





मराठीचा विकास : महाराष्ट्राचा विकास  
नोंदणी क्र. एफ. १६०९४ (मुंबई)



महाराष्ट्र शासन  
मराठी भाषा विभाग

राज्य मराठी विकास संस्था



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## निवेदन

महाराष्ट्र राज्याचे सांस्कृतिक धोरण २०१० अंतर्गत मराठी भाषेतील प्रतिमुद्राधिकाराची (कॉपीराइटची) मुदत संपलेले दुर्मिळ ग्रंथ महाजालावर उपलब्ध करून द्यावे असे म्हटले आहे. त्यानुसार मराठी भाषा विभागाच्या आदेशाप्रमाणे (शासननिर्णय क्र. रासांधो १०१२/ प्र. क./२०१२/भाषा-३ दि. २८ मार्च २०१३) राज्य मराठी विकास संस्थेद्वारे असे ग्रंथ आणि नियतकालिके महाजालावर उपलब्ध करून देण्याचा प्रकल्प राबवण्यात येत आहे.

तथापि प्रतिमुद्राधिकाराच्या कक्षेत येणारे काही ग्रंथही प्रतिमुद्राधिकारधारकांची उचित अनुमती प्राप्त झाल्यास संस्थेद्वारे संगणकीकृत करून अभ्यासकांसाठी उपलब्ध करून देण्यात येत असतात. त्यानुसार ख्यातकीर्त मुद्रणतज्ज्ञ स्मृतिशेष श्री. बापूराव नाईक ह्यांचे काही महत्वाचे आणि संशोधनपर स्वरूपाचे ग्रंथ त्यांचे चिरंजीव श्री. अरुण नाईक ह्यांच्या अनुमतीने अभ्यासकांसाठी संगणकीय स्वरूपात उपलब्ध करून देण्यात येत आहेत.

सदर ग्रंथाचे प्रतिमुद्राधिकार स्मृतिशेष बापूराव नाईक ह्यांच्या कुटुंबीयांकडे असून केवळ अभ्यासकांच्या सोयीसाठी ही सामग्री त्यांच्या अनुमतीने आणि सहकार्याने महाजालावर उपलब्ध करून देण्यात येत आहे.

ह्या ग्रंथांच्या पीडीएफ प्रती आपण विनामूल्य उतरवून घेऊ शकता. असे करताना आपण खालील सूचना लक्षात घेऊन त्यांचे पालन करावे.

- १) सदर ग्रंथांच्या पीडीएफ प्रती ह्या वैयक्तिक वापरासाठी विनामूल्य उतरवून घेता येतील तसेच इतरांनाही विनामूल्य देता येतील. पण कोणत्याही कारणासाठी त्याचा व्यावसायिक वापर करता येणार नाही.
- २) सदर ग्रंथांचे दुवे इतरांना देताना त्यासाठी कोणतीही रकम आकारता येणार नाही.
- ३) पीडीएफ प्रतींवर असलेली राज्य मराठी विकास संस्थेची मुद्रा आपणास काढता येणार नाही.
- ४) आपल्या अभ्यासासाठी, संशोधनासाठी ह्या सामग्रीचा उपयोग करताना आपण योग्य तो श्रेयनिर्देश केला पाहिजे. वरील अटींचा भंग झालेला आढळल्यास कायदेशीर कारवाई करण्यात येईल.

स्पष्टीकरण : सदर सामग्री ही केवळ ऐतिहासिक दस्तऐवज म्हणून उपलब्ध करण्यात आली असून ह्या सामग्रीतून व्यक्त होणारी मते, विचारसरणी इ. त्या त्या लेखक, संपादक इ. कर्त्यांची आहे. त्यांपैकी कोणतेही मत, विचारसरणी इ. ह्यांचा पुरस्कार महाराष्ट्र शासन, मराठी भाषा विभाग, राज्य मराठी विकास संस्था ह्यांपैकी कुणीही करत नसून त्या त्या मताचे वा विचारसरणीचे दायित्व उपरोक्त विभागांवर असणार नाही.

अनुक्रमणिका



मराठीचा विकास : महाराष्ट्राचा विकास  
राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



GOVERNMENT OF MAHARASHTRA

# TYPOGRAPHY OF DEVANAGARI

## Volume Two

by

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अनुक्रमणिका

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२३/२४  
एडिओ  
कलेगापुर  
२६३४०  
पुणे  
२०२४

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
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# Typography of Devanagari

(Volume Two—Parts III, IV & V)





## PART THREE

### Devanagari Setting, by Hand, Mechanical and Photo

( Chapters XII to XV )

H 5447-22

अनुक्रमणिका

“ज्या”  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत





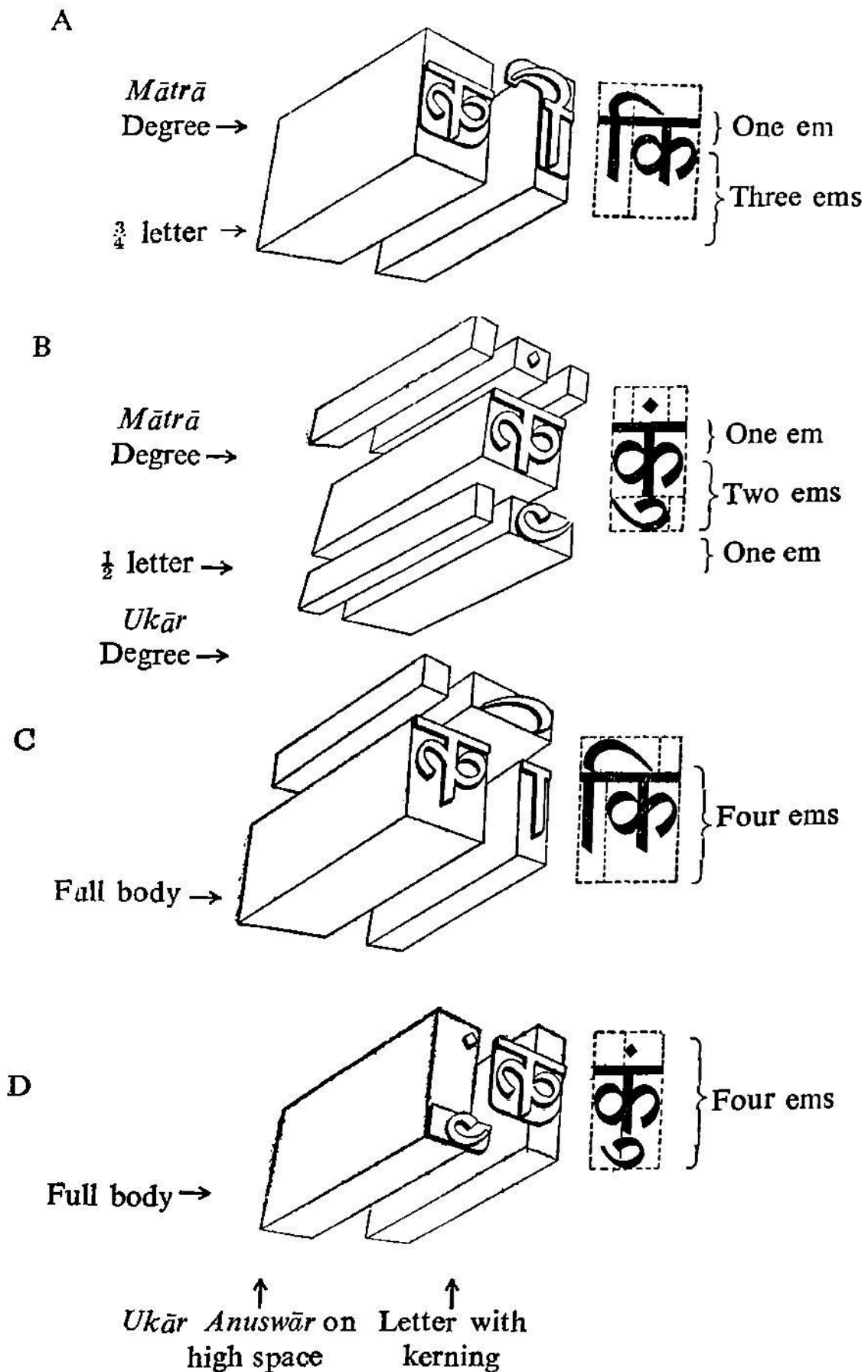


Fig. 96. Degree and Akhand Type

A NEW CONCEPTION IN DEVANAGIRI TYPE-SETTING

259. Ganesh Pandurang Vijapure, manager of the Kirloskar Press patented the Improved Vijapure Type in 1929. The object of his invention was stated as 'to add and to modify certain details in the existing printing types which will facilitate the work of composing by obviating the use of *degrees* as well as bring about an economy to the printer by reducing the number of types required to make up a complete fount.' Complete fount of the Vijapure type as patented is given on succeeding pages. The type sorts are classified and listed hereunder in three groups: (a) letters with verti-bar, (b) letters without verti-bar and (c) letters with central-bar:—

Table 55. Fount of Vijapure Type

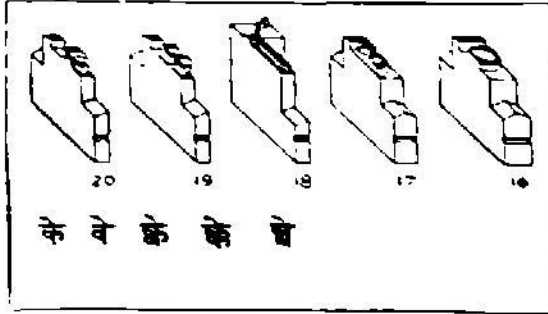
	A	B	C	Nos.
Vowels	ॐ			1
Consonants	क ख ए च ज झ ङ ष ट थ द न त ठ ड ढ ड ढ ङ ढ ढ ढ ढ	क ख ट व ड ढ द र ल ह ङ ङ	फ ष	37
Half Conjuncts	च = त ष ढ श ह र ष	ल ह द	फ ष ह उ	16
Full Conjuncts		ह ङ ङ ङ ह ह ह ष ष ष ह ष ष		13
Vowel signs	ा ि ि ि ि ि ि ि ि ि ि ि ि ि	- - - - - ॐ ॐ ॐ ॐ ॐ ॐ		31
Vowel signs with <i>Rafar</i>	ि ि ि ि ि ि ि ि ि ि ि ि	ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ		25
Double <i>Kana</i> , with <i>Matra</i> and <i>Velanti</i> do- with <i>Rafar</i>	ा ि ि ि ि ि ि ि ि ि ि ि			16
Figures, signs, punctuation marks	१ २ ३ ४ ५ ६ ७ ८ ९ ० (   : ! ? . , ; ' ' S - X			10 13
Total				162

260. The minimum number of type sorts in the Vijapure fount for hand-composition, as given on next page, is 123. In addition sixteen types are provided with double *kānā*, *velānti* and *mātrās* in order to save the setting time. Ten figures and thirteen punctuation marks, signs, etc., are required to complete the fount raising the total number to 162.





263. Construction of the letters क and फ in Devanagari is difficult.



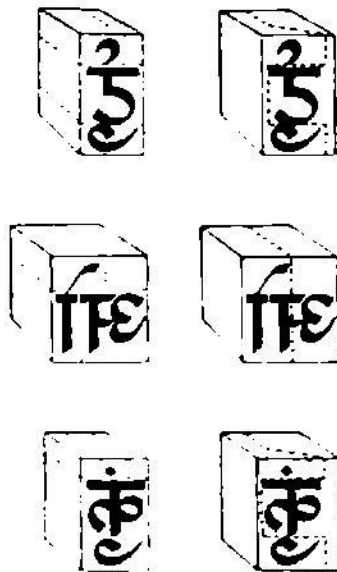
Vijapure solved this problem by splitting the letter vertically in two parts  $\text{३} + \text{४} = \text{क}$  and  $\text{३} + \text{४} = \text{फ}$  (Fig. 99). The types ३ and ४ cut for the consonants व and प are used here with only one common addition of ४. Since the half form of क and फ is made by cutting portion of the right hand element one additional type ४ (15) is cut. One more type (13) is cut to construct the conjunct

Fig. 100 : Vijapure type : Construction of Conjuncts of क and व

क. Vijapure suggested the novel method of constructing the conjuncts in their conventional design. For instance conjunct के in केटा is constructed with three types व १ and २ shown at numbers 17, 18 and 20 (Fig. 100) के in धके is constructed by व १ and ३ numbers 17, 18 and 19.

264. This method of constructing full letters by combining vowel signs with the consonants cast on linear bodies is an important departure from the conventional three-step degree method.

*Degree type*    *Vijapure types*



In the degree method more sorts are required to be set up and justified. For instance the letter ओ can be constructed with only two types in the linear system of Vijapure while in the conventional three-step degree system four types are required, three types and one degree as graphically shown here (Fig. 101).

The setting of letter कुं in Vijapure system can be done with only two sorts ३ + ४ as against four, three types and one degree in the degree method.

Fig. 101. Setting of the Degree and Vijapure types

This requirement is even more pronounced in certain combinations like "कुं" where the Vijapure system can manage with two types, while in the degree system five sorts are required.

### VJAPURE'S TYPOGRAPHIC EXPERIMENTS

265. Vijapure has contributed materially to the evolution of the Devanagari type founding, particularly in its linear setting. The Vijapure system of providing a deeper support to the over-hangs is beneficial for







ANNEXURE I  
DEVANAGARI TYPE FOUNTS





Table 58. The Fount scheme of Degree system recently introduced.

Vowels ( $\frac{1}{2}$ letters)	अ इ उ ऊ ए ऋ	6
Consonants ( $\frac{1}{2}$ letters)	क ख ग घ ङ च छ ज झ ञ ट ठ ड ढ ण त थ द ध न प फ ब भ म य र ल व श ष स ह ळ क्ष ज्ञ	36
Full letters	ॐ रु रू	3
Half Consonants	क् ख् ग् घ् ङ् च् छ् ज् झ् ञ् ट् ठ् ड् ढ् ण् त् थ् द् ध् न् प् फ् ब् भ् म् य् र् ल् व् श् ष् स् ह् ळ् क्ष् ज्ञ्	30
Conjuncts	क्ख् खक् ग्ग् गक् घ्घ् घक् त्तत् त्रत्र त्रन् द्दद् द्यद्य द्रद्र द्र्व प्रफ् ब्रभ्र भ्र व्रख् ख्रह्र ह्रल्ल श्रश्	34
Kūnā	। ि	2
Mātrās	ˆ ˆ	20
	ˆ ˆ	4
Figures	१ २ ३ ४ ५ ६ ७ ८ ९ ०	10
Signs and Matras	, ; . : - ) [ ? ! ।	10

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“अ” “आ”  
“इ” “उ” “ए” “ओ”  
“ऋ” “ॠ” “ऌ” “ॡ”  
“क” “ख” “ग” “घ” “ङ”  
“च” “छ” “ज” “झ” “ञ”  
“ट” “ठ” “ड” “ढ” “ण”  
“त” “थ” “द” “ध” “न”  
“प” “फ” “ब” “भ” “म”  
“य” “र” “ल” “व” “श” “ष” “स” “ह” “ऌ” “क्ष” “ज्ञ”

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



	<i>Letters with verti-bar</i>	<i>Letters with short-bar</i>	<i>Letters with central-bar</i>									
<i>Mātrās</i> letters	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	38								
Vowel-Signs	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	25								
<i>Rafāri</i> Vowel-Signs	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	17								
Figures and Signs	१ (	२ ।	३ :	४ ।	५ ?	६ .	७ ,	८ ;	९ '	० -	...	22
												<hr/> 255

**Additional Types : Akhand**

Extras with exten- ded head-line.	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	20
	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	20
	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	21
	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	अ आ इ ए उ ऊ ऋ ॠ ऌ ॡ	6
	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	। । । । । । । । । ।	2
									<hr/> 69







out, creating cavities in which the nearby types slip, disturbing the alignment. The normal fount for hand composing in Devanagari, in this style, consists of about 400 type sorts. Attempts have been made by the Devanagari punch-cutters to do away with the three-step setting by casting the *veñanti*, *mātrā* and *ukār* signs on their body with overhangings. This system is known as *Akhand* in which the fount is made of over 600 types.\* The Akhand System has also been adapted to the Gujarati script except for a very few characters. Gujarati normally requires about 475 or more types.

271. In the pamphlet *Reform of the Nagari Script*<sup>2</sup> published by the Language Department of the Government of Madhya Pradesh, it is stated that 'it was the Nagari Pracharini Sabha which for the first time made some suggestions for the reform of Nagari'. This statement is not based on facts as the history of script reforms can be traced back to some sixty years. Ramchandra Bhikaji Gunjekar was probably the first scholar to advocate the necessity of reforms in the Devanagari Script.†

#### LOKAMANYA TILAK : PIONEER ADVOCATE IN DEVANAGARI LINEAR SETTING

272. The necessity of introducing linear type setting was felt as far back as 1904, when the late Lokamanya Tilak took up the improvement in type casting, so as to facilitate the adaptation of the Devanagari script to the composing machines. The efforts of Lokamanya Tilak are explained in detail in Appendix 'A'. The famous Nirnaya Sagar Type-foundry accepted his suggestions and issued a new fount in linear design as shown below :

इलीच्या अवकारी कमिस्थांपुढे विचारार्थ आलेल्या सूचनांची वासलत कशी लागते याचा मासला म्हणून आम्ही पुणे शहरच्या कमिटीच्या कामाची नोटक हकीकत ता. ३० जानेवारीच्या अंकांत दिली होती त्या हकीकतीवरून कमिटीपुढे आलेल्या सूचना सरकारी अधिकाऱ्यांकडून कशा फेटाळून दिल्या जातात हे उघड होवे अर्थात् बस्तुस्थिति अशीच आहे.

Fig. 102. Nirnaya Sagar version of the Tilak types<sup>3</sup>

This subject again attracted attention of those interested, when the *Masik Manoranjan*, a Marathi magazine issued from Bombay (edited by Kashinath Raghunath Mitra), published two articles on the Devanagari script<sup>4</sup>. Immediate occasion for the discussion was the suggestion of Rev. Noels regarding acceptance of the Roman script for Indian languages.

273. Since then several scholars have contributed to this subject. The late K. K. Gokhale, a judge from Jat, suggested a reformed version of the

\* Fount of Devanagari Type, Table 57, pp 336-7. † See Appendix A.



Devanagari script. Some matter, set up in his style, used to be published in the *Dainik Dnyānprakash* of Poona. Bhau-Shastri Lelo advocated<sup>1</sup> his new one-step setting of Devanagari without the ascenders and descenders of *mātrās* and *ukārs*. The Nirnaya-sagar Type-foundry came out with a reformed system of Devanagari setting as shown hereunder :

पुस्तक चक्रकश्च कल्याणेश्वाय एसादयास अपराध्क मान्ऊन  
शिक्षा करण्णः फार वाङ्कट आह्ण. या प्रकारच्या न्याय कर.  
णाराच्या उताव्कळपणाम्ऊळ्णः खत्त गउन्हणार अङ्कवात सु.  
ऊन कइत्येक व्कळ्णः न्हरपराध्याःस व पुष्कळ व्कळ ह्इतक.  
न्त्याःस द्दएरुळ्णः व्कळ्णः न्नाकारण म्ण्णाल्या शिक्षा श्णाल्या आह्णत.

Fig. 103. Nirnaya-sagar Type for linear composing \*

Vaidya brothers of the Hindu Missionary Society contributed their suggestions in this regard. Br. Savarkar started a campaign through the weekly paper *Shradhānand*. Y. M. Nanal, S. D. Nadkarni, N. B. Huparikar, S. S. Pandit, Benare, G. S. Bhagawat, V. D. Gurjar and others put up their own solutions to the problem. They are all summarised in Appendix ' A '.

#### THE WORK OF LITERARY CONFERENCES

274. In the Annual Marathi Sahitya Sammelan held in 1927 at Poona, a committee was appointed to make recommendations on the changes in the script to facilitate printing. The committee reported to the Hyderabad Session in 1931. The difficulties presented by the Devanagari script in its composing were thus also engaging the attention of the literary and learned conferences. A. Latif of the Indian Civil Service advocated the use of Roman script for Indian languages. He was supported by the Late Sayajirao Gaikwad in the Baroda session of the Oriental Conference. Sayajirao Gaikwad later discussed the script reforms in his address to the Marathi Sahitya Sammelan held at Kolhapur in 1932. He again touched this subject in the Hindi Sahitya Sammelan held at Delhi in 1934, when a committee was constituted to investigate into this subject and Kakasaheb Kalelkar was appointed the chairman to this committee. The Maharashtra Printers' Conference discussed the script reforms in its session, held at Sholapur in 1941, under the presidentship of Y. R. Date.

#### SCRIPT REFORMS AT THE GOVERNMENTAL LEVEL

275. The U.P. Government appointed a committee under the chairmanship of Acharya Narendra Deo, by a resolution dated 31st July 1947. The committee reported to the Government in May 1949.<sup>7</sup> The

H 5447-23a





## ATTEMPTS TO REDUCE THE NUMBER OF TYPE SORTS

281. The work of Bhau Shastri Lele, P. B. Kale, V. S. Gharpure, Vaidya, Bhagwat, Gurjar, Benare, S. S. Velingkar, Kakasahib Kalelkar and others relates mainly to the second aspect of script reforms, *i.e.* change in the method of consonant vowel-sign combination and the ways of reducing the number of types. Some of them have advocated the placement of vowel-signs after the consonants in the same line thus eliminating the three-step arrangement. Some recommended placing the vowels in original form after the consonants. In this context it must be remembered that there is distinction between a vowel proper and a vowel-sign. In the Roman script the vowel in original form is placed after the consonant, resulting in introduction of the spelling system. In Devanagari the vowels इ, ई, उ, ए etc. when combined with consonants to construct letters, take the form of vowel-signs ( ि ी ु े ) and wrap the consonant, from the left, right, bottom and top as the case may be ( कि, की, कु, के ). This is the peculiarity of the Devanagari script. If this is given up in favour of placing the vowels in the original form, after the consonants, then what we may produce is a new script based on a foreign convention, but using the Devanagari graphemes.

## KALE'S BHARATI SCRIPT

282. P. B. Kale entered the discussion on script reforms in 1914 when he wrote an article criticising Rev. Noels and made his own suggestions.\* Kale revived his proposals after the publication of the Report of the Maharashtra State Committee on Standard Keyboard for Devanagari. He had been most active in this field during the last few years. Kale presented his scheme to the late Pandit Jawaharlal Nehru in the form of an engraved copper-plate. His main proposal is that the vowel-marks in improved design may be placed after the consonants. The Kalelkar Committee had recommended such a proposal but it was limited to the placement of the vowel-signs only. The design of the vowel-signs was not then proposed to be altered much. Kale has realised the effect of placing of the vowel-signs after the consonants, which results in disturbing white space. He therefore advocates redesigning of the *mātrā* signs. His other suggestion was to use the *halant* in forming conjuncts. He suggested that the method of joining 'य' in conjuncts may be adopted even for conjuncts of 'र' which are frequent. Kale also designed a linear *halant* sign. He afterwards modified his proposals particularly the graphemic

\* See Appendix A.

representation of vowel-designs. A print from the last version of his linear Devanagari or Bharati Lipi, is reproduced in Fig. 105 below :

## 12 Point Bharati

चर्चोचा कपोलकल्पित अर्थ (अनर्थ)  
लाऊन कॉर्पोरेशन अॅम्प्लॉईज  
अॅसोसिएशनला असें सूचित  
आहो की, कॉम्प्यूटरसवर काम सुरू  
केलयामुळे ज्या समस्या निर्माण  
होतील त्यावर विचार करण्याकरिता  
अॅसोसिएशनच्या प्रतिनिधींनी  
कॉर्पोरेशनबरोबर संयुक्त वाटा-  
घाटी करण्यास तयारी दाखवावी.  
कॉर्पोरेशनने शिस्त संहिता मान्य  
केली असून मॉडेल अॅग्रिमेन्ट-  
मधील अटीचे पालन करण्यास  
स्वतःची तयारी व्यक्त केली आहे  
असेही ठोकून दिले आहे.

## 12 Point Mono

चर्चेचा कपोलकल्पित अर्थ (अनर्थ)  
लाऊन कॉर्पोरेशन एम्प्लॉईज  
अॅसोसिएशनला असे सूचित  
आहे की, कॉम्प्यूटरसवर काम सुरू  
केल्यामुळे ज्या समस्या निर्माण  
होतील त्यावर विचार करण्याकरिता  
अॅसोसिएशनच्या प्रतिनिधींनी  
कॉर्पोरेशनबरोबर संयुक्त वाटा-  
घाटी करण्यास तयारी दाखवावी.  
कॉर्पोरेशनने शिस्त संहिता मान्य  
केली असून मॉडेल अॅग्रिमेन्ट-  
मधील अटीचे पालन करण्यास  
स्वतःची तयारी व्यक्त केलेली आहे  
असेही ठोकून दिले आहे.

हमारी परमपरीय परधानमंतरी शशी लालबहादुर शास्त्री जी की  
लीयीं अीश्वर करी यह श्रुभ दीन बार बार आयीं.

नागपूर, ता. 2-10-64.

पुरुषोत्तम बाळकृष्ण काळी.

टाटा मर्सिडीझ-बी०ए० गाडीयां, अ-ब-सडर कार, आरिंर जीप  
की बीपारी आरिंर दीवनागरी टापी की क-पा-झीटर, अीलींक्ट्रीकल  
अीं जीनीयर तथा ट-कलींथक, अधींकर 'भारती लीपी' की  
स-शांथक (जीसतीं चालू दीवनागरी लीपी की छपाअी. ट-कलींथन  
अरिंर टीलीपरी-टी-ग सलभतासी तथा कारखषमतापरवक हांता ही  
ही, लीकींन राीमन लीपी सींभी 12 परतींशत ज्यादा कारखषमता  
बदती हीं).

Fig. 105. Kale's Linear Devanagari or 'Bharati Lipi' (Earlier Version)

## SHIRWADKAR'S LINEAR DEVANAGARI

283. Shirwadkar has recently taken up the advocacy of linear setting of Devanagari script. He first raised the question in his presidential speech at the Margao Session of the Marathi Sahitya Sammelan (1964).

Later, Potnis, editor of *Daily Gaokari*, supported Shirwadkar in his presidential address to the Maharashtra Mudran Parishad, held at Sholapur in 1966. Main feature of Shirwadkar's proposal is discarding of the head-line, modification of the design of the vowel-sign and introduction of a conjunct sign (Λ). (See appendix A for details).

चाहू पद्धतीप्रमाणे :

जामनगर दि. १९ (टाइम्स वृत्तसंस्था)

'शंकराचार्यांना वाचवा' दिनानिमित्त विद्यार्थ्यांनी दगडफेक करून येथील शाळा बंद करण्यास भाग पाडले.

सुर्वावेलेल्या पद्धतीप्रमाणे :

जामनगर दि. १९ (टाइम्स वृत्तसंस्था)

'शंकराचार्यांना वाचवा' दिनानिमित्त विद्यार्थ्यांनी दगडफेक करून येथील शाळा बंद करण्यास भाग पाडले.

Fig. 106 Shirwadkar's linear Devanagari.

284. The argument of the inevitability of drastic changes for mechanical composition put forth by many of the advocates of the above suggestions, is in itself doubtful and is based, to some extent, on lack of appreciation of what can be achieved on the composing machine. Secondly, the result of the acceptance of these suggestions would be that the printed script would be changed to such an extent that it would look like a new script. Those who would be taught to read the mutilated script advocated by Bhagwat, Benare and others, will remain illiterate as far as the books so far printed in the current Devanagari are concerned. Some of these script reformers claim that the books can be reprinted in the new script, invented to suit the machines. Unfortunately, they do not realise the fantastic requirements of reprinting, the production facilities required to be provided and the time and expenditure involved. Such a drastic change in the script is nothing short of accepting a new script. Interestingly enough, the advocates of these suggestions press for the introduction of these so called reforms mainly to avoid acceptance of the Roman script.

#### TYPOGRAPHERS AT WORK

285. The third aspect of the script reforms is the change in the present method of casting types. The pioneer thinker on this aspect of



the script reforms is the Late Lokamanya Tilak and the contemporary typographers working on this aspect are Hari G. Govil, S. R. Date, G. P. Vijapure and L. S. Wakankar. The work of these typographers is related mainly to the adaptation of the Devanagari script to the mechanical composing machines. The contribution made by S. R. Date is dealt with while commenting on Monotype Devanagari while that of Vijapure is dealt with in Chapter XII.

286. L. S. Wakankar is one of the script scholars who has studied the Devanagari script from both the calligraphic as well as the typographic points of view. The Government of India Committee on Standard Keyboard for Typewriter and Teleprinter recently invited suggestions for a modified Devanagari script for the teleprinter. The Committee has proposed the use of *halant* in conjuncts. In response to the invitation of the Committee for comments, Wakankar has put up a novel scheme of splitting the Devanagari letters obliquely which makes it possible to use the common vowel-marks for both the letters with verti-bar and letters without verti-bar or with small-bar. A patent was applied for this scheme by Ramu and Wakankar. The scheme is reproduced in Fig. 107.

#### LIMITATIONS OF THE COMPOSING MACHINES

287. The demands of the stereotyping process also affect the design of the type and the method of setting. The early practice of a three-step degree method of setting had helped in retaining the aesthetic quality of the letter forms of the Devanagari script. It will, however, be conceded that some distortion is inevitable with the change in the design when the script is to be adapted to the mechanical composition. However, there has always been opposition to any drastic change in the *look* of the script as was fully realised by the pioneer script reformer, the Late Lokamanya Tilak.<sup>16</sup> Owing to the opposition to the change of the design of the letters S. R. Date who succeeded in adapting the Devanagari script to the Monotype machine had to rely on the *Akhand* system of composition, and had to stretch it rather too far. The letters which cannot be made available in full form are cut with over-hangs to be completed by inserting high space with vowel-signs at the top and bottom. The Date method of Monotype setting is explained earlier.

288. Owing to the fact that the Linotype matrices carrying the engraved impression are set in a line in the Linotype system, it is not possible to use the Linotype for setting the three-step Devanagari; neither is it possible to set Devanagari on the Linotypes in the *Akhand* system of Date, as over-hangs are equally impossible on the slug composing machines. It is for this reason that even the italics are required to be

अनुक्रमिका  
 १. अक्षर  
 २. अक्षर  
 ३. अक्षर  
 ४. अक्षर  
 ५. अक्षर  
 ६. अक्षर  
 ७. अक्षर  
 ८. अक्षर  
 ९. अक्षर  
 १०. अक्षर  
 ११. अक्षर  
 १२. अक्षर  
 १३. अक्षर  
 १४. अक्षर  
 १५. अक्षर  
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 १७. अक्षर  
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 ९६. अक्षर  
 ९७. अक्षर  
 ९८. अक्षर  
 ९९. अक्षर  
 १००. अक्षर

NAMES OF APPLICANTS - **97673/30-1-65** NO. OF SHEETS - 3  
 1) L. S. WAKANKAR. **(COMPLETE)** SHEET NO. - 1  
 2) S. RAMU.

**शुद्ध स्वरः PURE VOWELS** **युद्धाक्षरः BACK-SYMBOLS**  
 अ इ क़ उ ऋ ए ऋ ऌ ऍ

**अक्षराणि FOLLOWING SYMBOLS** **अक्षरानि NON-FOLLOWING SYMBOLS**  
 पा पी पि नः नी नो

**स्पर्श वर्णः PLOSIVES** **पूर्ण घोष** **अर्ध घोष**  
 कि ख ग घ (वि) ख ग घ

च छ ज झ ट ठ ड ढ ध

त थ द ध नः त थ द ध नः

प (फ) ब भ म (फ) व श्च

**अर्ध-स्वरः SEMI-VOWELS.**  
 य र ल व र (ः) य र ल व

**उच्चारणः SIGILLANTS** **अति-लिङ्गः EXTRA**  
 श ष स ष (ः) श ष स ष क्ष क्ष श्च

**संख्याः NUMERALS**  
 १ २ ३ ४ ५ ६ ७ ८ ९ ० (लि)

ABOVE 90 SIGNS SUFFICE TO COMPOSE, COMPLETELY OFFICIALLY APPROVED DEVANAGARI PER-  
 G.C./MISC. ED. FA-7/57-H2 (31-1-60) AND GOVT OF MAHARASHTRA, G.R. T.B.K. 1762 (207-60).  
 ADDITIONAL TRADITIONAL CONJUNCTS:

ॐ लृ ऽत्तं त्रयस्य द्वन्द्वस्य द्वन्द्वस्य  
 द्वन्द्वस्य द्वन्द्वस्य द्वन्द्वस्य द्वन्द्वस्य

BOMBAY, 5-1-1965 } *S. Wakankar*

Fig. 107. Linear oblique type of Wakankar.

straightened up to some extent on the slug composing machine leaving white space between the letters. Besides the capacity of the main keyboard and the magazine is limited to ninety matrices. With a side-magazine thirty-four more matrices can be accommodated and by using the second positions on the double-letter matrices eighty-seven more characters can be set from the keyboard. The total number of characters which can be set on the plain Linotype with the Greek attachment is only 174 exclusive of three space-matrices.

### THE BASIC PROBLEM

289. The problem before the script reformers is essentially to produce all the graphemes and their combinations for constructing full letters and conjuncts with a minimum number of type-sorts or matrices without altering the *look* and sacrificing the beauty of the script. There are thus three difficulties in adapting Devanagari to the mechanical composing machines :

(1) The total number of characters is required to be reduced to the minimum of 255 for the Monotype.\* For the Linotype, ninety characters of high frequency to be accommodated on the main keyboard, thirty-four on side keyboard and very few as hand-sorts.

(2) The method of setting the types of full letters by joining the vowel-signs on all the four sides of the consonants is required to be revised in favour of linear setting.

(3) The method of constructing the conjuncts by attaching consonants at the bottom (ट्र) ; inserting them on either of the two sides (द्व, ह्य) and producing altogether a new grapheme (त्र) representing two consonants त् + र should be changed in favour of linear setting, i.e.

ट्र or ट=ठ, द्व or द=व, ह्य, त्र

290. The choice left before the exponents of Devanagari script who are against the acceptance of Roman script was, therefore, either to invent a machine to suit the peculiar setting of Devanagari or to alter the setting methods including conjunct formation to suit the linear setting. The former was considered impracticable and hence all the script reformers have relied on the latter course as will be seen from the summary of the Script Reforms given in Appendix A.

### METHODS OF REDUCTION IN TYPE SORTS

291. Owing to the uncertainty of the final decision in this matter of standardisation of Devanagari script the type designers did not make much headway and its satisfactory adaptation to the mechanical composing

\*The Monotype with a die-case of 270 matrices is now available.

machines was delayed. In almost all the attempts in reforming the Devanagari script emphasis was on reducing the number of characters in a fount. The step towards acceptance of the method of constructing conjuncts by placing the consonants one after the other, first consonant being either in half form or with *Halant*, was helpful and the number of types was considerably reduced. This step along with introduction of the *Swarākhadi* coupled with the possibilities of using over-hangs and *Halant*, resulted in considerable reduction in the number of types for both the hand-composing and the Monotype composition.

#### COMMENTS ON THE STANDARD DEVANAGARI

292. The Devanagari script as was standardised for Marathi by the Government of Maharashtra\* differed from that accepted by the Government of India in few respects, as shown hereunder:

			<i>Hindi</i>	<i>Marathi</i>
(1) Vowels	..	..	.. ऋ, लृ,	ऋ, लृ
(2) Consonants	..	..	.. ख, छ, ल, श	ख, छ, ल, श
(3) Figures	..	..	.. ५, ८	५, ८

(a) I see no reason why the Hindi forms of vowels ऋ and लृ should not be accepted for Marathi. It is possible to construct the letters ऋ and लृ, which do not occur very frequently, by combination of the available type sorts ऋ, =, and ऀ and ऌ and ऍ respectively. The Hindi forms of खल and श are now accepted by the Government of Maharashtra.†

(b) The letter ख accepted for Hindi can be accepted for Marathi. The change in the design of ख is long awaited. The acceptance of Gujarati form of ॡ has been advocated since long, but calligraphically it is foreign to the present design of Devanagari letters.

(c) In case of ल its acceptance reduces two matrices for Linotype as ल and ले can be constructed by joining ल and ऀ and ले and ऀ respectively.

(d) The Marathi form of श is not according to the Devanagari convention where in the *A-kār* is present in the consonants either in the form of verti-bar (च) or short-bar (ट). In the Marathi form of श both are present. The Hindi form (श) is therefore preferable. An argument against the acceptance of श is that it possesses a loop which may fill in while printing. We have already introduced loops in case of भ and ध and one more may not make material difference.

(e) The Hindi form of छ is not acceptable as the short-bar is omitted, and it therefore suggests the absence of अ. In its place the Marathi form छ should be substituted.

\* See Table 60, pp 354-361. † G.R. देनांक 1066 म dated 24th Sept. 1966

(f) Two numerals ५ and ८ have been accepted in the North Indian design for Hindi. They do not blend well with other figures of the Bombay style. The Bombay numeral forms should therefore be accepted even for use in Hindi.

### SIMPLIFICATION OF R-CONJUNCTS

293. Linear design of the conjuncts has been accepted in the standard script in all cases except in case of conjuncts of र. Table 66 will show that the use of *rafār* in its present design increases the number of matrices required by 22. Use of *halant* ( र् ) is not considered advisable as the frequency of conjuncts of र is high and will therefore require more linear space. The half = used in र्हास is not accepted for *rafār* as it is currently used in Marathi to represent unaccented र्, while the *rafār* is accented. Some of the script reformers have advocated that the present form of र् may be continued but that it should be placed in the phonetic sequence, i.e. र्स्व for र्स्व and र्काष्ण्येय for र्काष्ण्येय. I feel that the accented र् may be replaced by र् with a *nukta*. The conjuncts of र as second member in the conjuncts, are at present written in two distinct forms र्र and र्र्. They can be written in linear design without any difficulty, i.e. र्र and र्र्. As a matter of fact in the absence of separate conjunct sorts in some founts it is being done and has not been objected to.

### PROBLEM OF THE CENTRAL-BAR AND SHORT-BAR LETTERS

294. The letters with central bar क and फ present difficulty in their linear setting with vowel-signs. A remedy suggested in this respect is that they should be provided with a *kānā* (क and फ). An objection has been raised that the *kānā* in addition to the central bar is likely to be mistaken for *Ā-kār* (i.e. क = का). The Hindi क् also possesses two veri-bars. It may be worth considering whether the Gujarati forms क् and फ्, which are not foreign to Devanagari, may be substituted with the addition of head-line, modeling them on ड.

### INTRODUCTION OF THE SWARAKHADI

295. Savarkar advocated adaptation of *swarākhadi* in the construction of vowels इ, ई, उ, ऊ, ए, ऐ, by joining *Mātrās* of these vowels to अ, as is done in case of आ, ओ and औ. Gujarati uses this method for ऐ and औ and there should be no objection to its extension to the other vowels. Objection to this reform on the plea that these vowels are separate entities and not modifications of the vowel अ, is not tenable as there is no reason why the modifications thus achieved should not be considered as distinct new forms.

अ	आ
इ	ई
उ	ऊ
ए	ऐ
ओ	औ
क	ख
ग	घ
ङ	च
ट	ठ
ड	ढ
ण	त
प	फ
ब	भ
म	य
न	र
ल	व
श	ष
स	ह

Table 60. Standard Devanagari Alphabet: Comparative Statement

1	2
Devanagari Alphabet finalised by the Lucknow Conference 1953.* 28/29th November 1953.	Devanagari Alphabet as accepted by Government of Madhya Pradesh†
<p>1. The Alphabet—</p> <p>(a) Vowels<sup>(1)‡</sup>—</p> <p>अ आ इ ई उ ऊ ऋ ॠ ऌ ॡ ए ऐ ओ औ अं अः</p> <p>(b) Matra (Vowel-marks)—</p> <p>(i) The matras will remain same except short 'इ' sign i.e. ि (3 अ).</p> <p>(ii) The short 'इ' sign may be written on the right (3 ब).</p> <p>(iii) The short 'इ' sign may be in the same style as long 'ई' sign, except that the vertical stroke should end off halfway as े in की (3 इ)</p> <p>(c) Consonants<sup>(1)</sup>—</p> <p>क ख ग घ ङ च छ ज झ ञ ट ठ ड ढ ण त थ द ध न प फ ब भ म य र ल व श ष स ह ळ क्ष ज्ञ</p> <p>(d) Figures<sup>(1)</sup>—</p> <p>१ २ ३ ४ ५ ६ ७ ८ ९ ०</p>	<p>1. The Alphabet—</p> <p>(a) Vowels<sup>(1)</sup>—</p> <p>अ आ इ ई उ ऊ ऋ ए ऐ ओ औ अं अः</p> <p>(b) Matra (Vowel-marks)—</p> <p>(i) The current style of the matras shall remain the same. (3)</p> <p>(ii) Even in case of short 'इ' sign the current method will continue, i.e. कि and not की. (3)</p> <p>(c) Consonants<sup>(1)</sup>—</p> <p>क ख ग घ ङ च छ ज झ ञ ट ठ ड ढ ण त थ द ध न प फ ब भ म य र ल व श ष स ह ळ क्ष ज्ञ ङ ढ</p> <p>(d) Figures<sup>(1)</sup>—</p> <p>१ २ ३ ४ ५ ६ ७ ८ ९ ०</p>

\*Reform of the Nagari Script, Government of Madhya Pradesh, Languages Dept.  
† *Ibid.*, p. 30. ‡ Figures in parenthesis refer to the sequence of rules in the original authorities referred to above.

3

Revised Hindi Alphabet as accepted  
by the Ministry of Education,  
Government of India  
G. C. F. 4-7/57-H. 2, dated  
21st January 1960

## 1. The Alphabet—

## (a) Vowels—

अ आ इ ई उ ऊ  
ऋ ॠ ए ऐ ओ औ  
अं अः

## (b) Matra (Vowel-marks)—

। ि ि ु ू े ै ो  
ो ी ी ी ी ी ी

## (c) Consonants—

क ख ग घ ङ  
च छ ज झ ञ  
ट ठ ड ढ ण  
त थ व ध न  
प फ ब भ म  
य र ल व  
श ष स ह ळ  
क्ष ज्ञ ण ढ श्र

## (d) Figures—

१ २ ३ ४ ५  
६ ७ ८ ९ ०

Explanation :

'ऋ' does not occur in Hindi,  
therefore it is not included  
in the list of vowels. (1)

4

Marathi Alphabet as accepted by  
the Education Department,  
Government of Maharashtra  
E & S.W.D./TBK. 1762-G, dated  
20th July 1962

## 1. The Alphabet—

## (a) Vowels—

अ आ इ ई उ ऊ ऋ  
ए ऐ ओ औ अं अः

## (b) Matra (Vowel-marks)—

। ि ि ु ू े ै ो  
ो ी ी ी ी ी ी

## (c) Consonants —

क ख\* ग घ ङ  
च छ ज झ ञ  
ट ठ ड ढ ण  
त थ द ध न  
प फ ब भ म  
य र ल\* व  
श\* ष स ह ळ  
क्ष ज्ञ श्र

## (d) Figures—

१ २ ३ ४ ५  
६ ७ ८ ९ ०

\* Vide G.R. देनाक 1060-म dated 24th  
Sept. 1966.

1

## 2. Conjuncts—

(i) Conjuncts may be constructed in two ways (5)

(a) in case of consonants having vertical stroke, by deleting the vertical stroke (5-1) ;

or

(b) by placing *halant* sign below the first consonant (5-2).

## (ii) Other Consonants (5-2)

(a) The current method of forming conjunct letters should be continued in the case of 'क', 'फ' and 'ह'.

2

## 2. Conjuncts—

(i) Consonants with vertical stroke (Khadi Pai):

ख ग घ च ज झ ञ ण  
त थ ध न प ब भ म  
य ल व श ष स क्ष ञ्

(ii) When conjunct letters are to be formed from consonants mentioned above, they may be made by deleting the vertical stroke and not by adding *halant* (4 अ),

i.e. उत्तर, मञ्जन, गन्ना, इत्यादी (Not उत्तर, मञ्जन गन्ना or उत्तर, मजन, गन्ना).

## (ii) Other Consonants (4 आ)—

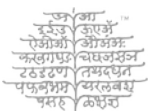
(a) The present method of forming conjunct letters in form of 'क' and 'फ' be continued, e.g.

संयुक्त, दफ्तर (and not संयुक्त दफ्तर).

(b) Conjunct letters without verti-bar ड, छ, ट, ठ, ड, ढ and द् may be formed by adding *halant* mark (The oblique stroke below a consonant) (4 ई), e.g.

गठ्ठा, बुड्ढा, विद्या

(not गठा, बुढ्ढा, विद्या).





3

## 2. Conjuncts—

(i) Consonants with vertical stroke (Khadi Pai) (2) :

ख ग घ च ज झ ञ  
 त थ ध न प ब भ म  
 य ल व श ष क्ष ज्ञ

(ii) When conjunct letters are to be formed from consonants having vertical stroke the vertical stroke shall be deleted (2) :

ख्याति, लग्न, विघ्न, कच्चा, छज्जा,  
 व्यञ्जन, नगण्य, कुत्ता, पथ्य, ध्वनि,  
 न्यास, प्यास, डिब्बा, सभ्य, रम्य,  
 शय्या, उल्लेख, व्यास, श्लोक, राष्ट्रीय,  
 स्वीकृत, यक्ष्मा।

(iii) Other Consonants—

(a) The present method of forming conjunct letters from 'क' and 'फ' be continued (3क), e.g.

