genesis of the latter fount, there is no evidence of involvement on Fouquet's part; although he is known to have been active in cutting Bengali punches for the Imprimerie Imperiale/Royale at the beginning of the nineteenth century. Moreover, from the little evidence available, it cannot be inferred that Fouquet's skills extended beyond that of engraving: neither the design nor the punchcutting of IR1 can be attributed to him. The lack of Bengali types, as noted above, in the imprints of the Vatican and Propaganda Fide presses, as well as in Bodoni's works does not support the notion that the French fount was derived from an Italian prototype.

38. 'Etat des Caracteres', *Specimen des Caractères ... de l'Imprimerie Royale*.

39. *Le Cabinet des Poinçons de l'Imprimerie Nationale*, 3rd edn (Paris, 1963), in the Gujarati section.

40. Information from Paul-Marie Grinevald, librarian to the Imprimerie Nationale.

One explanation may be that the IR1 was cut solely for setting the Bengali text in the publication *Recherches Asiatiques*. Wilkins's third fount of Bengali types (CW3) had been used for the original English edition, and the Imprimerie Royale's fount could be regarded as a reinterpretation of CW3. A cursory comparison of both settings of the same text<sup>41</sup> shows a strong resemblance between the two typefaces, principally occasioned by the adherence to the unusual proportions of CW3, as instanced by the undersized and tight ঞ and the narrow internal counter of ঙ . Yet IR1 is intrinsically different: note the stroke terminations of উ , the curves of উ , the lengthened diagonal of দ , and the angle of ঞ . In this fount Wilkins's typeforms appear to have been refined according to Western conventions of type design by a skilled artisan who was ignorant of their meaning: the errors of CW3<sup>42</sup> have been reinforced rather than removed.

The impracticalities of the design and its markedly European appearance hardly rendered IR1 influential in the development of Bengali typography. Moreover, it is not known whether characters additional to those used in the sample were ever produced. Nevertheless its manufacture is of interest because it exemplifies the production of founts designed to serve purposes divorced from their natural function. As indicated above, it is unlikely that IR1 was conceived as a vehicle for communicating the Bengali idiom to native readers. Any demand for its economic viability was waived by a special allowance within the Imprimerie Royale's budget for unprofitable yet prestigious ventures;<sup>43</sup> a resource not commonly available to the majority of typefoundries.<sup>44</sup> The seemingly principal

41. Which differ in their word breaks; see pls. 102 and 103. Even Falkenstein's specimen reproduces the first two lines of this text.

42. See above, chapter 1.

43. Which required the use of Oriental characters; Charles Mortet, 'France', trans. Andre Pauliau, *Printing A Short History of the Art*, ed. R.A. Peddie (London, 1927), p. 110.

44. Royal subventions assisted the Imprimerie Royale in the production of types 'which never would have existed for commercial reasons'; Updike, *Printing Types*, I, p. 246. However, a reinterpretation of an existing typeface would have been cheaper to produce than an original design.

posed in regular anapæstic verses according to the strictest rules of *Greek* prosody, but in rhymed couplets, two of which here form a *śloca*.

মূঢ়জহীহিষণাগমতৃষ্ণা° দৰুণবৃষ্টিমদঃ সূবিবৃষ্ণা° ।  
যল্লভনেনিঅকর্মোপাত্ত° বিত্ত° ভেনবিনোদমচিত্ত° ॥

কাতবকাত্তাকন্তেপুত্রঃ স° সারোয়মতীবৈবিচিত্রঃ ।  
কন্যস্ব° বান্ধতআযাতন্বস্ব° চিত্তযতদিদ° ভ্রাতঃ ॥

মানদবর্ধনজনযৌবনগর্ভ° হবত্তিনিমেঘাৎকালঃ সর্ভ° ।  
মায়াময়মিদমখিন° হিহ্নাত্মপদ° পুৰিশাশুবিদিত্বা ॥

নদিনীদনগাতজনবত্তল° তদ্বস্ত্রীবনমতিশয়চপন° ।  
ক্ষামিহসস্ত্রন° গতিবেকাতবতিতবার্হবতবশেনৌক ॥

যাবস্ত্রন° ত্রাবস্ত্রন° ত্রাবস্ত্রনীজচবেশমন° ।  
ইতিস° সারেনজুটতবদোষঃ কথামিহমানবতবদত্তোষঃ ॥

দিনযামিন্যোসাম° প্রাতঃ শিশিববদন্তৌপুনরায়াতঃ ।  
কালঃ ক্রীড়তিগল্পত্ৰায়ব্দদিনমুঞ্চত্ৰাশাবায়ুঃ ॥

অঙ্গি° গলিত° পলিত° মৃগ° দয়বিহীন° জাত° শুভ° ।  
কবধুতকল্লিতশোভিতদন্ত° তদদিনমুঞ্চত্ৰাশাত্ত° ॥

F 2

সূৰবৰবদ্বিবতকতলবাসঃ শয্যাভূতলমজিন° বাসঃ ॥  
সৰ্বৰ্ণবিগ্ৰহভোগাত্ৰাণঃ কন্যাসূখ° নকৰোতিবিৰাগঃ ॥

শত্ৰৌমিত্ৰেপুত্ৰেবকৌমানৰযত্ন° বিগ্ৰহনমো ॥  
ভবনমচিত্তঃ সৰ্বত্ৰয়° বাঙ্কন্যাচিৰাহ্নদিবিকৃত্ত° ॥

অঙ্কুলাচলসত্ত্বনম্দ্ৰাব্ৰহ্মপূৰন্দৰদিনকৰবদ্বাঃ ॥  
নহ° নাহ° নাম° নোকনুদপিকিমর্থ° ত্ৰিমুভেশোকঃ ॥

ষট্ৰিনবিচান্যত্ৰৈকাবিস্কৰ্ব্যর্থ° মপ্যসিমযাসেহিষ্ণুঃ ॥  
সৰ্ব° পশ্যম্ন্যাআন° সৰ্বত্ৰোৎসৃজতেদজ্ঞান° ॥

বান্ধবৎক্ৰীড়াশক্তস্বপ্নাবৎকনীবক্তঃ ॥  
বৃদ্ধতাবৎচিহ্নাময়ঃ পৰমেব্ৰহ্মণিকোপিনয়ঃ ॥

ছাদশপঙ্কটিকতিৰশেহঃ শিষ্যাণা° কথিতোভ্যুপদেশঃ ॥  
বেষা° নৈবকৰোতিবিবেক° তেষা° কঃ কুৰতামতিবেক° ॥

mú:lha jahíhi dhanágamatrīshnám  
curu tenubuddhimaanah suvitriśhnám  
yallabhasè nijacarmópáttam  
vittam téna vinódaya chittam

cá tava cántà castè putrah  
sañscároyam atíavichittrah  
casya twam và cuta áyátā  
stattwam chintaya tadidam bhrátah.

function of the 'exotic' founts developed for grand polyglot publications<sup>45</sup> was to bear testimony to the artistic skill of the type designer, typographer, and printer,<sup>46</sup> but above all, to display the omniscience and imperial power of the country in question - in this instance, France.

Whilst Napoleon Bonaparte may be accused of robbing Italian foundries in order to enrich the Cabinet des Poinçons of the Imprimerie Imperiale, the introduction of new technology encouraged another kind of theft, namely plagiarism on a grand scale. The copying of successful type designs by punchcutters has always existed. Copies of founts often masqueraded as original designs by dint of slight divergencies from the progenitors. The issues of copyright and originality of design have never been satisfactorily resolved and constantly feature among the topics for discussion at typographic conventions.<sup>47</sup> One of the most explicit definitions of what constitutes an original design is to be found in Legros and Grant's *Typographical Printing-Surfaces*, and merits quoting almost in its entirety:

a new design must not comprise anything that is merely an enlarging, a diminishing, a broadening, a lengthening, or even a distorting of some already-known form<sup>48</sup> . . . . Nor can a new design be produced by the mere removal of some portion of a letter, and the substitution of another portion, from a type form already known, for the portion removed.

A new design in type must present an actual and demonstrable difference of outline and change when compared with any of the existing forms of type, or indeed, of any existing form of portions of type. New design must mean an essential change in the structure of the character, and an essential change in its outline, so as to produce not only a different form and effect for

45. The 1805 and 1806 versions of the *Oratio Dominica* can hardly be considered suitable missionary or pedagogic material. The readership of the somewhat academic *Recherches Asiatiques* would have been limited.

46. Being one and the same in Bodoni's case. He suffered criticism for inaccuracies in his texts; Updike, *Printing Types*, II, 174-5.

47. e.g. ATypl conferences; see Edward Gottschall. 'The State of the Art in Typeface Design Protection', *Visible Language*, XIX, I (Winter, 1985), pp. 149-55.

48. Here italic is mentioned.



the eye, but also an altogether different set of proportional measurements . . . .

What frequently comes under the head of new design in typefounders' catalogues and circulars is simply a compilation from and variation in dimension of existing originals, by which an apparent or temporary novelty or improvement is brought about to meet the taste of the day.<sup>49</sup>

Legros and Grant, however, were not convinced, particularly in the case of Latin typefaces, that their criteria for original designs could be met, for they say of their own efforts:

The authors have themselves produced what have been and would still be called original faces, but, for their part, they have never attempted to register them, as with their present knowledge of type faces they cannot honestly declare that anything they have ever done in this matter has been truly original. A merciless analysis has shown these designs to have merely been the unconscious adaptation or combination of some already existing, if not well-known, designs.<sup>50</sup>

The practice of the electrotyping of matrices which became widespread in the 1840s brought with it an increase in the conscious plagiarism of successful designs.<sup>51</sup> Standardization of type measurements and the baseline<sup>52</sup> assisted in the wholesale copying of type designs by this convenient and economic method. Attempts at disguising the original models were frequently dispensed with, since no real protection was afforded by copyright laws.<sup>53</sup> The greatest, or perhaps simply the most public, exercise of this kind was carried out by the Austrian kaiserlich-koeniglichen Hof- und Staats-Druckerei in the mid-nineteenth century.

The foundation of the K. K. Hof- und Staats-Druckerei in Vienna dates back to the beginning of the nineteenth century, when it was decided by the presiding Austrian government that the Imperial and Government printing establishments

49. Legros and Grant, *Printing-Surfaces*, pp. 118-119.

50. Legros and Grant, *ibid.*

51. See Richard E. Huss, *The Printer's Composition Matrix* (Delaware, 1985), pp. 28-29; see also Gaskell, *Introduction to Bibliography*, pp. 206, 207 and 210; and J.R. Johnson, 'On Certain Improvements in the Manufacture of Printing Types', *Journal of the Society of Arts*, XXI (21 Mar 1873), pp. 334.

52. See below, chapter 10; see also Gaskell, *Introduction to Bibliography*, p. 284.

53. See Huss, *Composition Matrix*, p. 28.

should be incorporated into one institution under the management of Vincenz Degen, printer to the Imperial Court. From 1804, during its so-called first period,<sup>54</sup> the press was mainly engaged in the production of government bank-notes.

The second period, when the Imperial and Government press came directly under governmental control,<sup>55</sup> saw the range of its publications extended to include 'Einlosungs- und Anticipations-Scheine',<sup>56</sup> material essential to war requirements, and legal books. By the year 1840, however, the use of the Hof- und Staats-Druckerei by the Austrian authorities had declined. The quality of its founts had diminished and considerations of economy had prevented the introduction of technical inventions; only essential supplies were added to its stock. Imprints were frequently marred by the varied colour and quality of its paper and commissioned work was often not completed within the required time-scales. In addition, the number of staff had dropped and, with the exception of one individual, no punchcutter was employed by the K. K. Hof- und Staats-Druckerei or any other printing office in <sup>the</sup> whole of the Austrian monarchy.<sup>57</sup>

Circumstances changed radically during the third period which commenced with the appointment of Alois Auer as director in 1841. Auer, formerly a teacher of Italian who had studied and practiced typography for eleven years, was responsible for introducing new measures and reforms which transformed the printing and typefounding establishment. In order to restock the foundry, types were purchased and were reproduced at various sizes by the new process of

54. 'Erster Zeitabschnitt'; *Geschichte der K.K. Hof- und Staats-Druckerei in Wien*, In zwei Theilen (Vienna, 1851), Pt I, p. 7.

55. From 1816, Degen was appointed its first director.

56. Treasury Notes and Government Bonds; *Geschichte der K.K. . . . Druckerei*, I, p. 12.

57. *Ibid.*, I, p. 28.

stereotyping.<sup>58</sup> It was not considered viable to acquire matrices owing to the capriciousness of public taste. Other reforms included the acquisition of iron presses and the recasting of all the types according to the typometric system which Auer sought to implement; it being a system comparable to the point system of Francois-Ambroise Didot.<sup>59</sup>

The prospect of the Austrian trades exhibition, which was to open on 15 May 1845, impelled the K. K. Hof- und Staats-Druckerei to undertake the urgent training of employees in the art of punchcutting by copying original models. The huge effort invested in this task enabled the K. K. Druckerei to produce 5,500 steel punches and about 10,000 matrices in sixty foreign languages which were displayed in the form of printed tables.<sup>60</sup> The press was thus able to realize a hitherto unfulfilled proviso of an earlier regulation that the K. K. Hof- und Staats-Druckerei was to be furnished with 'die Lettern aller erbländischen Sprachen'.<sup>61</sup>

Auer, who was well acquainted with the polyglot publications of other nations, intended to place Austria at the forefront of foreign language type-cutting at the trade exhibition. To this end, he arranged the 'Typenschau des gesammten Erdkreises, neu angefertigt in der K. K. Hof- und Staats-Druckerei zu Wien 1845'.<sup>62</sup> This comprised tables of type collections arranged according to their countries of origin, but which were, in fact, imitations produced by the Viennese foundry. The tables included the types of the Imprimerie Impériale,

58. Ibid., I, p. 16.

59. Described in chapter 10.

60. The *Geschichte der K.K. . . . Druckerei*, (I, p. 28) is ambiguous as to whether the punches were displayed as well; English translation in the polyglot version is unreliable. Punches were certainly displayed at the London exhibition: *Uebersicht der von der Wiener k. k. Hof- und Staats-Druckerei in London ausgestellten Gegenstaende aller Graphischen Kunstzweige* (Vienna, 1851), p. 9.

61. *Geschichte der K.K. . . . Druckerei*, I, p. 9. Presumably these would include Greek, Cyrillic, and Arabic types, but not Indian founts.

62. Ibid., I, p. 28.

Propoganda Fide, Bodoni's types, and those of the Serampore missionaries.<sup>63</sup> Auer made no claims of originality for the designs. On the contrary, he invited comparison with the original models in order to demonstrate the faithfulness of the replicas. The *Typenschau* concluded with the table entitled 'Oestereichs fremde Typen' containing 72 'alphabets' arranged according to the space available, all cast according to the typometric system (and all ostensibly original designs).

Such a table is also to be found in the second edition of *Alfabeto des Gesammten Erdkreises aus der K. K. Hof- und Staats-Druckerei in Wien* (1876),<sup>64</sup> a copy of which is housed at St Bride Printing Library and includes a Bengali script. It shows the same typeface as that employed for a Bengali version of the Lord's Prayer in the 1847 imprint, *Das Vaterunser in mehr als 200 Sprachen und Mundarten mit Originaltypen*,<sup>65</sup> contained in Auer's *Sprachenhalle*. An extremely large folio imprint, the *Sprachenhalle*<sup>66</sup> was intended to form a contribution to the study of comparative philology and to demonstrate advances in the field of foreign language setting. Auer, recognizing the limitations of the earlier copperplate specimens of non-Latin scripts<sup>67</sup> and the copious errors in the *Oratio Dominica* imprints of Marcel and Bodoni, intended to produce a truer representation of the script and achieve 'grammatical correctness of composition'.<sup>68</sup>

63. But the English and academic presses of Berlin and Petersburg were not fully represented in the display of type specimens; *Geschichte der K.K. . . . Druckerei*, I, p. 29.

64. See pl. 104.

65. 2nd edn (Vienna, 1847).

66. It measures 58 by 81 centimetres.

67. Such as Chamberlayne's, see above, Introduction.

68. *The Times*, (London, 11 Oct 1851), quoted in *Beurtheilungen uber die k. k. Hof- und Staats-Druckerei in Wien* (Vienna, 1852), p. 118. The result can be seen in pl. 105.

BATTA.  
(Cicero.)

୧	୨	୩	୪	୫	୬	୭	୮	୯	୧୦	୧୧	୧୨
୧୧/୧୬	୧୨/୧୬	୧୩/୧୬	୧୪/୧୬	୧୫/୧୬	୧୬/୧୬	୧୭/୧୬	୧୮/୧୬	୧୯/୧୬	୨୦/୧୬	୨୧/୧୬	୨୨/୧୬
୨୩	୨୪	୨୫	୨୬	୨୭	୨୮	୨୯	୩୦	୩୧	୩୨	୩୩	୩୪
୩୫	୩୬	୩୭	୩୮	୩୯	୪୦	୪୧	୪୨	୪୩	୪୪	୪୫	୪୬
୪୭	୪୮	୪୯	୫୦	୫୧	୫୨	୫୩	୫୪	୫୫	୫୬	୫୭	୫୮
୫୯	୬୦	୬୧	୬୨	୬୩	୬୪	୬୫	୬୬	୬୭	୬୮	୬୯	୭୦

BENGALISCH.  
(Petit.)

୧	୨	୩	୪	୫	୬	୭	୮	୯	୧୦	୧୧	୧୨
୧୧/୧୬	୧୨/୧୬	୧୩/୧୬	୧୪/୧୬	୧୫/୧୬	୧୬/୧୬	୧୭/୧୬	୧୮/୧୬	୧୯/୧୬	୨୦/୧୬	୨୧/୧୬	୨୨/୧୬
୨୩	୨୪	୨୫	୨୬	୨୭	୨୮	୨୯	୩୦	୩୧	୩୨	୩୩	୩୪
୩୫	୩୬	୩୭	୩୮	୩୯	୪୦	୪୧	୪୨	୪୩	୪୪	୪୫	୪୬
୪୭	୪୮	୪୯	୫୦	୫୧	୫୨	୫୩	୫୪	୫୫	୫୬	୫୭	୫୮
୫୯	୬୦	୬୧	୬୨	୬୩	୬୪	୬୫	୬୬	୬୭	୬୮	୬୯	୭୦

LIGATUREN.








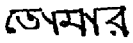
୧	୨	୩	୪	୫	୬	୭	୮	୯	୧୦	୧୧	୧୨
୧୧/୧୬	୧୨/୧୬	୧୩/୧୬	୧୪/୧୬	୧୫/୧୬	୧୬/୧୬	୧୭/୧୬	୧୮/୧୬	୧୯/୧୬	୨୦/୧୬	୨୧/୧୬	୨୨/୧୬
୨୩	୨୪	୨୫	୨୬	୨୭	୨୮	୨୯	୩୦	୩୧	୩୨	୩୩	୩୪
୩୫	୩୬	୩୭	୩୮	୩୯	୪୦	୪୧	୪୨	୪୩	୪୪	୪୫	୪୬
୪୭	୪୮	୪୯	୫୦	୫୧	୫୨	୫୩	୫୪	୫୫	୫୬	୫୭	୫୮
୫୯	୬୦	୬୧	୬୨	୬୩	୬୪	୬୫	୬୬	୬୭	୬୮	୬୯	୭୦

104. K.K. Hof- und Staats-Druckerei Bengali types (KKB); *Alfabeto des Gesammten Erdkreises aus der K.K. Hof- und Staats-Druckerei in Wien*, 2nd edn (Vienna, 1876)

## Bengalisch (Bengalee).

Assam (Assam).					91.				
Ma	ámár	owergaitbatí	pitr	tá-	Ma	ámárdír	owergaitba	pitá	tá-
হে	আমাৰ্	স্বৰ্গেথকা	পিত্ত	তো	হে	আমাৰ্দের	স্বৰ্গস্থ	পিত্ত	তো
O	unser	Himmel-in-willender	Vater	Kerr	O	unser	Himmel-willender	Vater	dein
már	nám	pabitir	mán	háb	már	nám	gowitt	mán	háb
মাৰ্	নাম	পবিত্ৰ	মান	হোক	মাৰ্	নাম	পবিত্ৰ	মান	হউক
	Name	heilig	gehalten	sei		Name	heilig	gehalten	sei
már	rág'ja	prand'híh	háb	jitá	már	rág'jer	ágman	háb	
মাৰ্	ৰাজ্য	পৌচিক	হোক	।	মাৰ্	ৰাজ্যেৰ	আগমন	হউক	।
	Reich	obhaber	sei	wie		Reich	sohommend	sei	
owergat	státhel	pflichtwid	támár		jáman	pflichtwid	támár	licht'e	bríjt
স্বৰ্গে	তেনেকৈ	পৃথিগীতো	তোমাৰ্		বেমন	পৃথিগীতে	তোমাৰ্	ইষ্ক	ক্রিয়া
Himmel-in	so such	auf Erde	dein		wie	Erde-auf	dein	Wille	gethan
wásh't	harem	hard	háb	ágl	hard	jáht	ágl	ámárdír	wi-
বাষ্টি	কৰম	কৰা	হোক	আজি	কৰা	য়াউক	।	অদ্য	আমাৰ্দের
Wille	in	Verrichtung	gethan	sei	gemacht	gehe	heute	unsern	tág-
ámár	khabar	sháhal	ámár	di-	ágl	shahágl	ámárdígt	ágl	ágl
আমাৰ্	শাবৰ্	বেহানি	আমাৰ্	দি	তা	ভক্স	আমাৰ্দিগকে	দেও	।
unsern	Nahrung	táglíche	un	gib	liche	Nahrung	un	gib	un
ágl	ágl	státhel	ámár	sharomá-	jáman	ámárd	ámárdír	un'áglí-	
য়া	।	আৰু	য়েনেকৈ	আমাৰ্	য়েমন	আমাৰ্	আমাৰ্দের	শ্ৰণধাৰি	
		ধৰবা			wie	wir	unsern	Schuld-	
háshab	ámár	sháhal	táthel	ámár	dígh	mágl	hágl	sei	un
ইতক্	আমি	সহা	তেনেকৈ	আমাৰ্	দিগকে	মাৰ্	করি	সেই	মত
un	wir	versuchen	so eben	unsern	un	Versuchung	machend	sind	noch
dhár	trásh	ámár	parshágl	tal-	dár	tá	mágl	hágl	ámár
ধাৰ্	ব্ৰতা	।	আমাৰ্	পৰীক্ষা	দের	শ্ৰণ	মাৰ্	কর	এব
Schuld	versuche	un	Versuchung-in	tágl.	un	Schuld	Versuchung	mach	un
ni	nicht	blate	ámár	ágl	dígh	parshágl	shágl	ná	blate
নি	নিশা	কিন্তু	আমাৰ্	আপদৰ্	দিগকে	পৰীক্ষায়	লওয়াইও	না	কিন্তু
un	nicht	sondern	un	Uebel	Versuchung-in	fáhrn	gehe	nicht	sondern
pará	parshágl	hágl	shágl	ágl	ámárdígh	ágl	shágl	par-	
পৰা	পৰিত্ৰাণ	কৰা	কিয়নো	সদা	আমাৰ্দিগকে	আপদহইতে	পরি		
von	Erthung	mach	denn	immer	un	sondern	Uebel-von	Erta-	
shágl	rág'ja	ágl	shágl	ágl	trín'bar	shágl	ágl	rág'ja	
সৰ্ধদা	ৰাজ্য	আৰু	শক্তি	আৰু	ত্ৰাণকর	কেননা	সদাসম্বন্ধে	ৰাজ্য	
und alle	Worte	Reich	und	Macht	anag	mach	denn	steht	immer
genow	ágl	shágl	támár		á	shágl	á	genow	támár
গৌৰব	ব্ৰহ্ম	সকল	তোমাৰ	।	ও	শক্তি	ও	গৌৰব	তোমাৰ
Herrlichk-it	ist	alles	Kerr		un	Macht	und	Herrlichkeit	dein
un					un				
আমেন	॥				আমেন	॥			
Amen					Amen				

At first glance, the poor quality of the K. K. Hof- und Staats-Druckerei's Bengali design (to be termed KKB) is obvious and cannot be attributed to the constraints of the typometric system. KKB, which has the appearance of being produced by an engineer rather than created by a type designer, is devoid of vitality. This is, in part, caused by the regularity of all the vertical strokes neatly right-angled to the headline and the limited degree of contrast in stroke weight. The diagonal stress of the Imprimerie Royale's fount has no place here.

Apart from the rigid adherence to a constant *akṣara* (base character) height, the vertical strokes form the only consistent, but dominant, design element of KKB. Many of the basic letterforms appear to pull in different directions: compare  with  ;  with  . Uneven stroke thickness is also clearly visible, for example initial and medial  are dark in comparison to  and  . One interesting feature is the apparent use of letterspacing to overcome excessive interword spacing when justifying text, compare the word  at the beginning and at the end of the text.<sup>69</sup> Considering the wealth of material the K. K. Hof- und Staats-Druckerei had to draw upon, KKB must be regarded as a remarkably poor effort by the Austrian letterfoundry, and one which contributes little to Bengali type history. The sole redeeming feature of the typeface is that it is legible.

The K. K. Hof- und Staats-Druckerei utilized its collection of 'exotic' types for printing editions destined to furnish the learned libraries in Europe, but in the context of vernacular typography the significance of Auer's work does not lie in the foundry's design of new typefaces. Of greater interest is the response of the K. K. Hof- und Staats-Druckerei to new technical processes, which enabled the copying of founts without the necessity of punchcutting.<sup>70</sup> The use of galvano-plastics to 'grow matrices' from types was fully exploited by the press.

69. In lines 2 and 13 of pl. 105.

70. As distinct from matrix-engraving; see Legros and Grant, *Printing-Surfaces*, pp. 236-238. See also below, chapter 8.

By 1845 the K. K. Hof- und Staats-Druckerei had employed this process to produce more than 20,000 matrices. Its awareness that the abuse of such practices was injurious to the punchcutting profession, however, makes the imperial press's justification for indulging in such a vast operation all the more remarkable:

Aber leider ward diese herrliche Erfindung von den meisten Schriftgiessern nur zum Nachtheile der Schriftschneider verwendet; indem sie pfundweise neue Schriften kaufen, und nach abgenommenen<sup>en</sup> Matrizen mit dem Gusse ungescheut Handel treiben.<sup>71</sup><sup>^</sup>

For some curious reason the K. K. Hof- und Staats-Druckerei considered itself exonerated from any charge of professional misconduct. It reasoned:

Die Staats-Druckerei hält auch diese wichtige Rücksicht des Eigenthums aufrecht. Sie ahmt nur derlei Gegenstände zum eigenen Gebrauche nach, und gibt weder galvanische noch davon abgenommene Erzeugnisse aus der Anstalt.<sup>72</sup>

It continued to state in the *Geschichte der K.K Hof- und Staats-Druckerei*,<sup>73</sup> that this work was to form the basis for a cabinet of types, a 'Typen-Cabinet',<sup>74</sup> which would be of use for future researchers, but it failed to mention by what authority the Staats-Druckerei obtained the right to copy founts even for its own use. By 1851 the K. K. Hof- und Staats-Druckerei employed over 900 persons, it printed more than 300,000 sheets each day,<sup>75</sup> and it possessed types for 104 languages.<sup>76</sup>

71. *Geschichte der K.K. ... Druckerei*, I, p. 33.

72. *Ibid.*, I, p. 34. Vincent Figgins publicly protested against the practice of the electrotyping of matrices at the 1862 London exhibition, but it was 'in vain'; T. B. Reed, *A History of Old English Letter Foundries*. A new edition revised and enlarged by A.F. Johnson (London, 1952), p. 336. See also Johnson, 'Manufacture of Printing Types', p. 334 f.

73. *Geschichte der K.K. ... Druckerei*, I, p. 34.

74. See below.

75. *Great Exhibition of the Works of Industry of All Nations 1851; Official Descriptive and Illustrated Catalogue* (London, 1851), III, p. 1027.

76. *Official ... Catalogue*, *ibid.*, p. 1025.



The European involvement in Indian vernacular fount production during the eighteenth and nineteenth centuries is indicative of the growing interest in Orientalism shown by Western countries. This interest, largely a by-product of imperialism, was mainly confined to political or scholastic circles, whose typographic creations were divorced from the needs of the native population and were conceived rather as esoteric items. The infrequent appearance of the Bengali founts in European publications underlines the fact that at this time preoccupation with Bengal was almost exclusively the province of the British.<sup>77</sup> Nevertheless these founts amount to more than historical curiosities. Their inclusion in multi-lingual editions published by countries possessing little more than tenuous links with Bengal serves to raise important issues pertinent to the development of all vernacular typeface design.

In contrast to the vernacular imprints of missionary bodies or even of Europeans residing in Asia, those of the imperial presses of Europe fail to reflect a genuine interest in the peoples or culture (or indeed typography) of the countries whose languages are represented. The grandiose multi-lingual imprints reveal the propensity of a nation to exhibit its wealth or demonstrate its dominance in all areas, cultural as well as geographic. It is interesting to note that the jury at the London Exhibition of 1851 felt compelled to express its regret that 'the private printers and type-founders of the Austrian empire should have failed so completely to exhibit their works';<sup>78</sup> so complete was the Imperial press's domination in this field.

It is to the credit of the K. K. Hof- und Staats-Druckerei that it experimented with new technology in the field of non-Latin typography. It even introduced the first Austrian composing machine that could be adapted for foreign-language

77. See Richter, *History of Missions*, p. 134, n. 1.

78. *Beurtheilungen uber die k.k. ... Druckerei*, p. 162.

setting.<sup>79</sup> The Staats-Druckerei professed an interest in comparative philology; but the notion of a 'Typen Cabinet'<sup>80</sup> exemplifies an attitude common to such establishments, namely that the collections of foreign types were to be regarded as the show-cases of the imperial presses.<sup>81</sup> Thus the primary function of the types would not appear to be the communication of the foreign idiom. If this did not constitute their main purpose, the question then arises, By what criteria should the founts be judged? Furthermore, is it justifiable to criticize designs for not accurately representing vernacular letterforms if they accord with the ideas of aestheticism acceptable to the intended, in this case European, public; the elegance of the Imprimerie Royale's founts can hardly be disputed.

Communication has always been the purpose of typographic design, but are the founts deprived of significance if they fail to communicate words to native readers and convey instead artistic expressions of grandeur to the intended recipients of this message? It does not lie within the scope of this thesis to fully discuss such issues. Their mention, however, serves to emphasize the importance of establishing the function of a typeface prior to its evaluation and, more importantly, prior to its design.

The activities of the Stamperia Vaticana, the Sacra Congregatio de Propoganda Fide, the Imprimerie Impériale, and the K. K. Hof- und Staats-Druckerei in relation to their respective collections of 'exotic' founts illustrate the confusion surrounding the originality of type designs. Far from being resolved, the problems regarding the protection of typeface designs have only been exacerbated by the implementation of new processes of type manufacture.

79. *Geschichte der K.K. . . . Druckerei*, I, pp. 36-37.

80. Presumably its response to the 'Cabinet de Poinçons'.

81. Indeed, foreign types seem to have been regarded by the imperial presses as collectable rather than functional items.

**Section C**

**Indigenous Ventures**

## Chapter 7

## The Girīśa Vidyāratna Press and later foundry types.

... about eighteen [years] after Dr Carey's arrival in India, some of the natives had begun to print in Bengalee for their own countrymen. The first Hindoo who established a printing press in Calcutta, was a native of Hindoosthan, Baboo Ram. He was followed by Gunga Kishore, formerly employed at Serampore - the first man who conceived the idea of printing works in Bengalee as a means of acquiring wealth. . . . By the close of 1820, there were no less than four native presses in constant employ, and they have been going on increasing . . . .<sup>1</sup> By 1825 there were six native newspapers . . . .<sup>1</sup>

The vigorous growth of the native press during the *incunabula*<sup>2</sup> of Bengali vernacular printing was not matched by a corresponding establishment of typefoundries. Only one is known to have existed in 1856, namely that attached to the Girīśa Vidyāratna Press<sup>3</sup> whose imprints exhibit the characteristics of Bengali type design peculiar to indigenous designers. The paucity of letterfoundries in the Indian subcontinent during the nineteenth century is strongly contrasted by the plethora of native foundries still active after the advent of both mechanical composition and photocomposition.

A number of reasons account for the sluggish beginnings of Indian participation in this field. The greatest, and most immediate, obstacle to the successful establishment of a typefoundry and press in Bengal was the necessity of importing from Europe virtually all the materials required for type manufacture and printing.<sup>4</sup> William Carey's preliminary enquires into the practicalities of vernacular printing revealed the high cost of procuring Bengali types at the turn

1. *Periodical Accounts of the Serampore Mission*, New Series, I, no. 9, p. 610.

2. 'when the appearance of printed letters was still in the experimental stage, before settling down to accepted conventional forms'; Steinberg, *Five Hundred Years of Printing*, 3rd edn rpt (Middlesex, 1979), p. 17.

3. Dates of the Girīśa Vidyāratna Press are 1856-1866; Khan, *Printing in Bengali Characters*, I, p. 391.

4. According to Peter Spalding, East India Company Mint Superintendent, 'all the Antimony that we occasionally find in this country, has been brought from Europe or Arabia. - It is true I have been told that some has been sent from *Napal*, as a matter of curiosity, but not as an article of commerce'; letter from P. Spalding to J. Gilchrist, 15 Aug 1797, in the later's *A Dictionary, English and Hindoostanee*, I, p.xlii, n. k.

of the eighteenth century.<sup>5</sup> The sentiment that ‘The greatest expense . . . is that of printing’<sup>6</sup> is reiterated in the *Memoirs* and *Periodical Accounts* of the Serampore Missionaries which document the financial commitment demanded by their typefounding and printing operations;<sup>7</sup> and reveal that the cost of the fire which destroyed their printing office in 1812 exceeded nine thousand pounds.<sup>8</sup> Admittedly, the Serampore Trio always undertook projects on a grand scale, but accounts of this period given by Charles Wilkins, John Gilchrist, and others<sup>9</sup> confirm that the burden of expense was a crucial factor in vernacular printing.

As Graham Shaw writes, ‘For a publication to be really successful, it would seem that the patronage of the East India Company was more or less essential’;<sup>10</sup> particularly since the Company had a vested interest in the development of vernacular printing in Bengal. It was not merely due to the lack of resources or finance that the native Bengali possessed less incentive than his European compatriot to see the Bengali script rendered into print; political and religious interests were the motivating forces behind the setting up of the first vernacular presses and foundries.<sup>11</sup> The earliest imprints were primarily intended for the enforcement of British rule,<sup>12</sup> either by instructing the Company’s servants in the native dialect, or by printing regulations and other

5. See above, chapter 3i.

6. *Memoir Relative to the Translations* (1808), p. 22.

7. Typefounding, as well as paper manufacture, was originally intended to circumvent the expense of importing types and paper.

8. *Baptist Magazine for 1812* p. 402; see above, chapter 3ii.

9. See Rāma Kamala Sena, *A Dictionary in English and Bengalee* (Serampore, 1834), I, Preface, pp. 5-20; see also Haji Mustapha, trans., *Seir Mutaqharin*, II, Letter to William Armstrong, Calcutta, 15 May 1790, pp. 3-31.

10. Shaw, *Printing in Calcutta*, p. 26.

11. Which were established principally ‘phiriṅgināmupakārārthaṃ’ (for the benefit of the foreigner); see above, chapter 1.

12. See above, chapter 1.

government material. Rāma Kamala Sena described the motivation behind his seventeen-year struggle to publish *A Dictionary in English and Bengalee*:

Bengal being the seat of the British Government, the language of that province is exclusively used in the principal offices of Government; the accounts of the territorial and financial departments are also in the first instance kept in Bengalee, and the principal native officers in these departments are natives of that province. Hence it is highly desirable that the Bengalee language should be known to Europeans, and that the native officers of the Government, on the other hand, should be acquainted with the English, as being the language of the rulers of the country, in which almost all the correspondence of Government is carried on, and which is the regular and principal channel of communication between Englishmen and Natives. It is therefore necessary that proper means should be placed within the reach of both parties for their mutual benefit and convenience, for until these languages are mutually understood by the rulers and the ruled, the administration of justice and the management of public affairs cannot be duly and advantageously secured.<sup>13</sup>

Otherwise publications were directed at the 'Heathen' for his conversion.

Consequently, the demand for printing services came either from the East India Company or the British and Foreign Bible Society and other such institutions, but not from the indigenous population, which had previously contented itself with a tradition of oral literature and a class of scribes able to produce written<sup>14</sup> documents when required.

Despite the often unacknowledged<sup>15</sup> native assistance in European typefounding ventures, there arose appreciable differences in the style of Bengali types cut by local craftsmen and those prepared by foreign residents in Bengal; the chief characteristic of the latter being a more constructed, less fluent shape that contradicts the customary penned stroke sequence, as illustrated below:<sup>16</sup>

13. Rāma Kamala Sena, *Dictionary*, I, Preface, pp. 6-70.

14. Or engraved.

15. See above, chapters 1 and 3i.

16. Also illustrated above, in chapter 3ii, but it is worth repeating, in part, here.



This dichotomy in design perhaps reflects the non-native designer's ignorance of the subtleties of Bengali calligraphy, or the influence of inscriptional forms created by a growing interest in Indian palaeography.<sup>17</sup> The origins of divergencies in contemporary styles of written forms have been explored in Indian palaeographical studies; R. J. Pandey summarized his findings:

There were three sets of people, who influenced the course of alphabets. Firstly there were the Brahmanical teachers, literateurs and priests, who invented alphabets and modified them for literary and religious purposes on the basis of pictographs, representations and symbols created by still earlier men. They further introduced changes under the impact of grammar and phonetics. This process was later on facilitated by the Buddhist and Jain monks and nuns, who assiduously devoted themselves to the task of writing and copying sacred texts. The second set of people, who affected the evolution of alphabets, consisted of the individual professional writers and the castes of writers, which originated in India. Their genius was not creative, but they had the power of adaptation and modification of forms to suit their convenience regarding writing materials and speed in actual writing. They were also not indifferent to the elegance of letters. This must have necessitated changes in the shapes of letters. This third set of people responsible for variations in the forms of letters included stone-masons and engravers on metals. This third set being semi-educated was less effective than the first two. But the very nature of materials (stone and metals) on which they had to work gave new orientations to the various limbs of letters. The evolution of the monumental forms and alphabets was mostly due to the needs of this class of people in carving, incising, drilling and engraving.<sup>18</sup>

17. As shown by the articles in *Asiatick Researches*, vols. 1-4 (Calcutta, 1788-1795) printed at the Honourable Company's Printing Office.

18. R.J. Pandey, *Indian Palaeography* (Benares, 1952), pp. 95 and 96.

The difference in approach to the design of Bengali phonemes for metal typesetting would have originated from two sources: the model from which a typeface was derived; and the instruments and materials employed for its generation. As debated above, the origins of CW1 cannot be attributed to any particular manuscript, and this fount exhibits characteristics reminiscent of early epigraphic forms.<sup>19</sup> Wilkins may have been inspired by the inscriptional forms he studied,<sup>20</sup> although a degree of correspondence would naturally occur by means of the similar method of character generation, i.e. engraving. But the constructed quality permeating the type designs of European authorship since Wilkins's first fount may be due, in part, to Pañcānana's involvement in cutting CW1 and in casting the early Serampore types. His second name, Karmakāra, signifies blacksmith, and, as stated by Pandey, 'persons who engraved documents on plates, belonged to the professional castes of blacksmiths, copper-smiths, gold-smiths and other artisans'.<sup>21</sup>

The attempts of native craftsmen to unite the two disciplines of writing and engraving in the production of their founts yielded quite different results. The decorative manuscript style formed the basis of their designs, which were necessarily compromised by three factors. Firstly, the intrinsic limitations of metal prohibited a free interpretation of the written hand irrespective of the script. Ruari McLean explains, 'Although the shapes of our letters were originally evolved and determined by the instruments . . . with which they were written, the fact that to turn them into types meant cutting shapes on steel punches brought another influence into their shaping: an influence that very

19. Compare the structure of CW1 with the letterforms of the 'Copper Plate Grant of Bakerganj' (see pl. 106); yet James Prinsep, secretary to the Asiatic Society of Bombay remarked, 'It is much to be regretted that when first a fount of Bengali type was prepared the letters were made after the model of the running hand or writing instead of this [copper plate grant] which may be called the *print hand*'; *Journal of the Asiatic Society of Bengal*, VII (Jan-Dec 1838), p. 40 n. [1].

20. See Johnston, 'Charles Wilkins', p. 128.

21. Pandey, *Indian Palaeography*, p. 93.





subtly affected the curves and the way that the curves joined straight lines.<sup>22</sup> Secondly, local punchcutters were impeded by their own relative inexperience in the craft of engraving steel punches. This inexperience rendered them <sup>susceptible</sup> to the influence of European traditions of type designs.<sup>23</sup> Thirdly, the principal purchasers of Bengali types - being, on the whole, foreign to Bengal - had become accustomed to the early founts of CW1 and CW2, and thus wished to adhere to familiar designs.<sup>24</sup> These factors are reflected in the type designs of the Girīśa Vidyāratna Press. Its most successful designs are these that emulate the chirographic style first captured in metal by Kālikumāra Rāya.<sup>25</sup>

Information regarding the origins of the many founts employed in the Vidyāratna Press's imprints is not available. It is probable that, at least initially, founts of type or matrices were acquired from outside sources like the Baptist Mission Press, or else they comprised imitations of styles then current in Bengal. Some designs, however, do appear peculiar to the Girīśa Vidyāratna Press and support the assumption that they were indigenous to its typefoundry.

The smallest text faces are the least satisfactory founts produced by the foundry. Although they follow the scribal style of character formation<sup>26</sup> and incorporate ligatures and conjuncts to maintain an even depth (and thereby uniformity), these faces do not share the elegance and flow of the larger-sized designs. One example is the fount termed here GV1;<sup>27</sup> its disproportionate intercharacter spacing diminishes the legibility of this typeface. The excessive spacing, which kills any vitality or movement inherent in the letterforms, is

22. McLean continues: 'Another factor in the design of metal types is that type metal, in the process of printing, gets worn, and thickens: the old typecutters therefore anticipated this and allowed for it in designing their types.' McLean, *Manual of Typography*, p. 80. Such refinements were unlikely to have been introduced into Indian typefounding until the late-nineteenth century.

23. Although Charles Wilkins and William Carey had not benefited from it.

24. See below, chapter 10 regarding reader conservatism.

25. See above, chapter 3ii and pl. 52.

26. i.e. ductal rather than glyptal; see Charles Bigelow and Donald Day, 'Digital Typography', *Scientific American*, 249, no. 2 (August, 1983), p. 108.