संयुक्त, पक्का, दफ्तर ( and not  
 संयुक्त, पक्का, दफ्तर ).

(b) Conjunct letters ड, छ, ट, ठ, ड, ढ and द may be formed by adding *halant* mark (The oblique stroke below a consonant) (3ख), e.g.

वाङ्मय लट्ट, बुड्डा, विद्या  
 ( not वाङ्मय लट्टू, बुड्डा, विद्या ).

4

## 2. Conjuncts—

(i) Consonants with vertical stroke (Regh) (1) :

ख ग घ च ज झ ञ  
 त थ ध न प ब भ म  
 य व श ष स क्ष ज्ञ

(ii) When conjunct letters are to be formed from consonants having vertical stroke, the vertical stroke shall be deleted :—

ख्याती, लग्न, विघ्न, कच्चा, सज्जा, माइया,  
 व्यञ्जन, नगण्य, सत्ता, पथ्य, ध्वनी,  
 न्यास, प्यादे, डब्बा, सभ्य, रम्य, शय्या,  
 व्यास, श्लोक, राष्ट्रीय, स्वीकृत, यक्ष्मा.

(iii) Other Consonants—

(a) The following method of forming conjunct letters should be continued in the case of

'क' 'फ' : (2 क) e.g.

संयुक्त, लफ्फा.

(b) Conjuncts of the consonants 'ड, छ, ट, ठ, ड, ढ, द, ल, ह, and ळ' (except in case of ल) shall be formed, if necessary, by adding *halant* mark. In case of ल they shall be formed according to the present method. When these consonants combine with य the *three-fourth* य can be used (2 ख) :

e.g. वाङ्मय, खट्टू, अड्डा, विद्या,  
 पाल्य, गोळ्या अगर गोळ्या etc.

1

2

(c) The old forms of र in conjunct letters be continued to be used. (4 उ)

नम्र, गर्व, राष्ट्र, श्रीमान्, पत्र  
(and not नम्, गर्व, राष्ट्र, श्रीमान्, पत्र).

(f) Conjuncts from 'ह' may be written in the present style or by using *halant* mark. (4 इ)

चिह्न और चिह्न  
(but not as चिह्न).

4. (1) The *shiro-rekha* (Head-line) should be continued to be used. (2)

4. (1) The use of *shiro-rekha* (Head-line) may be continued. (2)

(2) (a) The following punctuation marks in use in English may be accepted, except full-stop and colon.

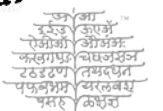
(4 क) - — , ; ! ?

Use khadi pai (।) for full point. (4 ख)

(2) (a) The punctuation marks, except fullstop, may be accepted as in English. (6)

- — , ; ! ?

For fullstop (.) vertical stroke (।) shall be used. (5)



3

(c) The old three forms of र in conjunct letters be continued to be used (3 ग), i.e. प्रकार, धर्म, राष्ट्र.

(d) The form of 'श्र' as it appears in 'श्री' may be retained. (3 घ)

(e) The conjunct letter त्र made from त and र be written as त्र. (3 ङ)

(f) Conjuncts from 'ह' may be written by using *halant* mark as in the current method. (3 च)  
चिह्न और चिह्न (but not as चिह्न)।

(g) *Sanskrit conjunct letters may be written in the old style.* (3 छ)

4. (1) The use of *shiro-rekha* (Head-line) will be in force. (4-1)

(2) (a) The punctuation marks, except full-stop, may be accepted as in English. (4-2फ)

. — , ; ! ? ! :

The colon sign (:) may be used for *Visarg*. (4-2 फ)

For fullstop (.) vertical stroke (i) shall be used. (4-2 ख)

H 5447-24a

4

(c) The present form of र in conjunct letters may be continued to be used as before (2 ग) :

प्रकार, धर्म, राष्ट्र, वैश्याने.

The short and long Ukars of र, can however be written as रु, रू.

(d) The form श्र in 'श्री' be retained. (2 घ)

4. (1) The *shiro-rekha* (Head-line) should be continued to be used. (3-1)

(2) (a) The following punctuation marks may be adopted (3-2 क) :—

. — , ; ! ? :

ॐ  
व्योम  
ॐ  
कलश  
ॐ  
ॐ  
ॐ  
ॐ  
ॐ

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

1

(b) As far as possible following signs may be provided for on the keyboard of the Typewriting machines (4ग) :—

. / , ° ^ % “ ” ( )  
+ × ÷ \* = †

The suggestion to drop one of the two forms ( ÷ ≍ ) of *Anuswār* Nasal Mark and *Anunāsik*, Nasal Consonant may not be accepted. (6)

*Note.*—The decision regarding the style of numerals shall be subject to the provisions in the Constitution.

2

(b) As far as possible the following marks may be provided on the keyboard of Typewriting machines. (7अ):

. / ° % “ ” ( )  
+ × ÷ \* = †

(c) The sign ( , ) may be introduced in place of ( ^ ) for the conjuncts ऋ ॠ etc. (7आ)

(d) The rounded design of *Halant* may be altered to short oblique ( \_ ). (7इ)

(e) The ॠ in *Rashtra* sign ( ^ ) may be made by joining ( , ) with ( \_ ) (7ई)

Two forms of *Anunāsik*, Nasal Mark and Nasal Consonant ÷ ≍ may be continued to be used. (8)

3

(b) As far as possible the following marks may be provided on the keyboard of Typewriting machines. (4-2π):-

˘ . • % “ ” ( )  
+ × ÷ \* = `

4

(b) As far as possible the following signs may be provided for *mechanical and hand composition* and on the keyboard of Typewriting machines. (3-2ख):-

˘ . “ ” ( )  
+ × ÷ = `

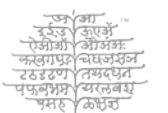
Two forms of *Anunāsik*, Nasal Mark and Nasal Consonant ( ˘ : ˙ ) may be continued to be used. (4-3)



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2. Vinoba Bhave "शिक्षण-विचार व लोकनागरी लिपी" pages 225-248.
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## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



## CHAPTER XIV

### MECHANICAL AND PHOTO-COMPOSING MACHINES

296. Before we examine the current methods of setting Devanagari on the mechanical composing machines, it will be worthwhile considering the features of the type-setting machines both mechanical and photographic and their limitations. There are two types of mechanical composing machines. On one of them single types are cast and on the other complete lines or slugs are produced. The Monotype Composing Machine is representative of the first type, while there are two types of Line-composing Machines, one is Linotype and other the Typograph. There is another machine known by the name Ludlow on which slugs are cast from matrices set by hand.

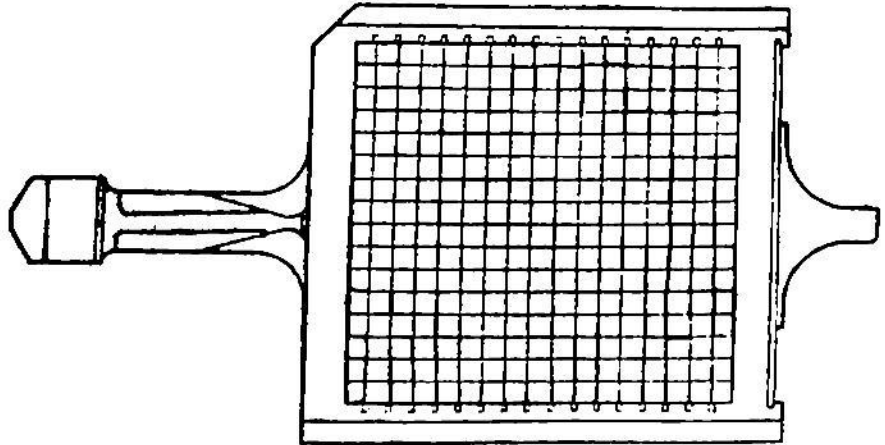
#### MONOTYPE COMPOSING MACHINE

297. The Monotype machine was invented by Talbert Lanston in 1887. The basic features of this machine were determined by 1893. Bancroft, Lanston's colleague, is responsible for designing (in 1899) the form of the Keyboard and the Caster which they still retain. The Monotype machine comprises of two separate units, one of which is the Keyboard and the other a Composition Caster. These machines are manufactured in England by the Monotype Corporation and in the U.S.A. by Lanston Industries Incorporated, Philadelphia. The Keyboard has two Keybanks with keys for letters, signs, etc., and also Justification Keys. When a key on the Keyboard is pressed, it causes a bar in the intermediate frame to move up carrying two traverse bars with it. They operate two vertical bars which open the plunger valves. Compressed air released by the valves raises two pistons which in turn drive two pins through paper ribbon,  $4.5/16''$  wide (*Fig. 110*) mounted on the tower.\* The ribbon is moved by means of transport holes on both edges, with which the toothed wheels engage and move it  $1/8''$  at every stroke. The series of the perforating holes are divided into two groups. Those on the left are identified with letters A to O and on the right, are marked with 1 to 15. Every letter is represented by two holes, one from each group, indicating the exact position of the letter-matrix on the matrix frame (*Fig. 108*). As

\*See Plate 101.



Fig. 108. The Mono-  
type Extended  
Die-case.



The Unit-Shift Attachment is fitted as standard on the composition casters. Two different unit values can now be mixed in most rows of the matrix-case while preserving the correct unit value in casting the type

UNIT	M	N	L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Fig. 109. Matrix-case  
arrangement 7949.

[Note—Heavy rule above the character indicates unit-shift. The unit value in this case is that of the row above.]



Fig. 110.  
Perforated paper ribbon.

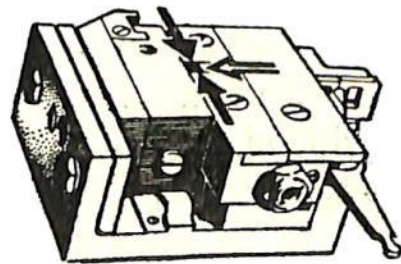
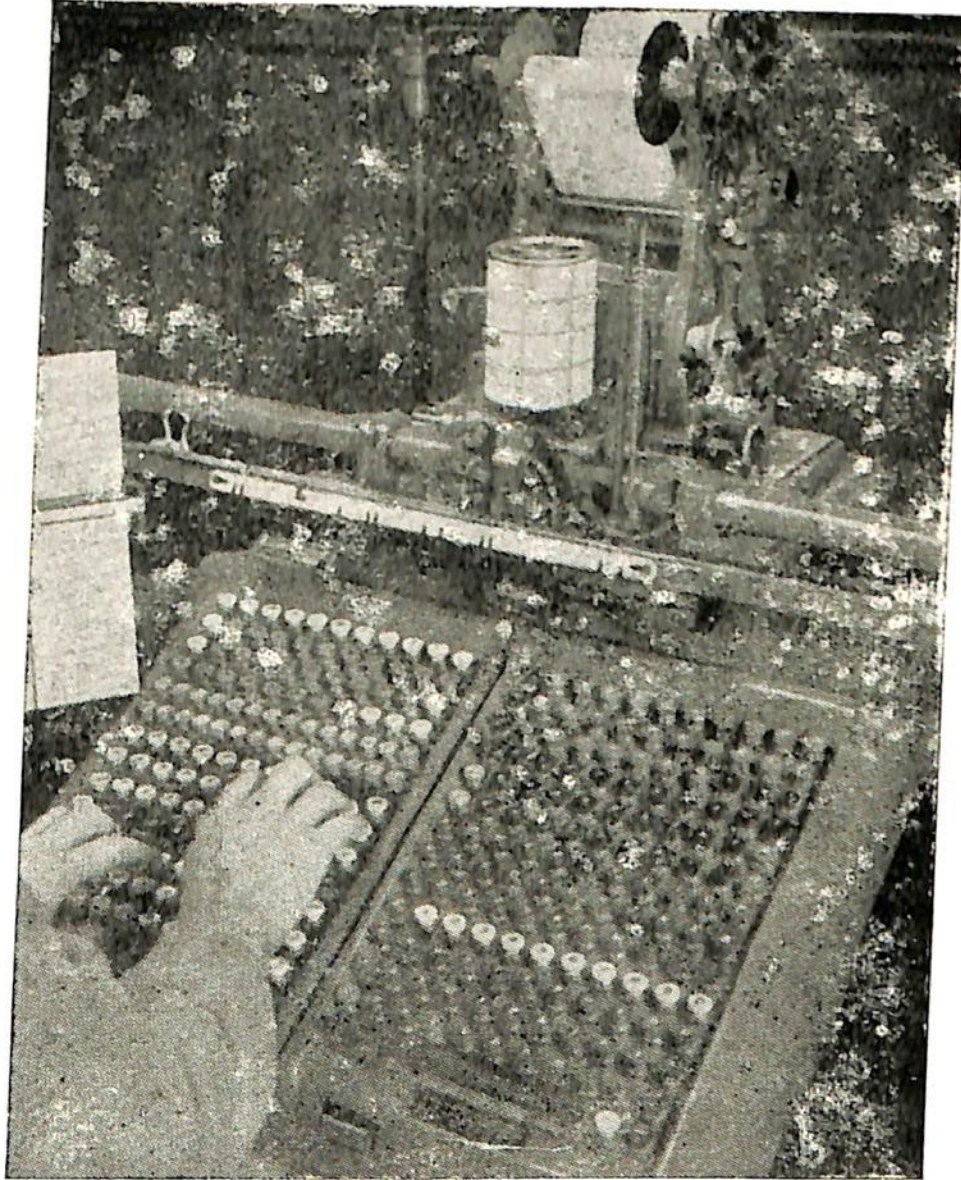


Fig. 111. Monotype  
composition mould.



**Monotype keyboard : Paper tower, Justification unit and Keybanks.**

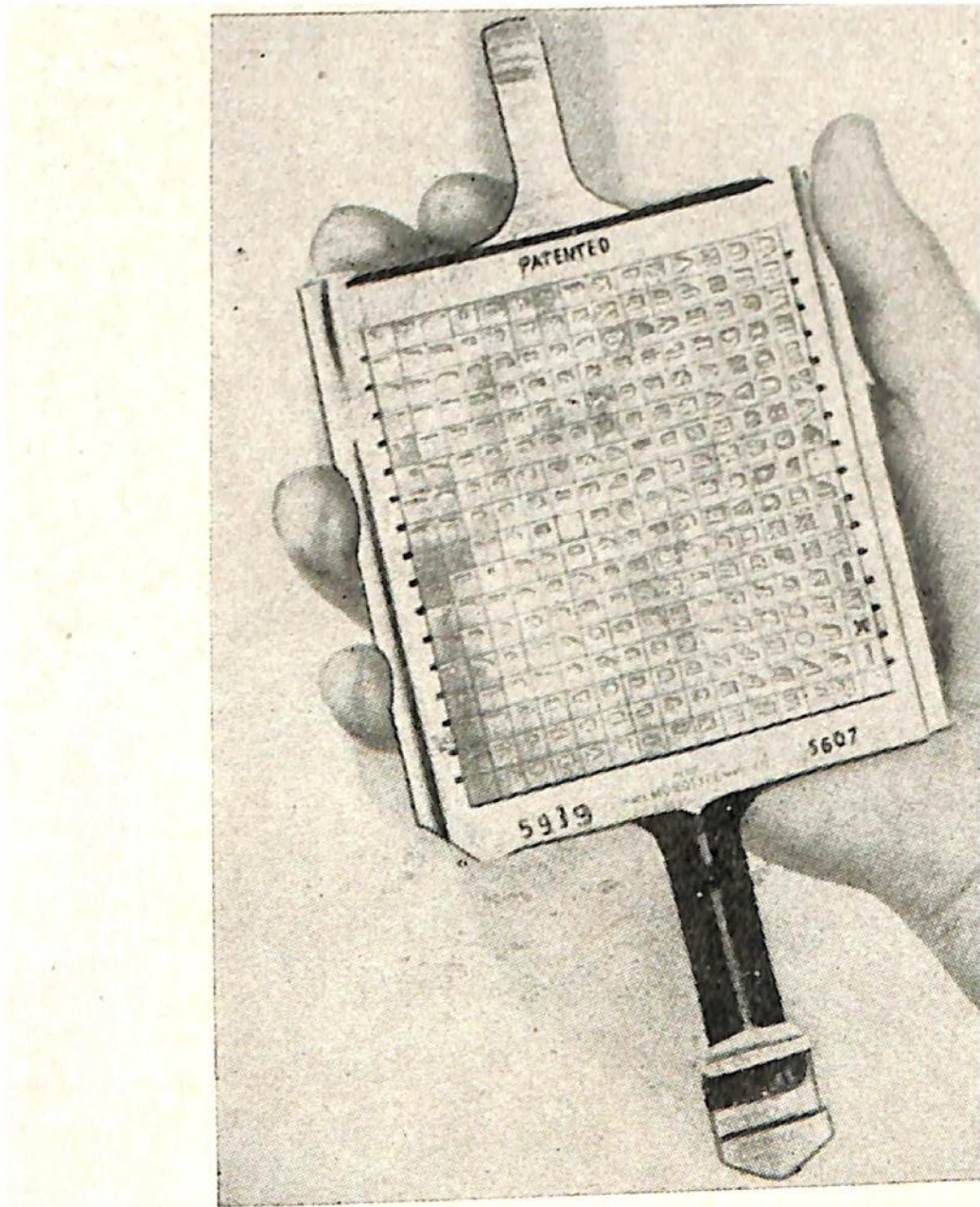
H 5447-24A

**PLATE 101**

अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास  
राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



**Monotype Matrix-frame**

the holes are being punched on the ribbon, the *set* or the thickness of the letter is registered in units in which the square quad in the Monotype system is divided.

298. The space which the type would occupy is registered by the turning of the unit wheel. A small unit rack (Fig. 112) rises at the depression of each key and engages the unit wheel which has been rotated by compressed air on release by the retaining of the pawl. The movement of the pointer on the scale corresponds to the width of the letter in units.

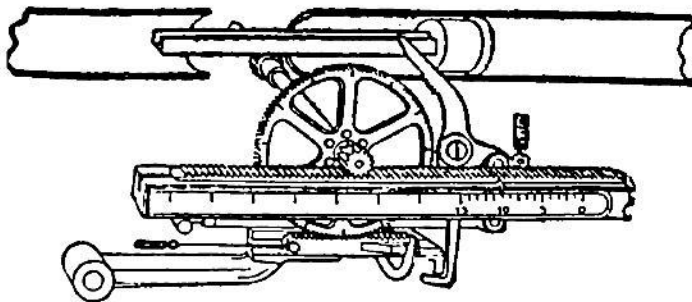


Fig. 112. The unit scale and wheel

At the end of the line, the justification drum which is a ready-reckoner (Plate 104B), indicates two numbers. The numbers are selected by the horizontal movement of the drum and the vertical movement of the space indicator, which raises one row of figures at every strike on the space-band. The operator then presses corresponding justification keys on the key-board from two rows. Each combination of the justification keys indicates a specific width of the space which is inserted between the words to justify the line on the caster.

the justification drum which is a ready-reckoner (Plate 104B), indicates two numbers. The numbers are selected by the horizontal movement of the drum and the vertical movement of the space indicator, which raises one row of figures at every strike on the space-band. The operator

	M	N	L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	.	i	l	e	'	:	:	i	□	l	.	.	l	l	.	.	.	.
6	:	f	j	.	/	(	f	□	j	)	-	t	f	j	:	:	:	:
7	.	l	é	é	z	c	s	r	e	r	s	t	r	s	l	-	!	!
8	?	q	g	ö	v	b	o	c	e	l	z	é	é	?	e	c	z	
9	i	d	a	7	4	l	â	g	a	l	4	7	a	p	ä	y	à	
9	y	k	d	8	5	2	ä	o	.	2	5	8	d	g	ö	v	x	
9	ä	h	0	9	6	3	à	ö	□	3	6	9	0	o	b	â	q	
10	ä	ü	l	n	ü	q	fl	k	p	n	d	S	.	h	u	k	S	
10	f	i	p	u	†	f	v	y	h	u	b	J	x	n	J	C	?	
11	Q	Z	J	S	f	Q	w	Z	C	f	T	P	L	F	Y	Z	Q	
12	w	C	Ö	G	L	O	æ	F	L	T	P	E	G	O	Ö	B	V	
13	B	E	F	P	T	V	Ö	G	A	E	O	B	Ä	Ä	R	U	N	
14	Ä	Ä	V	R	A	m	æ	Y	R	U	N	D	A	Ä	Ä	w	X	
15	X	Y	K	D	H	N	U	M	m	H	D	K	X	m	M	H	K	
18	W	M	Æ	Œ	&	%	=	-	□	W	+	x	‡	‡	‡	‡	W	

Fig. 113. Matrix arrangement

made of hard bronze. The extended matrix-frame (Plate 102) contains fifteen rows of seventeen matrices each. Out of the 255 matrices, four are for casting spaces. Each type-matrix is engraved with a character in recess (Fig. 114). The compressed air passing through the perforated holes of the paper ribbon and through the copper pipes raises the stop-pins

in two blocks positioned on the caster at right angles. The block at the rear of the mould has seventeen pins marked A to O, NI and NL

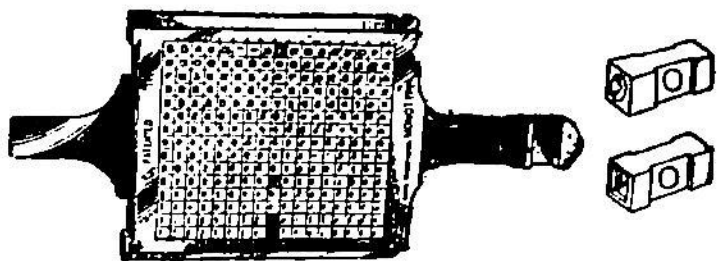


Fig. 114. Matrix Frame

Matrices

while the block on the left has fifteen pins marked 1 to 15. The raised pins stop a pair of tongs (Plate 103) and in turn position the matrix-frame by means of the extended rods attached to the matrix-frame. The matrix-frame positions the required letter on the

mould opening. The extent of the mould opening is determined, one way by the body size of the mould (Fig. 111.) which is fixed and the other way by the set-width of the letter concerned, which varies with the letters. This opening to the set-width is determined by the movement of the set-wedge or normal-wedge which is caused by the escapement of the air from one of the holes numbered 1 to 15. The matrix is held by the centre pin in position while the metal is pumped and the type is cast.

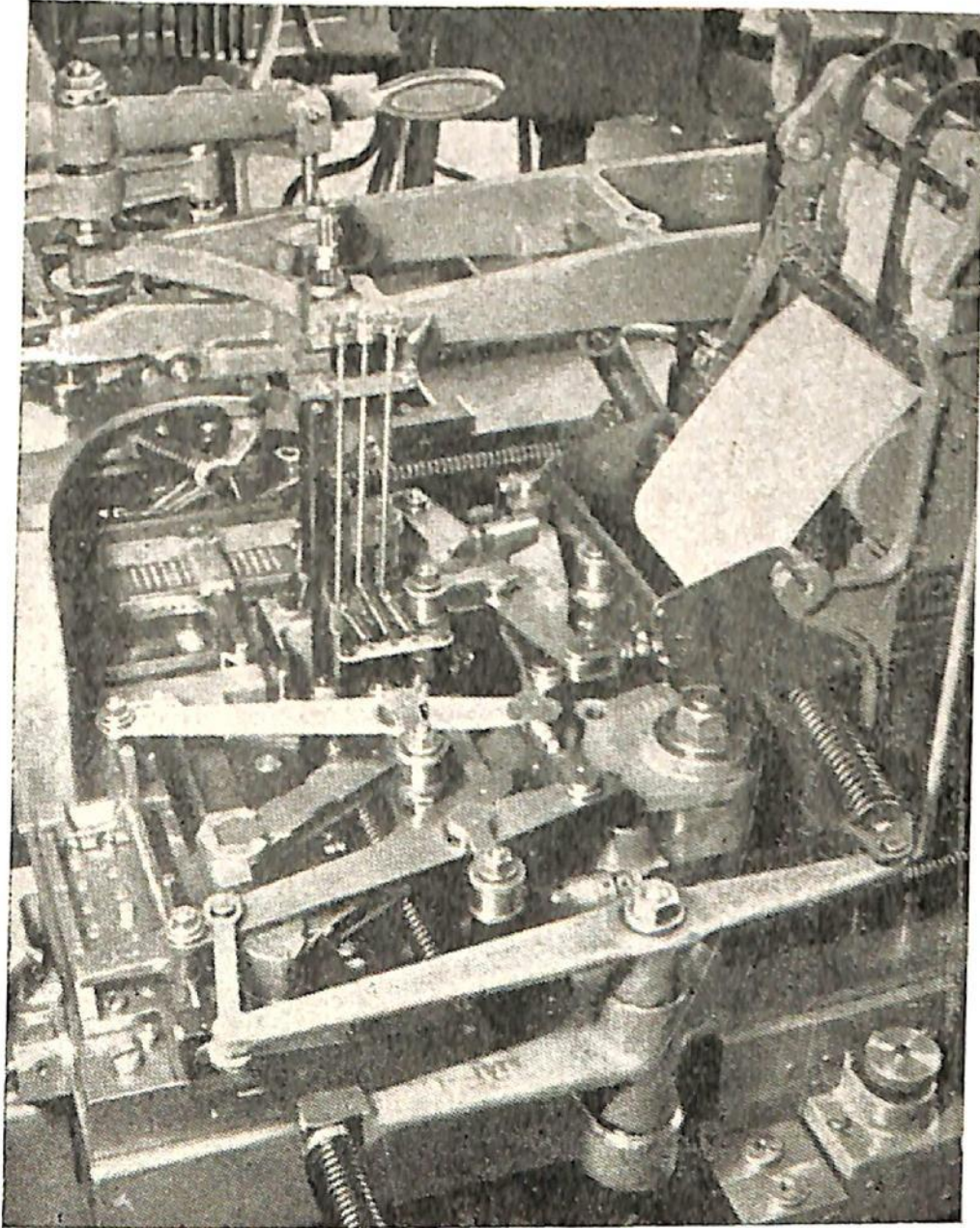
300. The Monotype metal-pot holds about seven kilograms of metal. Monotype composition metal is an alloy made of 6 to 9 percent tin, 15 to 19 percent antimony and balance lead. The machine casts type at a speed of 6,000 to 11,000 types per hour depending on the size, between 14 pts. and 5 pts. The cast type is cooled by the water running through the mould. The width of the spaces in each line is kept uniform and is determined by movement of two justification wedges before the casting of the line begins. The positioning of these wedges is determined by the escape-ment of air through the justification holes. The types are ejected one by one and pushed in a channel from where, on completion of the line, they are transferred on to the galley.

301. The Monotype system of type-casting is based on the unit system of type measurement. The basic unit in this system is one-eighteenth of one point, i.e. .0007685". The point is approximately one-seventy-second of one inch. The basic unit multiplied by the 'Monotype Set' is the unit of that *face*. The set sizes in the Monotype system range from 5 to 26, graduating in quarter sizes. Twelve-set em is 12 point or 0.166".

$$12 \text{ Set} = 0.166"$$

$$1 \text{ Set} = 0.166" \div 12 = .0138333"$$

$$\text{One unit of 1 Set} = .0138333 \div 18 = .0007685."$$



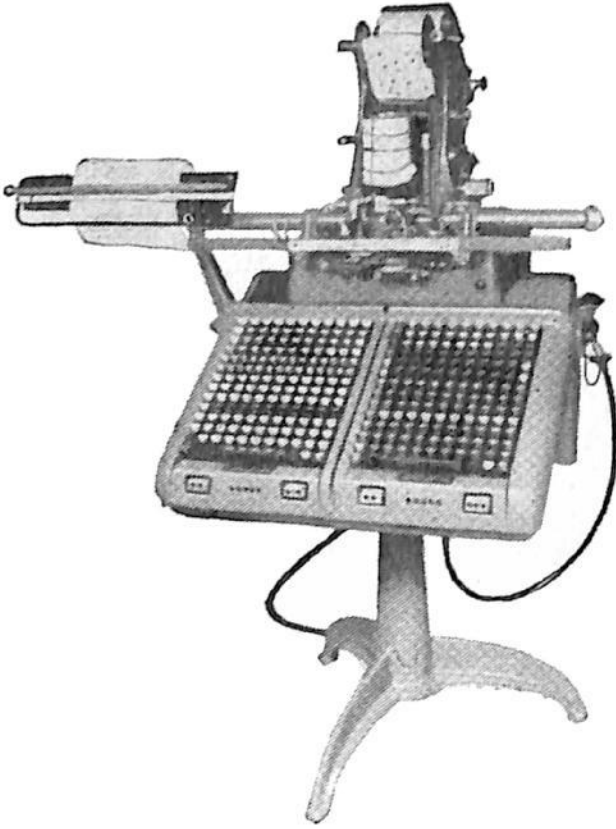
**Monotype Composition Caster : Tongs  
and Stop-pin Block**

**PLATE 103**

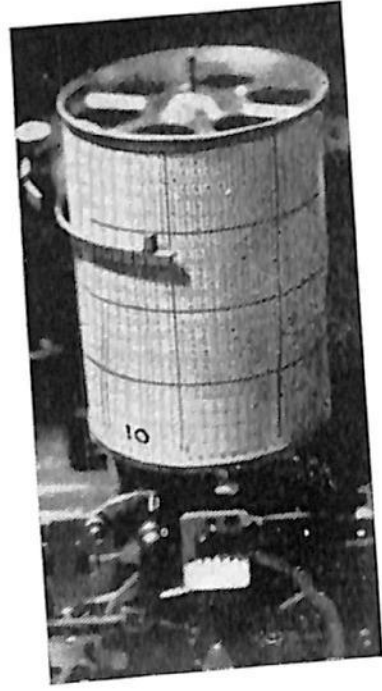
ज्येष्ठ  
१९२२  
एडिओ  
कलकत्ता  
२४३४  
पुस्तकालय  
बनारस

अनुक्रमणिका

मराठीचा विकास - महाराष्ट्राचा विकास  
राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

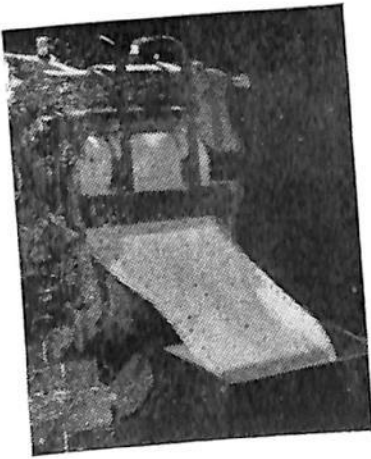
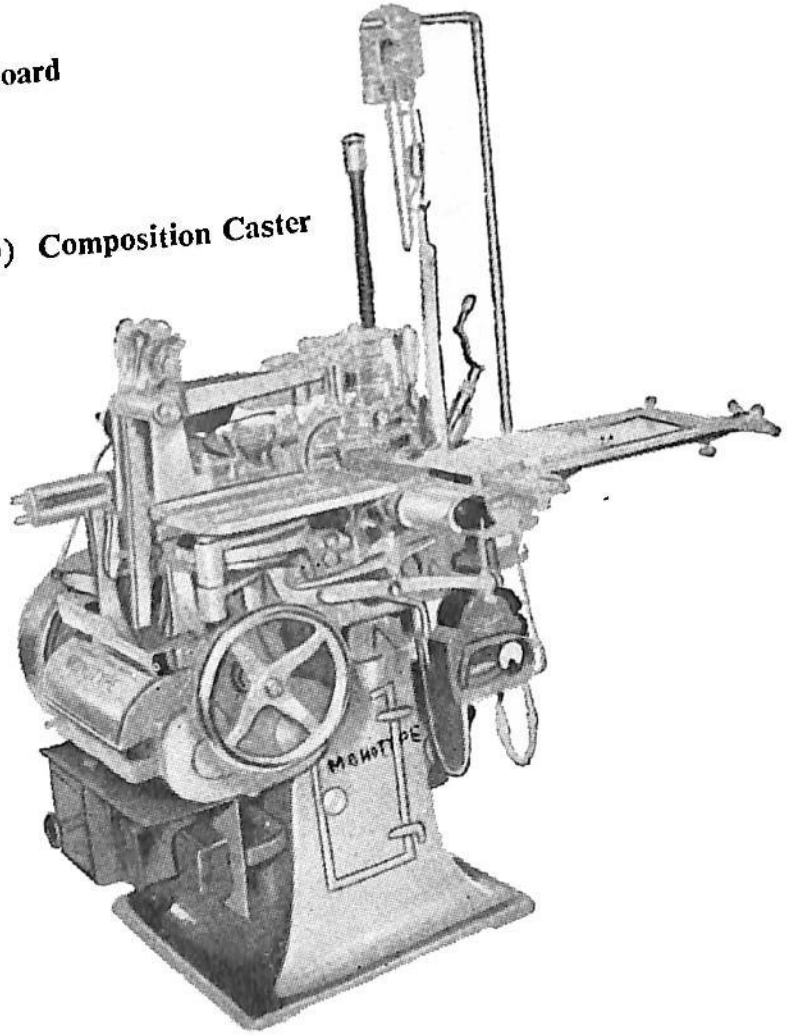


(A) Monotype Keyboard



(B) Justification Scale

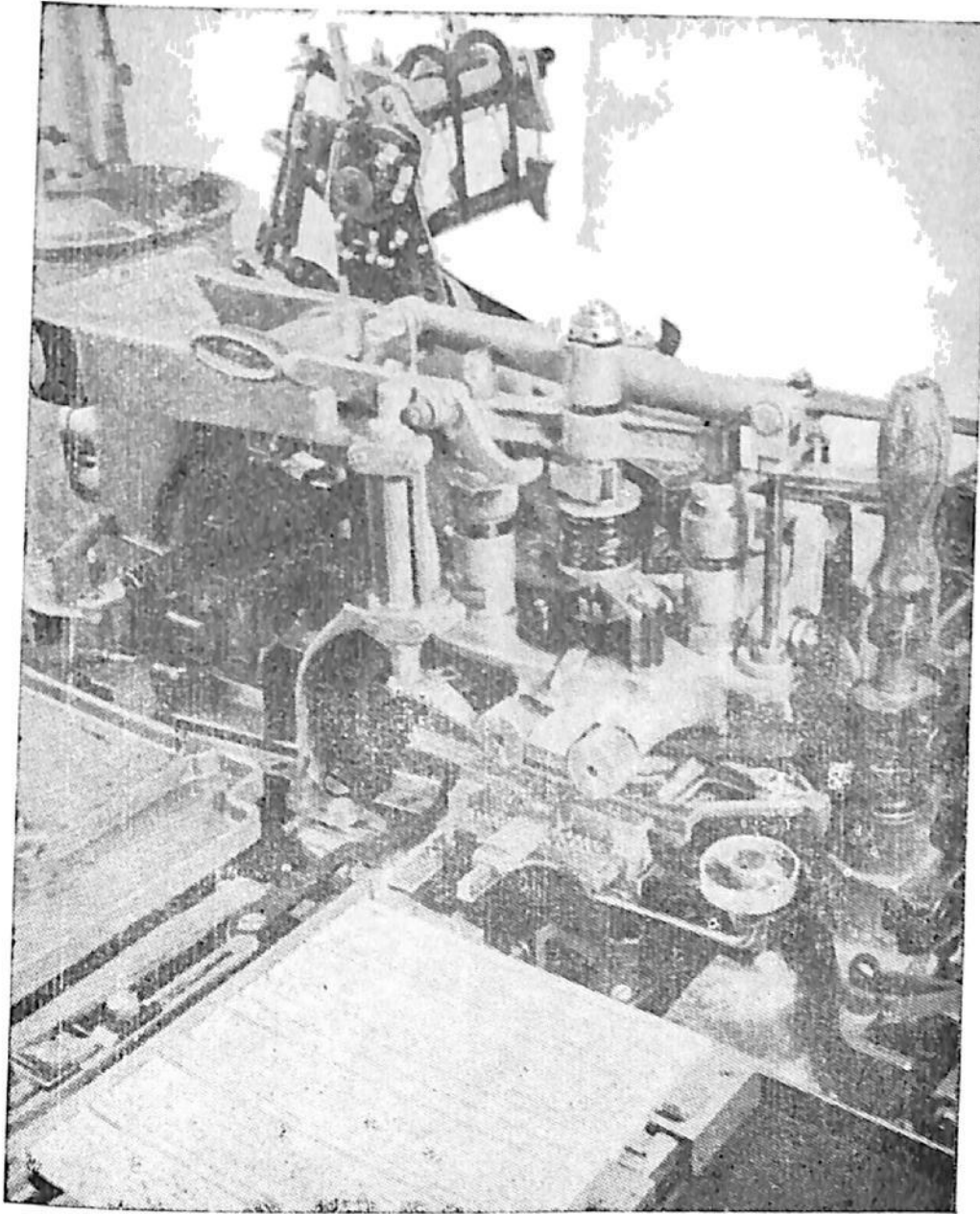
(D) Composition Caster



(C) Paper tower

PLATE 104





**Monotype Composition Caster : Bridge  
Pump and Galley**

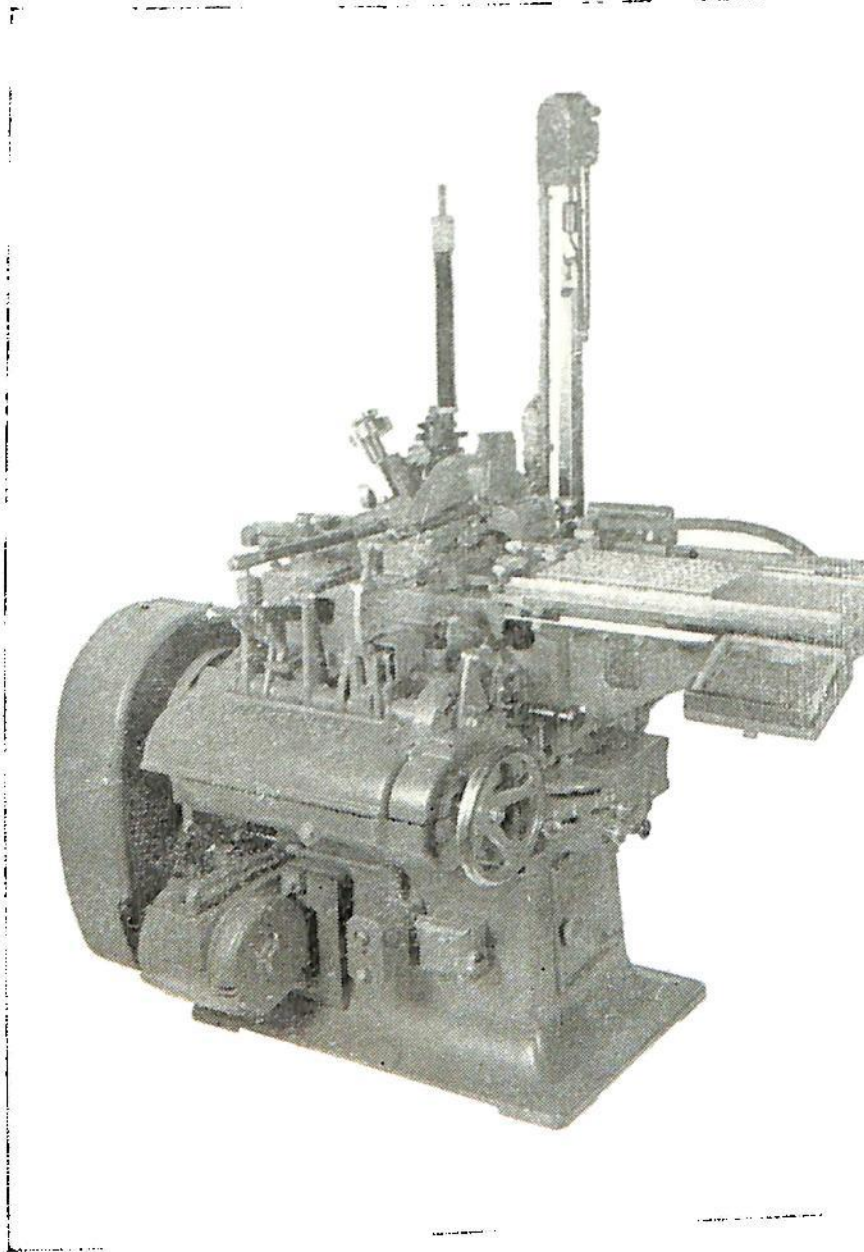
**PLATE 105**

ज्योत्सना  
१९२२ कोश  
एडोको  
कलामण्डल  
२४३४०  
पुस्तकालय  
बम्बई

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

अनुक्रमणिका



**Monotype Super Caster**

**PL:**

**PLATE 106**

To find the unit of any set, the fundamental unit ( $\cdot 0007685$ ) is multiplied by the set-width of the type as given in points.

$$1 \text{ unit of 8 set} = \cdot 0007685 \times 8 = \cdot 006148.$$

$$1 \text{ em (18 units) of eight set} = \cdot 006148 \times 18 = \cdot 110664 \text{ say } \cdot 1107.$$

The caster attendant has to set the measurement of em quad of the fount accurately, so that the required width is correct to 1/10,000th of an inch. If this is not done, the set-measure of the lines will be irregular.

302. Seven Roman alphabets can be set on the modern Monotype machine from the same keyboard and cast from one matrix frame :

ROMAN CAPS, Roman Lower case and SMALL CAPS.

*ITALIC CAPS* and *Italic Lower case*.

**BOLD CAPS** and **Bold Lower case**.

### SLUG-COMPOSING MACHINES

303. There are two makes of the slug-composing machines currently on the market. One is the Linotype and the other is Intertype. The main features of both are the same. Identical slug-composing machine is also available from the U.S.S.R. The Linotype Machine is designed for setting and casting in continuous 'lin(es) o(f)' types (Linotype) known as slugs. It was invented by Ottmar Mergenthaler in 1886. *The Tribune Book of Open Air Sport* was the first work set up on this machine at the office of the New York Tribune. Regular manufacture of this machine was taken up later. The Machine was put on the market in U.S.A. in 1890 and in Europe in 1894. It is now manufactured by the

Mergenthaler Linotype Company, Brooklyn, in U.S.A., and by the Linotype and Machinery Co., Altrincham, in U.K. Linotype machines are widely used for printing newspapers and they are also being used on a large scale in America for book work.

#### LINOTYPE MACHINE

304. The Linotype Machine consists of three main parts: (1) Composing mechanism for assembling the matrices in lines, (2) Casting mechanism to cast the slugs, and (3) Distributing mechanism for carrying the matrices to their channels in the magazine. The Linotype main Keyboard consists of 90 keys. Each key is connected with a channel in the magazine containing matrices, which are rectangular blocks, measuring 14 mm.  $\times$  32 mm (Fig. 115). The thickness of the matrices varies according to the set-measure of the letters engraved on

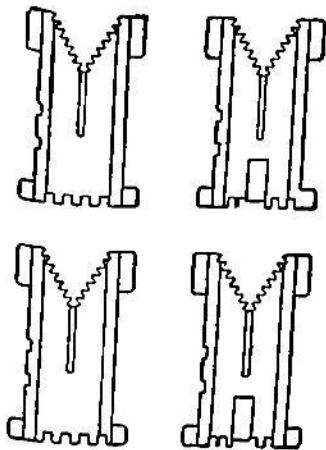


Fig. 115. Linotype Matrices.

blocks, measuring 14 mm.  $\times$  32 mm (Fig. 115). The thickness of the matrices varies according to the set-measure of the letters engraved on

them with the side walls. Matrices are supported by two ears at the upper end and two lugs at the bottom end during their travel. The upper part is given an angular cut in the middle with teeth to correspond with the projections on the distributor-bar. The type character is stamped, 1·05 mm. deep, on one of the edges of the matrix body. Two letters are stamped on each duplex matrix—Roman and *Italic* or Roman and **Bold**.

305. The magazine in which the matrices are steered is kept inclined so that the matrices may slide by gravity. Touching a key on the keyboard pulls out the pawl's front tip positioned at the bottom end of each magazine channel. The lowest matrix is thus released. Movement of the next matrix is arrested by the rear tip of the pawl moving up through the hole in the channel at a little higher position. Matrices released from the channel, travel on a revolving belt up to the assembler-box, where they are positioned erect by the star-wheel. After each word a special key is struck which discharges a steel space-band made of two inter-linked wedges. When the matrices fill the assembler box, the operator ascertains that the remaining space is not more than that which could be filled in by expansion of the wedges in the space-bands. The operator then raises the assembler-box to a position where the line is received by two fingers and pushed by a spring and lever to the left side of the machine into the first-elevator.