27. See pl. 107.

কিছু ঐ তাবৎ প্রত্যয় উক্ত রূপ তাবৎ পদে প্রযুক্ত না  
হইয়া বিশেষ ২ প্রত্যয় বিশেষ ২ পদে যুক্ত হইয়া থাকে,  
এবং উল্লখে কোন প্রত্যয় কোন ভাবের আভাস দেয় বা  
কোন অর্থে ব্যবহৃত হয়, এবং কোন প্রত্যয় কোন অর্থে  
প্রকাশ করে না।

এই সকলের সবিশেষ বর্ণনা সপ্তম পরিচ্ছেদের  
শেষে লিখা গেল।

GV1

বঙ্গভাষায় ব্যবহৃত সংস্কৃত পদের বা শব্দের  
সন্ধি নিমিত্ত যে সংস্কৃত আবলীক তাহাই এই পুস্তকে  
লিখিত হইল। এবং সংক্ষেপে বর্ণন ও অম্পাদ্যাসে  
স্মরণ নিমিত্ত ঐ সকল সংস্কৃত বোপদেবের মতে সং-  
স্কিপুস্তকে লিখা গেল। পরন্তু ঐ সংস্কৃত বৃষ্টি-  
বার নিমিত্তে নিম্ন লিখিত সংস্কৃতসময় কণ্ঠস্থ করা  
আবশ্যিক।

সংস্কৃত।

১ অ ঙ উ ঋ ২ ক, এ ও ঙ, ঐ ও ঙ। হ য ব  
র ল, ঞ গ ন ঙ স, ঞ ট ণ য ত, ঞ ড দ গ ব, খ ফ  
ছ ঠ থ, চ ট ত ক প, শ য স।

এখানে অ-কার হইতে চ-কার পর্যন্ত বর্ণ ব্রহ্মজের সং-  
গ্রহ, অতএব আ ঙ ঐ উ ঋ ২ এই কয়েক দীর্ঘ বর্ণ অপ্রকাশ  
থাকতেও ঐ সংগ্রহের অন্তর্গত বোধ করিতে হইবে।

ক, ও, চ এই তিন বর্ণের বর্ণ সংক্রান্ত অথবা স্বর সং-  
গ্রহের অন্যায়নে উচ্চারণ, বর্ণ ব্রহ্মজের মধ্যে ব্যবহৃত হইয়াছে,  
অতএব ঐ অক্ষরত্রয় এ স্থলে অক্ষর বসিয়া গণিত নহে।

GV1

অক্ষর সকলের এমত কৌশলক্রমে বিন্যাস করার তাৎ-  
পর্য্য এই যে স্তরের মধ্যে উল্লেখ্য সমুদয় অক্ষর লিখিলে  
ঐ সংস্কৃত (বাক্য-সংস্কৃত) অত্যাগ করা ও স্মরণ রাখা কঠিন  
হয়, এই নিমিত্ত উল্লেখ্য অক্ষর-সমূহের প্রত্যেক কণ্ঠ  
লিখিয়া উক্ত বর্ণ বিন্যাসানুসারে কেবল ঐ সকলের আভাস  
বর্ণ লিখিত হয়, তাহাতেই আভাস সহিত সংস্কৃত  
সকল বর্ণ উল্লেখিত হইল বোধ করিতে হইবেক। ঐ  
আভাস বর্ণ সদাচার হইয়া উত্তমর ইমেতপূর্বক সংস্কৃত  
অভ্যাস হয়, যথা—

৩

### দ্বিতীয় পরিচ্ছেদ।

সন্ধি।

সংস্কৃত ভাষায় সংযোগশীল শব্দকে সংযুক্ত  
না করিলে তাহার যে উচ্চারণকর্কশতা ও অসু-  
আব্যতা দোষ ঘটে, অথবা তাহার উচ্চারণে যে  
কঠিনতা বোধ হয়, তাহা নিবারণ নিমিত্তে দুই (কিষ্কা  
অধিক) শব্দকে পূর্ক শব্দের শেষাক্ষরের অথবা  
পর শব্দের প্রথমাক্ষরের অথবা উভয়ের পরিবর্তন  
দ্বারা সংযুক্ত করায়। এই রূপ সংযোগকে ব্যাক-  
রণে সন্ধি কহে। সন্ধির ব্যবহার তিন স্থানে হয়,  
অর্থাৎ শব্দ ও ধাতুর মধ্যে বিভক্তি বা প্রত্যয়ের  
যোগে, সমাস বিনা শব্দ বা পদদ্বয়ের যোগে, এবং  
সমাসে দুই বা অধিক শব্দের যোগে।

বঙ্গভাষাতেও সংস্কৃত শব্দ বা পদ সমূহের উক্ত  
কারণে উক্ত রূপ সন্ধি করিয়া গিয়া থাকে।

GV3

accentuated by the uneven texture of the typeface created by clumsy weight distribution. Such basic faults in type design appear indicative of this foundry's inexperience in translating lettering into type.<sup>28</sup>

The design of the types employed for the footnotes in the third edition of Śyāmacaraṇa Śarmā's Bengali grammar has been more successfully executed.<sup>29</sup> Here the spacing is in keeping with the disposition of the strokes, which do not attempt to maintain a great amount of weight differential, whilst the wider internal counters compensate for the loss in character height. The design, to be termed GV2, resembles the smaller typefaces of the Serampore and Baptist Mission Presses, particularly with regard to medial ৳ and the manner in which the oblique downstrokes join the perpendicular stems of the letterforms.

Although the smaller-sized Bengali founts issued from the Girīśa Vidyāratna typefoundry are disappointing in terms of design, they were skilfully used by the Press, who did not baulk at complex handsetting. Often several different type sizes appear on the same page - at times to the detriment of its readability - as well as superiors, mathematical signs, and complex tabulation with two reading directions. The hyphen was also employed for justified text; ragged right and centred text were also customary, depending on the nature of the publication. There was no lack of experimentation in typographic layout, which was generally very successful, serving to enhance the founts at its disposal.<sup>30</sup>

The larger types of the letterfoundry conform to the essential prerequisites of good lettering, showing uniformity and consistency in design, maintaining

28. e.g. the failure to recognize that a character is determined as much by the space that encompasses it, as by the space that it encloses.

29. Śyāmacaraṇa Śarmā, *Bāṅgalā Vyākaraṇa* (Calcutta, 1860); see pls. 107 and 108.

30. See pls. 109 and 110.

## তৃতীয় পরিচ্ছেদ।

শব্দ।

যে সকল হিফুদ্বারা কোন অভিপ্রায় নিপিবদ্ধ করা যায় তাহার নাম অক্ষর বা বর্ণ।

ছই বা অধিক অক্ষর যথাক্রমে বিন্যস্ত হইয়া কোন বস্তু বা অর্থ বোধক হইলে ঐ বিন্যস্ত অক্ষর সমূহকে বাক্যরূপে শব্দ কহে, \* যেমন মর্গ, বারি। ঐ শব্দ যখন প্রয়োগ করা যায় তখন তাহাকে পদ কহে। সংস্কৃত ভাষায় শব্দমাত্রেরই আন্তরিক্য প্রয়োগ হইতে না পারাতে, শব্দ সকল বিভক্তির যোগ বা (তদ্ যোগান্তে) লোপ বিনা পদ বাচ্য হয় না। কিন্তু বঙ্গভাষায় প্রায় তাবৎ শব্দ বিভক্তি যুক্ত (যথা ব্রাহ্মণেরা) ও বিভক্তি লুপ্ত (যথা ব্রাহ্মণী ভাক) এবং বিভক্তি-হীন (যথা ব্রাহ্মণ) তিন অবস্থাতেই প্রয়োগশীল হওয়াতে, প্রয়োগ করা শব্দমাত্রকে তাহা যে কোন অবস্থা প্রাপ্ত কেন হউক না পদ বলা যাইতে পারে।

ছই বা অধিক পদ যথাক্রমে বিন্যস্ত হইয়া কোন

\* অতএব শব্দের (বা পদের) অপেক্ষ ভাগ জ্ঞেয়।

† এখানে ব্রাহ্মণ শব্দে সর্বত্র যুক্ত 'এ' বিভক্তি যুক্ত হইয়াছে।

‡ এখানে ব্রাহ্মণীয় 'কে' বিভক্তি লুপ্ত হইয়াছে।

§ এখানে ব্রাহ্মণ শব্দে এক বচনান্ত কর্তৃগদ, বস্তুভাষায় ঐ পর সম্বন্ধীয় কোন বিভক্তি নাই, জোর তাবৎ শব্দই আদিপদীয় কর্তৃপদরূপে ব্যবহৃত।

অভিপ্রায়কে সম্পূর্ণরূপে প্রকাশ করিলে ঐ বিন্যস্ত পদ সমূহকে বাক্য বলা যায়,—অসম্পূর্ণরূপে প্রকাশ করিলে বাক্যংশ বা অসম্পূর্ণ বাক্য বলা যায়।

শব্দমাত্র আদি ছই ভাগে বিভক্ত,—‘অব্যয় ও সব্যয়’। অব্যয় তাহার নাম যাহার রূপ হয় না, যথা,—ইহাতে, দিয়া, এবং, আঁহা, ইত্যাদি \*। সব্যয় তাহাকে বলে যাহা বিভক্তি আদির যোগে রূপ করা যায়।


সব্যয় দ্বিবিধ,—পাতু ও শব্দ। পাতুর বর্ণনা যথাস্থলে হইবেক। শব্দ তাহাকে বলে যাহা কোন বস্তুর বোধক হয়, অথবা যাহা কোন বস্তুর দোষ গুণাদি বর্ণনা বা কোন ক্রিয়ার কোন বিশেষ বর্ণনা করে। অতএব শব্দ ও ছই প্রকার,—‘বিশেষ্যশব্দ’ ও ‘বিশেষণ’। বিশেষণ তাহার নাম, যদ্বারা কোন বস্তুর দোষ গুণাদি বর্ণনা হয়; অথবা ক্রিয়ার বিশেষ বর্ণনা হয়, যথা, মন্দ্র দ্রব্য; তিনি শীঘ্র লিখেন। বিশেষণের বিশেষ বর্ণনা যথাস্থলে হইবে। বিশেষ্য শব্দ সেই যদ্বোধ্য বস্তুর গুণ বা দোষ বর্ণনা হয় ও হইতে পারে।

এস্থলে শুদ্ধ বিশেষ্য না বলিয়া বিশেষ্য-শব্দ বলার কারণ এই যে ক্রিয়াও বিশেষ্য হয় যেহেতু ক্রিয়ারও বিশেষণ আছে, অতএব কেবল বিশেষ্য বলিলে শব্দ এবং ক্রিয়া

\* স্থল বিশেষে আবশ্যিকরূপে অব্যয়ের রূপ হয়, যথা, “বঙ্গভাষায় কর্তৃক, করণক, দ্বারা, ও দ্বিঃ-শব্দের যোগে করণ পদ নিপাত হয়; কর্তৃক, করণক, দ্বারা ও ‘দ্বিঃ-র’ মধ্যে যে বিশেষ্য তাহা পরে লিখা যাইবে”। অব্যয়ের এক রূপ কেবল এইরূপ স্থলেই হইয়া থাকে, পরন্তু অণ্ডেও তাহা যে একরূপ রূপ বলিয়া ধর্তব্য নয়।





sufficient distinction in character formation to ensure readability. These faces share the method of letter structure common to formal Bengali penmanship<sup>31</sup> which is lacking in the designs produced by the European typefoundries and also in GV2. The elegance and vibrancy of these founts employed in editions of *Chandaḥkusuma*<sup>32</sup> and *Naradeha Nirṇaya*<sup>33</sup> are aided by the deliberate effort given to the design of each sort, as instanced by , whose finial varies in length and curvature when in conjunction with another consonant.<sup>34</sup> Each sort, whether basic character, conjunct, or ligature appears carefully designed in harmony with the remainder of the typeface, rather than fused together from common components. A number of conjuncts, however, are still generated by the *phalā* system created by Wilkins for his first Bengali typeface.

The later imprints of the Girīśa Vidyāratna Press<sup>35</sup> show that, in time, it was competent to produce very presentable and readable typefaces in the smaller range of type sizes while still avoiding the European style of letter structure. However, none of the founts can be considered outstanding for its period, and the employment of the accepted method of composition did not encourage other native foundries to seek alternative solutions to the problem of the reproduction of the Bengali script by pre-fabricated letterforms.

The founts produced by the first native foundry thus adhered closely to the European *modus operandi* of Bengali composition, and the gap between the handwritten and the printed form necessarily remained wide. Although in the first instance the printed form of the Bengali script was intended to mimic the calligraphic hand, it gradually produced its own peculiarities. Bengali type

31. See above, chapter 3ii, and Lambert, *Devanagari Script*, pp. 177 and 178.

32. Bhuvanāmohana Rāya Caudhuri *Chandaḥkusuma* (Calcutta, 1864); see pl. 111.

33. Rājākṛṣṇa Rāya Caudhuri, *Naradeha Nirṇaya* (Human Physiology in Bengali) (Calcutta, 1859); see pl. 112.

34. See pl. 102, lines 7, 12 and 14 (GV3); see also pl. 107, *sandhi* section.

35. See 1899 edition of Nīlmaṇi Vāsaka's *Navanāri* (Calcutta, 1899); see pl. 113.





## HUMAN PHYSIOLOGY

IN

BENGALI

BY

RAJ KRISHNA RAI CHOUDHURIE.

নরদেহ নির্ণয়।

ঐরাজকৃষ্ণ রায় চৌধুরী কর্তৃক

লিখিত।

কলিকাতা।

সিরাজপুর, অপর সরকারিউলার রোড, নং ৫২।

বিত্তাবৃত্ত যন্ত্র।

সন ১২৫৬ সাল।

মূল্য—১০ এক টাকা।



## বিজ্ঞাপন।

এক্ষণে আমরাদিগের দেশে যে সকল বাঙ্গালী  
 বিজ্ঞালয় স্থাপিত হইয়াছে, তৎসমূহে সাহিত্য  
 ও বিজ্ঞানশাস্ত্রবিষয়ক অনেক গ্রন্থের অধ্যাপনা  
 হইতেছে। শারীরবিধান মনুষ্যদিগের অবশ্য  
 শিক্ষণীয়; সুতরাং সমুদায় বিজ্ঞালয়ে তাহার  
 অধ্যাপনা হওয়া নিতান্ত প্রয়োজনীয় হইয়া  
 উঠিয়াছে। প্রত্যাপাশা ছিল, চিকিৎসাশাস্ত্র-  
 ব্যবসায়ী কোন বিজ্ঞতম দেশীয় ডাক্তার বিজ্ঞা-  
 লয়-সমূহে ব্যবহার জন্য দেশীয় ভাষায় তথিব-  
 যক কোন গ্রন্থ প্রণয়ন করিয়া সেই প্রয়োজন  
 সাধন করিবেন। কিন্তু দুর্ভাগ্যক্রমে তাঁহা-  
 দিগের তথিবয়ে মনোযোগ দেখা যায় না।  
 জেলা নদীয়ার স্কুলসমূহের ডেপুটী ইনিম্পেক্-  
 টর শ্রীযুত বাবু রাধিকাপ্রসন্ন মুখোপাধ্যায় মহা-  
 শয়ের অনুরোধক্রমে ইংরেজী শারীরবিধান

করিতেছেন, অতএব আপনি ইহার সহপাণ কখন, নতুবা রাজ্যনাশ হইবে।

দময়ন্তী এতাবধিবরণ অবগত হইয়া স্বামীর অন্তত-কীড়া-শান্তি-করণের নামমত চেষ্টা করিলেন, এবং রাজাকে বিধি-ভুক্তে বৃদ্ধাইলেন, কিন্তু তাহাতে কোন ফলোদয় হইল না। রাজা ক্রমাগত পাশক্রীড়ায় মত্ত থাকিলেন। দময়ন্তী তাহাতে বিষম বিপদ জান করিয়া, প্রিয়তমা দাদীকে, সুলীলনামা সারথিকে নীচ ডাকিয়া আনিতে আজ্ঞা করিলেন। সারথি আজ্ঞামাত্র রাজমহিষীর সম্মুখে উপস্থিত হইল। রাণী অশ্রুপূর্ণিতনয়নে সারথিকে বলিলেন, হে শুলীল সারথি, মহারাজ জানশূন্য হইয়া সর্বস্বাস্ত করিতে বসিয়াছেন; আমার আদৃষ্টে যাহা থাকে, তাহাই হইবে। সম্মতি তুমি ইচ্ছনেন এবং ইচ্ছনেনাকে আমার পিত্রাভায়ে রাখিয়া আইস। সারথি আজ্ঞামাঝেই রাজপুত্র ও রাজকন্যাকে রথারোপণপূর্বক বিদূরভ্রাজ-ভবনে লইয়া গেল।

এদিকে নল রাজা পাশা-খেলায় উন্নত হইয়া, পুষ্করের স্থানে ক্রমে ক্রমে রাজ্য ও ধন সকল হারিয়া, অধশেষে উক্ত-রায় বস্ত্র পর্যন্ত হারিলেন। পরে যখন কেবল পরিষেয়মাত্র আছে, তখন পুষ্কর বাস করিয়া করিলেন, তুমি সকল হারিয়াছ, যদি ভার্য্যা পণ করিতে পার, তবে আইস। রাজা এই কথায় অত্যন্ত কুপিত হইলেন, কিন্তু কি করেন, সর্বস্ব গিয়াছে, দাস দাদী সকলি হারিয়াছেন। অতএব লাভকে কিছু বলিতে না পারিয়া, শুদ্ধ পরিষেয় বস্ত্রমাত্র পরিধান করিয়া আনয় হইতে বহির্গত হইলেন। রাজার এই

দুঃসহ্যার বিবরণ অস্তঃপুরে প্রকাশ হইলে, পুষ্করের অনুজরণ দময়ন্তীর অননুগ্রাহি কাড়িয়া লইল। দময়ন্তী একবজা হইয়া স্বামীর পচাৎ পচাৎ গমন করিলেন।

পুষ্কর এই বিশাল রাজ্যের অধীশ্বর হইয়া সমস্ত রাজ্যে ঘোষণা করিয়া দিলেন, আদ্যাবধি নল রাজাকে যে ব্যক্তি স্থান দান করিতে, তাহার জ্ঞানমত্ত হইবে। প্রজাগণ কি করে, প্রাণের ভয়ে নল রাজাকে বাসস্থান দেওয়া দূরে থাকুক, তাঁহার সহিত সাক্ষাৎও করিল না। নল রাজা কুত্রাপি আশ্রয় না পাইয়া তিন দিবস অনাহারে থাকিলেন। চতুর্থ দিবসে অত্যন্ত দুর্ধার্ত এবং তৃষ্ণায়ুক্ত হইয়া এক নদীতে গিয়া অশ্রুনি করিয়া বারি পান করিলেন। পরে নদীতটে রজনী বধন করিয়া, নিশাবাসনে ভার্য্যাসহ নিবিড় অরণ্যে প্রবেশ করিয়া, বনজ স্বহৃদ ফল চয়নপূর্বক জীবন রক্ষা করিতে লাগিলেন।

এইরূপে কয়েক দিবস অতীত হইলে, এক দিন কনকপক্ষ-যুক্ত এক বিহঙ্গ নল রাজার দৃষ্টিগোচর হইল। ভূপতি তৎপক্ষী অবলোকনে পরমানন্দিত হইয়া ভাবিলেন, এই সুদৃশ্য বিহঙ্গমকে কোনরূপে ধৃত করিতে পারিলে আমার পিণের ক্রেশের অনেক লাভ হইতে পারিবে, কেননা ইহার পক্ষ সকল স্বর্ণনির্মিত, তাহা বিক্রয় করিয়া কিছুদিন অনায়াসে দিনপাত করিতে পারিব, এবং ইহার মাংসও ভোজন করিব। এই বিবেচনা করিয়া পক্ষীকে ধরিবার উপক্রম করিয়া, স্বীয় পরিষেয় বস্ত্র তাহার গাজের উপর নিক্ষেপ করিলেন। কিন্তু যেমন বস্ত্র তাহার উপর কেলিয়া

design developed as an art form, distinct from (and not secondary to) that of lettering. Charles Wilkins and William Carey as pioneer designers of Bengali founts had been disadvantaged by their ignorance of typefounding as well as by their limited comprehension of the Indian phonological system; but even to the native typefounder, the Bengali script was much more complex to cast and compose than the Latin alphabet.

No absolute character set had been determined for Bengali composition;<sup>36</sup> even the simplest textual matter required several hundred sorts to achieve a fair representation. The time and cost of engraving so many punches<sup>37</sup> prohibited the production of many different weights and type sizes. Thus the emphasis from the outset was placed on reducing the number of characters by various means. Wilkins confined his first Bengali fount to some 170 sorts by employing common components to generate types that were wanting.<sup>38</sup> An increasing number of indigenous designs, however, sought to improve the quality of handsetting by extending the number of sorts to include the most frequent conjuncts, combinations with *raphalā*, and some with subscript vowel signs. The customary number of sorts grew to just over 500.

Two works by the founders of the Sanskrit Press,<sup>39</sup> Īśvaracandra Vidyāsāgara and Madanamohana Tarkālaṅkāra, first published in the mid-nineteenth century assisted in establishing a standard Bengali character set for printed works. *Śīśusīksā*<sup>40</sup> and *Varṇaparicaya*<sup>41</sup> enjoyed immense popularity, both running to well over a hundred editions before the turn of the century. In typographic terms Vidyasagara's Bengali primer, *Varṇaparicaya*, is of greater importance.

36. This remains the case today. See above, chapter 3iii.

37. 'About one per day being the average output' [for Latin]; Whetton, *Practical Printing*, p. 8; see also chapters 1 and 5.

38. Using what later became known (particularly for Devanagari composition) as the 'Degree' system; see below, chapter 8.

39. Founded in 1847; there were several Sanskrit Presses at this time.

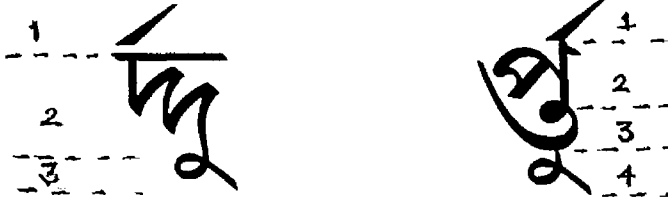
40. Madanamohana Tarkālaṅkāra, *Śīśusīksā* (The Infant Teacher), (Calcutta, 1849).

41. Īśvaracandra Vidyāsāgara, *Varṇaparicaya*, Pts I and II (Calcutta, 1855).

The author, who is known to have concerned himself with typographic problems,<sup>42</sup> explains in the preface to the first part the necessity for introducing the dotted characters ঞ , ঢ and ড ; the relegation of *anusvāra* ঞ , *visarga* ঞ , and *candrabindu* ঞ to the list of consonants (*vyañjana*), and ঞ to the conjuncts; and the omission of ঞ and ঞ which were to be regarded as obsolete. These practices still occur in printed text. Furthermore, the conjuncts listed by Vidyāsagara replaced Carey's as the standard set to be taught in schools. This 'simplified' character set, which was used to typeset his works, became known as the 'Vidyāsāgar sort'.<sup>43</sup>

Perhaps surprisingly, Vidyāsāgara, a Sanskrit pundit and eminent literary figure, had no reservations regarding the free use of Latin punctuation in Bengali text,<sup>44</sup> and thus endorsed the acceptance of traditional European typographic values.<sup>45</sup> His works utilize the hyphen to justify the text; justification could otherwise only be achieved by variable interword spacing, since the supposedly connecting headline prohibited letterspacing.<sup>46</sup>

The joining nature of the script did not pose as great a problem as the three to four tier nature of the writing system, illustrated below:



The difficulties this system imposed were overcome to some extent by reducing the so-called x-height<sup>47</sup> of the basic *akṣaras*, and setting half-bodied, or quarter-bodied, characters above or below these in order to attach vowel signs and compose conjuncts not available as one sort. The fit was often far from

42. See Benoy Bose, *Iswar Chandra Vidyasagar* (Delhi, 1965), p. 147; see also Asok Sen, *Iswar Chandra Vidyasagar and his elusive Milestones* (Calcutta, 1977), pp. 23-28.

43. Bose, *Iswar Chandra Vidyasagar*, p. 148.

44. Unlike Marathi composition, the Latin full-point has never been adopted.

45. N.b. some attempts were made to print in *puṭhi* form, but these were abandoned.

46. In hand-composed matter, gaps in the headline are often apparent.

47. See above, pl. 12.

satisfactory and the process was cumbersome for the compositor. The half-bodied characters and the difficult kerning characters also necessitated a large amount of interlinear spacing. Composing was therefore a complex and time-consuming business. It entailed memorizing large case lays (which could number up to eight per fount) and the different methods of producing the required character combinations. The distribution<sup>48</sup> of typeset matter was a correspondingly lengthier task than for English composition, which only had an upper and a lower case. The number of types cast from each matrix depended on the frequency of each sort in normal text. Frequency also determined the arrangement of the case lays; they can thus be considered as the forerunners of the keyboard layouts of mechanical composition.

Initially, the typefoundries and the presses in Bengal were housed in the same establishment, but as Calcutta increased in stature as a major printing centre in South Asia, indigenous foundries grew up independently, supplying the presses with Bengali type, usually to a 510 character set. Over the last two centuries, the products of the typefoundries have improved in quality,<sup>49</sup> but the design of Bengali types for text matter has not changed in any significant manner.

The display faces or designs intended for commercial use have, however, altered radically. Type specimen books produced after Indian independence surprisingly show the latest designs to possess an even greater Western influence than the earliest founts of the Girīśa Vidāyratna Press. This is primarily due to the status still enjoyed by the English newspaper and magazine as models of typographic excellence. In addition, the continued use of English in many vernacular papers and magazines, particularly in advertisements, has created a demand for Bengali types compatible in design to the popular Latin

48. 'Distribution ... is the practice of returning type, leads and other materials utilized in composing a job back to their respective cases and racks'; Whetton, *Practical Printing*, pp. 23-24.

49. For a publication of excellent quality, see the Sanskrit Press's 1864 edition of *Śiśuśikṣā*; see pls. 114 and 115.

ব্যাঞ্জন বর্ণ।

কি খা গা ঘা উ  
 চ ছ জ ঙ ঞ  
 ত থ দ ধ ন  
 প ফ ব ভ ঝ  
 ষ ঝ স হ ঞ

**শিশুশিক্ষা**  
*1864*

৬ মদনমোহন তর্কালঙ্কার প্রণীত।

প্রথম ভাগ।

—

একত্রিংশ বার মুদ্রিত।

—

কলিকাতা

সংস্কৃত যন্ত্র।

সংখ্যা ১১২০১

—

মূল্য এক আনা।

TRUBNER & CO.,  
 60, Parliament Street,  
 LONDON.

[ ১৫ ]

ক্ষুধিত জনে ভোজন করাইবে।  
 বিবাদ করা ভাল নয়।  
 কাহারও গায় হাত তুলিও না।  
 মুনীলকে সকলে ভাল বাসে।  
 কদাচ মিছা কথা কহিও না।  
 কাহার কিছু চুরি করিও না।  
 কথায় কথায় শপথ করিও না।

পিতা মাতার সেবা কর, তাঁহারা  
 যাহা কহিবেন তাহাই করিবে। গুরু-  
 লোকের উপদেশ অবহেলা করিও  
 না। যাহারা তোমার একপাঠী তাহা-  
 দের সহিত কখন কলহ করিও না,  
 কাহাকেও কটু কথা কহিও না।

সকলকেই ভাল বাসিবে ও ভাল  
 কথা কহিবে, যে জন যে কথায় মনে  
 পীড়া পায় তাহাকে তেমন কথা  
 কহিবে না। কাণাকে কাণা, খোঁড়াকে

[ ১৬ ]

খোঁড়া বলিও না, তাহা বলিলে তাহারা  
 মনে দুঃখ পাইবে। পড়িবার সময়ে  
 আর দিকে মন দিও না। যিনি তোমা-  
 কে শিক্ষা দেন সাবধানে তাঁহার কথা  
 মনে রাখিবে, এবং তিনি যে বিষয়ে  
 নিষেধ করেন কদাচ তাহা করিও না।

মেঘ হইতে জলধারা পড়িতেছে,  
 এখন ঘরের বাহিরে যাইব না। আনার  
 গা ও পা ভিজিয়া যাইবে, শীত করিবে  
 এবং অবশেষে কফ কাসী হইয়া বড়  
 পীড়া পাইব। মেঘের ভিতর হইতে  
 আলো বাহির হইয়া আনার চক্রে  
 লাগিতেছে, জনালার কপাট দি।  
 উঃ! মেঘের ডাকে কান ফাটিয়া যায়।  
 আলো বাহির হইতেছে আবারও  
 বুঝি মেঘ ডাকে, চক্ষু রুজিয়া থাকি,  
 কান ঢাকিয়া রাখি এবং নাঝের কুঠ-



fonts. Hence the appearance of Bengali typefaces drawn with specific Latin faces in mind; expressions like Bengali Times and Devanagari Helvetica are not uncommon. Whether such designs, as figured on plates 116 and 117, function satisfactorily as representations of the Bengali script is a separate issue that requires further discussion.<sup>50</sup>

Despite the introduction of mechanical composition, succeeded by photocomposition, the demand for movable metal type continues. Paristosh Dhar the President of the All India Type Founders Federation, in his address to the *7th Conference of All India Type Founders* (Calcutta, 1982), estimated that there existed over 300 foundries in India.<sup>51</sup> The Girisa Vidyaratna Foundry was the first of many native typefoundries in Bengal whose livelihood was sustained by the establishment of Bengali-owned presses spearheaded by Bābū Rāma in 1807.<sup>52</sup> The growth of the indigenous typefoundries in the Indian subcontinent, precipitated by the rise of the native press,<sup>53</sup> was not merely due to the increased demand for printed vernacular matter and increases in the literacy of the local population; their development, and without doubt their continued existence, was for the most part owed to the mechanization of punchcutting.<sup>54</sup>

50. See below, Epilogue.

51. p. 6.

52. G. Smith, *The Life of William Carey*, p. 274. He did not undertake Bengali printing until 1816; Khan, *Printing in Bengali Characters*, I, p. 404.

53. During the period 1857-1867 there were 87 periodicals and newspapers in Bengal; B.S. Kesavan, *History of Printing and Publishing in India* (New Delhi, 1985), I, p. 214.

54. See Part II.

দেখাও, তোমার রূপটি দেখাও—মানুষের মনের ইহাই সনাতন প্রশ্ন।  
 অজানাকে মানুষ জানিতে চায়। কঠাপনিষাদ দেখা যায়, নটিকতা,  
 যমের নিকট গিয়া মানব মনের এই বিচিকিৎসাই ব্যক্ত করেন। মরণের  
 পর কি হইবে, মানুষের ইহাই গরম জিজ্ঞাসা। কেন? কারণ সম্ভবতঃ  
 এই যে, এই প্রশ্নের সমাধানের সহিত মানুষের মনে যেটি একান্তভাবে প্রয়োজন,  
 সেই বস্তু বিশেষভাবে এমন কী অশেষভাবে বিজড়িত রহিয়াছে। মানুষ  
 মরিতে চাহে না। জানে বা অজানে মরণকে প্রতিহত করাই সে জীবনের  
 প্রয়োজন বলিয়া বুঝিয়া লইয়াছে। ১২৩৪৫৬৭৮৯০

হেথায় দাঁড়িয়ে ছুবাহ বাড়ায়ে নমি নরদেবতারে,  
 উদার হৃদে পরমানন্দে বন্দন করি তাঁরে।  
 ধ্যানগঙ্গার এই যে ভূধর,  
 নদীজপমালা ধৃত প্রান্তর,  
 হেথায় নিত্য হেরো গবিজ ধরিজীরে  
 এই ভারতের মহামানবের সাগর তীরে।

আমাদের মধ্যে যদি জনগত ঐক্য  
 থাকিত, যদি পরস্পর সংলগ্ন হইয়া  
 জয়ের গৌরব, পরাজয়ের লজ্জা,  
 উন্নতির চেষ্টা আমরা এক বৃহৎ স্বদেশের  
 মধ্যে অনুভব করিতে পারিতাম, তবে  
 সেই জনগণলী স্বভাবতই উর্গনাতের  
 মতো আপনার ইতিহাসতত্ত্ব প্রসারিত  
 করিয়া দূর-দূরান্তরে আপনকে সংযুক্ত  
 করিত। তাহা হইলে আমাদের দেশের  
 ১২৩৪৫৬৭৮৯০

কলিকালের সর্বশ্রেষ্ঠ সাধক  
 হিসাবে ঠাকুর শ্রীশ্রীরাঘচন্দ্র  
 দেবের নাম বিশেষেহে করি  
 তে পারি। যোগ বিভূতিতে  
 ব্রহ্মা ভক্তিভে, সদাশিবোক্ত  
 দেবনন্দিত ক্রিয়াদিতে, দয়ায়  
 দাক্ষিণ্যে, শ্রীশ্রীঠাকুরের  
 জীবন যেন ভক্তি রসসিদ্ধ

Bourgeois

কবি রবীন্দ্রনাথ ঠাকুর ভারত প্রথম নোবেল পুরস্কার পাইয়াছেন  
যেদের জন্য সর্বদা স্মরণ করিয়াছিলেন বাংলার দেশবন্ধু চিত্তরঞ্জন

Ajanta Script (12 Point)

সম্ভ্রাম কাজ করিতে গিয়া এখন অধিকাংশ  
প্রিন্টারগণের অবস্থা দাঁড়াইয়াছে ঠিক এইরূপ।

Double Great (Compressed)

স্বনাম পুরুষঃ ধন্যঃ ১ ২

Double Great

মুদ্রাকর সম্মেলন

TANSEN (Double Great)

ভারত মাতা ১ ২

Nalanda Italic (54 Point)

অভিজ্ঞতা ৫ ৬

24 Point

খরচ খরচা বাদে ১ ৩

Rabindranath (72 Point)

সহিবুত্তা ১৩

**Part II**  
**Mechanical Typefounding and Composition of Bengali**

## Chapter 8

### Linotype Composition

The closing quarter of the nineteenth century witnessed the transformation of typesetting and printing in Europe and America by the invention of various mechanical devices. It was not until the third decade of the twentieth century that Bengal experienced the true impact of these inventions which effectively revolutionized vernacular printing.

The exacting task of punchcutting was the first to be transformed. As already indicated,<sup>1</sup> in the creation of every typeface each sort required its own punch<sup>2</sup> 'strong enough to imprint its image upon a piece of metal capable, itself, of serving as a matrix to receive molten metal. And the task of creating the punch for every alphabet, in every desired size was indeed formidable'.<sup>3</sup> The cutting of Bengali punches was even more demanding than those of the Latin script owing to the size of the character set, the complexity of the letterforms including kerning characters, and the three to four tier nature of the script.<sup>4</sup> In 1884 the highly skilled and laborious work of the punchcutter was greatly facilitated, if not rendered redundant, by the pantographic punchcutting machine<sup>5</sup> invented by an American from Milwaukee named Linn Boyd Benton.<sup>6</sup>

1. See chapter 1.

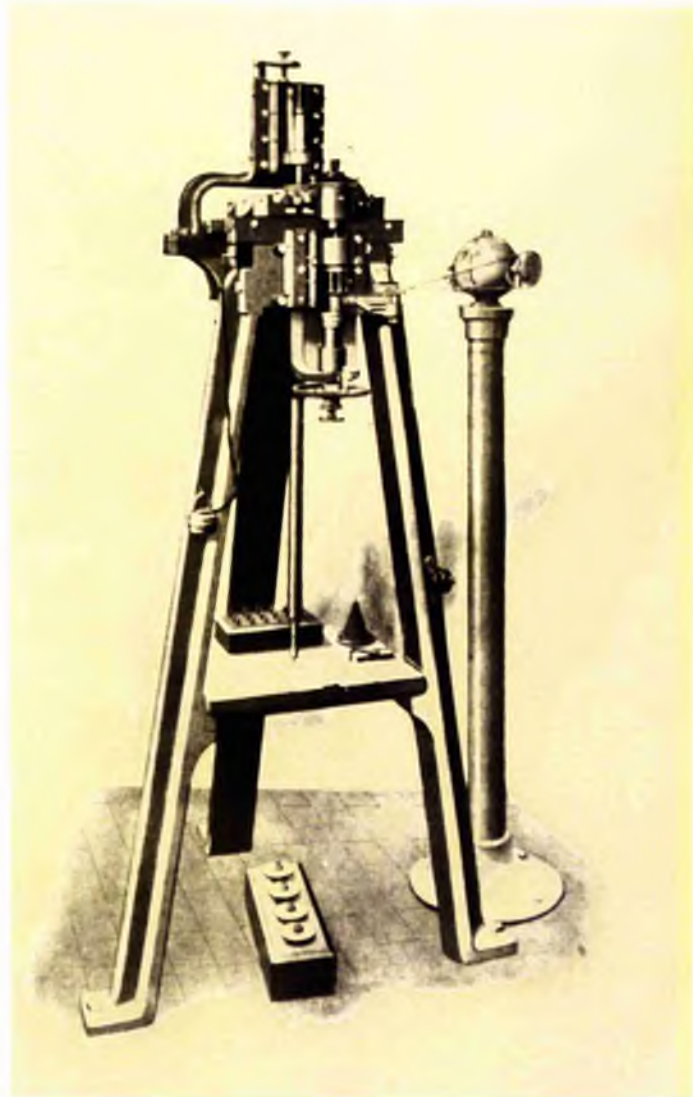
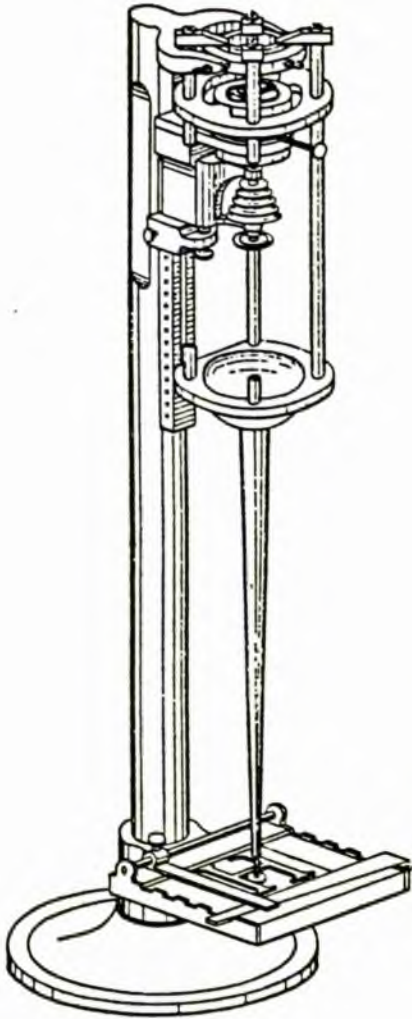
2. Or counter punch/punches, which were frequently shared by different sorts.

3. John W. Seybold, *The World Of Digital Typesetting* (Pennsylvania, 1984), p. 7.

4. Bengali foundry founts averaging 500 characters; see above, chapter 7. Gutenberg's original fount comprised approximately 290 sorts; Albert Kapr, *Johannes Gutenberg; Persönlichkeit und Leistung* (Leipzig, 1986), p. 158. Although some of Gutenberg's sorts were arguably as complex, they did not operate on so many levels.

5. Subsequent punchcutting machines can be considered as versions or modification of this; see pl. 118. Hand-cut punches are still produced today, see Stan Nelson, 'Mould Making, Matrix Fitting and Hand Casting', *Visible Language* XIX, 1 (Winter, 1985,) p. 98-106.

6. In partnership with R.V. Waldo (Walter Tracy, *Letters of Credit* (London, 1986), p. 35). It was patented in Great Britain in 1885; Legros and Grant, *Printing-Surfaces*, p. 630 (patent no. 327855).



118. Fig. 1. Benton punchcutting machine  
Fig. 2. Linotype punchcutting machine  
(L. A. Legros and J. C. Grant, *Typographical Printing-Surfaces*, London 1916,  
figs. 149 and 160)

In order to cut a punch from this machine, or one of its derivatives, a large-scale drawing, approximately ten inches in height, was required from which to make a model, a *former*, in high relief and pantographically reduced to about two and a half inches high. The formers when fixed on the punchcutting machine were traced around the edge by the operator with a blunt rod<sup>7</sup> which caused a revolving cutter to engrave a punch at the correct size in direct relation to the contours of the model. An operator could produce between twenty and thirty punches a day for a Latin typeface, averaging seventeen cuts per punch<sup>8</sup> and by means of an adjustment he was able to cut different sizes from the same drawing.<sup>9</sup>

The pantographic punchcutter heralded the mechanization of typesetting and typesetting which served to blur once again<sup>10</sup> the distinction between typefounder, compositor, and printer. The earliest successful<sup>11</sup> typesetting machine was the Linotype invented by Ottmar Mergenthaler (1854-1899)<sup>12</sup> and patented in the United States in 1886: it was installed in the New York Tribune the same year. It distinguished itself from earlier cold-metal composing machines, which cast pre-set type, by utilizing hot metal to cast fresh type during composition. The Linotype derived its name from its facility of casting lines or 'slugs' of type rather than individual types.<sup>13</sup> It comprised a keyboard, a magazine containing matrices, a casting and a distributing mechanism.<sup>14</sup> Over the years the Mergenthaler Linotype Company developed a variety of models

7. Beginning with the larger.

8. Compare to the figure of one punch per day in handcutting (H. Whetton, ed., *Practical Printing and Binding* (London, 1954), p. 8.) and the necessity to have different masters for each size.

9. Thereby adumbrating film and digital fonts that use one design size as a master for all sizes, which is not always desirable, see below, chapters 10 and 11.

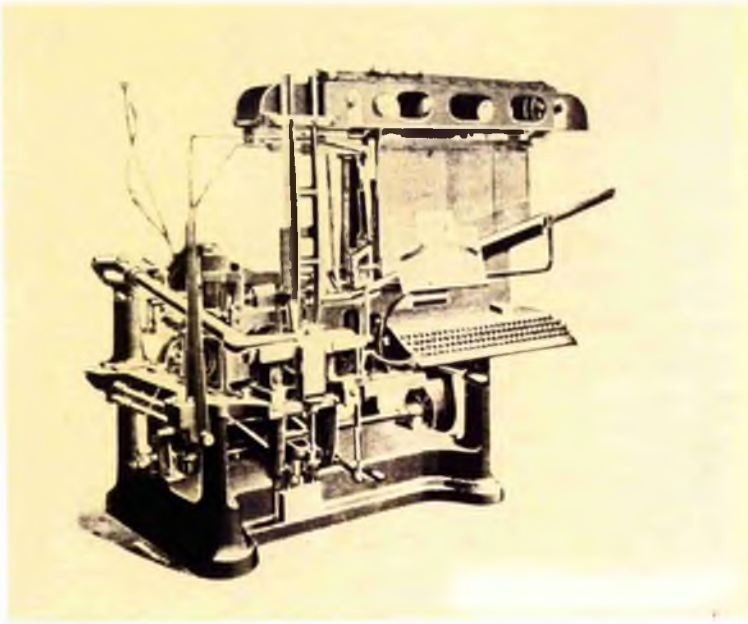
10. See above, chapter 7.

11. The first composing machine to be patented (patent no. 4664, 24 March 1822) was invented by Dr William Church. 173 such devices are listed in *The Journal of Typographical Research* (July, 1967). Seybold estimates 38,000 Linecasters were sold by the late 1960s; Seybold *Digital Typesetting*, pp. 40 ff.

12. Strictly speaking, Mergenthaler should only be credited with the invention of the notion of circulating matrices and their distribution.

13. Thus such devices became known as linecasters or slugcasters. The first commercially available Linotype machine was called the 'Blower'; see pl. 119.

14. See the description given in Mergenthaler's *Linotype's Machine Principles* (1940).



119. Fig. 1. Linotype Blower of 1886  
Fig. 2. Linotype Arabic machine  
(Legros and Grant, *Printing-Surfaces*, figs. 401 and 407)



with additional features, but these were based on essentially the same principles as the early Linotypes.<sup>15</sup>

In lieu of a compositor to assemble cast types, the Linotype operator controlled this function of the machine by means of the keyboard. On depression of the keys, the matrices assembled in the order in which they were typed. Once a line was complete, justification being 'mechanically automatic',<sup>16</sup> it was cast in metal as a finished slug or line, thus obviating the need for a typefounder. Since each matrix automatically returned to its position after casting, ready for further use, distribution was also performed by the Linotype and the quantity of matrices required per fount was considerably less than the number of types usually held in a founder's fount.<sup>17</sup> In the case of Latin founts, each matrix normally accommodated two characters, one roman and the other either bold or italic. Typically, the linecaster had access to a magazine of ninety channels at one time. This contained the fount of type at a given size<sup>18</sup> in the form of duplexed matrices;<sup>19</sup> thus the operator did not need to change magazines<sup>20</sup> when switching from roman to bold.<sup>21</sup> After use, the slugs were melted down for the metal to be recycled, thereby avoiding the cost and space created by standing type.

15. It is not within the scope of this thesis to discuss all models and features. See Legros and Grant, *Printing-Surfaces*, (pp. 423-5) regarding the early models.

16. Unlike cold-metal machines. For a description of the mechanism see Legros and Grant, *Printing-Surfaces*, p. 428; also see below, chapter 9. Linotype linecasters are still in use and serviced today, but they are no longer manufactured.

17. The number of matrices held for each character depended on the fount scheme, up to 20 were required. The type it cast was of softer type alloy than that used in foundry types; see Whetton, *Printing and Binding*, pp. 13 ff.

18. The Linotype normally cast slugs 5½ to 36 point and 48 point capitals up to a maximum measure of 30 or 36 ems; some models could set 42 picas. See chapters 9 and 10 regarding type measurements.

19. Which had to share the same width, the double-letter matrix was introduced in 1898/9.

20. When full, it weighed between 50 to 60 lb.

21. 'Roman' meaning ordinary; see Linotype, *Printing Terms*, p. 36. Some models had switching facilities.

The advantages<sup>22</sup> of the Linotype were evident since the tasks of type casting, composing, justifying, and distributing had either been simplified or eliminated with no great diminution in typographic quality.<sup>23</sup> Unprecedented setting speeds were now achievable: a skilled compositor could compose approximately 2000 characters an hour in English. Nevertheless there existed considerable disadvantages for non-Latin typesetting, for which purpose the composing machines had never been designed. The numerous attempts to adapt Indian scripts to the limited ranges of mechanical typesetters (and their keyboards) developed by foreign manufacturers met with varying degrees of success, but ultimately redefined what was henceforth considered acceptable as legible typography.

The two methods of hand composition originally designed for setting Devanagari, viz. the 'Akhand' and the 'Degree' systems, proved untenable for linecasting and rotary printing. The Akhand (otherwise known as Calcutta) system, relied on the support of kerning elements by the shoulders of adjacent characters and employed a large character set. The Degree (or Bombay) system,<sup>24</sup> utilized three levels of type-matter comprising main character, subscript, and superscript in order to compose one line.<sup>25</sup> All these features were inadmissible in the case of the linecaster, and the adaptation of vernacular scripts for such mechanical inventions encouraged the formation of script reform committees who were particularly active in the case of Hindi.<sup>26</sup>

22. Not all of which can be mentioned here, and which are not necessarily pertinent to this discussion.

23. Regarding this point see John C. Tarr, *Printing To-day* (Oxford, 1949), pp. 44 ff.

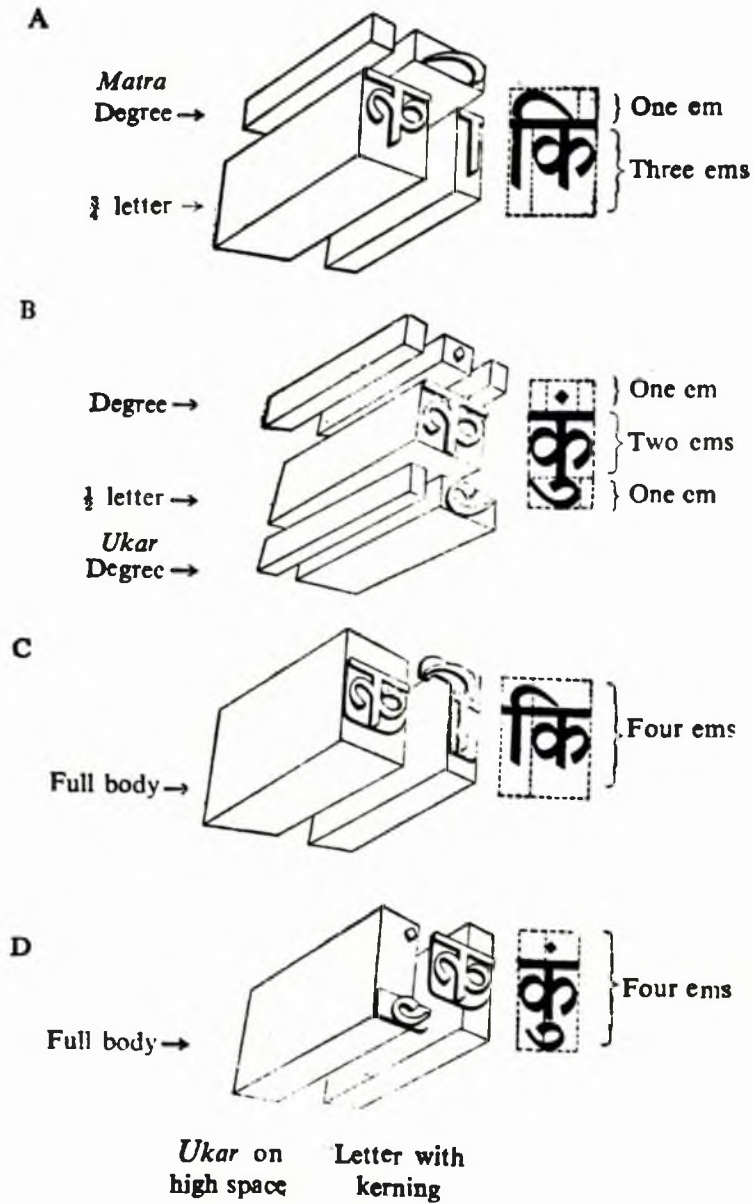
24. Akin to the *phalā* system; see pl. 120.

25. Consequently causing much breakage of type through continual use.

26. Often known as 'Hindi Script Reform' despite the fact that Hindi is a language, not a script.

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## TYPOGRAPHY OF DEVANAGARI



120. The Degree and Akhand systems of composition (B.S. Naik, *Typography of Devanagari*, Bombay, 1965, fig. 19)

The aspirations of the script reformers as described by Bapurao S. Naik in relation to Devanagari were equally applicable to Bengali:

- a) Improvement in the script with a view to facilitate the graphic representation of all phonemes, including those in the foreign words in order to maintain the precision of the language.
- b) Change in the present method of joining the vowels with the consonants, for the elimination of the three step method of setting and changes in conjunct formation which are aimed at the reduction in the number of types.
- c) Change in the present method of casting type sorts so as to facilitate linear setting either with or without overhangs and thus provide the desired facility for mechanical composition.<sup>27</sup>

With regard to Naik's first point, it should be recalled that at the beginning of this century the Bengali script had still eluded formalization. The earliest attempts at type design for Indian scripts had been modelled on characters penned by scribes, whose hands betrayed their place of origin and period as styles varied from region to region.<sup>28</sup> The problem of standardization, which was essentially that of orthography, and to some extent morphology,<sup>29</sup> became entangled with the modifications in typefoundry for ease of composition. In the case of Devanagari, many conferences were convened to discuss the standardization of the typeforms. But it was only in 1960 that the Indian Government was able to reach a decision on this issue, which was endorsed by the Government of Maharashtra in 1962 after some amendments. Its decision<sup>30</sup> could not, however, be regarded as conclusive: printers often felt disinclined to implement the recommendations of the committees.

27. B.S. Naik, *Typography of Devanagari* (Bombay, 1965), pp. 146-7.

28. See above, chapter 1.

29. In Nepali नेपालमा is preferred to नेपालमा .

30. Summarized by Naik, *Typography of Devanagari*, pp. 394-5.

The driving force behind the implementation of Bengali on a Linotype machine was Sires̄h Chandra Majumdar of the Śrī Gaurāṅga Press, the proprietor of the daily newspaper, *Ananda Bazar Patrika*.<sup>31</sup> During the 1930s Indian newspapers were eager to convert from the slow flat-bed presses to the more economical high-speed rotary presses, but this presented problems in the case of vernacular printing. The use of these presses demanded that all type-matter be stereotyped;<sup>32</sup> a process that exerted tremendous pressure<sup>33</sup> on the kerns and interlocking features peculiar to Indian vernacular foundry types. The resulting breakages and excessive wear and tear caused some newspapers to revert to the slower printing methods. Majumdar, however, persisted<sup>34</sup> in discovering a means of overcoming the obstacles that hindered the setting of his newspaper by means of a slugcaster.

The principal technical difficulty in the typographic reproduction of traditional Bengali chirography was the necessity of having an extensive range of typeforms.<sup>35</sup> For hand composition this had meant considerable expenditure in type before even a small job could be set; and the speed of composing from four, or more, typecases was extremely slow. The requisite linear setting of the Linotype constituted an additional obstacle, for it did not permit the overhanging or interlocking characteristics of individual characters and the placing of subscribed vowel signs and other superimposed diacritical marks, for instance the *repha*. A scheme was required to overcome these problems in order to verify the feasibility of composing legible Bengali text from such contrivances. In a letter on this subject addressed to the English office of Linotype & Machinery Limited, dated 14 October 1933, Majumdar wrote:

31. The title *Ananda Bazar Patrika Ltd* was to become the name of the publishing house.

32. See Gaskell, *Introduction to Bibliography*, pp. 201-5 for a description of this process.

33. About 1500 lb pressure per square inch; J. Schemmel 'The Technological Aspects of Hindi Script Reform' *Indian Print and Paper* [1954], Article 2, p. 10.

34. For 20 years; see below.

35. See chapters 3ii and 7.

we have finally fixed up a Key Board Scheme for a Bengali Linotype. We have practically reduced nearly 600 letters for the Bengali script to 124 on the Key Board, plus about 50 in the side cases including signs etc.

Perhaps you know that I am over this job for the last 20 years and I had to give up my efforts several times owing to the appalling prevalence of compound letters in the Bengali script which it became impossible to simplify. But last year I renewed my efforts in connection of printing my daily *Ananda Bazar Patrika* on Duplex Rotaries and an intimate friend of ours Mr Ray Sekhar Bose - late Manager of Bengal Chemical & Pharmaceutical Works, who is a scientist and writer of repute came to my help and gave me very valuable suggestions. . . .

A standard Model 6 or Model 14 with a side magazine would be ideal for a Bengali Linotype. . . . I am arranging with an artist to draw up the letters in accurate measurement.<sup>36</sup>

Majumdar's scheme for a Bengali Linotype,<sup>37</sup> which was to be 'quite different from Devanagari in relation to sectional characters',<sup>38</sup> gained credence in Mergenthaler's eyes by the approval it met of Hari Govil, the designer of the Devanagari Linotype scheme. With a plan for '124 characters for magazines and 64 in the side case', it was agreed that enlarged drawings should be prepared in Bengal, but the matrices punched in America to the English depth.<sup>39</sup> The first steps in matrix production for the Linotype were based on the principle of pantographic punchcutting. In 1948 the *Linotype Matrix* stated: 'The modern version of Benton's machine is possibly the most important single factor in mechanical typesetting, and the Linotype matrix is the tangible evidence of it'. Again, in 1960 the *Linotype Matrix* confirmed that 'without the pantographic punch-cutting machine<sup>40</sup> the production of enough punches to keep

36. Majumdar to May, 14 Sept 1933, Mergenthaler Correspondence file no. 918, henceforth designated as MC 918.

37. Described below, pp. 283 ff.

38. Which required up to four matrices to make one character. MC 918: May to Walker, 14 May 1934.

39. MC 918: May to Walker, 13 Nov 1933.

40. Mark Barr of Linotype produced an improved model for the company; Legros and Grant, *Printing-Surfaces*, p. 204. See pl. 118, fig 2.

mechanical composing machines supplied with the necessarily large number of accurately stamped matrices would be a difficult problem'.<sup>41</sup>

A pattern for punchcutting was first made by means of a pantograph using the large-scale finished drawings which contained all the working dimensions and required precision to the thousandth of an inch. The resulting pattern comprised two brass plates soldered together, measuring approximately three and a half inches square and a quarter of an inch thick, bearing a character in relief on its surface. This could then be locked into position on the bed of the punchcutting machine, ready for cutting the blank steel punch pantographically to the desired typeface size. The punch was then checked against an original drawing by means of a projectoscope; it was examined to within one ten-thousandth of an inch. Once approved, it was employed for matrix-stamping. The high precision stamping of Linotype matrices could involve as many as sixty different processes. This was subsequently reduced to a minimum of forty-eight. Special characters, including logotypes, for which only a few matrices were required, were engraved directly by machine onto brass matrix blanks.<sup>42</sup>

At an early stage it was suggested<sup>43</sup> that the matrices be manufactured in London, but Victor E. Walker, the then Deputy Chairman and Managing Director of Linotype & Machinery Limited,<sup>44</sup> considered his office too ill-informed regarding Oriental languages to undertake the work. An opinion he expressed more than once:

41. *Linotype Matrix*, II, no. 1 (Spring, 1948), p. 8 and *Linotype Matrix*, no. 33 (May, 1960), p. 2. It further mentions that in practice the Linotype matrix department seldom cut more than three sizes from one set of patterns, and 'not infrequently [prepared] a new set of drawings . . . for each size in a series'; *ibid.*

42. See *Linotype Matrix*, no. 4 (Winter, 1949/1950), p. 7. As distinct from electrotypes matrices referred to in chapter 6.

43. MC 918: Griffith to Walker, 14 Dec 1933.

44. Situated in London at that time.

It is regrettable that there is not somebody over here with sufficient knowledge of Bengali who could not examine the drawings and form an opinion on the matter, but we are not in a position even to get an idea as to whether the arrangement as suggested [Majumdar's scheme] is a practical one, and if so whether it is a marked improvement on the system produced at your factory for the composition of Hindi.<sup>45</sup>

For many years this view was shared by the parent company:

After we adapt these languages to the Linotype and establish the general principles, London can perfectly well take care of their promotion, but I have seen nothing so far that would justify our leaving the initiative and the adaptation of any vernacular to London.<sup>46</sup>

The Mergenthaler Linotype Company in New York could avail themselves of the services of Professor Harold H. Bender, Professor Norman Brown,<sup>47</sup> as well as Hari Govil. Together they possessed the linguistic and technical knowledge necessary to undertake the typographic development of an Indian script for Linotype composition. Mergenthaler relied on Bender to assess the viability of Majumdar's scheme. It was confirmed that the letterforms would be designed in India; the patterns, punches, and matrices manufactured in America; and the project co-ordinated in England. Progress, however, was slow, exacerbated by the great distances between the three countries. It eventually required the presence of Govil and Brown in India to see the work to its fruition. Norman Dodge, the president of Mergenthaler, described Govil's usefulness:

Govil is at present essential in the adaptation of the native languages to the Linotype, both because of his knowledge of the Linotype machine and its mechanical limitations. For the same reason Govil seems to be the key man in the very important matter of instructing the native Indian operators in the use of the Linotype.<sup>48</sup>

45. Which had not met with much success; MC 918: Walker to Dodge, 28 May 1934.

46. MC 918: To Griffith, 3 Apr 1935; this was to change in the 1960s.

47. Bender was a consultant to Mergenthaler; Brown was Professor of Sanskrit, the University of Pennsylvania.

48. MC 918: Dodge to Walker, 22 Jan 1935.



Difficulties soon arose with regard to the drawing of the characters. Majumdar employed a local artist to design Bengali letterforms according to his scheme, but these were unsatisfactory for punchcutting since they did not meet the technical requirements of the Linotype. Griffith stated:

It is always difficult to cut a letter in correct proportion from artists sketches that are not drawn to working scale, particularly Oriental faces where we are not thoroughly familiar with all the details of design.<sup>49</sup>

The American office therefore provided a carefully assembled package to assist Majumdar in the preparation of the artwork. This comprised half a dozen letter-drawings of twelve point<sup>50</sup> Bengali experimental characters, showing the scale employed for those drawings, matrices of these characters, slugs cast from these, press proofs of them to show the relative alignment and other details, and a brass scale for laying out the dimensions of the Bengali characters to correct proportions.<sup>51</sup> In addition, charts were supplied showing the channel sizes of characters, including minimum and maximum widths, for both the main and auxillary magazines.<sup>52</sup> Blank keyboard layouts were also included in the package.

The American interpretation of the Bengali characters was not to Majumdar's satisfaction. He had by this time more than a hundred drawings prepared to the wrong scale,<sup>53</sup> for which he had paid five hundred rupees.<sup>54</sup> After some correspondence between the three countries,<sup>55</sup> in which Majumdar, who did not wish to waste the drawings, was begged to follow the design specifications, it was agreed that Mergenthaler Linotype would produce scaled drawings based on

49. MC 918: Griffith to Dodge, 8 June 1934.

50. Point sizes are discussed below; see chapter 10.

51. MC 918: Griffith to May, 29 May 1934. The proofs can be seen in pl. 121, fig. 1.

52. The charts had to be replaced at a later date because they were devoured by ants; MC 918: May to Griffith, 21 Jan 1935.

53. He was also deprived of the services of the artist whose family was killed in the 1934 earthquake; MC 918: Govil to Griffith, 23 Oct 1934.

54. He was later reimbursed for his expenses and received payment in the form of equipment for his work on the Bengali Linotype.

55. Letters averaging about a month's delivery from India to USA.



the artwork received. But drawing revisions were still required, since it became evident that the artist employed by Majumdar had not 'got the correct size of the main part of the letter in proportion to the top and bottom'<sup>56</sup> which threw out the balance of the whole character. The difficulties encountered in the drawing of the Bengali fount, which typify international design projects, were reported by Professor Brown:

The fundamental trouble with the designing of the Bengali perhaps lies in the fact that Mr Majumdar did not realize that his artist and the MLC<sub>o</sub> [Mergenthaler Linotype Company] designer were using different relative proportions for separate parts of the letters. The MLC<sub>o</sub> design gives a proportion of main body to superscript and subscript signs about 3:1. Mr Majumdar's designs give a proportion of about 3.5:1. Hence his superscript and subscript signs appear small. He admitted at once that the New York proportions were correct (the fault with the New York product he considered to be lack of balance between characters rather than of parts of individual characters). After Mr May and I got him to this point, he got at his artist to have the designs redrawn on New York's proportions, and I stayed over in Calcutta waiting for them. But again the artist missed the proportions, this time erring on the other side. When Mr May and I measured his new (and even to Mr Majumdar unsatisfactory) designs, we found that he had used proportions of about 2.5:1. Mr Majumdar is now trying again.<sup>57</sup>

By February 1935 Majumdar had arranged a room for the artist to work on the drawings<sup>58</sup> under Govil's supervision. The intention was to despatch ten to twelve drawings twice a week by airmail. Adjacent photographic facilities enabled reductions of the artwork to be made for approval by Majumdar prior to despatch. One such reduction sent to Griffith that month included nine revised characters. The optical slant which subsequently proved to be a problem was already observed but not corrected by Majumdar, who erroneously assumed it to be a camera fault.<sup>59</sup> Although the revised drawings proved acceptable,<sup>60</sup> the New York office was still lacking the vital information necessary to

56. MC 918: May to Griffith, 29 Jan 1935.

57. MC 918: Brown, Report no. 14, Benares 1 Feb 1935.

58. Outside his regular employment. MC 918: Brown, Report no. 16, 18 Feb 1935.

59. See pl. 121, fig. 2. Pl. 116, fig. 1 demonstrates that this was not the case.

60. Drawings were usually checked with an epidiascope; *Linotype Matrix*, II, no. 3 (Spring, 1949), p. 6.

commence production of the founts. The drawings were missing important technical data essential to the first steps of matrix-making.

A letter in the Mergenthaler Linotype correspondence files records:

Mr Govil is thoroughly familiar with all the technical details, and I am rather surprised that he has passed the drawings on to us for cutting the punches without giving us all the necessary preliminary data.<sup>61</sup>

Moreover, it transpired that the technical information on later batches of drawings contradicted previous specifications causing the New York office to express its frustration: 'It was just such conflicting information which had us confused, and we were already proceeding on the basis of our own judgment'.<sup>62</sup> Furthermore, all work on the Bengali, which the New York office estimated required sixty working days for the manufacture of ten fonts of matrices,<sup>63</sup> was impeded by the failure of Majumdar to submit a keyboard layout with the artwork, as Griffith noted:

the drawings will be entirely satisfactory as a working basis, but it is absolutely necessary for us to have a complete keyboard layout before we can proceed with any degree of intelligence to establish sizes of the respective characters. . . .

If we are going to make any progress with this work Mr Govil will have to get busy at once and submit a complete keyboard arrangement, which he very well knows is necessary before we can proceed to cut any of the characters.<sup>64</sup>

Notwithstanding such remarks, contractual obligations compelled the Americans to begin punchcutting without reference even to a draft keylayout; thereby running a high risk that their work would be invalidated by the final

61. MC 918: Griffith to May, 5 Mar 1935.

62. MC 918: Griffith to May, 29 Mar 1935. Confidence in Govil's abilities gradually diminished; Griffith stated, 'Govil made a mess of things'; MC 918: Griffith to Brown, 23 June 1944.

63. Upon receipt of good finished drawings.

64. MC 918: Griffith to May, 5 Mar 1935.

arrangement of the keyboard. The frequent references to this fact which punctuate the correspondence between the two parties serve to underline another crucial turning point in the history of Bengali typefounding,<sup>65</sup> namely the unprecedented importance of the keyboard layout in the process of fount manufacture.<sup>66</sup>

The considerable freedom of handsetting from a variable number of type cases, where the restrictions to the size of the Bengali fount were largely self-imposed,<sup>67</sup> was replaced by the absolute physical limitations of the linecaster. The Linotype keyboard, which even when coupled with a side magazine could not accommodate the customary 500 sorts for handsetting, was still required to generate the same phonemes as a foundry fount, and in a legible form. The keyboard, *ipso facto*, lay at the core of the entire project as is attested by Majumdar's reference to it at the project's inception.<sup>68</sup>

The keying method indubitably governed the design of the characters.<sup>69</sup> Its size determined the number of sorts, and thereby the fount conspectus. Its manner of composition, in this case linear, affected the actual shape of the letterforms, as well as their spacing which was also governed by the channel sizes.

Conversely, the layout itself was determined by the widths of some of the typeforms occasioning cross-lugging,<sup>70</sup> where due to the excessive width of a character the adjacent sort had to possess a narrow width. Duplexing<sup>71</sup> also required letterforms occupying the same channel to be of identical width.

Channel positions were therefore crucial to matrix manufacture. In short, until

65. A turning point not confined to the Bengali script.

66. This is different in the case of Monotype; see below, chapter 9.

67. Chiefly occasioned by expense, see above, p. 243.

68. See above, p. 276.

69. See below, pp. 300-7.

70. For a definition of this technique see Linotype, *Printing Terms*, p. 9.

71. i.e. creating double-letter matrices.

the keyboard was conceived at least in draft form, no artwork could be designed; until it was completed, no fount could be manufactured.

Although the arrangement of the keyboard had its precursor in the case lays of founder's type, new frequency counts were required for mechanical composition where speed was vital to newspaper production, since the fount synopsis differed radically to its earlier counterparts. Assisted by Brown, Majumdar perfected the keyboard layout<sup>72</sup> having consulted publishers regarding the acceptability of some of the new forms of characters.<sup>73</sup> Additional problems were the engraving of the dual language keybuttons and the supply of 'wing buttons' to enable the keyboard to be changed for setting various vernaculars. A.J. May, the manager of the Calcutta office, was instrumental in proposing the notion of a new design of wide sidecase containing 150 compartments to replace the existing grouping of three cases of 48 large and 12 small compartments employed for Devanagari, where two sorts were forced to share the same compartment.<sup>74</sup> The new case would accommodate the 136 characters, or more, required for Bengali in addition to the main magazine. According to May, 'many of the high frequency symbols placed in the sidecase are traditional symbols and are alternate forms for [the] sound[s] represented otherwise in Mr Majumdar's system'.<sup>75</sup>

The features observable in the photographic reproduction of Majumdar's typeface,<sup>76</sup> produced in February 1935,<sup>77</sup> are already indicative of his entire scheme based on the keyboard layout finally established in July the same year.<sup>78</sup> This trial, which strove to emulate the output of the linecaster, at once reveals the adverse effects of linear setting on Bengali typography.

72. MLCo was very impressed by their thoroughness; MC 918: Griffith to May, 30 Apr 1935.

73. See below, p. 294 and pl. 121, fig. 1.

74. MC 918: May to Griffith, 12 Apr 1935 (letter 1).

75. MC 918: May to Griffith, 12 Apr 1935 (letter 2) and 5 Aug 1935.

76. Which had lost a great deal of the calligraphic quality of his earlier trials; see pl. 121 fig. 2 comprising photographic reductions of trial characters (19 Oct, 1934).

77. See pl. 122, fig. 2.

78. Apparently no longer extant; it was revised in 1938, see below.

• TRADE **LINOTYPE** MARK •

10 POINT BENGALI

হিন্দুন্যারি  
হিন্দুন্যারি

হি ন্দ ন্যারি  
হি ন্দ ন্যারি

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IN  
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শ্রীজ্ঞানন্দগঠঢ় ডয়গখঙটহছসঢ়ঔয় থঘশচওইষর উন্দৎৎগাঁয়ে  
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122. Fig. 1. Linotype 10 point Bengali trial  
Fig. 2. Linotype '12 pt. Bengalee' trial

The necessity for robustness coupled with kerning restrictions demanded the condensed shape of the medial vowel signs  $\text{ঋ}$  and  $\text{ঌ}$ , causing unevenness in spacing; particularly in the case of  $\text{ঌ}$ , whose ascender appears almost reversed in the earliest proofs. Subscript vowel signs were similarly affected: these were required to occupy their own width, rather than attach themselves to their host characters, creating excessive amounts of white space wherever they occurred. Restrictions imposed on the size of the character set necessitated the creation of as many conjunct characters as possible by the lateral combination of common elements (rather than the mainly vertical combination of Wilkins's *phalā* system), thereby giving rise to less orthodox letterforms. Another point of interest arising from this test of nine characters concerns the conjunct  $\text{ঋঌ}$ . This consonantal cluster created by Majumdar's method of composition is conspicuously wider than was customary in founder's type, where in recognition of its frequency it was commonly designed as one sort.

The fount synopsis of the Linotype ten point Bengali Light and Bold face printed in July 1935<sup>79</sup> shows the full extent of the compromises made for the adaptation of this script to Linotype composition. The main magazine held the customary basic characters of the syllabary as well as the vowel signs, each possessing only one form.<sup>80</sup> Punctuation including the hyphen was also incorporated, as this had become the norm for Bengali composition. Additional to these sorts were the conjunct characters whose frequency of occurrence merited inclusion, e.g.  $\text{ঋঌ}$ , and the reduced characters (*half-forms*) specifically designed to compensate for deficiencies in sorts. The employment of *half-forms* to restrict the size of the character set recalls Wilkins's use of *phalās*, yet the Linotype forms differed substantially, being neither quarter-bodied, nor half-bodied, but the full-bodied characters demanded by slug-composition. The

79. See pl. 123. Both light and bold tpestyles were conceived as one design, this is a comparatively late phenomenon; see Tracy, *Letters of Credit*, pp. 65-66.

80. i.e. no initial form of  $\text{ঋ}$ .





Linotype Bengali *half-forms* comprised, for the most part, the reduced initial elements of consonantal clusters, possessing no space to their right (or left, if they were secondary or tertiary elements), enabling them to butt up against the succeeding types, which in some cases were also *half-forms*. Since it was not possible for these components to be superscribed or subscribed, and their union with adjacent characters was not always successful, the final effect was markedly different to foundry setting. It is interesting to note that the lateral combination of these elements with the *raphalā* 𑂣 was not attempted and the formations required were designed as one sort, e.g. 𑂣. <sup>81</sup> Some ligatures comprising consonants with subscribed vowels were also to be found in the fount synopsis in order to compensate for the inability to float subscript vowel signs. The logograph 𑂣, however, was the only ligature created with the kerning 𑂣.

The contents of the main and side magazine were determined according to the thorough frequency counts conducted by Majumdar and Brown in 1935 in accordance with their scheme. The auxiliary magazine therefore held those matrices deemed less common, viz. additional conjuncts of vertical formation, the vowel signs 𑂣 and 𑂣, and Bengali numerals in the light tpestyle.<sup>82</sup> *Pie* matrices<sup>83</sup> were also available of more orthodox conjuncts, a number of ligatures, bold numerals, maths signs, and several fractions. In practice, the *Pi* set was rarely used in newspaper composition owing to speed requirements, but it did possess the sorts required by Calcutta University for book production.

Irrespective of the limitations the typesetting scheme imposed, the design of the

81. But added to the founts at a later date, see pls. 124 and 125.

82. In this study, the term tpestyle is used to distinguish between the different weights of the same typeface design.

83. Nowadays usually written as 'Pi', meaning mixed/assorted printer's type. See pl. 121, fig. 3.

# Linotype Bengali

Main Magazine						Spec. No. 1
1 ট	42 ৫	84 ট	112 র	225 ঙ	267 ঙ	
2 ফ	43 -	85 ঙ	113 ঙ	226 ঙ	268 ঙ	149 ( (
3 ৫	44 Th. Sp.	86 ঙ	149 ( (	227 ঙ	269 ঙ	114 ) )
4 ন	45 ৫	87 ঙ	114 ) )	228 ঙ	270 ঙ	150 ( )
5 ৫	46 ঙ	88 ট	115 ঙ	229 ঙ	271 ঙ	120 ) )
6 ঙ	47 ' .	89 ট	116 ৷	230 ঙ	272 ঙ	91 ( ৷
7 ঙ	48 ঙ	90 ট	117 ঙ	231 ঙ	273 ঙ	151 / ১
8 ত	49 ৫		118 ঙ	232 ঙ	274 ঙ	92 ৷
9 র	50 ঙ	Aux. Magazine	119 ঙ	233 ঙ	275 ঙ	152 / ২
10 ব	51 ঙ	91 ( ৷	150 ( )	234 ঙ	276 .	93 ( ঙ
11 ঙ	52 ঙ	151 ) ১	120 ) ২	235 ঙ	277 ঙ	153 / ০
12 ঙ	53 ত	92 ( ৷	121 ৷	236 ঙ	278 ঙ	94 ( ঙ
13 ঙ	54 ট	152 ) ২	122 ঙ	237 ত	279 ঙ	154 / ৪
14 ঙ	55 ৫	93 ( ঙ	123 ঙ	238 ঙ	280	95 ( ঙ
15 হ	56 ৫	153 / ০	124 ৷	239 ঙ	281	155 / ৫
16 ঙ	57 ঙ	94 ( ঙ		240 ত	282 ,	96 ( ৷
17 হ	58 .	154 ) ৪	Pi Characters	241 ঙ	283 )	156 / ৬
18 ঙ	59 ৫	95 ( ৷	201 ঙ	242 ঙ	284 ৷	97 ( ঙ
19 ঙ	60 ঙ	155 / ৫	202 ঙ	243 ঙ	285 ৷	157 / ৭
20 ঙ	61 ঙ	96 ( ৷	203 ত	244 ঙ	286 ৷	98 ( ৷
21 ঙ	62 ত	156 / ৬	204 উ	245 ঙ	287 ৷	158 / ৮
22 ঙ	63 ঙ	97 ( ঙ	205 ঙ	246 ঙ	288 ৷	99 ( ঙ
23 ঙ	64 ঙ	157 / ৭	206 ক	247 ঙ	289 ৷	100 ( ৷
24 ঙ	65 ত	98 ( ৷	207 ঙ	248 ঙ	290 .	159 / ৯
25 ঙ	66 ৷	158 / ৮	208 ঙ	249 ৫	291 :	100 ( ৷
26 ' .	67 .	99 ( ঙ	209 ৫	250 ঙ	292 " .	160 / ০
27 ঙ	68 ঙ	159 / ৯	210 ট	251 ঙ	293 " .	
28 ঙ	69 ঙ	100 ( ৷	211 .	252 ঙ	294 [	
29 ট	70 ৷	160 / ০	212 ঙ	253 ত	295 ]	
30 ঙ	71 ত	101 .	213 ঙ	254 ঙ	296 *	
31 —	72 ঙ	102 !	214 ঙ	255 ত	297 §	
32 ...	73 ত	103 ৫	215 ৷	256 ঙ	298 ৷	
33 ,	74 ঙ	104 ৫	216 ঙ	257 ঙ	299 +	
34 ৷	75 ঙ	105 ৫	217 ঙ	258 ঙ	300 †	
35 ৫	76 ঙ	106 ৫	218 ঙ	259 ঙ	301 +	
36 ;	77 ৫	107 ৫	219 ঙ	260 ঙ	302 -	
37 ?	78 ঙ	108 ৷	220 ঙ	261 ঙ	303 x	
38 Fig. Sp.	79 ঙ	109 ট	221 ঙ	262 ঙ	304 =	
39 ৫	80 ৷	110 ৷	222 ঙ	263 ঙ	305 ÷	
40 ৫	81 ৷	111 :	223 ঙ	264 ঙ	306 .	
41 ' .	82 ৷		224 ট	265 ঙ		
	83 ৷			266 ৫		

TRADE MARK  
**LINOTYPE**

## 12 POINT BENGALI LIGHT AND BOLD

Char. Nos.	308	309	310	311	312	313	314	315	316
	১	২	৩	৪	৫	৬	৭	৮	৯
	১	২	৩	৪	৫	৬	৭	৮	৯

IDRY—PHONE No. 788 B. B.

16

No. 36. Small Pica. Rs. 55/ ৩৭ m d.

রথ দিন প্রভাত হইবামাত্র, লক্ষ্মণ স্তম্ভকে আহ্বান করিয়া কহিলেন, নাথের অবিলম্বে রথ প্রস্তুত করিরা আন, আৰ্য্যা জানকী তপোবনদর্শনে গমন করিবেন। স্তম্ভ, আদেশ প্রাপ্তিমাত্র, রথ প্রস্তুত করিবার নিমিত্ত প্রস্থান করিলেন। অনন্তর লক্ষ্মণ জানকীর বাসভবনে গমন করিয়া দেখিলেন, তিনি, তপোবনগমনোপযোগী বাবতীয় আয়োজন করিয়া প্রস্তুত হইয়া রথের প্রতীক্ষা করিতেছেন। লক্ষ্মণ সন্নিহিত হইয়া, আৰ্য্যে! অভি বাদন করি, এই বলিয়া প্রণাম করিলেন। সীতা, বৎস! চিরজীবী ও চির সুখী হও, এই বলিয়া অকৃত্রিম স্নেহ সহকারে আশীর্বাদ করিলেন। লক্ষ্মণ কহিলেন, আৰ্য্যে! রথ প্রস্তুতপ্রায়, প্রস্থানের অধিক বিলম্ব নাই। সীতা পতন পরিভাব প্রাপ্ত হইয়া প্রফুল্লবদনে কহিলেন, বৎস! অশু প্রভাতে তপোবনদর্শনে যাইব, এই আনন্দে আমি রাত্রিতে নিদ্রা যাই নাই;

No. 37. Porgeous. Rs. 75. ৩৭ md.

সেই দুই কুমারকে নখনগোচর করিয়া অবধি, রামের চিত্ত এত চঞ্চল ও সীতালোক এত প্রবল হইয়া উঠিয়াছিল যে, লোকলজ্জাতরে আর ঐর্ষ্য-লখন করা অসাধ্য ভাবিয়া, তিনি সহসা সভাভঙ্গ করিয়া বিজন প্রদেশ সেবার নিমিত্ত অত্যন্ত উৎসুক হইয়াছিলেন: এতদ্ব্যতিরিক্ত, অশু তোমরা নিজ অভিপ্রায়ানুরূপ যে কোন অংশ পান কর, কল্যা প্রভাত অবধি প্রতিদিন কিঞ্চিৎ করিয়া তোমাদের মুখে সন্দূর কাব্য প্রবেশ করিব। তাহার। যে আজ্ঞা মহারাজ! বলিয়া সন্নীত অঃরস্ত করিল। সভাস্থ সমস্ত লোক মোহিত হইয়া মুক্তকণ্ঠে অশেষ সাধুবাদ প্রদান করিতে লাগিলেন। রাম, কবির পাণ্ডিত্য ও রচনার মালিত্য দর্শনে চমৎকৃত হইয়া জিজ্ঞাসা করিলেন, এই কাব্য কাহার রচিত, কাহার নিকটে। ১৮ তোমরা সন্নীত শিক্ষা করিয়াছ? তাহার। কহিল মহারাজ! এই কাব্য ভগবান্

.pooker Lane ,Calcutta.

125. Fig. 1. Linotype 12 point Light and Bold specimen  
Fig. 2. Bengali Foundry setting

typeface was not entirely satisfactory. Brown acknowledged this fact in his report of 24 May 1935:

I do not believe the face we are cutting . . . will prove satisfactory, and I think we shall have to design another. Because of certain optical illusions the present face appears to have a slope, and this I think will be found objectionable, although we must go ahead now in order to get Mr Majumdar his six machines and probably also provide the Government Press with five machines in time to set the Bengal electoral rolls.<sup>84</sup>

The typeface design was determined by the scheme to such an extent that it is difficult to isolate the two. However, the initial Linotype Bengali founts possess a measure of liveliness and spontaneity which partially overcomes the technical constraints of the linecaster. This vibrancy is largely created by the dynamic manner in which the oblique downstrokes unite with perpendicular stems<sup>85</sup> - a feature unusually echoed in the finials of such sorts as 𑌧 and 𑌨 - revealing the influence of penmanship. It is, in fact, accentuated by the overemphatic slant that subsequently proved so unacceptable. The weight differential is well maintained even at small point sizes, but problems arise in the case of the reduced initial consonants whose stroke width has been reduced to hairline thickness.<sup>86</sup> The counters of some complex forms, e.g. 𑌛, suffer from fill-in, yet the light weight, in particular, benefits from the open counters of the base characters. The immediate impression of harmonious design is, however, dispelled upon careful scrutiny of the founts in question.

As discussed above, the vowel signs suffer the most from the effects of linearity. The kerning vowel signs, 𑌧 and 𑌨, are exceptionally hooked in order to give a semblance of kerning and also to avoid type breakage. These typeforms and others of a similar disposition disturb the flow of text due to the excessive white space they necessarily incur. Notwithstanding spacing problems,

84. MC 918: Brown, Summary Report, Red Sea, 24 May 1935 [p. 2].

85. See pls. 123 and 126.

86. See initial 𑌧.

যদি এমন ভাবে বঙ্গভাষার সম্পদ বৃদ্ধি করা যায় যে, সম্পূর্ণরূপে মানুষ হইতে হইলে অপরাপর ভাষার ন্যায় বঙ্গভাষাও শিথিতে হয়, এবং না শিথিলে অনেক অবশ্যজাতব্য বিষয় চিরকালের মত অজ্ঞাত থাকিয়া যায় ও অন্য শত ভাষা শিক্ষা করিয়াও পূরা মানুষ হওয়া না যায়, তবেই বঙ্গভাষা জগতে চিরস্থায়িনী হইবে; বাঙ্গলার ভাষা জগতের অন্যান্য প্রধানতম ভাষার শ্রেণীতে সম্মুখী হইবে। অন্যথা বঙ্গের তথা বঙ্গভাষার গৌরব বাড়িল কৈ? বঙ্গসাহিত্য বলিলেই যাহাতে একটা বিরাট সাহিত্য বুঝায়, বিশ্বের অন্যতম প্রধান সাহিত্য বুঝায়, এমন ভাবে বঙ্গসাহিত্যের গঠন করিতে হইবে। কিছই অসম্ভব নহে। চেষ্টা ও একাগ্রতা থাকিলে এই সংসারে স্বপ্নকেও বাস্তবে পরিণত করা যায়। কাল অনন্ত এবং পৃথিবী বিশাল, সুতরাং ব্যস্ততার কারণ নাই। ধীরে ধীরে পদবিক্ষেপপূর্বক আমার জননী বঙ্গভাষাকে অনন্তকাল-রূপী অক্ষয়বটের ছায়াশীতল তনুদেশে বহিয়া যাইয়া বঙ্গের পূজনীয় ভাষাকে জগতের পূজনীয় করিতে হইবে।—আশুতোষ মুখোপাধ্যায়।

• TRADE **LINOTYPE** MARK •

Proof of 10 Point Bengali Light and Bold with 10 Point Excelsior with Bold Face No. 2.

The words **লিণ্ডাইট** ইন্সট্রাক্টর mean Linotype composition

The words **লিণ্ডাইট** ইন্সট্রাক্টর mean Linotype composition

PRINTED  
7-30-'35

126. Fig. 1. Linotype Bengali Light text sample  
Fig. 2. Linotype proof of 10 point Bengali Light and Bold

the frequently used vowel sign  $\text{ূ}$  reproduces very poorly in print, and numbers among a group of letterforms possessing highly idiosyncratic shapes, e.g.  $\text{ঞ}$  (matrix no. 254) and  $\text{ঞ}$  (matrix no. 77), some of which have become hallmarks of Linotype hot-metal Bengali composition. In addition, the scheme itself throws up peculiar character formations, e.g.  $\text{ঞ}$  rather than  $\text{ঞ}$ ,<sup>87</sup> requiring the reader to make some adjustment to the new method of setting. However, the unattractiveness of several sorts is not solely attributable to the limitations of the linecaster, but constitutes poor and inexperienced design work.

The proportions of some of the characters, e.g. the narrow  $\text{ঞ}$  in comparison to  $\text{ঞ}$ , and to the very rounded  $\text{ঞ}$ , suggest compromises were made to adapt characters to channel widths; particularly in the case of the bold letterforms whose counters have lost some of their clarity on account of duplexing with the light face. Close examination also reveals unevenness in weight distribution: the ascender of  $\text{ঞ}$ , which had been redesigned since the first trial, is clearly too light for its stem. The founts also display an inconsistent treatment of related elements (e.g.  $\text{ঞ}$  for  $\text{ঞ}$  and  $\text{ঞ}$ ) that is not demanded by technical constraints; unlike the case of  $\text{ঞ}$ , where limitations in depth prohibited constancy in design with  $\text{ঞ}$ . Such unwarranted drawing errors, not uncommon in preliminary founts, naturally impair readability and bring into question the suitability of the designs for newspaper composition.<sup>88</sup> Moreover, if the sample of foundry types sent by Majumdar to MLCo was intended as a model for the hot-metal typefaces (notwithstanding typefounding problems), then Linotype failed in its objectives with regard to the first Bengali founts.<sup>89</sup>

87. Although the latter was available as a *Pi* sort.

88. i.e. continuous reading matter.

89. See pl. 125, fig. 2.

The operation of the first Bengali Linotype upon its official inauguration on 26 September 1935 was given a mixed reception. The media, whilst recognizing the historical significance of the occasion and the consequent impact it was to have on subsequent vernacular printed matter, confined itself to describing the history of the project. Despite the fact that some leading newspapers, including *Amrta Bazar Patrika* and *The Statesman*, reproduced a paragraph of Bengali text set on the Linotype,<sup>90</sup> the typeface itself received no comment - although for the first time mention was made of its artist, Sushil Kumar Bhattacharya, who it was reported worked under the guidance of Jatindra Kumar Sen.<sup>91</sup> The inauguration was officiated by the vice-chancellor of Calcutta University, Mr Syama Prasad Mookerjee, yet the University, which exerted considerable influence on Bengali printing, soon declared the design unsuitable for setting its text books.<sup>92</sup> Majumdar conceded that improvements were required, particularly with regard to the design of thirteen characters, but he intended to employ these founts for his newspaper, despite opposition from others including Kedar Nath Chatterjee of Prabhasi Press, who advocated a more orthodox design.

The importance of developing a Bengali typeface acceptable to Calcutta University was indeed recognized by the Mergenthaler Linotype Company, as well as by Majumdar whose inspiration for devising the scheme had been revived by the decision of the former vice-chancellor, Sir Ashutosh Mukherjee, that Bengali become the medium of instruction up to matriculation standard. Kedar Nath Chatterjee, who was subsequently described as a 'most troublesome customer',<sup>93</sup> worked with Majumdar on the new designs. Refusing to be hurried, and yet conscious that the Monotype Corporation was developing a Bengali system in competition,<sup>94</sup> the pair modified all the characters in the light and the bold typestyles, particularly with respect to their spacing.

90. See pl. 126, fig. 1.

91. His name is not to be found in any of the Linotype records.

92. MC 918: Govil to May, 13 Jan 1936.

93. MC 918: King to Linotype & Machinery Ltd, London, 26 Feb 1944.

94. MC 918: King to Griffith, 9 July 1936.



The most recognizable feature of the resulting design (Bengali Light and Bold no. 2)<sup>95</sup> is the absence of the slant that had provoked so much criticism<sup>96</sup> in the earlier typestyles. As a result, the typeface lacks the dynamic quality of its precursor. The terminations of all independent perpendicular strokes have become flared and thus no longer echo the line of the converging strokes of such characters as ঞ . The result is the loss of the immediate homogeneity of the initial designs, giving a vertical stress to the typeface which contributes to its somewhat stiff, yet tidy, appearance. The dominance of the vertical strokes, a characteristic understandably more prevalent in Devanagari founts, is emphasized by the lighter weight of the headline. This uncommon trait diminishes the strength of the typeface.