306. The first-elevator descends, with the line of the matrices, into two vice-jaws, held apart equivalent to the length of the line measure. The

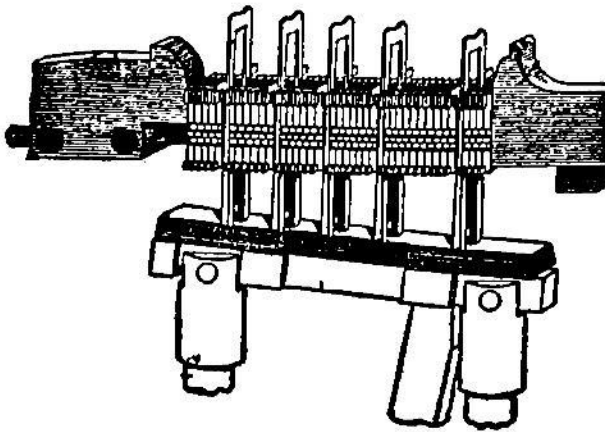


Fig. 116. Assembled line of Linotype Matrices in the Vice Jaws.

mould-wheel turns quarter of a revolution bringing one of its four moulds in front of the line of matrices. On the other side of the mould-wheel is the mouth-piece of the metal-pot. The spacebands are pushed from the bottom, operating the wedges and expanding the spaces. The mould-wheel advances, sealing the line of matrices. The molten metal kept at a temperature of a 550°C is pumped into the

mould. The mould-wheel then recedes and makes three-quarters of revolution during which movement the back of the slug is plained off by the knife and cleaned by a wiper. The slug then comes to the ejecting position, from where it is ejected through two parallel

जन्म  
रक्षणे  
एवमपि  
कलमपि  
रक्षणे  
पुस्तक  
व्याप्त  
कामे  
व्ययम्  
विद्यमान  
तस्मिन्  
कारणम्  
कुरुते

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

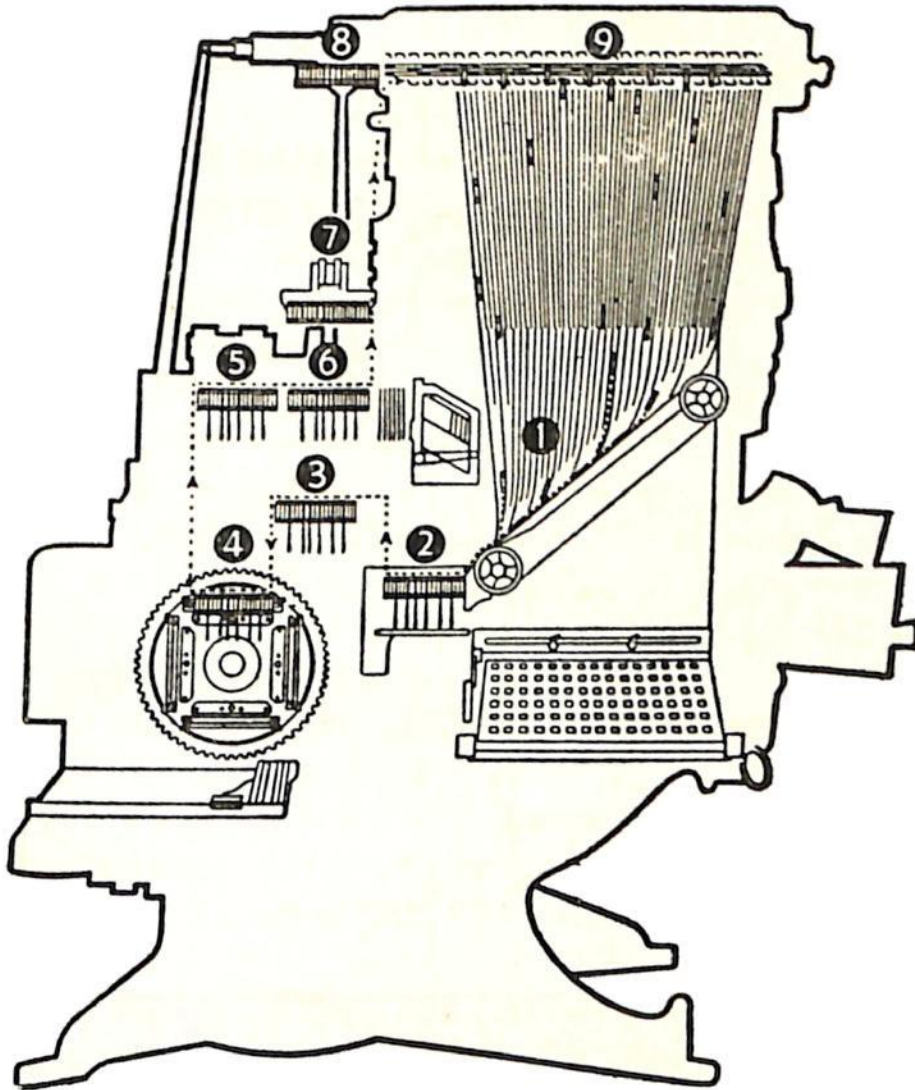


Fig. 117. Linotype machine operating parts

- 1 Matrices leaving the Magazine
- 2 Assembler Box
- 3 First Elevator
- 4 Mould Wheel with a line of Matrices
- 5 Matrices ready for transfer to the Second Elevator
- 6 Second Elevator
- 7 Matrices being lifted to the Distributor Box
- 8 Distributor Box
- 9 Distributor Bar

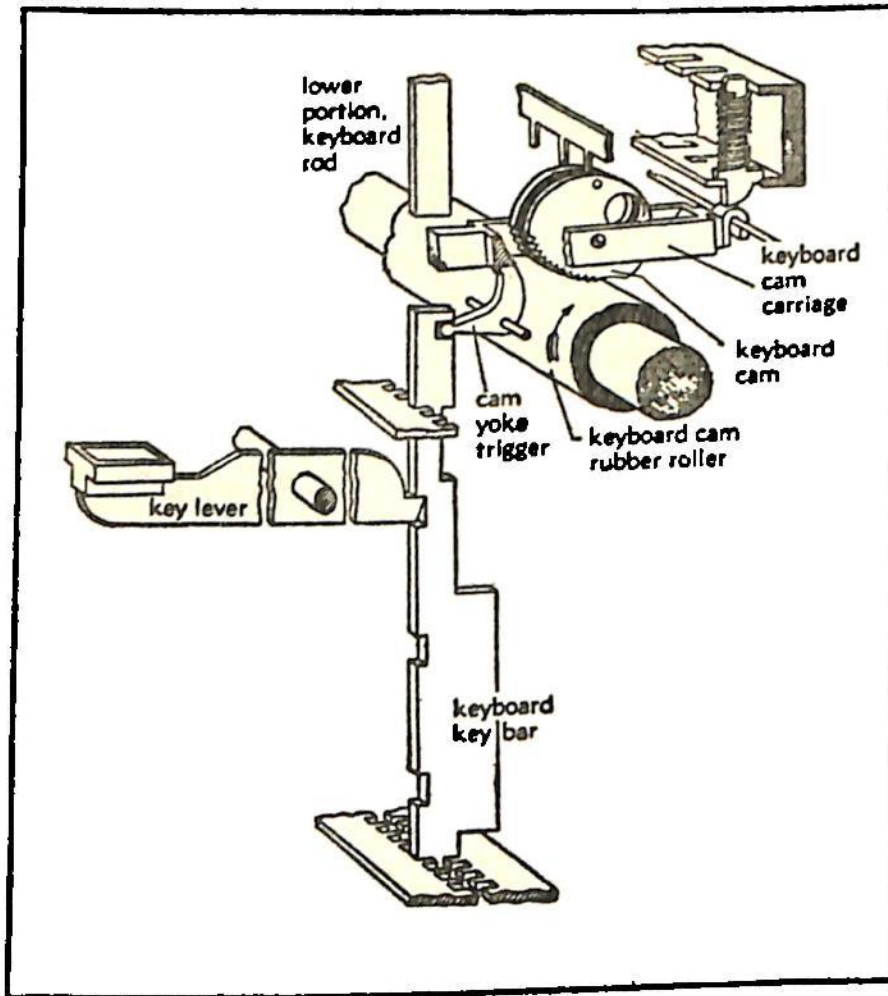


Fig. 118. Mechanism of the Linotype matrix release

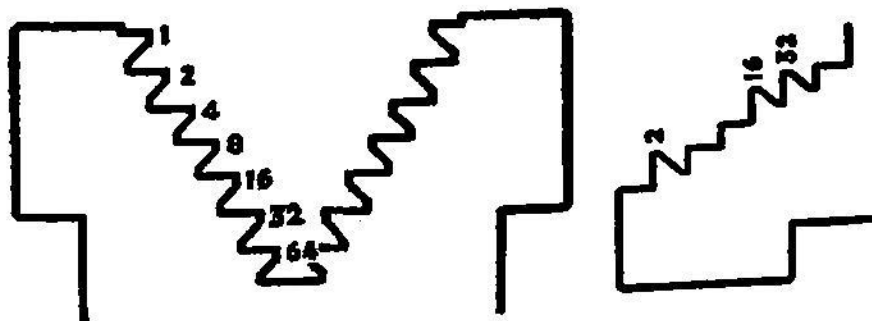


Fig. 119. Matrix teeth for selection

[Note : To find the channel number, add the number of the uncut combination teeth and subtract 2. The remainder gives the channel number which is 48 in this case.]

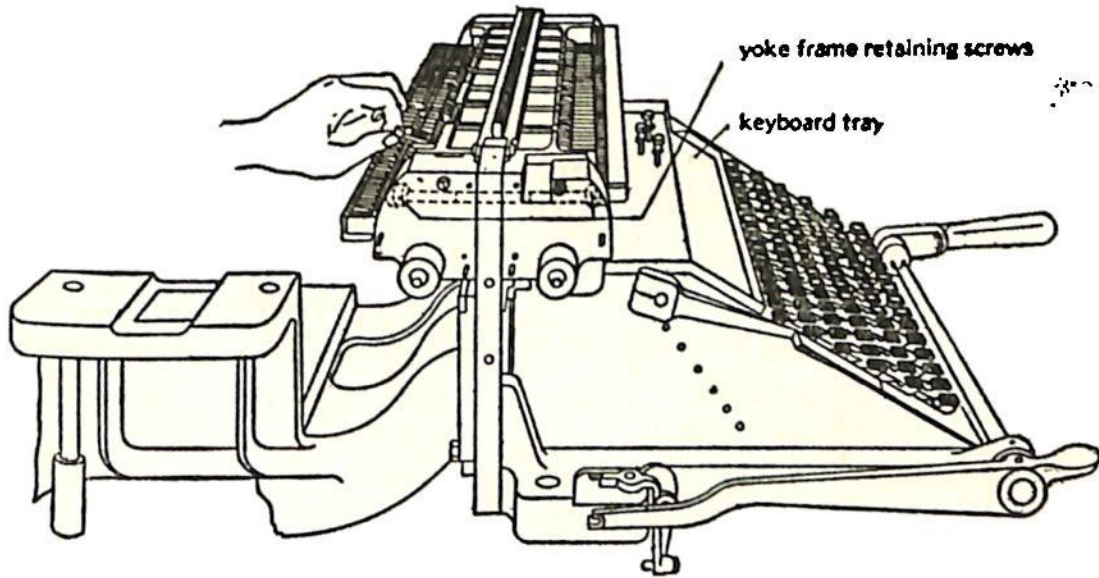


Fig. 120. Linotype Keyboard swung out

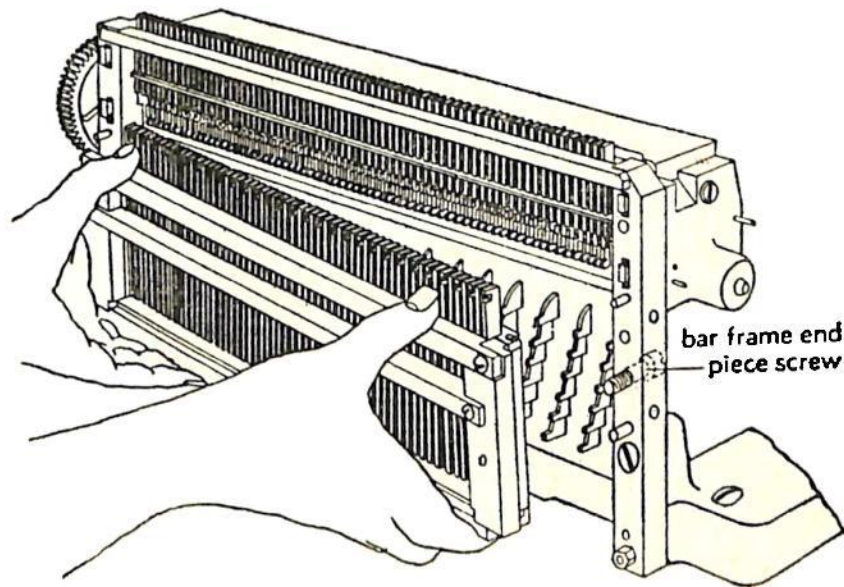
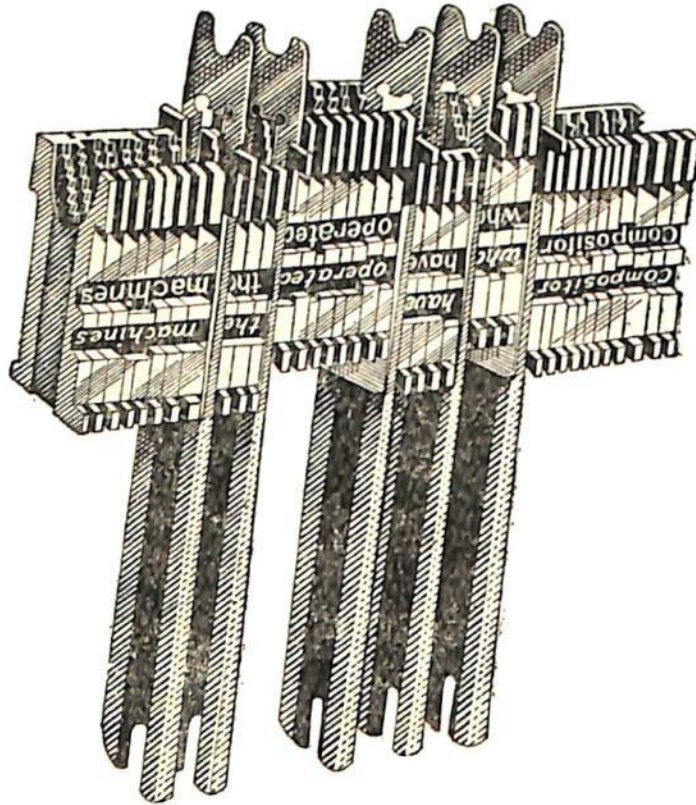
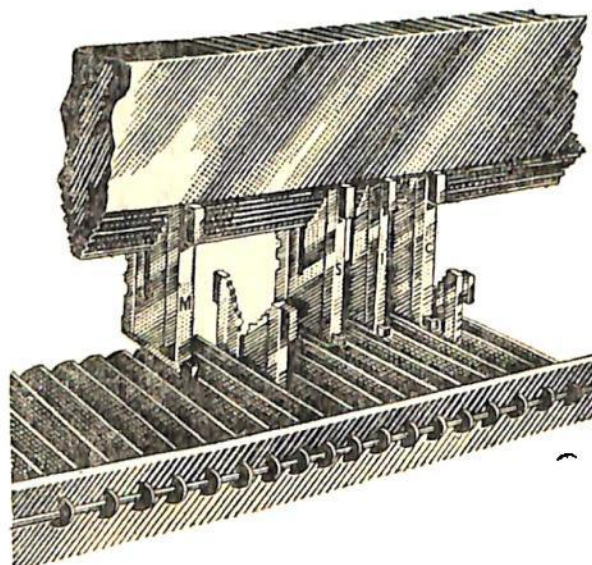


Fig. 121. Key-bars on the Linotype

H 5447-25



**Fig. 122.** An assembled line of matrices and space-bands showing the italic and roman word alignment.



**Fig. 123.** A position of Matrix distributor showing matrix release.



knives, out into the galley. These knives trim the slug on both sides to the exact body-size.

307. While the mould-wheel is carrying the cast slug to the ejecting position the line of matrices is carried up, by the matrix-lift to the transfer channel where a long lever descends to take charge of the matrices.

It lifts them to its top position from where they are pushed on to the distributor-box. The matrices are lifted one by one by a vertical finger moving up and down and delivered to the distributor-bar with seven grooves. The matrices are carried through the revolving spiral rods and dropped into the magazine-channel at the positions, where the grooves in the bar are cut to correspond with the teeth on the matrix. The space-bands are not lifted by the second elevator, but are pushed into the space-box. Matrices inserted by hand are carried over the distributor-bar and are dropped into the pie-stacker.

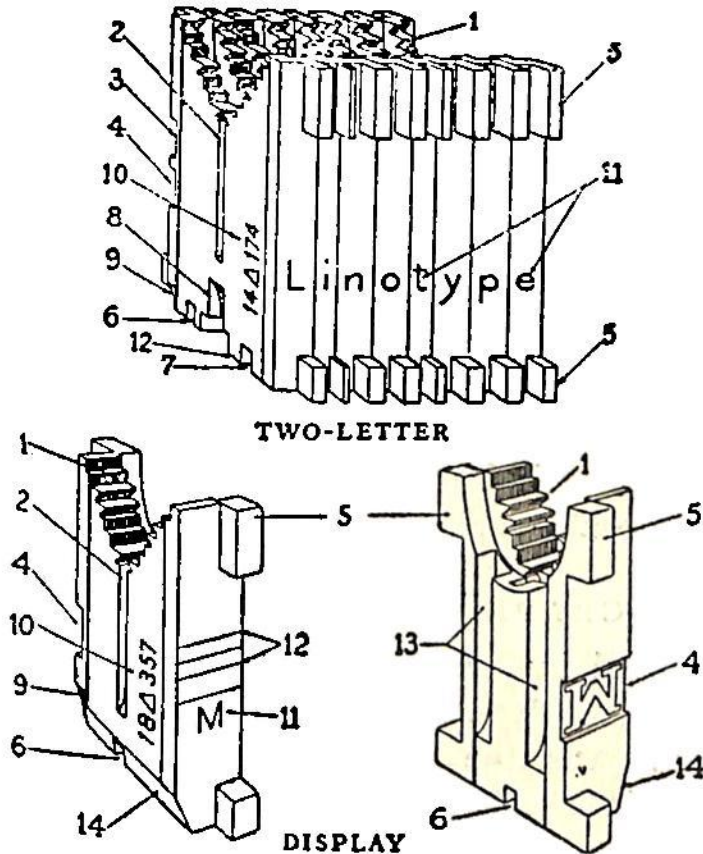


Fig. 124. Linotype Matrices

308. On the Linotype machines text matter is set from  $4\frac{3}{4}$  points to 14 points inclusive, in a range of type faces. Almost all the matrices carry two characters. The most used face is Roman or normal character. The second position on the matrix is utilised for italic or bold face. The signs and figures are duplexed with Small-caps. Larger display faces are also set on the Linotypes in sizes up to 48 points. Set-measures are available up to 36 ems on the Linotypes. On Intertype the set-measure is available up to 42 ems. By the use of different matrix-founts various combinations of alphabets are available on a single machine as follows :-

- Roman with *Italic* and SMALL CAPS or
- Roman with **Bold** and SMALL CAPS or
- Bold** with *Bold Italic* and SMALL CAPS.

809. On the mixer type slug composing machines (Linotype 70 and

H 5447-25a

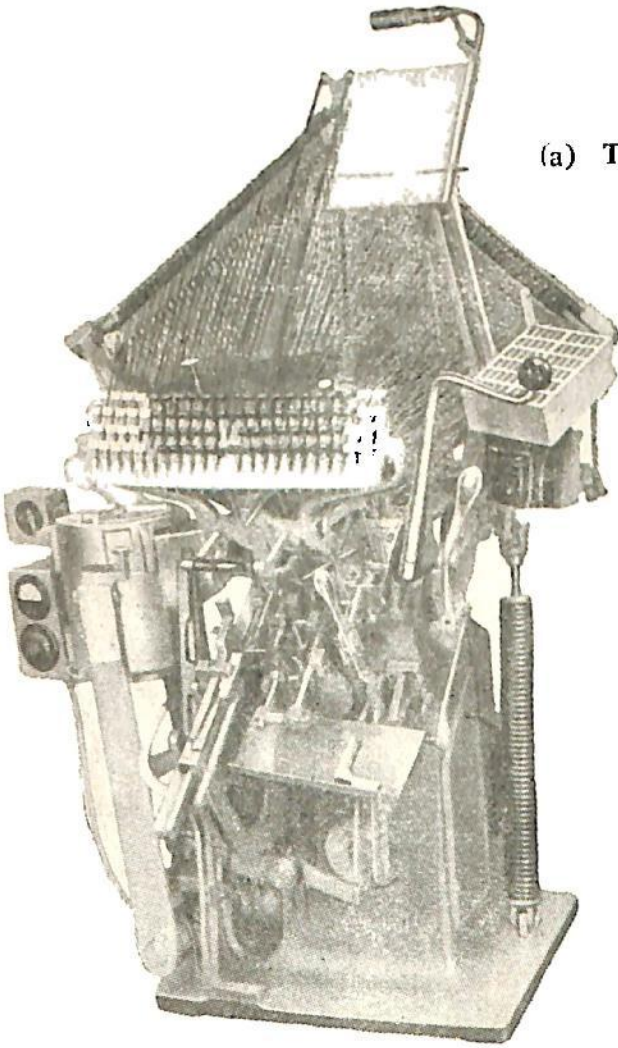
70 SM and Intertype F and F-SM) with double distributor-bar any four matrix-founts making eight complete faces are under keyboard control without magazine replacement. With the addition of side magazines (up to four) an alphabet of single letter matrices in 18 point to 36 point capital and lower case and 42/48 point capitals becomes available. Super-range machines (Linotype 72 and Intertype G) carry 90 channel text and 72 channel display magazines on the main magazine bank. These machines have double distributors but they are not of the mixer type. Side magazines can be added to the Super-range machines. By casting the slugs on larger bodies leading can be provided. Founts with small ascenders and descenders or capitals and small capitals can be cast on smaller body for close fitting. With the simple modifications of the assembler-box, called 'Greek Attachment' speedy alignment of different characters pushed in the normal and auxiliary positions is effected, which makes it possible to set 174 characters and 3 spaces from the main keyboard. The modern slug machines produce a good range of tabular work. Special vertical figures and leaders make available a wider coverage of time-table and rule-form setting.

### TYPOGRAPH

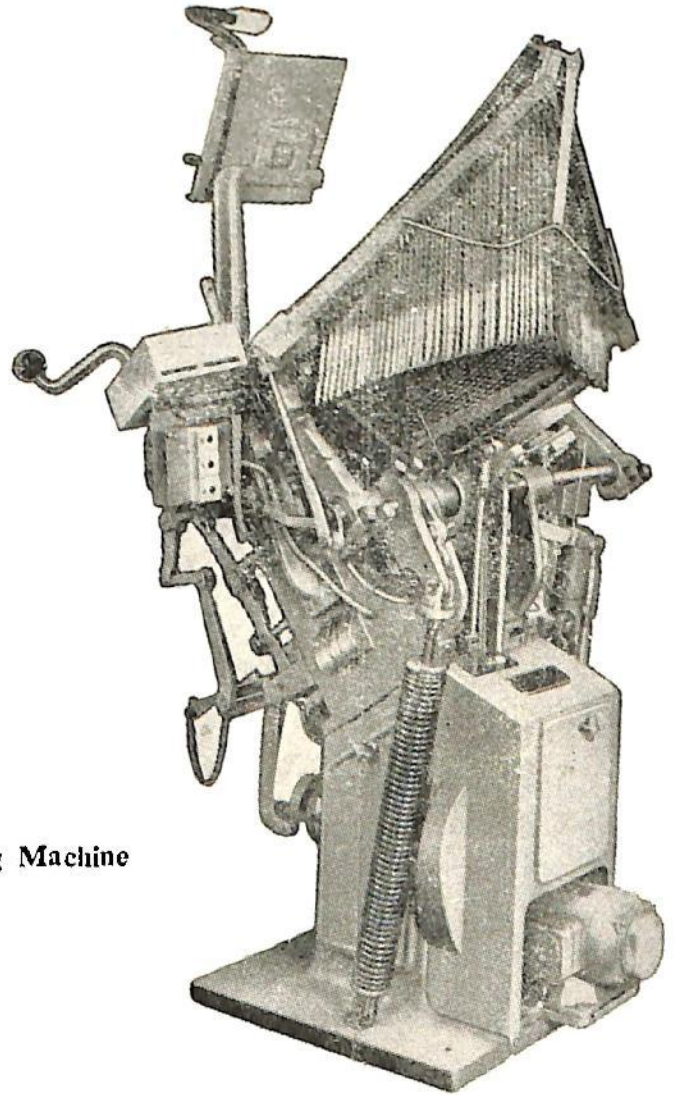
310. Typograph was constructed in 1890 at Cleveland, U.S.A., by John R. Rogers and Fred E. Bright. It is a slug-casting type-setting machine consisting of two main parts, the upper part is a magazine unit comprising of the matrices and the keyboard, the lower part contains the spacing and casting mechanism. Due to a law case concerning its patent which was lost, the Typograph could not be built in America and its manufacture was transferred first to Canada and then to Germany (Loewe and Co., Berlin, now the Typograph G.m.b.H.). There some details were altered, and early in the present century a large number of machines were installed in Europe. In 1908 a two-letter matrix was devised, and in 1914 the Universal model appeared with facilities for the rapid exchange of matrices and moulds and in 1928 the mould was improved.

311. The Typograph keyboard contains eighty-four keys arranged in a manner similar to those on a standard typewriter. As the keyboard is placed rather high the operator has to stand at the machine. Behind the keyboard, on a higher plane, is a frame from which guide-wires descend to a point of junction below the keyboard. At the upper end of the wires hang the matrices consisting of steel shanks with eyelets, brass bodies bearing the characters. Bold letters and

(a) Typograph Slug-casting Machine  
(Front View)

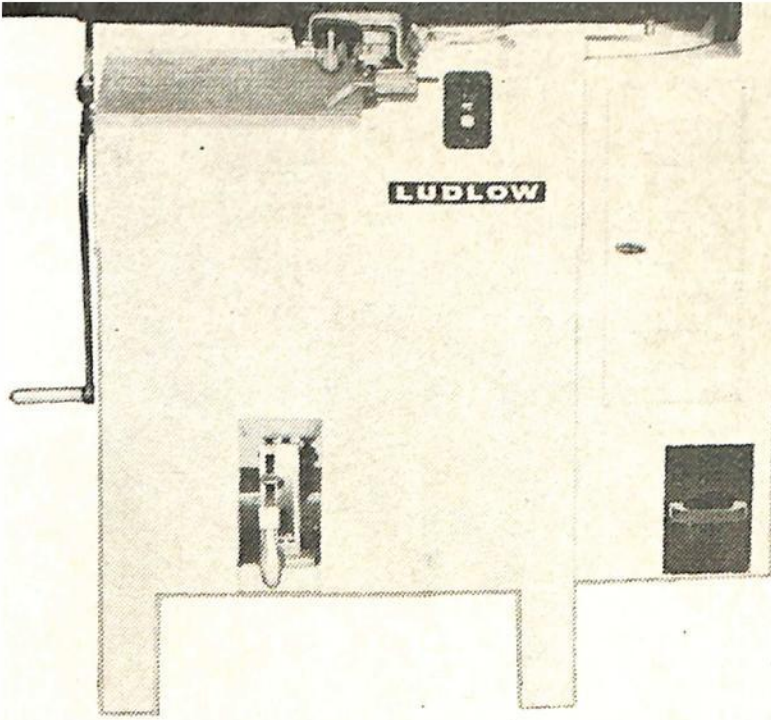


(b) Typograph Slug-casting Machine  
(Rear View)

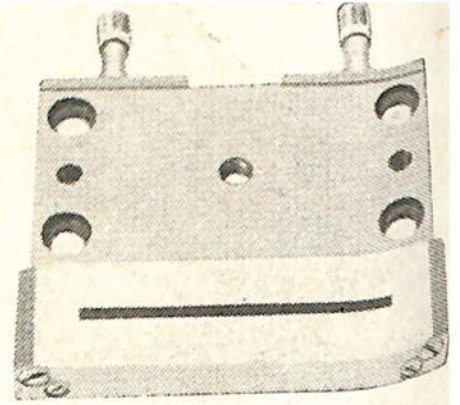


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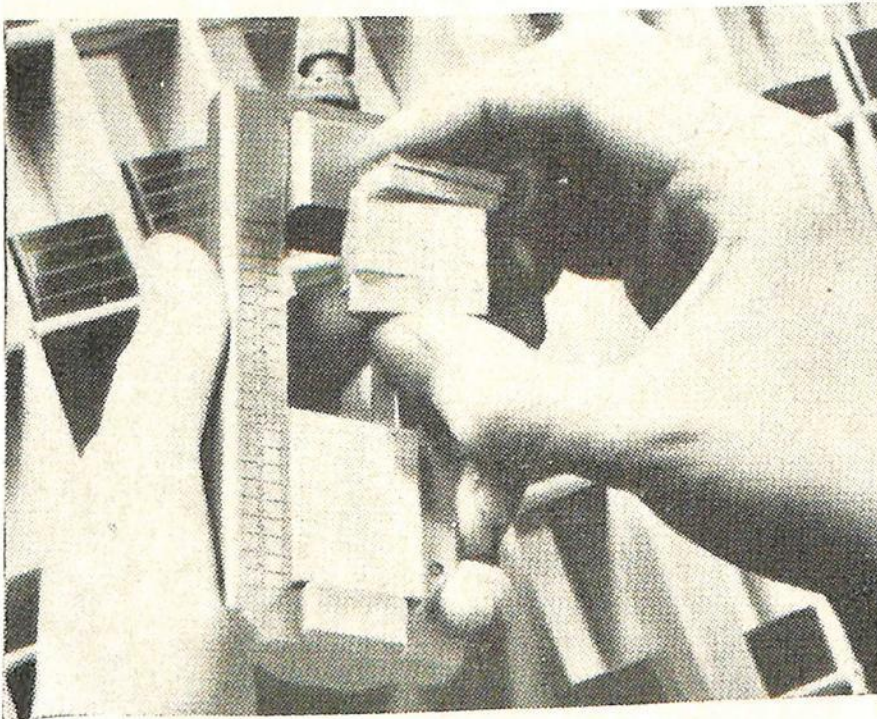
PLATE 107



(a) Ludlow Machine



(b) Ludlow Mould



(c) Ludlow Stick

PLATE 108

roman or gothic, can be mixed at will. The matrices are prevented from sliding down the guide wires by blocking forks. The depression of a key lifts its corresponding fork and releases a matrix down a wire into the assembling channel, while the remaining matrices of the same letter are held back by a rear blocking fork. By striking a spacing key, a spacing ring, a disc with a tapered edge is released. A wedge-shaped tongue is connected with the disc which has a square hole. Spacing rings slide on a square axle. When the line of types and spaces is almost complete and the casting mechanism has been started, the matrix line is held between two jaws while a rail guides them into line. The square axle turns the spacing rings, thereby increasing the spaces between words until the line is justified. The mould, supported by levers, now swings forward towards the matrix line, and a metal plate shoots in between the metal-pot and the mould, into which the metal is now pumped in a single stream.

312. After casting, the Typograph slug is already finished and need not be trimmed with knives at the sides or the base. The jet is broken off slightly above the base by the intermediate plate, after which the line is pressed out of the mould by spring pressure and is drawn to the slug galley, situated in front, under the keyboard. Slugs and hand-set matter can be mixed in the galley. The matrices are distributed by tipping backwards the frame with the guide-wires.

### LUDLOW SLUG-CASTING MACHINE

313. The Ludlow Typograph Co. founded in Chicago in 1906 developed the type-casting machine devised by Washington I. Ludlow. The model was improved upon in 1911. The Ludlow caster is a semi-mechanical slug-casting machine. Brass matrices set by hand in a rectangular stick and spaced are cast in solid lines or slugs on the Ludlow machine.

314. When the matrices are assembled and the stick is made up by tightening the screw provided on the side, it is put in a groove on the top of the caster and locked in position. The machine is then set in motion which automatically moves and brings the mould against the line of matrices, the pump operates, a slug is cast, trimmed and ejected in the galley in about four seconds. The slugs can be repeated. Rules can be cast on this machine as a continuous operation. After the slug is cast the stick is removed and the matrices distributed. Over-hangs at the top or bottom are possible on Ludlow. With angular matrices sloped italics can be set up. In case of the over-hangs, supporting type-high slugs are required to be cast and placed in position.



## THE BHISOTYPE

315. The *British Printer* in its September 1908 issue reported : “ Unlike any other casting or composing device on the market, the Bhisotype is the invention of an Indian gentleman and Professor S. A. Bhisay, has thus set up a new record. Coming from India, with the admittedly highly skilled ingenuity of his race, it would appear that he is working on original lines right through. The possibilities of the Bhisotype are probably very great. ” Bhisotype was universally acclaimed as “ an appliance that is conceived on entirely original lines and that has several novel and original features ”, as recorded by the *British and Colonial Printer*. It was entirely different in its construction to the Linotype, Monotype, Stringertype, Wicks or other of its predecessors. The Bhisotype did not require movable matrices to assemble and distribute as in Linotype, a perforated paper strip and complicated diecase moving mechanism as in Monotype ; or any bulky revolving wheel with pumps and chain as in Wicks which were the principal mechanical devices in use at that time. *The Inland Printer* (August 1908) described the advent of Bhisotype thus : “ A surprise is about to be sprung on the trade in the form of a new type-casting and composing machine, which even in its initial stage, seems to bid fair to prove a formidable competitor to the existing appliances. ”

## THE SPASOTYPE MACHINE

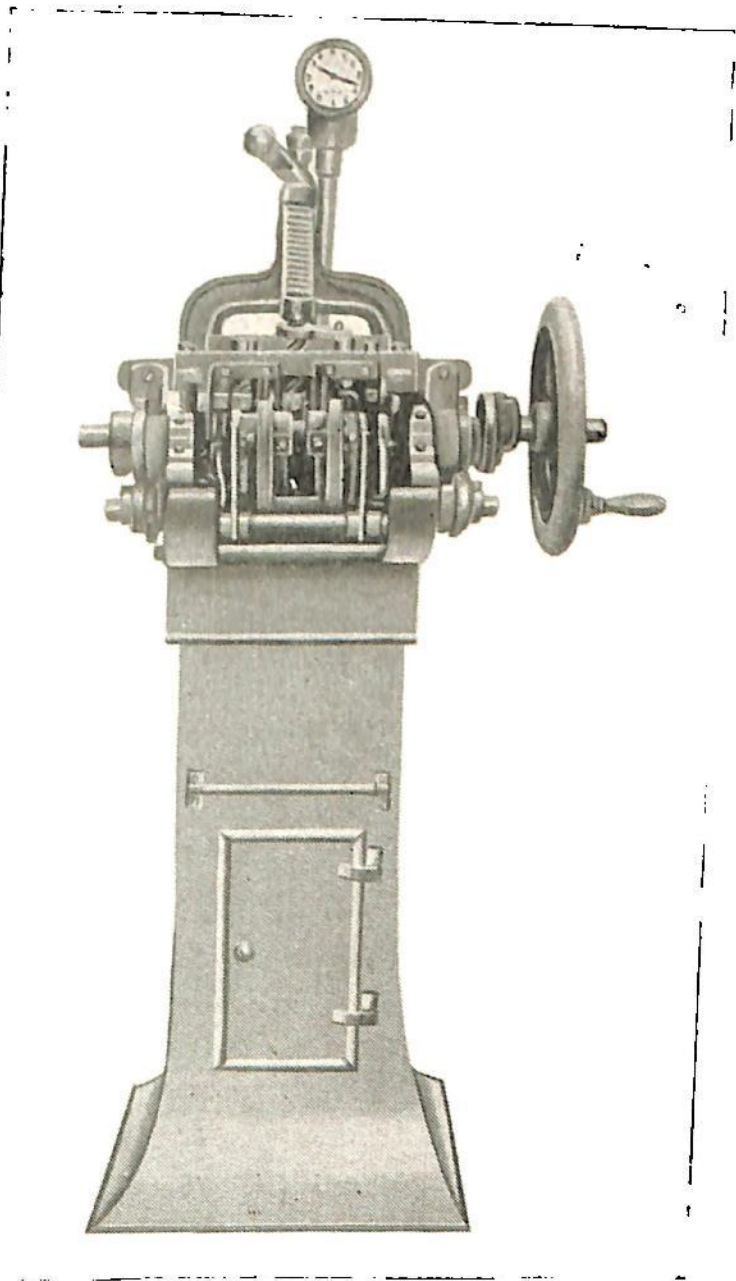
316. Bhisay's Type Casting and Type Composing Machine was invented in 1901 and a provisional patent ( No. 24506 dated 2nd December 1901) was granted. Hughes Son and Company, the patent agents, remarked in their report on Search, dated 30th January 1902, that in their Search of previous patents they did not find “ any specification that has any way anticipated.—

(1) Peculiar construction of the matrices having flexible stems and adopted to cast therefrom a properly justified line of selected letters of words either in *a bar or single types*.

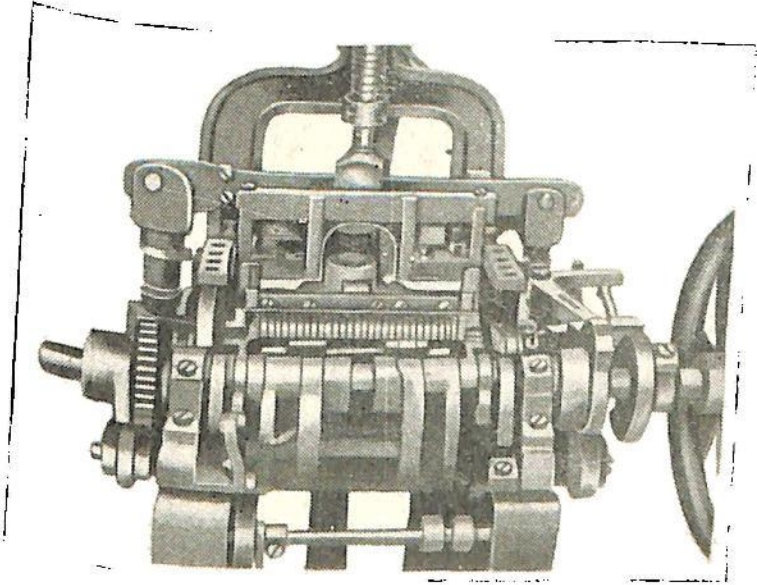
(2) Arrangements of parts by which the selected matrices are assembled and brought in alignment and made to resume their normal position without requiring any distribution.

(3) Space-bars having flexible stems and the arrangement of parts by which the selected one is brought in or taken out of action automatically.

(4) Temporary letter spacing pieces and the arrangement of parts by which they are automatically brought in or taken out of action to form a line bar or single types.



(a) Bhise Type-casting Machine



(b) Arrangement of Multiple Mould

H 5447-25B

PLATE 109

## THE BHISOTYPE

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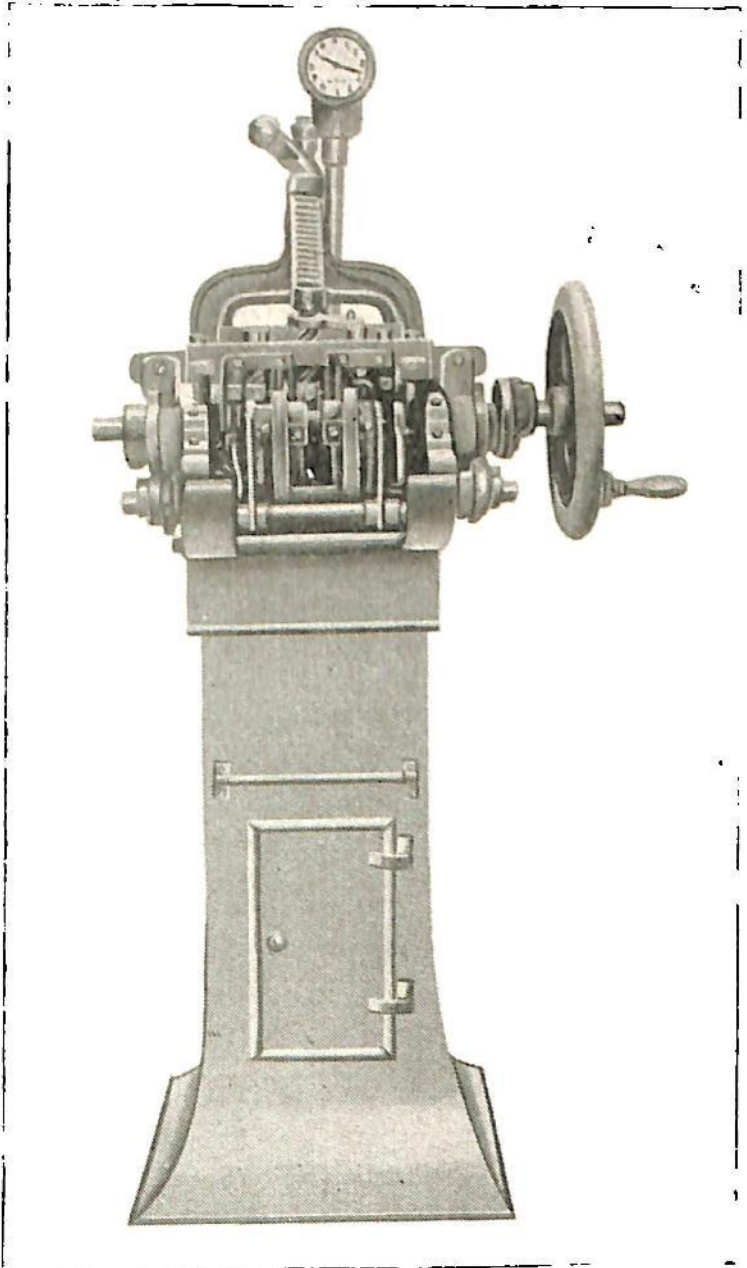
(1) Peculiar construction of the matrices having flexible stems and adopted to cast therefrom a properly justified line of selected letters of words either in *a bar or single types*.

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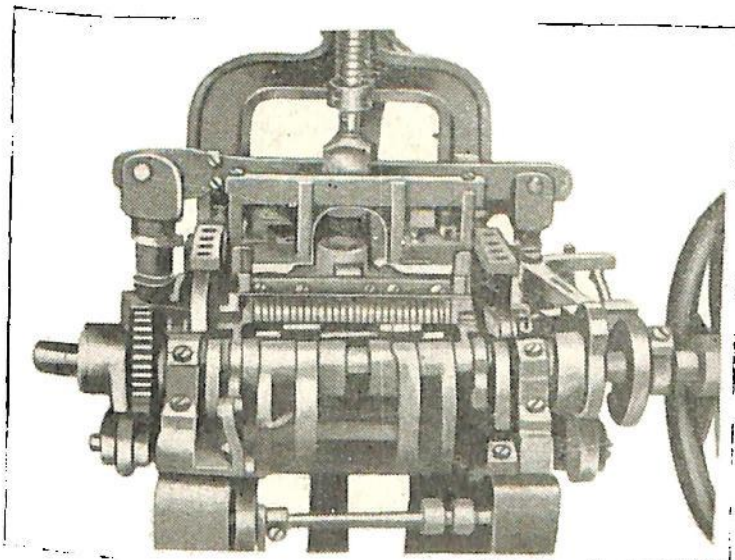
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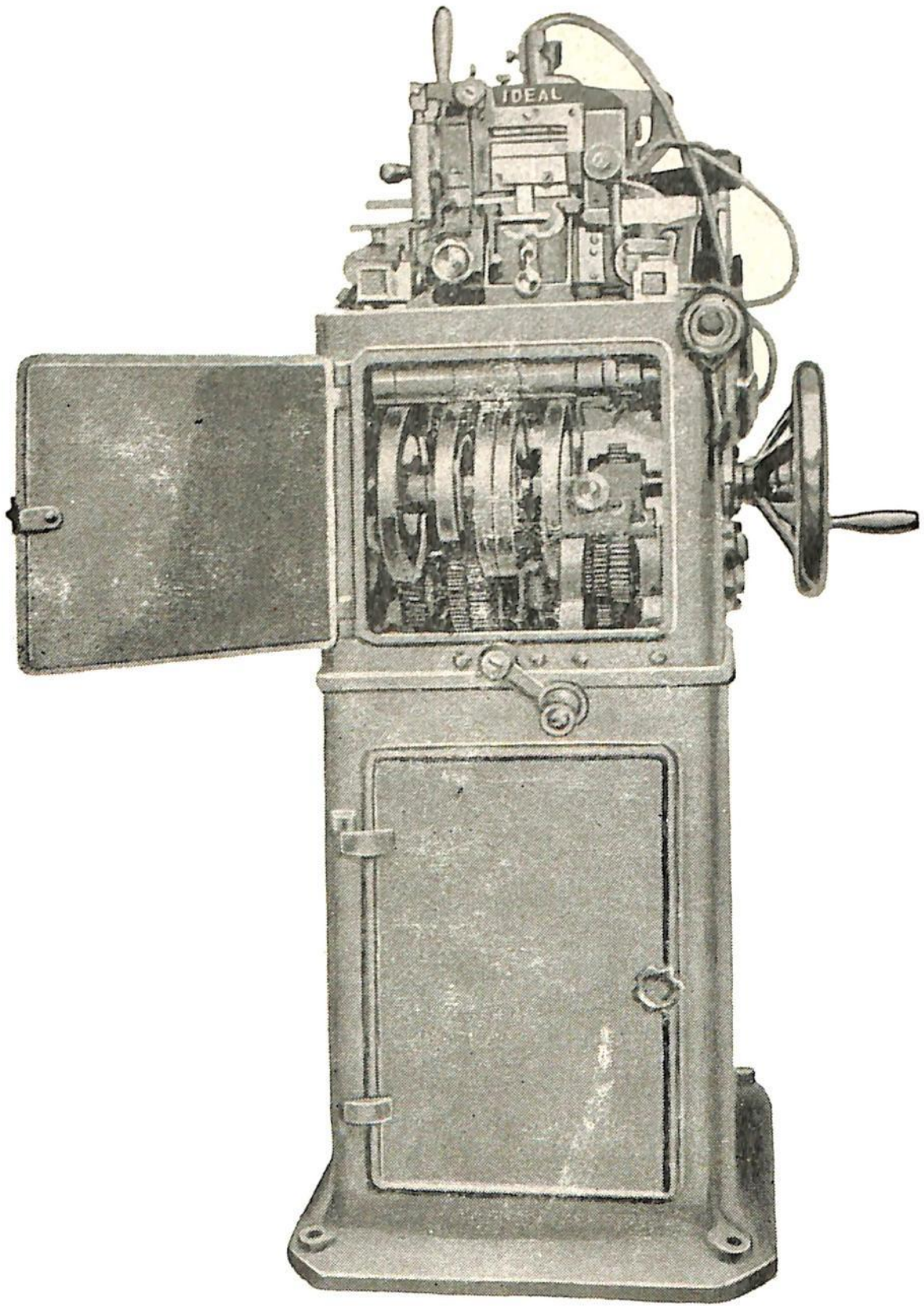


(a) Bhise Type-casting Machine



(b) Arrangement of Multiple Mould

H 5447-25B



**Bhise Ideal Type Caster**

**PLATE 110**

**अनुक्रमणिका**

ज्येष्ठ  
१९२२  
एडिओ  
कलिंग  
२८३८  
पुस्तक  
४५४

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संगणकीकृत

(5). Construction of the mould wheel and arrangement of its various adjusting parts adopted for water circulation opening or closing the cavity automatically and forming a nick in the body of the type. In the prospectus issued by Mr. A. N. McGray in June 1902 the machine is referred to as 'Spasotype'. It was expected to cost £250 as against the Linotype then costing £1200 and selling at £3200.

#### SPECIAL FEATURE OF THE SPASOTYPE

317. The Spasotype machine had four groups of mechanism, Adjusting Board, Temporary Changing Matrix Frame, Type casting Mechanism and the Key-Board and was designed to set a line of selected matrices from which a line of justified types could be cast. It was also possible to cast set up matter in types as in Monotype or individual types on a Foundry caster. The hand-out issued for private circulation also claims "Owing to the interlocking parts the matrices could be adopted to cast Eastern Languages types requiring intricate accents below or above the line. Four lines of set-up matrices were in one operation at a time and the machine could produce 15,000 to 20,000 ens per hour. The special features of this machine as given in the hand-out issued, are :

(1) Compact size, less power required, automatically formed nick, requires only one-sixth of the superficial space occupied by the Linotype.

(2) No complicated series of teeth for purposes of distribution of matrices and avoids spoilage of matrices. The space-bars are arranged under the line of matrices and a proof can be taken while the line of matrices is proceeded on the matrix adjusting board, in advance of the casting of the line.

(3) No air compressor is required nor the use of punching ribbon. Complete set of alphabets could be cast in one operation. The matrix frame being detachable the same could be interchanged.

(4) Lastly the versatility of the machine is claimed to be in its multi-purpose use for casting slugs for newspaper, composed pages of individual types ready for book work and separate letters for foundry.

#### BHISOTYPE CASTING MACHINE

318. The Multiple Casting Machine was invented in 1905. Bhise later founded the Bhisotype Ltd. and produced the first machine in 1908. The famous *Caxton Magazine* said "that a native of India should produce results which the most able Engineers of the world have so far failed to accomplish". This invention brought to Bhise the Membership of the

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Society of Engineers of London and Fellowship of the Society of Science, Letters and Arts, London.

319. The ' Bhisotype ' was a multiple type-casting and mechanical type-composing device, consisting of two separate machines one for casting types and the other for setting them mechanically. The basic machine was mounted on a plate 18 inches by 20 inches. It was 21 inches high, provided with 30 small type-casting moulds. The standard machine could work with 60 moulds and was only 9 inches wider.

320. The casting machine had a rectangular sliding block on which was mounted L-shaped uncovered moulds in a line. A sliding top plate placed in position completed the series of moulds. Each of the 30 moulds had a projection which facilitated extracting the type from the mould. Metal was pumped in from a single plunger pump into the moulds, through a front plate having a ridge, to form a groove at the foot of the types. The other ends of moulds were sealed with the matrices mounted on a frame attached to the sliding cover plate. The moulds had one or two projections in the body to provide the nicks at the required positions. The moulds were kept cool by water circulating through the mould block and the cover plate.

321. During working, the moulds on the blocks were closed by the cover plate by a novel pressure device, pushed forward by cams and brought in contact with the mouth of the spout. The powerful plunger pump operated forcing the molten metal in all the moulds, simultaneously casting 30 separate types, one in each mould. The mould block was then drawn back from the spout, the tails under each of the types were broken off by a special arrangement leaving grooves on the types. Types were removed from the moulds on a turning platform by a coverplate provided with 'extruding projections'. The types could be conveyed to a table for automatic assembling into founts or to the magazines of one or more Bhisotype Composing Machines.

322. The moulds provided on the Bhisotype were made of two pieces fixed together to form an L-shaped rectangular slot varying in size according to the ' body size of the type proposed to be cast. Each mould occupied only  $\frac{1}{4}$  inch for types up to 12pt. making the total length of the mould plate to  $7\frac{1}{2}$  inches only. The matrices were made of rectangular copper blocks on which were punched deep steel letters. They could also be made by the electrotyping or 'battary method'. Matrices could carry two deep punchings as in case of Linotype duplex matrices. Each of the matrices was on a pre-fixed unit width, which determined the set size of the types with a common body governed by the corresponding mould

ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
ॐ नमो भगवते वासुदेवाय  
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ॐ नमो भगवते वासुदेवाय

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संगणकीकृत

slot sizes . The matrices could be grouped together to cast logotypes, line-bars or slugs, by insertion of a plain block of the length required. Change-over to other body-size was effected by substitution of the appropriate L-shaped mould-piece only, and the top cover plate was common to all sizes. The moulds on Bhisotype were so constructed that the metal inlets automatically increased in size for larger bodies allowing larger quantities of metal and thus insuring solid bodies. The machine made only forty revolutions per minute as compared to 80 to 100 revolutions of ordinary type-casters and 140 upwards of the Monotype composition caster, but could cast 60 types per revolution increasing the output to 2,400 types per minute.

### BHISOTYPE COMPOSING MACHINE

323. The Bhisotype Composing Machine was a simple device consisting of a magazine with 90 chambers each of which held 10 types at a time. The chambers were connected with the respective keys on the keyboard, similar in design to that of a type writer. The chambers were connected with the Bhisotype Caster by a travelling chain effecting automatic supply of fresh types. One Bhisotype Casting Machine could supply types to ten composing machines at a time. The keyboard operator of the Bhisotype Composing Machine had to set the lines by operating the keyboard and by releasing a lever, shifting the line to a specially built compartment. The line was automatically justified and transferred to the galley without disturbing the setting operations. A complete Bhisotype unit of one caster and ten composing machines was then (1908) expected to cost only one-fifth of the cost of Linotypes or Monotypes capable of producing identical output.

### TATA BHISE INVENTIONS SYNDICATE

324. Professor Bhise had thus succeeded in inventing a novel device for mechanical typesetting, which was considered superior to the then existing mechanical composing machines. He was however unable to arrange for its commercial production and had to join the Tatas to form the "Tata Bhisey Inventions Syndicate". He had to drop the manufacture soon owing to difference with the directors of the Tatas. This proved very unfortunate particularly for the Oriental languages. The sponsors of the Bhisotype had claimed "The peculiar construction of the Bhisotype mould and its method of operation are admirably adopted for casting types or characters of any of the Oriental languages with all their intricacies. The inventor has given special attention to this. It is impossible to cast

जन्म  
२३/१२  
कोशी  
विलासपुर  
२६/३/०९  
पुस्तकालय  
पुस्तक  
कोशी  
कोशी  
विद्यार्थन  
तमदधन  
करलभय  
कोशी

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and compose such types (with combination accents) by existing machines.

325. Bhise had realised that his Multiple Type Caster was more useful to the type founders and it was not popular with printers. He tried to meet the requirement of average printer with his invention of Universal mould for single type caster in 1914. His machine designed to cast type was then considered the simplest with only 250 parts against 600 parts of the Thomson Caster, 1,000 parts of the Universal Caster and over 1,500 parts of the Monotype Caster. The Bhise Ideal Type Casting Corporation was founded in 1920. Mr. W. Ackerman, the Linotype Engineer, has remarked " He (Bhise) has now solved a problem which had been the dream of type machine inventors for many years. . . . and no doubt would be welcomed by the trade as the solution of many of the problems now connected with the commercial use of typecaster. "

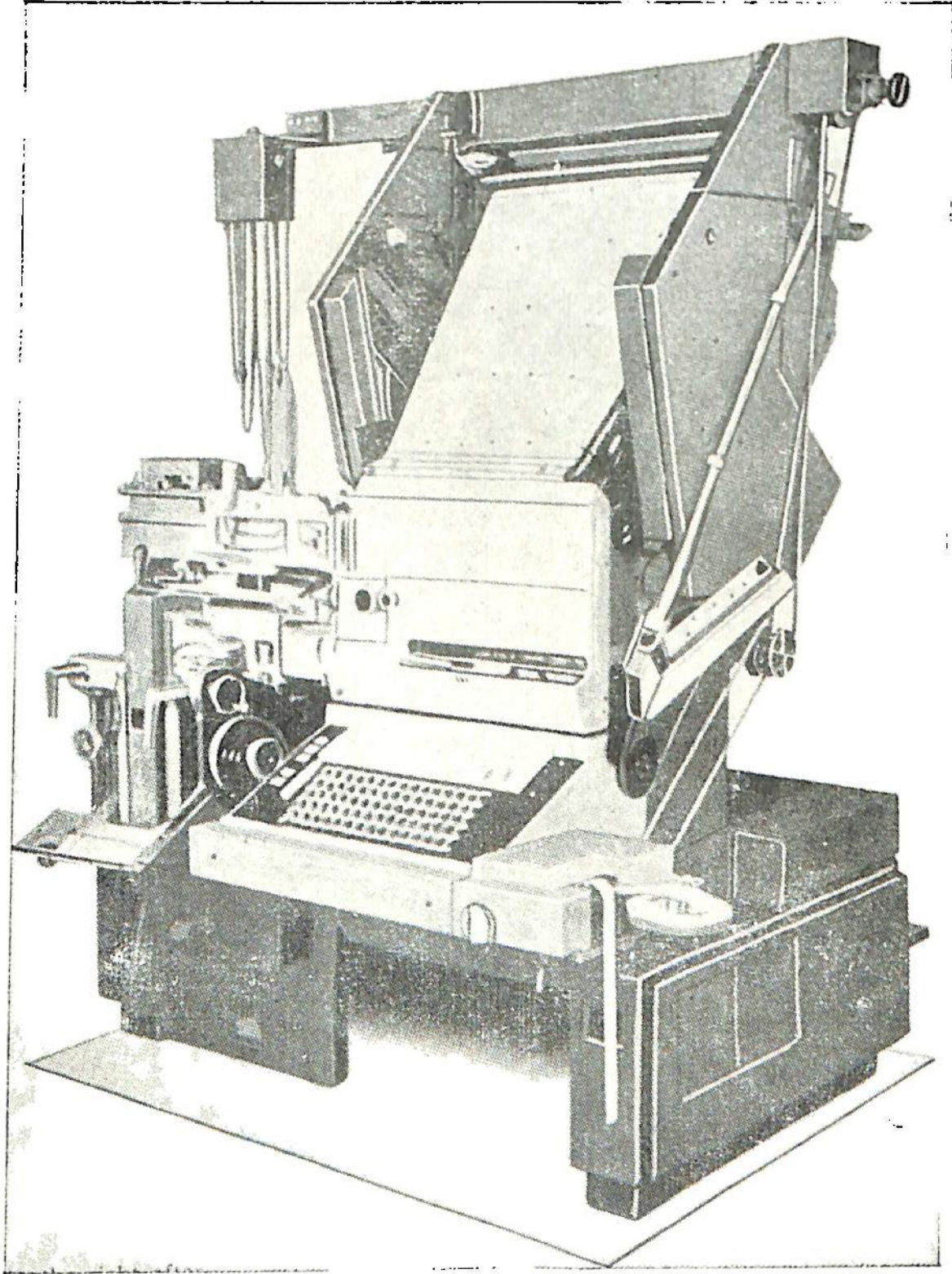
#### T.T.S. LINOTYPE

326. Speedier slug-casting machines (70 Series Linotypes) have now been manufactured by removing the mechanical limitations to the speed. They are provided with high-angled magazines which permit extra fast flow of matrices. The mechanical speed of T.T.S. (Model 79) and Comet 300 Linotype is variable from 8 to 12 newspaper lines of 12 em pica in 8 pt. per minute (17,000 to 26,000 ens.).

327. Electron is the fastest line-casting machine of the single distributor type with four magazines. The improvements incorporated in it include uninterrupted assembly of matrices and their straight line travel, eliminating use of assembling elevator. All the controls are centralised for the benefit of the operator. The new design of the improvements of the keyboard height permits more restful posture reducing the operator fatigue. The machine can be provided with six moulds in place of usual four moulds. With this improvement it is possible to set 15 newspaper lines (32,000 ens) per minute, subject to the ability of the operator. With such tremendous speed the limiting factor is only the operator's performance and for full utilization of the machine capacity, it is necessary to feed a perforated tape.

328. The perforated tape is required to be justified. This can be done manually by an operator setting at a special Tape Perforator. Automation in slug composition is introduced with the Multiface Perforator, a desk type electrical typewriter, producing a six hole 7/8" wide code tape, which is fed to the Linotype machine. Additional keys are provided on the keyboard for fixed spaces, ligatures and odd characters. The different combinations of the holes provide for all the keyboard





**Fastest Lino Casting Machine : T.T.S.**

**PLATE 111**

ज्येष्ठ  
 एकोवीस  
 कलिंग  
 २४३४  
 पक्षिभूषण  
 चमरे

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
 संगणकीकृत

अनुक्रमणिका

quantity of metal is, therefore, required when the hot-metal process is used, particularly when it has to be kept standing for books which are likely to be reprinted, technical and educational books, for example, the type of which may also need to be corrected for new editions. A great deal of storage space is also required for storing the standing types. The space required for 250 pages of negatives, when a book is photo-set, is much less than that required for ten pages of type.

332. The versatility of photo-setting is greater than that of the hot-metal setting. It eliminates completely type-casting, imposing, proving and all camera work. The product of the photo-setting machine is two-dimensional as against three-dimensional types produced by the mechanical composing machines. Photo-composing makes the work in the printing press quicker, cleaner and simpler. By changing the adjustments of the machine the distance between film and matrix can be altered, which means that the size of the type is almost infinitely variable, as against the fixed-size point system used in the hot-metal setting. Photo-setting is developing extensively in the western countries and is likely to be introduced in this country on a large scale in the near future. The photo-setting machines fall into two categories. The first category is of the machines developed by adapting the existing type-setting machines, i.e., Foto-setter and Mono-photo. The second category is a complete departure from the design of the existing type-setting machines. The machines in this category are the Lino-film and the Photon or the Lumi-type which make use of electrical and electronic techniques.

#### INTERTYPE FOTO-SETTER

333. The Foto-setter is a photo-composing machine manufactured by the Intertype Co. It employs the same principle of circulating matrices as in the hot-metal composing machine. The Foto-setter matrix, known as Foto-mat, carries a photographic negative embedded in its side in horizontal position. In all other respects the Foto-mat is identical with the ordinary matrix. The mats are assembled in the box, the same way as is done in the hot-metal machine. They are then pushed to the photographic section located in place of the hot-metal slug casting mechanism and are held on a carriage rack.

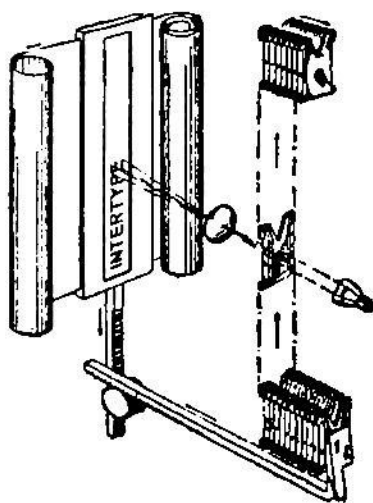


Fig. 125. Photographing of Foto-mats.

The line-length is measured and the remaining space is distributed over



the entire length. The mats are lifted one after the other to a position in front of the light beam, held them firmly stationary by a positioning slot and the images of the letters embedded in them are photographed on the positive film. As a mat is lifted the next mat takes its place and the rack moves by the distance equivalent to the width of the mat lifted. This causes the film to move the exact distance, identical with the set width of the letter, as determined by the brass-width of the mat, and makes room for the next image to be recorded. The spacing is obtained by adjusting the micrometer film-fed dial. The exposed mat is lifted to the second elevator.

334. Exposed film is removed for developing in a light proof-receiver. The corrections are carried out by cutting the portion of the lines involved and pasting the corrected strip on special Intertype Foto-setter correction device. The product of the Foto-setter is, right or wrong reading film negative or positive and right reading paper positive, ready for plate-making. The Foto-setter is equipped with four magazines with 114 characters. Modern Foto-setters are equipped with a lens-turret which contains up to 14 different pre-focussed lenses. Fourteen type-sizes 3 pt. to 72 pt. can thus be photographed from one magazine. The maximum measure is 51 ems. About 240 faces are available on the Foto-setter.

### ROTO-PHOTO

335. The Roto-photo machine was invented by George Westover in 1948. It consisted of 4 units :

- (1) Standard Monotype Keyboard ;
- (2) Single-character projector to replace hot-metal casting equipment on the Composition Caster ;
- (3) Proofing Projector ;
- (4) Make-up Projector.

The Roto-photo made use of the Mono-type paper-spool perforated on the standard keyboard. The paper spool is mounted on the caster and the air, passing through the perforations, positions the master-negative which has taken the place of the matrix frame. The master-negative is a sheet of glass contained in a holder closely resembling the normal Monotype matrix frame. The facility of changing the matrices is not available. Different master-negatives are required for different sizes. The camera photographs the image on a 35 mm. film. The light source is a 60 watt lamp projecting downwards from the centre-pin position. Camera moves to set the lines and columns. It is loaded with 10 feet roll of 35 mm. film. For 12 pt. type in 24 em set measure the image size on the 35 mm.

film is only 3.6 pt. body size. Spaces are recorded after each word by the movement of the camera. Exposing time is one-fifteenth of a second. Camera can be adjusted to move right to left, according to the requirements. Set-size can be increased by using 60 mm. film. The speed on Roto-photo is 120 types per minute or 7,200 ems per hour. The film is put on the proofing projector where each line is projected and printed on sensitised photostat paper, in the form of galley slips, at a speed of 60 to 100 lines per minute. Corrections are then made and a corrected film is produced. Unit of correction is a complete line.

336. In the make-up machine the lines are enlarged, and projected to the required size from the original. Corrected lines are similarly enlarged and projected from the film of corrected lines, in position. Headlines etc. are also separately set and projected in position in the make-up projector. The speed of the make-up projector is 20 lines per minute. The product of this machine is a roll film of positive or negative transparencies of made-up pages up to 24 ems set measure and in type sizes 5 to 14 pts. Roto-photo was an experimental machine. It is not now in manufacture.

### MONO-PHOTO

337. Mono-photo Film-setter unit comprises of the standard

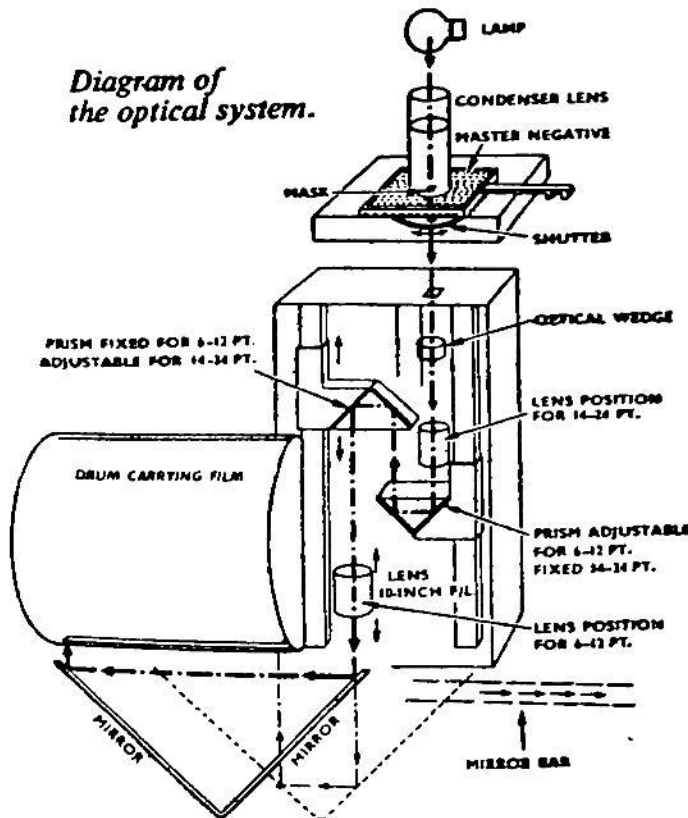
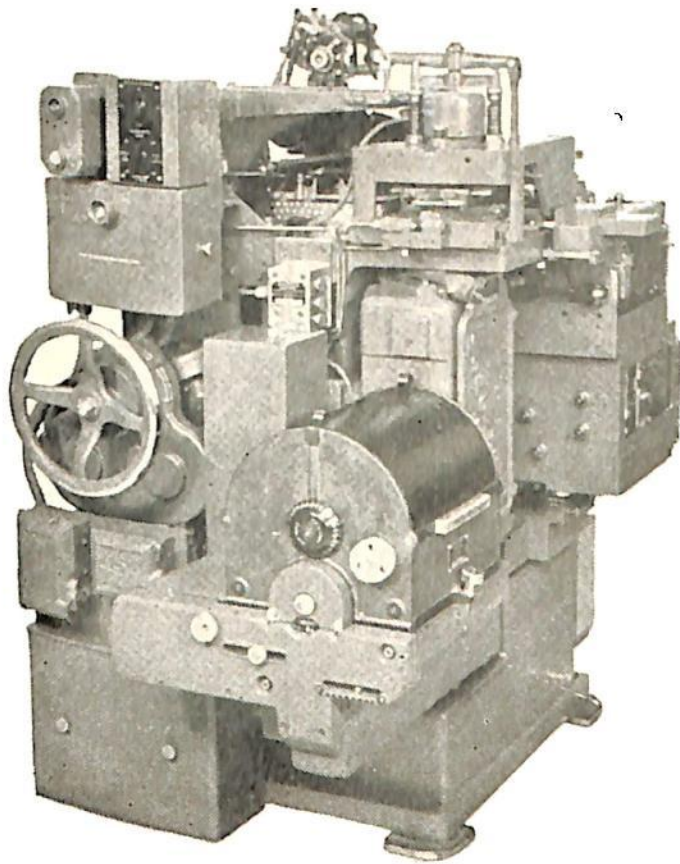
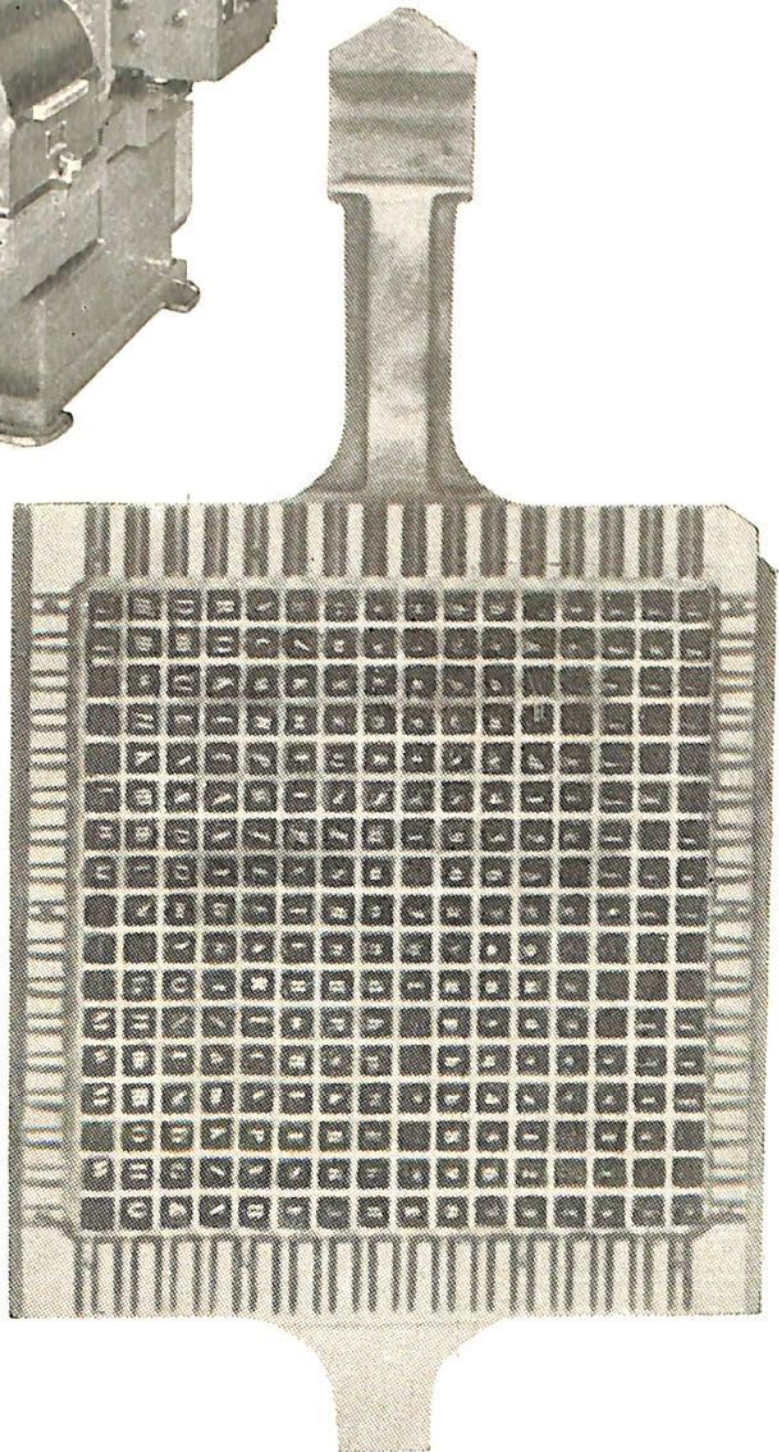


Fig. 126. Optical system of Mono-photo.

Mono-Keyboard and the Film-setter to take the place of the Composition Caster. The film-matrix case has 255 characters and spaces, all of which are separate and can be replaced individually. One set of matrices covers 8 pt. to 24 pt. Another set is required for setting type, smaller than 8 pt., in body size, while a third set is required for sizes larger than 24 pt.



(a) Mono-Foto



(b) Mono-Foto  
Negative Case

H 5447-25C

PLATE 113

ज्योत्सना  
रंजना  
ऐश्वर्या  
कल्याण  
रंजना  
पद्मिनी  
चैतन्य  
विभव  
विभव  
विभव  
विभव

मराठीचा विकास - महाराष्ट्राचा विकास

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संगणकीकृत

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338. In the Film-setter the mould, metal-pot and galley portion are replaced by the photographic unit. Light from a head lamp-type of bulb is directed by a condenser to give an equal distribution of illumination over the whole area of the selected characters in the film matrix case. As the path of the light is projected from the matrix to the drum unit, it is folded up by prisms. The positions of the prisms and lenses are variable, to give the signal focus for whatever degree of magnification required. This is done by the insertion of focussing bars of pre-determined length. The film is in the drum unit. In order to make a line of successive images on the film, the light is directed to the horizontal axis, which moves laterally, the distance of each character width, after it has been exposed. The magnification and focus are preserved while the character-images are thrown on to successive positions on the film. Normal exposure time is one fifteenth of a second. The signal of killing of a line causes a shutter vane to come into action, to obscure the light for the duration of that line. The Film-setter works with a speed of three characters per second.

339. The principle of set and units is incorporated in the Film-setter without the wedges, which are replaced by racks and pinions. The film is eleven inches wide and can take 60 ems measure. It is attached to the drum which moves. While one drum is in operation the other can be unloaded or reloaded with film or in the dark room. Corrections are made by stripping out error lines and the freshly re-tapped lines are set on the stripping film.

### LINO-FILM

340. Lino-film is a photo-composing machine. It does not make use of the circulating matrices like the Foto-setter. It provides for the make-up functions. Lino-film installation consists of the following :

- (1) Lino-film Keyboard Unit. (2) Lino-film Photographic Unit.
- (3) Lino-film Corrector. (4) Lino-film Composer.

The first unit is a keyboard which is like that of an ordinary typewriter. By depressing the keys a spool of paper is perforated, and at the same time a typewritten record is produced. The Lino-film keyboard is very different from the Monotype keyboard. It is more like the console of an organ. There is one standard electric keyboard with 44 keys. On the right is an auxiliary keyboard which provides for the selection of point size and leading by turning the appropriate dial. The operator can select any one of the 18 different founts by depressing one of the several buttons. Each fount is available in six



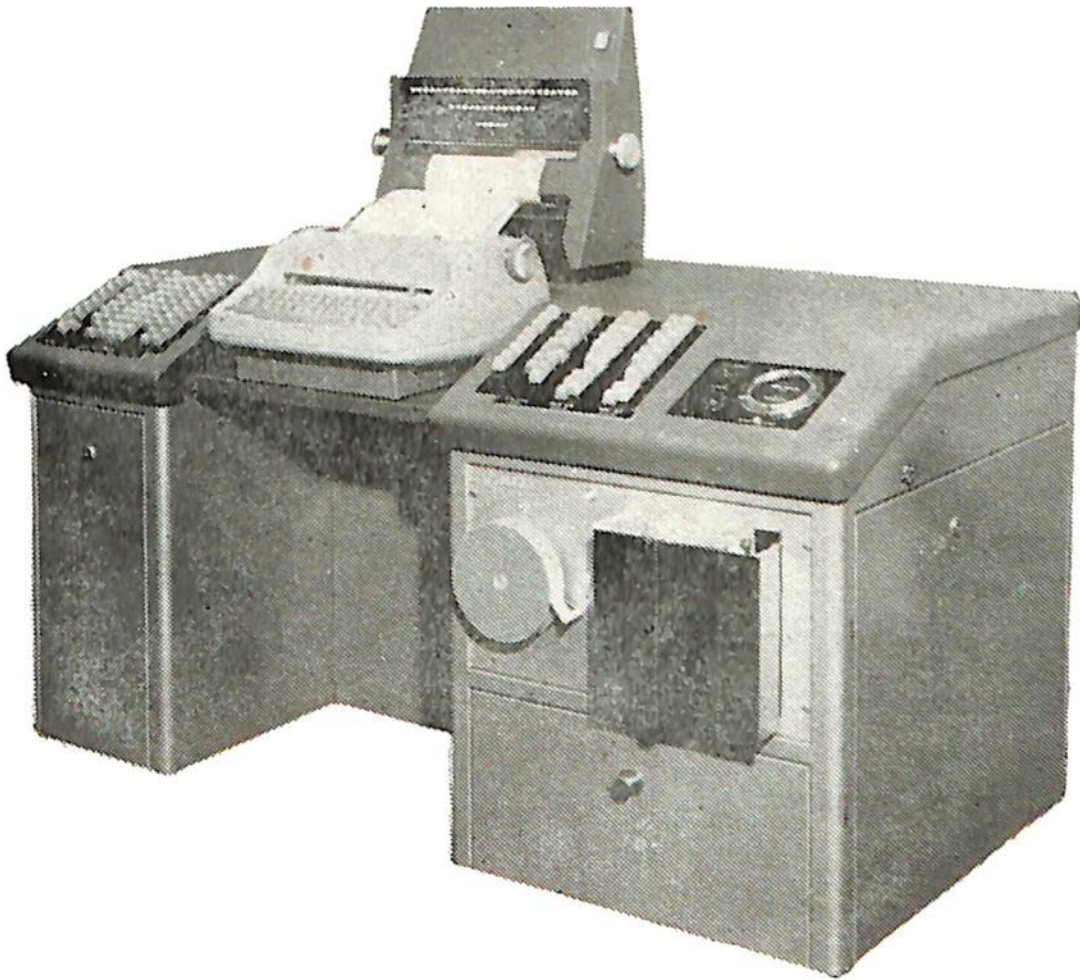
different point sizes, making a total of 108 different faces and sizes. On the left of the keyboard is a panel, controlling the machine functions, i.e. quad right, quad centre, quad left, justify and line erase. Justification is done by pressing a button. A line can be tried without perforating a tape.

341. The tape is then fed into the Photo-machine, which is very large. It contains many electronic circuits and works very rapidly, faster than the eye can register. The machine sets the matter as recorded on the tape, changing type-size, leading, founts and so on. Lines up to 30 ems, and in point sizes 5 to 18, can be set at a rate of fifteen newspaper lines per minute, i.e. approximately 50,000 characters per hour. The photo unit contains 18 fount grids. Each grid is a piece of glass, partly transparent and partly opaque, containing 88 characters. There are 18 grids in the machine, which means that 1,584 characters are available in six different point sizes. The perforated tape instructs the machine as to which character to place between the light source and the sensitive film. The exposure is made and the process is repeated very rapidly until the spool is completed, after which the exposed film is developed. The product is positive, right reading characters on film or paper. This machine can cope up with the output of three keyboard operators. Once the film has been developed it can be used to prepare both letterpress blocks and litho-plates.

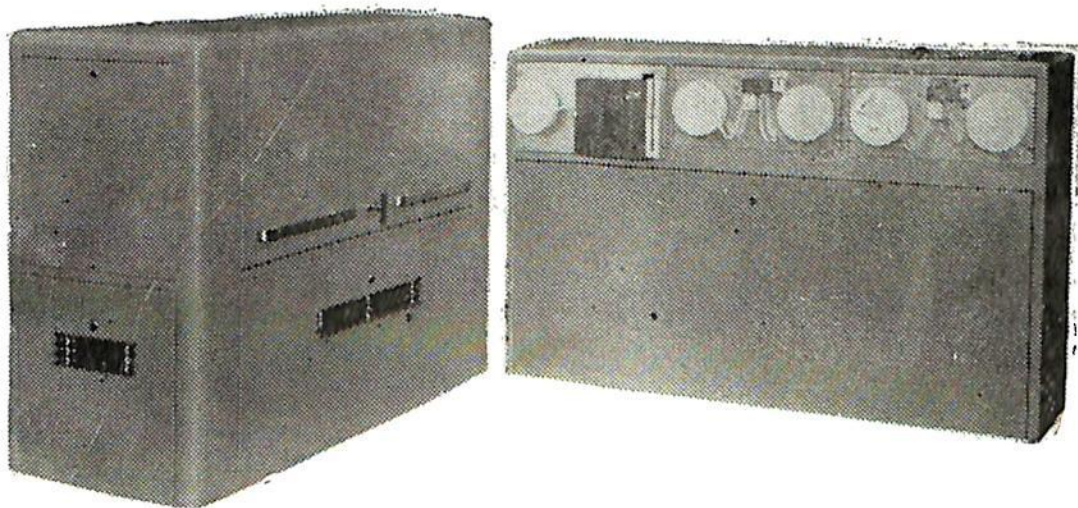
342. The Lino-film Corrector : The film requiring correction is placed in one galley and the film containing corrected lines in the adjacent galley. The point size is set on the dial. The dial is also set for the desired type of correction, line for line, substitution of a complete paragraph or replacing a line by three or four. The machine then automatically removes the lines not required and prints the corrected ones in place. The correction speed is three lines per minute. It may be noticed that many corrections can be avoided by the line-erase device on the keyboard. Composer performs two functions, one of make-up and the other of enlarging. This produces film or paper positive 3 to 108 pt. size and 96 ems measure. It photographs the galley, line by line, altering its position to conform to a layout and if necessary by enlarging or reducing its size within certain limits.

#### THE PHOTON OR THE LUMITYPE

343. The Lumitype is known as Photon in America. It is marketed in Great Britain by Messrs. Crossfield Electronics Ltd. The keyboard unit produces one inch wide, eight level tape, which records all the



(a) Lumitype 540 Keyboard



(b) Lumitype 540 Control-unit and Photo-unit

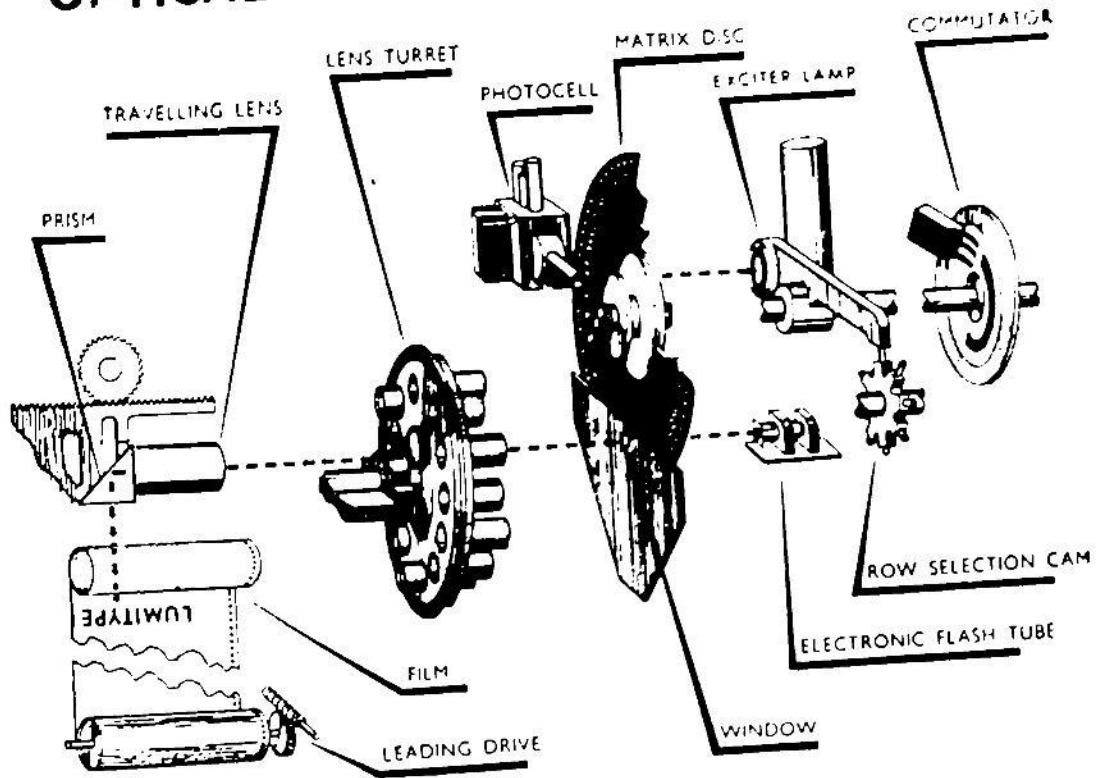
PLATE 115

ज्या  
रुद्र  
ऐओओ  
कलाप  
रुद्र  
पुन  
कोओ  
ओओ  
चिओओ  
तम  
कर  
रुद्र

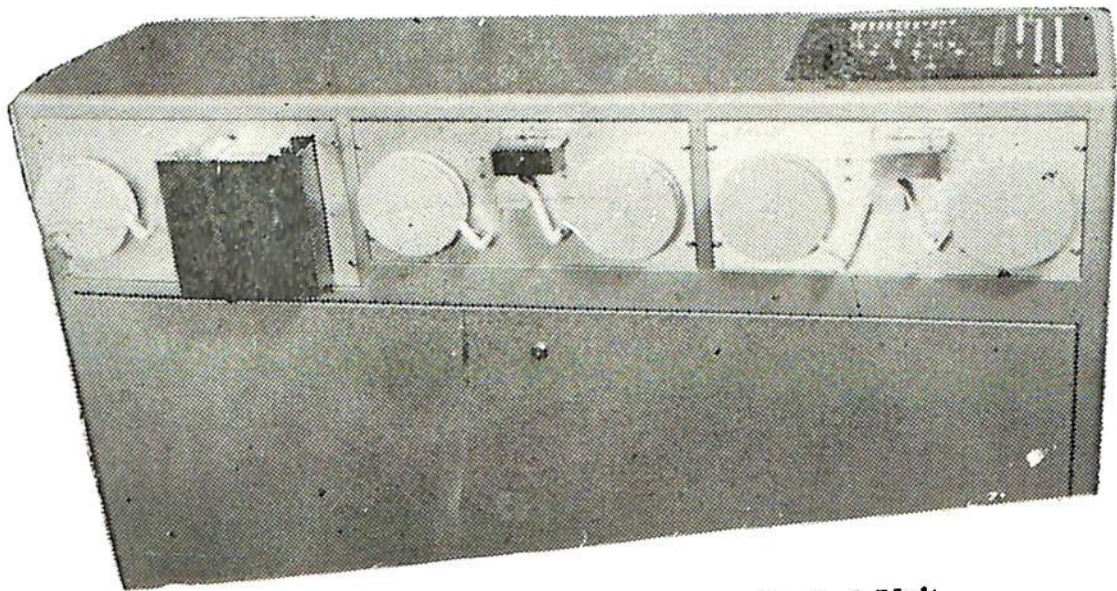
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# OPTICAL SYSTEM OF THE LUMITYPE



(c) Optical system of the Lumitype



(d) Tape merging Unit fitted to Control Unit



information necessary for the photographic unit. The first row of each group of three designates the character itself. The second row relates to the width or set and the third can be used for any other function. An extra hole, provided above the third row, is used for synchronization.

344. The Lumitype installation comprises of a Tape perforating keyboard, a Photographic Unit and a Control Unit with a tape-reader. The keyboard unit is composed of a new I B M input-output electric typewriter of golf-ball type, with push buttons on both sides of the typewriter, counters, various controls and indicators. The Style-selector keyboard permits mixing of type faces and sizes, even in the same line. On the 540 Lumitype, sixteen type faces can be selected in any of the twelve different point sizes from 5 points to 72 points. More than 40 different point-sets are available to push button control. This special feature of the keyboard facilitates close-ups and open-ups of the set-up matter. Line lengths are possible from zero to 7" by increment of 1/100". This can be increased to 9" by special arrangements. Facilities for multiple justification, cancellation of a line set, additional leading, automatic insertion of leaders, letter-spacing, are all available on the keyboard. The provision of the zero-set enables the operator to superimpose a character. This device would be particularly suitable for the Devanagari setting, when certain elements are superimposed with the other characters, on the same set-width. A Stop-code punched, causes the photographic unit to stop, giving a signal to the attendant who can then perform necessary change. The operation can vary the set of the space-band at will. When the tape is fed the functions are read by the calculation unit first and the character information is read next. The end of the line is presented to the reading unit first. The code of line-length and deficit is read and necessary calculations are made for justification.