On the other hand, a character by character analysis evinces substantial improvements in design. The juncture of the oblique to the vertical strokes is more gracefully executed, approaching penned letter-formations. Both ঞ and ঞ have been drawn more generously. This is also true of those letterforms possessing large main curves, e.g. ড , ড and ঞ . Characters that have suffered from this redesign include ঞ with its now curtailed finial, and the diminutive ঞ . Some anomalies which existed in the first founts are still to be found here, e.g. ঞ , but there exists a greater degree of conformity to the structure of founder's sorts. The vowel signs ঞ and ঞ have been modified for the better. The former possesses a less unusual shape and the latter bears a higher ascender which compliments ঞ . The positioning of these sorts and the construction of many conjuncts, however, still amount to a regression from Wilkins's first fount of Bengali types created over a century earlier.<sup>97</sup>

95. See pl. 127.

96. And which was too exaggerated.

97. Insufficient space prohibits discussing the variations of character formation to be found in the different point sizes; suffice to say that all the Linotype Bengali founts were derived from the same artwork, but concessions were made for the smallest type sizes.

TRADE LINOTYPE MARK

12 POINT BENGALI LIGHT

নরবলহয়শসপম্বজ্‌শ্রঙ্গ

নরবলহয়শসপম্বজ্‌শ্রঙ্গ

নরবলহয়শসপম্বজ্‌শ্রঙ্গ

নরবলহয়শসপম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

PRINTED IN INDIA 5-5-'37

TRADE LINOTYPE MARK

BENGALI NO. 2 WITH BOLD FACE NO. 2

Comparison proof of 10, 11 and 12 Point.

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

নিনৌঅতরবলমকহয়শসদপূজ্‌টম্বজ্‌শ্রঙ্গ

PRINTED IN INDIA 2-18-'38

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127. Fig. 1. Linotype 12 point Bengali Light  
Fig. 2. Linotype Bengali No. 2. with Bold Face No. 2;  
comparison proof of 10, 11 and 12 point

The stronger contrast between the light and bold typestyles constitutes another distinguishing characteristic of Linotype Bengali No. 2. Apart from displaying inconsistencies, the weight distribution of the bold appears clumsy in certain instances,<sup>98</sup> since the greater proportion of the weight has been added to the inside of the lettershapes in order to duplex them with the light font. However, concessions were made to the width of some of the bold designs since 'it was found impossible to design certain of these characters of the same width as the light drawings of similar characters without distortion'.<sup>99</sup> Single-letter matrices were therefore employed for a few sorts.<sup>100</sup> Predictably, the *half-forms* such as **৳** suffered the most from the additional weight, either causing fill-in due to the more fluid nature of the ink employed for rotary printing,<sup>101</sup> or producing uneven texture in text-setting due to underweighted sorts like **৳** and **৳**.<sup>102</sup>

The new designs in light and bold were more favourably received than the preliminary founts, and gained the approval of Calcutta University for the composition of university text books. Chatterjee personally received a letter from Dr Rabindranath Tagore declaring:

I have seen a sample of printing from the Bengali type as designed under the direction of Mr Kedar Nath Chatterji. The typeface is very legible and there is hardly any departure from the type face familiar to the Bengali reader. There will not be the slightest difficulty about reading the print from this type face.<sup>103</sup>

98. See sorts **৳** and **৳** in pl. 128.

99. MC 918: King to Griffith, 4 Nov 1937.

100. MC 918: *ibid.*

101. K. Sree Vijayapaliah, *Introduction of Kannada on the Typewriter, Linotype and Monotype* (Bangalore, 1954), p. 3.

102. See pl. 129.

103. Quoted in MC 918: King to Griffith, 30 Aug 1937.



## লাইনোটাইপ বাঙ্গলা নং ২-এর সাথে বোল্ড ফেস্ নং ২

12 point (12△472)

১২ পয়েন্ট

লাইনোটাইপের মূদ্রণ-সম্ভাবনা বিশ্বপ্রসারী। সাড়ে আটশতেরও অধিক সংখ্যক ভাষা এবং উপভাষায় ইহার 'কী-বোর্ড' দ্বারা অক্ষরবিন্যাস সম্ভব। বৃটিশ এবং মার্কিন লাইনোটাইপ সংস্থাগুলির দ্বারা প্রবর্তিত অন্যান্য অক্ষর-বিন্যাস পদ্ধতির মধ্যে প্রায় এই 'স্লাগ' পদ্ধতির অক্ষরবিন্যাস পৃথিবীর বহু জাতি এবং ভাষার যে উপকার সাধন করিয়াছে, তাহাই ইহার সাফল্যের প্রকৃষ্ট প্রমাণ। তাহাদের অক্লান্ত প্রচেষ্টা এবং তাহার সহিত প্রত্যেক দেশের অভিজ্ঞ ব্যক্তিদের অমূল্য উপদেশের ফলেই লাইনোটাইপ আজ সারা পৃথিবীতে সংবাদ-পত্র, পুস্তক এবং অন্যান্য যাবতীয় মূদ্রণের কাজে ব্যবহৃত হইতেছে। প্রথমে 'রোমান' হরফে মূদ্রণের উদ্দেশ্যেই লাইনোটাইপ আবিষ্কৃত হইয়াছিল, কিন্তু আজ ইহা বাংলার মত নানা ছাঁদের অক্ষরবিন্যাসে সক্ষম। শব্দ সক্ষমই নহে, এ-যন্ত্র অতি সহজে এবং অপূর্ব দ্রুতগতিতে কাজ সম্পাদন করিতে সক্ষম। দক্ষিণ হইতে বামে পাঠ্য অক্ষরবিন্যাসও ইহার দ্বারা অত্যন্ত সহজসাধ্য। প্রমাণ 'গ্যালী'র স্থলে একটি সামান্য বিপরীতমুখী কৌশলের দ্বারা ইহা সম্ভব করা হয়।

লাইনোটাইপের মূদ্রণ-সম্ভাবনা বিশ্বপ্রসারী। সাড়ে আটশতেরও অধিক সংখ্যক ভাষা এবং উপভাষায় ইহার 'কী-বোর্ড' দ্বারা অক্ষরবিন্যাস সম্ভব। বৃটিশ এবং মার্কিন লাইনোটাইপ সংস্থাগুলির দ্বারা প্রবর্তিত অন্যান্য অক্ষর-বিন্যাস পদ্ধতির মধ্যে প্রায় এই 'স্লাগ' পদ্ধতির অক্ষরবিন্যাস পৃথিবীর বহু জাতি এবং ভাষার যে উপকার সাধন করিয়াছে, তাহাই ইহার সাফল্যের প্রকৃষ্ট প্রমাণ। তাহাদের অক্লান্ত প্রচেষ্টা এবং তাহার সহিত প্রত্যেক দেশের অভিজ্ঞ ব্যক্তিদের অমূল্য উপদেশের ফলেই লাইনোটাইপ আজ সারা পৃথিবীতে সংবাদ-পত্র, পুস্তক এবং অন্যান্য যাবতীয় মূদ্রণের কাজে ব্যবহৃত হইতেছে। প্রথমে 'রোমান' হরফে মূদ্রণের উদ্দেশ্যেই লাইনোটাইপ আবিষ্কৃত হইয়াছিল, কিন্তু আজ ইহা বাংলার মত নানা ছাঁদের অক্ষরবিন্যাসে সক্ষম। শব্দ সক্ষমই নহে, এ-যন্ত্র অতি সহজে এবং অপূর্ব দ্রুতগতিতে কাজ সম্পাদন করিতে সক্ষম। দক্ষিণ হইতে বামে পাঠ্য অক্ষরবিন্যাসও ইহার দ্বারা অত্যন্ত সহজসাধ্য। প্রমাণ 'গ্যালী'র স্থলে একটি সামান্য বিপরীতমুখী কৌশলের দ্বারা ইহা সম্ভব করা হয়।

**LINOTYPE BENGALI No.2 WITH BOLD FACE No.2**

**LINOTYPE AND MACHINERY LIMITED 21 JOHN STREET LONDON W.C.1**

Such an accolade was a boost to the Mergenthaler Linotype Company, yet they remained conscious of the inherent deficiencies of the Linotype scheme which particularly compromised the positioning and design of the vowel signs, and in truth was barely comparable to foundry composition.<sup>104</sup> Solutions were sought to the kerning problems and uncongenial spacing by emulating Latin italic founts, but the ensuing increase in the size of the already large character set prohibited such attempts.<sup>105</sup>

The fount synopsis and linear method of composing the script thus remained essentially unaltered despite a slight rearrangement to the keyboard layout in April 1938.<sup>106</sup> Revisions to the typeface, however, occasioned Majumdar to reconsider the keyboard arrangement with the intention of eliminating over one hundred characters infrequently used in newspaper composition which had rendered the typesetting of Bengali matter very cumbersome. With the aim of devising a newspaper keyboard layout requiring only one 90-channel magazine, and thereby to approach English setting speeds,<sup>107</sup> Majumdar finally submitted a new keyboard design to the Mergenthaler Linotype Company in 1949.<sup>108</sup> For the scheme to function, it was necessary to augment the fount with one character, viz. the *hasanta* bearing a headline,<sup>109</sup> to cover deficiencies in conjuncts. The arrangement was accepted by Mergenthaler, but its efficacy was disputed by Professor Norman Brown who proposed an alternative layout.

Majumdar was eager to adhere as closely as possible to the 1938 layout, to which his trained operators had become accustomed, and Mergenthaler was keen

104. See pl. 130 for a comparative study made by Linotype of different composing techniques.

105. MC 918: 21 Jan 1938.

106. See pl. 131.

107. See Gaskell, *Introduction to Bibliography*, p. 278.

108. The project was begun in January 1947.

109. Sketch sent to Griffith by King, 27 Apr 1949.

## HAND SET TYPE

da বিঘ্ন বিপদ দুঃখ দহন তুচ্ছ করিল যারা  
মৃত্যু গহন পার হইল টুটিল মোহ কারা

বন পথ ভয় নখ দশ চর অচল অধম শরণ  
মন রথ বয় জন ছল নয় কমল চরণ ভজন

বর্ষা এলায়েছে তার মেঘময় বেণী  
গাঢ় ছায়া সারাদিন মধ্যাহ্ন তপন হীন  
দেখায় শ্যামলতর শ্যাম বন শ্রেণী

ললিত লবঙ্গলতা পরিশীলন কোমল মলয় সমীরে  
মধুকর নিকর করম্বিত কোকিল কুজিত কুঞ্জ কুটীরে

dh বস্তুত কাব্যে দেয়াল-ছাঁদা ঘরও কবির, নির্দেয়াল  
বাগানও তার। আমার কবিতায় কোথাও কোথাও  
ছন্দের দেয়াল দেওয়া নেই বলে মনে কোরো না,  
যে, ইটের পাজা পোড়ে নি, মিস্ত্রীর মজুরীর অভাব।

## EXISTING BENGALI

da বিঘ্ন বিপদ দুঃখ দহন তুচ্ছ করিল যারা  
মৃত্যু গহন পার হইল টুটিল মোহ কারা

বন পথ ভয় নখ দশ চর অচল অধম শরণ  
মন রথ বয় জন ছল নয় কমল চরণ ভজন

বর্ষা এলায়েছে তার মেঘময় বেণী  
গাঢ় ছায়া সারাদিন মধ্যাহ্ন তপন হীন  
দেখায় শ্যামলতর শ্যাম বন শ্রেণী

ললিত লবঙ্গলতা পরিশীলন কোমল মলয় সমীরে  
মধুকর নিকর করম্বিত কোকিল কুজিত কুঞ্জ কুটীরে

বস্তুত কাব্যে দেয়াল-ছাঁদা ঘরও কবির, নির্দেয়াল  
বাগানও তার। আমার কবিতায় কোথাও কোথাও  
ছন্দের দেয়াল দেওয়া নেই বলে মনে কোরো না,  
যে, ইটের পাজা পোড়ে নি, মিস্ত্রীর মজুরীর অভাব।

## NEW BENGALI

da বিঘ্ন বিপদ দুঃখ দহন তুচ্ছ করিল যারা  
মৃত্যু গহন পার হইল টুটিল মোহ কারা

বন পথ ভয় নখ দশ চর অচল অধম শরণ  
মন রথ বয় জন ছল নয় কমল চরণ ভজন

বর্ষা এলায়েছে তার মেঘময় বেণী  
গাঢ় ছায়া সারাদিন মধ্যাহ্ন তপন হীন  
দেখায় শ্যামলতর শ্যাম বন শ্রেণী

ললিত লবঙ্গলতা পরিশীলন কোমল মলয় সমীরে  
মধুকর নিকর করম্বিত কোকিল কুজিত কুঞ্জ কুটীরে

dh বস্তুত কাব্যে দেয়াল-ছাঁদা ঘরও কবির, নির্দেয়াল  
বাগানও তার। আমার কবিতায় কোথাও কোথাও  
ছন্দের দেয়াল দেওয়া নেই বলে মনে কোরো না,  
যে, ইটের পাজা পোড়ে নি, মিস্ত্রীর মজুরীর অভাব





to satisfy Majumdar. Brown attempted a compromise which primarily rationalized the positioning of the numerals so they tallied with English layouts, but he eventually drew up two keyboard layouts: one designed specifically for Majumdar but not considered practicable for other users, and the other termed the *General Trade Keyboard* which he described as keeping

the lefthand side of the old keyboard intact, which was originally worked out on the basis of frequencies.<sup>110</sup> It has the numerals and punctuation signs in their normal positions. The characters on the righthand side of the keyboard are arranged with attentions, as far as seems feasible, to alphabetical association. The application of this last principle should facilitate the process of learning the keyboard and its use.<sup>111</sup>

It is known that the *Ananda Bazar Patrika* layout was not introduced until 1950 due to Majumdar's ill-health. In March 1954 Majumdar stated to a printers' conference that he had 'completely succeeded in his efforts to apply his reformed Bengali system to a straight 90-channel Linotype'.<sup>112</sup> However, in 1962 the manager of the Linotype office in India, N. Balasubrahmanian, reported:

the 90-channel layout formulated in 1949 had to be discarded because . . . the script set from this keyboard gave rise to adverse criticism from the readers of this newspaper, and the 90-channel scheme was immediately withdrawn. Since then there has been no demand for matrices of this scheme which, we can now safely assume, as having been scrapped.<sup>113</sup>

Linotype records imply that Brown's *General Trade Keyboard* was never produced. The standard or 'traditional arrangement' therefore comprised a main magazine and side magazine, but only the prosperous customer could afford the latter, since it cost considerably more than the main magazine unit. Even those with both magazines were reported not to fully utilize them:

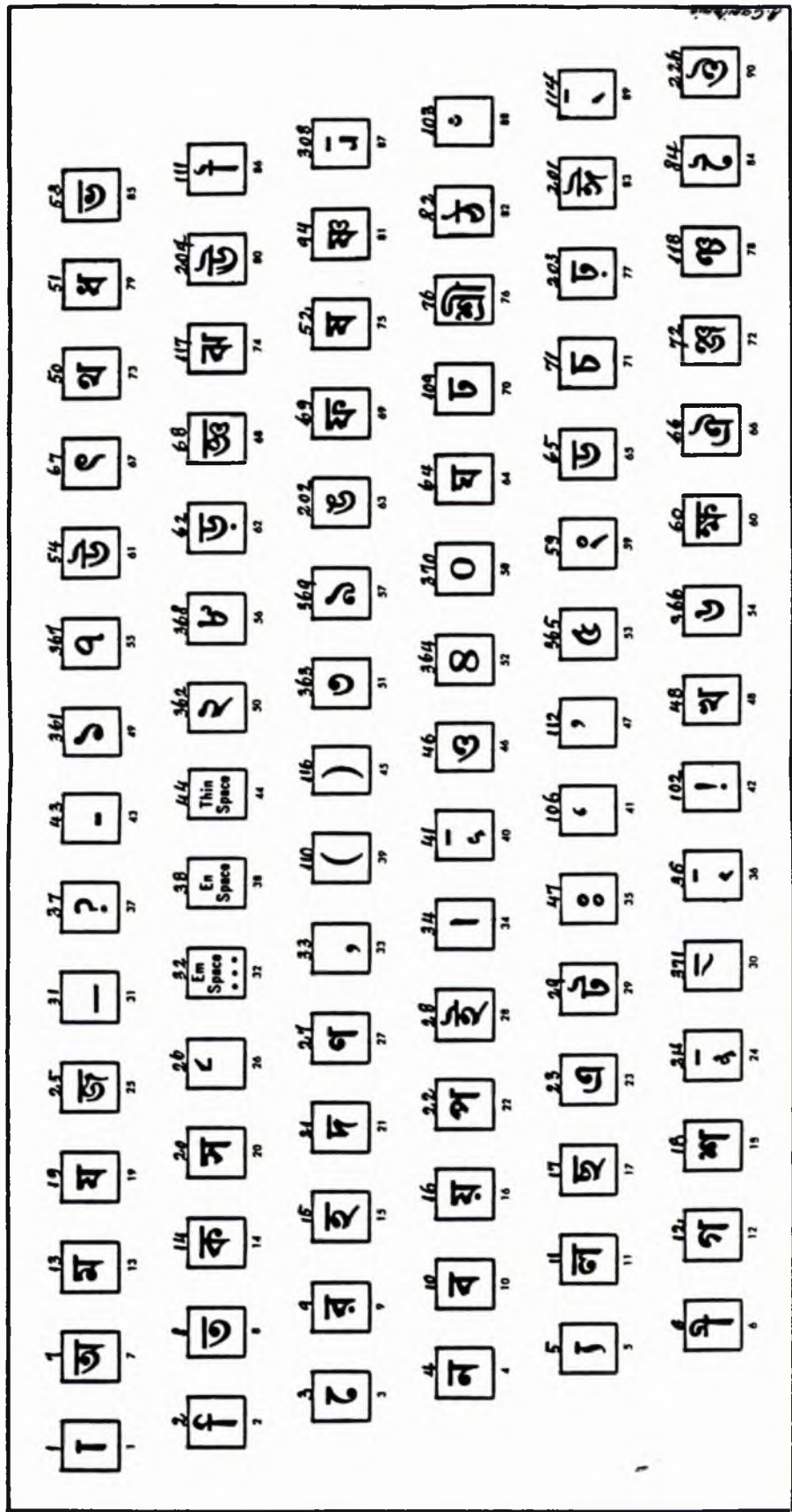
110. In 1935.

111. MC 918b: 10 July 1949.

112. MC 918b: King's Quarterly Report, 4 Mar 1954. Majumdar also advocated its emulation for Hindi, *ibid.* Pl. 132 illustrates the layout.

113. Linotype Correspondence file (LC) 17A: Bala to Tracy, 28 May 1962.

LINOTYPE BENGALI DIAGRAM NO. 209



Although the Linotype main and side scheme provides a large array of characters, including many combination of sorts, operators prefer to make speed by staying as far as possible on the main keyboard; instead of looking around for single combination character they set the two separate letters of which it consists, that is to say, they set a kind of 'spelled out' Bengali rather than the traditional - and this has come to be accepted, certainly in the newspapers.<sup>114</sup>

On the basis of this report, and in order to compete with a 90-channel Bengali layout with 'Greek attachment' allegedly in production by Intertype,<sup>115</sup> the Mergenthaler Linotype Company in 1964 decided to review the question of producing a 90-channel Bengali keybank layout. To this effect, the company enlisted the services of Willem De Leng, the designer of the Intertype layout, to formulate an improved version for the Linotype that would adhere as closely as possible to the traditional arrangement, yet merely require some 110 sorts. The project had the full support of Ananda Bazar Patrika, but Saraswati Press,<sup>116</sup> whose opinion was also sought, considered the proposal only suitable for newspaper requirements, and preferred the main and side magazine system of composition for quality book production. The Linotype 90-channel Bengali was produced in 1965, 'It was to be regarded as an advance on the traditional one, in line with the simplifying of composition which is so necessary. . . . This scheme even opens the way towards automatic Linotype composition from perforated tape'.<sup>117</sup> A note in the Linotype files, however records that by 1967 they had received no orders.<sup>118</sup>

114. LC 17A: Tracy to Martin, 3 Sept 1964. Speed averaging 3,000 ens an hour in India on main and side magazine; LC 17A: Martin to Tracy, 30 Sept 1964.

115. LC 17A: Martin to Tracy, 28 Apr 1962.

116. Reputedly one of the finest Bengali book publishers in Calcutta; LC 17A: Bala's Bengali Report, 5 Nov 1964. (They had also ordered Assamese characters.)

117. LC 17A: Tracy to Tammannai, 17 Sept 1964; see also pl. 133.

118. LC 17A: Tracy to Rego, 4 Apr 1967.



The introduction of linecasters, whose technical impositions exceeded those of handsetting, unwittingly rendered the design of the keyboard fundamental to the design of vernacular typefaces. The 90-channel layout was the last significant contribution to the mechanization of Bengali typefounding and composition made by Siresh Chandra Majumdar, whose efforts permitted printed Bengali to become more accessible to the literate public by transforming, some say mutilating,<sup>119</sup> the script. The multifarious difficulties which occurred during the course of Majumdar's project merit observation, as they are still encountered today - albeit ameliorated by improved communications. The experience gained by the project retains its relevance, for the advice given by Professor Norman Brown, however apposite, has remained unheeded in subsequent typographic enterprises even four decades later:

One of the most valuable lessons of the vernacular developments in India is that in launching a new script on the Linotype we should at all stages consult with local printers who are to use the machine. Such consultation saves us from many mistakes and gives the printers interest and confidence in our development.<sup>120</sup>

Economic and practical considerations encouraged India to embrace the new technology with greater consequences than in the Western world. Brown assessed the situation in 1935:

The printing trade in India seems to realize the advantage of mechanical type-setting, and those presses which can afford machines will put them in. The volume of printing is steadily increasing in India, and the use of the vernacular scripts is for the present increasing. It is possible, perhaps even probable, that in the course of time the roman script will supplant the local scripts for the writing of Indian languages. But it is not likely that the change will take place for several decades. In all parts of India I find people thinking of ways to simplify the local script, but the simplification, even if effected, seems a less logical final development that [*sic*] the adoption of roman with simple diacritical marks.<sup>121</sup> But, whatever may be the situation fifty years from now, the present offers an opportunity for vernacular script

119. Schemmel, 'Script Reform', p. 11.

120. MC 918: Brown, Summary Report, Red Sea, 24 May 1935 [p. 2].

121. N.b. this was before Indian independence.

Linotypes. The present effort to displace all other Indian scripts by the Devanagari does not seem to me likely to succeed.<sup>122</sup>

The implementation of Bengali on the Linotype permitted the native press in Bengal to compete with the English language daily papers set on line-composing machines, and to outstrip the growth of the Hindi vernacular press whose development was considerably retarded by the relatively less successful adaptation of Devanagari for the slugcaster.<sup>123</sup> The new technology therefore signified that the mass production of printed vernacular literature had become commercially viable, but the cost in typographic terms amounted to the greatest divergence from the handwritten Bengali character since CW1, and a future readership unable to recognize orthodox letterforms. In 1954 K. Sree Vijayapaliah wrote:

It must be emphasized that the Linotype is as essential as the Typewriter for a progressive nation. Its necessity is . . . being felt by Printers in general and Newspaper Offices in particular. Newspapers will in future have to come out with as much information as is provided in the big English dailies like *The Hindu*, *The Indian Express* and *The Times of India*.<sup>124</sup>

The development of the Bengali Linotype constituted one of the earliest multinational ventures in which the manufacturers of typographic equipment, apparently uninfluenced by political or religious motives, viewed India as a potential market for their products and the development of non-Latin fonts as a commercial proposition. The inauguration of the Bengali Linotype on 26 September 1935 retains its significance as the point at which printing in India was transformed from a craft into an industry.

122. MC 918: Brown, *Red Sea*, 24 May 1935 [p. 1].

123. Schemmel, 'Script Reform', pp. 14 and 16.

124. Vijayapaliah, *Introduction of Kannada on the . . . Linotype*, p. 3.

## Chapter 9

### Monotype Composition

The history of 'Monotype' composing machines cannot be understood without a realization that the full weight of trade opposition as such had gathered, fallen and broken on the Linotype almost a decade before any other make of composing machine had gone into factory production.<sup>1</sup>

The Monotype composing machine, invented by Tolbert Lanston (1844-1913), an American from Washington D.C.,<sup>2</sup> distinguished itself in a variety of ways from the Linotype. It overcame, to a large extent, the deficiencies of linecasters and in consequence was preferred for book work and the higher quality setting of particular non-Latin scripts including Bengali. The generic difference between the Linotype and the Monotype was succinctly described by Legros and Grant, who classified subsequent hot-metal composing machines according to these two types:

in the Monotype class, the product, loose type, is cast by the successive presentation of matrices to a type mould for successive casting of individual types or units which go to form the finished product of this class of machine - a line of individual type; whereas in the second, or Linotype class, the product of the machine, usually a slug, is cast in a single operation of pouring metal into the mould.<sup>3</sup>

The Monotype method of composition was achieved by means of two contrivances: the keyboard and the caster.<sup>4</sup> These functioned separately; the latter being operated by a perforated paper spool produced by the keyboard.<sup>5</sup>

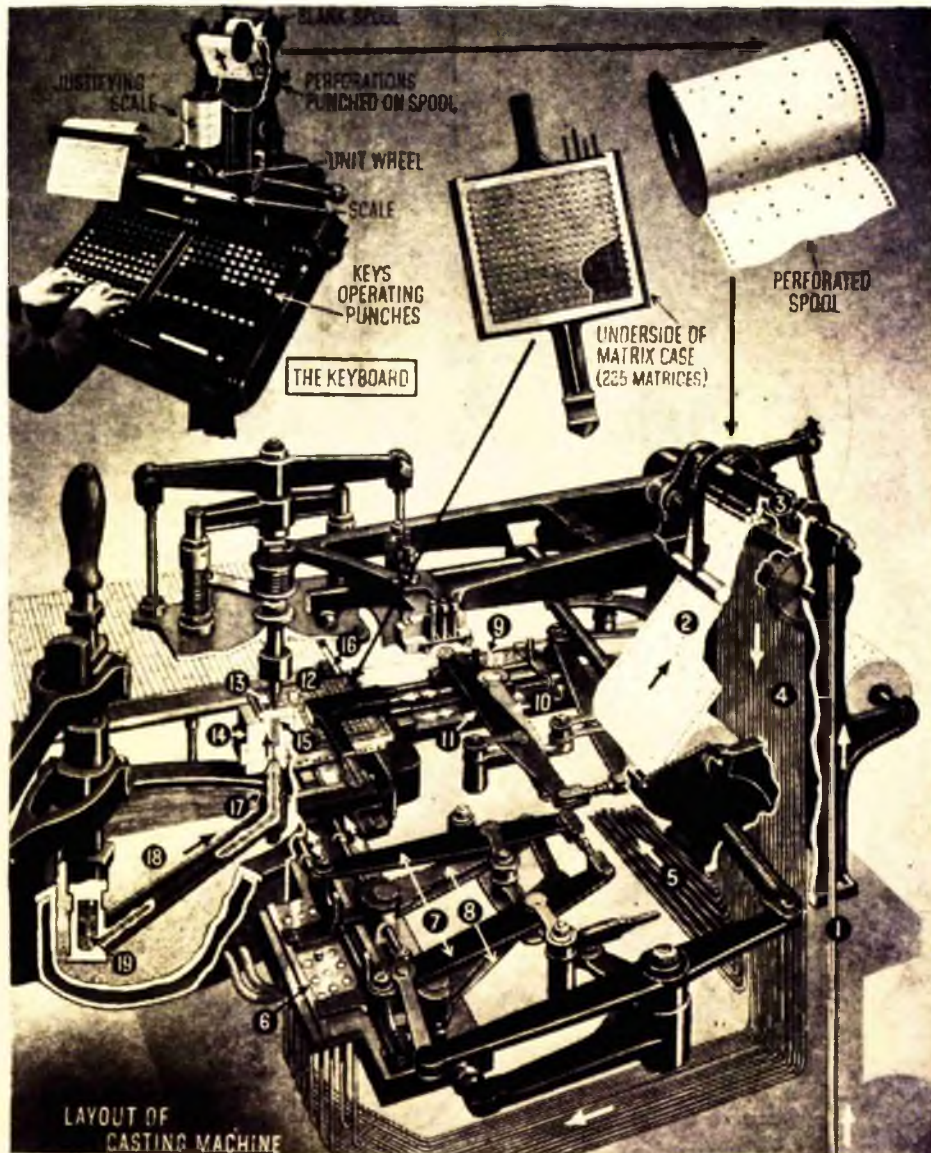
1. *The Monotype Recorder*, 39, no. 1 (Autumn, 1949), p. 6.

2. It was first exhibited in 1889; Seybold, *Digital Typesetting*, p. 51. Patents were taken out in 1887.

3. Legros and Grant, *Printing-Surfaces*, p. 288.

4. See pl. 134.

5. In the manner of a pianola. The Monotype was initially a cold-metal device, early machines had two spools, one for character selection, the other for justification.



#### MONOTYPE COMPOSING MACHINE

Fig. 6. (1) Compressed air supply pipe; (2) perforated spool; (3) air escaping through perforations and operating stop-pins; (4) air pipes to position stop-pins; (5) air pipes to unit stop-pins; (6) fifteen stop-pins controlling movement of matrix case; (7) tongs controlling movement of stop rack; (8) tongs controlling movement of matrix case; (9) fifteen stop-pins controlling matrix case unit-wise; (10) tongs controlling movement of matrix case and normal wedge; (11) tongs controlling movement of stop rack; (12) matrix case; (13) centring pin; (14) mould; (15) cast type in mould; (16) cast types being assembled; (17) pump nozzle; (18) molten type metal; (19) type metal pump.



The keyboard comprised some 274 keys of which 225 were related to the sorts in the fount; the remainder were employed for justification. The depression of a key caused a punch to rise by means of compressed air in order to perforate the paper ribbon; the location of each perforation uniquely identified the character required for manufacture by the caster.<sup>6</sup> The caster itself contained the matrix case: a metal plate holding a grid of 225 matrices.<sup>7</sup> Compressed air blown through the holes in the ribbon forced the matrix case into position over an adjustable mould for a separate type to be cast automatically at the right width. For the purposes of justification, the spool was run through the caster in reverse, i.e. last character first, but the end result was a galley of type similar to a galley of hand-set foundry type. The typefounder's role had been reduced to that of machine attendant:

All these movements are perfectly automatic and the machine attendant has nothing to do except to keep the pot of metal replenished with fresh ingots, and to remove the galleys when they are full of type. . . .

These new types are piled in lines of correct length at the rate of 150 types per minute.<sup>8</sup>

Since the type was cast individually, corrections could be achieved without recasting the entire line; skilled operators were also able to patch the tape.<sup>9</sup> Another advantage was that the paper spool could be re-used whenever required, even with different grids<sup>10</sup> and with casters situated in separate locations.<sup>11</sup>

6. 'The perforated ribbon was proposed at least as early as 1848, and was actually adopted by Mackie, of Warrington, in 1868, for his composing machine'; Legros and Grant, *Printing-Surfaces*, p. 393.

7. Also called the die case; see pl. 135. John Sellers Bancroft was largely responsible for extending it from 210 to 225 and simplifying Lanston's original caster for increased efficiency, making it 'the father of modern machines'; Sean Jennett, *Pioneers in Printing* (London, 1958), p. 187.

8. *The 'Monotype' How it works* (London, c. 1922-1931), p. 9.

9. Gaskell, *Introduction to Bibliography*, p. 279. But patching the tape was not recommended by the manufacturers of the Monotype; Lanston Monotype Machine Co., *The Monotype System*, 2nd edn (Philadelphia, 1916), p. 155.

10. But to the same layout, see below.

11. Which precipitated the development of off-line keyboards.



Perhaps the most significant aspect of Monotype composition, however, was its method of justification. In the case of the Linotype, the operator was required to make 'end-of-line' decisions: he had to assess when the line was sufficiently filled for casting, ensuring that the remaining unfilled space did not exceed the expansion capacity of the space bands within the line.<sup>12</sup> A lever or handle used by the Linotype operator set in train the justification block which caused wedge-shaped space bands to be pushed up between those sets of matrices forming words until they were spaced out to the full measure. Such a method was inappropriate for the Monotype.

Since the Monotype keyboard was required to function independently of the caster, it was necessary for it to possess a counting mechanism. This comprised a justifying scale in the form of a revolving cylinder bearing rows of figures situated above the keyboard.<sup>13</sup> The device kept track of the width of each character keyed, and sounded a warning bell four ems<sup>14</sup> before the end of a line. In order to justify the line, the operator struck those red spacing keys which corresponded to the figures indicated by the space pointer on the justifying scale. Another key restored the counting mechanism to zero; the keying of the next line could then commence.

It was Monotype's<sup>15</sup> introduction of the relative-unit, or 18-unit, system which rendered possible its method of automatic justification; a system subsequently adopted by other manufacturers of type for mechanical typesetting and which was to have far-reaching consequences for the design of new or revived typefaces.<sup>16</sup> Monotype attributed a value of 18 units set-wise (width) to the em in each typeface irrespective of the point size, although normally this was also

12. Three times the volume of the band's narrowest position was the maximum expansion capacity; Seybold, *Digital Typesetting*, p. 49.

13. See pl. 134.

14. 5 ems according to Legros and Grant (*Printing-Surfaces*, p. 395).

15. See below, regarding the Lanston Monotype Company and the Monotype Corporation.

16. See below, chapters 10 and 11.

equal to the point size of the fount concerned.<sup>17</sup> All characters held in the fount, including spaces, had a fixed unit value in respect of the 18-unit em quad, thus facilitating the calculations performed by the justification mechanism. The type designer, in some cases the manufacturer of the typeface, had to allocate widths to each character in multiples of a fixed unit which was one eighteenth of the em. The widths of the bold and italic characters were not required to match the light sorts and could possess widths more suited to their characteristics, thereby obviating spacing problems caused by the duplexed characters of the linecaster. The 18-unit system was considered sufficiently flexible so as not to constrain type designers, at least in the case of Latin typefaces.<sup>18</sup>

However, restrictions did exist: the 225 sorts, which included thirteen fixed spaces,<sup>19</sup> were arranged in the fifteen by fifteen matrix case according to their widths. All characters in the same comb<sup>20</sup> carrying fifteen characters had to bear the same width. The common arrangement in the case of a Latin typeface was one row per unit size from five to eighteen units, with three rows of nine and ten units each; unit sizes of sixteen and seventeen were not used.<sup>21</sup>

Customers who specialized in unusual work could employ a different arrangement. The introduction of the Unit Shift in 1962, simultaneously with the sixteen by seventeen matrix, provided a greater choice of character widths in the die case.

The implementation of the relative-unit system meant the adoption of drawing criteria different to those used for the design of early Linotype founts, and new

17. N.b. any face could be cast on a larger body size; *The Monotype System*, p. 231.

18. But see below, chapters 10 and 11.

19. Seybold, *Digital Typesetting*, p. 54.

20. See pl. 135, fig. 1.

21. See pl. 135, fig. 2.

methods of matrix manufacture. As in the production of a Linotype former, an enlarged drawing of each character was required measuring approximately ten inches. By following the contours of the character with a pantograph, often employing the same french curves as used for the drawing, a needle cut the letter in precise reduction on wax-coated glass.<sup>22</sup> The wax core was removed, the plate sensitized and placed in an electrolytic bath which deposited a thin sheet of copper on the surface. Once backed with type-metal, this constituted the pattern Monotype employed for punchcutting; it being a true replica of the original drawing but about a third to a quarter of its size. The formers were made 'with the letters properly placed relatively to their exterior, so as to produce a punch with a correctly-located face and one which will constantly require the minimum of justification'.<sup>23</sup>

The Monotype punchcutting machine<sup>24</sup> also operated on the pantographic principle. Designed by Frank Hinman Pierpont<sup>25</sup> and based on Lloyd Benton's device, it was intended to simplify punchcutting so that the less skilled person could operate it and achieve optimum output without impairing the final image. The introduction of such a device brought into being a different class of punchcutter: the punchcutter who was neither the designer, nor the interpretive punchcutter, but the skilled technician capable of imitating punches if the need arose.<sup>26</sup> The matrices created by the punches were bronze prisms, each about seven millimetres square containing the impression of the character in its lower end. Mechanization thus redefined the roles of the punchcutter and the

22. See pl. 136.

23. (i.e. the justification of individual characters, see above, p. 224); Legros and Grant, *Printing-Surfaces*, p. 206.

24. See pl. 137.

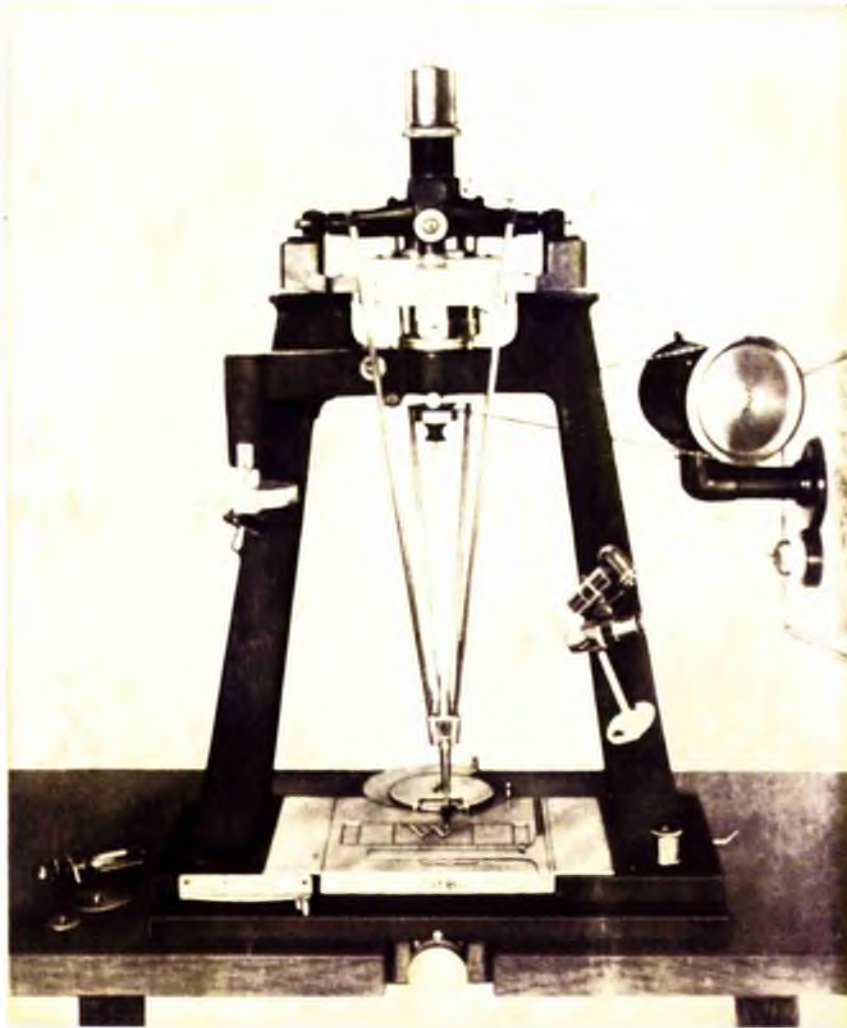
25. From New England. He joined the Monotype Salford Works in 1899 and was largely responsible for the high standards of engineering achieved by the English company; *Monotype Recorder*, 39, no. 1, pp. 21-22.

26. See Tracy, *Letters of Credit*, pp. 34-35.



#### MAKING A WAX PATTERN

Fig. 2. Use of the pantograph in type design. The illustration shows also (at top) pattern letters at three different stages with wax partially removed, the electrotype shell in the holder (the pattern from which the punch is cut); and a completed pattern.



137. Monotype punchcutting machine  
(Legros and Grant, *Printing-Surfaces*, fig. 162)

typesetter. In many instances, the virtual demise of the hand-cut punch has been mourned, but the mechanization of typesetting has generally been lauded.<sup>27</sup>

The introduction of what may be more accurately described as a matrix-composing machine demanded new standards of engineering. Every Monotype model was designed to be capable of being upgraded with new enhancements and innovations. At the same time, each machine was to be composed of interchangeable parts; a requirement which necessitated considerable initial investment for the manufacture of special tools before production of the Monotype could commence.

Historical circumstances account for the paucity of information regarding the development of Monotype hot-metal Bengali fonts. The Lanston Monotype Company, established with the financial backing of J. Maury Dove in 1887, ran into pecuniary difficulties in 1897 due, in part, to the destruction of their factory by fire. Whilst Tolbert Lanston continued to work on improvements to the keyboard unit, his technical adviser, Harold Malcolm Duncan, accompanied Dove to England in search of funds.<sup>28</sup> A chance meeting with the Earl of Dunraven during their Atlantic crossing provided the necessary finance by Dunraven's formation of a syndicate to purchase the British and Empire<sup>29</sup> rights for one million dollars. In December of the same year the Lanston Monotype Corporation was founded in England (in 1931 its title was changed to the Monotype Corporation Limited). It functioned separately to the American

27. See Stanley Morison *Typographic Design in Relation to Photographic Composition* (San Francisco, 1959), p. 27; Huss, *Composition Matrix*, p. 12; see also Updike, *Printing Types I*, pp. 10-13. Some are still cut by hand, see Henk Drost, 'Punch Cutting Demonstration', *Visible Language*, XIX, no. 1 (Winter, 1985), pp. 98-105; and see above, p. 267.
28. Duncan returned to England in 1900 as technical managing director at Salford Works; a position he retained until his death in 1924.
29. Excepting Canada.



company, being without common ownership of shares.<sup>30</sup> 1924 saw the distribution of the first English-built machines; by this time Stanley Morrison had become typographical adviser to the company, which embarked upon an ambitious typographic programme. However, the English company, whose premises included the Works at Salford in Surrey and an office in Drury Lane,<sup>31</sup> suffered interruptions to its activities on more than one occasion: during the first World War the Salford Works was devoted to the production of machine-gun parts; in the Second World War it was used as a munitions factory. 1941 witnessed the bombing of the Fetter Lane office, which destroyed the technical library, and with it, irreplaceable records of the company's typographic activities.<sup>32</sup>

According to the records that have survived, the hot-metal Bengali Series 470 was started in 1936 in twelve point. The design, which was introduced in 1937, was based on type provided by the Monotype office in Calcutta and was made for H. L. Mazunder, a Calcutta printer-publisher. It was supplied to William Clowes & Sons in 1938 and used at Oxford and Cambridge Universities for work in connection with the Indian Civil Service. A ten point was added in 1939 for the Bengali Government Press.<sup>33</sup>

The 470 Series<sup>34</sup> at once displays the most noticeable advantage of Monotype composition over Linotype setting, viz. the ability to kern.<sup>35</sup> It is vital to note that this one facility, added as an afterthought by engineers,<sup>36</sup> should have such overriding importance in the development of Indian vernacular typefaces, and be

30. For a concise history of the company, see the Corporation's *The Monotype Book of Information* (1970), pp. 5-9.

31. The office was moved to Fetter Lane in 1904; *Monotype Book of Information*, p. 6.

32. See *Monotype Recorder*, 39, no. 2 (Autumn, 1950), pp. 5-6.

33. Information from David Saunders of the Monotype Corporation Ltd. See chapter 10 regarding point sizes.

34. See pl. 138.

35. This facility was not introduced by Monotype [for Latin scripts] until the beginning of this century; Gaskell, *Introduction to Bibliography*, p. 279 n. 12a; see also John Randle, 'The Development of the Monotype Machine', *Matrix*, 4 (Andoversford, 1984), p. 47.

36. *Monotype Recorder*, 39, no. 1, p. 47.

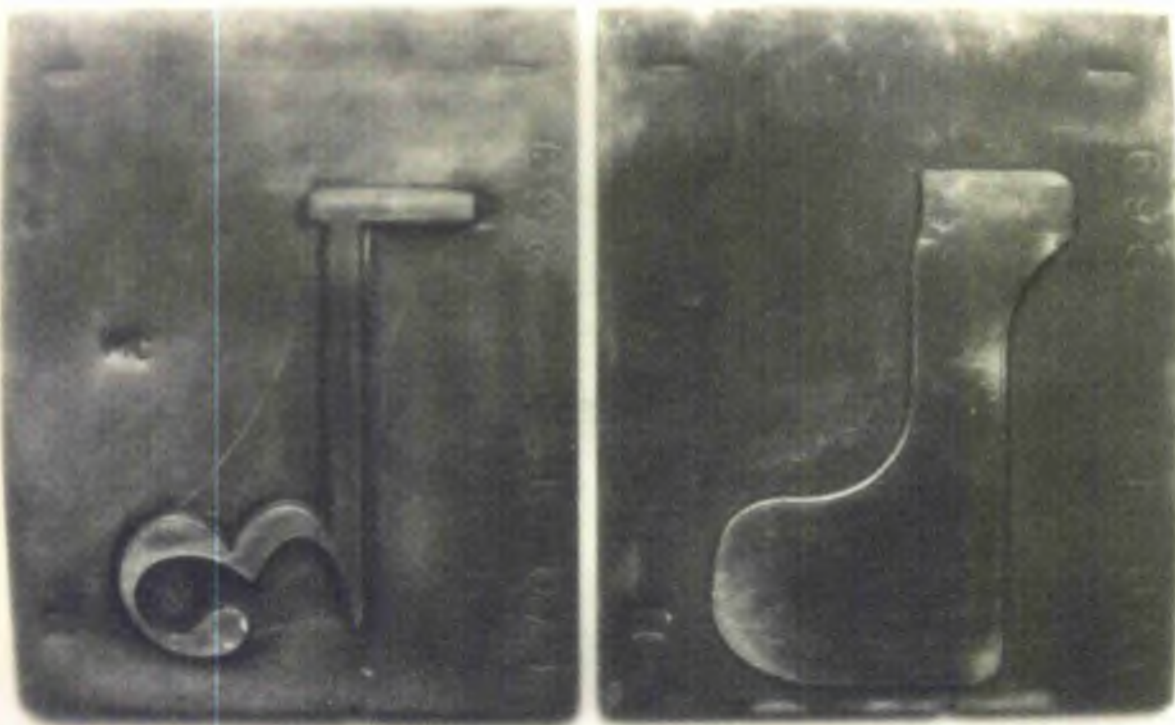


so fundamental to their readability. The invention and implementation of this facility, which may at first appear relatively trivial, serves to distinguish good typefaces from the mediocre and contributes greatly to their success in quality work. It cannot, however, make up for deficiencies in the design itself.

Despite the technical advantages the Monotype method of composition enjoyed over its hot-metal rival, the 470 Series cannot be considered a readable design in any of its type sizes. The moderately-weighted headline and principal strokes (which do not compensate for the thinness of the secondary strokes), combine with the looseness of spacing to produce a stencil effect that is dazzling to the reader. The rigid and squared-off vertical strokes, particularly in the dominating and over-long medial †, arrest the eye in mid-word. The rigidity of the face is instanced by the shaping of 𑄚, whose vertical downstroke gives a stiff curve and counteracts any movement a preceding character might possess. It appears as if some characters have been deliberately foreshortened, e.g. 𑄛, in order to maintain a constant depth, but this has the effect of making the poor-joining *raphalā* 𑄜 and *laphalā* 𑄝 all the more noticeable. The limited character set necessitated their design as separate elements,<sup>37</sup> but their design as subscripts, as in some foundry founts, would have been preferable.

It can be assumed that the proportions and spacing of some of the characters were dictated by the relative-unit system, e.g. 𑄞 as compared to 𑄟, but the relationship of the majority of the characters to each other does not appear disproportionate; although 𑄠 is oversized and the counters of 𑄡 and 𑄢 in the ten point size do appear ungenerous. It has to be concluded that the design of 470 Bengali is marred by injudicious stroke weights, the poor quality of some of the lines, the disjunctions caused by the *raphalā* and *laphalās*, and the unhappy white-to-black ratio which hampers continuous reading.

37. See pl. 139. N.b. a small number were available as conjuncts and accessible with the Unit Shift arrangement (see below, pls. 146-8).



139. *Raphala* and *laphala* copper patterns

The exact source of artwork remains unknown, but proofs held by the Monotype India Office show sample settings comparing the 470 Bengali types with foundry types, presumably those from which the face was derived.<sup>38</sup> The copying of foundry type designs was normal practice for mechanical casting, as *The Monotype Recorder* reported:

In their pioneer days, all composing machine companies were compelled by the demands of their customers to copy the designs originated by the founders of movable type for hand-composition. Thus, at the date when 'Monotype' composing machines were introduced into this country the invention of new designs was unpractical, unnecessary and undesirable.<sup>39</sup>

In the case of Bengali composition, however, even Monotype casting could not match foundry setting, as the proofs of foundry type demonstrate.

The Bengali Series 700 and 701<sup>40</sup> were made from artwork produced in India by a calligrapher whose name is not known.<sup>41</sup> They were manufactured for the Indian market in 1963.<sup>42</sup> Series 700 is a very confident design. Being much easier on the eye than 470, it is more vigorous and dynamic, and there is a rhythm to the strokes lacking in the earlier design. It is as if all the faults of Series 470 have been deliberately eliminated: the lines have been strengthened; the knots of **ন**, **ঞ**, etc., enhanced, the terminations of the vertical strokes softened, the counters opened up, and the spacing tightened - too much in the case of **ৗ**. However, Series 700 cannot be considered a mere revision of the Series 470 but a new design. On account of its weight and its slightly

38. See pls. 140 and 141.

39. *Monotype Recorder*, 39, no. 2, pp. 1-2. Also see below, chapter 10.

40. See pls. 142-5.

41. According to a former employee of the Corporation, they were designed by Mr Chakravarti of Ananda Bazar Patrika; this information remains unconfirmed.

42. Information from David Saunders.



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SYNOPSIS IN 10 POINT

‘ ’ : . , । ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ১১ ১২ ১৩ ১৪ ১৫ ১৬ ১৭ ১৮ ১৯ ২০ ২১ ২২ ২৩ ২৪ ২৫ ২৬ ২৭ ২৮ ২৯ ৩০ ৩১ ৩২ ৩৩ ৩৪ ৩৫ ৩৬ ৩৭ ৩৮ ৩৯ ৪০ ৪১ ৪২ ৪৩ ৪৪ ৪৫ ৪৬ ৪৭ ৪৮ ৪৯ ৫০ ৫১ ৫২ ৫৩ ৫৪ ৫৫ ৫৬ ৫৭ ৫৮ ৫৯ ৬০ ৬১ ৬২ ৬৩ ৬৪ ৬৫ ৬৬ ৬৭ ৬৮ ৬৯ ৭০ ৭১ ৭২ ৭৩ ৭৪ ৭৫ ৭৬ ৭৭ ৭৮ ৭৯ ৮০ ৮১ ৮২ ৮৩ ৮৪ ৮৫ ৮৬ ৮৭ ৮৮ ৮৯ ৯০ ৯১ ৯২ ৯৩ ৯৪ ৯৫ ৯৬ ৯৭ ৯৮ ৯৯ ১০০

10 PT. 7½ SET

১৮৯৭ খ্রীস্টাব্দে আধুনিক মডেলের একটি নূতন ও উন্নত ধরনের যন্ত্র আগাম নমুনা হিসাবে ইংলণ্ডে আনা হয়। ছিপ্রিত কাগজের রিবনের সাহায্যে ঠাণ্ডা সীসার পাত হইতে বিভিন্ন অক্ষর (টাইপ) প্রস্তুত করার জন্য এই যন্ত্রটি নিমিত হয়। ল্যান্সটন নামে একজন আমেরিকান আবিষ্কারক সর্বপ্রথমে এই পরিকল্পনা করেন। তালাই করিয়া সুসংবদ্ধ ও সুপরিমিত পণ্ডুক্তিতে অক্ষর (টাইপ) যোজনা করার উদ্দেশ্যে কিছুদিন পরে ল্যান্সটন ও বিখ্যাত ইঞ্জিনিয়ার জন

12 PT. 9 SET

১৮৯৭ খ্রীস্টাব্দে আধুনিক মডেলের একটি নূতন ও উন্নত ধরনের যন্ত্র আগাম নমুনা হিসাবে ইংলণ্ডে আনা হয়। ছিপ্রিত কাগজের রিবনের সাহায্যে ঠাণ্ডা সীসার পাত হইতে বিভিন্ন অক্ষর (টাইপ) প্রস্তুত করার জন্য এই যন্ত্রটি নিমিত হয়। ল্যান্সটন নামে একজন আমেরিকান আবিষ্কারক সর্বপ্রথমে এই পরিকল্পনা করেন। তালাই করিয়া সুসংবদ্ধ ও সুপরিমিত পণ্ডুক্তিতে অক্ষর (টাইপ)

14 PT. 10½ SET

১৮৯৭ খ্রীস্টাব্দে আধুনিক মডেলের একটি নূতন ও উন্নত ধরনের যন্ত্র আগাম নমুনা হিসাবে ইংলণ্ডে আনা হয়। ছিপ্রিত কাগজের রিবনের সাহায্যে ঠাণ্ডা সীসার পাত হইতে বিভিন্ন অক্ষর (টাইপ) প্রস্তুত করার জন্য এই যন্ত্রটি নিমিত হয়। ল্যান্সটন নামে একজন আমেরিকান আবিষ্কারক সর্বপ্রথমে এই পরিকল্পনা করেন। তালাই করিয়া সুসংবদ্ধ ও সুপরিমিত পণ্ডুক্তিতে অক্ষর (টাইপ) যোজনা করার উদ্দেশ্যে কিছুদিন পরে ল্যান্সটন ও বিখ্যাত ইঞ্জিনিয়ার জন সেলর ব্যাক্সফোর্ট একটি নূতন যন্ত্র নির্মাণ



'MONOTYPE' BENGALI LIGHT  
SERIES No. 700

10 POINT

71<sub>2</sub> SET

১৮৯৭ খ্রীষ্টাব্দে আধুনিক মডেলের একটি নতুন ও উন্নত ধরণের যন্ত্র আগাম নমুনা হিসাবে ইংলণ্ডে আনা হয়। ছিত্রিত কাগজের রিবণের সাহায্যে তাঁরা সীসার পাত হইতে বিভিন্ন অক্ষর (টাইপ) প্রস্তুত করার জন্য এই যন্ত্রটি নিমিত্ত হয়। ল্যান্সটন নামে একজন আমেরিকান আবিষ্কারক সর্বপ্রথমে এই পরিকল্পনা করেন। ঢালাই করিয়া সুসংবদ্ধ ও সুপরিমিত পঙ্ক্তিতে অক্ষর (টাইপ) যোজনা করার উদ্দেশ্যে কিছুদিন পরে ল্যান্সটন ও বিখ্যাত ইঞ্জিনিয়ার জন সেলর ব্যাক্‌হুইট একটি নতুন যন্ত্র নির্মাণ করেন। এই যন্ত্রটিই উন্নত হইয়া পরে আধুনিক মনোটাইপ মেশিনে পরিণত হয়।

১৮৯৭ খ্রীষ্টাব্দে কেবল প্রদর্শনের উদ্দেশ্যেই এই মডেলটি ইংলণ্ডে প্রেরণ করা হয়। বায়ুচালিত কী-বোর্ড ও সম্পূর্ণ মেট্রিক সহ ইহার একটি উন্নততর মডেল ১৮৯৯ খ্রীষ্টাব্দে প্রথমে বাজারে ছাড়া হয়। এই ১৮৯৯ খ্রীষ্টাব্দেই সারে প্রদেশের অন্তর্গত রেডহিল নামক স্থানে এই যন্ত্র নির্মাণের জন্য একটি কারখানা স্থাপন করা হয়।

তখন কেহই ধারণা করিতে পারেন নাই যে, অক্ষরযোজনা (কম্পোজিং) বিভাগে এই নবাগত যন্ত্রটি মূদ্রণসৌষ্ঠববিধানে একটি প্রধান ও মূল্যবান অঙ্গহিসাবে ব্যবহৃত হইবে কিংবা এই মনোটাইপ মেশিনে প্রস্তুত অক্ষরের দ্বারা বিশিষ্ট ও পরিমিতসংখ্যক মনোত্র সংস্করণ সর্বোৎকৃষ্ট হাতের-টাইপে তৈরী ছাপা অপেক্ষাও সুশৃঙ্খল মূদ্রণ সম্ভব হইবে। কিন্তু বিংশ শতাব্দীর দ্বিতীয় দশকে এই সকল সম্ভাবনার সূচনা হয়।

১৯১৮ খ্রীষ্টাব্দের পরে কয়েক বৎসরের মধ্যেই আনুষঙ্গিক যন্ত্রপাতিসহ মনোটাইপ মেশিন ইংলণ্ডেই সম্পূর্ণভাবে নিমিত্ত হইতে থাকে। এই সময়ে ঢালাই ও অক্ষরের ছাঁচ তৈয়ারীর এমন এক সুদূরপ্রসারী কার্যক্রম গ্রহণ করা হয় যাহা মূদ্রণ জগতের ইতিহাসে আর কোনও প্রতিষ্ঠান কতক পূর্বে অবলম্বিত হইতে দেখা যায় নাই। মূদ্রণব্যবসায়ও ইহা অচিরে সমাদর লাভ করে।

প্রথম ও দ্বিতীয় মহাযুদ্ধের অন্তর্বর্তী সময়ে মূদ্রণকলা ও আক্ষরিক সৌষ্ঠববিধানের প্রতি আগ্রহ উত্তরোত্তর বৃদ্ধি পায় এবং রেডহিলের মনোটাইপ মেশিনের কারখানা পৃথিবীর বিভিন্ন স্থানের অক্ষরশিল্পী ও বিশেষজ্ঞগণের পীঠস্থান হইয়া উঠে। ইতঃপূর্বেই এই বিশেষজ্ঞগণ এই সম্পর্কে প্রয়োজনীয় ও মূল্যবান সংস্কারকার্যে, যথা সময়-তালিকা ও পাঠ্যপুস্তক মূদ্রণবিষয়ক অভিনব প্রণালী আবিষ্কার ইত্যাদি বিষয়ে, ব্রতী ছিলেন। "টাইপস্" পত্রিকা মনোটাইপ কর্পোরেশনকে শীর্ষাঙ্ক র (হেড লাইন টাইপ) ও অন্যান্য অক্ষরের (টাইপ) নক্সা প্রস্তুত করার ভার অর্পণ করেন। এই অক্ষরগুলিই বর্তমানে "টাইপস্ নিউ রোমান" নামে সুপরিচিত। এইভাবে অসংখ্য সুন্দর ও বিদেশী অক্ষরের সমাবেশে এমন একটি ভাণ্ডার গড়িয়া উঠিল যাহা বৈচিত্র্যে ও বিভিন্ন আক্ষরিক নক্সার সমৃদ্ধিতে পৃথিবীর অন্যতম শ্রেষ্ঠ ভাণ্ডাররূপে পরিগণিত হইল।

মাত্র অর্ধশতাব্দী বৎসর আয়ুষ্কালের মধ্যেই মনোটাইপ মেশিন মূদ্রণজগতে অসংখ্য বৈপ্লবিক পরিবর্তন আনয়ন করিতে সক্ষম হইয়াছে। এই সকল পরিবর্তন ও উৎকর্ষবিধান কেবলমাত্র মূদ্রণকলা ও উৎপাদন প্রণালীতেই সীমাবদ্ধ থাকে নাই, মুদ্রিত বস্তুর সাতিশয় সৌকর্যবিধানেও ইহাদের অবদান রহিয়াছে। ১৮৯৯ খ্রীষ্টাব্দে ইহার প্রাথমিক পর্যায়ে রুটিশ আবিষ্কারকগণ যে উদ্যোগী মনোবৃত্তি, উৎসাহ ও আত্মপ্রত্যয়ের সহিত এই পথে যাত্রা করিয়াছিলেন, সেই উদ্যোগ, উৎসাহ ও আত্মপ্রত্যয়েরই দ্বারা প্রণোদিত হইয়া এই কর্পোরেশন শতাব্দীর দ্বিতীয় অর্ধে পদক্ষেপ করিল।



## MONOTYPE' BENGALI BOLD

SERIES No. 701

10 POINT

7½ SET

১৮৯৭ খ্রীষ্টাব্দে আধুনিক মডেলের একটি নূতন ও উন্নত ধরণের যন্ত্র আগাম নমুনা হিসাবে ইংলণ্ডে আনা হয়। ছিঁদ্রিত কাগজের রিবনের সাহায্যে তাঁণ্ডা সীসার পাত শুইতে বিভিন্ন অক্ষর (টাইপ) প্রস্তুত করার জন্য এই যন্ত্রটি নিৰ্মিত হয়। ল্যান্সটন নামে একজন আমেরিকান আবিষ্কারক সর্বপ্রথমে এই পত্রিকল্পনা করেন। চালাই করিয়া সুসংবদ্ধ ও সুপরিমিত পঞ্জিত অক্ষর (টাইপ) যোজনা করার উদ্দেশ্যে কিছুদিন পরে ল্যান্সটন ও বিখ্যাত ইঞ্জিনিয়ার জন সেলর ব্যাক্সফোর্ট একটি নূতন যন্ত্র নিৰ্মান করেন। এই যন্ত্রটিই উন্নত হইয়া পরে আধুনিক মনোটাইপ মেসিনে পরিণত হয়।

১৮৯৭ খ্রীষ্টাব্দে কেবল প্রদর্শনের উদ্দেশ্যেই এই মডেলটি ইংলণ্ডে প্রেরণ করা হয়। বায়ুচালিত কী-বোর্ড ও সম্পূর্ণ মেক্ট্রিক্স সহ ইহার একটি উন্নততর মডেল ১৮৯৯ খ্রীষ্টাব্দে প্রথমে বাজারে ছাড়া হয়। এই ১৮৯৯ খ্রীষ্টাব্দেই সারে প্রদেশের অন্তর্গত রেডহিল নামক স্থানে এই যন্ত্র নিৰ্মানের জন্য একটি কারখানা স্থাপন করা হয়।

তখন কেহই ধারণা করিতে পারেন নাই যে, অক্ষরযোজনা (কম্পোজিং) বিভাগে এই নবাগত যন্ত্রটি মুদ্রণসৌষ্ঠববিধানে একটি প্রধান ও মূল্যবান অঙ্গ হিসাবে ব্যবহৃত হইবে কিংবা এই মনোটাইপ মেসিনে প্রস্তুত অক্ষরের দ্বারা বিশিষ্ট ও পরিমিত সংখ্যক মনোজ সংস্করণ সর্বোৎকৃষ্ট হাতের-টাইপে তৈরী ছাপা অপেক্ষাও সূত্বতর মুদ্রণ সম্ভব হইবে। কিন্তু বিংশ শতাব্দীর দ্বিতীয় দশকে এই সকল সম্ভাবনার সূচনা হয়।

১৯১৮ খ্রীষ্টাব্দের পরে কয়েক বৎসরের মধ্যেই আনুষঙ্গিক যন্ত্রপাতিসহ মনোটাইপ মেসিন ইংলণ্ডেই সম্পূর্ণভাবে নিৰ্মিত হইতে থাকে। এই সঙ্গে চালাই ও অক্ষরের ছাঁচ তৈয়ারীর এমন এক সুদূরপ্রসারী কার্যক্রম গ্রহণ করা হয় যাহা মুদ্রণ জগতের ইতিহাসে আর কোনও প্রতিষ্ঠান কর্তৃক পূর্বে অবলম্বিত হইতে দেখা যায় নাই। মুদ্রণব্যবসায়ের ইহা অচিরে সমাদর লাভ করে।

প্রথম ও দ্বিতীয় মহামুদ্রের অন্তর্বর্তী সময়ে মুদ্রণকলা ও আক্ষরিক সৌষ্ঠববিধানের প্রতি আগ্রহ উত্তরোত্তর বৃদ্ধি পায় এবং রেডহিলের মনোটাইপ মেসিনের কারখানা পৃথিবীর বিভিন্ন স্থানের অক্ষরশিল্পী ও বিশেষজ্ঞগণের পীঠস্থান হইয়া উঠে। ইতঃপূর্বেই এই বিশেষজ্ঞগণ এই সম্পর্কে প্রয়োজনীয় ও মূল্যবান সংস্কারকার্যে, যথা সময়-তালিকা ও পাঠ্যপুস্তক মুদ্রণবিষয়ক অভিনব প্রণালী আবিষ্কার ইত্যাদি বিষয়ে, ব্রতী ছিলেন। “টাইপস্” পত্রিকা মনোটাইপ কর্পোরেশনকে শীর্ষাঙ্কর (হেড লাইন টাইপ) ও অন্যান্য অক্ষরের (টাইপ) নক্সা প্রস্তুত করার ভার অর্পণ করেন। এই অক্ষরগুলিই বর্তমানে “টাইপস্ নিউ রোমান” নামে সুপরিচিত। এইভাবে অসংখ্য সুন্দর ও বিদেশী অক্ষরের সমাবেশে এমন একটি ভাণ্ডার গড়িয়া উঠিল যাহা বৈচিত্র্য ও বিভিন্ন আক্ষরিক মন্ডার সমৃদ্ধিতে পৃথিবীর অন্যতম শ্রেষ্ঠ ভাণ্ডাররূপে পরিগণিত হইল।

মাত্র অর্ধশতাব্দী বৎসর আয়ুষ্কালের মধ্যেই মনোটাইপ মেসিন মুদ্রণজগতে অসংখ্য বৈপ্লবিক পরিবর্তন আনয়ন করিতে সক্ষম হইয়াছে। এই সকল পরিবর্তন ও উৎকর্ষবিধান কেবলমাত্র মুদ্রণকলা ও উৎপাদন প্রণালীতেই সীমাবদ্ধ থাকে নাই, মুদ্রিত বস্তুর সাতিশয় সৌকর্যবিধানেও ইহাদের অবদান রহিয়াছে। ১৮৯৯ খ্রীষ্টাব্দে ইহার প্রাথমিক পর্যায়ে বৃটিশ আবিষ্কারকগণ যে উদ্যোগী মনোহুতি, উৎসাহ ও আত্মপ্রত্যয়ের সহিত এই পথে যাত্রা করিয়াছিলেন, সেই উদ্যোগ, উৎসাহ ও আত্মপ্রত্যয়েরই দ্বারা প্রণোদিত হইয়া এই কর্পোরেশন শতাব্দীর দ্বিতীয় অর্ধে পদক্ষেপ করিল।

expanded, somewhat untraditional style, it is unsuitable for newspaper text, but it became deservedly popular for magazine and book work.<sup>43</sup>

The Series 701 is not such a successful design. Although based on Series 700, the added weight and strong horizontal emphasis tend to cloud the face and hamper readability. The *repha* ' is very undersized and the words appear too stretched-out for comfortable reading. The design works better in the larger sizes but it bears no comparison to foundry heading types.<sup>44</sup>

The benefits of separating the keyboard and the caster were stressed by the manufacturer of the Monotype in its promotional literature. The Corporation considered it preferable to preserve the distinction between the composing and typefounding arts, yet the skills demanded of these professions were minimized by the new technology. The keyboard, however, was more cumbersome to use than the Linotype, possessing four times the number of keys than a standard typewriter;<sup>45</sup> it was, in fact, unlike any other keyboard. Just as the Linotype layout was to some extent dependent on the channel widths, the original Monotype keyboard arrangement was governed entirely by the unit widths of the sorts and not by their frequency of use. It was improved by the introduction of the 'D' layout in 1908<sup>46</sup> which retained its pneumatic action while mechanical modifications allowed the keys to be arranged to conform to the 'universal typewriter' layout.<sup>47</sup>

43. Ananda Bazar Patrika Ltd was one of its users.

44. Compare to pls. 66 and 114.

45. See Huss, *Composition Matrix*, p. 15.

46. Designed by Bancroft and based on Lanston's C layout; Jennet, *Pioneers in Printing*, p. 188. According to Monotype's *Book of Information* (p. 7) this occurred in 1907, but the *Monotype Recorder* (39, no. 1, p. 25) also gives the date as 1908.

47. Commonly referred to as QWERTY; see *The Monotype System*, p. 198.

The Monotype keyboard could be adapted for specialized setting, but deviation from the standard layout was not a simple task, for it could entail the replacement of keybanks, keybars, and the justifying scale as well as the memorization of the new key locations. The Monotype keyboard operator was also disadvantaged by the lack of copy for proofing - apart from the perforations in the ribbon indicating the matrix locations. Keying speeds similar to Linotype keyboarding speeds were achievable,<sup>48</sup> but the type had yet to be cast.

Whereas the English Monotype keyboard was capable of composing up to seven Latin founts, the Bengali script made full use of all available positions on both keybanks to cover the characters it required for one fount. The basic characters of the syllabary were positioned in the lower portion of the left-hand bank. It was a large layout to memorize, yet smaller than the layouts of foundry cases. Just as in foundry setting, care had to be taken to distinguish between kerning and non-kerning sorts. It is interesting to note that the layout differs considerably <sup>from</sup> the case lays employed by the Oxford University Press for the same founts.<sup>49</sup> The latter seem to better reflect the frequency of the sorts, no doubt because constraints imposed by the relative-unit system do not apply to hand composition.

The Monotype method of composition for the Bengali script, being a form of the Degree system, did cause problems in printing. Its very advantage over the Linotype in design terms, namely its kerning facility, was a severe disadvantage in newspaper printing. Although the metal used for casting the type was harder than that used for Linotype slugs, it was softer than foundry type, thus the

48. Accurate keying speeds are difficult to obtain, since speeds which have been quoted were often taken from keyboarding competitions and not under production conditions; see Legros and Grant, *Printing-Surfaces*, pp. 429-30.

49. See pls. 146-8.



THE MONOTYPE CORPORATION LIMITED

M.C.A. 8569

UNIT SHIFT

Folio No. F 8864

Units	NI	NL	A	B	C	EF	E	F	G	H	I	J	K	L	M	N	O
5	২	ঠ	।	ঊ	৳	৳	৳	৳	ট	চ	ষ	৳	৳	৳	৳	৳	৳
5	য়	ঢ	ষ	র	য	ম	ব	ষ	ধ	দ	ঠ	ঢ	৳	৳	৳	৳	৳
6	!	শ	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
7	গ	গ	ন	ব	ঘ	ঝ	ক	ি	।	।	হ	স	ছ	ন	ঙ	ক	ক
8	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
8	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব	স্ব
9	(	)	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
10	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
11	ক	ঢ	ষ	ট	ষ	ট	য়	ঢ	ষ	র	য	ম	ব	ধ	দ	প	ব
11	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
12	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
12	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
13	ও	ঠ	ক	স্ব	স্ব	জ	হ	ঋ	ক	ঐ	এ	ড	ক	ট	ম	স্ব	স্ব
14	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
15	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳
15	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳	৳

Language BENGALI

Series 470 - 10 PT (7½ Set). 12 PT (9 Set).

Keybars 85149 - 85150

Stopbars 1702

Wedge 1702





kerns and interlocking parts suffered even more from the pressure exerted on it by the presses.<sup>50</sup> During the 1950s methods were sought by the Monotype Corporation to improve the casting of the Indian founts including Bengali. The bevel was changed: bevel shaping was taken over by the Drawing Office and a secondary copper blank was developed to control the cutting of the bevels. David Saunders, who was involved in the maintenance of non-Latin founts at the time, describes the results:

By following the outline of this blank the punchcutter ensured that the bevels would not foul on all the required combinations, that the punch would be strong enough to withstand the stresses of pressing off the matrices, that there would be sufficient aperture for the metal to flow in casting and that the types would have sufficient strength. It was a fact of life that some printers in India ignore our recommendations on type metal alloy of 10% tin, 10% antimony, 80% lead, and used pressure on the press as a general cure all - or at least tried to.<sup>51</sup>

Apart from problems relating to the strength of the metal, the method of composition adopted by Monotype for setting Bengali was not suitable for rotary printing, but where considerations of quality could prevail over those of speed, it was the preferred method of mechanized setting. The Monotype was said to be the only 'composing machine to recognise the existence of the hand compositor' and the only mechanical means of 'producing printing surfaces superior to hand-set foundry type'.<sup>52</sup> Although no such claim can be made in the case of Bengali setting, the Monotype became popular in India. Indeed, in 1984 India was recorded to have the greatest number of Monotype hot-metal machines in any one country.<sup>53</sup> In many printing establishments where there was no shortage of cheap labour, mechanical composition was not taken full advantage of: types were commonly cast into case, hand set, and distributed.

50. See above, chapter 8. Extra tin was added for casting into case; John R. Biggs, *An Approach to Type* (London, 1949), p. 38.

51. Letter from David Saunders, 16 Dec 1986.

52. *The Monotype System*, p. 1.

53. Randle, *Matrix*, 4, p. 47.

This practice, which was also adopted in England by the Oxford University Press for some of its non-Latin setting, continues in many parts of India. In such instances the Super Caster remains especially popular, for with its capacity to cast rules and other furniture, it represents a miniature foundry and can be used to supplement existing founder's type.

The Monotype method of Bengali composition produced the most successful rendition of the script mechanically composed in hot-metal. Due to limitations in the designs of the Series 470, 700, and 701, however, it could neither match nor surpass foundry setting. In this respect, it failed to live up to the expectations of its manufacturers:

However ingenious a machine may be, whatever the speed it may attain in composition, quality in printing surface and facility of correction are essential features of its practical utility. No machine that is devised to do what previously was done by hand can be looked upon as correct in principle or perfect in adaptation, unless it maintains equal quality and greatly increased quantity of production. In such a degree as the machine lowers the standards created by the slow evolution of manual methods, it must be pronounced a failure.<sup>54</sup>

But such pronouncements were not intended to apply to non-Latin typesetting. Since the introduction of mechanical composition, vernacular founts have constantly been compromised in their adaptation for use with equipment of European or American manufacture. Whilst the mechanical composition of Indian scripts assisted the spread of vernacular printed matter in the subcontinent, it precipitated the lowering of typographic standards, which was not to be reversed until the new technology of photocomposition had become well established. Until the 1960s, fount and typesetter manufacturers saw little value in designing special composing techniques to handle the indigenous Indian scripts, and little necessity for the quality of non-Western setting to be comparable to that of the Western world. In the case of India, where printing

54. Quoted in the *Monotype Recorder*, (39, no. 1, p. 16) from the *Lanston Machine for Casting and Setting Single Type in Perfectly Spaced Lines*.

paper and ink are often of inferior quality, the indigenous scripts extremely complex, and the level of literacy low, the requirement for founts of a very high calibre should have been considered essential.

**Part III**  
**Photocomposition of the Bengali Script**

## Chapter 10

### Filmsetting

The second half of the twentieth century saw the second radical transformation in typesetting technology: the era of photocomposition<sup>1</sup> had begun. Filmsetting, which has been described as 'the greatest step forward since the invention of movable type',<sup>2</sup> was developed in North America and Europe during the 1940s;<sup>3</sup> it had no perceptible effect upon Bengali typography until the 1970s.

Filmsetting comprised 'the composition of characters in the sequence required on film or photographic paper for the purpose of transferring to sensitized plates and printing without the intervention of [metal] type'.<sup>4</sup> It answered the needs of the increasingly popular printing processes of lithography and offset-lithography, which did not respond well to raised printing surfaces. Filmsetting could also be used in conjunction with letter-press printing, owing to the innovation of flexible plates usable for rotary printing which dispensed with the intermediate process of stereotyping. It met the demand for greater efficiency in composing techniques, overcoming many of the disadvantages implicit in hot-metal composition.

The printing industry commonly borrows terms from the computer industry, with which it has now become intimately linked, when referring to phototypesetters. Models known as first-generation phototypesetters were based on their hot-metal progenitors and functioned, as far as was possible, upon the

1. In 1960 James Moran considered the term 'photocomposition' to be ambiguous (*Filmsetting - Bibliographical Implications* (London, 1960), p. 232), but it is now commonly used as here, particularly in connection with third-generation typesetters; see below, chapter 11.
2. Moran, *Filmsetting*, p. 235.
3. Although a patent for a 'Means of composing characters by producing Photographic negatives therefrom' was taken out in Britain by W. Friese-Greene in 1898; Morison, *Photographic Composition*, p. 2.
4. Moran, *Filmsetting*, p. 231.

<sup>SAME</sup>  
 A principles. First-generation models, such as the Intertype Fotosetter<sup>5</sup> and the Monophoto Filmsetter, smoothed the path of transition from metal to film composition, when the nature of type changed from a three-dimensional object to a two-dimensional image.

The Monotype Corporation, who were later to manufacture a number of non-Latin film founts, introduced the Monophoto Filmsetter in 1955. The company was naturally anxious that its hot-metal machines should not become immediately obsolete; it therefore advocated that existing typesetting plants should be adapted for filmsetting to work concurrently with hot-metal. Monotype was in a position to recommend this because the keyboards, which functioned independently of the caster, could be used to drive either the Monotype Composition Caster or the Monophoto Filmsetter.<sup>6</sup> The air tower of both machines was identical and characters were selected in the same manner, but the mould, metal pot, and galley portion had been replaced by the photographic unit.<sup>7</sup>

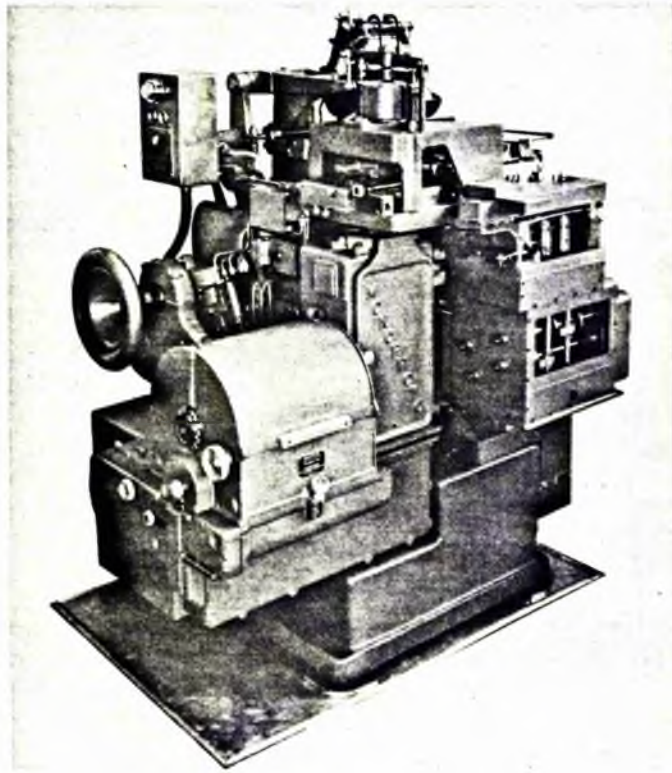
The die case was now a master negative plate of 255 characters and spaces;<sup>8</sup> in lieu of a centering pin, its underside was notched for accurate registration. A light source was directed through a condenser-lens to ensure that all portions of the image were illuminated evenly. A single zoom-type lens and two prisms were used to photograph the characters, at one fiftieth of a second, on to a flat sheet of film which remained stationary until each line was complete. As before, the width values were obtained from the location of the characters in the master grid. Until 1956 the Monophoto matrix case comprised a single sheet of glass. In order to increase the versatility of the founts, Monotype

5. First exhibited in 1950.

6. *The Monotype Recorder*, 42, no. 2 (Spring, 1961), p. 1. Although this situation changed.

7. See pl. 149.

8. It was extended to 272 in 1963; *Monotype Recorder*, 43, no. 2 (Summer, 1965), p. 45.



149. Monophoto Filmsetter (*The Monotype Recorder*, 43, no. 2, Summer, 1965, p. 33)

introduced a matrix case in which each sort existed on a separate piece of film within the case and could be either direct-reading or reverse-reading. Individual characters could thus be substituted by others, or damaged matrices replaced. The sizes obtainable from one negative by means of a manual adjustment ranged from 6 to 24 point.<sup>9</sup>

There were immediate benefits to be derived from filmsetting which quickly offset the initial high cost of the equipment. One advantage, as Monotype pointed out, was 'the ability to store in one shallow box, or to slip into one airmail packet, the equivalent of tons of standing metal type'.<sup>10</sup> The expense of storing vast quantities of lead type, in terms of space and cost of type metal, far exceeded the cost of film.<sup>11</sup> Wear and tear of type, a perennial problem with Indian language printing<sup>12</sup>, was another hindrance eliminated by filmsetting.<sup>13</sup> Furthermore, type set by film was able to produce a sharper image than metal, although in practice this was not often achieved.<sup>14</sup> The Monophoto Filmsetter was capable of high-quality output and required only one matrix-case assembly to output a full range of sizes required for normal composition.<sup>15</sup> But with regard to speed, the first-generation model showed no marked improvement on the hot-metal machine.

Although the Monotype Company was at pains to stress the similarities of the two technologies, problems were soon encountered by the compositors who had

9. See below, pp. 343-8 regarding the point system.

10. *The Monotype Recorder*, 42, no. 2, p. 1.

11. See Naik, *Typography of Devanagari*, pp. 188-9.

12. See above, chapter 8.

13. Metal type begins to show signs of wear after 50,000 impressions and is thus reserved for short runs; McLean, *Manual of Typography*, p. 30.

14. See *Monotype Recorder*, 43, no. 2, p. 14 and Frutiger, *Type Sign Symbol*, p. 20.

15. See below, pp. 348-9.



trained with hot-metal composition. Page make-up and corrections were ostensibly easier with film than metal, but composing-room technicians were unskilled in working with a scalpel on the unfamiliar gelatinous sheet.<sup>16</sup> Care had to be taken to achieve uniformity of colour when stripping in corrections or adding text set at a different time to the original copy. Variations in quality could easily occur depending on the batch of film used; the strength, age, and temperature of the developer; and the intensity of the light source. Monotype sought to alleviate this problem by supplying a Monophoto Test Negative<sup>17</sup> for controlling the quality of the typeset output.

Another problem experienced by the composing-room concerned the measurement of type. For at least two centuries,<sup>18</sup> type had been cast in sizes bearing such names as Minion, Pica and Cicero. The sizes, however, bore no relation to each other and could vary from one foundry to another. A standardization of type height and a systematic means of type measurement were advocated by the French Government in 1723, but the vested interests of established founders and printers inhibited its realization for more than ten years. In 1737 the Parisian typefounder, Pierre Simon Fournier,<sup>19</sup> devised the point system of measurement in which a point measured 0.0137 of the English inch or 0.349 mm. All body-sizes were to be cast to a definite number of points; Cicero, for instance, measured twelve points.<sup>20</sup> This system was published by Fournier in his 1742 specimen book *Modèles des Caractères*.<sup>21</sup> He subsequently described it in greater detail in the first volume of *Manuel*

16. *Monotype Recorder*, 42, no. 2, p. 5.

17. Described in *The Monotype Recorder*, 42, 2, p. 7.

18. See Moxon, *Mechanick Exercises*, pp. 19-27.

19. Sometimes referred to as Simon-Pierre; see James Mosley, *An Introduction to Pierre Simon Fournier's Modèles des Caractères de l'Imprimerie* (London, 1965), p. 3.

20. Cicero was a measurement used in Europe which came to be used for defining line measure (length), as Pica was in England.

21. S.P. Fournier, *Modèles des Caractères de l'Imprimerie* (Paris, 1742); a copy of which is held at the St Bride Printing Library.

*Typographique*.<sup>22</sup> After his death,<sup>23</sup> another Parisian typefounder, Francois Ambrose Didot, revised Fournier's system according to the official linear measure of France, *pied-du-roi*; a point now measured 0.0148 inch or 0.3759mm. Although disliked by many typefounders, it became the standard system of type measurement in most of Europe.<sup>24</sup>

The American point system, which was adopted by Britain in 1898, was not established until after the great Chicago fire of 1871 in which the typefoundry of Marder, Luse & Co. was destroyed. The foundry's reconstruction under John Marder's supervision resulted in the implementation of a system devised by Nelson Crocker Hawks, a Milwaukee printer, who was, presumably, conversant with the French systems. His idea was to adopt a standard pica that was divisible into twelve parts called points and each body-size of type would amount to a specific number of points. This system was formally adopted in September 1886 by the United States Type Founder's Association, of which Marder was vice-president. However, the pica chosen as a standard was not that used by Marder's foundry, but the more commonly used pica which measured 0.166044 inch.<sup>25</sup>

Neither the Didot system nor the American point system proved very satisfactory: the former did not match the European metric system; the latter did not match the foot and inch measures used in Britain and America. Many English printers wishing to use existing stocks of type continued with the old English type body-sizes, particularly in the smaller text sizes.<sup>26</sup>

22. P.S. Fournier, *Manuel Typographique*, I, (Paris, 1764).

23. Fournier died in 1768; it is not known exactly when Didot established his system of measurement.

24. Belgium still uses the Fournier system; Tracy, 'The Point', *Penrose Annual*, 55 (London, 1961), p. 64.

25. Tracy, 'The Point', p. 67.

26. See pl. 150 showing sizes in use at OUP in 1969.

## ACCESSORIES

## TYPE BODY SIZES

<i>Point</i>	<i>Monotype</i>	<i>English</i>	<i>Didot</i>	<i>Old Bodies</i>	<i>O.U.P. Moulds</i>
4½	·0588	—	—	Diamond	·0579
4½	·0622	—	—	—	—
4½	·0657	—	—	—	—
5	·0692	·0660	·0740	Pearl	·0660
5½	·0726	—	—	—	—
5½	·0760	·0725	—	Ruby	·0710
6	·0830	·0833	·0888	Nonpareil	·0837
6½	·0847	—	—	—	—
6D (6½)	·0888	—	—	—	—
7	·0968	·0972	·1036	Minion	·0972
7½	·1038	—	—	—	—
8	·1107	·1083	·1184	Brevier	·1083
8½	·1176	—	—	—	—
9	·1244	·1180	·1332	Bourgeois	·1177
10	·1383	·1350	·1480	Long Primer	·1356
11	·1522	·1450	·1628	Small Pica	·1445
12	·1660	·1667	·1776	Pica	·1670
13	·1799	—	—	—	—
13½	·1867	—	—	English	—
14	·1937	·1880	·2072	—	—
15	·2076	—	—	—	—
16	·2213	—	·2369	2-l. Brevier	—
17	·2352	—	—	—	—
18	·2490	·2350	·2665	Great Primer	·2351
19	·2629	—	—	—	—
20	·2767	·2626	·2961	Paragon	·2546
21	·2905	—	—	Double Pica	·2864
22	·3043	·2890	·3257	—	—
23	·3182	—	—	—	—
24	·3320	·3362	·3553	2-l. Pica	·2862
28	·3874	·3750	·4145	2-l. English	·3362
30	·4150	—	·4441	—	—
32	·4428	·4690	·4736	—	—
36	·4980	·4980	·5329	—	—
42	·5810	—	—	3-l. English	·3779
48	·6640	—	—	—	—
60	·8300	—	—	—	—
72	·9960	—	—	—	—

Since the British were the most influential in the design of Indian typefaces, it is not surprising that the same systems of measurement, however inappropriate, were employed for Indian founts. The earliest founts were cast by means of adjustable hand-moulds in sizes most suited to their purposes. However, in order to classify these types in type specimen books, and in order to indicate the Latin faces with which they would most appropriately align, the foundries of Vincent Figgins, Stephen Austin, and certain Indian foundries<sup>27</sup> soon allocated English body-size measurements to Indian language founts. The difficulties of defining the type height of Indian founts which employ Wilkins's *phalā* system or the Degree system of composition, are illustrated by an extract from the Oxford University Press's description of its 'Sanskrit Paragon'<sup>28</sup>

Devanagari founts:

The original fount (purchased from Mr Watts, of Crown Court, Temple Bar, London) includes types on English and Bourgeois bodies, and points on a Pearl body. The latter are justified with the English body (either at the top or bottom, or with the Bourgeois for both top and bottom).<sup>29</sup>

Oxford University Press also possesses 'Sanskrit Old Pica' and 'New Pica' founts. The 'Old Pica', originally purchased from Watts in about 1840, is described as a 'smaller form of the ... Paragon Sanskrit' which includes 'Bourgeois, Pearl and Minikin bodies which are used in combination for making pointed characters'. In order to complete the description, OUP was forced to resort to the new point system of measurement by concluding that the sorts '419-23 are cast on 3-pt body.'<sup>30</sup> OUP's Bengali founts which originated from a later date are not so elaborately described: the Figgins fount, acquired

27. e.g. the Gujarati Type Foundry at the turn of the century; Geoffrey Osborne, 'An Unusual Type Specimen Book from India', *Matrix*, 2 (Winter, 1982), p. 100.

28. Paragon, in this case, being equivalent to about 19 point.

29. *List of Ancient and Modern Greek and Oriental Founts at the University Press, Oxford* (Oxford, 1959), p. 28.