345. The Lumitype Photographic Unit is provided with a matrix disc, which is a glass plate 8 inches in diameter, containing 16 complete founts of 90 character alphabets in the negative form. The disc is pivoted at its exact centre. These 16 type-sets combined with 12 lenses, held in a turret, enable setting of a minimum of 192 type founts from one single disc. The disc rotates continuously at a speed of ten revolutions per second, giving 30,000 characters per hour. While the character information is read from the moving coded tape, a beam of light from a stroboscopic flash tube illuminates the characters selected and exposes their images through appropriate bases into the photographic film or paper. The strobe-flash of four micro-seconds duration, optically stops the disc during the exposure. A second travelling lens in the optical

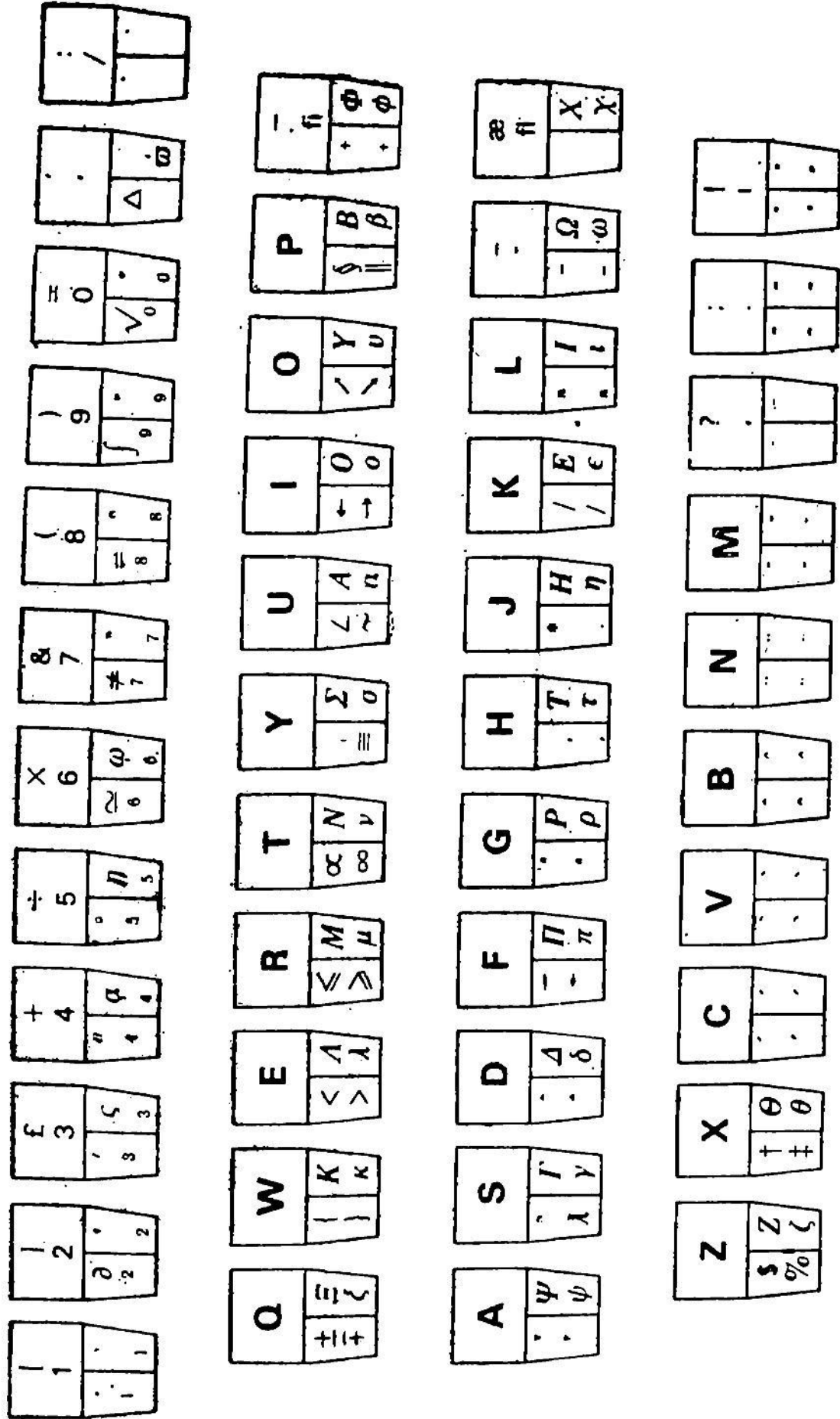
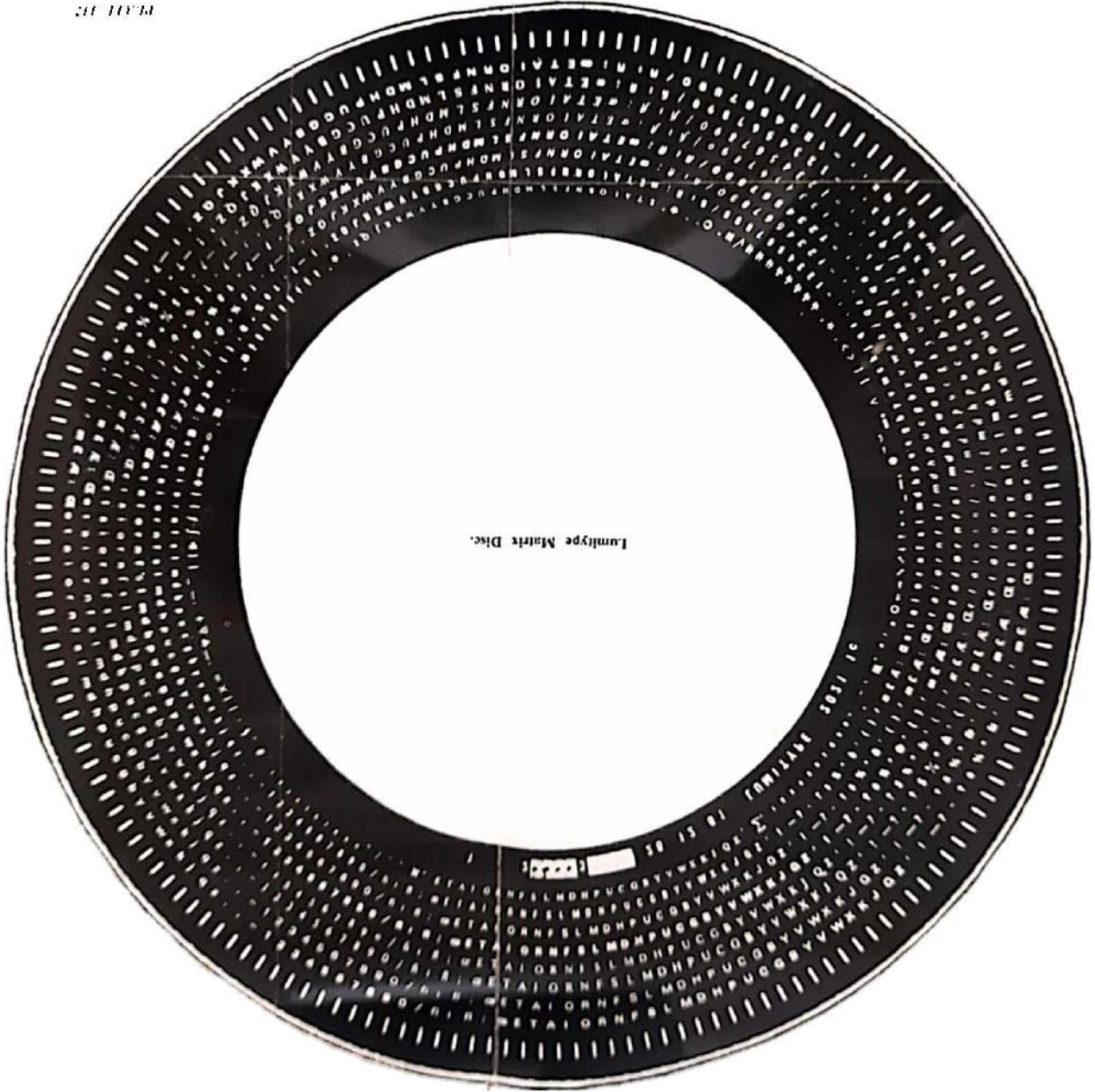


Fig. 127. Lumitype Keyboard



## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

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system moves with its axis parallel to the surface of the film and in conjunction with a right angle prism, produces the desired letter and necessary word spacing. The film or paper remains stationary as a line is set. The photographic unit houses an electro-mechanical justification check circuit. It gives a signal for wrong justification or when the calculation circuit commits an error.

346. The corrections in Lumitype setting can be done either by 'killing' the line or by changing characters within the line. When an error is noticed on the type-script proof, the operator touches a key which removes the code information for each character to be deleted. A Tape Merging Device is provided to enable the production of a perfected film. The correction-tape is separately keyboarded and is merged with the main tape, wherever a correction is required, by erasing the incorrect line. The correction-tape also carries code for follow-ons running headlines, other alterations in style, placings, etc. Merging of the make-up tape with the main tape, produces made-up pages automatically. Kerning and special fillings of characters are accomplished and set-width is changed. The Pi-Mat attachment provides the characters and symbols, not on the matrix disc. Floating accents are provided. The end product of the Lumitype Photo Unit is a wrong reading (Model 200) or right reading (Model 540) film positive, suitable for direct production of offset and photo-gravure. From the positive contact negative is made for letterpress plates. Paper positive can also be produced for art-work. The photo-setting technique cannot therefore be by-passed while considering the problems of script.

### LINASEC COMPUTER

347. About forty per cent of the time of the perforator-operator is

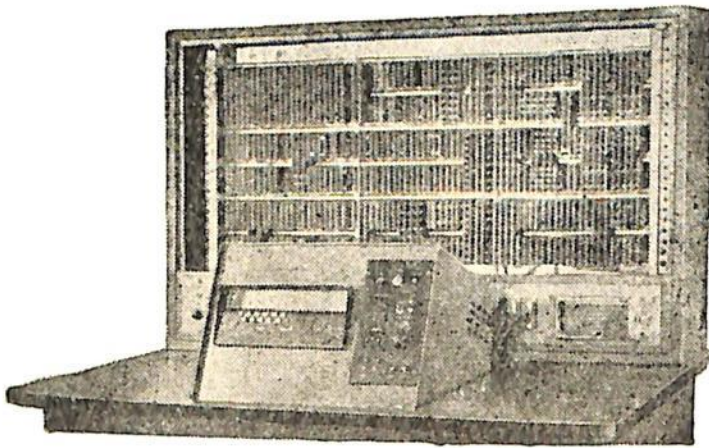
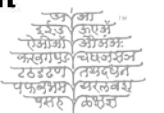


Fig. 128. Linasec

spent in watching the justification functions, making proper line, etc. These extra functions limit the speed of perforating. The Linotype Company has developed a computer perforator known as *Linasec*. It is a semi automatic electronic computer specially built for producing the justified tapes for the fast line-

casting machines. A running tape perforated on a simple typewriter is placed into the input-reader of the Linasec. The Linasec is set to the desired length and a width plug inserted to impose the matrix-width values of the type-face to be used. The Linasec when switched on, reads the simple input-tape and begins to perforate a new tape at the rate of 5,000 to 6,000 newspaper lines an hour. Lines which end with the complete words are automatically perforated into the output-tape. When hyphenation is required, the entire word is displayed on cathode ray tubes together with an indication of the last character which can be accommodated. The monitor then decides on the breaking of word by depressing one of the eleven buttons for hyphenation or selects the preceding inter-word space. Along with the hyphenation the speed of the Linasec is about  $1\frac{1}{2}$  news paper lines of 12 ems per second, i.e. about 3,00,000 ems per hour.

348. The work of the monitor in hyphenation can be eliminated by using a general purpose intermediate-range computer, in which is stored a dictionary to take over the functions of the Linasec. Such a computer can consume input-tape at the rate of about 100 characters per second. The computer techniques were first applied to printing by the French team of Bafour, Bernard and Raymond who patented in 1953-54 a system for controlling Slug casters, Monotype casters and Photo-composing machines. The system involves feeding the computer with words, figures and symbols, programming the computer to carry out editorial and typographical instructions, and translating the results into a form suitable for operating composing machines. The word-splitting computer-programme demonstrated in the U.K. was developed in 1962 by P. K. Mitra of the Indian Statistical Institute working with Ferranti Ltd. At the Perry Publications Inc., West Palan Beach, Florida, a programme is used wherein hyphenation is effected by (1) recognising key prefixes and suffixes, (2) table look up in a stored dictionary and (3) arbitrary division after 3, 5, 7 or 9 characters. Under the Department of Scientific and Industrial Research Project, research is taken up at the Physics Department at the King's College, Newcastle-upon Tyne. The work is aimed at minimising the amount of hyphenation required by operating on several lines of type at once. The Ferranti Argus 104 system is built around a computer capable of executing 14,000 instructions in a second. The programme involves about 70 computer-instructions for each character composed. Thus 200 characters can be set per second. The computer-processed T.T.S., Monotype or Photo-composing tape contains code numbers indicating the chosen types and sizes. The product of one such computer would be sufficient to operate about 25 composing machines.



## CHAPTER XV

### MECHANICAL COMPOSING IN DEVANAGARI

349. Since, on the Monotype machine individual types are cast, it is possible to cast a wider face on thinner set-size with an overhang. It is possible to cast sloping italics on the Monotype machine. The overhangs then *sit* on the body of the adjacent type, which is set either before or after. If the word begins with an overhang on the left or ends with an overhang on the right, there would be no other type to support the overhang. In such cases a high-space, i.e. a space of the same shoulder height, is set to support the overhang. Due to the fact that the Monotype machine is constructed to compose the Roman script, which is a linear script, it is not possible to set the three-step Devanagari on it. It is possible to set *akhand* system of the Devanagari on the Monotype without resorting to angular bodies. But owing to the limitations of the Monotype matrix-case, this has not been possible. It may be noted here that the number of characters in the *akhand* system is as high as 600, inclusive of the conjunct letters usually required.

#### MONOTYPE DEVANAGARI SYSTEM OF DATE

350. The present Monotype Devanagari System was perfected by S. R. Date. In the Monotype system, the principle of *akhand* types with overhangs was adopted as a basis, in preference to the three-step composition. The principle was, however, extended to all letters and practically every alternate letter is constructed by combination of the letters with overhanging *velānti*, *mātrā* and *ukār* characters on high-space. The Monotype system works with 255 matrices\* out of which four are spaces, one high-space, 88 letters with overhangs, 17 letters on extended body, 107 full body letters, 33 *mātrā* signs and a few special letters. The letters with overhangs are required to be combined with *velāntis*, *mātrās* and *ukārs*, on either sides, at the top or at the bottom. These overhanging letters are cast on body, less by 5 units in set-width. When the overhanging letters are not to be combined with any vowel-signs at the top or bottom, the body space under the overhang is filled in with high-space. The system is explained graphically in earlier chapter.

\* The capacity is now increased to and the Russian Monotype provides matrices.



Table 61.

**MONOTYPE**

**LIST OF THE CHARACTERS AVAILABLE ON THE  
AND SUPERIOR FIGURES AND FRACTIONS**

Letters on full body					
Full & half letters			Ukāri	Mātrā letters	
[ अ ]	[ अ ]	ई	उ		
13/195*	3/312	10/196	2/197		
क	ग	ङ	ञ	के	के
13/176	11/177	12/263	13/269*	13/198*	13/199*
व	[ रु रु ]	र	ऋ		
9/61	[ 9/479 9/492 ]	6/63	12/65		
ऌ	क	रु	र		
8/64	9/248*	7/249*	6/250		
च	ज	ञ		चे	चे
13/178	13/179	7/309*		13/200	13/201*
च	ड	ड	ड		
9/66	9/67	9/68	12/69	9/251*	
ट	ड	ण	प		
10/180	11/181	13/223	7/70	जे	
				13/202*	
त	द	ध	न	ते	दे
11/182	10/183	12/485*	11/184	11/203*	10/205
				11/429*	
त	ट	ट	न	ते	ने
6/71	8/74	8/482	6/76	11/204*	11/206*
प	व	भ	म		
10/185	11/186	13/491*	12/187	ते	ने
				11/203*	10/205
प	फ	फ	फ	ते	ने
6/77	9/78	7/79	9/486	8/81	9/252*
य	र	[ ल ल ]	व	ते	ने
11/188	10/189	[ 13/313 /190 ]	11/191	11/204*	11/206*
				पे	भे
[ श श ]	स	ह		10/207	12/454*
[ 13/369 /192 ]	12/193	10/194		12/208	
ट	=	रु	[ श श ]	पे	भे
7/82	6/83*	8/84	7/85	[ 13/324*/211* ]	मे
				11/442*	12/436*
ठ	रु	रु		12/438*	
7/87	8/88	9/90		रे	वे
				10/209	11/213*
				11/213*	[ 13/324*/211* ]
				से	है
				12/215	10/325
				वें	[ लें लें ]
				11/214*	[ 13/326* /212* ]
				सैं	हैं
				12/216*	11/218*
				हैं	हैं
				10/421*	10/449*

Note.—The first figure under the character indicates the unit value while the second figure indicates the matrix number. The 'star' after the letter indicates overhang, while the star before the letter indicates extended body on which the overhang of the preceding letter rests. The star after the matrix number indicates outside-characters.





## Vowel-signs, Figures and Conjuncts

ॠ	ॡ	ॢ	ॣ	।	॥	०	१	२	३		
6/224	6/225	6/147	6/148	7/220	6/149	6/150	6/258	5/261*	5/262*		
5/165	5/169	5/173*	5/166	5/170	5/167	5/171*	5/171*	5/238*			
5/156	5/157	5/160	5/161	5/158	5/159	5/162	5/163	11/472*			
5/151	5/153	5/152	11/472*	5/154	5/155		7/265	5/128	5/126		
5/164	5/168	5/259*	5/260*	6/310	5/311	5/175	5/172	5/314*	5/174		
5	।	:	,	;	!	?	( )	—	—		
7/219	7/124	6/125	5/119	12/120	5/121	12/123	12/122	12/130	12/131	12/127	6/126
[ १ ]	[ २ ]	[ ३ ]	[ ४ ]	[ ५ ]	[ ६ ]	[ ७ ]	[ ८ ]	[ ९ ]	[ १० ]	[ ११ ]	[ १२ ]
[ 12/502 ]	[ /108 ]	[ 12/109 ]	[ 11/110 ]	[ 11/111 ]	[ 12/235 ]	[ /112 ]	[ 12/113 ]	[ 12/114 ]	[ /115 ]	[ 12/236 ]	
[ ६ ]	[ ७ ]	[ ८ ]	[ ९ ]	[ १० ]	[ ११ ]	[ १२ ]	[ १३ ]	[ १४ ]	[ १५ ]	[ १६ ]	[ १७ ]
[ 12/237 ]	[ 12/116* ]	[ 12/117 ]	[ 12/118* ]	[ 12/25 ]	[ 12/267 ]	[ 12/268 ]	[ 12/270 ]	[ 5/264 ]	[ /351 ]		
कृ	क	ञ	ट	ठ	ड	डु	डू	डु	डु		
13/91	11/466*	12/462	10/221	10/254	11/233	11/222*	11/257				
ॢ	ॣ	।	॥	०	१	२	३	४	५		
9/72	/73	8/556	11/467*	11/468*	12/93	6/226	6/239*				
Space	5/U	6/U	8/U	12/U.							

351. Monotype Devnagari design in 12 pt. (9 set) is based on Nirnaya-sagar Pica No. 1 and is not much distinguishable to a common reader. The larger versions 14 pt. and 16pt. are the enlargements of 12 pt. design and have no relation to the original Nirnayasagar design of 14 pt. Great face. In all the three cases the Monotype face is wider as compared to the height of the letters. Following deficiencies are inherent in the Monotype Devanagari currently in use :

(1) The *Velānti* ॠ ॡ and *Velānti-rāfār* ॢ ॣ overhang. They do not meet the vertibar of the letter i.c. (मार्मिक).

(2) The *Ukārs* cast on high-speces do not fit properly, distorting the look of the letter (कुणबी).

(3) The *Mātrās* and *Ukārs* do not touch the headline and the Vertibar (मेंबर, नूतन).

(4) The double *mātrās* are too small (मैने).

(5) Letter ह is disproportionate in height.

(6) Letter ऋ, and conjuncts of ह, ड, द are disproportionate. घ, भ्र, अ are wide in set. Letters like ख are not available.

*Letters with extended body*

*।	*ि	*ि	*ि	*ि		
11/132	11/133	11/134	11/137	11/138		
*ी	*ै	*ै	*ै	*ै	*ँ	*ँ
11/145	11/146	11/141	11/142	11/135	5/210	5/217
*ी	*ी	*ी	*ी	*ी		
11/139	11/140	11/144	11/143	11/136		

*Conjuncts*

क*	ख*	ख*	ख*	ख*	ग*	घ*
8/42	13/279	13/278	13/280	12/277*	6/43	11/284
ज*	ट*	ड*	ड*	ड*	त्र	द
13/283	5/253	6/256	5/44	6/45	/46*	/410*
त*	त*	त*	त*	त*	त*	त*
9/54	7/511	5/47	5/60	5/58	13/281	5/55
थ*	द*	प्र*	ब्र*	भ्र*	फ*	फ्र*
11/483	8/56	6/48	6/49	11/487	8/245	8/246
व*	स*	ह*	ह*	ह*	ह*	ह*
6/30	9/52	11/271	11/272*	11/275*	11/234	11/273
					12/282	13/274

(7) The *Mātrās* and *Ukārs* cast on high space are fragile and break while printing.

The above deficiencies are due to the peculiar method of setting over hanging letters, which also makes hand correction rather difficult. These defects can however be removed by adopting linear method of setting the full body letters.

Main Magazine

Auxiliary Magazine

1	7.	13	2	19	18	25	14	31	37	48	49	55	61	67	73	78	83	88	91	97	102	108	114	120	126
2	8	14	3	20	26	32	38	44	50	56	62	68	74	80	86	92	98	104	110	116	122	128	134	140	146
3	9	15	4	21	27	33	39	45	51	57	63	69	75	81	87	93	99	105	111	117	123	129	135	141	147
4	10	16	5	22	28	34	40	46	52	58	64	70	76	82	88	94	100	106	112	118	124	130	136	142	148
5	11	17	6	23	29	35	41	47	53	59	65	71	77	83	89	95	101	107	113	119	125	131	137	143	149
6	12	18	7	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150

200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Pie Characters

Fig. 129. Govil's Linotype font

अ आ इ ई उ ऊ ऋ ॠ लृ लृ ए ऐ ओ औ अं अः  
 ऎ ए ऐ ऑ ऒ ओ औ क ख ङ ञ ण णः  
 क का कि की क् क् कृ के के कां काँ कं कः  
 ख खा खि खी ख् ख् खृ के खँ खां खाँ खं खः  
 च चा चि ची च् च् चृ चे चँ चां चाँ चं चः  
 ट टा टि टी ट् ट् टृ टे टँ टां टाँ टं टः  
 त ता ति ती त् त् तृ ते तँ तां ताँ तं तः  
 र रा रि री र् र् रृ रे रँ रां राँ रं रः  
 ह हा हि ही ह् ह् हृ हे हँ हां हाँ हं हः  
 हं हां हि ही ह् ह् हं हँ हँ हाँ हाँ  
 मं मां मि मी म् म् मृ मे मँ मां माँ  
 दं दां दि दी द् द् दृ दे दँ दां दाँ दं दः

Fig. 130. Setting of Barakhadi on the Linotype machine

क्क क्ख क्क्य क्र क्र क्त क्व क्ल र्व्य ग्ग ग्घ ग्न  
 ग्य ग्र ग्ल ग्व ग्म ग्व घ्न घ्य घ्र ङ्ङ ङ्घ ङ्ग ङ्घ  
 च्च च्छ च्य च्र ज्ञा ज्ञ् ज्व ज्र ज्म ज्ज ज्घ ज्ञ्  
 ट्ट ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ ट्ठ  
 थ्य द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध द्ध  
 न्त न्थ न्द न्ध न्न न्म न्य न्व न्ह ण्ण प्त प्न प्य  
 प्र प्ल प्ल प्द प्थ प्थ प्थ प्थ प्थ प्थ प्थ प्थ प्थ  
 म्ल म्ह ल्ल ल्व ल् ल्व ल्व ल्व ल्व ल्व ल्व ल्व ल्व ल्व  
 ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य ह्य  
 ण्य ष्य स्क् स्क् स्क् स्क् स्क् स्क् स्क् स्क् स्क् स्क्  
 श्य श्च श्च श्च श्च श्च श्च श्च श्च श्च श्च श्च श्च

Fig. 131. Conjuncts set up on Govil's Linotype Devanagari



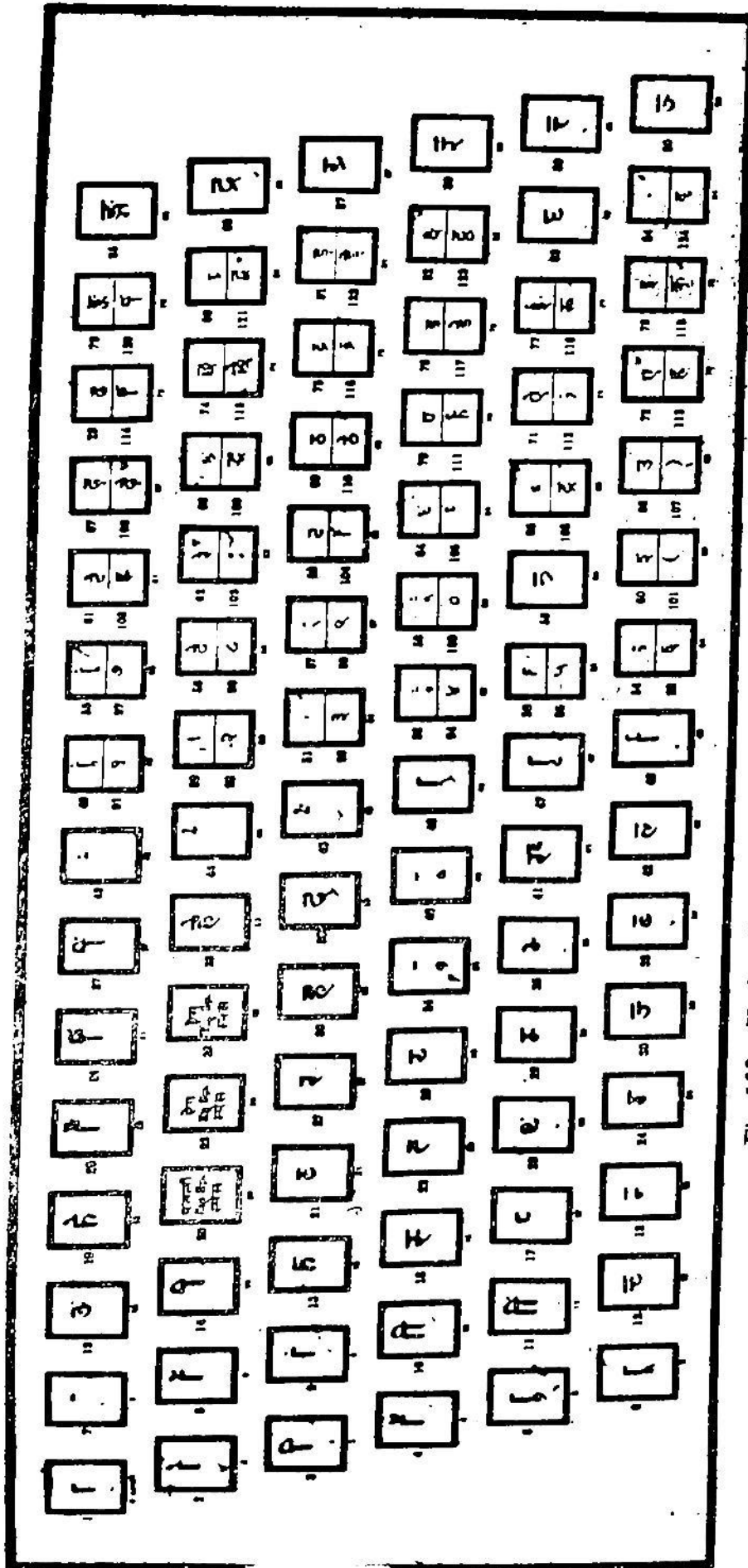


Fig. 132. Keyboard arrangement of Govil's Devanagari Linotype

Where two different characters are shown on the same key in this diagram, the upper matrix runs in the main magazine, and the lower in the auxiliary magazine. Both are controlled by the same key.



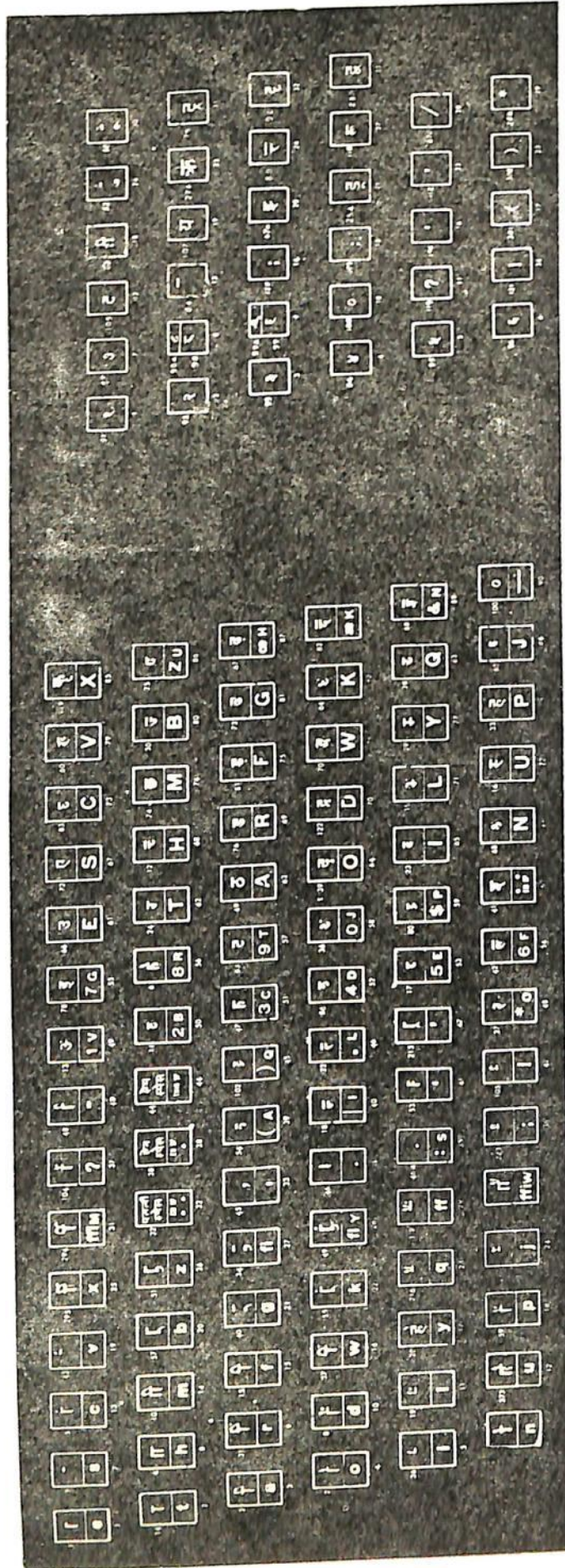


Fig. 133. Linotype revised Devanagari and English No. 12, Keyboard and Sorts Case 1952



355. The method of setting the letters in the Linotype system as designed by Shri Govil is shown below :

Table 62. System of setting Devanagari on the Linotype machine

अ	३	१	न	१८	१	को	२१	०	१६	१	२	हं	३६	७	४
आ	३	१	प	१७	८	कों	२१	०	१६	१	४	हँ	३६	७	२६
इ	७	७	फ	१७	८	कं	२१	०	१६	४	३	क	३६	७	१५
ई	७	७	ब	३६	६	कः	२१	०	१६	१०३	३	ख	३६	७	१
उ	७	७	भ	३६	६	ता	२१	०	१६	१	१	ख	३६	७	५
ऊ	७	७	म	३६	६	ति	३१	३	२३	१	१	ख	३६	७	२३०
ऋ	३६	२	य	३६	६	ती	३१	३	२३	१०	१	ख	३६	७	२२१
ॠ	३६	२	र	३६	६	व	३१	३	२३	५	१	ख	३६	७	२२६
ऌ	३६	२	ल	४२	१	व	४२	१	२२	६	१	ख	३६	७	२१३
ॡ	४२	१	व	४२	१	वं	४२	१	२२	२	१	ख	३६	७	१०६
अं	७१	७	श	४२	१	वं	४२	१	२२	४	१	ख	३६	७	१०४
अः	७१	७	ष	४२	१	वो	४२	१	२२	१	१	ख	३६	७	१०४
इ	३	१	स	१६	१	वों	२२	१	१	४	१	ख	३६	७	१०४
ई	३	१	ह	३६	७	वं	२२	१	१	९	१	ख	३६	७	१०४
उ	३	१	क्ष	३६	७	वः	३६	१	१	१०३	३	ख	३६	७	१२०
ऊ	३	१	त्र	३६	७	मां	३६	१	१	९	१	ख	३६	७	२३०
ऋ	३	१	श	३६	७	मि	३६	१	१	१	१	ख	३६	७	४३
ॠ	३	१	श्र	३६	७	मीं	३६	१	१	११	१	ख	३६	७	४३
ऌ	३	१	म्	३६	७	मुं	३६	१	१	११	१	ख	३६	७	२०६
ॡ	३	१	मृ	३६	७	मुं	३६	१	१	११	१	ख	३६	७	१५
अ	३	१	मं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
इ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ई	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
उ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ऊ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ऋ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ॠ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ऌ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
ॡ	३	१	कं	३६	७	मं	३६	१	१	६	१	ख	३६	७	१
अ	३	१	का	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
इ	३	१	कि	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
उ	३	१	की	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऊ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऋ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ॠ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऌ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ॡ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
अ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
इ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
उ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऊ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऋ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ॠ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ऌ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१
ॡ	३	१	क	३६	७	हं	३६	१	१	६	१	ख	३६	७	१



**Table 63 : COMPARATIVE STATEMENT OF THE MATRICES MACHINE AND THOSE PROVIDED ON 1953**

(i) INTERTYPE MATRICES 1963

(Number 142)

उ	इ	उ	ए	ऋ									
31/85	61/16A	67/77A	73/76	152									
फ	ख	ग	घ	ङ	च	छ	ज	झ	ञ	झ			
44/156	8/154	16/9A	10/10	11/11	148	14/14	76/93	15/15	100	161	177		
ट	ठ	ड	ढ	ण	त	थ	द	ध	न				
68/79A	62/95	69/94A	75/96A	17/17	21/20	22/21	74/82A	23/23A	27/24				
प	ब	भ	म		य	थ	र	ऌ	ॡ	ल			
20/26	29/28	36/29A	28/30		12/31	160	65/64A	102	18/43	9/12	178		
श	ष	स	ह	ळ	क्ष	त्र		ड़	ढ़	ड			
30/18	24/37	59/22	64/73A	149	97	60/10366/104		57/146A	145A	37/159			
कृ	श्र	द्र	र	ऌ	ह	द्र		ऌ	ह				
151	53/132A	78/141A	124	42/162	135	70/143A		25/137A	150A				
ॢ	ॣ	।											
142A	147A	63/144A											
रु						॥				॥			
77/153						50/157				28/155			
◌	◌	◌	◌	◌	◌	◌	◌	◌	◌	◌	◌		
7/7	1/1	54/112	19/19	13/13	71/41	52/105	53/108	98	99	49/59	55/60	39	45
ी	ु	ू	ृ	ॄ	ॅ	ॆ	े	ै	ॉ	ॊ	ो	ौ	्
5/6A	6/163	4/339	170	41/5	47/47	48/164	173	116	107	56/109	46/169	115	166
ॎ	ॏ	ॐ	॑	॒	॓	॔	ॕ	ॖ	ॗ	क़	ख़	ग़	ज़
72/4	2/2A	3/25A	158	125									
ड़	ढ़	फ़	य़	ॠ	ॡ	ॢ	ॣ	।	॥	०	१	२	३
51/113	45/114	174	127	126	167	168	175	176	171	165			172
१	२	३	४	५	६	७	८	९	०				
79/49	80/50	81/51	82/52	83/53	85/54	86/55	87/56A	88/57	89/58				
ॣ	।	॥	०	१	२	३	४	५	६	७	८	९	०
33/33	36	34/34	40/40	48	42	35/35	120	119					
-	-	-	+	x	‘	★	( )	÷	=				
43/46	181	184	183	185	182	188	84/118	90/117	186	187			
em sp		en sp		thin sp									

*Note.*--The figures under the characters are the matrix numbers. Where two figures are given the first represents the key-button number and the second the matrix number.



AVAILABLE AT PRESENT ON THE INTERTYPE  
KEYBOARD OF LINOTYPE

(ii) LINOTYPE MATRICES 1953

(Number 134)

क	इ	उ	ए	ऋ	ऌ						
49/13	55/78	61/66	67/72	276	—						
फ	हि	ख	ग	घ	ङ	च	छ	ज	झ	ञ	
41/53	51/47	79/60	62/24	73/83	67	68/12	74/74	80/30	67/a	—	
ट	ठ	ड	ढ	ण		र	य	ट्	ड्	ण्	
57/63	63/69	69/76	81/73	86/25		46/22	58/36	64/39	82/64	40/18	
ट	ठ	ड	ढ			य	य	र	ल	व	
53/17	65/23	71/35	77/29			83/28	107	48/27	54/42	50/11	
इ	ष	र	ह	ळ	इ	क्ष	द्र		ड़	ढ	श्
60/41	84/65	72/16	78/33	87	88/82	88	89/88		75/81	87/67	66/68
कु	ट्र	इ	र	उ	द्र	इ	द्र	ऌ	ऍ	ह	
85/119	75	254	89	52/86	230	76/70	90	70/122	59/80	45/102	113-90

रु									के	हे			
118									56/6	17/20			
—	।	ॐ	ं	।	।	।	।	।	।	।	।		
7/7	1/1	19/43	13/5	2/14	8/4	21/40	27/34	52	58	26/51	20/57	28/49	22/55
२	३	०	०	०	०	०	०	०	०	०	०	०	०
5/26	11/19	4/2	6/9	10/8	18/59	12/373	30/374	23/216	29/309	—	109	47/215	
॥	॥	॥	॥	॥	॥								
14/10	85	3/3	15/15	9/31	16/37								
०	०	०	०	०	०	०	०	०	०	०	०	०	०
42/105	38/223	43/48	25/295	31/294	24/217	37/104			70	85	...	...	
१	२	३	४	५	६	७	८	९	०				
91	92	93	94	95	96	97	98	99	90/				
,	;	.		!	!	:	'	'					
33/45	120	35/46a	34/46	114	121	103	106	112					
—	*	/	(	)									
84	280	370	301	302									
em sp	en sp	thin sp											
44/44	38/88	32/88											

H 5447-27

TYPOGRAPHICAL DEFICIENCIES IN THE DEVANAGARI SLUG-COMPOSITION

356. The defects and deficiencies in the linear Devanagari available on the slug-composing machines are enumerated below :

(1) Separate types for the consonants with slanting top *mātrās* are not available. The *mātrās* in the combinations formed by the *mātrā* matrices placed after the consonants look perpendicular. The *mātrās* are actually printed at right angle to the head-line, instead of, at an acute angle.

(2) The double *mātrās* are cut at obtuse angle to the head-line, i.e., they are inclined towards right.

(3) In case of letters made of consonants with short-bar such as ढ ढढ and short and long *ukār* ( ु and ू ) they are placed after the consonants. In this method the next letter is printed at a distance leaving disturbing white space in between two letters such as टुमदार.

(4) छ ठ ढ are cut in conventional style and therefore, the *mātrās* to be joined with them, are placed at a distance छे, ठे, ढे .

(5) It is not possible to construct ऊ and छू.

(6) The vowel mark “ े ” is not cut. In case of other *mātrā* signs, there is white space between two letters, i.e. फि क

(7) Letters ञ and ङ are not provided in the fount.

(8) Satisfactory combinations of क and फ are not possible as the vowel-signs fall apart. क, कू, कं, काँ

All the defects referred to above are more pronounced in the Intertype. In addition the following defects are noticed in the Intertype\* composition :—

(1) The *Mātrā* is *anaemic*.

(2) The belly of letter ‘ द ’ is too large.

(3) Short ि sign falls away from the consonant.

(4) The signs of short and long *ukār* ( ु, ू ) are *anaemic*.

(5) The x-portion of ‘ र ’ is too large.

357. Owing to the distortion in the face of Linotype Devanagari, it is not very popular. Although many Devanagari founts were sold in India, they were hardly made use of. The Government of Bombay purchased two new machines of American height in 1951-52 with Devanagari founts. The then existing Keyboard was revised by the present author in consultation with Prabhakar Padhye, the then Editor of *Nava-shakti*, a popular Marathi Daily, and C. G. Raman, the Manager of Linotype and Machinery Company in Bombay. No further progress could, however, be made till the Printing and Stationery Department, Government of Bombay, commissioned the services of G. P. Vijapur in 1956.

\* For comparison please see the Table 70 facing page 422

VJAPURE LINOTYPE DEVANAGARI

358. Vijasure in his reformed Devanagari, as patented for use in hand-composition and now adapted with considerable modifications, to the Linotype machines, succeeded in eliminating the three-step arrangement and also has done away with the overhanging characters. Vijasure's contribution referred to here is essentially concerned with the angle of the *Mātrā* characters. In addition to this, he has redesigned certain characters such as ढ, ढ, etc. by re-positioning the short verti-bar joining the basic character with the head-line, so that when combined with the vowel-signs (*Mātrās*), etc., they are positioned properly, without distorting the original design. In order to adapt the Vijasure type to the Linotype for Devanagari composition, it was necessary to cut new characters with *Mātrās* in the revised design. It was obvious that without the properly designed *Mātrās* in the slanting angle according to the Vijasure scheme, the essential purpose in the reformed Devanagari script as proposed to be adapted to Linotype machine would be lost.

LUCKNOW DEVANAGARI LINOTYPE FOUNT

359. The Vijasure type, which has been adapted to Linotype, was originally designed according to the decisions of the Lucknow Conference on the Devanagari script for Hindi composition. This fount was composed of 150 characters as given hereunder :—

Table 64. Vijasure Linotype fount for Lucknow Hindi

उ इ ई उ ऋ ॠ ऌ ए	9
क ख ग घ ङ च छ ज झ ञ ट ठ ड ढ ण	
त थ द ध न र प फ ब भ म	
य र ल व व श ष स ह ळ क्ष ण	38
ॠ ॡ ॢ ॣ ।	5
ऐ ऌ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	34
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	11
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	22
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	11
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	10
ॠ ॡ ॢ ॣ । ॥ ० १ २ ३ ४ ५ ६ ७ ८ ९ ०	10
( ) - , ; ! ? ! ' :	
	<hr/> 150 <hr/>



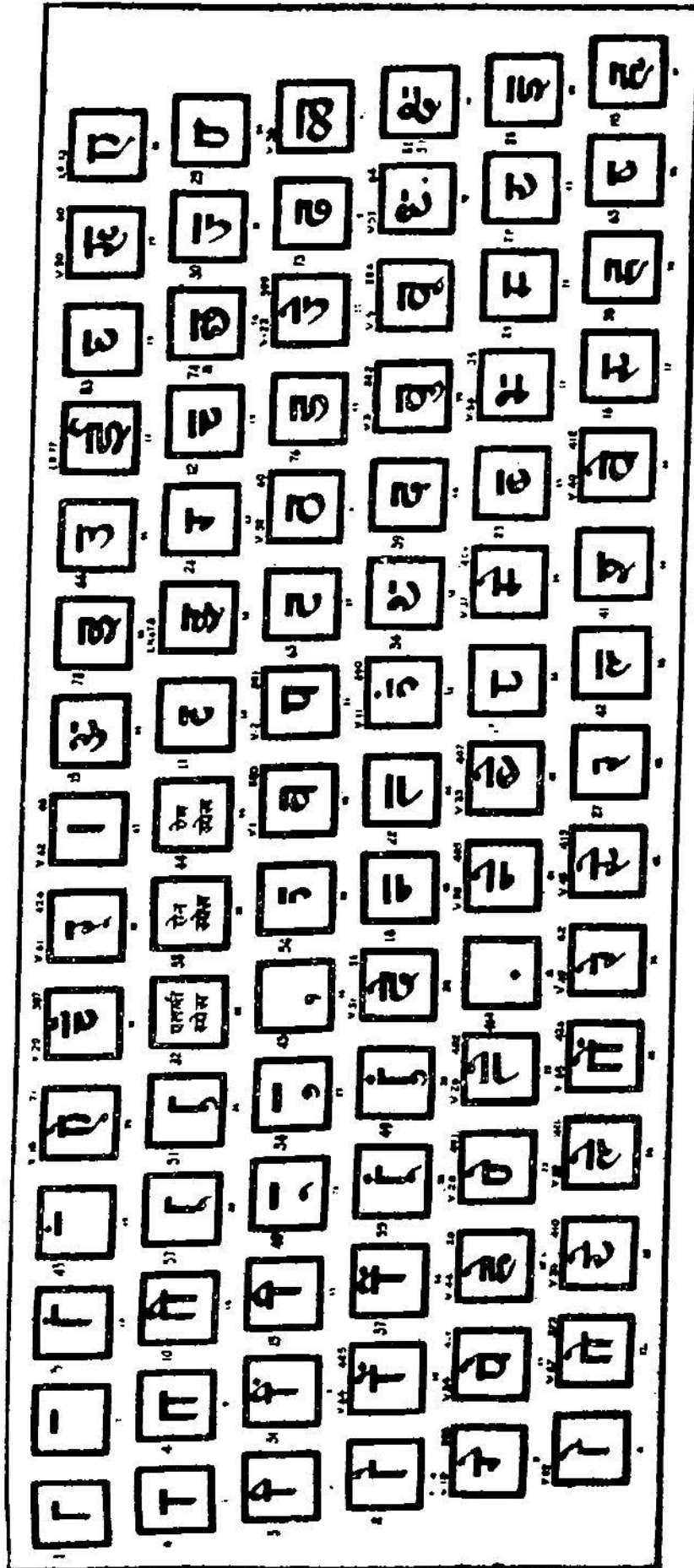


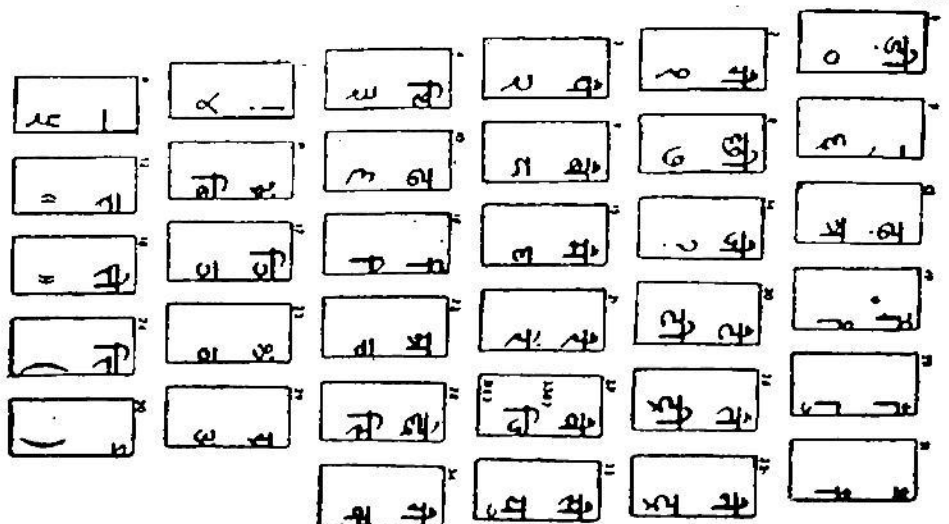
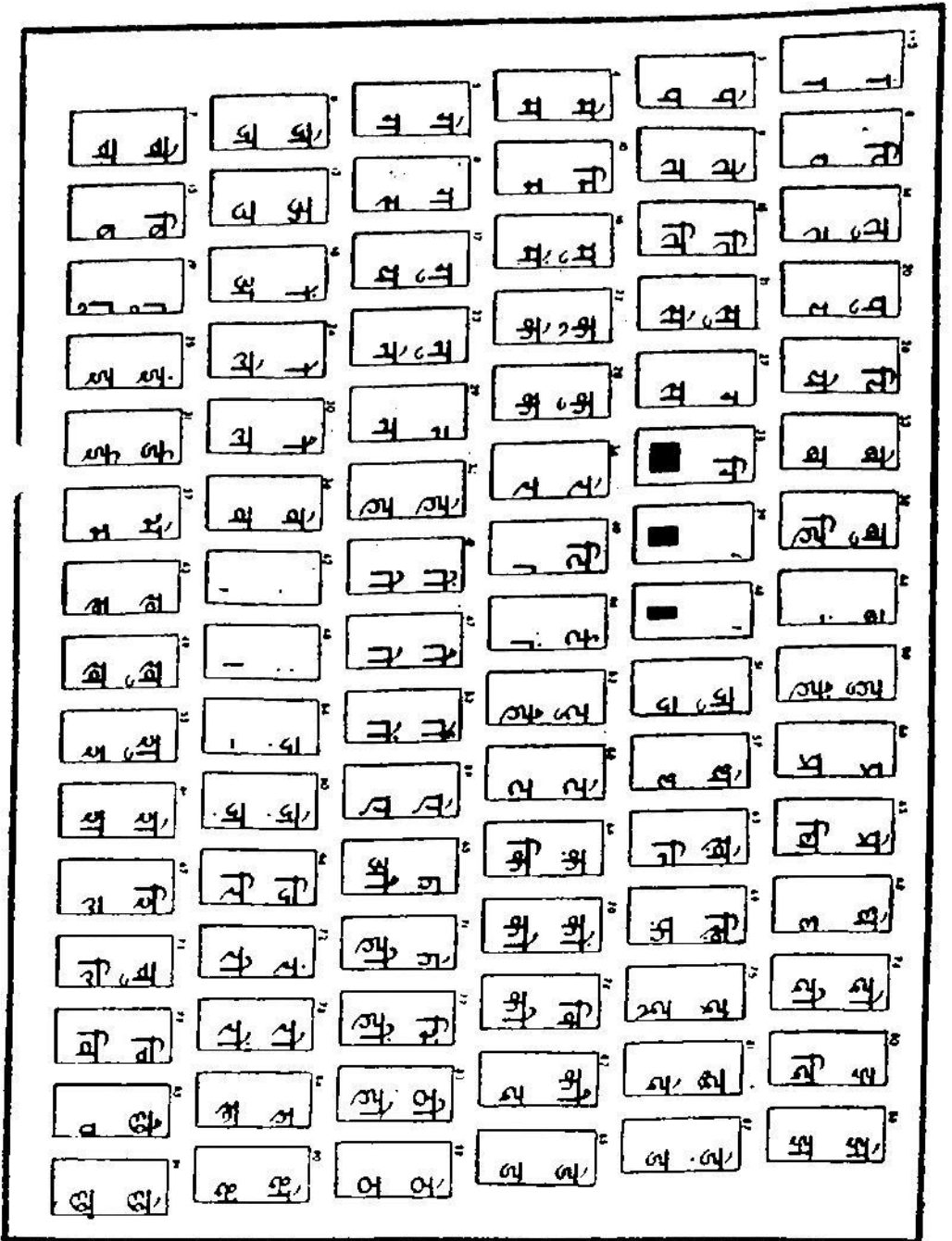
Fig. 134. Linotype Devanagari Keyboard for Devanagari Vijaypure System, based on Lucknow Script Reforms  
( Prepared for the Government Central Press, Bombay, 1959 )











१ २ ३ ४ ५ ६ ७ ८ ९ १० ११ १२ १३ १४ १५ १६ १७ १८ १९ २० २१ २२ २३ २४ २५ २६ २७ २८ २९ ३० ३१ ३२ ३३ ३४ ३५ ३६ ३७ ३८ ३९ ४० ४१ ४२ ४३ ४४ ४५ ४६ ४७ ४८ ४९ ५० ५१ ५२ ५३ ५४ ५५ ५६ ५७ ५८ ५९ ६० ६१ ६२ ६३ ६४ ६५ ६६ ६७ ६८ ६९ ७० ७१ ७२ ७३ ७४ ७५ ७६ ७७ ७८ ७९ ८० ८१ ८२ ८३ ८४ ८५ ८६ ८७ ८८ ८९ ९० ९१ ९२ ९३ ९४ ९५ ९६ ९७ ९८ ९९ १००

Fig. 135d. Russian Slugg Composing Machine, Keyboard layout (Basic) Model H-8.

१९५३  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८  
 २६३८



Govil scheme i.e. १ ४ १ as well as the Vijapure scheme १ ४ १. In the Russian scheme the letter is constructed with only two sorts ११. This method however increases the number of sorts with matrices like ११, ११, ११ etc. without providing the facility of setting slanting mātrās, which serves dual purpose (i.e. ४ १ and १ ४ १)

363. The revised Russian Devanagari system was formulated, under the guidance of Mr. F. Sh. Tagirov on the basis of frequency study. Mr. Tagirov published a paper on this scheme in the Monograph 29, issued by the Typographic Research Institute, Moscow. The fount scheme was conceived for model H-8 which is a mixer model with side magazines. The fount contained 248 matrices on the main and side keyboard and 90 hand sorts (see fig. 135a). The alternate Keyboard is shown at Fig. 135b. The same fount was later adapted to Greek attachment (Fig. 135c). In these founts the Mātrā and velanti matrices are seperatly provided.

Table 65. Russian Devanagari fount scheme (Greek attachment)		M	U	S
ॐ	अ इ ई उ ऊ० ऋ० ए ऐ*	6	1	2
क ख ग घ* ङ०	च छ ज झ* ञ* ट ठ ड ढ* ण*			
त थ द ध न न ण प ब भ म				
य र ल व व श ष स ह क्ष	ॠ* ॡ ॢ ॣ* ।*	37	8	1
॥० ०० ॥*	ॡ ॢ ॣ* ।* ॥* ००	2	5	3
ॠ* ॡ* ॢ* ॣ* ।* ॥*	०० ने* पे* मे* ये* रे* ले* वे* से* हे*			
ॠ० ॡ० ॢ० ॣ० ।०		1	18	2
ॠि ॠि*	ॡि ॡि* ॢि ॢि* ॣि ॣि* ।ि ।ि* ॥ि ॥ि*			
ॠि ॡि*	ॢि ॢि* ॣि ॣि* ।ि ।ि* ॥ि ॥ि*			
ॠि* ॡि ॢि ॣि ।ि ॥ि	ॠि* ॡि* ॢि* ॣि* ।ि* ॥ि*	13	13	4
ॠु* ॡु*	ॢु* ॣु* ।ु* ॥ु* ०० ॠु* ॡु*	3	7	2
ॠि ॡि*	ॢि ॣि ।ि ॥ि ॠि* ॡि* ॢि* ॣि* ।ि* ॥ि*			
ॠि* ॡि	ॢि ॣि ।ि ॥ि ॠि* ॡि*			
ॠि* ॡि ॢि* ॣि*	।ि ॥ि ॠि* ॡि* ॢि* ॣि* ।ि* ॥ि*	14	15	5
ॠि ॡि ॢि ॣि ।ि ॥ि	ॠु* ॡु* ॢु* ॣु* ।ु* ॥ु* ॠु* ॡु* ॢु* ॣु* ।ु* ॥ु*	5	7	2
० २ ४ ६ ९ । ,	■ ■			
१* ३* ८* ०* ५*				
! * . : - ; ) * ' * ( * ? * ... * _ *		9	17	
		90 91 22		

M = Main Magazine ; U\* = Second position characters ; S° = Hand-sorts.



ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ  
 ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ ॐ

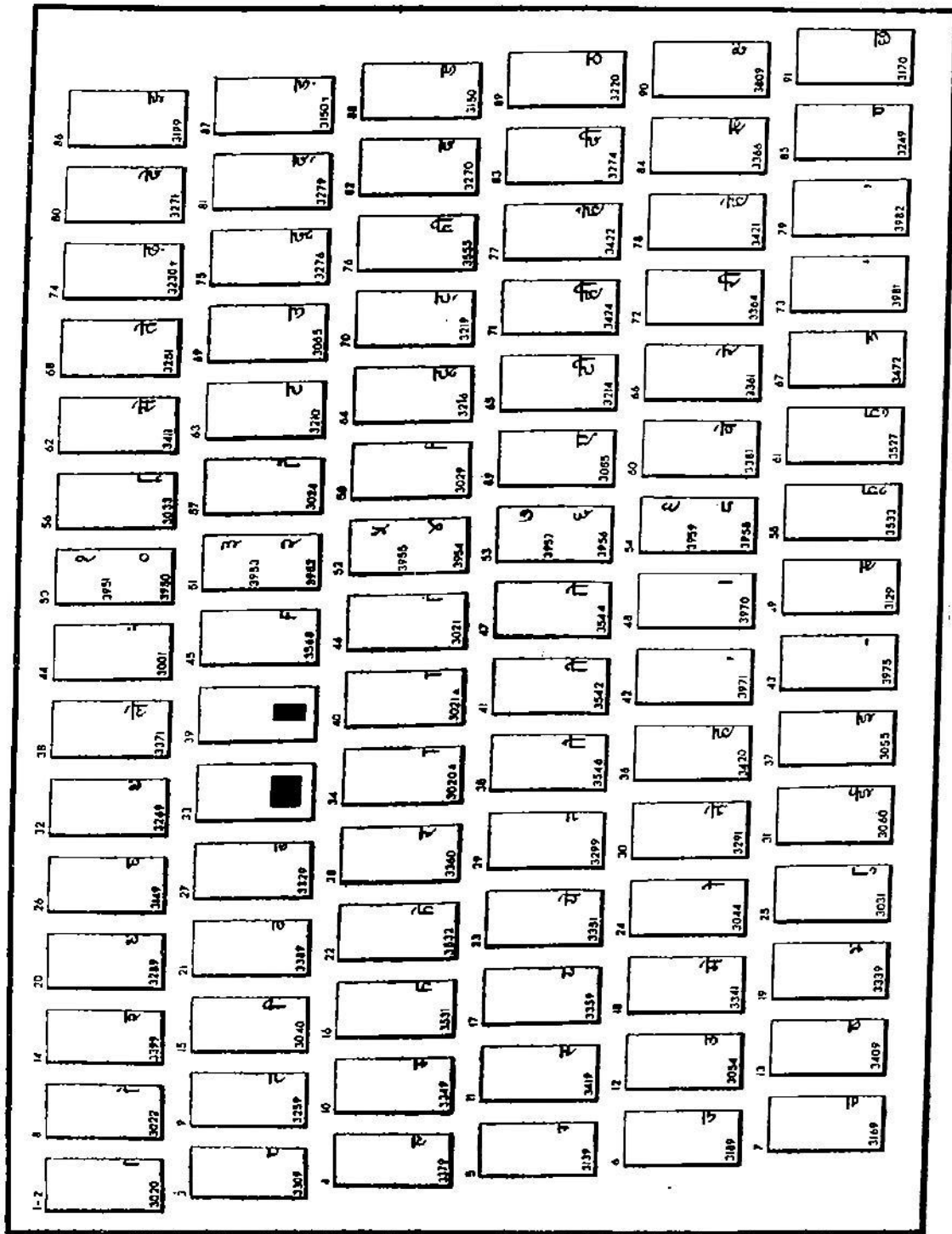


Fig. 136. Russian Slog Composing Machine, Revised Devanagari Keyboard 906 (1965).



364. Since the mixer model scheme is elaborate containing large number of sorts the initial investment in the machine is heavy. It was not therefore considered suitable for newspaper setting. So also was the Greek attachment scheme. A revised fount scheme is therefore worked out on the basis of the Govil-system of constructing short 'i' combinations. The fount scheme consists of 90 matrices five of which contain double characters. The earlier schemes of Devanagari setting on Russian Slug Composing machines were conceived with a view to meet the typographic requirement of maintaining the existing look of the script.

Table 66. Revised fount scheme for Russian Slug Composing Machine Layout 906 (1965).

	M	S
अ इ ई उ ऊ* ए ऋ* ॠ*	5	3
ख ग घ ङ* च छ ज झ ट ठ ड ढ* ण		
त थ द ध न र व श स		
ह र ल व श ष स ह ङ* ङ* ड* ङ* ङ* ङ*	31	6
ॐ दू दू डू* डू* टू*	3	3
ऐ* छे* टे* ठे* ढे* त् वे न पे* म ढे*		
ये रे ले वे सं हे ङै* ङै* छै* टै* ठै* रै* ङै*	11	13
छी* टी* टी* दी* सी* ही* डी*	4	3
छू* छू* दू* दू* टू* टू* टू* टू* डू* रू* रू* डू* डू*	3	10
फ न नी हु नू ने नै* नो* नू* नै* नै*	6	5
। ं ः ऄ अ आ इ ई उ ऋ ॠ ऌ ॡ		
ः ः ः ः ः	15	5
१ ३ ५ ७ ९ ,   - ' ' ■ ■	12	
० २ ४ ६ ८	(5)†	
■* ;* ँ* :* .* -* !* ?* (* )*		10
	90	58
	(5)†	

M = Main Magazine ; S\* = Side case. † Second position.

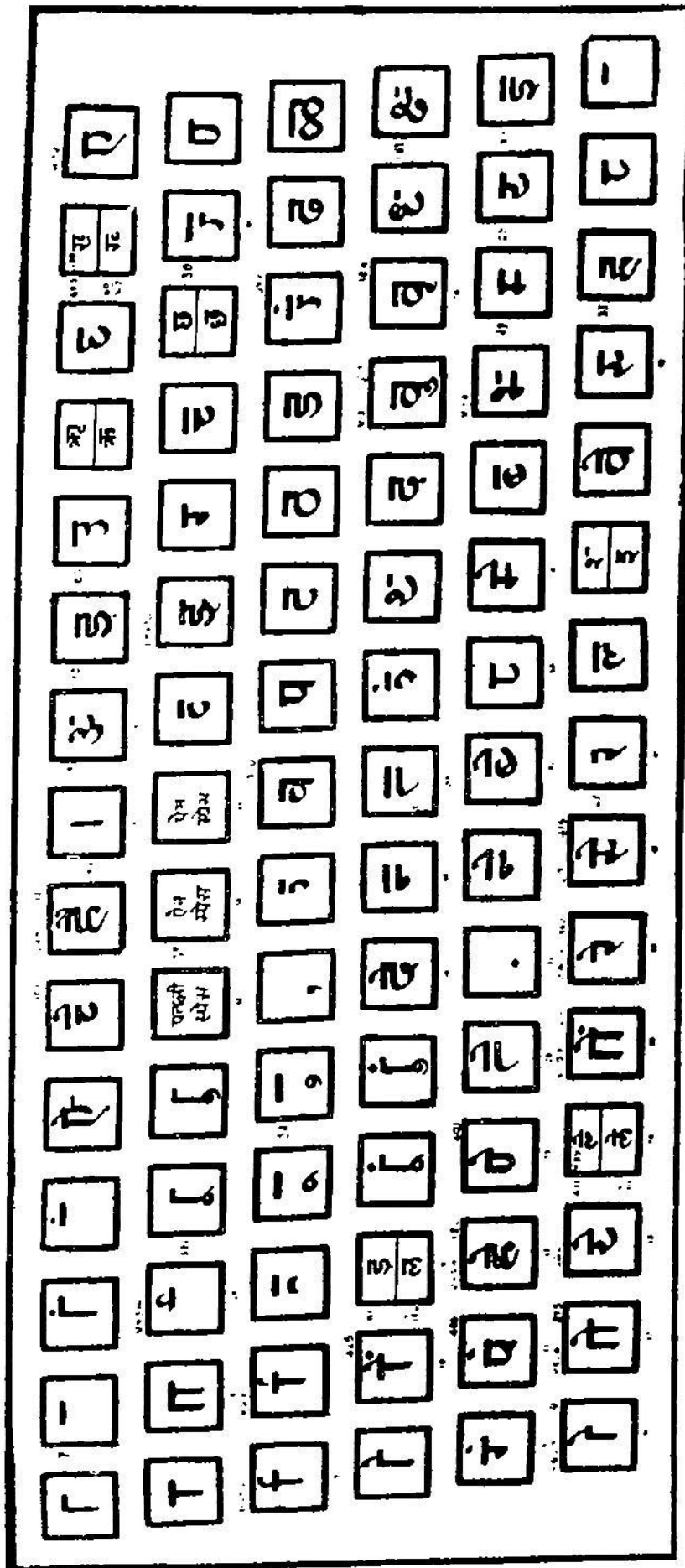


Fig. 137. Provisional Linotype Keyboard for Devanagari, (Hindi and Marathi) 1962 (Vijapure System)

VIJAPURE METHOD OF LINEAR SETTING OF 'SHORTS *i*-MATRA'

365. In the Devanagari script available on the Linotype and also in the Devanagari introduced by G. P. Vijapure, the sign *f* representing the vowel (short इ) falls a little away from the main consonant. For instance *f* क. As the overhanging of the top curve cannot be obtained on slug-casting machine, Vijapure proposed to obtain this short *f* sign by using a special character with half the top curve on the *Kānā f* and join it with the consonant with *mātrā* (ॐ) as is shown here : *f*ि. Trial characters cut for this purpose were tried and found to be successful. The implementation of this scheme involved re-designing of all the *mātrā* characters in a different angle suitable for joining with the special short इ sign *f*, to complete the *Velāntī*. This is a novel typographical solution which will eliminate the disturbing white space between the short इ vowel-sign (*f*) and the consonant.

## STANDARDISED METHOD OF CONJUNCT FORMATIONS

366. It is well known that the main obstacle to any attempt towards reduction in the number of type sorts in Devanagari fount, is the irregular conjunct formations. The Lucknow reforms had simplified this problem by allowing the use of *halant*. That decision was however not acceptable to many and it was not until 1960, that a firm stand was taken in respect of conjunct formations by the Government of India. The Government of Maharashtra subsequently accepted these decisions of the Government of India with slight change.\* One of the important decisions is in regard to the conjunct formation as shown at 2 pp. 356-357 in the accepted alphabet for Devanagari. Several full and half conjuncts can now be removed from the main magazine and the sorts case.

## VIJAPURE FOUNT FOR LINOTYPE DEVANAGARI

367. The standard Vijapure fount scheme for slug composition, as finalised on the basis of the latest decision of the Government of India (1960) and that of the Government of Maharashtra (1962) on the Devanagari Script, is given overleaf. I have made certain suggestions regarding the reduction of 89 sorts by making slight alterations in the method of constructing certain letters including conjuncts. These suggestions can easily be accepted for news-paper setting with only the main keyboard of 90 channel layout. The original scheme, as given in table 67 with *Mātrā* letters in side case, will be suitable for Book-work. For further refinement the *Ukāri* letters can be added in the side case.

\* See Table 60. Comparative study of the decisions on the standard Alphabet for Devanagari, pp. 354-361.



Table 67. Vijaypure Devanagari for Hindi and Marathi

Classification	Devanagari for Hindi			Replace- ment for Marathi	Common	Hindi only	Marathi only			
	Letters with a verti-bar	Letters with a short-bar	Letters with central- bar							
1	2	3	4	5						
1 Vowels	इ	इ उ ए ऐ (ऋ)		ऋ	5	1	1			
2 Half con- sonants	ख ग घ	क	व = ँ	छ	}	}	}			
	च ज झ ञ	(छ)						39	1	1
	ष	ट ठ ड ढ [ड़] [ढ़]						[2]		
	र ल ळ	र ह ळ	प							
	ट ढ ळ र									
	ऌ ऍ									
3 Mātrās	अ आ इ ई [ऀ] [ी] [ँ] [ं]	ऀ ँ ी ु ु ः	ऀ ँ		27	..	..			
	ः ँ ु ु ः	ः ु ु ु ः	ः ु		6	..	..			
4 Chandra	ँ ि	ँ ि	ँ ि		12	1	1			
5 Con- juncts of र	र र र र र र	र र र र र ह (ॣ)	र	ॣ						
6 Rāfari	र र र र र र	र र र र र र	र		22	..	..			
	र र र र र र	र र र र र र	र		4	..	..			
7 Ukāri			र र र र र र							
8 Mātrā conso- nants	ख ग घ	(छ)	ख ख ख ख ख ख	छ	}	}	}			
	च ज झ ञ	ख ख ख ख ख ख [खे] [खे]						34	1	1
	ष	ख	ख ख ख					[3]		
	र ल ळ	र ल ल [हे]	ख ख							
	ऌ ऍ	र ल ल [हे]			4	..	..			
9 Special mātrās	ँ ि	ँ ि	ँ ि		153	4	4			
					[5]					
10 Figures	१ २ ३ ४ (५) ६ ७ (८) ९ ०			५, ८	8	2	2			
11 Signs	, ; . ! ? ! : ' s - / * ( )			..	14	..	..			
12 Spaces	en sp. em sp. thick sp.			..	3	..	..			
					25	2	2			
					178	6	6			
					[5]					



## A SCHEME FOR FURTHER REDUCTION IN THE NUMBER OF SORTS

368. My proposal for reduction of sorts is mainly based on elimination of *Rafāri* characters, replacement of full र conjuncts with linear setting, introduction of *Bārākhadi* of अ and providing full *Kānā* to क and फ. The following notes refer to the table 67 on page 418.

Notes—			
1.	The characters in column 3 in brackets [ ] are additions for Hindi.		
2.	Characters (5) shown in parenthesis in column 3 are used only in Hindi. Four of them (except है) are replaced by those in column 5 for Marathi composition.	—	+
3.	Acceptance of <i>Swarākhadi</i> will replace 5 matrices ऋ, इ, उ, ए and ऐ and will add one ऐ इमान = अिमान; उत्तम = अुत्तम; एक = अेक; ऐक = अैक; ऋण = अृण or रुण	5	1
4.	Replacement of <i>Rafār</i> combinations by prefixing <i>Rafār</i> , accented = or <i>halant</i> र् will reduce 22 matrices against Serial No. 6 and will retain one ( ८, ९ or र् ) घर्म = अर्म अर्म or अर्म	22	1
5.	Replacement of conjuncts with full र against S. No. 5 (except ह, वृ, २, छ and वृ required for कृ) with linear setting will reduce 8 matrices. पत्र; = अत्त; प्रकार = अकार; ब्रम्हा = अरम्हा; तीव्र = अतीव्र; राष्ट्र = अराष्ट्र; द्रामा = अद्रामा; द्राक्ष = अद्राक्ष	8	—
6.	The provision of verti-bar to half forms of क and फ (का फा) will replace 17 matrices in addition to 2 <i>Rafāri</i> (६, ६) included against Note No. 4 above. It will then be necessary to provide ६, ७ and ८ and retain = for combinations like दन्व for द्.	17	3
	का, कि, की, क्, क्, क्		फा, फि, फी, फ्, फ्
7.	Eliminating the compounds क्ष and ज्ञ (and क्षे ज्ञे) in favour of linear setting of these conjuncts will reduce the matrices by 4. क्षमा = अक्षमा; ज्ञान = अज्ञान or अज्ञान	4	—
8.	Use of <i>kānā-mātrā</i> and <i>mātrā</i> ( १ and २ ) for the <i>mātrā</i> consonants (Serial No. 8 in the table except है) will reduce the matrices by 31 for Hindi exclusive of 4 वै, पै, वे, पे reduced as per Note No. 6 above, and क्षे ज्ञे reduced as per note 7 above.	31	—
9.	The above suggestion (Note 8) will necessitate provision of 3 matrices. १ १ १ in place of १ १ १ (and ६ at note No. 4) to be discarded.	3	3
		90	8

The net reduction of Matrices is 81 and the number of matrices, after these reforms are implemented, will be only 101 for Hindi and 96 for Marathi.

**Greek Attachment Linotype Devanagari Keyboard  
designed by the Author. (See opposite page 420a)**

१	२	३	४	५	६	७	८	९	१०	११	१२	१३	१४	१५	१६	१७	१८	१९	२०	२१	२२	२३	२४	२५	२६	२७	२८	२९	३०	३१	३२	३३	३४	३५	३६	३७	३८	३९	४०	४१	४२	४३	४४	४५	४६	४७	४८	४९	५०	५१	५२	५३	५४	५५	५६	५७	५८	५९	६०	६१	६२	६३	६४	६५	६६	६७	६८	६९	७०	७१	७२	७३	७४	७५	७६	७७	७८	७९	८०	८१	८२	८३	८४	८५	८६	८७	८८	८९	९०	९१	९२	९३	९४	९५	९६	९७	९८	९९	१००
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**अनुक्रमणिका**



LINOTYPE DEVANAGARI KEYBOARD FOR GREEK ATTACHMENT

369. Last stage of the Vijapure scheme submitted to the Linotype & Machinery Co., has yet to be implemented. On the basis of the study undertaken by me, in adaptation of Devanagari to Slug Composing Machines based on the frequency count carried out, a new revised keyboard is worked out (fig. 138). Characters in the main positions are arranged according to frequency and alphabet classification. Those in the italic position include *mā'rā* characters.

Table 68. Fount of Matrices for Linotype Greek Attachment

उ 7 ५५	प 4 ५६	इ 2 ५७																																																																																																																																																																																																																																																																																																																																																				
126	127	164																																																																																																																																																																																																																																																																																																																																																				
व 5 ५८	ळ 6 ५९	र 7 ६०	ड 8 ६१	श 10 ६२	ष 11 ६३	ञ 12 ६४	झ 13 ६५	ण 14 ६६	ॠ 15 ६७	ॡ 16 ६८	ॢ 17 ६९	ॣ 18 ७०	। 19 ७१	॥ 20 ७२	० 21 ७३	ॠ 22 ७४	ॡ 23 ७५	ॢ 24 ७६	ॣ 25 ७७	। 26 ७८	॥ 27 ७९	० 28 ८०	ॠ 29 ८१	ॡ 30 ८२	ॢ 31 ८३	ॣ 32 ८४	। 33 ८५	॥ 34 ८६	० 35 ८७	ॠ 36 ८८	ॡ 37 ८९	ॢ 38 ९०	ॣ 39 ९१	। 40 ९२	॥ 41 ९३	० 42 ९४	ॠ 43 ९५	ॡ 44 ९६	ॢ 45 ९७	ॣ 46 ९८	। 47 ९९	॥ 50 १००	० 51 १०१	ॠ 52 १०२	ॡ 53 १०३	ॢ 54 १०४	ॣ 55 १०५	। 56 १०६	॥ 57 १०७	० 58 १०८	ॠ 59 १०९	ॡ 60 ११०	ॢ 61 १११	ॣ 62 ११२	। 63 ११३	॥ 64 ११४	० 65 ११५	ॠ 66 ११६	ॡ 67 ११७	ॢ 68 ११८	ॣ 69 ११९	। 70 १२०	॥ 71 १२१	० 72 १२२	ॠ 73 १२३	ॡ 74 १२४	ॢ 75 १२५	ॣ 76 १२६	। 77 १२७	॥ 78 १२८	० 79 १२९	ॠ 80 १३०	ॡ 81 १३१	ॢ 82 १३२	ॣ 83 १३३	। 84 १३४	॥ 85 १३५	० 86 १३६	ॠ 87 १३७	ॡ 88 १३८	ॢ 89 १३९	ॣ 90 १४०	। 91 १४१	॥ 92 १४२	० 93 १४३	ॠ 94 १४४	ॡ 95 १४५	ॢ 96 १४६	ॣ 97 १४७	। 98 १४८	॥ 99 १४९	० 100 १५०	ॠ 101 १५१	ॡ 102 १५२	ॢ 103 १५३	ॣ 104 १५४	। 105 १५५	॥ 106 १५६	० 107 १५७	ॠ 108 १५८	ॡ 109 १५९	ॢ 110 १६०	ॣ 111 १६१	। 112 १६२	॥ 113 १६३	० 114 १६४	ॠ 115 १६५	ॡ 116 १६६	ॢ 117 १६७	ॣ 118 १६८	। 119 १६९	॥ 120 १७०	० 121 १७१	ॠ 122 १७२	ॡ 123 १७३	ॢ 124 १७४	ॣ 125 १७५	। 126 १७६	॥ 127 १७७	० 128 १७८	ॠ 129 १७९	ॡ 130 १८०	ॢ 131 १८१	ॣ 132 १८२	। 133 १८३	॥ 134 १८४	० 135 १८५	ॠ 136 १८६	ॡ 137 १८७	ॢ 138 १८८	ॣ 139 १८९	। 140 १९०	॥ 141 १९१	० 142 १९२	ॠ 143 १९३	ॡ 144 १९४	ॢ 145 १९५	ॣ 146 १९६	। 147 १९७	॥ 148 १९८	० 149 १९९	ॠ 150 २००	ॡ 151 २०१	ॢ 152 २०२	ॣ 153 २०३	। 154 २०४	॥ 155 २०५	० 156 २०६	ॠ 157 २०७	ॡ 158 २०८	ॢ 159 २०९	ॣ 160 २१०	। 161 २११	॥ 162 २१२	० 163 २१३	ॠ 164 २१४	ॡ 165 २१५	ॢ 166 २१६	ॣ 167 २१७	। 168 २१८	॥ 169 २१९	० 170 २२०	ॠ 171 २२१	ॡ 172 २२२	ॢ 173 २२३	ॣ 174 २२४	। 175 २२५	॥ 176 २२६	० 177 २२७	ॠ 178 २२८	ॡ 179 २२९	ॢ 180 २३०	ॣ 181 २३१	। 182 २३२	॥ 183 २३३	० 184 २३४	ॠ 185 २३५	ॡ 186 २३६	ॢ 187 २३७	ॣ 188 २३८	। 189 २३९	॥ 190 २४०	० 191 २४१	ॠ 192 २४२	ॡ 193 २४३	ॢ 194 २४४	ॣ 195 २४५	। 196 २४६	॥ 197 २४७	० 198 २४८	ॠ 199 २४९	ॡ 200 २५०	ॢ 201 २५१	ॣ 202 २५२	। 203 २५३	॥ 204 २५४	० 205 २५५	ॠ 206 २५६	ॡ 207 २५७	ॢ 208 २५८	ॣ 209 २५९	। 210 २६०	॥ 211 २६१	० 212 २६२	ॠ 213 २६३	ॡ 214 २६४	ॢ 215 २६५	ॣ 216 २६६	। 217 २६७	॥ 218 २६८	० 219 २६९	ॠ 220 २७०	ॡ 221 २७१	ॢ 222 २७२	ॣ 223 २७३	। 224 २७४	॥ 225 २७५	० 226 २७६	ॠ 227 २७७	ॡ 228 २७८	ॢ 229 २७९	ॣ 230 २८०	। 231 २८१	॥ 232 २८२	० 233 २८३	ॠ 234 २८४	ॡ 235 २८५	ॢ 236 २८६	ॣ 237 २८७	। 238 २८८	॥ 239 २८९	० 240 २९०	ॠ 241 २९१	ॡ 242 २९२	ॢ 243 २९३	ॣ 244 २९४	। 245 २९५	॥ 246 २९६	० 247 २९७	ॠ 248 २९८	ॡ 249 २९९	ॢ 250 ३००	ॣ 251 ३०१	। 252 ३०२	॥ 253 ३०३	० 254 ३०४	ॠ 255 ३०५	ॡ 256 ३०६	ॢ 257 ३०७	ॣ 258 ३०८	। 259 ३०९	॥ 260 ३१०	० 261 ३११	ॠ 262 ३१२	ॡ 263 ३१३	ॢ 264 ३१४	ॣ 265 ३१५	। 266 ३१६	॥ 267 ३१७	० 268 ३१८	ॠ 269 ३१९	ॡ 270 ३२०	ॢ 271 ३२१	ॣ 272 ३२२	। 273 ३२३	॥ 274 ३२४	० 275 ३२५	ॠ 276 ३२६	ॡ 277 ३२७	ॢ 278 ३२८	ॣ 279 ३२९	। 280 ३३०	॥ 281 ३३१	० 282 ३३२	ॠ 283 ३३३	ॡ 284 ३३४	ॢ 285 ३३५	ॣ 286 ३३६	। 287 ३३७	॥ 288 ३३८	० 289 ३३९	ॠ 290 ३४०	ॡ 291 ३४१	ॢ 292 ३४२	ॣ 293 ३४३	। 294 ३४४	॥ 295 ३४५	० 296 ३४६	ॠ 297 ३४७	ॡ 298 ३४८	ॢ 299 ३४९	ॣ 300 ३५०	। 301 ३५१	॥ 302 ३५२	० 303 ३५३	ॠ 304 ३५४	ॡ 305 ३५५	ॢ 306 ३५६	ॣ 307 ३५७	। 308 ३५८	॥ 309 ३५९	० 310 ३६०	ॠ 311 ३६१	ॡ 312 ३६२	ॢ 313 ३६३	ॣ 314 ३६४	। 315 ३६५	॥ 316 ३६६	० 317 ३६७	ॠ 318 ३६८	ॡ 319 ३६९	ॢ 320 ३७०	ॣ 321 ३७१	। 322 ३७२	॥ 323 ३७३	० 324 ३७४	ॠ 325 ३७५	ॡ 326 ३७६	ॢ 327 ३७७	ॣ 328 ३७८	। 329 ३७९	॥ 330 ३८०	० 331 ३८१	ॠ 332 ३८२	ॡ 333 ३८३	ॢ 334 ३८४	ॣ 335 ३८५	। 336 ३८६	॥ 337 ३८७	० 338 ३८८	ॠ 339 ३८९	ॡ 340 ३९०	ॢ 341 ३९१	ॣ 342 ३९२	। 343 ३९३	॥ 344 ३९४	० 345 ३९५	ॠ 346 ३९६	ॡ 347 ३९७	ॢ 348 ३९८	ॣ 349 ३९९	। 350 ४००

\* These four matrices are to be substituted for the four matrices in the row above, for short "i" combinations in the improved style.

H 5447-28

## A SCHEME FOR LINEAR SETTING ON MONOTYPE

370. In the Monotype system of type setting the over hanging characters predominate. The method of setting on Monotype has been explained at page 393 and a complete sorts-list with the comments has been reproduced on pages 394-397. As has already been stated, the setting system adapted on the Monotype helps in retaining the conventional look of the script but the large number of overhangs create problems. It is therefore necessary to formulate a linear setting method without overhangs or at least with very few overhangs. The Vijapure system of linear setting adapted to the Linotype can be considered for Monotype setting. In order to reduce the number of sorts on Linotype the characters with short and long *Ukārs* are constructed with two types, one is consonants and the other is vowel sign in ढ+ॢ ; ढ+ॣ . In doing so, it is noticed that the vowel signs fall wide apart in case of letters like क, फ and they create disturbing white spaces in case of letters with short-bar ढ+ॣ ; ढ+। . Even in case of the letters with *Kānā*, the *Kānā-Ukār* does not look well. It is therefore proposed that for setting on Monotype machine the *Ukārs*, both short and long, may be cast with overhangs on the right. The additional sorts-list is reproduced in table 69.

Table 69. Additional matrices in the Fount for Linear Setting on Monotype

बु खु गु घु	चु छु जु झु	तु थु दु धु नु	टु ठु डु ढु णु	
बु भु मू	यु रु लू शू षू सू हू लू क्षू ज्ञू	डू ढू		33
बू खू गुू घू	चू छू जुू झू	तू थू दुू धू नू	टू ठू डू ढू णू	
बू भू मू	यू रू लू शू षू सू हू लू क्षू ज्ञू	डू ढू		33
				66



Table 70. Comparative study of the matter set up by hand and on Mechanical Composing Machines

Handset 12 pt., 2 pt. leaded

Monotype 12 on 14 pt.

महाराष्ट्राच्या भक्तिसंप्रदायात भागवत पंथ, लिंगायत पंथ, वारकरी पंथ, महानुभावी पंथ इत्यादी पंथ निर्माण झाले. त्या सर्वांत जुना नाथपंथ आहे. या नाथपंथाची गाणी गाणारा एक खेडूत कलाकार महाराष्ट्रात ज्ञानेश्वरांच्या पूर्वीपासून संचार करीत आहे. त्याचे नाव कानफाट्या किंवा कोकेवाला.

खेड्यातील हा कलावंत रानावनात राहणारा गोसावीच असतो. एक भगवी कफनी किंवा अंगाभोवती फिरवून मानेमागे गाठ मारलेला भगवा फडका आणि अंगभर फासलेली राख हे त्याचे स्वरूप. हे गोसावी रानमांजराची शिकार करतात. त्या रानमांजराच्या हाडाच्या मोठमोठ्या बाळ्या करून त्यांनी कानात घातलेल्या असतात. त्या चांगल्या बसाव्यात म्हणून कानाच्या पाळ्याला ते एवढी मोठी मोठी भोके पाडतात की त्याचमुळे त्यांचे नाव समाजाने कानफाट्या ठेवले.

कल्पना, कर, स्मारक, केवळ कुमाराप्पा, कुशाग्र, कुर्सी, गई प्रदेश, कार्मुक, कूट, चौराहेपर, दौड, है, शैली, सजावट, दुखी, बुढा, दादा, उर्दु, पण्डित, सिंग, बुद्धि, पंक्ति, तालियां, जिंदगी, किंकर्तव्य, जाति, साहित्य, आणि, पाणी, गिर्वाण, अघटित, टिटवी.

महाराष्ट्राच्या भक्तिसंप्रदायात भागवत पंथ, लिंगायत पंथ, वारकरी पंथ, महानुभावी पंथ इत्यादी पंथ निर्माण झाले. त्या सर्वांत जुना नाथपंथ आहे. या नाथपंथाची गाणी गाणारा एक खेडूत कलाकार महाराष्ट्रात ज्ञानेश्वरांच्या पूर्वीपासून संचार करीत आहे. त्याचे नाव कानफाट्या किंवा कोकेवाला.

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कल्पना, कर, स्मारक, केवळ कुमाराप्पा, कुशाग्र, कुर्सी, गई प्रदेश, कार्मुक, कूट, चौराहेपर, दौड, है, शैली, सजावट, दुखी, बुढा, दादा, उर्दु, पण्डित, सिंग, बुद्धि, पंक्ति, तालियां, जिंदगी, किंकर्तव्य, जाति, साहित्य, आणि, पाणी, गिर्वाण, अघटित, टिटवी.



महाराष्ट्राच्या भक्तिसंप्रदायात भागवत पंथ, लिंगायत पंथ, वारकरी पंथ, महानुभावी पंथ इत्यादी पंथ निर्माण झाले. त्या सर्वांत जुना नाथपंथ आहे. या नाथपंथाची गाणी गाणारा एक खेडूत कलाकार महाराष्ट्रात ज्ञानेश्वरांच्या पूर्वीपासून संचार करीत आहे. त्याचे नाव कानफाट्या किंवा कोकवाला.

खेड्यातील हा कलावंत रानावनात राहणारा गोसावीच असतो. एक भगवी कफनी किंवा अंगाभोवती फिरवून मानेमागे गाठ मारलेला भगवा फडका आणि अंगभर फासलेली राख हे त्याचे स्वरूप. हे गोसावी रानमांजराची शिकार करतात. त्या रानमांजराच्या हाडाच्या मोठमोठ्या बाळ्या करून त्यांनी कानात घातलेल्या असतात. त्या चांगल्या बसाव्यात म्हणून कानाच्या पाळ्याला ते एवढी मोठी मोठी भोके पाडतात की त्याचमुळे त्यांचे नाव समाजाने कानफाट्या ठेवले.

कल्पना, कर, स्मारक, केवळ कुमाराप्पा, कुशाग्र, कुर्सी, गई प्रदेश, कार्मुक, कूट, चौराहेपर, दौड, है. शैली, सजावट, दुखी, बुढा, दादा, उर्दू, पण्डित, सिंग, बुद्धि, पंक्ति, तालियां, जिंदगी, किंकर्तव्य, जाति, साहित्य, अग्नि, पाणी, गिर्वाण, अघटित, टिटवी.

महाराष्ट्राच्या भक्तिसंप्रदायात भागवत पंथ, लिंगायत पंथ, वारकरी पंथ, महानुभावी पंथ इत्यादी पंथ निर्माण झाले. त्या सर्वांत जुना नाथपंथ आहे. या नाथपंथाची गाणी गाणारा एक खेडूत कलाकार महाराष्ट्रात ज्ञानेश्वरांच्या पूर्वीपासून संचार करीत आहे. त्याचे नाव कानफाट्या किंवा कोकवाला.

खेड्यातील हा कलावंत रानावनात राहणारा गोसावीच असतो. एक भगवी कफनी किंवा अंगाभोवती फिरवून मानेमागे गाठ मारलेला भगवा फडका आणि अंगभर फासलेली राख हे त्याचे स्वरूप. हे गोसावी रानमांजराची शिकार करतात. त्या रानमांजराच्या हाडाच्या मोठमोठ्या बाळ्या करून त्यांनी कानात घातलेल्या असतात. त्या चांगल्या बसाव्यात म्हणून कानाच्या पाळ्याला ते एवढी मोठी मोठी भोके पाडतात की त्याचमुळे त्यांचे नाव समाजाने कानफाट्या ठेवले.

कल्पना, कर, स्मारक, केवळ कुमाराप्पा, कुशाग्र, कुर्सी, गई प्रदेश, कार्मुक, कूट, चौराहेपर, दौड, है, शैली, सजावट, दुखी, बुढा, दादा, उर्दू, पण्डित, सिंग, बुद्धि, पंक्ति, तालियां, जिंदगी, किंकर्तव्य, जाति, साहित्य, अग्नि, पाणी, गिर्वाण, अघटित, टिटवी.



## PART FOUR

### Frequency Studies of Devanagari Graphemes and Type Sorts

*(Chapter XVI and Tables 71 to 75)*

## अनुक्रमणिका



## CHAPTER XVI

### GRAPHEMIC FREQUENCIES OF DEVANAGARI

371. The frequencies of the letters of the alphabet determine the relative quantity of type and the location of the sorts in the type case. The same data can be made use of in formulating the keyboards for typewriters and the composing machines. Intensive studies have been made in case of the Roman alphabet in its use for the various languages. Prof. S. H. Caldwell carried out studies in the Chinese language with a view to develop a composing machine for Chinese. His studies were incorporated in his paper<sup>1</sup> presented to the Franklin Institute of Pennsylvania. Prof. Caldwell's work on Devanagari was financed by the Carnegie Corporation of New York and the results were published in the Graphic Arts Research Foundation Reports<sup>2</sup> during 1953-54. The United States Army and Air Force have taken keen interest in the study of the languages of the Far East. The mass communication division of the UNESCO is also interested in the studies in respect of Devanagari and other Oriental languages. Louis Rosenblum has recently produced a report<sup>3</sup> on Devanagari Photo-composition with the assistance of Centre of Communication Sciences and Graphic Arts Research Foundation Inc., Massachusetts Institute of Technology.

#### SIGN LIST OF DEVANAGARI *Akṣaras*

372. The Devanagari script, which has been fully explained in the pages which precede, is of semi-syllabic nature. The graphic units known as *akṣaras* are constructed by combining the vowel-signs with the consonants. There are twelve vowels including *ॠ*, and *ॡ*, but excluding *अ* and *इ*. When they combine with the thirty-six consonants, 432 graphic units or *akṣaras* are formed. The conjuncts, which are graphic units, made of more than one consonants combined with a vowel-sign, are many. As many as 378 conjuncts are listed by Lambert in her study of the Devanagari script.<sup>4</sup> The possible number of conjuncts multiplied by 12 vowel-signs works out to 4,536 *jod-akṣaras*. The *akṣaras* (about 5,000) may also be used with *anuswār* which will increase the number to almost double. It has however been estimated that about 2,000 *akṣaras* would be needed for satisfactory setting of Devanagari, the remaining being very infrequent.