30. *List of ... Oriental Founts*, p. 29.

in 1888, is simply called 'Bengali 3nk Pica'; its hot-metal fount of the Monotype 470 series has Monotype's '12 pt' classification.

Such designations for Indian vernacular founts, however unsuitable, do assist the typographer in copyfitting. Type measurement, however, only refers to the actual size of the metal body, not to the appearance of the face. A face which is small on the body - small x-height - but has long ascenders can be the same point size as one that is large on the body with short ascenders and descenders, however, the visual appearance will be quite different.<sup>31</sup>

Furthermore, if the main body-size of a non-Latin fount is identical in the case of, for example, Burmese and Devanagari, the actual depth taken up on the page will be far greater in the latter, since it uses superscribed and subscribed vowel signs: the manner of composition, therefore, is also crucial to measurement. The linear setting of, for instance, 8 point Linotype Bengali Light No. 2 may achieve more lines to the inch than the equivalent matter set in 8 point Monotype Bengali 470, but it will fit less words to the line owing to the linecaster's inability to kern.<sup>32</sup>

The advent of filmsetting brought with it further complications relating to type measurement for both Latin and non-Latin founts. Metal body-size has no true significance in film, yet, for want of a new system, type composed photographically is still specified according to the point system.<sup>33</sup> As John Seybold writes, 'The point size is, in a sense, an abstract concept which relates to the amount of vertical white space necessary to accommodate the distance from the lowest descender to the highest ascender, plus clearance from above and below the letter.'<sup>34</sup> The only relevant dimension in film is the height and

31. And would probably require different leading.

32. Assuming that the set width of the Linotype sorts is not considerably narrower than the Monotype Bengali.

33. Some specifiers use millimetres.

34. Seybold, *Digital Typesetting*, p. 35.

depth of the image, leading can be adjusted in hitherto unattainable fractions of points<sup>35</sup> depending on the job in hand. In consequence, it is extremely difficult to ascertain simply by measuring copy the point size of a typeface set by film, unless the interlinear spacing is also known.

In the case of Indian founts the problem is exacerbated by the ability of some machines to 'float accents' in their correct positions by means of superimposition. Whilst this facility improves the quality and readability of the text, the compositor cannot assume that the depth-count will be identical to that of the same text set in hot-metal using the equivalent typeface,<sup>36</sup> at the same point size, with the same leading. Similarly, the ability to alter the intercharacter spacing by discriminatory kerning, or by utilizing the condensing or expanding facilities which became available, necessarily renders the set width of the typeface at variance with that of its hot-metal counterpart. The Monotype Corporation repeatedly stressed that Monotype copyfitting tables were not be used with Monophoto founts.<sup>37</sup>

Another factor serves to differentiate metal and film founts, namely sizing. Founts of foundry type had been designed according to the characteristics most suited to their type size. Just as the earliest types strove to emulate handwriting, the first hot-metal founts for mechanical composition sought to imitate foundry types and, therefore, to maintain the principle of optical compensation by manufacturing different styles of the same face in different type sizes. As has already been mentioned, compromises were introduced when the same drawing or pattern was employed to create more than one size of the same typeface. <sup>38</sup> Normally, three masters were used to create matrices in a whole range of sizes; a different set of matrices was required for each point size in hot-metal composition. In the case of filmsetting, one matrix case could

35. e.g. 10 point on 9½ point.

36. Produced by the same manufacturer.

37. e.g. *Monotype Recorder*, 42, no. 2, p. 15 and *Monotype Recorder*, 43, no. 2, p. 17.

38. See above, chapter 8.

be used to set all sizes from 6 to 24 point with the result that typefaces would appear ill-proportioned in certain sizes. Consequently, the letterforms exhibited divergencies from the hot-metal designs rendering them unacceptable to many users, who wished to purchase 'known standards'.<sup>39</sup> Monotype<sup>40</sup> attempted to remedy this problem by introducing two, or sometimes three, sets of matrices to maintain the correct proportions of the typeface. The master size on the Monophoto matrix approximated 8 point.

For reasons of economy and, as indicated above, for the sake of compatability in line with customer expectations,<sup>41</sup> the first film founts were photographic copies of the hot-metal designs. Such was the case with Monotype's Bengali founts. The one distinction was the use of double-exposure techniques in place of overhanging characters. Bengali Monophoto founts were introduced in 1970 for the Mark 3 version of the Filmsetter.<sup>42</sup> This machine was still a mechanical photosetter, but it possessed superior optics which improved the character fit; the revised gear box enabled it to expose at a speed of 144 characters per minute, at one fiftieth of a second. The Bengali script was also implemented on later versions of the Monophoto: the Mark 4, which had an increased character set of 340 characters; and the Mark 5, which could no longer be classed as a first-generation device and whose facilities principally assisted mathematical composition.<sup>43</sup> However, repeated attempts to obtain matter composed with Bengali Monophoto founts produced at this time have proved unsuccessful.<sup>44</sup>

39. *The Monotype Recorder*, 43, no. 2, p. 12.

40. And others, including Linotype, see below.

41. See also below, pp. 362-3.

42. See pl. 151 showing a film matrix case of Bengali.

43. The All India Press at Pondicherry installed all three models.

44. Monophoto founts were redesigned, but not during the period under discussion [i.e. in 1984].





Second-generation phototypesetters still employed master negatives and a direct light source to produce type images, but they differed from first-generation machines in that they were not adaptations of hot-metal devices. Second-generation machines were designed specifically as phototypesetters; they relied less on mechanical parts which were increasingly substituted by electronic components. Higher setting speeds were characteristic of these machines: between forty and several hundred characters a second could be exposed. Speed had become a crucial factor in the printing industry, particularly for newspaper composition. Grids, film strips, or discs contained the character sets. The number of characters held varied: at times two grids or strips were required for one fount, usually both being simultaneously accessible. Characters were either exposed when stationary or moving ('on the fly'). When exposing 'on the fly' in particular, the critical timing of the illumination, the accuracy of the character positioning on the negative, and the quality of the lenses and design of the typeface were all vital to the sharpness of the image.

Character sizing of second-generation typesetters was effected by changing the lens (or lens position), the film strip, or the disc containing one or more master sizes.<sup>45</sup> Usually, however, type could be sized automatically without stopping the typesetter. The Linofilm, the first machine of this kind introduced by the Mergenthaler Linotype Company, offered the ability to change the size of the lens<sup>46</sup> and the master by supplying A, B, and C-range masters for the purpose of optical compensation. A-range founts were intended for text sizes; B-range founts for 12 to 18 point; and C-range for 18 to 36 point.<sup>47</sup> The founts were held in a grid basket, containing 18 grids of 88 characters, which would rotate in response to the particular command keys of the keyboard.

45. There was always an enlarging factor, i.e. not a one for one relationship.

46. It utilized a zoom lens. The Linotype Company had also considered adapting the hot-metal linecasting machine; Moran, *Filmsetting*, p. 235.

47. Other sizes were available; John W. Seybold, *Fundamentals of Modern Photocomposition* (Pennsylvania, 1979), p. 96.

In 1956 investigations were made by the Mergenthaler Linotype Company to implement Bengali and Urdu on the Linofilm in response to an enquiry from Tor Gjedsdal, the UNESCO Director of Mass Communication. At this point, Linotype hot-metal Bengali founts were being supplied in two 90-channel magazines with an additional 160 pi characters; the Linofilm could easily accommodate this character repertoire, but the real problem lay in the keyboarding, as Scordato explained:

Whatever the number of characters available in the machine, these can only be selected through the medium of the keyboard that has 44 keys which, with shift and unshift positions, makes identically available 88 characters . . . .

It is necessary to have all the characters in their finished form on the character grid available from the 44 keys of the keyboard. Since this is virtually impossible, other means such as keyboard charts, must be resorted to. In this case five keyboard charts would be required in addition to the layout on the keyboard itself.

The project was never realized, for Mergenthaler concluded:

Studies are proceeding on the numerous problems of using Linofilm on the photocomposition of foreign languages. The strides that photocomposition will make now and in the future, depend essentially upon the economics of the *entire* photo-reproductive process.<sup>48</sup>

Another photsetter produced by the Mergenthaler Company was also considered for the composition of Bengali: the V-I-P, which gained considerable popularity in the 1970s. Similar to the Linofilm, the V-I-P held A and B fount ranges;<sup>49</sup> these covered the type sizes 6 to 72 point.<sup>50</sup> Some typefaces were specifically designed to be set from one master.<sup>51</sup> The firm D. Stempel AG,<sup>52</sup> who

48. MC 918b: E. A. Scordato to the Secretary of the Pakistan National Commission for UNESCO, July 1956.

49. Not in all models; Seybold, *Modern Photocomposition*, pp. 96-97. Of course, there was nothing to prevent customers using the founts at the wrong sizes.

50. For further details see Linotype-Paul Ltd, *V-I-P Operation Manual* (January, 1978).

51. e.g. Icone by Adrian Frutiger. His typeface Meridien was re-worked for photocomposition; Frutiger, *Type Sign Symbol*, pp. 16-17 and 32. See also below, chapter 11.

52. Now part of Linotype AG.

manufactured V-I-P fonts,<sup>53</sup> produced an information bulletin that explained the significance of the design sizes:

The artwork for the majority of our photocomp typefaces has been drawn to permit the proper setting of the entire size range from only one font. . . .

Of course to guarantee that typefaces look their best in all sizes, the spacing between characters should be tightened or loosened to correspond to the enlarged or reduced character size. . . .

Some typefaces, such as Bodoni, rely on the fine contrast between thick and thin. If we take a font of Bodoni, enlargement or reduction may lead to a loss in quality since the serifs, which are a characteristic design element of Bodoni, become too thick or too thin. For this reason we offer a range of design sizes.

The information bulletin also stated:

Special design sizes may also be required if compatibility with hot metal type is called for.<sup>54</sup>

The introduction of on-line casters for teletypesetting (TTS) in the 1930s - whereby type could be set at remote locations by transmitting impulses via a telegraph or telephone line - prompted the Linotype company to adopt Monotype's relative-unit system of 18 units to the em.<sup>55</sup> The 'saleable' typefaces were refitted, 'one unit was reserved for kerning, and roman and italic f were redesigned accordingly, as was the capital W where the original was wider than 17 units'.<sup>56</sup> The use of this system was also vital to Mergenthaler's phototypesetting machines, whose employment of lenses, rather than different matrices, for changing sizes required the storage and calculation of the relative widths peculiar to each typestyle,<sup>57</sup> which were translatable into absolute terms by the software. The V-I-P used punched paper width-tapes for

53. As well as MLCo in the USA


54. Stempel, *Information; Photocomp Type Faces* (January, 1980), Design Sizes [p.1].

55. Since the keyboard was necessarily separated from the caster. At first the founts had to have uniform widths, i.e. lower case 'a' had to take on the same width in every typeface and style; Seybold, *Digital Typesetting*, p. 61.

56. Tracy, *Letters of Credit*, p. 41.

57. Widths were no longer duplexed.


each font to load the width data into the core memory of the machine.<sup>58</sup> The maximum width was eighteen units and the minimum, apart from zero unit accents, was four units. Within these delimiters, special width modifications could be made by altering the paper tape. A central processing unit performed the typographic functions which included 'end-of-line decisions, hyphenation and the determination of interword space and letterspace values required to justify the line'.<sup>59</sup>

Different processing, however, was required for the setting of non-Latin scripts by the V-I-P. The development of software specifically to process Arabic and Indian scripts was undertaken by the British company, then called Linotype-Paul Ltd, and it represented the beginning of a commitment by the company to produce non-Latin typesetting of a quality comparable to that of Latin. In the case of Devanagari and Gujarati, which shared the same software, this was confined to designing an accent-placement routine and hyphenation/justification logic. It was recognized that the normal V-I-P accent-placement routines would compromise the scripts to an unacceptable extent; although considerably less than in the case of hot-metal Linotype setting. Both scripts demanded the placement of superscripts to the right of the letterforms, generally above the main upright stroke (*kana*), but in some cases they needed to be centred, e.g. . Similar placements below the characters were required for the subscripts (vowels, *halant*, etc.).<sup>60</sup> This facility had not been possible with the slugcaster.

Indian language hyphenation - breaking words at the end of a line but not necessarily with a hyphen - is extremely simple in comparison to English language setting, but the fount scheme called for by the V-I-P rendered it more

58. *V-I-P Operation Manual*, Processing Sequence, p. 35.

59. *Ibid.*, p. 5.

60. See pl. 152 where problems occur with . Bengali 'accent-placement' is more demanding than Devanagari; see below pls. 165 and 168.

## विश्व अर्थ व्यवस्था के लिए मिल जुल कर काम करना आवश्यक

फेडरल जर्मन लोकसभा में 13  
अप्रैल को चांसलर शिमठ के नीति  
विषयक बयान के कुछ अंश

complex. The V-I-P film strips which were fixed to a rotating drum carried 96 characters. In order to make up the necessary complement of characters, the Devanagari founts occupied four film strips: founts 1 and 2 for the light face; and founts 3 and 4 for the bold.<sup>61</sup> The layouts of founts 1 and 3 were identical, but founts 2 and 4 differed. In addition to the Devanagari letterforms, numerals, and mathematical signs, both founts contained a contingent of characters unique to the fount that were of 'common weight', i.e. they could be used with the light or the bold fount. These comprised superior figures and other signs deemed necessary for setting Devanagari.

The limitations of the V-I-P fount capacity necessitated the use of the linecaster method of composing Devanagari conjuncts devised by Hari Govil which utilized *half-forms*.<sup>62</sup> Indeed, the V-I-P still required that the infrequent letterform ऌ be made up of a *half-form* ऍ and a *kana* ऎ . The justification software when making end-of-line decisions therefore had to take into account the presence of half characters. Care had to be taken when breaking a word that half characters did not become separated, and that at least four characters were carried over to the next line. It was possible to cancel the use of hyphenation: the typesetter would then justify the lines, if required, by altering the interword spacing.

There existed a considerable difference between the output of the V-I-P and the printed image of Linotype hot-metal Devanagari: the typeface had been redesigned.<sup>63</sup> Moreover, the new design was enhanced by the implementation of the sorely-needed<sup>64</sup> kerning facilities and software for accurate diacritical positioning that phototypesetting allowed Linotype customers to enjoy for the first time. The significant improvement to the typeface clearly removed the

61. See pls. 153 and 154.

62. See above, chapter 8. The linecaster used *half-forms* to create base characters; see Naik, *Typography of Devanagari*, pp. 209-30.

63. By Matthew Carter based on a Nirnaya Sagar foundry face. It was subsequently redesigned by Carter and the Linotype-Paul Letter Drawing Office for the Linotron 202 typesetter.

64. Particularly for Indian and Arabic scripts.







possibility of maintaining compatibility between hot-metal and photocomposed Linotype Devanagari. The hot-metal Devanagari founts, which were clearly inferior in design to the Monotype Devanagari founts (mainly owing to the limitations of the linecaster), had received a good deal of criticism. The Mergenthaler Linotype Company decided, in defiance of the reading public's conservative nature, to take advantage of the opportunity afforded by the introduction of new technology to revise both weights of the typeface.

Suggestions were made to develop Bengali V-I-P fonts based on the fount scheme already devised for Gujarati and Devanagari. Walter Tracy, then manager of Typographic Development at Linotype and Machinery Limited, was hopeful that the same layout and hyphenation program could be used for the script. In 1977 he wrote to N. Balasubramaniam, the manager of the Linotype office in India:

we need to have a complete list of all the characters needed by potential customers for the script, using the Mergenthaler Linotype character numbers. The total number of characters in the light and also the bold should be 96 or a multiple of 96 or a number between 96 and 192 which can be made up by the addition of special signs and decorative material, as in the case of Gujarati and Devanagari. In short, the number of characters in the set should be related to the 96 characters contained in a V-I-P font strip.

Indeed, only when this set of characters is defined in detail will it be possible to compare it character for character with the Gujarati and Devanagari sets of characters in order to see whether the present program can be used for Bengali.<sup>65</sup>

In view of the developments undertaken for V-I-P Devanagari composition, it is strange to find that the redesign of the Bengali founts was not contemplated before its translation into film. The typeface could have benefitted greatly from the kerning and accent placement possibilities alone, placing it on a par with Monotype setting. It seems scarcely credible that MLC<sub>o</sub> should have considered the Bengali No. 2 designs satisfactory, (no doubt, commercial reasons and tight

65. LC 17A: Tracy to Bala, 3 August 1977.

time-scales played a part),<sup>66</sup> yet the original Bengali hot-metal drawings prepared for punchcutting were to be used. The letterforms needed to be unitized; Tracy suggested that the recently introduced 54-unit system be employed for this purpose<sup>67</sup> as the 18-unit system was found too coarse to achieve finely-tuned spacing.<sup>68</sup> Thus in the 1970s Megenthaler Linotype adopted the more flexible system of 54 units to the *em*; the V-I-P could accept both systems depending on how many levels of the eight-level width tape were utilized.

Once the letterforms had been unitized, a negative was required of each sort in the fount. This was accomplished by placing a sheet of rubilith film over the outline drawing of the character. With the aid of a light table, the outline was traced with a scalpel, the rubilith core was then peeled away revealing the character in negative; in this case white on red rather than black: the result was termed a frisket.<sup>69</sup> The use of a pin-bar and registration holes ensured accuracy in cutting and ultimately in photographing the characters onto a master film fount. Frisket-cutting was thus considerably easier, quicker, and cheaper than punchcutting, particularly in comparison to hand-cut punches. However, the difference in quality is open to debate.<sup>70</sup>

V-I-P founts of the Bengali script were never manufactured. Perhaps the keyboarding difficulties were considered insurmountable, as was the case with regard to the Linofilm.<sup>71</sup> It is certain, however, that if founts had been produced they, like the Monophoto founts, would have been adaptations of the hot-metal designs, but showing considerable divergencies from their progenitors.

66. Tracy informed MLCo that he would not have enough staff to undertake the frisket-cutting; LC 17A: telex Tracy to Parker, 1 Jan 1977.

67. LC 17A: Tracy to Genower, 4 April 1977.

68. See also below, chapter 11.

69. See pl. 155; originally the term had a different meaning, see Linotype, *Printing Terms*, p. 17.

70. See Morison, *Photographic Composition*, p. 27.

71. Keyboarding is discussed in chapter 11.



155. Example of a frisket (reduced by 30%) cut by Lesley Sewell

The quality of the character fit, and therefore legibility, would have improved, but not the design. Possibly the lack of linguistic knowledge on the part of the Western fount manufacturers made them reluctant to tamper with non-Latin type designs whose hot-metal forms had been found 'acceptable'.<sup>72</sup> It is more likely, however, that the precedent set by the development of Latin founts was followed for non-Latin scripts.

The manufacturers of type and typesetting equipment have constantly experienced that 'In the continuous-reading field, nothing whatever goes as a type design that offends against the canon of familiarity'.<sup>73</sup> Thus the production programme of film founts repeated the initial approach to fount manufacture both at the advent of movable metal type and at the introduction of mechanical typesetters: in order to gain the acceptance of the reading public, new typeforms should be imitative of, if not indistinguishable from, their precursors. Compromises were unavoidable, but the intention existed of reproducing even seventeenth-century type in Monotype hot-metal founts, despite the fact that new typesetting and printing technology would have benefited from the use of less anachronistic type designs. Bengali and other non-Latin scripts could have profited greatly by exploiting the possibilities of filmsetting, but as in the case of Latin founts, revolutions in typesetting and printing technology were not echoed by revolutions in type design. Although typeforms could now be freed from the constraints of metal, new processes of fount manufacture for photocomposition were not taken full advantage of until they became firmly established. In an article entitled 'Type Design in the New Cold-type Age', Beatrice Warde, former publicity manager of the Monotype Corporation and editor of *The Monotype Recorder*, vividly described the situation in 1963:

72. The Linotype Devanagari was clearly not acceptable.

73. Beatrice Warde, 'Type Design in the New Cold-Type Age', *Print in Britain* (September, 1963), Supplement, p. 10.

Here for the first time in printing history it has become possible to design a typeface without any reference to the behaviour of steel, under the shaping tool or under the blow that sinks the punch into the matrix-metal; or to the limitations of metal casting (such as the difficulty of making letters appear to link); or to the behaviour of lead under repeated pressure. No need to allow for 'bevel' and, much less chance that a 'small counter' (enclosed white space) will be filled-in by the spread of the ink. Here, for the first time, type can be designed in terms of white-on-dark print - with due attention to the effects of halation, but no worry about extra cost or time. Again for the first time, an entire series (of sizes) of a new face can be thought of as comprised in one set of master-letters - with all the resulting need for forethought about the effects of mechanical enlargement and reduction. The designer whose fingers are itching for a chance to explore the many possibilities may well drum those fingers impatiently as the new machines are fitted out with matrices of 'the most popular' designs of the past fifty years.<sup>74</sup>

Nevertheless the early years of filmsetting did furnish the type designer and type manufacturer with a greater appreciation of the capabilities of photocomposition and the implications it held for vernacular setting. The limitations of the V-I-P Gujarati and Devanagari founts and method of composition played an essential role in defining the requirements for the implementation of the Bengali script on third-generation typesetters in the late 1970s.

74. Warde, 'Type Design', p. 9.

## Chapter 11

### Digital Photocomposition

The advent of phototypesetting represented a turning point in the history of printing: it signified the demise of the typefounding industry and the eventual obsolescence of hot-metal typesetting equipment. Hot-metal machines have, however, continued to operate in many parts of the world, such as India and Pakistan, where no film founts existed<sup>1</sup> to compose vernacular languages. But even these areas, whilst bypassing the filmsetting revolution, have been affected by the latest 'fundamental revolution in the creation and reproduction of typeforms'<sup>2</sup> - that of digital fount storage and reproduction. This was achieved by a certain type of third-generation phototypesetter.

A third-generation phototypesetter has been defined as '*one which does not in fact expose type directly from photographic masters but reproduces them electronically on the face of a cathode ray tube*'.<sup>3</sup> Two kinds of such CRT devices were developed: one which still employs photographic masters with which to generate the image on the cathode ray tube; and another which utilizes stroke dots or patterns, having stored the characters as digital representations, or sets of co-ordinates. An example of the first type is Mergenthaler's Linotron 505 machine,<sup>4</sup> originally designed by two Englishmen, Peter Purdy and Ronald Macintosh, and which was capable of setting 325,000 Latin characters per hour in comparison to 140,000 per hour in the case of the V-I-P. The second kind took setting speeds to another dimension, and is illustrated by the Linotron 202 also developed in England and introduced in

1. Or were unsatisfactory.

2. Jonathan Seybold, 'Digitized Type: What is it? . . .', *The Seybold Report*, 8, no. 24 (Aug 27, 1979), p. 3.

3. Seybold, *Digital Typesetting*, p. 112; see also Seybold, *ibid.*, pp. 113-4 for further information.

4. First exhibited in 1968.

1978. Although slower than some of its rivals, and its precursor the Linotron 606, the 202 could set almost one million Latin characters per hour, i.e. up to 700 newspaper lines a minute.<sup>5</sup>

Linotype Mergenthaler contemplated implementing the Bengali script on the 303 machine which was introduced in 1974; it being a faster version of the Linotron 505. But by this time digital equipment was being developed, and so it was to the Linotron 202 that the company looked for its implementation. The 202 did not differ from other contemporary digital CRT typesetters in its basic components which comprised 'a minicomputer controller, moving-head disc or discs for font storage, a memory into which the particular font masters to be used at any time may be loaded, an output cathode ray tube, a system for transferring the patterns generated on the face of the tube onto output film or paper, and the film/paper transport'.<sup>6</sup> The machine was all-electronic, possessing few moving parts to be adjusted or renewed: two disc drives, the paper tape reader, two rollers in the film transport, the film advance trip counter, and the cooling fan. Its method of font storage enabled the 202 to be marketed as the first low cost high-speed digital typesetter, particularly suited to newspaper setting.<sup>7</sup>

Since the 202 digitized its characters only in outline form, the lettershapes could be stored on a floppy disc rather than on the more expensive rigid disc utilized by other digital phototypesetters. The outline of the required character was transmitted to the character generator, which performed the sizing and instructed the CRT to fill in the outline with scan lines appropriate to its height and width. The normal stroking resolution was constant at 975 strokes

5. 'CRT and Laser Typesetter Comparisons 1981', *The Seybold Report*. The more conservative estimate of 450 newspaper lines a minute was the official figure which Linotype would guarantee; Jonathan Seybold, 'The Linotron 202: Better than Anybody Anticipated', *The Seybold Report*, 7, no. 21 (July 17, 1978), p. 13.

6. Jonathan Seybold, *ibid.*, p. 3.

7. Although the past tense is used here, 202 machines are still being manufactured.

per inch<sup>8</sup> regardless of the point size, which was generated electronically without lenses, prisms, or mirrors - the photographic material being in direct contact with the fibre optic face-plate of the CRT. Only one fount master was thus required to reproduce all 136 sizes from 4½ to 72 point;<sup>9</sup> between thirty and forty Latin fonts could be stored on each floppy disc.<sup>10</sup>

In addition to the benefits of being relatively low in cost and high in output speed, this typesetter possessed other advantages over photomechanical typesetters. Its design using electronic controls ensured increased reliability,<sup>11</sup> greater accuracy of character alignment and positioning, and improved consistency in exposure.<sup>12</sup> Because no lenses were employed for enlargement, the machine could provide constant sharpness of image at larger point sizes, and possessed the ability to expand, condense and slant type electronically;<sup>13</sup> but as was the case with all digital founts, the quality of the image presented new problems and was a matter of concern to type designers.

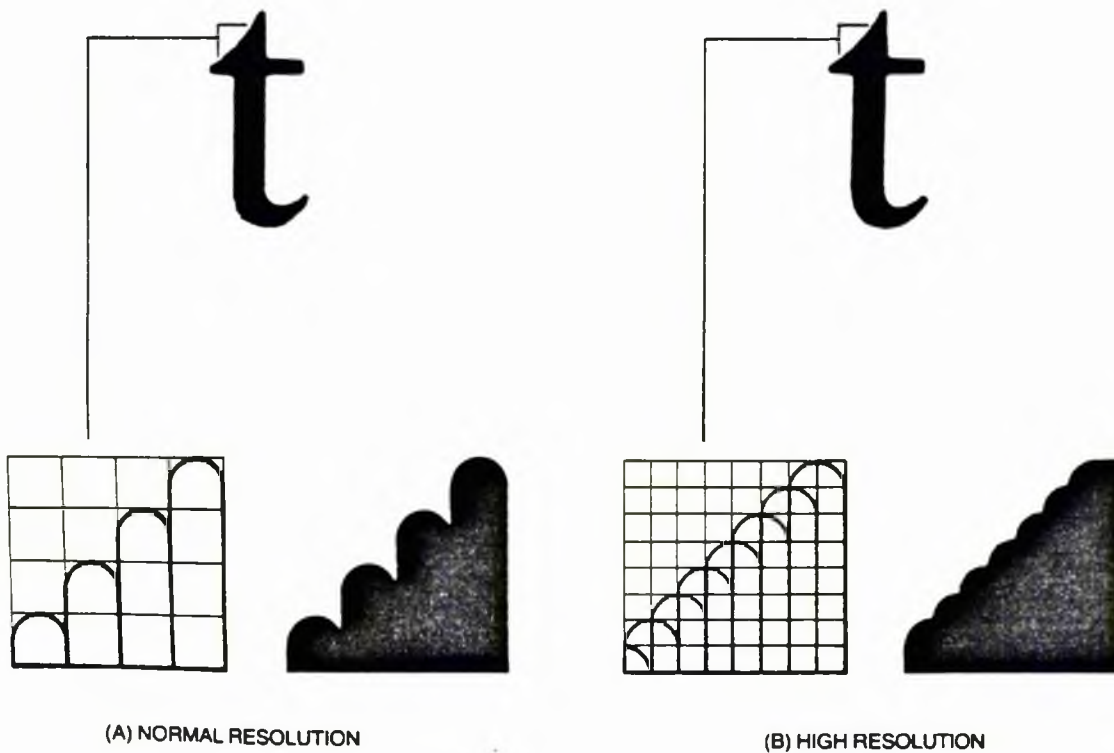
Various techniques were available for digitizing characters; the method employed by Mergenthaler was also adopted by some other manufacturers. A frisket - identical to that produced for V-I-P<sup>14</sup> - was required of each character. Each pre-punched frisket was fixed in register to a revolving drum and scanned at approximately 30000 by 30000 resolutions per em. This was accomplished by

8. An option of higher resolution was introduced in 1983 which supplied 1950 scan lines per inch for sizes less than 48pt; above this size, 'Superfonts' were required; Linotype-Paul Ltd, *Linotron 202N Operation Manual* (September, 1983), sections 1-2 and 8-5. See also pl. 156.
9. 'Superfonts' (Latin only) extended this range above 96 pt.
10. This was a conservative estimate given by the company. About 60 fonts could be stored; 100 fonts on a double-sided disc (typefaces with serifs occupied more room).
11. Even installations in remote parts of India did not feel the need for back-up machines.
12. But see below; see also Charles A. Bigelow, 'Technology and the Aesthetics of Type', *The Seybold Report*, 10 (Aug 24, 1981), p. 10.
13. The latter was no substitute for a true italic fount. Other facilities included automatic generation of fractions.
14. See above, chapter 10. Often V-I-P friskets were used for 202 digitizations (see pl. 155); for the earlier 606 digital typesetter, some artwork required revision because of a difference in the imaging window.



Figure 8.3 shows the difference in output of a lower case 't' in (A) normal resolution and (B) high resolution. On close examination of the top and bottom of the 't' it will be seen in normal resolution that the curve is ragged, but in high resolution it is a smooth curve, which shows the closer overlapping fit of the scan lines.

The second part of the illustration shows how this is achieved in practice.



**Fig. 8.3: Comparison of Normal and High Resolution Output**

'using a light source to detect the change from positive to negative on film and record these "crossover" points' or 'transitions from light to dark'.<sup>15</sup> The original scan data was then reduced to 432 by 432 per em resolution for the 48 point master of the Linotron 404 and 606 machines, and the information was stored on magnetic tape.

A print-out of the resulting dot-matrix pattern was produced by means of a Versatec printer for proofing purposes.<sup>16</sup> It was scrutinized by trained letter-drawers who would mark it for editing or re-editing, indicating which superfluous or missing picture elements (pixels) should be removed or added; the size of the basic element being related to the writing spot of the output device. Editing amounted to a skilful and time-consuming process because it involved the manipulation of the letterform image by altering the bit-maps on a visual display unit (VDU). Correction programs existed to check consistency in stroke weight, alignment, and so forth as well as to accelerate the editing process, but compromises were inevitable. The 202 character outlines, which were derived from the 606 48-point master, were described as straight-line segments.<sup>17</sup> With the breakdown of each letterform into discrete elements, the edge quality of the characters suffered; at large sizes, the straight-line segments became visible on curves and diagonals.<sup>18</sup> The trueness of the digital output to the original letter-drawing depended, to some extent, on the nature of the design,<sup>19</sup> but it also relied on the resolution of the machine, and the size and sharpness of its writing spot.<sup>20</sup>

15. Edward H. Bunnell, *Understanding Digital Type* (New York, 1978) pp. 8 and 9. The 202 permitted only 16 intersections; see pl. 157 which shows an image that caused problems in digitization.

16. See pl. 158.

17. See Jonathan Seybold, 'The Linotron 202', p. 8.

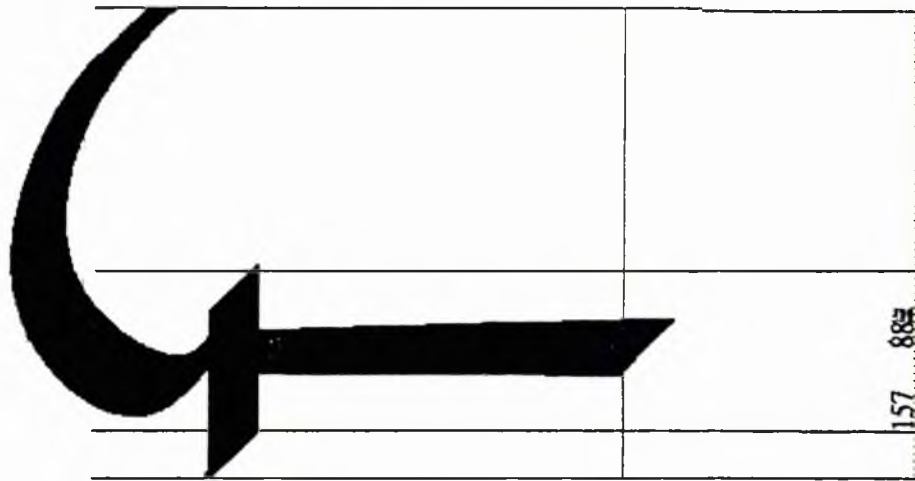
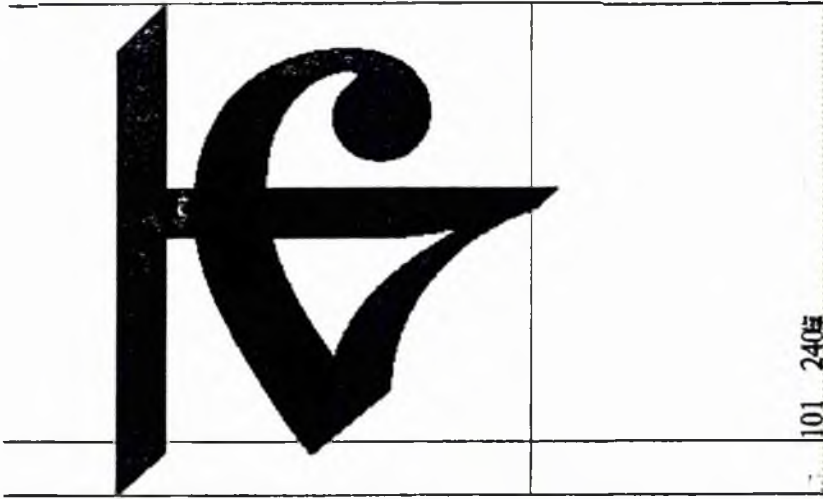
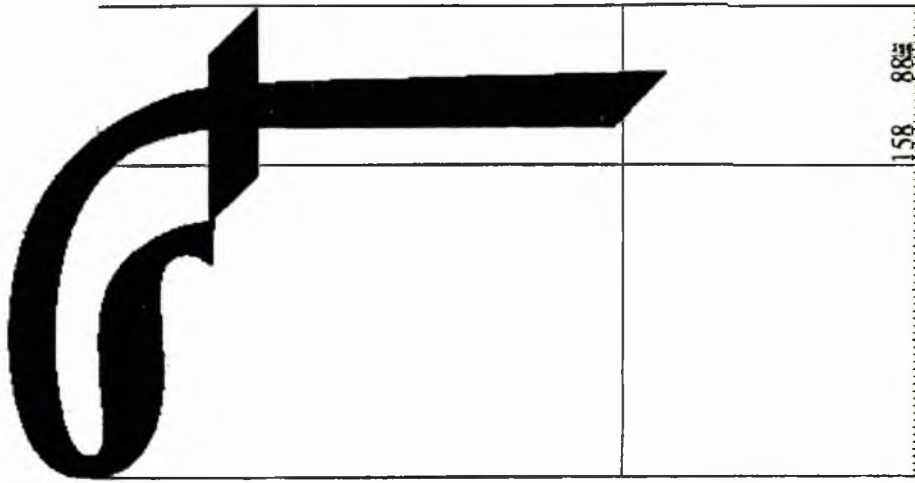
18. See pl. 159.

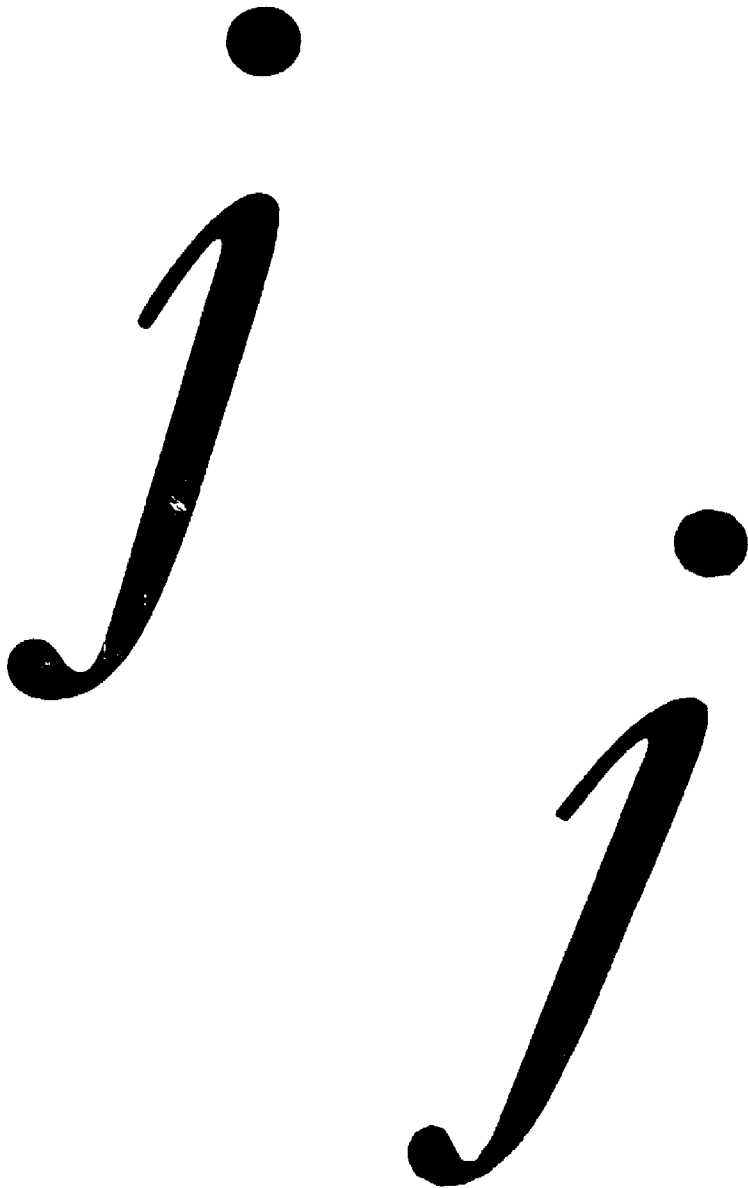
19. i.e. some designs translated into digital typeforms better than others; see below, p. 386-8. See also Bunnell, *Understanding Digital Type*, pp. 15-16.

20. The writing spot on the 202 was 1.1 to 1.2 mils at the centre of the tube; Jonathan Seybold, 'The Linotron 202', p. 4. See pl. 160 showing a summary of the digitization process.

اَكْبَرُ  
عَلَيْهِ  
الْحَمْدُ  
وَالسَّلَامُ

157. Example of a character with too many intersections for scanning in one pass.

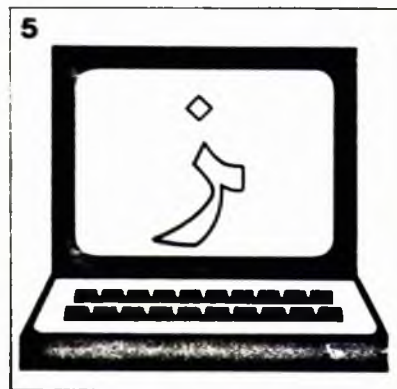
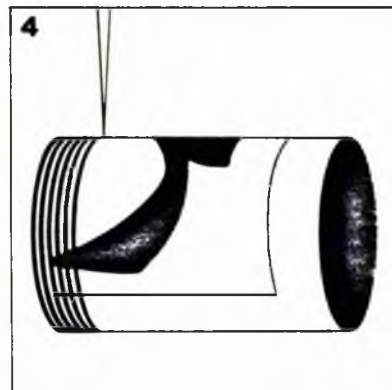
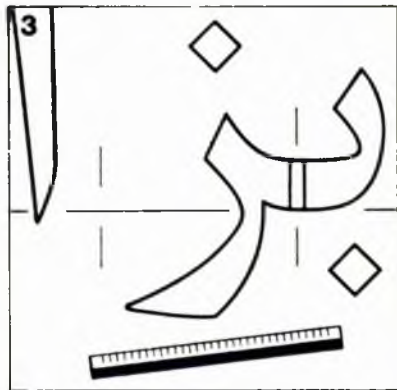
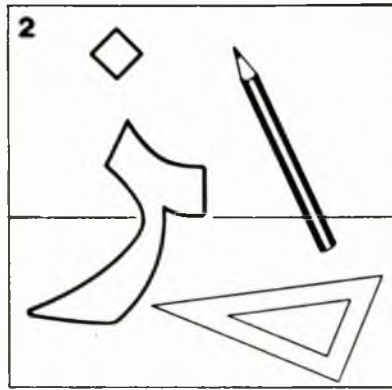
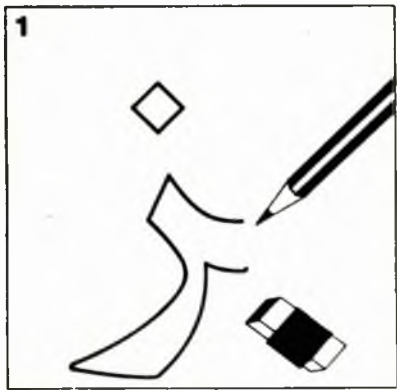




159. Comparisons of V-I-P and 202 output  
(400% of original size)

# GENESIS OF A TYPEFACE

## From The Design To The Digital Form



**1**  
The artist's drawing: The artist creates the form of the character.

**2**  
Artwork: Prepared in the drawing department of Linotype Ltd..

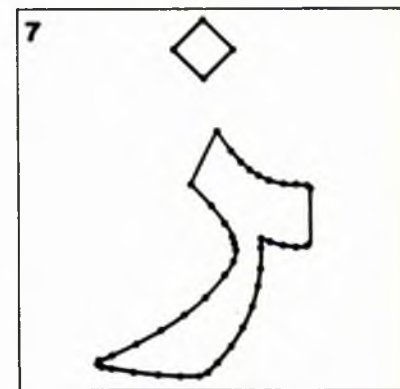
**3**  
Sidebearing and unitizing: Determining the spaces between characters, positioning of characters in the optical centre.

**4**  
Digitizing in a drum scanner: Converting characters into scan lines.

**5**  
On-screen editing: Correcting digital data on the screen.

**6**  
Scan line format: Vertically defined data on the screen.

**7**  
Outline format: The character outlines are only stored on the font by means of coordinates.



160. Diagram of the 202 fount manufacturing process; Linotype Ltd, *Genesis of a Typeface, From the Design to the Digital Form* [1987]  
Frisket cutting is not shown here as photographic friskets are now usually produced; or else drawings are scanned in using the Ikarus system.

Drawings by D. Yandle -

The exact replication of analogue artwork in digital format was not possible, yet the pattern, which has run throughout printing history,<sup>21</sup> of using new technology to imitate the products of previous technologies was repeated even here. Major fount manufacturers who embraced the technical process of digital photocomposition initially sought to reproduce their existing founts, however inappropriate, in the new format. In order to reassure customers, comparisons were made between the output of the newer and the later technologies - the latter usually showing inferior results.<sup>22</sup> In fact, Mergenthaler not only wanted to digitize all its existing founts, which made good commercial sense, but it also began by emulating the typesetting programs designed for filmsetting instead of taking advantage of the freedom presented by the new technical changes.<sup>23</sup>

The request to implement the Bengali script on the Linotron 202 was met with the customary response of favouring imitation rather than innovation. Whilst no film founts had been made of the hot-metal Bengali No. 2 designs, Linotype still possessed the drawings that had been prepared for punchcutting. The first customer who wished to purchase a 202 for setting Bengali was Ananda Bazar Patrika Ltd, also the first customer of the Bengali Linotype. It therefore seemed convenient, logical, and economic to use the existing drawings. The plan was to unitize the artwork prior to frisket-cutting and digitization. It was hoped that readers of *Ananda Bazar Patrika* would not object to the unavoidable discrepancies between the output of the old and the new founts.

The notion of emulating all the defects of the linecaster merely to pander to reader conservatism could not be considered laudable. Early trials of cutting

21. See above, chapters 2, 6 and 10.

22. See Jonathan Seybold, 'The Linotron 202', p. 9. It should be added that some founts were digitized in anticipation of future improvements in resolution and digitizing techniques.