## NECESSITY OF FREQUENCY COUNT OF THE DEVANAGARI GRAPHEMES

373. So far the basic data required for formulating the fount schemes used to be worked out by a very practical method. Set-up matter of representative character is distributed in an empty case and the number of types in each compartment is counted. Similar study has recently been carried out by David Ray who visited India on behalf of the South Illinois University, U.S.A. This method is not very scientific as one has to rely on whatever set-up matter is available. The frequencies of type sorts, worked out under a specific method of type-setting cannot be applied to the other methods of type-setting. For instance the frequencies worked out for the *degree* type fount of 155 type-sorts will not be applicable in case of *Akhand* type fount of 600 type-sorts. They will have to be worked out afresh.

374. I, therefore, thought it necessary to work out the graphemic frequencies of Devanagari on the basis of the complete graphemic units. The graphemic units in Devanagari may amount to about 10,000 as already stated. Once these graphemic units are counted and tabulated in an easily understandable chart, all the basic information necessary for the study of the graphemic structure of Devanagari script would be available. The Report of Rosenblum referred to above envisages working out of graphemic frequencies of 1,00,000 words specifically selected for the purpose. He further recommends working out of frequencies of *akṣara*-sequences ".... to establish the optimum keyboard layout. By maximising the alternation of hands in successive key-strokes, by maximising the keyboarding in the central horizontal row of the typewriter and by minimising the sequences from top to bottom row in the same hand, it will be possible to minimise the operator-fatigue, minimise operator-errors and maximise operator-speed".

## EXPLANATION OF THE FREQUENCY TABLES

375. Although I originally proposed to work out the frequencies of 1,00,000 words I could not wait till the passages were selected on random sampling basis. I therefore limited my studies to three groups of words. (1) 10,000 words from the passages selected by the Language Department of the Maharashtra Government for working out the graphemic frequencies for developing a standard typewriter keyboard,\* (2) passages covering 5,000 words from a daily newspaper in Marathi, \* (3) passages covering 5,000 words from a daily newspaper in Hindi. In order to have a comparative study of the graphemic frequencies worked out under these three groups, the frequency figures for the second and the

\*These passages were written according to the New Rules of Orthography of Marathi.

third groups are doubled. The basic data collected is tabulated in table 71. The totals thus represent 30,000 words. The data is retabulated in tables 72 and classified under (A) *Akṣaras* representing vowels only, (B) central-bar letters, (C) short-bar letters, (D) verti-bar letters and (E) letters with *Nukta*, (F) special compounds. Conjuncts are tabulated in table 73. The totals are tabulated on pages 464-65. The figures are horizontally arranged according to the vowel sequence in four groups : (1) twelve vowels, *Bārākhadi*, (2) nine vowels आ to औ with *anuswār*, (3) special vowels अँ and आँ, with and without *anuswār*, (4) vowels कृ and लृ, and (5) semi-vowels या with and without *anuswār*.

376. The information in 72-73 tables has been made use of in working out the matrix frequencies. All the graphemes were analysed on the basis of 188 matrices in the Vijapure system of the slug composition. The data worked out is tabulated in table 74, arranged according to the frequency percentages. Cumulative percentages are also given. It will be seen that first ten matrices represent over fifty per cent of the key-strokes. First thirty matrices cover eighty-four per cent of the key-strokes and seventy matrices, which can be accommodated on the Linotype keyboard, in addition to the spaces, a few signs and numerals, cover 97.47 per cent of the key-strokes. The main purpose of this frequency count is to formulate a standard keyboard for the Linotype machine. Similar use can be made of the tables 72-73 for developing the standard keyboard for Monotype or other type-composing or photo-setting machines and for different systems of hand-setting.

#### BASIC DATA FROM THE FREQUENCY COUNT

377. The information which may be available from such a study of frequencies is of great use for linguistic studies. Orthographic scrutiny is, however, required to be made before the frequency count of 1,00,000 words is undertaken. It is possible to study the effect of the rules of orthography recently accepted by the Government of Maharashtra on the frequencies. For that purpose it would be necessary to select and re-write passages according to different rules of orthography.

378. The following basic information is available from the study carried out :

(1) The number of words studied	..	..	..	30,000
(2) Number of non-conjunct letters	..	..	..	79,933
(3) Number of conjunct letters	..	..	..	6,639
(4) Number of graphemic units (1+2)	..	..	..	86,572
(5) Half consonants used in conjuncts (includes first and middle members).				6,852
(6) Total number of key-strokes in the Vijapure system of Linotype setting of 30,000 words.				1,93,526

## RELATIVE FREQUENCIES

379. Average word is made of 2·9 *akṣaras* and 6·4 key-strokes in Vijapure method, exclusive of spaces in the Vijapure Linotype system. “क” is the most frequent letter followed by र, न, त, स, ल, ह, म, व, च, in that order. The most frequent vowel-sign is अ followed by आ, ए, ई, इ, उ, ओ, ऊ, ए and औ in that sequence. The frequency of the *akṣaras* ending with semi-vowel या is between that of इ and उ. The frequencies of the consonants, particularly the relative frequencies are of special interest to the script reformers as the effect of any alteration in the design of a particular consonant can be pre-judged with this data.

## REFERENCES

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2. Caldwell, S. H., *Final Report on Studies . . . Chinese and Devanagari*, Graphic Arts Research Foundation, New York (1954).
3. Louis Rosenblum, *Proposed Programme for the Development of Photographic Typesetting Machines for India*.
4. Lambert, H. M., *Introduction to the Devanagari Script*, Oxford University Press, 1953.



## TABLES OF THE GRAPHEMIC FREQUENCIES OF DEVANAGARI

*Table 71.*—Graphemic frequencies 30,000 words, classified as (a) Bhasha Mandal, (b) Marathi Newspapers and (c) Hindi Newspapers.

*Table 72.*—Arranged vertically, according to the groups of letters (A) Vowels only (B) Letters with central-bar, (C) short-bar letters, (D) verti-bar letters, (E) consonants with *Nikṛta* (F) special compounds and are arranged horizontally according to the vowel sequence, i.e.—

- (1) Ten vowels and the *visarga*.
- (2) Ten vowels with the *anuswāra*.
- (3) Special vowels ँ and ॐ with and without the *anuswāra*.
- (4) Vowels ऋ and ॠ
- (5) Semi-vowel ञ with and without the *anuswāra*.

(a) The figures in bold in the second lines against the consonants, refer to the frequencies of conjuncts having the relative consonant as last member.

(b) The frequencies of the consonant graphemes as first (or middle) member in conjuncts are shown in the last but one column.

(c) The totals of the four tables are worked out on page 464-465, represent the *akṣharas* or graphemic units as represented in Devanagari writing.

*Table 73.*—Graphemic frequencies of the conjunct letters in Devanagari and *Rafāri* conjuncts.

*Table 74.*—Linotype matrix frequencies in the Vijapure Method worked out in Percentages.

*Table 75.*—Frequencies of *Ukārī* letters for Monotype linear setting.





—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
हं	...	..	4	4	तां	8	70	..	78
हां	1	..	...	1	तीं	3	20	..	23
हं	..	6	...	6	तूं	..	2	..	2
ह्या	3	2	...	5	तैं	..	32	2	34
				262	तों	1	8	6	15
					तृ	4	..	..	4
ण	256	388	168	812	त्या	195	152	..	347
णा	191	260	36	487	त्यां	51	88	..	139
णि	130	84	..	214					5,918
णी	119	36	12	67	थ	24	20	56	100
णु	1	2	2	5	था	8	20	68	96
णू	42	38	..	80	थि	1	..	..	1
णे	120	18	..	138	थी	5	4	8	17
णो	1	..	..	1	थु	1	..	..	1
णं	1	..	..	1	थे	18	32	10	60
णां	2	20	..	22	थै	1	..	..	1
णीं	..	12	..	12	थो	11	8	6	25
णें	..	36	..	36	थं	1	..	..	1
प्या	291	138	..	429	थां	2	4	..	6
प्यां	1	62	—	63	थीं	1	..	2	3
				2,367	थें	..	18	..	18
					थों	..	..	2	2
त्	..	2	10	12	थ्या	1	..	..	1
त	1,168	1,232	464	2,864					332
ता	274	146	162	582	दू	..	26	2	28
ति	57	110	86	253	द	176	196	154	526
ती	388	236	68	692	दा	113	110	74	297
तु	28	18	34	80	दि	75	90	112	277
तू	66	14	142	222	दी	38	16	48	102
तें	89	182	..	271	दु	56	20	28	104
तै	5	..	4	9	दु	31	..	26	57
तों	63	78	44	185	दू	125	166	90	381
तौ	..	..	2	2	दू	5	34	..	39
तैं	15	6	..	21					
तं	15	6	..	21					
तः	15	22	46	83					

ज्येष्ठ  
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२०२७  
२०२८  
२०२९  
२०३०



—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
हं	...	..	4	4	तां	8	70	..	78
हां	1	..	..	1	तीं	3	20	..	23
हं	..	6	..	6	तूं	..	2	..	2
ह्या	3	2	..	5	तैं	..	32	2	34
				262	तों	1	8	6	15
					तृ	4	..	..	4
ण	256	388	168	812	त्या	195	152	..	347
णा	191	260	36	487	त्यां	51	88	..	139
णि	130	84	..	214					5,918
णी	119	36	12	67	थ	24	20	56	100
णु	1	2	2	5	था	8	20	68	96
णू	42	38	..	80	थि	1	..	..	1
णे	120	18	..	138	थी	5	4	8	17
णो	1	..	..	1	थु	1	..	..	1
णं	1	..	..	1	थे	18	32	10	60
णां	2	20	..	22	थै	1	..	..	1
णीं	..	12	..	12	थो	11	8	6	25
णें	..	36	..	36	थं	1	..	..	1
प्या	291	138	..	429	थां	2	4	..	6
प्यां	1	62	—	63	थीं	1	..	2	3
				2,367	थें	..	18	..	18
					थों	..	..	2	2
त्	..	2	10	12	थ्या	1	..	..	1
त	1,168	1,232	464	2,864					332
ता	274	146	162	582	दू	..	26	2	28
ति	57	110	86	253	द	176	196	154	526
ती	388	236	68	692	दा	113	110	74	297
तु	28	18	34	80	दि	75	90	112	277
तू	66	14	142	222	दी	38	16	48	102
तूं	89	182	..	271	दु	56	20	28	104
तैं	5	..	4	9	दु	31	..	26	57
तों	63	78	44	185	दु	125	166	90	381
तूं	..	..	2	2	दु	5	34	..	39
तैं	15	6	..	21					
तों	15	22	46	83					

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
दो	29	10	14	53	नि	131	140	156	427
दौ	1	2	..	3	नी	78	134	116	328
दं	1	6	12	19	नु	32	32	10	74
दुः	1	4	..	5	नू	1	..	..	1
दां	6	18	..	24	ने	274	218	400	892
दी	1	2	..	3	नै	5	2	..	7
दं	..	2	6	8	नो	8	14	2	24
दी	..	..	4	4	नं	30	38	2	70
दू	21	42	4	67	नः	3	4	4	11
दा	85	78	6	169	नां	34	34	6	74
दां	14	10	..	24	नि	..	..	2	2
				2,190	नीं	..	2	..	2
					नं	..	68	12	80
ध	134	52	30	216	नों	4	..	52	56
धा	86	30	70	186	नृ	..	..	4	4
धि	53	78	62	193	न्या	15	18	22	55
धी	40	30	8	78	न्यां	11	14	..	25
धु	7	10	2	19					5,272
धू	5	12	..	17	प	550	676	420	1,646
धे	6	2	2	10	पा	249	210	102	561
धो	11	10	..	21	पि	21	..	10	31
धं	33	54	..	87	पी	19	4	..	23
धः	..	..	4	4	पु	95	92	86	273
धां	1	2	..	3	पू	63	82	50	195
धीं	..	2	..	2	प्व	16	30	6	52
धुं	2	..	..	2	वै	15	28	10	53
धूं	..	..	2	2	पो	6	12	6	24
धँ	..	..	2	2	पौ	..	2	..	2
ध्या	14	14	10	38	वं	52	2	4	58
ध्यां	..	2	..	2	पां	2	10	4	16
				882	पूं	..	2	..	2
न्	..	..	2	2	वं	1	2	..	3
न	696	724	604	2,024	पां	..	2	..	2
ना	336	474	304	1,114	वं	1	..	..	1

	Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total		Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total
मां	-	2	..	2	बृ	2	..	..	2
प	3	4	..	7	व्या	1	..	..	1
				2,951					1,190
क	15	26	32	73	भ	38	82	44	164
ख	49	28	4	81	भा	189	130	132	451
ग	2	6	14	22	भि	10	34	16	60
घ	2	8	4	14	भी	2	..	146	148
ङ	1	4	4	9	भु	4	..	..	4
च	11	..	4	15	भू	13	32	10	55
छ	6	4	10	20	भे	10	6	8	24
ज	2	..	-	2	भो	3	..	..	3
झ	2	..	2	4	भौ	-	2	..	2
ञ	..	2	-	2	भं	1	2	..	3
ट	..	2	-	2	भां	4	12	..	16
ठ	..	2	-	2	भें	1	..	2	3
ड	..	2	-	2	भों	-	2	2	4
				246	भृ	-	2	..	2
ढ	198	142	224	564	भ्या	14	4	..	18
ण	105	106	104	315					957
त	14	4	20	38	म	405	554	332	1,291
थ	13	12	8	33	मा	320	358	100	778
द	3	8	..	11	मि	133	126	80	339
ध	5	10	4	19	मी	90	42	44	176
न	7	2	12	21	मु	137	310	130	577
प	1	..	2	3	मू	16	6	..	22
फ	5	24	4	33	मे	19	28	20	67
ब	53	18	24	95	मै	9	2	2	13
व	35	2	4	41	मो	41	72	..	113
श	3	2	..	5	मौ	..	2	8	10
ष	..	..	2	2	मं	25	50	42	117
स	..	..	2	2	मां	16	14	38	68
ह	1	-	-	1	मीं	-	2	..	2
र	4	-	-	4	मुं	21	8	-	29

ज्योतिबा  
रुद्रो  
ऐकोजी  
काळ्यापु  
२६३८०  
पुणे  
मराठी विकास - महाराष्ट्र विकास  
राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत





—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
बू	17	24	..	41	बि	3	..	2	5
बै	118	166	86	370	बे	2	..	..	2
वै	7	22	4	33	बो	..	4	..	4
वां	..	10	..	10	बं	2	..	..	2
वं	1	34	16	51	बां	1	2	..	3
वां	4	2	..	6	बें	1	..	..	1
बुं	..	14	..	14	ब्या	1	2	..	3
बैं	..	16	4	20	ब्यां	..	2	..	2
वां	..	..	30	30					123
बु	3	10	6	29					
व्या	66	30	2	98	स्	..	6	..	6
व्यां	3	2	..	5	स	753	756	708	2,217
				3,984	सा	338	288	166	792
श	115	210	116	441	सि	13	16	32	61
शा	122	118	36	276	सी	8	4	14	56
शि	69	116	38	223	सु	87	56	46	189
शी	69	80	14	163	सू	82	62	16	160
शु	1	2	8	11	से	116	62	196	374
शू	1	4	..	5	सै	5	..	2	7
शे	101	20	22	143	सो	47	20	6	73
शै	2	..	..	2	सौ	..	..	6	6
शौ	8	4	..	12	सं	138	164	82	384
शौं	1	..	..	1	सां	17	22	2	41
शं	1	6	2	9	सिं	..	..	12	12
शां	5	..	..	5	सुं	..	6	..	6
शिं	1	12	..	13	सैं	..	32	4	36
शीं	..	4	..	4	सों	..	2	6	8
शैं	..	2	..	2	सौं	..	4	4	8
शौं	..	..	18	18	सृ	..	4	..	4
श्या	1	4	2	7	स्या	1	8	4	13
				1,335	स्यां	7	..	..	7
प्र	73	22	..	95					4,460
पा	2	4	..	6	ह	150	142	334	626
					हा	123	206	150	479

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
हि	103	238	64	405	क्ष	98	120	40	258
ही	208	178	90	476	क्षा	25	16	18	59
ह्ये	11	8	86	105	क्षि	4	8	8	20
ह्ये	21	6	..	27	क्षी	1	4	2	7
ह्ये	296	378	38	712	क्षु	1	..	..	1
ह्ये	..	..	368	368	क्षे	34	26	26	86
ह्ये	199	186	146	531	क्षै	..	2	..	2
ह्ये	2	2	..	4	क्षां	1	6	..	7
ह्ये	1	4	24	29	क्ष्या	..	..	2	2
ह्ये	4	8	6	18					442
ह्ये	..	30	88	118	क्ष	..	..	6	6
ह्ये	..	..	8	8	क्षा	2	8	8	18
ह्ये	..	6	12	18	क्षां	1	..	..	1
ह्ये	..	22	2	24	क्षों	..	..	4	4
ह्ये	..	..	64	64					29
ह्ये	1	..	8	9	क्ष्र	2	..	10	12
ह्ये	..	..	4	4	क्ष्रा	3	..	..	3
ह्ये	2	8	..	10	क्ष्रि	..	..	2	2
ह्या	50	50	..	100	क्ष्री	6	82	42	130
ह्यां	5	..	..	5	क्ष्रु	..	4	..	4
				4,140	क्ष्रे	8	2	4	14
ळ	135	90	..	225	क्ष्रो	..	2	..	2
ळा	57	34	..	91	क्ष्रां	1	..	..	1
ळी	34	14	..	48	क्ष्रृ	..	1	..	1
ळू	14	8	..	22					169
ळे	87	30	..	117	क्ष्र	43	78	36	157
ळो	1	2	..	3	क्ष्रा	38	12	6	56
ळं	..	2	..	2	क्ष्रि	14	2	2	18
ळां	5	8	..	13	क्ष्री	15	8	14	37
ळीं	..	10	..	10	क्ष्रू	1	6	..	7
ळूं	..	2	..	2	क्ष्रै	7	..	..	7
ळें	..	16	..	16	क्ष्रां	6	28	..	34
ळ्या	16	10	..	26					
ळ्यां	2	18	..	20					
				595					

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
त्रं	..	4	..	4	क्य	12	2	2	16
त्रो	..	..	16	16	क्यु	3	..	10	13
त्र्या	4	..	..	4	क्यू	..	..	2	2
त्र्यां	4	..	..	4	क्यों	..	..	6	6
				344					37
ड	..	..	24	24	क्र	25	36	14	75
डा	..	..	6	6	क्रा	1	4	..	5
डि	..	..	2	2	क्रि	8	..	16	24
डी	..	..	2	2	क्री	6	..	2	8
				34	क्रे	..	..	2	2
ढ	..	..	12	12	क्रां	..	..	2	2
ढी	..	..	2	2					116
				14	किट्ट	2	..	..	2
कक	8	..	4	12	कल	..	..	2	2
कका	1	4	..	5	कव	1	4	..	5
कके	15	2	2	19	किवं	..	..	6	6
ककां	1	..	..	1					11
				37	कश	1	..	..	1
कव	1	..	..	1	कस	5	..	2	7
कट	..	6	8	14	ख्य	13	10	14	37
कट्ट	..	..	2	2	ख्ये	..	2	..	2
कट्यां	1	..	..	1	ख्यें	..	6	..	6
				17					45
क	21	22	46	89	ग्	..	4	..	4
का	1	..	..	1	ग्घ	..	2	..	2
कि	1	14	20	35	ग्ग	3	..	..	3
की	13	8	..	21	ग्गी	1	..	..	1
कु	..	..	2	2					4
कू	..	2	..	2	ग्य	23	12	4	39
कुट्ट	..	6	..	6	ग्यं	..	..	1	1
कत्यां	1	..	..	1					40
कत्यां	..	2	..	2					
				159					

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
अ	4	10	6	20	ख	..	10	..	10
आ	9	4	12	25	खो	1	..	..	1
इ	3	..	2	5					11
ई	3	..	6	9					1
उ	..	6	8	14	ख	1	..	..	1
ऊ	..	4	..	4	खो	1	..	..	1
				77	खो	..	..	2	2
ग	..	2	..	2					3
गा	..	..	2	2					2
				4	ख	..	..	2	2
घ		..	6	6	खो	..	..	2	2
गा	..	..	2	2	खो	1	..	4	5
च	5	..	..	5	खो	..	..	2	2
चा	1	4	..	5					7
चि	1	..	..	1	ख	2	4	8	14
चे	2	..	4	6	ख	..	2	..	2
च्या	1	..	..	1	ख	1	..	2	3
				18					5
छ	5	..	10	15	ख	17	22	10	49
छा	3	6	..	9	खा	3	8	20	31
छि	..	2	..	2	खी	4	..	..	4
छी	2	..	18	20	खो	1	..	..	1
छे	3	..	2	5	खो	1			1
				51					86
ज	..	..	8	8	ख	..	2	..	2
जा	1	4	..	5	ख	14	6	12	32
ज्य	17	20	14	51	खो	9	..	..	9
ज्य	1	..	..	1	खो	..	2	..	2
जी	5	..	..	5	खो	3	..	..	3
जी	1	..	..	1	खो	..	..	2	2
				6					48

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
त्प	8	2	..	10	त्स	..	6	..	6
त्पा	11	2	6	19	त्सा	1	8	2	11
त्पः	7	..	..	7	त्सु	..	2	..	2
				36					19
त्म	..	4	..	4	थ्य		..	2	2
त्मी	1	..	..	1	द्वा	—	..	6	6
				5	द्वात्	7	14	..	21
त्य	22	10	10	42	द्वात्वा	1	4	..	5
त्यत्	..	..	2	2	द्वात्सु	3	2	..	5
त्यत्सु	21	26	12	59	द्वात्सुत्	2	..	2	4
त्यत्सुः	..	10	..	10	द्वात्सुत्सु	1	..	..	1
				113	द्वात्सुत्सुत्	2	2	18	22
त्स्य	2	..	..	2					58
त्स्या	1	..	..	1	द्वा	31	34	4	69
				3	द्वा	10	..	..	10
त्स्यत्	5	..	..	5	द्वात्	..	..	6	6
त्स्यो	1	..	..	1	द्वात्सु	1	2	..	3
त्स्यं	..	4	..	4	द्वात्सुत्	2	..	..	2
				10	द्वात्सुत्सु	..	..	2	2
त्व	4	14	6	24					92
त्वा	22	20	..	42	द्वा	..	..	2	2
त्वै	1	..	..	1	द्वात्	1	..	..	1
त्वौ	..	..	4	4					21
				71	द्वु	5	14	2	21
त्वत्	..	4	..	4	द्वुत्	8	2	..	10
त्वात्	—	4	..	4	द्वुत्सु	1	..	..	1
				8	द्वुत्सुत्	30	18	6	54
									86

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पुस्तकालय  
पुणे

—	Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total	—	Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total
द्र	12	204	80	296	न्न	15	6	8	29
द्रा	15	4	2	21	न्ना	...	2	2	4
द्रि	4	2	8	14					33
द्री	1	6	..	7	न्म	1	..	..	1
द्रे	7	..	..	7	न्मा	5	..	..	5
द्या	1	..	..	1					6
				346	न्न्य	16	20	14	50
द्रा	3	20	26	49	न्न्यू	1	..	2	3
द्रि	1	..	..	1	न्न्ये	2	..	..	2
				50	न्न्यो	1	..	..	1
									56
ध्य	22	22	24	68	न्नी	..	..	2	2
ध्ये	38	12	2	52	न्नी	..	4	2	6
ध्यं	..	2	..	2	न्नी	..	..	10	10
				122					16
ध्व	1	10	2	13	न्म	1	..	..	1
न्	..	..	4	4	न्व	2	8	2	12
न्नी	..	..	2	2	न्वि	1	..	..	1
				6					13
न्नी	..	2	2	4	न्शि	1	..	..	1
न्ना	1	..	16	17	न्स	12	6	..	18
न्ना	..	6	..	6	न्सी	..	2	..	2
न्नि	..	4	4	8					20
न्नु	8	..	2	10	न्ह	..	2	..	2
				41	न्हा	4	..	4	8
न्थ	..	..	2	2	न्ही	6	6	..	12
न्नी	..	2	6	8	न्ही	6	..	..	6
न्नी	..	36	18	54	न्ही	..	6	..	6
				62	न्ही	..	2	8	10
न्ध	..	16	..	16	न्ही	..	..	14	14
न्धि	..	4	2	6					58
न्धी	..	2	2	4					
				26					

—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
त्र	1	..	28	29	ब्जा	1	..	..	1
स	..	..	24	24	ब्ज	1	2	..	3
सि	..	..	8	8	ब्जि	..	..	2	2
सि	1	..	..	1	ब्जो	..	2	..	2
सि	3	..	..	3	ब्जां	3	..	..	3
सि	1	..	..	1	ब्जों	..	..	2	2
				66					12
म	..	10	..	10	ब्ध	12	2	..	14
म	1	..	..	1	ब्धे			1	1
				11	ब्धु	1	..	..	1
प	1	..	..	1	ब्ब	..	2	2	4
पा	5	..	..	5	ब्बि	1	..	..	1
पू	1	..	..	1	ब्बु	1	..	..	1
प्या	2	..	..	2					6
				9	ब्बि	3		..	3
प्र	233	242	186	661	ब्भ			26	26
प्र	31	24	36	91	ब्भ			4	4
प्रि	2	2	..	4	ब्भू			2	2
प्रि	2	22	12	36	ब्भो			2	2
प्रो	1	10	2	13					8
प्रो	1	..	..	1	म्फी		..	2	2
प्रौ	..	2	..	2	म्ब	..	..	34	34
प्रां	..	4	..	4	म्बा	..	..	2	2
प्रिं	..	..	..	..	म्बो	..	..	2	2
				812					38
खि	1	..	..	1	म्भ			2	2
ख	4	..	..	4	म्भा			2	2
खि	..	..	4	4					4
खि	4	..	..	4					4
खि	..	..	4	4					8

ज्येष्ठ  
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—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
मा	..	..	2	2	ली	7	..	6	13
मि	..	..	2	2	ले	4	12	26	42
मी	2	..	..	2					72
मे	..	..	30	30	ल्वा	14	..	..	14
				36	ल्वु	2	..	..	2
मु	..	..	2	2					16
म्र	..	2	..	2	ल्व	..	2	..	2
मश	1	..	..	1	ल्हा	13	20	..	33
मह	71	82	2	155	ल्ली	1	..	..	1
माहा	7	6	..	13	ल्ले	3	..	..	3
मीही	9	4	..	13	ल्ल्या	19	..	..	19
ल्ले	1	..	..	1	ल्ल्यां	8	4	..	12
				182					68
य	5	4	2	11	य	22	84	58	164
यल	2	10	..	12	य्ये	1	..	..	1
यल्ले	3	16	..	19					165
				31	व	..	..	2	2
क	1	..	..	1	व्ह	4	6	..	10
कले	..	..	2	2	व्हा	26	4	..	30
				3	ल्ली	..	4	..	4
ल	1	..	..	1	ल्ले	4	2	..	6
ले	..	..	2	2	ल्ल्यां	..	4	..	4
ल्ल	1	..	..	1					54
ल्ल	9	6	12	27	क्कि	..	..	2	2
ल्ले	1	..	..	1	श्च	3	2	6	11
ल्ल	..	..	2	2	श्चा	1	..	6	7
ल्ल	2	..	..	2	श्चि	13	4	16	33
				2					51
ल्ल	..	2	..	2	श्न	15	14	6	35
ल्ल	9	..	6	15	श्ना	4	..	..	4

उत्कृष्टा  
स्वच्छता  
शिक्षण  
कल्याण  
संरक्षण  
पुरुषार्थ  
चरित्र

मराठी विकास संस्थेच्या विकासासाठी

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
शनां	..	2	..	2	ष्य	..	2	..	2
शुनो	..	..	2	2	ष्य	..	4	..	4
				43	ष्य	8	40	30	78
शुमी	5	..	4	9	ष्य	17	..	..	17
शुथ	26	14	50	90	ष्ये	20	4	..	24
शुथों	..	..	6	6	ष्ये	1	..	..	1
				96	ष्ये	4	10	2	16
शुव	3	2	..	5	ष्ये	..	..	2	2
शुवा	2	6	2	10					138
				15	सु	..	..	2	2
सु	9	..	..	9	सु	..	4	..	4
सु	2	2	..	4	सु	..	..	2	2
सु	1	..	..	1					8
				14	सु	..	6	6	12
सु	25	30	18	73	सु	..	2	2	4
सु	1	..	..	1	सु	2	..	..	2
सु	2	12	..	14	सु	4	2	..	6
सु	10	36	..	46	सु	..	2	..	2
सु	3	8	..	11	सु	..	1	..	1
				145					27
सु	4	2	..	6	सु	14	30	8	52
सु	..	2	8	10	सु	19	6	30	55
सु	..	2	..	2	सु	6	4	..	10
				18	सु	12	4	5	21
सु	4	..	..	4	सु	5	14	6	25
सु	..	..	2	2	सु	3	..	8	11
सु	1	4	4	9	सु	2	..	..	2
सु	..	2	..	2	सु	1	..	..	1
सु	..	6	..	6	सु	7	..	..	7
				17	सु	1	2	..	3

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—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total	—	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
स्त्या	16	..	..	16	स्त्य	..	2	..	2
स्त्यां	..	2	..	2	स्थ	1	..	2	3
				205	स्त्	1	..	..	1
स्थ	17	..	26	43	स्त्री	..	..	6	6
स्था	51	34	48	133	स्त्रो	..	..	6	6
स्थि	26	26	52	104	स्त्रां	..	2	..	2
स्थी	13	..	..	13					15
स्थू	1	..	..	1	स्त्र	3	2	4	9
स्थं	6	8	..	14	स्त्रि	2	..	..	2
स्थै	1	4	..	5	स्त्री	5	2	..	7
स्थां	5	..	..	5					18
स्थं	..	2	..	2	स्त्रा			4	4
स्थ्या	1	..	..	1	स्त्रि			4	4
				321					8
स्त्रे	2		2	4	स्त्र	34	46	28	108
स्त्र	5	22	22	49	स्त्रा	8	12	16	36
स्त्रू	..	2	..	2	स्त्री	9	6	6	21
				51					165
स्त्रु	1	..	..	1	स्त्रां	..	..	2	2
स्त्रुं	1	2	..	3	स्त्रां	..	..	2	2
स्त्रां	1	..	..	1					4
				5	ह्य	1	4	..	5
स्त्रा	2	..	..	2	व्य	..	2	..	2
स्त्र	..	6	..	6	धमी	1	2	..	3
				8	क्ष्य			2	2
स्य	2		2	4	र्क	1	2	..	3
स्यां	..		6	6	र्क	..	4	..	4
				10					

	Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total		Bhasha Mandal	Marathi News-paper	Hindi News-paper	Total
भ	4	20	2	26	वुं	..	4	..	4
भे	7	2	2	11	व्या	1	..	..	1
भि	4	..	..	4					62
भो	2	..	4	6	थ	19	4	20	43
भू	..	..	4	4	थी	19	4	..	23
				51	थि	9	20	10	39
घ	3	..	4	7	थी	2	4	..	6
घे	11	2	2	15					111
घि	8	4	8	20	थ्य	..	4	..	4
घो	4	4	..	8	थ्या	3	2	..	5
				43					9
च	17	8	4	29	थ्य	..	4	..	4
चे	9	..	..	9	थ्या	3	2	..	5
				38					9
च	4	12	..	16	थ्य	..	4	..	4
चे	..	4	..	4	थ्या	3	2	..	5
चि	..	2	..	2					9
				22	थ्य	..	4	..	4
च	3	2	..	5	थ्या	3	2	..	5
चे	1	..	..	1					9
				6	थ्य	..	4	..	4
च	28	12	12	52	थ्या	3	2	..	5
चे	2	..	..	2					9
				54	थ्य	..	4	..	4
च	2	6	10	18	थ्या	3	2	..	5
चे	..	4	2	6					9
चि	1	..	18	19	थ्य	..	4	..	4
चो	7	6	..	13	थ्या	3	2	..	5
	1	..	..	1					9

—	Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total	—	Bhasha Mandal	Marathi Newspaper	Hindi Newspaper	Total
क	5	2	6	13	र	2	..	6	8
क	1	14	..	15	ल	..	2	..	2
क	..	8	..	8	व	42	56	12	110
				36	वा	5	8	6	19
क	..	..	8	8	वी	15	12	16	43
क	..	..	4	4	वे	1	2	..	3
क	1	2	..	3	वो	1	2	..	3
				7	वा	4	14	..	18
				23					196
म	..	2	4	6	वि	1	..	..	1
म	4	2	2	8	श	2	30	..	32
मि	..	2	..	2	शि	..	12	..	12
म	2	..	..	2	शी	..	4	..	4
म	1	..	..	1					48
म	..	4	..	4	व	1	4	8	13
				12	वा	16	14	2	32
म	2	4	6	12	वि	23	..	4	27
म	7	20	2	29	वी	9	6	..	15
मि	3	6	..	9	वा	..	2	..	2
				50	वा	..	2	..	2
य	46	26	42	114	व	..	4	..	4
य	33	16	12	61	व्या	..	2	..	2
य	17	18	..	35					97
				210	स	..	10	2	12
					स	..	2	..	2

TABLE 72

TABLE OF FREQUENCIES OF DEVANAGARI AKSHARAS



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

Table 72. Table of Frequencies of Devanagari Aksharas

Consonants Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	आं	इं	ईं
<b>A. VOWELS</b>	1525	1864	282	285	632	74	457	57	42	120	57	..	26	41	1
<b>B. CONSONANTS WITH CENTRAL-BAR</b>															
क	2857	1813	391	161	88	563	234	154	132	..	19	..	202	43	4
ख	29	16	4	..	..	..	19	..	..	..	..	..	1	..	..
ग	73	81	22	14	9	15	20	2	4	2	..	..	..	..	..
घ	13	1910	417	2	1	3	16	..	..	..	..	..	..	..	..
	2972	1906	421	177	98	581	289	156	136	2	19	..	203	43	4
<b>C. CONSONANTS WITH SHORT-BAR AND NO-BAR</b>															
च	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
छ	80	62	4	2	..	..	..	2	59	..	..	..	..	10	..
ज	15	9	2	20	..	..	5	..	..	..	..	..	..	..	..
झ	481	77	21	60	..	3	61	..	15	4	..	..	17	..	2
ञ	124	9	14	55	..	2	7	..	1	..	..	..	2	2	11
ट	119	63	32	194	2	..	52	..	4	..	..	..	6	..	12
ठ	6	10	..	..	..	..	2	..	..	..	..	..	..	..	..
ड	325	79	8	69	2	57	112	..	41	..	..	..	9	..	..
ढ	10	1	..	5	..	..	2	..	2	..	..	..	..	..	..
ण	138	23	..	24	..	15	46	..	..	..	4	..	1	..	..
त	28	526	297	277	102	1054	57	381	39	53	3	19	24	..	3
थ	40	17	8	60	..	1	35	2	4	..	..	..	3	..	..
द	3771	816	369	518	86	266	208	..	112	2	100	..	129	8	5
ध	1167	159	49	66	1	..	55	..	19	1	14	..	20	4	..
न	626	479	405	476	105	27	712	368	531	..	4	..	29	18	118
प	167	96	1	30	..	..	35	..	..	..	..	..	4	..	6
फ	225	91	..	48	..	22	117	..	3	..	2	..	13	..	10
	28	7822	2288	1190	1729	1250	450	1832	411	844	10	143 (7)	257	42	167
<b>D. CONSONANTS WITH VERTI-BAR</b>															
श	280	185	18	42	13	16	59	5	21	..	16	..	10	2	..
ष	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
स	1008	335	79	108	59	12	118	29	83	4	6	..	52	..	4
ह	26	11	4	6	..	..	..	..	..	..	..	..	..	..	..
ळ	136	120	6	3	2	17	74	..	11	..	4	..	7	..	..
व	7	6	..	..	..	..	..	..	..	..	..	..	..	..	..
य	559	677	129	464	20	18	396	3	4	1	6	..	29	7	10
र	32	32	34	..	..	..	14	..	..	..	..	..	..	..	..

उं	ऊं	एं	ऐं	ओं	औं	अँ	आँ	अँ	आँ	ऋ	ॠ	या	यां	Total			Total.
														Last member in conjunct	Full letters	First member in conjunct	
6	36	4	..	40	..	3	16	3	2	2	..	..	..	..	5575	..	5575
..	4	48	..	39	..	4	18	..	10	22	..	19	4	..	6829	..	7295
..	..	..	..	..	..	..	..	..	..	3	..	..	..	72	..	394	
..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	246	..	314
..	..	8	..	..	..	..	1	..	..	..	..	..	..	44	..	24	
..	4	56	..	39	..	6	21	..	10	25	..	19	4	116	7075	418	7609
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	223	..	272
..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	..	..	
6	6	12	..	2	..	1	..	..	..	..	..	19	7	..	794	..	1195
..	..	..	..	..	..	..	..	..	1	..	..	..	..	228	..	173	
..	..	..	..	..	..	..	..	..	..	..	..	37	1	..	522	..	542
..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	..	2	
1	..	6	..	2	..	..	4	..	..	..	..	26	17	..	758	..	785
..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	7	
..	..	6	..	..	..	..	..	..	..	..	..	5	..	..	262	..	264
..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	
..	..	8	..	..	4	..	..	..	..	67	..	169	24	..	3140	..	3983
..	..	..	..	2	..	..	..	..	..	..	..	..	..	172	..	666	
..	16	26	..	52	..	..	..	..	..	..	..	159	28	..	6671	..	8268 1206
..	..	..	..	2	..	..	2	4	..	..	..	1	..	1564	rafar	33 1206	
8	18	24	64	9	..	..	..	..	4	10	..	100	5	..	4140	..	4539
..	..	10	..	..	14	..	..	..	..	..	..	19	12	394	..	5	
..	2	16	..	..	..	..	..	..	..	..	..	26	20	..	595	..	597
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	
15	42	108	64	69	18	1	6	4	5	77	..	560	114	2449	17105	890 1206	20447 1206
..	..	2	..	..	..	..	..	..	1	..	..	41	..	..	711	..	756
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	
3	..	2	8	..	..	..	..	..	..	22	..	3	..	..	1935	..	2117
..	..	..	4	..	..	..	..	..	..	..	..	..	..	51	..	131	
4	..	..	..	..	..	..	..	..	..	..	..	7	..	..	391	..	410
..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	6	
..	..	96	..	..	..	..	..	..	..	..	..	698	2	..	3119	..	3309
..	..	..	..	..	..	..	..	..	..	..	..	1	..	113	..	77	

Conjuncts	Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	:	वां	इं	ईं	
		ॐ	ॐ	818	390	159	158	18	53	94	8	89	..	12	..	13	..
अ	अ	34	10	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	11	202	8	6	3	..	9	..	3	..	..	..	4	..	..	
अ	अ	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	812	487	214	67	5	80	138	..	1	..	1	..	22	..	12	
अ	अ	52	6	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	12 2864	582	253	692	80	222	271	9	185	2	21	..	78	..	23	
अ	अ	83	..	..	..	..	..	..	..	..	..	..	(83)	..	..	..	
अ	अ	254	127	80	60	35	13	6	..	..	..	..	..	1	..	4	
अ	अ	100	96	1	17	1	..	60	1	25	..	1	..	6	..	3	
अ	अ	90	156	143	13	..	1	14	5	..	..	..	..	11	..	..	
अ	अ	216	186	193	78	19	17	10	..	21	..	87	..	3	..	2	
अ	अ	4	120	30	12	7	..	1	..	2	..	..	..	4	..	..	
अ	अ	2 2024	1114	427	328	74	1	892	7	24	..	70	..	74	2	2	
अ	अ	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	139	17	3	3	..	..	5	..	3	..	..	..	5	..	..	
अ	अ	1646	561	31	23	273	195	52	53	24	2	58	..	16	..	..	
अ	अ	91	24	..	..	..	5	..	..	6	..	..	7	..	..	..	
अ	अ	7	564	315	38	33	11	19	21	3	33	..	95	..	41	..	
अ	अ	36	6	..	..	..	..	1	..	2	..	3	..	..	..	..	
अ	अ	164	451	60	148	4	55	24	..	3	2	3	..	16	..	..	
अ	अ	11	10	2	..	2	..	1	..	..	..	..	..	4	..	..	
अ	अ	1291	778	339	176	577	22	67	13	113	10	117	..	68	..	2	
अ	अ	23	38	11	15	..	..	30	..	..	..	..	..	..	..	..	
अ	अ	762	783	25	73	46	8	393	..	232	..	43	..	185	..	4	
अ	अ	2	785	69	..	..	36	5	117	..	57	..	50	..	..	..	
अ	अ	1485	923	157	367	10	56	639	2	99	2	15	..	31	11	2	
अ	अ	8	19	4	13	..	..	44	..	..	..	..	..	..	..	..	
अ	अ	1797	617	736	126	1	41	370	33	10	..	51	..	6	..	..	
अ	अ	282	174	2	64	2	..	4	..	3	..	..	..	18	6	..	
अ	अ	441	276	223	163	11	5	143	2	12	1	9	..	5	13	4	
अ	अ	33	..	13	4	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	95	6	5	..	..	..	2	..	4	..	2	..	3	..	..	
अ	अ	13	32	27	15	..	..	..	..	..	..	..	..	2	..	2	
अ	अ	6 2217	792	61	56	189	160	374	7	73	6	384	..	41	12	..	
अ	अ	50	13	3	2	2	..	..	..	..	..	2	..	..	..	..	
अ	अ	258	59	20	7	1	..	86	2	..	..	..	..	7	..	..	
अ	अ	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
अ	अ	6	18	..	..	..	..	..	..	..	..	..	..	1	..	..	
		20	21747	10733	3520	3337	1494	1021	4529	182	1143	30	1056	107	763	53	79



व	अं	ए	ऐ	ओं	औं	अँ	आँ	इँ	ऊँ	ऋ	ॠ	या	याँ	Total			Total
														Last member in conjunct	Full letters	First member in conjunct	
..	8	..	..	4	..	..	..	..	..	..	..	68	11	..	1903	..	2004
..	..	..	..	..	..	..	..	..	..	..	..	..	..	44	..	57	
2	..	..	..	..	..	..	..	..	..	..	..	6	..	..	254	..	254
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2446
..	..	36	..	..	..	..	..	..	..	..	..	429	63	..	2367	..	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	58	..	21	
..	2	34	..	15	..	..	..	..	4	347	139	..	..	..	5918	..	7030
..	..	8	..	..	..	..	..	..	13	18	4	623	..	..	83	406	
..	..	18	..	2	..	..	..	..	..	1	..	..	..	..	332	..	782
..	..	2	..	..	..	..	..	..	..	1	..	436	..	..	..	14	
2	2	2	..	..	..	..	..	..	..	..	..	38	2	..	882	..	1200
..	..	..	..	..	..	..	..	..	..	..	..	..	..	176	4	138	
..	..	80	..	56	..	..	..	..	4	55	25	..	..	..	5272	..	5807
..	..	..	..	2	..	..	..	..	..	..	..	177	..	..	11	347	
..	2	3	..	2	..	1	2	..	7	..	..	..	..	..	2951	..	3992
..	..	..	..	..	..	..	..	..	..	..	2	..	..	135	..	899	
..	..	..	2	2	..	1	..	4	2	..	1	..	..	..	1190	..	1276
..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..	38	
..	..	3	..	4	..	..	..	..	2	..	18	..	..	..	957	..	987
..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	..	..	
29	..	408	2	12	..	..	..	..	9	..	1	..	..	..	4034	..	4458
..	..	..	..	..	..	..	..	..	6	..	..	..	..	123	..	301	
..	..	16	..	58	..	..	..	..	..	..	10	..	..	..	2640	..	3808
..	..	4	6	18	..	..	..	..	..	..	6	..	..	1153	..	15	
..	..	64	..	20	..	..	1	..	..	..	400	6	..	..	4290	..	4576
..	..	..	..	..	..	..	1	..	..	..	..	..	..	89	..	197	
..	14	20	..	30	..	..	..	..	29	..	98	5	..	..	3984	..	4765
..	..	..	..	4	..	..	..	..	..	..	..	..	..	559	..	222	
..	..	2	..	18	..	..	..	..	..	..	7	..	..	..	1335	..	1601
..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	..	216	
..	..	1	..	..	..	..	..	..	..	..	3	2	..	..	123	..	564
..	4	..	..	..	..	..	..	..	..	..	2	..	..	97	..	344	
6	..	36	..	8	8	..	..	..	4	..	13	7	..	..	4460	..	5391
..	..	..	..	..	..	..	..	..	..	..	..	..	..	72	..	859	
..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	442	..	447
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	
..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	29	..	29
46	32	837	10	271	8	2	4	4	1	102	..	2276	266	4054	49617	4338	58,009

H 5447-30

Conjuncts Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	आं	इं	उं
<b>E. CONSONANTS WITH NUKTA.</b>															
कृ	24	6	2	2	..	..	..	..	..	..	..	..	..	..	..
खृ	12	..	..	2	..	..	..	..	..	..	..	..	..	..	..
	36	6	2	4	..	..	..	..	..	..	..	..	..	..	..
<b>F. SPECIAL COMPOUNDS.</b>															
क	12	3	2	130	4	..	14		2		..	..	1	..	..
ख	157	56	18	37		7	7				..	..	34	..	..
	9	..	2	9	..	..	..	..	..	..	..	..	..	..	..
	178	59	22	176	4	7	21	..	2	..	..	..	35	..	..