23. See Jonathan Seybold, 'The Linotron 202', p. 8.

friskets from newly-unitized artwork emphasized the limitations of such an approach. Not only would digital founts inherit the deficiencies of the hot-metal designs, but problems would soon be encountered in digitizing letterforms designed for another method of composition.<sup>24</sup> Other factors led Linotype to the conclusion that the mere re-processing of existing founts was inappropriate and retrogressive. The adaptation of Devanagari for the V-I-P was not as successful as Linotype would have wished. 'old' was not necessarily 'best'; Bengali No. 2, irrespective of kerning problems, had not proved entirely satisfactory. Moreover, the investment of intensive research and finance into the enormous technical development of digital photocomposition merited a certain degree of investment in the area of type design. Upon the recommendation of Balasubramanian, then managing director of Linotype Associates India Private Ltd,<sup>25</sup> the responsibility for the design and implementation of new founts and the typesetting scheme fell to the department of Typographic Research and Development of Linotype-Paul Limited<sup>26</sup> situated in London.<sup>27</sup>

The function of the typeface formed the department's first consideration. The brief received from Ananda Bazar Patrika was for Linotype-Paul to produce a text typeface with a complementary bold fount for its daily Bengali language newspaper, which was to be printed by offset-lithography in Calcutta.<sup>28</sup> In time, the founts might be used for different publications such as magazines and books also published by Ananda Publishers Private Ltd. The style of type design constituted another major consideration. The criteria commonly regarded as being essential to a good text face, as described by John Dreyfus, were clearly not applicable to the hot-metal Bengali No. 2 designs:

24. Described below; see also Frutiger, *Type Sign Symbol*, pp. 41 and 44.

25. Bala, as he was known, was a respected figure in the Indian printing industry; he died 23 Jan 1982.

26. Project undertaken by Fiona Ross, then research assistant; 1979 head of Language Research and Development; 1985 manager of Typographic R & D.

27. In 1979 the department moved to Cheltenham; in 1987 Linotype-Paul Ltd became Linotype Limited.

28. The printing of the daily *Ananda Bazar Patrika* was converted to offset-litho in June 1982.



The eye must be able to read a text type without difficulty or distraction, but at the same time the human mind must derive some degree of conscious or unconscious pleasure from the impression which the design creates.<sup>29</sup>

Nor were the hallmarks of good design apparent:

the qualities to be looked for in a text type are the absence of any marked peculiarities in the letters, and the ease with which the complete set of letters combine.<sup>30</sup>

It had to be established whether Ananda Bazar Patrika desired what has aptly been described as 'ersatz design'<sup>31</sup> or whether the customer was receptive to change. In June 1979 Linotype-Paul wrote to the works manager of Ananda Bazar Patrika Ltd, Mr P. K. Mukherji, with suggestions to alter three characters, viz.  $\text{f}$  ,  $\text{y}$  , and  $\text{t}$  :

please find enclosed three rough drawings<sup>32</sup> which are suggestions for alternative designs of three basic characters, viz. nos. 156, 157 and 164. In the past our typeface has received criticism regarding the shapes of the vowel signs which had been restricted by the limitations of hot metal. Since these limitations no longer apply, it is possible to implement any changes of design you may consider necessary. Your newspaper, however, has always been associated with the original typeface, and you may naturally feel it would be preferable to keep to the original design.<sup>33</sup>

Ananda Bazar Patrika's approval of the proposed revisions effectively gave Linotype licence to re-evaluate the design of all the letterforms and to conceive a new design that took advantage of the flexibility of digital photocomposition to achieve quality comparable to that of Latin founts typeset from the same device.

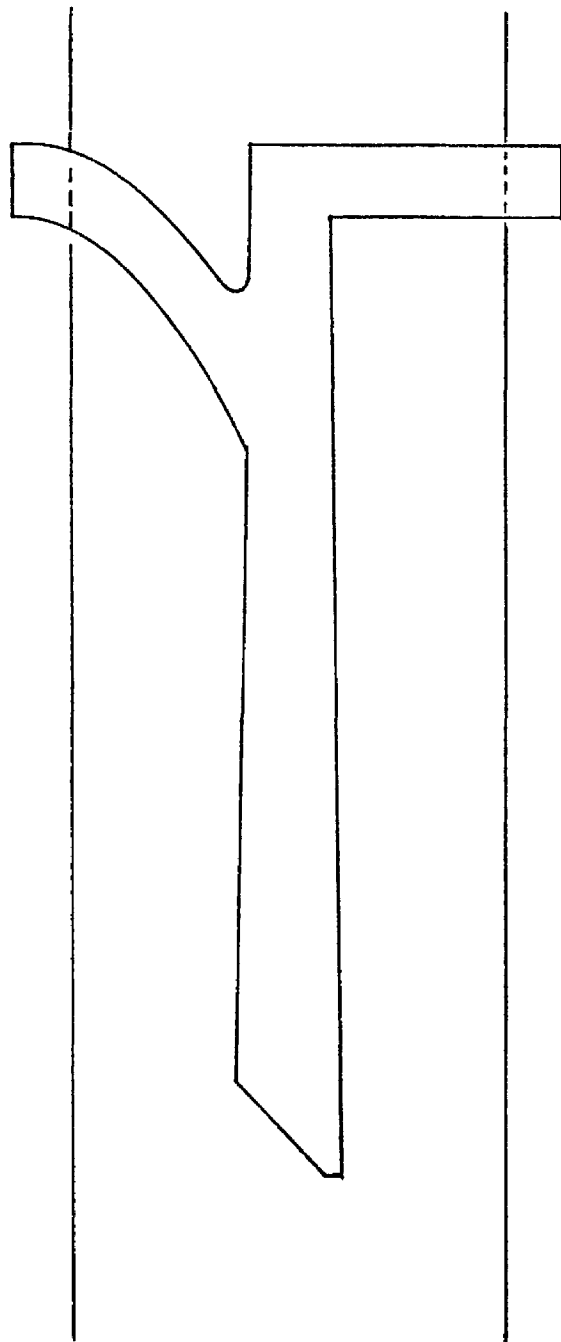
29. John Dreyfus, 'A Turning Point in Type Design', *Visible Language*, XIX, no. 1 (Winter, 1985), pp. 17-18.

30. Dreyfus, *ibid*, p. 20.

31. Hermann Zapf, 'Future Tendencies in Type Design', *Visible Language*, XIX, no. 1, p. 26.

32. Only one is extant; see pl. 161.

33. Ross to P.K. Mukherji, 6 June 1979.



161. Sketch of revised vowel sign sent to Ananda Bazar Patrika

Notwithstanding ethical and copyright issues, it seemed pointless to imitate previous Bengali designs originally conceived for now invalid political, religious, or commercial reasons.<sup>34</sup> Yet these typefaces, discussed in previous chapters, contain noteworthy characteristics which could assist in defining the qualities desirable for new Bengali typeforms. It was necessary to observe manuscript forms and the circumstances surrounding the genesis of earlier founts in order to distinguish between the various characteristics which made up the final letterform image: those characteristics forming an intrinsic part of the design style; those serving purely functional purposes; those resulting from the misinterpretation of the structure of the letterforms; and those due to the constraints of the typefounding or typesetting technology. Research into the evolution of Bengali typeforms therefore played an essential part in formulating a design concept for the 202 founts: the opportunity existed to appreciate the legacy of the past and to reinterpret letterforms for the future within the limitations of the new technology. This research,<sup>35</sup> supplemented by frequent discussions with Dr Mukherjee of the School of Oriental and African Studies and members of Ananda Bazar Patrika Ltd, notably Mr Aveek Sakar and Mr P. K. Mukherji, determined the specifications for the typeface and thereby the typesetting scheme.<sup>36</sup>

The department of Typographic Development proposed that the design of the new Bengali founts should display the elegance and vitality observable in the indigenous foundry types. It should possess good stroke contrast, in conformity with manuscript letter structures, and remain legible at small point sizes with

34. A point expressed by Dreyfus with regard to Latin founts; Dreyfus, 'Turning Point in Type Design', p. 15.

35. Undertaken by Fiona Ross.

36. Described below.

no diminution of the thin strokes. The proportions and spacing should be very carefully balanced: the widths of the bold face should not be restricted by those of the light fount.<sup>37</sup> The ability to kern characters was deemed essential; another prerequisite was the ability to position vowel signs and other modifiers with greater accuracy than had been achieved for V-I-P Devanagari. Conjuncts, particularly those with *raphalā*, should appear as integral characters, even if this entailed extending the character set: the *phalā* method would not be adopted. The hot-metal drawings formed the starting point, but a foundry fount recommended by Dr Tarapada Mukherjee, possessing many of the design characteristics which Linotype sought to incorporate, formed the yardstick (in terms of style and design quality) and an inspirational guide.<sup>38</sup> Having established the primary desiderata of the typeface design, Linotype-Paul chose to employ a designer with experience of non-Latin typefaces who was capable of producing artwork of the quality Linotype was seeking, and who would be prepared to work interactively with the Typographic department.<sup>39</sup> Accordingly, Tim Holloway, a freelance type designer and former employee of the company, was commissioned to design the artwork. It was also considered invaluable to have an impartial native speaker knowledgeable in Bengali lettershapes to assess the designs: Dr Tarapada Mukherjee agreed to vet the artwork prior to digitization.

The digitization of Bengali letterforms presented difficulties over and above those encountered for Latin types. The joining nature of the Bengali writing system did not present a problem inasmuch as the connecting headline was simpler to achieve than with metal types due to the possibility of overlapping strokes by means of double-exposure. The consequent tight spacing favoured by

37. It will be recalled that the hot-metal Bengali founts were duplexed; see above, chapter 8.

38. See pl. 162. The Bengali section (prepared in association with G.M. Summers) of Hester Lambert's previously cited work *Introduction to the Devanagari Script* and a foundry heading face in use at Ananda Bazar Patrika (see pl. 163) formed other sources of reference.

39. Fiona Ross was to provide the artwork brief and design the typesetting scheme.

উভয়ই এই পরিকল্পনার মূলে। পূর্বে কোনো গ্রন্থের অঙ্গীভূত হয় নি এমন রচনাও এই গ্রন্থে সন্নিবিষ্ট। গ্রন্থসূচনায় বলা হয় : 'গল্পগ্রন্থাবলী হইতে বাছিয়া পাঠ্য-পুস্তক ব্যতীত কোনো বই এ পর্যন্ত প্রকাশিত হয় নাই। এইবার আমরা গল্প-গ্রন্থাবলী হইতে বাছিয়া 'সঙ্কলন' বাহির করিতেছি। গল্প ও উপন্যাস ভিন্ন আর সকল রকম লেখাই ইহাতে আছে।... লেখাগুলি বিষয় অনুযায়ী ভাগ করিয়া লেখার তারিখ অনুসারে সাজানো হইয়াছে।'

বিশ্বভারতী গ্রন্থনবিভাগ কর্তৃক রবীন্দ্রনাথের নূতন গ্রন্থ (কাব্য) প্রকাশিত হল 'পুরবী', ১৩৩২ শ্রাবণে (১৯২৫)। মুদ্রণসৌষ্ঠব আর সামগ্রিক পরিকল্পনা অবশ্যই প্রশংসনীয়—রবীন্দ্র-গ্রন্থপ্রকাশের মান কী হওয়া উচিত তাও যেন নির্দেশ করেছে। এর অল্পকাল পরে ১৩৩২ অগ্রহায়ণে প্রকাশিত হয় 'প্রবাহিণী', গীতাঞ্জলি-গীতিমাল্য-গীতালি-পরবর্তী যুগের বহু এবং বিচিত্র রবীন্দ্রগীতের সুপরিকল্পিত সংকলন, কাব্যমূল্যেও যা অতুলনীয়। গ্রন্থনসৌষ্ঠব পূর্ববৎ অথবা বেশি। মলাটে গ্রন্থ এবং গ্রন্থকারের নাম মুদ্রিত সুন্দর রবীন্দ্র-লেখাক্ষনে—ক্রমশ এই রীতির প্রচলন হয়েছে অধিকাংশ রবীন্দ্রগ্রন্থে। যা হোক, পুরবীর প্রসঙ্গে ফেরা যাক। ইণ্ডিয়ান প্রেস সর্বশেষ রবীন্দ্রগ্রন্থ প্রকাশ করেন 'শিশু ভোলানাথ' ১৯২২ সেপ্টেম্বরে। তার পরে এই নূতন গ্রন্থ বা কাব্য পুরবী, প্রকাশ ১৯২৫ সালে, মাঝে তিন বৎসরের 'দীর্ঘ' ব্যবধান। রবীন্দ্রনাথ বিশ্বভারতীর সর্বাঙ্গীণ পরিকল্পনায় ও সংগঠনে ব্যাপৃত, দূর প্রাচ্যে আর পাশ্চাত্যের নানা দেশে অধিকাংশ সময় পরিভ্রমণে রত, এ অবস্থায় নূতন রচনার, বিশেষত কাব্যরচনার আবেশ আবহাওয়া আর স্ফুটন অল্পই। অথচ অপ্রত্যাশিত ভাবে সেই স্ফুটন এবার এল জাহাজে অসুস্থ



photocomposition<sup>40</sup> gave rise to the danger of characters clashing (a problem Linotype had previously encountered with Arabic founts), or setting so tightly so as to resemble conjunct characters. The use of the 54-unit system for character spacing resolved many difficulties, and the facility to kern was of tremendous benefit to the Bengali script, but limitations also existed here.

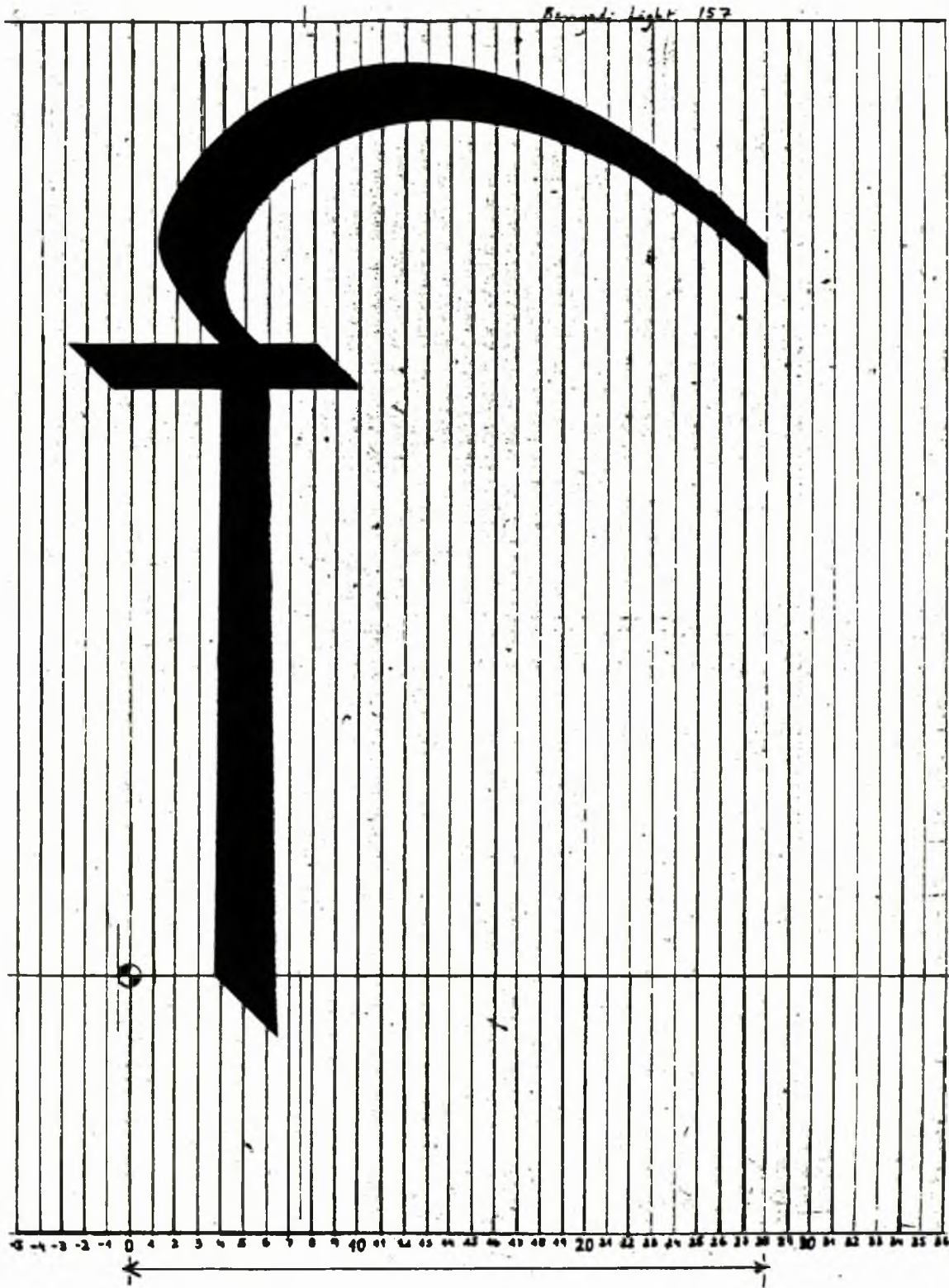
All characters had to be drawn within the limits of an em-square which, for the purpose of determining character widths, was divisible into 54 sections, or units. In the case of the 202 there were 9 additional units available on the left and right for kerning only, but this amount of kern was insufficient for the Bengali vowel signs  $\text{ঐ}$  and  $\text{ঔ}$  : the solution was to offset the character  $\text{ঐ}$  (157) by 9 units in addition to the 9-unit kern. The scanner could only cope with 9 units of kern, and thus the character had to be scanned in its entirety and the width doctored during editing.<sup>41</sup> A feasibility test was conducted at the firm of Stempel AG<sup>42</sup> in Frankfurt where the artwork would be digitized. In consequence, the positioning and amount of kern of the vowel signs  $\text{ঐ}$  and  $\text{ঔ}$  determined the positioning and maximum width of the non-kerning characters, and thereby the dimensions of the typeface. It was important that the amount of kern taken up by these characters, particularly 157, did not eat into the width allocation of the non-kerning characters, nor that the hot-metal constraint of a minimum character width of 5 units<sup>43</sup> be imposed. The intended method for creating conjuncts demanded some very wide letterforms; on the other hand, the vowel signs were extremely narrow. Tim Holloway described the situation :

40. See P. Karrow, *Digitale Speicherung von Schriften*, (Hamburg, 1987), p. 10.

41. See pl. 164. The design size was 12 point.

42. This renowned German foundry was established in 1895; it has now been absorbed into Linotype AG.

43. Of eighteenthths, i.e. 15 of 54.



164. Kerning vowel sign drawing



[ঐ] is the only character that needs so much right hand kern. As it represents one of the vowels, its frequency may justify its position (its effective 18 units kern) and the consequent loss of the first 9 units past zero on all characters. So, Bengali widths will be counted from +9 giving a maximum counting width of 54 (at + 63) which will be O.K. for the Light whose widest character falls within 45 units (i.e. left hand side bearing on +54) and allows 9 units for thickening up in the Bold.<sup>44</sup>

Once the positioning of the kerning vowel signs was established, a spacing pattern could be developed, as Tim Holloway explained in a note enclosed with some drawings sent to Linotype for frisket-cutting on 10 February 1981:

You will notice that the light face characters<sup>45</sup> are not centred in their widths. Also you will see that the other alphabet characters are not centred. The reason is that the light face was spaced to suit the kerning vowel signs.

Once the position of the vowel signs was fixed characters 123 ঐ and 116 ঐ were drawn as spacing guides for other alphabet characters. (The spacing is a compromise between what looks well in the middle of ঐ . . . . ঐ and ঐ . . . . ঐ )

After the conjuncts, the brackets were spaced with 123 and 116. Then figure 366 ঐ was spaced between brackets and the rest of the figures in the middle of 366 and 366.

The punctuation was more difficult because of the kerns on the top left and bottom right of certain alphabet characters. The comma (& semi colon) were checked with 123 ঐ and 159 ঐ and with 133 ঐ . Quotes were checked with 111 ঐ and 640 ঐ .

I hope you can follow this as I am using the same spacing pattern on the Bold.

Another facility played a crucial part in character spacing, namely accent-placement. In order to reduce the number of ligatures required, it was decided to 'float' the subscribed and superscribed vowel signs and modifiers into their correct locations in relation to each character and to each typestyle, while taking care to examine problems caused by the varying degrees of thickness in

44. Holloway to Byrne, 23 Mar 1980.

45. These were additions to the fount requested by Ananda Bazar Patrika.

the vertical strokes<sup>46</sup> and connections with rounded letterforms.<sup>47</sup> The method by which the 'floating' characters would be positioned was dependent on special programming software; until it was devised, it was not possible to finalize the drawings.

Yet another difficulty concerned the size of the character set. By means of written and verbal communications with Ananda Bazar Patrika Ltd the range of characters to be typeset had been established. Since Linotype-Paul had decided in the interests of quality, to dispense with half characters for generating conjuncts, a means was required of overcoming the fount size limitations introduced by mechanical composition in order to represent all the required letterforms. The 240-character fount capacity of the 202 was insufficient to meet the requirements of the proposed manner of composition; again, software was required to merge fount units.

Problems not peculiar to non-Latin typefaces, but due to the new technology also presented themselves. One of these concerned the shaping of strokes. It had been decided to take advantage of the hitherto impossible opportunity to have an unbroken headline that was sheered diagonally as in the formal written hand. Another design feature considered important was the subtle flaring of the principal vertical strokes. This feature was difficult to reproduce in digital founts since the detail would be lost at small sizes, creating a lump in the stem, and exaggerated at large sizes, causing a step-like effect, or the 'jaggies'.

Chuck Bigelow described this dilemma in *The Seybold Report*:

Another unwanted effect of digitization can be the loss of fine detail. If the raster is too coarse in comparison to the design, many of the subtle and refined details which give a type design its quality will be lost. The thickness of a stroke, a hairline or a serif can no longer

46. Compare the vertical stems of ॢ and ॣ in pl. 165.

47. A great deal of time was spent on character fit with accents; the 54-unit system was very constraining for this task.

ক ত দ প ষ ম

কু তু দু পু ষু মু

ক ত দ প ষ ম

কু তু দু পু ষু মু

be as the designer intended, but must be rounded off to some integer number of scan lines. Similarly, subtle curves may have to be rendered in a cruder fashion to fit within the digitizing pattern.

In general, the ability of a typesetter to render detail accurately is a function of the writing stroke spacing (the more strokes per em the better), and the size and sharpness of the writing spot (the smaller the sharper the better). As you can see, there are some conflicts here: a soft writing spot can hide some of the jagged appearance at the expense of losing fine character detail.<sup>48</sup>

Hermann Zapf had encountered problems of this nature with the adaptation of his typeface, Optima, for digital composition. He writes:

digitizing my Optima roman presented many difficulties. The well-balanced shape of the stems is contrary to the digital principle, especially in low resolutions. . . . The design must be reduced to a heart-breaking compromise. The answer to this problem is that Optima was never designed for digital storage. If I had been asked, I would have done a new design, used another principle and another name, but would have tailored it to the needs and limitations of today's equipment.<sup>49</sup>

Trials of Optima set at sizes equivalent to Bengali newspaper text indicated that the flared vertical strokes of the proposed Bengali fount were worth retaining,<sup>50</sup> but proper control over editing was required.<sup>51</sup>

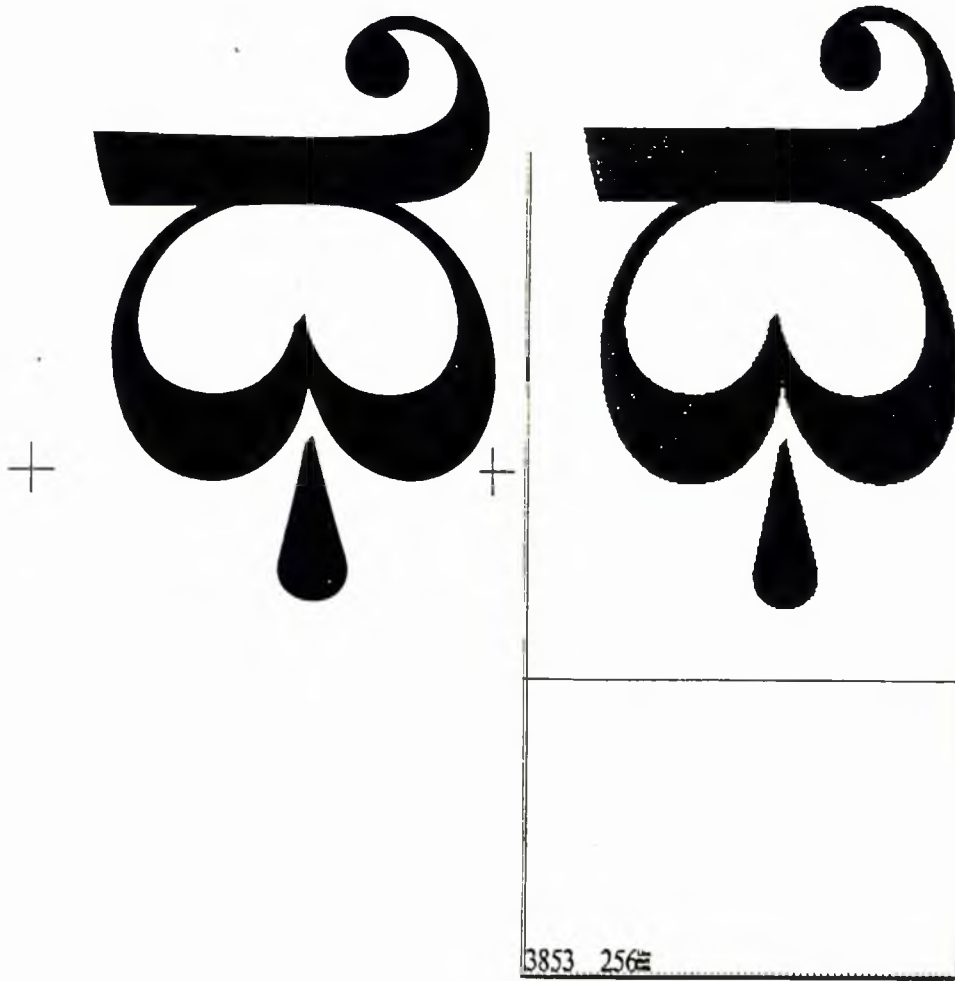
Compromises in design were indeed inevitable due to technological limitations, the reluctance to deviate far from current accepted Bengali newspaper setting, and time constraints. The progress of the project was punctuated by frustrations similar to those experienced in the development of the hot-metal Bengali founts for the Linotype machine. Although the design concept for the 202 founts was conceived in 1978, Ananda Bazar Patrika did not switch over to production of

48. Bigelow, 'Technology and the Aesthetics of Type', p. 15.

49. Zapf, 'Future Tendencies in Type Design', p. 29.

50. However, in the case of the Linotype digital Kannada fount (see pls. 166 and 167), it was found necessary to eliminate the slight curve in the crest of the characters, which had been designed to add vitality to the typeface.

51. The editing of the Bengali founts was undertaken at Stempel AG by people skilled in editing, but who had no knowledge of the script.



*finished drawing  
(not full size)*

*versatec output*

## ಕಲೆಯ ಬಲೆ

ದೇವಾಲಯದ ಗೋಡೆಯಲ್ಲಿ ಮೊದಲು ಆನೆಗಳ ಸಾಲು, ಅನಂತರ ಸಿಂಹಗಳ ಸಾಲು, ಸವಾರರನ್ನೂ ಹೊತ್ತಿರುವ ಕುದುರೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ಲತೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ರಾಮಾಯಣ, ಮಹಾ ಭಾರತ, ಮುಂತಾದ ಕಥೆಗಳ ಚಿತ್ರಗಳು ಇದೇ ರೀತಿ ಮೇಲಿನವರೆಗೆ ಹನ್ನೆರಡು ಹಂತಗಳಲ್ಲಿ ಕಲೆಯ ಬಲೆಯನ್ನು ಶಿಲ್ಪಿಗಳು ನೇಯಿದ್ದಾರೆ. ಇದೆಲ್ಲದಕ್ಕೂ ಹೆಚ್ಚಿನ ದಂದರೆ ಮೇಲು ಭಾಗದಲ್ಲಿ ಗೋಡೆಗೆ ಜೋಡಿಸಿರುವ ಮದನಿಕೆ ವಿಗ್ರಹಗಳು, ಇವು ಅತಿ ನಾಜುಕಿನ ಕೆತ್ತನೆ ಕೆಲಸ ದಿಂದ ಕೊಡುವ. ಈ ರೀತಿಯ ಒಟ್ಟು ನಲವತ್ತೆರಡು ಮದನಿಕೆ ವಿಗ್ರಹಗಳು ದೇವಾಲಯದ ಸುತ್ತ ಇವೆ. ದೇವಾಲಯದ ಹೊರ ನಾರೀಮಣಿಯರು-ಇದಕ್ಕೆ ಕೆಲವು ಊದಾ ಹರಣಗಳು.

ದೇವಾಲಯದ ಗೋಡೆಯಲ್ಲಿ ಮೊದಲು ಆನೆಗಳ ಸಾಲು, ಅನಂತರ ಸಿಂಹಗಳ ಸಾಲಲು, ಸವಾರರನ್ನೂ ಹೊತ್ತಿರುವ ಕುದುರೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ಲತೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ರಾಮಾಯಣ, ಮಹಾ ಭಾರತ, ಮುಂತಾದ ಕಥೆಗಳ ಚಿತ್ರಗಳು ಇದೇ ರೀತಿ ಮೇಲಿನವರೆಗೆ ಹನ್ನೆರಡು ಹಂತಗಳಲ್ಲಿ ಕಲೆಯ ಬಲೆಯನ್ನು ಶಿಲ್ಪಿಗಳು ನೇಯಿದ್ದಾರೆ. ಇದೆಲ್ಲದಕ್ಕೂ ಹೆಚ್ಚಿನ ದಂದರೆ ಮೇಲು ಭಾಗದಲ್ಲಿ ಗೋಡೆಗೆ ಜೋಡಿಸಿರುವ ಮದನಿಕೆ ವಿಗ್ರಹಗಳು, ಇವು ಅತಿ ನಾಜುಕಿನ ಕೆತ್ತನೆ ಕೆಲಸ ದಿಂದ ಕೊಡುವ. ಈ ರೀತಿಯ ಒಟ್ಟು ನಲವತ್ತೆರಡು ಮದನಿಕೆ ವಿಗ್ರಹಗಳು ದೇವಾಲಯದ ಸುತ್ತ ಇವೆ. ದೇವಾಲಯದ ಹೊರ ನಾರೀಮಣಿಯರು-ಇದಕ್ಕೆ ಕೆಲವು ಊದಾ ಹರಣಗಳು.

ದೇವಾಲಯದ ಗೋಡೆಯಲ್ಲಿ ಮೊದಲು ಆನೆಗಳ ಸಾಲು, ಅನಂತರ ಸಿಂಹಗಳ ಸಾಲು, ಸವಾರರನ್ನೂ ಹೊತ್ತಿರುವ ಕುದುರೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ಲತೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ರಾಮಾಯಣ, ಮಹಾ ಭಾರತ, ಮುಂತಾದ ಕಥೆಗಳ ಚಿತ್ರಗಳು ಇದೇ ರೀತಿ ಮೇಲಿನವರೆಗೆ ಹನ್ನೆರಡು ಹಂತಗಳಲ್ಲಿ ಕಲೆಯ ಬಲೆಯನ್ನು ಶಿಲ್ಪಿಗಳು ನೇಯಿದ್ದಾರೆ. ಇದೆಲ್ಲದಕ್ಕೂ ಹೆಚ್ಚಿನ ದಂದರೆ ಮೇಲು ಭಾಗದಲ್ಲಿ ಗೋಡೆಗೆ ಜೋಡಿಸಿರುವ ಮದನಿಕೆ ವಿಗ್ರಹಗಳು, ಇವು ಅತಿ ನಾಜುಕಿನ ಕೆತ್ತನೆ ಕೆಲಸ ದಿಂದ ಕೊಡುವ. ಈ ರೀತಿಯ ಒಟ್ಟು ನಲವತ್ತೆರಡು ಮದನಿಕೆ ವಿಗ್ರಹಗಳು ದೇವಾಲಯದ ಸುತ್ತ ಇವೆ. ದೇವಾಲಯದ ಹೊರ ನಾರೀಮಣಿಯರು-ಇದಕ್ಕೆ ಕೆಲವು ಊದಾ ಹರಣಗಳು.

ದೇವಾಲಯದ ಗೋಡೆಯಲ್ಲಿ ಮೊದಲು ಆನೆಗಳ ಸಾಲು, ಅನಂತರ ಸಿಂಹಗಳ ಸಾಲಲು, ಸವಾರರನ್ನೂ ಹೊತ್ತಿರುವ ಕುದುರೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ಲತೆಗಳ ಸಾಲು, ಅದರ ಮೇಲೆ ರಾಮಾಯಣ, ಮಹಾ ಭಾರತ, ಮುಂತಾದ ಕಥೆಗಳ ಚಿತ್ರಗಳು ಇದೇ ರೀತಿ ಮೇಲಿನವರೆಗೆ ಹನ್ನೆರಡು ಹಂತಗಳಲ್ಲಿ ಕಲೆಯ ಬಲೆಯನ್ನು ಶಿಲ್ಪಿಗಳು ನೇಯಿದ್ದಾರೆ. ಇದೆಲ್ಲದಕ್ಕೂ ಹೆಚ್ಚಿನ ದಂದರೆ ಮೇಲು ಭಾಗದಲ್ಲಿ ಗೋಡೆಗೆ ಜೋಡಿಸಿರುವ ಮದನಿಕೆ ವಿಗ್ರಹಗಳು, ಇವು ಅತಿ ನಾಜುಕಿನ ಕೆತ್ತನೆ ಕೆಲಸ ದಿಂದ ಕೊಡುವ. ಈ ರೀತಿಯ ಒಟ್ಟು ನಲವತ್ತೆರಡು ಮದನಿಕೆ ವಿಗ್ರಹಗಳು ದೇವಾಲಯದ ಸುತ್ತ ಇವೆ. ದೇವಾಲಯದ ಹೊರ ನಾರೀಮಣಿಯರು-ಇದಕ್ಕೆ ಕೆಲವು ಊದಾ ಹರಣಗಳು.

their newspaper on the Linotron 202 until February 1981. The light fount was completed first and it was fortunate for Linotype-Paul that Ananda Bazar Patrika was pleased with the result, since the sum of all the modifications to the original Bengali Light No. 2 designs amounted to quite a new image.

The most marked difference between the two fount styles is the re-design of the very hooked kerning vowel signs to give a generous kern now permissible in photocomposition. The flourish occurring above the headline of  $\text{ঔ}$  and  $\text{ঔ}$ , has also been amended, and all flourishes have been made more consistent. As in foundry setting, two forms of  $\text{ঐ}$  and  $\text{ঐ}$  have been designed for initial or medial use. A special software routine handles the positioning of all the subscripts, even in the case of very deep conjuncts, to create forms which would have comprised ligatures in founder's type. The program also copes with the different locations of the *repha*  $\text{ঁ}$ , accurately specified according to reference sources, and the *candrabindu*  $\text{ে}$ , which has to be raised over characters possessing a flourish.

The vowel sign  $\text{ঐ}$  has been restored to its customary form, i.e. a vertical stroke branching at the headline with a joining segment on the right and an upstroke above the headline - a characteristic that persists throughout the typeface in all the relevant characters, e.g.  $\text{ঐ}$ ,  $\text{ঐ}$ ,  $\text{ঐ}$ , etc. The loop of  $\text{ঐ}$  has been redesigned so that its tail connects with the upstroke of these particular characters, effectively creating ligatures. All other simple consonants and conjuncts possessing a right-hand vertibar have been re-spaced so that they also appear to form a ligature when conjoined with  $\text{ঐ}$ . This design feature, which accords with calligraphic practice, has the benefit of relieving the severity of the headline and increasing

the character count.<sup>52</sup> As discussed above, all principal vertical stems have been flared.

The 202 possesses a greater number of conjuncts than the original hot-metal founts; additions include  $\text{क्ष}$ ,  $\text{श्र}$ ,  $\text{ज्ञ}$ ,  $\text{य}$ , and  $\text{श्}$ . In December 1980 Tim Holloway remarked:

the addition of a wider range of conjunct forms to the 202 fount should have been attempted only with a change in scale of the hot-metal artwork in proportion to the em-square. (This, however, was advised against because of the lack of time available.) In that case the more complex forms could have been more open. It was necessary to compromise between the openness of these forms and good positioning of their floating signs within optical limits.<sup>53</sup>

In keeping with the style of the new founts, a number of existing hot-metal sorts have been revised: among these is  $\text{क्ष}$ , whose loop was found too small; the sort  $\text{श्र}$ , which was totally mis-shapen; the over-condensed sorts  $\text{य}$  and  $\text{य}$ . Similarly, the shape of the phoneme  $\text{श्र}$  when represented by *raphalā* in conjunct forms has been lengthened to harmonize with the more generous-looking vowel signs and characters. The forms assumed by  $\text{य}$  and  $\text{य}$  in conjuncts also depart from the original Linotype designs. Their new forms accord more with founder's type and 'facilitate the development of the Bold version - giving a better distribution of colour ( as in  $\text{य}$ , for example, and  $\text{य}$  ).<sup>54</sup> The figures have also been revised with reference to founder's type, making them more open and the closed counters more even.

In addition, the same space between the medial vowels with consonants has been given to all other characters. The rather indeterminate weight of the hot-metal headline has been thinned and the difference in the depth of the strokes,

52. An important objective for newspaper composition. See pls. 168, 171 and 172.

53. Holloway to Byrne, 10 Dec 1980.

54. Ibid. Compare pls. 169 and 170.

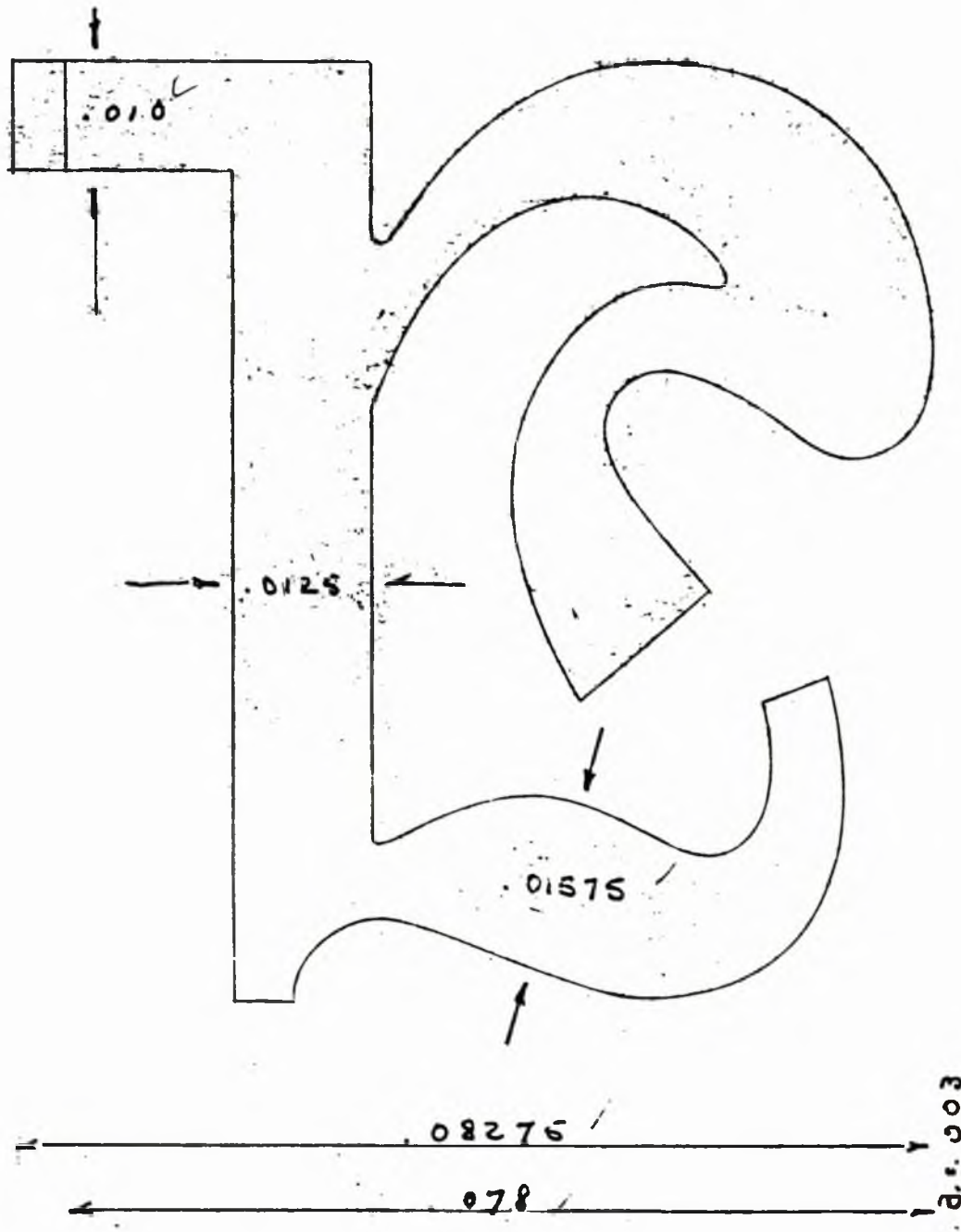


আমাদের পোস্টমাস্টার কলিকাতার ছেলে। জলের মাছকে ডাঙ্গায় তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টারেরও সেই দশা উপস্থিত হইয়াছে। একখানি অন্ধকার আটচালার মধ্যে তাঁকহার অফিস। অদূরে এটি পানাপুকুর একবং তাহার চার পাড়ে জঙ্গল। কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত নহে। বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে না। অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকে। এই কারণে স্থানীয় লোকের সহিত তাহার মেলামেশা হইয়া উঠে না। অথচ হাতে কাজ অধিক নাই। গল্পগুচ্ছ, রবীন্দ্রনাথ।

আমাদের পোস্টমাস্টার কলিকাতার ছেলে। জলের মাছকে ডাঙ্গায় তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টারেরও সেই দশা উপস্থিত হইয়াছে। একখানি অন্ধকার আটচালার মধ্যে তাঁকহার অফিস। অদূরে এটি পানাপুকুর একবং তাহার চার পাড়ে জঙ্গল। কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত নহে। বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে না। অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকে। এই কারণে স্থানীয় লোকের সহিত তাহার মেলামেশা হইয়া উঠে না। অথচ হাতে কাজ অধিক নাই। গল্পগুচ্ছ, রবীন্দ্রনাথ।

আমাদের পোস্টমাস্টার কলিকাতার ছেলে। জলের মাছকে ডাঙ্গায় তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টারেরও সেই দশা উপস্থিত হইয়াছে। একখানি অন্ধকার আটচালার মধ্যে তাঁকহার অফিস। অদূরে এটি পানাপুকুর একবং তাহার চার পাড়ে জঙ্গল। কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত নহে। বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে না। অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকে। এই কারণে স্থানীয় লোকের সহিত তাহার মেলামেশা হইয়া উঠে না। অথচ হাতে কাজ অধিক নাই। গল্পগুচ্ছ, রবীন্দ্রনাথ।

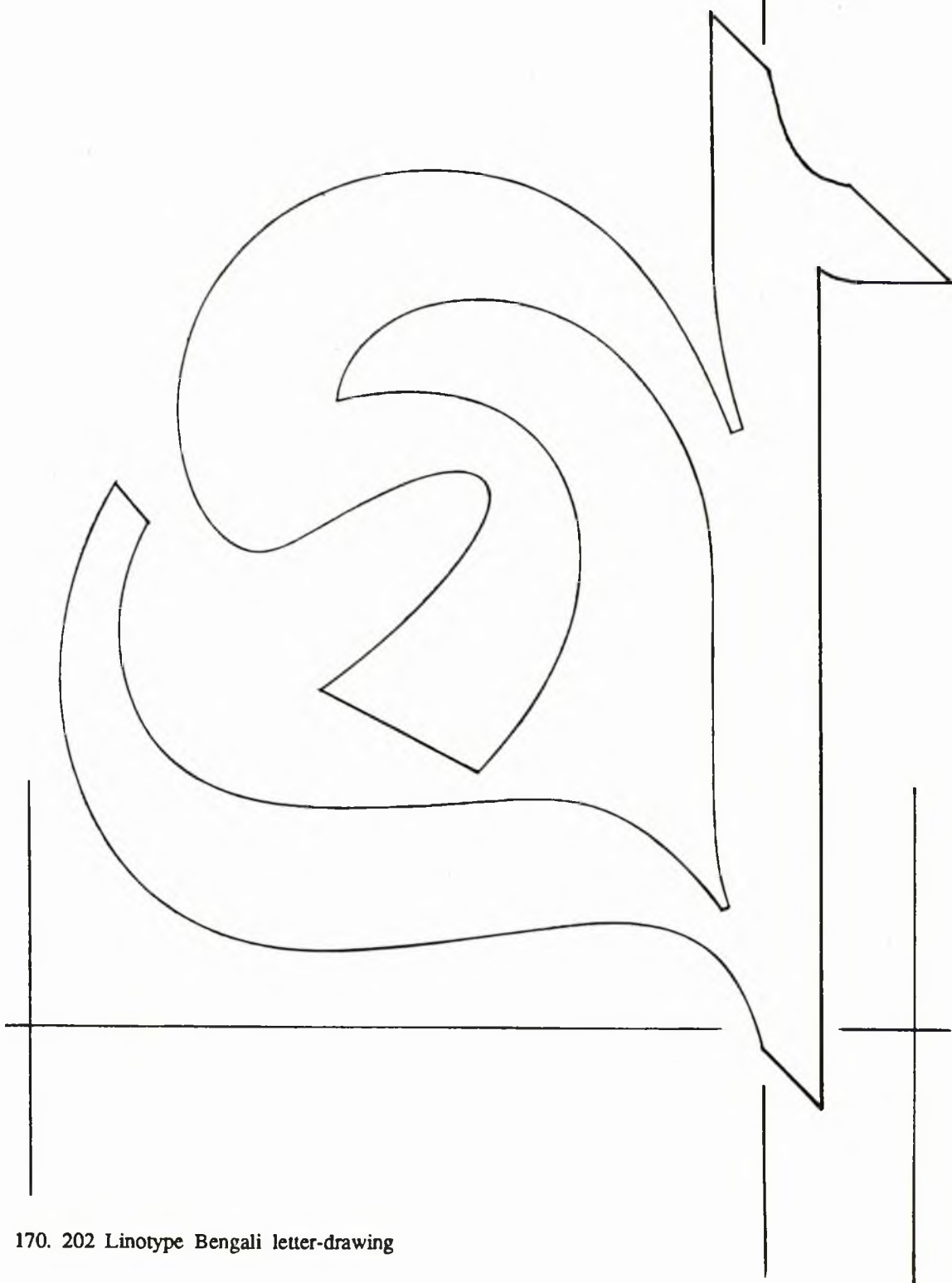
আমাদের পোস্টমাস্টার কলিকাতার ছেলে। জলের মাছকে ডাঙ্গায় তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টারেরও সেই দশা উপস্থিত হইয়াছে। একখানি অন্ধকার আটচালার মধ্যে তাঁকহার অফিস। অদূরে এটি পানাপুকুর একবং তাহার চার পাড়ে জঙ্গল। কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত নহে। বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে না। অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকে। এই কারণে স্থানীয় লোকের সহিত তাহার মেলামেশা হইয়া উঠে না। অথচ হাতে কাজ অধিক নাই। গল্পগুচ্ছ, রবীন্দ্রনাথ।



169. Linotype hot-metal Bengali letter-drawing

Bengali DDL

184



170. 202 Linotype Bengali letter-drawing



## কাশ্মীরে হত ৫ আহত ৫০০

শ্রীনগর, ২২ মে— জম্মু ও কাশ্মীরে নির্বাচনের দিন যত এগিয়ে আসছে, হান্দামা ততই বাড়ছে। নির্বাচনী সংগ্রামে পিচন মারা গিয়েছেন, আহত হয়েছেন পিশতর্ষিক লোক। অবস্থা সামাল দিতে আজ ১০ ব্যাটালিয়ন বি এস এফ ও সি আর পি এফ কাশ্মীরে গিয়ে পৌঁছেছে। আগামী দিন তিনজনের মধ্যে সেখানে আরও সীমান্ত নিরাপত্তা বাহিনী এবং কেন্দ্রীয় সংরক্ষিত পুলিশ বাহিনী পাঠানো হবে। জম্মুতেও দুই ব্যাটেলিয়ন অ্যাগ সামরিক বাহিনী চলে গিয়েছে। জম্মু ও কাশ্মীরে নির্বাচনী ইতিহাসে এই প্রথম এত ব্যাপক হারে হান্দামা দেখা গিল। এই প্রথম সেখানে একটিতে নির্বাচনে সতর্কতামূলক ব্যবস্থা হিসাবে মোট ৩২ ব্যাটেলিয়ন বি এস এফ ও সি আর পি এফ মোতায়েন করা হচ্ছে।

প্রধানমন্ত্রী ইন্দিরা গান্ধী ধর্ম যখন নির্বাচনী প্রচারে ওই বাক্যে বলেছেন তখনই এই হান্দামা ও গণগোল নিঃসন্দেহে তাঁকে বিচলিত করে তুলেছে। আজ সন্ধ্যায় জম্মুতে রাজাপাল বি কে নেহরু প্রধানমন্ত্রীর সঙ্গে দেখা করেন। ঘটনাক্রমে তাঁদের মধ্যে কথোপকথন হয়। রাজাপাল শ্রীমতী গান্ধীকে সাম্প্রতিক আইন শৃঙ্খলা পরিস্থিতি সম্পর্কে অবহিত করেন এবং আগামী ৫ সপ্তাহের নির্বাচন উপলক্ষে কী ব্যবস্থা নেওয়া হয়েছে তাও জানান।

গতকাল শ্রীনগরের কাছে সোনাওয়ারিতে কাশ্মীর পিপলস ফনফানসনের কর্মী অলি মহম্মদ ওয়ানি খুন হন। ওই দিনের জানক মুখপত্র জানান, ওয়ানি যখন তাঁর সহকর্মীদের নিয়ে একটি টাকে করে নির্বাচনী প্রচারে যাচ্ছিলেন তখন শাসক দল জাতীয় সম্মেলনের কর্মীরা সেই টাকটির ওপর আক্রমণ চালায়। ওয়ানি গুরুতর আহত হন। হাসপাতালে তিনি মারা যান।

এদিকে কংগ্রেস (ই)-এর একজন মুখপাত্র অভিযোগ করেন, গত ২৪ ঘণ্টার মধ্যে জাতীয় সম্মেলনের কর্মীদের আক্রমণে তাঁর দলের প্রায় ৫০ জন আহত হয়েছেন। কয়েকজনের আঘাত গুরুতর। প্রদেশ কংগ্রেস (ই)-এর পুলিশের কাছে অভিযোগ করা হয়েছে।

টোলিকোনে হুমকি দেওয়া হয়েছে, বলে পুলিশের কাছে অভিযোগ করা হয়েছে। মুখাম্মদী ফারুক আবদুল্লাহ ইতিমধ্যে আগওয়ামি আকশন কমিটির নেতা মিকাহাজ মৌলভি ফারকের সঙ্গে দেখা করেছেন। মুখাম্মদীর আজ জম্মুতে যাওয়ার কথা ছিল, কিন্তু তিনি এই সফর ২৪ তারিখ পর্যন্ত পিছিয়ে দিয়েছেন। তবে বেগম শেখ আবদুল্লাহ আজ জাতীয় সম্মেলনের সাধারণ সম্পাদক শেখ নাজির আহমেদকে সঙ্গে নিয়ে ভোতা, পুঞ্চ ও রাঙ্কোরি জেলায় সাতদিনের নির্বাচনী সফরে গেরিবে পড়েছেন।

কাশ্মীরের মুখাম্মদী ডাঃ সার্কক আবদুল্লাহ বলেছেন, তিনি স্বৈচ্ছায় পদত্যাগ করতে রাজি আছেন, কিন্তু তার আগে প্রমাণ করতে হবে যে নির্বাচনের কাজে সরকারি প্রচার বাটান হয়েছে। গতকাল উত্তর কাশ্মীরে এক নির্বাচনী প্রচারলজায় তিনি একথা বলেন।

## পাকিস্তান আক্রমণ হানলে



মেদিনীপুরের কসবা গ্রামে পঞ্জাগেত নির্বাচনের প্রচার চলাচ্ছে।

দুপুর পর্যন্ত  
নির্জলা ছিল

পঞ্চাগেত নির্বাচন '৮৩  
এবার বাঁকুড়ায় সি পি এমের

as found in the imprint *Viśvabhāratī Granthanavibhāga*, has been emulated<sup>55</sup> with the intention that the characters appear suspended from the headline, rather than situated on the baseline in the customary posture of Latin typeforms.

As indicated above, special programming was intimately linked to the design of the typeface. Indeed the typeface design, software, and typesetting scheme were inseparable; the latter two determining the nature of the artwork. The font-handling and typesetting software, devised by Dr Mike Fellows at Linotype-Paul specifically for Bengali composition on the 202, was fundamental to the realization of the typesetting scheme.<sup>56</sup> The scheme formed the essence of the design concept and can claim to have revolutionized keyboarding procedures for Bengali and all Indian scripts by the introduction of the *phonetic keyboard*.

Since the advent of mechanical typesetting, the keyboard had become a vital element in typographic composition.<sup>57</sup> Whilst accelerating composing speeds, it has in the case of Indian scripts severely restricted the design of the founts by limiting the character set, introducing *half-forms*,<sup>58</sup> and, in some cases, dictating character widths. In other instances, its very nature prohibited the introduction of the script onto a typesetting device, for example Bengali on the Linofilm or the Linoterm.<sup>59</sup> In addition to the above restrictions, the keyboards had proved cumbersome to use, as is evidenced by the large Monotype hot-metal Bengali keyboard and more recently, the Devanagari V-I-P keyboard.<sup>60</sup> Sometimes identical shapes existed on the keyboard, obliging the operator to select the appropriate one for a given situation;<sup>61</sup> the person keying was required to think 'graphically', analyzing each lettershape in order to build up the desired image. Moreover, in order to typeset every character on the fount, each sort had to be

55. *Viśvabharati Granthanavibhāga*, (Calcutta, 1974); see pls. 162 and 173.

56. Devised by Fiona Ross at Linotype-Paul.

57. See above, chapters 8, 9 and 10.

58. Generally, the smaller the number of keys, the greater the use of *half-forms*.

59. See above, chapter 10.

60. See above, chapter 10, and pls. 153 and 154.

61. e.g. vowels signs for use at different heights.

হয়ে পড়াতে আর দক্ষিণ-আমেরিকার সুদূর প্রবাসে বিশ্বামের কারণে। এই পথে ও প্রবাসে লেখা কবিতা নিয়েই 'পুরবী' (১৩৩২); আর পথে পথে লেখা প্রধানত নিজের সঙ্গে নিজের আলাপন গৌণে গৌণে 'পশ্চিমযাত্রীর ডায়ারি'—'জাভা-যাত্রীর পত্র'-সহ পরে যার সংকলন 'যাত্রী'তে, ১৩৩৬ জ্যৈষ্ঠে।

পুরবী-প্রবাহিণীর পর থেকে কবির তিরোধান পর্যন্ত অব্যাহত-ভাবে নূতন নূতন গ্রন্থ, সংকলনগ্রন্থ, পূর্বরচনার রূপান্তর ( গল্প কবিতা থেকে নাটক / নাটক কবিতা থেকে নৃত্যনাট্য ), যাকে নূতন, না ব'লে উপায় নেই—এ-সবই রবীন্দ্রশৃষ্টির নিরবচ্ছিন্নতার সাক্ষ্য বহন করে— বিশ্বভারতী গ্রন্থনবিভাগ থেকে পর পর যে ভাবে গ্রথিত ও প্রকাশিত হতে লাগল তার মধ্যে বিশেষভাবে উল্লেখ করা যায়—

চিরকুমার সভা / নটীর পূজা / রক্তকরবী ( ১২২৬ )

রবীন্দ্র-লেখাঙ্কন নিয়ে : লেখন ( ১২২৭ )

যাত্রী / যোগাযোগ / শেষের কবিতা / তপতী ( ১২২২ )

রবীন্দ্রনাথ-অঙ্কিত প্রচ্ছদ, রঙিন নামপত্র ও লেখাঙ্কন নিয়ে :  
মহুয়া ( ১২২৯ )

রাশিয়ার চিঠি ( ১২৩১ )

রবীন্দ্রনাথ-অঙ্কিত প্রচ্ছদে : বনবাণী ( ১২৩১ )

গানের কালক্রমিক সংকলন : গীতবিতান ১-২ ( ১২৩১ )

স্বনির্বাচিত কাব্যসংকলন : সঞ্চয়িতা ( ১২৩১ )

গীতবিতান ৩ / পরিশেষ / কালের যাত্রা / পুনশ্চ ( ১২৩২ )

ছুই বোন / মাহুঘের ধর্ম ( ১২৩৩ )

রবীন্দ্রনাথ ও অস্ফাঙ্ক শিল্পীর নানাবর্ণ চিত্রভূষণে : বিচিত্রিতা  
( ১২৩৩ )

located on the keybank: additional characters could only be treated as Pi sorts, set by hand in hot-metal composition and called up by number in photocomposition. In the case of non-Latin founts, there were often as many as four characters situated on one key, requiring a fount change or different levels of shift<sup>62</sup> to access the required characters. In V-I-P Devanagari, for example, the *daṇḍa* was located on the shift of fount 2.

The keyboard device used to operate the V-I-P, called the MVP Editing Terminal, was also employed to drive the Linotron 202. It was possible, however, to alter its method of operation by means of software. Dissatisfied with the V-I-P keying procedures for Devanagari, the department of Typographic Development sought to dispense with the encumbrance of past limitations as a Linotype-Paul in-house document explains:

In the past, conjuncts have been formed, for typesetting purposes, by means of combining half forms - the half forms being engraved on the keytops. This has proved unsatisfactory since it not only necessitates the appearance of additional forms on the keyboard, which are hard to distinguish,<sup>63</sup> but also tends to produce distorted forms of characters. In digital photocomposition, there is no need to employ this method since we are able to store a great number of characters in the font which do not necessarily appear on the keyboard.<sup>64</sup>

Central to the operation of the *phonetic keyboard* was the *conjunct key*.<sup>65</sup> This key when used with the appropriate simple consonants in the desired sequence caused the requisite conjunct to be selected from the fount disc. The unshift or shift status of the key informed the program whether a two-character or three-character conjunct was required.<sup>66</sup> The nature of the keyboard was quite simple, its logic being based on the Indian phonological writing system: the keyboard contained the basic characters of the syllabary, vowel signs, modifiers,

62. Special commands had to be keyed before each fount change. The different shift levels, usually comprised unshift, shift and supershift.

63. e.g. *raphalās* of different lengths.

64. Fiona Ross, in-house document, *Indian Scripts for Photocomposition* (July, 1979), [p. 2].


65. Also termed the *conjunct button*.


66. Subsequently, supershift status of the *conjunct key* was introduced to access four-character conjuncts.



punctuation, numerals, mathematical signs, and typographical symbols. Since there were, relatively speaking, so few characters on the keyboard, the operator was able, barring a few exceptions, to associate one sound with each key. The distribution of the characters was determined according to the frequency counts conducted by Linotype-Paul, which differed considerably from previous counts due to the absence of *half-forms* and conjunct characters on the keyboard.<sup>67</sup> The simple consonants were placed in such a way that certain common sequences which formed conjuncts could be typed with ease; various phonetic groups traditionally classed together were placed together, e.g. labials, sibilants, and so forth. The aspirates were ranged along the top row in relation to the locations of their unaspirated counterparts.

The mode of operation was straightforward. All the characters of the syllabary were keyed directly, usually in the unshift mode. All superscripts and subscripts, comprising vowel signs and modifiers, including the *repha*, were keyed directly after the character they affected; the software placed them in their correct lateral and vertical positions relative to each character in the font and to each typestyle.<sup>68</sup> Punctuation and numerals were keyed directly.

Conjuncts were keyed phonetically by means of the *conjunct key*,<sup>69</sup> the software automatically selected the correct form. Special forms of consonants combined with vowels, e.g. , were also keyed as conjuncts; where no conjunct existed on the font, a *halanta* (hasanta) sign was automatically inserted between the two or three consonants.<sup>70</sup> The *phonetic keyboard* therefore enabled the operator to touch-type phonetically without having to recognize and memorize the locations of a great number of *half-forms*. Furthermore, the keyboard imposed

67. Except for very frequent combinations such as .

68. As distinct from a typeface, which may comprise a whole family of typestyles (i.e. related designs), e.g. light, bold, italic, etc.

69. The sequence is illustrated in pl. 174.

70. This is rare in Bengali.

Examples of *Phonetic Keyboard* keying sequences

using the *Conjunct Key [c]*.

Conjuncts/Ligatures :

[c] ক and ক gives ক্ক

[c] ক and ত gives ক্ত

[c] গ and ্ gives গ্গ

shift of [c] ন and দ and র gives ন্দ্র

Vowel signs are keyed directly :

গ and ্ gives গ্

[c] ক and ক and ্ gives ক্ক্

few, if any, restrictions on the typeface design. Conjuncts or ligatures could be added to the fount, to keep up with new trends in the transliteration of foreign words or names,<sup>71</sup> without revising the keyboard layout. Moreover, if some users required alternative forms of the same conjunct, these could be included in the fount and the appropriate one selected by the fount specification tables (FSTs).<sup>72</sup>

Since the logic of the *phonetic keyboard* was based upon the Indian phonological system, it is curious that such a solution to Indian keyboarding problems had not been conceived of before. The answer perhaps lies in the fact that most keyboards and their layouts were designed by manufacturers of typesetting equipment who possessed only a rudimentary knowledge of the non-Latin script being implemented. Even when native speakers were consulted, the customary approach was to adapt the non-Latin script to the Western-made keyboard despite the consequent impairment to the typography: it was felt that the inferior print quality in Asia and other non-Western countries did not merit concern for the quality of the typeface, nor resources devoted to its production. The reverse attitude would have been more appropriate: typeset output should be of a high standard in order to compensate for low standards of printing.

The *phonetic keyboard* possessed several characteristics that would warn off many companies from undertaking its production. Firstly, it was unlike any other keyboard manufactured for typesetting Indian scripts; consequently there was no precedent to ensure its acceptability to the user and guarantee its commercial success. Secondly, it was only operable by native speakers due to the potentially unnerving fact that the majority of sorts were not to be found on the keyboard. But this presented no problem to the native speaker, who

71. e.g. Thatcher and Schultz.

72. An important requirement for Devanagari.

would instantly recognize<sup>73</sup> which simple consonants combined to create particular conjuncts (whose forms often bear scant resemblance to the characters from which they are derived). Thirdly, the manner in which the keyboard functioned in order to compose the script was only intelligible to those who had designed the typesetting scheme. This method of keyboard operation was software intensive:<sup>74</sup> software-generated characters and positioning routines being crucial to the typesetting scheme and the design of the typeface. Thus resources devoted to this aspect of the project were required, and also a belief in its viability. There existed one very obvious advantage: no special hardware was needed.

It took some time for Ananda Bazar Patrika to appreciate the way in which the keyboard operated, since it contravened customary perceptions of how keyboards should function. A note in Linotype-Paul's development files states:

[they] haven't fully understood our keyboard layout as they still use half-forms, in fact [a] total mixture between our method and V-I-P Devanagari method losing all the advantages.

[The] Best answer would be to discuss it with them . . . he [P. K. Mukherji] appears to be under the impression that the conjunct button is used only to access those logotypes which exist on hot-metal matrices. The rest are built with half-forms.<sup>75</sup>

Notes taken during a subsequent meeting with P. K. Mukherji on the 19 March 1979 record his acceptance of the keyboard layout 'without reticence', once he had been explained its nature. But owing to the conviction that characters with subscribed vowel signs constituted logotypes, as the joins were not perceptible, Ananda Bazar Patrika continued for quite some time to specify additional characters with vowels signs as separate sorts.

73. Since this is how the scripts are taught to native speakers, as is evidenced by many primers published in India.

74. And therefore was only realizable after the advent of computerised typesetters.

75. Fiona Ross, c. Feb 1979.

Ananda Bazar Patrika also had a requirement to typeset Hindi. Since the Bengali-English keyboard was so uncluttered and the same operators were to be used for setting Hindi, as well as for reasons of economy, Linotype-Paul was requested to design a combined keyboard layout for Bengali, Devanagari, and English. The nature of the *phonetic keyboard* rendered this request realizable.

The typesetting scheme devised for Bengali formed the blue-print for Linotype-Paul's development of Devanagari, and subsequently all other Indian scripts, for digital photocomposition. Only the syllabary, punctuation, numerals, and mathematical and typographical symbols were required on the keyboard. Since the major differences in character frequency in Bengali and Hindi text occur in the use of conjuncts, it was possible to locate the basic *akṣaras* and vowel signs (with some notable exceptions) on the same keys in both scripts. The FSTs devised by the Typographic department informed the typesetting program of all the idiosyncracies of each script (different 'accent' positioning, ligature or conjunct formation, and so forth) without troubling the operator who had only to select the appropriate font. As the same typesetting program was used for all languages, it was simple to mix the different scripts within the same piece of work. Similarly, the software coped simultaneously with the justification logic for Bengali, Hindi, and English.<sup>76</sup> Linotype-Paul's intention was to produce 'an efficient keyboard which is simple and fast to operate and yet can handle all the complexities of the Indian languages'.<sup>77</sup>

The introduction of digital photocomposition forms a particularly significant landmark in the history of non-Latin printing types. It revolutionized Indian

76. Contained in the typesetting program.

77. Ross, *Indian Scripts for Photocomposition*, [p. 2.]

language setting by permitting the implementation of the *phonetic keyboard*,<sup>78</sup> whose flexibility gave the type designer and fount manufacturer an unprecedented degree of freedom. The impoverishment of Bengali type designs and typography, consequent of the mechanization of typefounding and composition (and not ameliorated by filmsetting), could now be arrested. It became possible by means of technical advances, and through innovation not emulation, to equal and surpass the quality of foundry types<sup>79</sup> - provided three essential skills were utilized: design expertise, technical proficiency and linguistic knowledge. However, as evidenced by the sympathetic handling of the Linotype 202 Bengali founts<sup>80</sup> in the daily newspaper *Ananda Bazar Patrika*, the final image of the printed Bengali character continues to rest in the hands of the user.

78. It has been emulated by other manufacturers, but in a half-hearted manner that still employs half-forms to create the majority of the conjuncts.

79. i.e. in terms of design; the quality of the image (e.g. the edge quality) is debatable, as discussed above.

80. These founts were later converted for other typesetters developed by Linotype, e.g. the CRTronic Series 300, and the Linotronic 300 and 500.

## Conclusion

The development of the printed Bengali character from movable metal type to digital photocomposition occurred chiefly at the hands of those to whom the Bengali language and script were foreign. Yet the execution of successful Bengali founts was contingent upon the generally unrecorded participation of native Bengali artisans and advisers. The evaluation of Bengali type designs spanning two centuries confirms that a combination of skills is requisite to the production of high-quality non-Latin founts whether in metal, film, or digital form.

The evaluation of all type designs - Latin as well as non-Latin - is inevitably subjective, but criteria independent of personal taste and current fashion exist by which a typeface design can be assessed. These fall into two intimately-related categories: those applying to its aesthetic form; and those relating to its functional aspect.<sup>1</sup>

An understanding of the writing system to be represented and an appreciation of typographic traditions are fundamental to a satisfactory design. Although the styling of the stroke terminations, counter shapes, stroke contrast, and such like are issues of taste, the clarity and constancy of the image<sup>2</sup> they produce contribute to the quality of a typeface. Other elements include observance of proportional relationships and evenness of texture (all the lettershapes of the fount should be readily differentiated and yet form a cohesive whole).

Even if such criteria have been observed in the type designer's original artwork, they may be doctored by the intervening hand of, *inter alia*, the

1. It is not within the scope of this thesis to discuss such issues as whether 'form' follows 'function', or whether a type design is separable from its material form.
2. In some cases deliberate 'distressing' is intentional.

punchcutter, frisket cutter, digitiser, compositor, or they may be necessarily altered by the resolution of the typesetter, printing surface, etc.<sup>3</sup> Although the precise intentions of the designer can only be speculated, the final printed image usually affords an indication of how skilfully an original design has been interpreted.

The functional aspect of a typeface relates to its suitability for its intended purpose, such as readability at small text sizes and good character fit at display sizes. Walter Tracy writes, 'it is the proper balancing of the functional and the aesthetic which we look for in the work of the type designer'.<sup>4</sup> New designs are often occasioned by the demand for founts that fulfil a specific function as, for example, John Lawson's SB2 designed to set the Bengali Bible in one pocket-sized volume and, more recently, Matthew Carter's Bell Centennial typeface designed for the American telephone directory.<sup>5</sup> However, since the advent of photocomposition type designs are frequently expected to have a more universal application than the earlier founts; one master size is often utilized to generate all point sizes.<sup>6</sup> The type designer or fount manufacturer cannot prevent the user from setting a fount at unsuitable sizes, or from manipulating it electronically in a way that was never intended.<sup>7</sup>

A few type designers are noted for not concerning themselves<sup>8</sup> with the technical aspects of fount manufacture or printing, but such an approach is untenable for Indian vernacular founts. As has been observed, the composing

3. If the technology is the limiting factor, some designers deliberately compensate for this in their artwork, but the resulting founts are often outdated by subsequent improvements to the technology.

4. Tracy, *Letters of Credit*, p. 32.

5. See Sebastian Carter, *Twentieth Century Type Designers*, (London, 1987), pp. 9-10. Other categories for which type faces have been specifically designed include corporate identities, school-books, celebrations of events, e.g. Linotype's 'Centennial' typeface by Frutiger, etc.

6. See Dreyfus, 'Turning Point in Type Design', pp. 20-21.

7. And with the limited range of Indian founts, the temptation to do this is even greater. Some typefaces have been designed to withstand such distortion, e.g. *Icone*, first issued by Linotype in 1980.

8. See Sebastian Carter, *Twentieth Century Type Designers*, p. 137.



technique was central to the design of Wilkins's first Bengali fount and of each successive design, for it determined the method of character formation. Thus a typesetting scheme must be designed in tandem with the drafting of the letterforms for the appropriate technology. All the attributes of a fount must be determined before finished drawings or patterns are undertaken:<sup>9</sup> these relate to methods of character joining, conjunct formation, subscript and superscript positioning, kerning, justification, etc. In defining these attributes, as in the choice of design style, linguistic knowledge is essential. It is in this area that Charles Wilkins and Vincent Figgins succeeded where Joseph Jackson failed.

A survey of Bengali printing types over a period of two hundred years shows the printed Bengali character to have evolved considerably: CW1 is not acceptable today; Figgins's VF1 now appears dated and would find no place in magazine publications; the use of hot-metal Linotype Bengali is avoided in quality imprints; and 202 Linotype Bengali, which follows traditional manuscript forms more closely than either CW1 or VF1, possesses a degree of sophistication unimaginable before the late 1970s.

CW1, as the first cogent attempt to integrate the aesthetic, functional, technical, and linguistic aspects of Bengali type design, inevitably became the model for subsequent founts. As already noted, the temptation to imitate is very strong in the field of type design and fount manufacture.<sup>10</sup> Plagiarist designs, however, rarely improve on originals; and when typeface designs are converted from one technology to another, the result is frequently unsatisfactory.<sup>11</sup> The imitator may capture the sensibility of the original letterform image, but he can seldom be

9. Conversely, the character design can dictate the composing technique.

10. See the Epilogue.

11. Bigelow makes the point that a 'designer skilled and knowledgeable enough to perceive and render all the subtle nuances of another major craftsman is really too good to do a slavish copy'; Bigelow, 'Technology and the Aesthetics of Type', p. 7.

aware of the historical decisions taken by the original designer, which may no longer be appropriate.

The latest trend in Indian vernacular typography sees an extension of this imitative trend: namely, the desire to produce Latin-style founts. The customary reason given is for the vernacular types to match Latin founts in bi-lingual publications, but such publications have existed (in satisfactory form) for over two centuries.<sup>12</sup> The fashion for designing Latin-style founts appears to be merely indicative of a desire to produce new typefaces with the minimum effort and expense. In the case of Devanagari types, it has produced a plethora of very dull and poorly-executed designs. The best of these are cleverly constructed, but they lack vitality, being stripped of their native characteristics. A Westernized non-Latin fount may indeed be eye-catching and suitable for display purposes, but it is too distracting for continuous reading.<sup>13</sup> A text face needs to be transparent to the reader<sup>14</sup> who 'can absorb it at high speed and with the minimum resistance'.<sup>15</sup> The much-needed means to improving the quality of non-Latin typography is not to be found in producing new designs in the guise of Latin timesteps. New typefaces can evolve from the indigenous tradition of inscribed, penned, or printed letterforms. Bengali type history shows type designs of enduring quality to be those formed not only by the marriage of all the necessary skills,<sup>16</sup> but also by innovation, not imitation.

The preceding chapters have shown the impact of technological change upon Bengali type design and typography to be greater than on Latin founts due to

12. Moreover, a number of fount manufacturers offer over 1500 Latin founts which must include some suitable for this purpose.

13. Although the reading public may become habituated to it.

14. See Beatrice Warde, 'The Crystal Goblet or Printing should be Invisible', *The Crystal Goblet; Sixteen Essays on Typography* (London, 1955).

15. Frutiger, *Type Sign Symbol*, p. 39.

16. See above, chapter 11.

the nature of the Bengali script. Complaints have often been voiced by fount manufacturers regarding the difficulties of non-Latin scripts, and by designers regarding the constraints of type manufacturing and typesetting technologies. But each technology has afforded new opportunities to non-Latin scripts; none more so than digital photocomposition.<sup>17</sup> However, the history of the development of the first fount of digital Bengali typeforms coupled with a new composing system illustrates not only the potential of digital composition for handling non-Latin scripts; it also demonstrates a new methodology for the typographic development of vernacular typeforms. A methodology that raises the following questions:

What letterforms are required? How much space/codes/memory is available for character storage? What are the design parameters? How are all the letterforms to be constructed? How will they be accessed? (Is new software required?)

What typefaces exist? What is the typographic tradition? What research material is available? What function is the typeface to serve? What equipment will be used for its composition? What design style is appropriate?<sup>18</sup> How will it be printed? When is it needed?

Such perennial questions reflect the need to integrate different resources to realize a common end. They are as pertinent to the Arabic script as to Amharic, and as relevant to high-resolution digital photocomposition as to low-resolution dot matrix printers; a failure to answer them reflects in the design.

If non-Latin types are no longer to be regarded as secondary to those of Latin, nor vernacular founts as peripheral to machine sales,<sup>19</sup> then a new approach to the typographic development of indigenous scripts is vital - an approach that stretches typesetting and typefounding techniques and resources to achieve

17. Particularly with the decreasing costs in fount manufacture and typesetting equipment; see below, the Epilogue.

18. Not necessarily in this order: a design may be first thought of, but then the artwork re-fashioned by other factors. This list of questions is not intended to be exhaustive.

19. A problem common to designers of Latin and non-Latin types.

optimum results. The history of the printed Bengali character confirms that it is the manner in which new techniques are embraced by designers and manufacturers that determines the final printed image.

## Epilogue

One topic that has been omitted from this thesis is the development of Bengali typewriter characters. Similarly, the subject of letterforms designed specifically for proofing purposes has not been studied. They are relatively unimportant in Bengali typography in comparison to typeforms; it cannot be claimed that typewriter letterforms or low-resolution character shapes have impinged upon the area of Bengali type design,<sup>1</sup> although this situation is changing.

The influence of the typewriter on editing devices for the Latin script has been noted.<sup>2</sup> Unlike the QWERTY and AZERTY layouts, typewriters manufactured for Indian scripts have not possessed standard keyboard layouts. Moreover, the extremely limiting technology of the Indian language keyboards (necessitating the use of *half-forms*, 'dead' keys, etc.) and the poor-quality typewriter faces were not worth emulating purely for the sake of standardization.

Initially the character sets designed for Video Display Terminals (VDTs) were intended as a means of identifying keyed matter, i.e. for proof-reading, editing, and correcting. These alphabets were functional and the demand for aesthetic quality was minimal; the intention was not to emulate typeset output. In the case of Indian scripts, the constraints of VDTs were often inhibitory.<sup>3</sup> The MVP editing terminal used by Ananda Bazar Patrika Ltd had severe limitations: only those characters situated on the keyboard (i.e. not conjuncts or ligatures) could be displayed on the screen; vowel signs were set adjacent to their host characters; and all characters were represented by means of the very constraining eight by twelve dot-matrix. Nonetheless, this editing system was

1. In the case of the 202 founts, screen shapes were not designed until after the type face had been completed.
2. Seybold, *Digital Typesetting*, p. 16; see also *ibid.* pp. 23, 256 and 252.
3. In fact, the restriction of the Linoterm prohibited Linotype's implementation of the Bengali script on this device.

considered satisfactory<sup>4</sup> since it enabled the operator to identify keyed text.<sup>5</sup> But editors and writers needed intelligible copy for proof-reading; typeset output for this purpose was extremely expensive. Thus devices known as 'intelligent printers'<sup>6</sup> were employed to reproduce on cheaper proofing paper the letterforms that would appear on the more costly phototypeset output.<sup>7</sup>

The introduction of more sophisticated VDTs and personal computers during the last few years has led to the demand for screen founts that accurately represent the phototypeset output. In the development of Bengali proofing founts for photocomposition by Linotype, the improvement of screen/dot-matrix printer forms<sup>8</sup> was necessarily gradual. The first step was to extend the dot-matrix area, both in depth and width, and to improve the position of the floating subscripts and superscripts.<sup>9</sup> The next step was to display conjuncts and ligatures, by means of new software, different hardware, and revised character shapes. This was a costly enterprise, and one not considered worthwhile by many manufacturers because these additional facilities were not required for the Latin script.

The final step was to show line-endings that matched the final copy.<sup>10</sup> This task was complicated in the case of non-Latin scripts by the larger character sets, the complex kerning tables, and because character sets could vary according to type style.<sup>11</sup> The result was termed WYSIMOLWYG (what you see is more or less what you get), since the same character designs (but

4. The benefits of the MVP (which are not the subject of this study) outweighed the limitations of the character display which did not compromise the typeset output.
5. A skilled operator rarely looked at the screen when keying in copy for typesetting.
6. i.e. which could interpret the keystrokes and typesetting commands entered by the operator; see pl. 175.
7. The greater cost of such printers was offset by the even greater cost of importing photographic film or paper to India.
8. The dot-matrix printer was driven in the 'graphics mode' i.e. it output exactly what was shown on the screen; see pl. 176.
9. It has not been possible to obtain information from other manufacturers regarding the development of screen founts. See pl. 176, fig. 2.
10. Called by Linotype 'counting' programs; see pl. 176, fig. 3.
11. Copyfitting has always been more complex than for Latin scripts due to the size of the character sets and the greater differences in character widths.

1 M39.3 H18 L22 F1 I10L 11 GL

আমাদের পোস্টমাস্টার কলিকাতার ছেলেগা জলের মাছকে ডাঙ্গায়  
তুলিলে যেবসম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টার-  
রেরও সেই দশা উপস্থিত হইয়াছেগা একখানি অন্ধকার আটচালার  
মধ্যে তাঁকহার অফিসগা অদূরে এটি পানাপুকুর একবং তাহার চার পা-  
ড়ে জঙ্গল । কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের  
ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত  
নহেগা বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে নাগা  
অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকেগা এই  
कारणे स्थानीय लोकের सहित ताहार मेलामेशा हईया उठे नाग  
हाते काज अधिक नईडा गल्लगुच्छ, रवीनदरनाथग

AS STOP

আমাদের পোস্টমাস্টার কলিকাতার ছেলে । জলের মাছকে ডাঙ্গায়  
তুলিলে যেবসম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমাস্টার-  
রেরও সেই দশা উপস্থিত হইয়াছে । একখানি অন্ধকার আটচালার  
মধ্যে তাঁকহার অফিস । অদূরে এটি পানাপুকুর একবং তাহার চার পা-  
ড়ে জঙ্গল । কুঠির গোমস্তা প্রভৃতি যে সকল কর্মচারী আছে তাহাদের  
ফুরসত প্রায় নাই এবং তাহারা ভদ্রলোকের সহিত মিশিবার উপযুক্ত  
নহে । বিশেষতঃ কলিকাতার ছেলে বিশেষ করিয়া মিলিতে জানে না ।  
অপরিচিত স্থানে গেলে হয়তো উদ্ধত নয় অপ্রতিভ হইয়া থাকে । এই  
कारणे स्थानीय लोकের सहित ताहार मेलामेशा हईया उठे ना । अथच  
हाते काज अधिक नई । गल्लगुच्छ, रवीन्द्रनाथ ।

আমাদের

পোস্টমাষ্টার কলিকাতার ছেলে । জলের  
মাছকে ডাঙ্গায় তুলিলে যেরষম অবস্থা হয়  
এই গণ্ড গ্রামের মধ্যে আসিয়া  
পোস্টমাষ্টারেরও সেই দশা উপস্থিত  
হইয়াছে । একখানি অঙ্ককার আটচালার মধ্যে  
তঁকহার অফিস । অদূরে এটি পানাপুকুর একবং  
তাহার চার পাড়ে জঙ্গল ।

আমাদের পোস্টমাষ্টার  
কলিকাতার ছেলে । জলের মাছকে ডাঙ্গায় তুলিলে  
যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া  
পোস্টমাষ্টারেরও সেই দশা উপস্থিত হইয়াছে ।  
একখানি অঙ্ককার আটচালার মধ্যে তঁকহার অফিস ।  
অদূরে এটি পানাপুকুর একবং তাহার চার পাড়ে  
জঙ্গল ।

আমাদের পোস্টমাষ্টার কলিকাতার ছেলে । জলের  
মাছকে ডাঙ্গায়  
তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে  
আসিয়া পোস্টমা-  
ষ্টারেরও সেই দশা উপস্থিত হইয়াছে । একখানি  
অঙ্ককার আটচালার  
মধ্যে তঁকহার অফিস । অদূরে এটি পানাপুকুর  
একবং তাহার চার পা-  
ড়ে জঙ্গল ।

আমাদের পোস্টমাষ্টার কলিকাতার ছেলে । জলের মাছকে ডাঙ্গায়  
তুলিলে যেরষম অবস্থা হয় এই গণ্ড গ্রামের মধ্যে আসিয়া পোস্টমা-  
ষ্টারেরও সেই দশা উপস্থিত হইয়াছে । একখানি অঙ্ককার আটচালার  
মধ্যে তঁকহার অফিস । অদূরে এটি পানাপুকুর একবং তাহার চার পা-  
ড়ে জঙ্গল ।

176. Fig. 1: Bengali phase 1 dot matrix character shapes; keyboard characters only  
Fig. 2: Bengali phase 2 dot matrix character shapes; with character selection  
Fig. 3: Bengali phase 3 dot matrix print out; with character selection and  
'counting'.  
Fig. 4: 202 Bengali typeset output of the same text



perhaps with a different character set) were used to depict each typestyle; a signifier on the screen indicated the fount being accessed.

The late 1970s saw the advent of laser printers capable of producing on plain paper near-typeset quality which created a new demand, viz. WYSIWYG (What You See [on the screen] is what you get). The resolution of laser printers vary from 300 dots per inch upwards and with the invention by Adobe Systems Inc. of a [computer] page description language called PostScript, documents could be created on personal computers and output either on low-cost laser printers or high quality laser typesetters.<sup>12</sup> The same became true for founts. Special applications software using PostScript enabled the personal computer user to design founts that could be output even on a high quality typesetter;<sup>13</sup> i.e. type design was now also in the hands of the non-professional designer. The result has been a rash of non-Latin founts.

True to the pattern that persists throughout the history of printing types, this fount-designing facility has not acted as an incentive to invention. The majority of non-Latin PostScript founts appear to be second-rate copies of well-known designs or hybrid founts that have gained acceptance for want of a better alternative. Inexperience in design is revealed by founts created with faults that have been encountered and subsequently resolved in previous type-manufacturing and typesetting technologies. In many instances, the badly-executed designs are further degraded by inadequate composing methods. These limitations are indicative of inadequate research and lack of appreciation of non-Latin type design traditions and typography. Furthermore, some founts which appear fairly adequate on a 300 d.p.i laser printer do not perform well when output as

12. i.e. resolution and device independent. PostScript has become an industry standard.

13. Provided it has a PostScript Raster Image Processor (RIP).

camera-ready copy on a Linotronic 300 at 2450 d.p.i.<sup>14</sup> The founts are not improved by the rough treatment they receive at the hands of the non-professional typographer in the world of 'desktop publishing'.

Although the low cost and ease of producing founts has meant an abundance of very poor designs, compromise character sets, and increased plagiarism, there now exists an opportunity to produce a multiplicity of type designs that can enrich the non-Latin typographic palette. However, as reiterated throughout this thesis, the creation of good quality founts depends on a positive correlation in technical, linguistic and artistic skills.

14. The Bengali fount of Dr Clinton Seely (University of Chicago) must rank as the best yet produced for a laser printer; but it was designed for the Xerox 9700, which apart from being costly, has no sizing mechanism and is not device independent; see pls. 177 and 178.

## 1. বিজ্ঞপ্তি

## কবিতা -

ত্রৈমাসিক পত্র। বর্ষারম্ভ আশ্বিনে। আশ্বিন, পৌষ, চৈত্র ও আষাঢ়ে প্রকাশিত। বার্ষিক চার টাকা, বর্ষায় চার টাকা চার আনা, প্রতি সংখ্যা এক টাকা। \* 'কবিতা'র গ্রাহক হ'তে হয় আশ্বিন থেকে— মনি-অর্ডরে বার্ষিক চাঁদা পাঠিয়ে কিংবা ডি.পি.তে। ষাণ্মাসিক গ্রাহক করা হয় না। সমস্ত চিঠিপত্রে গ্রাহক নম্বর উল্লেখ করা আবশ্যিক। \* প্রকাশের জন্য লেখা পাঠাতে হ'লে ঠিকানা-লিখা টিকিট-লাগানো খাম সঙ্গেই দেবেন—নয়তো পরে আর সম্পাদকের সিদ্ধান্ত জানানো সম্ভব নয়। নিজের কাছে প্রেরিত রচনার অনুলিপি রাখা সব সময় বাঞ্ছনীয়। \* সুসংস্কৃত বিত্তশালী বাঙালি ও ছাত্রসমাজে প্রচারের পক্ষে 'কবিতা' একটি উৎকৃষ্ট বিজ্ঞাপন-বাহন। বিজ্ঞাপনের মূল্য-পঞ্জী চিঠি লিখলে পাঠানো হয়। \* 'কবিতা'ই একমাত্র পত্রিকা, যাতে কবিতাভবনের সমস্ত বই, পত্রিকা ও পুস্তিকার বিজ্ঞাপন নিয়মিত প্রকাশিত হয়, অতএব কবিতাভবনের সঙ্গে অক্ষুণ্ণ যোগাযোগ রাখতে হ'লে 'কবিতা'র গ্রাহক হওয়াই শ্রেষ্ঠ উপায়।

## কবিতাভবন

২০২ রাসবিহারী এভিনিউ

কলকাতা ২৯

('কবিতা,' আশ্বিন ১৩৫৩, পৃঃ ৮।)

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3988. ....
3989. CHARACTER-SEQUENCE=131
3990. CHARACTER-WIDTH=0037
3991. COL=0001-0080
3992. ....XX.....
3993. ....XXXXX.....XXX.....
3994. ....XXXXXXXX.....XXXXXXXX.....
3995. ....XXXXXXXX.....XXXXXXXXXX.....
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3998. ....XXXXX.....XXXXX.....XXXXXXXXXXXX.....
3999. ....XXXXX.....XXXXXXXXXX.....XXX.XXXXX.....
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4029. COL=0079-0082
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