Table 73. Table of Frequencies of Conjuncts in Devanagari

क	कक्	12	5	..	..	..	..	19	..	..	..	..	..	..	1	..	..
	कक्	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	कट्	14	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..
क्	कत्	89	1	35	21	..	2	2	..	..	..	..	..	..	..	..	..
	कय्	16	..	..	..	13	2	..	..	..	..	..	..	..	..	..	..
क्र	कर	75	5	24	8			2	..	..	..	..	..	..	2	..	..
कट्	कटर	..	..	2	..			..	..	..	..	..	..	..	..	..	..
	कल्	2	..	..	..			..	..	..	..	..	..	..	..	..	..
क	कव्	5	..	..	..			..	..	..	..	..	..	..	..	6	..
	कश्	1	..	..	..			..	..	..	..	..	..	..	..	..	..
	कस्	7	..	..	..			..	..	..	..	..	..	..	..	..	..
	क्य	37	..	..	..			2	..	..	..	..	..	..	..	..	..
	कद्	4	..	..	..			..	..	..	..	..	..	..	..	..	..
	कध्	2	..	..	..			..	..	..	..	..	..	..	..	..	..
क्	कन्	3	..	..	1			..	..	..	..	..	..	..	..	..	..
	कय्	39	..	..	..			..	..	..	..	..	1	..	..	..	..
क्	कर	20	25	..	5			9	..	..	..	14	..	..	..	..	..
कु	कुल्	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
क्	कुक्	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
कु	कुम्	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
क्	कुव्	5	5	1	..	..	..	6	..	..	..	..	..	..	..	..	..
	कुल्	15	9	2	20	..	..	5	..	..	..	..	..	..	..	..	..
	कुय्	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
क्	कुज्	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	कुय्	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	कुव्	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	कुट्	..	..	..	5	..	..	1	..	..	..	..	..	..	..	..	..

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

अं	ऊं	एं	ऐ	ओं	औं	अँ	आँ	इँ	ईँ	ऋ	ॠ	या	यां	Total			
														Last member in conjunct	Full letters	First member in conjunct	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34	..	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..	
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	169	..	
..	..	4	..	16	..	..	..	..	..	..	..	4	4	..	344	..	
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	10	
..	..	4	..	16	..	..	..	..	..	1	..	4	4	..	20	513	10
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37	..	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	..	..
..	..	..	..	..	..	..	..	..	..	6	..	1	2	..	159	..	..
..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	37	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	116	..	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
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अं अँ आँ इँ ईँ ऋ ॠ  
 ऐँ औँ ओँ औँ  
 क्लगपु चघञ्ज  
 रडडण तमदधन  
 फडभभ्र वरलभय  
 यरह ऋरुच

Conjuncts	Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	अं	अः	अं
व्य	व्य	10	..	..	..	..	..	..	..	1	..	..	..	..	..	..
१	१	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
२	२	..	..	१	..	..	..	..	..	2	..	..	..	..	..	..
३	३	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..
४	४	..	..	२	..	..	..	..	..	..	..	..	..	..	..	..
५	५	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..
६	६	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
७	७	..	३	..	..	..	..	..	..	..	..	..	..	..	..	1
८	८	49	31	..	4	..	..	1	..	..	..	..	..	..	..	..
९	९	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
१०	१०	32	9	..	2	..	..	..	..	..	..	..	..	..	3	..
११	११	10	19	..	..	..	..	..	..	..	..	..	7	..	..	..
१२	१२	7	..	..	1	..	..	..	..	..	..	..	..	..	..	..
१३	१३	4	..	..	1	..	..	..	..	..	..	..	..	..	..	..
१४	१४	42	..	..	..	2	..	59	..	..	..	10	..	..	..	..
१५	१५	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..
१६	१६	5	..	..	..	..	..	..	..	1	..	4	..	..	..	..
१७	१७	24	42	..	..	..	..	1	..	..	..	..	..	..	..	..
१८	१८	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..
१९	१९	6	11	..	..	2	..	..	..	..	..	..	..	..	..	..
२०	२०	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
२१	२१	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..
२२	२२	21	5	5	4	..	1	22	..	..	..	..	..	..	..	..
२३	२३	69	10	6	3	..	..	..	..	2	..	..	..	..	2	..
२४	२४	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
२५	२५	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
२६	२६	21	..	..	..	10	..	1	..	54	..	..	..	..	..	..
२७	२७	296	21	14	7	..	..	7	..	..	..	..	..	..	..	..
२८	२८	..	49	1	..	..	..	..	..	..	..	..	..	..	..	..
२९	२९	68	..	..	..	..	..	52	..	..	..	..	..	..	..	..
३०	३०	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
३१	३१	4	..	..	2	..	..	..	..	..	..	..	..	..	..	..
३२	३२	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..
३३	३३	17	6	8	..	10	..	..	..	..	..	..	..	..	..	..
३४	३४	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
३५	३५	8	..	..	54	..	..	..	..	..	..	..	..	..	..	..
३६	३६	16	..	6	4	..	..	..	..	..	..	..	..	..	..	..

व	ऊं	एं	ऐं	ओं	औं	अँ	भाँ	अँ	आँ	ऋ	लृ	या	यां	Total		
														Last member in conjunct	Full letters	First member in conjunct
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	86	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	48	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	113	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..
..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	71	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	92	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	86	..
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	346	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	..
..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	122	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	..

Conjuncts Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	आं	इं	ईं
अ	29	4										...	...		...
अ, अ	1	5	...	...		...	...		...			...	...		...
अ, अ	50	...	...	...		3	2		1			...	...		...
अ, अ	...	...		2		...						...	...		...
अ, अ	6	...	...	10		...						...	...		...
अ, अ	1	...	...	...		...						...	...		...
अ, अ	12	...	1	...								...	...		...
अ, अ	...	...	1	...			...					...	...		...
अ, अ	18	...	...	2			...					...	...		...
अ, अ	2	8	...	12			6					...	...		6
अ, अ	29	24	8	1			...					...	...		3
अ, अ	10	...	...	...		...	1					...	...		...
अ, अ	1	5	...	...		1	...		...	...		...	...		...
अ, अ	661	91	4	...		...	36		13	1		...	2	4	...
अ, अ	...	...		...								...	...		...
अ, अ	4	...		...								...	...		...
अ, अ		4	...	...								...	...		...
अ, अ		...	4	4								...	...		...
अ, अ	...	1	...	...					...			...	...		...
अ, अ	3		2						2			...	3	...	...
अ, अ	14	...					...					...	...		...
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अ, अ	4	...	1	...	1		...					...	...		...
अ, अ	...	...	3	...	...							...	...		...
अ, अ	26	...	...	...	...	...			...			...	...		...
अ, अ	4	...		...	...	2			2			...	...		...
अ, अ	...	...		2					...			...	...		...
अ, अ	34	2							2			...	...		...
अ, अ	2	2	...	...				...				...	...		...
अ, अ		2	2	2	...		30					...	...		...
अ, अ	...			...	2							...	...		...
अ, अ	2											...	...		...
अ, अ	1	...		...					...	...		...	...		...
अ, अ	155	13		13					1		...	...	...		...
अ, अ	11	...					...				...	...	...		...
अ, अ		12					19		...	...		...	...		...



व.	अं	एं	ऐं	ओं	औं	अँ	आँ	अँ	आँ	ऋ	ॠ	या	यां	Total		
														Last member in conjunct	Full letters	First member in conjunct
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	56	..
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..	..	10	..	..	14	..	..	..	..	..	..	..	..	..	20	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	66	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..
..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	9	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	812	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..
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..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	12	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..
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..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	182	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	..

अं अँ  
 ऐं आँ  
 ओं औं  
 एं एँ  
 क्लिपित  
 २४ इट्टण  
 पकलभु  
 चरलेभु  
 चरले

Conjuncts	Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	आं	इं	ईं	
ऋ	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	15	..	13	..	..	42	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	14	..	..	2	..	..	..	..	..	..	..	..	..	..	..
ॠ	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	33	..	1	..	..	3	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	164	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	10	30	..	4	..	..	6	..	..	..	..	..	..	4	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	11	7	33	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	35	4	..	..	..	..	..	..	..	..	..	..	..	2	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	..	9	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ॡ	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	5	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	9	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	73	1	14	46	..	..	..	..	..	..	..	..	..	..	..	11
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	6	10	..	..	..	..	2	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	78	17	..	24	..	..	1	..	..	..	..	..	..	16	..	..
ॢ	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	2	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	12	4	..	2	..	..	6	..	..	..	..	..	..	..	2	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	52	55	10	21	25	11	2	..	..	..	..	..	1	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	43	133	104	13	..	1	14	5	..	..	..	..	5	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	49	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..

ॐ श्री गणेशाय नमः  
 १९९२  
 एकोटि  
 कलामण्डल  
 २०३००  
 पञ्जलमण्डल  
 चमरे



ऐं	ओं	औं	अँ अॉ अँ अॉ				ऋ	ॠ	या	याँ	Total		
			Last member in conjunct	full letters	First member in conjunct								
..	..	..	..	..	..	..	..	..	..	..	3	..	
..	..	..	..	..	..	..	..	..	..	..	1	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	1	..	
..	..	..	..	..	..	..	..	..	..	..	27	..	
..	..	..	..	..	..	..	..	..	..	..	1	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	72	..	
..	..	..	..	..	..	..	..	..	..	..	16	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	165	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	54	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	51	..	
..	2	..	..	..	..	..	..	..	..	..	43	..	
..	..	..	..	..	..	..	..	..	..	..	9	..	
..	6	..	..	..	..	..	..	..	..	..	96	..	
..	..	..	..	..	..	..	..	..	..	..	15	..	
..	..	..	..	..	..	1	..	..	..	..	14	..	
..	..	..	..	..	..	..	..	..	..	..	145	..	
..	..	..	..	..	..	..	..	..	..	..	18	..	
..	..	..	..	..	..	..	..	..	..	..	4	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	6	..	..	17	..	
..	..	..	..	..	..	..	..	..	..	..	2	..	
..	..	..	..	..	..	..	..	..	..	..	4	..	
..	2	..	..	..	..	..	..	..	..	..	138	..	
..	..	..	..	..	..	2	..	..	..	..	8	..	
..	..	..	..	..	..	1	..	..	..	..	27	..	
..	..	..	..	..	..	3	..	16	2	..	205	..	
..	..	..	..	..	..	..	..	1	..	..	321	..	
..	..	..	..	..	..	..	..	..	..	..	4	..	
..	..	..	..	..	..	..	..	..	..	..	51	..	
..	..	..	..	1	..	..	..	..	..	..	5	..	

Conjuncts Halants	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं अः	आं	इं	ईं
स	..	2	..	..	..	..	..	..	..	..	..	..	..	..
स	4	..	..	..	..	..	..	..	..	..	..	..	..	..
स्य	2	..	..	..	..	..	..	..	..	..	..	..	..	..
स्य	3	..	..	..	..	..	..	..	..	..	..	..	..	..
स	1	..	..	6	..	..	..	6	..	..	..	..	..	..
स	9	..	2	7	..	..	..	..	..	..	..	..	..	..
स	..	4	4	..	..	..	..	..	..	..	..	..	..	..
स	108	36	..	21	..	..	..	..	..	..	..	..	..	..
स	..	2	..	..	..	..	..	..	..	2	..	..	..	..
स्य	5	..	..	..	..	..	..	..	..	..	..	..	..	..
स्य	2	..	..	..	..	..	..	..	..	..	..	..	..	..
क्ष	..	..	3	..	..	..	..	..	..	..	..	..	..	..
क्ष्य	2	..	..	..	..	..	..	..	..	..	..	..	..	..

RAFARI CONJUNCTS

स	3	..	..	..	..	..	..	..	..	..	..	..	..	..
स	4	..	..	..	..	..	..	..	..	..	..	..	..	..
स	26	11	4	6	..	..	..	..	..	..	..	..	..	..
स	7	..	..	..	..	..	..	..	..	..	..	..	..	..
स	15	20	..	..	..	8	..	..	..	..	..	..	..	..
स	29	9	..	..	..	..	..	..	..	..	..	..	..	..
स	16	4	..	..	..	..	..	..	..	..	..	2	..	..
स	5	1	..	..	..	..	..	..	..	..	..	..	..	..
स	52	2	..	..	..	..	..	..	..	..	..	..	..	..
स	18	6	19	13	..	..	1	..	..	..	..	..	..	..
स	43	23	39	..	..	..	..	..	..	..	..	6	..	..
स	4	5	..	..	..	..	..	..	..	..	..	..	..	..
स	4	12	1	..	..	..	13	2	2	..	..	..	..	..
स	6	..	..	..	..	..	..	..	..	..	..	..	..	..
स	19	19	..	..	..	..	1	..	..	..	..	2	..	..
स	..	1	..	..	..	..	..	..	..	..	..	..	..	..
स	2	..	..	..	..	..	..	..	..	..	..	..	..	..
स	3	..	3	..	..	..	..	..	1	..	..	..	..	..
स	..	..	..	..	..	..	..	..	4	..	..	..	..	..
स	13	..	..	..	..	..	15	..	..	..	..	..	..	..
स	..	..	..	..	8	..	..	..	..	..	..	..	..	..
स	..	4	..	..	..	..	..	..	..	3	..	..	..	..



उं	कं	एं	ऐ	ओं	औं	अँ	आँ	अँ	आँ	ऋ	ॠ	या	यां	Total		
														Last member in conjunct	Full letters	First member in conjunct
..	..	..	..	..	..	..	..	..	..	6	..	..	..	..	8	..
..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	10	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	15	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	165	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..
..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	51	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54	..
..	..	..	..	..	..	..	..	..	4	..	1	..	..	..	62	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	111	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	42	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..
..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	4	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..

जं/का  
रं/रं  
ऐ/ओ  
कं/कं  
रं/रं  
पं/पं  
चं/चं  
तं/तं  
दं/दं  
धं/धं  
नं/नं  
मं/मं  
यं/यं  
रं/रं  
लं/लं  
व्यं/व्यं

	अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः	आं	इं	ईं
Conjunct Halants	6	8	2	..	2	..	1	..	..	..	..	..	4	..	..
भ	12	29	9	..	..	..	..	..	..	..	..	..	..	..	..
भ	114	61	..	..	..	..	..	..	..	..	35	..	..	..	..
भ	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..
भ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
भ	110	19	..	43	..	..	3	..	3	..	..	..	18	..	..
भ	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
भ	32	..	12	4	..	..	..	..	..	..	..	..	..	..	..
भ	13	32	27	15	..	..	..	..	..	..	..	..	2	..	2
भ	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..
भ	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
रसं	3666	1076	439	451	77	30	414	8	97	1	69	7	75	12	23

TOTALS OF TABLES 72 A TO F																
A	1525	1864	282	285	632	74	457	57	42	120	57	..	26	41	1	
B	2972	1906	421	177	98	581	289	156	136	2	19	..	203	43	4	
C	28	7822	2288	1190	1729	1250	450	1832	411	844	10	143	257	42	167	
D	20	21747	10733	3520	3337	1494	1021	4529	182	1143	30	1056	763	53	79	
E	36	6	2	4	..	..	..	..	..	..	..	..	..	..	..	
F	178	59	22	176	4	7	21	..	2	..	..	..	35	..	..	
	48	34171	16858	5437	5708	2533	2133	7128	806	2167	162	1275	114	1284	179	251

GRAPHENIC FREQUENCIES OF DEVANAGARI

465

व	क	एं	ऐ	ओं	औ	अं	अँ	अों	ऋ	ऌ	या	यी	Total	
													Last member in conjunct	Full letters member in conjunct
..	..	..	..	..	..	..	..	..	..	..	..	..	23	50
..	..	..	..	..	..	..	..	..	..	..	..	..	50	..
..	..	..	..	..	..	..	..	..	..	..	..	..	210	..
..	..	..	..	..	..	..	..	..	..	..	..	..	8	..
..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	..	..	..	..	..	..	..	..	..	..	..	..	196	..
..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
..	4	..	..	..	..	..	..	..	..	2	..	..	97	..
..	..	..	..	..	..	..	..	..	..	..	..	..	12	..
..	..	..	..	..	..	..	..	..	..	..	..	..	2	..
..	4	32	6	34	14	..	4	4	..	23	..	50	16	6632
6	36	4	..	40	..	3	16	3	2	2	..	..	5575	..
..	4	56	..	39	..	6	21	..	10	25	..	19	4	116
15	42	108	64	69	18	1	6	4	5	77	561	114	2449	17105
46	32	843	10	271	8	2	4	4	1	102	2276	266	4054	49617
..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
..	..	4	..	16	..	..	..	..	..	1	..	4	4	20
69	..	1009	74	435	26	12	47	11	18	207	2858	388	6639	79933
														6852

Table 74. Frequencies of Linotype matrices in Vijapure System

Serial No.	Matrix No.	Percentage	Cumulative Percentage	Serial No.	Matrix No.	Percentage	Cumulative Percentage
1	।	1	16.431	38	१	48	.491
2	॥	4	8.134	39	ले	411	.485
3	-	7	5.763	40	६	35-S	.477
4	र	27	3.928	41	वे	56	.422
5	१	V63	3.385	42	ल	66	.399
6	३	54	3.394	43	ख	60-S	.357
7	त	22	3.376	44	ड	76	.350
8	ठ	28	3.202	45	से	415	.348
9	व	380	3.044	46	श	36	.348
10	॒	V93a	2.833	47	३	397	.346
11	॒	16	2.537	48	३	78	.325
12	न	18	2.325	49	त	402	.321
13	॒	V94a	2.106	50	३	384	.302
14	त	42	1.956	51	३	410	.298
15	उ	13	1.913	52	३	40R	.269
16	॒	29	1.908	53	३	62	.261
17	॒	17	1.878	54	॒	65	.259
18	॒	11	1.822	55	॒	409	.252
19	॒	5	1.781	56	॒	81a	.247
20	ह	33	1.533	57	॒	72/v99	.246
21	॒	12	1.364	58	॒	V97	.235
22	॒	14	1.206	59	॒	418	.230
23	॒	39	1.193	60	॒	413	.230
24	॒	25	1.067	61	॒	26	.219
25	वे	412	1.028	62	॒	401	.207
26	॒	V95	1.013	63	॒	43	.198
27	॒	24	1.011	64	॒	V52	.188
28	॒	30	.929	65	॒	105	.182
29	॒	V44a	.879	66	॒	82	.181
30	॒	51	.815	67	॒	83	.176
31	॒	405	.748	68	॒	425	.167
32	॒	373	.723	69	॒	34	.163
33	॒	23	.641	70	॒	426	.154
34	॒	419	.624	71	॒	399	.139
35	॒	63	.584	72	॒	V107	.134
36	॒	57R	.537	73	॒	101	.127
37	॒	64S	.529	74	॒	L67a	.126

Serial No.	Matrix No.	Percentage	Cumulative Percentage	Serial No.	Matrix No.	Percentage	Cumulative Percentage
75	३	·126	98·125	113	385	·010	99·932
76	७	·112	98·237	114	४००	·009	99·941
77	११	·110	98·347	115	५२	·008	99·949
78	१५	V96	·107	116	६७	·007	99·956
79	१९	381	·106	117	४४७	·007	99·963
80	२३	386	·100	118	३८३	·005	99·968
81	२७	406	·092	119	४३१	·005	99·973
82	३१	403	·075	120	२१४	·004	99·977
83	३५	275	·071	121	४३९	·004	99·981
84	३९	300	·068	122	४५२	·004	99·985
85	४३	2	·068	123	३९१	·003	99·988
86	४७	390	·061	124	V98	·002	99·990
87	५१	416	·058	125	२०४	·002	99·992
88	५५	109	·054	126	४३४	·002	99·994
89	५९	299	·050	127	४३६	·002	99·996
90	६३	408	·047	128	४४०	·002	99·998
91	६७	382	·047	129	४२०	·001	99·999
92	७१	394	·046	130	२१७	·001	100·00
93	७५	110	·046	131	४१७		
94	७९	435	·044	132	२२३		
95	८३	396	·043	133	३७७		
96	८७	19	·041	134	२५९		
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98	९५	407	·037	136	२४९		
99	९९	387	·031	137	३९२		
100	१०३	324	·030	138	V109		
101	१०७	243	·029	139	V110		
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108	१३५	55R	·015	146	४३२		
109	१३९	388	·013	147	४४४		
110	१४३	414	·012	148	४४६		
111	१४७	V108	·011	149	१०७		
112	१५१	124	·011	150	V106		

Serial No.	Matrix	Percent- age	Cumulative Percentage	Serial No.	Matrix	Percent- age	Cumulative Percentage
151	ट	75		170	ॡ	99	
152	ड	254		171	0	100	
153	ट	89		172	thin sp.	32	
154	ट	90		173	en sp.	38	
155	र	122		174	em sp.	44	
156	उ	86		175	,	45	
157	ः	80		176	.	46a	
158	ः	116		177	1	46	
159	व	102		178	?	114	
160	ह	113		179	!	121	
161	ः	68		180	hyphen	84	
162	१	91		181	;	102	
163	२	92		182	:	103	
164	३	93		183	,	v102	
165	४	94		184	(	301	
166	५	95		185	)	302	
167	६	96		186	/	370	
168	७	97		187	*	280	
169	८	98		188	₹	253	







PART FIVE  
**Appendices**  
*(A to E and Index)*

H 5447-31

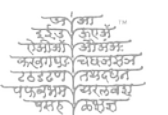
अनुक्रमणिका

“ज्या”  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३  
३३३३ ३३३३

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

## अनुक्रमणिका



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राज्य मराठी विकास संस्थेद्वारे  
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## APPENDIX A

### NOTES ON THE WORK OF SCRIPT REFORMERS

#### 1. Ramchandra Bhikaji Gunjekar (1874)\*

The credit of initiating discussion on the necessity of changes in the Devanagari script goes to the philologist, late Ramchandra Bhikaji Gunjekar (1843-1901). He published an article on 'Shorthand for Marathi' as far back as 1870.<sup>1</sup> His article on 'Ancient Indian Script' was published in 1871.<sup>2</sup> The charts of the comparative study of the Brahmi and Devanagari graphemes prepared by him are reproduced elsewhere in this book. Gunjekar published his book on 'Shorthand Script for Marathi' in 1874.<sup>3</sup> In this small book Gunjekar included an appendix discussing the Devanagari script, which is summarised below:—

(a) The Devanagari script is required to be set in three steps which is laborious.

(b) The scriptures were being printed in Europe in Roman script and it had become necessary to learn the Roman script to read our own sacred books.

Gunjekar suggested the following changes in the Devanagari script:—

(1) The consonants, conjuncts, verti-bars and *visarga* may be written in the conventional style.

(2) The *repha* on the letters and short *i* vowel sign (*velānti*) may be written on the left instead of on the top.

(3) The *mātrā*, *anuswār*, long *velānti*, *ukār*, *Ṛ-kār* and the *halant* sign may be written on the right

क, का, क्क, क्क, क्क, क्क, क्क, क्क, क्क, क्क, क्क, क्क,

क+ऋ=क<sub>c</sub>; क+ॠ=क<sub>e</sub>; क-अ=क्; र्+क=त्क.

Gunjekar recommends provision for indicating long vowel-signs as in *modi* to facilitate transcription of news reports, etc. His specific suggestion is that of adding a loop to the *velānti*, *ukār* and the end of *kānā*.

\* The figures in brackets represent the date when the suggestions first appeared, as ascertained from the references.



## 2. Lokmanya Bal Gangadhar Tilak (1904)

The late Lokmanya Tilak as the founder and editor of *Kesari*, had to think on better production facilities for the growing circulation of the premier Marathi newspaper, which was founded in the year 1881. The subscribers had increased to about 5,000 by 1888. Since the type had to be renewed very often, owing to the large circulation, the necessity of installing

( सन १९१४ मध्ये सुधारून केलेला टिळक टाइपाचा मजकूर )

श्रीमद्भगवद्गीता हा आमच्या धर्मग्रंथांपैकीं एक अत्यंत तेजस्वी व निर्मल हिरा आहे. पिंडब्रह्मांडज्ञानपूर्वक आत्मविद्येचीं गूढ व पवित्र तत्त्वे थोडक्यांत पण असंदिग्ध रीतीनें सांगून त्यांच्या आधारे मनुष्यमात्रास आपल्या आध्यात्मिक पूर्णावस्थेची म्हणजे परम पुरुषार्थाची ओळख करून देणारा, आणि त्याबरोबरच भक्तीची ज्ञानार्थी व अखेर या दोहोंचीहि शास्त्रतः प्राप्त होणाऱ्या व्यवहारांशीं सोपपत्तिक व सुंदर जोड घालून संसारांत भांबावून गेलेल्या मनास शांत आणि विशेषतः निष्काम कर्तव्याचरणास प्रवृत्त करणारा, यासारखा दुसरा बालबोध ग्रंथ संस्कृतांतच काय पण जगांतील इतर वाङ्मयांतहि सांपडणें दुर्मिळ होय. केवळ काव्य या दृष्टीनें जरी याचें परीक्षण केलें, तरी आत्मज्ञानाचे अनेक गहन सिद्धान्त प्रासादिक भाषेनें आबालवृद्धांस सुगम करणारा आणि ज्ञानयुक्त भक्तिरसानें भरलेला हा ग्रंथ उत्तम काव्यांत गणिला जाईल. मग सकल वैदिक धर्माचें सार श्रीभगवंतांचे वाणीनें ज्यांत सांठविलें गेलें त्याची योग्यता काय वर्णावी! भारतीय युद्ध समाप्त होऊन कृष्ण व अर्जुन प्रेमानें गोष्टी बोलत बसले असतां श्रीभगवंतांचे मुस्ताने गीता पुनः ऐकण्याच्या इच्छेनें अर्जुनानें एक दिवस श्रीकृष्णांस अशी विनंति केली कीं, “ युद्धारंभीं तुम्हीं केलेला उपदेश मी विसरलों; मला तो कृपा करून फिरून सांगा.” तेव्हां, “ सदर उपदेश त्या प्रसंगीं अत्यंत योग्युक्त चित्तानें केला असल्यामुळें तो पुनः तसाच सांगणें मलाहि अशक्य आहे!” असें भगवंतांनीं त्यास उत्तर दिले, म्हणून अनुगीतेच्या आरंभीं म्हटलें आहे (म. भा. अश्वमेध, अ. १६ श्लो. १०-१३) वास्तविक पाहिलें तर, भगवंतांस अशक्य असें कांहींच नाहीं, पण त्यांनीं सुद्धां गीता पुनः सांगणें अशक्य म्हणावें, यावरून गीतेची थोरवी केवढी मोठी आहे हे मात्र चांगलें व्यक्त होतें. वैदिकधर्मातील भिन्नभिन्न संप्रदायांस वेदाप्रमाणें हा ग्रंथ आज सुमारे अडीचहजार वर्षे, -सर्वास एकसारखाच-मान्य व प्रमाणमूत होऊन बसला आहे, यांतील बीजहि हेंच असून, याच कारणास्तव—

Fig. 141. Specimen of Tilak type as improved in 1914.

a type-foundry within the press was felt. Sahadevrao Pimple, a punch-cutter, was engaged in the Arya Bhooshan Press where the weekly *Kesari* was being printed. With his assistance a smaller type was introduced in 1891. This type is known as pica of Ganpat Krishnaji, as it was cast from the matrices obtained from Ganpat Krishnaji of Bombay. It is also known as '*Kesari* pica type'. The Arya Bhooshan Press was later transferred to Vasudevrao Kelkar and Haripant Gokhale, and the *Kesari* office was shifted to the Gaikwadwada in Poona in 1905. Lokmanya Tilak then installed his own type-foundry and purchased matrices in Great Primer, Jabra, One-nick, Three Line Pica, etc. Lokmanya Tilak also obtained matrices of Nirnaya-sagar Pica, struck from the punches engraved by Ranoji Ravaji Aru. The pica type of Ganpat Krishnaji and that of Nirnaya-sagar was in use in *Kesari*. Tilak's attention was later drawn to the Linotype and Monotype machines and he started thinking on adaptation of the Devanagari script to the mechanical composition. In his attempts towards this end, he got punches of half letters made from Sahadevrao Pimple. This type was first introduced in the *Kesari* in 1904. Tilak also got new matrices made according to his system from Ranoji Aru of Nirnaya-sagar. Later the fount was again improved upon under his own guidance in 1914. The types cast by the late Lokmanya Tilak were taken by him to England where he is reported to have got new types cast in the Monotype factory. The Lokmanya, however, did not succeed in getting his system adapted then, either to Monotype or to Linotype. Later in 1926 N. C. Kelkar, the then Editor of *Kesari*, improved upon this fount, with the assistance of Narayanarao Pimple, son of Sahadevrao Pimple, the original punch-maker of the *Kesari* type-foundry. Pandit Dattatrey Krishna Deodhar, an artist, sculptor, engraver and the proprietor of Co-operative Industrial School, Sangli, has written a note on the script reforms of the late Lokmanya Tilak. He quotes the Lokmanya as under :<sup>4</sup>

"The reforms should be introduced slowly, so that they may not annoy the reader. In this regard, I am willing to be classed as a conservative. One should not take over the whole responsibility of reforms on oneself. Reforms should be introduced in stages so that they are not disliked by the public. We must always leave some scope to the next generation to improve. There then will not be too much responsibility on us and the ultimate aim will be achieved without encountering difficulties. *We should not lag behind or run ahead too much.* My suggestions about the reforms in Devanagari type design are based on these principles."

Table 76. Table of Sorts—Tilak's linear Devanagari.

Vowels		1904	1914	1926	
अ इ ई उ ऋ ए ऐ उं ऊं	10	अ इ उ ऋ ए	5	अ इ उ ऋ ए	5
Half consonants with verti-bar					
ख र घ ङ च उ झ ञ	0	ख र घ ङ च उ झ ञ		ख र घ ङ च उ झ ञ	0
र छ ङ ङ ङ ङ ङ		र छ ङ ङ ङ ङ ङ		र छ ङ ङ ङ ङ ङ	
ट ठ ड ढ ण ण ण	24	ट ठ ड ढ ण ण ण	23	ट ठ ड ढ ण ण ण	23
Half consonants with small-bar					
झ छ ट ठ ड ड द र ह ल	10	झ छ ट ठ ड ड द र ह ल	10	झ छ ट ठ ड ड द र ह ल	10
Conjuncts of half letters					
झ ङ ङ ङ		झ ङ ङ ङ		झ ङ ङ ङ	
र छ ङ ङ ङ ङ ङ		र छ ङ ङ ङ ङ ङ		र छ ङ ङ ङ ङ ङ	
र = ह		र = ह		र = ह	
अ ङ ङ ल रु क ह ल	28	अ ङ ङ ल रु क ह ल	31	अ ङ ङ ल रु क ह ल	31
Conjuncts of small-bar letters					
छ छू छू छू छू छू छू		छ छू छू छू छू छू छू		छ छू छू छू छू छू छू	
दू दू दू दू दू दू दू		दू दू दू दू दू दू दू		दू दू दू दू दू दू दू	
ह क	22	ह क	18	ह क	19
Ukār letters					
छू छू छू छू छू छू छू		छू छू छू छू छू छू छू		छू छू छू छू छू छू छू	
रू रू रू रू रू रू रू	13	रू रू रू रू रू रू रू	12	रू रू रू रू रू रू रू	12
Mātrā letters, verti-bar removed					
खे खे खे खे खे खे खे		खे खे खे खे खे खे खे		खे खे खे खे खे खे खे	
रे रे रे रे रे रे रे		रे रे रे रे रे रे रे		रे रे रे रे रे रे रे	
ले ले ले ले ले ले ले	23	ले ले ले ले ले ले ले		ले ले ले ले ले ले ले	



*Mātrā letters (short-bar)*

छे ङे ठे डे छे दे रे हे छे 9

Letter for क, फ and ल

क नी नीं हु हुं किं किं फं फं लं लं

क ङे ङीं डे डे छे छे दे रे हे छे  
F F F F F F F F F F F F

15 क ङे ङीं डे डे छे छे दे रे हे छे  
F F F F F F F F F F F F

*Mātrās for letters with verti-bar*

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

*Rajari mātrās for letters with verti-bar*

र रीं रीं  
र रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

*Mātrās for use with letters with small-bar*

र रीं रीं  
र रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं

**Figures and Signs**

१ २ ३ ४ ५ ६ ७ ८ ९ ० 10 १ २ ३ ४ ५ ६ ७ ८ ९ ०  
४ - ? | : | ( \* ' S ; , , - 14  
Total 213 - \* ' ) | : | ? . , , - S 14

15 क ङे ङीं डे डे छे छे दे रे हे छे  
F F F F F F F F F F F F  
18 र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं  
10 र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं  
15 र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं  
17 र रीं रीं रीं रीं रीं रीं  
र रीं रीं रीं रीं रीं रीं  
10 १ २ ३ ४ ५ ६ ७ ८ ९ ०  
- \* ' ( | : | ? . , , - S ४

14

14

181

189

## ( सन १९२६ मध्ये सुधारून केलेला टिळक टास्पाचा मजकूर )

**श्री**मज्जावद्गीता हा आमच्या धर्मग्रंथांपैकी एक अत्यंत तेजस्वी व निर्मल हिरा आहे. पहिल्यांदा ज्ञानपूर्वक आत्मविद्येची मूळ व पवित्र तर्क्ये मोठक्यांत पण असंदिग्ध रितीने सांगून त्यांच्या आधारे मनुष्यगात्रास आपल्या आध्यात्मिक पूर्णावस्थेची म्हणजे परम पुरुषार्थाची ओळख करून देणारा, आणि व्याबरोबरच मत्तीची ज्ञानार्थी व अखेर या दोहोंचीहि शास्त्रतः प्राप्त होणाऱ्या व्यवहारांशी सोपपत्तिक व सुंदर जोड घालून संसारांत आवावून गेलेल्या मनास शांत आणि विशेषतः निष्काम कर्तव्याचरणास प्रवृत्त करणारा यासारखा दुसरा बलबोध ग्रंथ संस्कृतांतच काय पण जगांतली इतर वाङ्मयांतहि सांपडणें दुर्मिळ होय. केवळ काव्य व दृष्टीने जरी याचें परोक्षण केलें, तरी आत्मज्ञानाच्या अनेक गहन सिद्धान्त प्रासादिक भाषेनें आबळवृद्धांस सुगम करणारा आणि ज्ञानयुक्त भक्तिरसानें भरलेला हा ग्रंथ उत्तम काव्यांत गणिला जाईल. मग सकल वैदिक धर्माचे सार श्रीभगवंतांचे वाणीनें ज्यांत सांठविलें गेलें त्याची योग्यता काय बर्बावी ! भारतीयें युद्ध समाप्त होऊन श्रीकृष्ण व अर्जुन प्रेमानें मोष्टी बोलत बसलें असतानां भगवंतांचे मुखानें गीता पुनः ऐकण्याच्या इच्छेनें अर्जुनानें एक दिवस श्रीकृष्णास अशी विनंति केली कीं, ' युद्धारंभी तुम्ही केलेल्या उपदेश मी विसरलों; मला तो कृपा करून फिरून सांगा. ' तेव्हां, " सदर उपदेश त्या प्रसंगी अत्यंत योग्युक्त विचारनें केला असल्यामुळे तो पुनः, तसाच सांगणें मलाहि अशक्य आहे ! " असें भगवंतांनीं त्यांत उद्गार दिलें, म्हणून अनुप्रीतेच्या आरंभी म्हटलें आहे. ( म. भा. अश्वमेध, अ. श्लो. १०-१३ ) वास्तविक पाहिले तर, भगवंतांस अशक्य असें कांहींच नव्हतें, पण त्यांनीं सुद्धां गीता पुनः सांगणें अशक्य म्हणानें, सावरून गीतेची थोरवी केवढी मोठी आहे हे मात्र चांगले व्यक्त होतें. वैदिकधर्मातील भिन्नभिन्न संपदायांस वेदाप्रमाणें हा ग्रंथ आज सुमारे अडीच हजार वर्षे, — सर्वास एकसारखाच — मध्य व प्रमाणभूत होऊन बसला आहे, यांतील बीजहि देव असून, याच कारणास्तव—

( ओळी ३२ )

सर्वोपनिषदो गावो दोग्धा गोपालनंदनः ।

। पार्थो वत्सः सुधीर्मत्स्य दुग्धं गीतामृदं महत् ॥

Fig. 142. Specimen of Tilak type as improved by N. C. Kelkar in 1926.

The Tilak system of setting Devanagari type in linear fashion is graphically explained in the *Kesari* of January 3, 1931. The basis of this system was the elimination of full letters with the verti-bar from the fount and replacing them with half letters with separate *kānā* to be attached to them for making full letters. The half letters were to be used with the vowel-signs cast on the linear basis. Some of the peculiar combinations in

अ	आ	इ	ई
उ	ऊ	ए	ऐ
ओ	औ	अक्षर	अक्षर
अक्षर	अक्षर	अक्षर	अक्षर
अक्षर	अक्षर	अक्षर	अक्षर
अक्षर	अक्षर	अक्षर	अक्षर

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

the system of setting, advocated by Lokmanya Tilak, are shown below :

Table 77 : Tilak's suggestion for linear setting of Devanagari

अ = अ	इ = इ	उ = उ	ए = ए	ए = ऐ	इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ
इ = इ	उ = उ	ए = ए	ए = ऐ	इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ	
उ = उ	ए = ए	ए = ऐ	इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ		
ए = ए	ए = ऐ	इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ			
ए = ऐ	इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ				
इ = ई	उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ					
उ = ऊ	ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ						
ऋ = ऋ	ॠ = ॠ	ऌ = ऌ	ॡ = ॡ							
ॠ = ॠ	ऌ = ऌ	ॡ = ॡ								
ऌ = ऌ	ॡ = ॡ									
ॡ = ॡ										

Lokmanya Tilak is the pioneer amongst the typographer script reformers and is responsible for the introduction of the linear setting method for the Devanagari. The fount introduced by him in 1904 modified by the improvements carried out in 1914 and again in 1926, is given in the table reproduced on pages 478 and 479

3. 'Madhup' in Masik Manoranjan (1914)<sup>5</sup>

The question of Devanagari script reforms was discussed by 'Madhup' in the monthly Magazine *Masik Manoranjan* in 1914. Madhup was criticizing Rev. J. Noels for advocating the replacement of the Indian scripts by the Roman script. Madhup discussed the inadequacies of the Roman script at length and then laid down four principles on which, according to him, the script reforms were to be based :

- (1) Script reforms should not distort the script much.
- (2) Composing should be possible by placing the types one after the other.
- (3) Style of the script should be the same for writing and printing.
- (4) The script so reformed should be capable of being adapted to the mechanical composition.

Madhup pointed out that the Roman alphabet was inadequate not only for Indian languages but even for English, as its use resulted in ambiguity as would be seen from the following possible pronunciations of the word City :

सिटि, किति, सायटि, कायटि, सति, सिताय, किताय, सित्य, कित्य, सिट्य, किट्य  
 He quoted an authority on the perfection of Devanagari. "The Marathi possesses a perfect alphabet already and I trust that this will never be

a	ɒ	i	j	u	ɥ	ə
अं	आऽ	इ	ई	उ	ऊ	ए
e	ɛ	ai	o	ø	au	
एऽ	एऽ	ऐ	ऑ	ओ	औ	
k	kh	g	gh	ŋ		
क	ख	ग	घ	ङ		
c	ch	j	jh	ɳ		
च	छ	ज	झ	ञ		
t	th	d	dh	n		
ट	ठ	ड	ढ	ण		
ṭ	tḥ	ḍ	dḥ	ṇ		
त	थ	द	ध	न		
p	ph	b	bh	m		
प	फ	ब	भ	म		
y	r	l	v	w		
य	र	ल	व			
ʃ	ʂ	s	h			
श	ष	स	ह			
ɽ	ɽ	ṛ	ɳ			
र्ल	र	र̣	न			
ə	j	g	h	x	ṭ	z

Fig. 143. Roman Alphabet for Indian languages suggested by Rev. Noels

जन्म  
१९२२  
कोलकाता  
२४६४  
पुस्तकालय  
४६४



exchanged for an imperfect Romanised substitute." (Dr. Machican, Vice-Chancellor University of Bombay). Rev. Greeves has remarked that "Nagari has a good useful character easy to read and in every way adapted to the Hindi language." Rev. Noels had put up his own scheme (Fig. 148 page 482) or a version of Roman script for use of Indian languages. Madhup discussed at length and discarded this suggestion.

Madhup was alive to the fact that Devanagari needed alteration in certain respects. His suggestions are enumerated below :

- (1) It is necessary to provide symbols for the following phonemes :  
Long आ as in Far Short ए as in Pen  
Long ए as in Pain (पेडन) and also इ ss, ऊ ss, औ and ओ S
- (2) The distinction in the Marathi and Sanskrit pronunciations of च, छ, ज and झ should be shown clearly by appropriate symbols.
- (3) The distinction between accented conjunct ष्या in पुण्याय and the simple conjunct ष्या in पुण्याला; accented ल्या in कल्याण and ल्या in पिल्याचा; फ in फार and फ in फादर (father) need to be represented by appropriate symbols.
- (4) Alteration in the design of ख to distinguish it from ख and also in the designs of घ and च; य and थ is necessary to facilitate easy recognition.
- (5) The written words should be capable of being read correctly by the reader who can recognise the letters i.e. उपयोग and not उप्योग; समजूत and not समजूत; कडक्वासले and not खडकवासले.
- (6) The Halant-sign may be written after the first consonant in the conjuncts in the same line as in राज्-य and not राज्य.
- (7) The method of constructing conjuncts by splitting and joining two or more consonant-graphemes is responsible for the increase in types required for setting the Devanagari. This method needs revision particularly with a view to promote literacy.
- (8) The method of joining vowel-signs to the consonants should be simplified. (Madhup indicates *degree* in the current method of three-step setting by the word *Mukā* (dumb type).)

Madhup, however, admitted that the script should not be altered to such an extent that those who learn it may be unable to read the books printed in the old style.

[The editor of *Manoranjan* recorded a note on these articles wherein he paid a tribute to Prof. Shankarrao Bhise, who took great interest in the script reforms. He had introduced Bhis-type. It was not clear to me who was the real author of the articles published under the name of 'Madhup'. Y. R. Date suggested that he may be Bhise. It is now revealed that it was K. K. Gokhale whose article on Reformed Devanagari

उच्चारण	उच्चारण
रुक्मिणी	रुक्मिणी
कल्याण	कल्याण
२८३४	२८३४
पुस्तक	पुस्तक
५५६	५५६

मराठीचा विकास - महाराष्ट्राचा विकास

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is summarised at pages 493-495. The editor of *Masik Manoranjan* hoped that it would be possible to instal a Devanagari Linotype machine during his lifetime. He added that it was necessary to simplify the conjunct forms and set up the letters in the full body size one after the other. In the discussion that followed various writers put up their suggestions on this subject which were published in subsequent issues of the *Masik Manoranjan*].

#### 4. Vinayak Shrikrishna Gharpure (1915)\*

Gharpure set down the peculiarities of the Devanagari script as under :

(1) The Devanagari script is not a running hand. Except in case of ten letters the writer has to lift his hand.

(2) The letters with a *kānā* can be split up for writing or set up in the spelling method as the Roman script.

(3) Almost all the vowels change their forms in combination but the *kānā* representing presence of vowel अ remains in full form on the right, as in ग and in the middle as in क except in case of few letters like ट, ठ etc.

(4) The vowels except अ and आ take the shape of *velānti* on left or right, *mātrā* on the top and *ukār* at the bottom.

(5) The head-line is essential as it connects the vowels with the consonants.

The suggestions of Gharpure in respect of the changes in the script are summarised below :

(1) The conjuncts may be constructed by placing the consonants one after the other and dropping the verti-bar except that of the last.

(2) In case of the consonants without the verti-bar the absence of the vowel अ may be indicated by using *halant*, or the *halant-sign*, before the said consonant and not below it.

(3) The letters क and फ with the verti-bar centrally positioned may be made into half forms by removing a small portion on the right क and फ. They may be provided with a *kānā* to complete the letters with vowel अ i.e. क + अ(१) = का ; फ + अ(१) = फा.

(4) The similarity between the letter ख and the letters रव may be removed by constructing the letter ख in two types, i.e. ख and र in which first half is made of र and व.

(5) The compounds क्ष and ज्ञ may be replaced, as they can be written in the conjunct forms of क् + ष = कष or र्ष and द् + न् + ज्ञ = द्नज or ज् + ज्ञ = ज्ञज. The Hindi pronunciation of ज्ञ is र्नज.

(6) The conjuncts of the letters without verti-bar written with *halant* may be written before the half consonant. It would be better still to provide verti-bar to letters like छ, ट, ठ etc.

(7) The letter ल may be written in its Hindi style ल.



(8) The letter-forms य थ घ ष may be retained as they are.

(9) All the five forms of र, may be continued to be used as र, ॠ, ॡ, ॢ, ॣ.

(10) The following vowel-signs may be adopted इइ for ई; ॠ for ऊ; ऋ for ऋ; ॡ for ॡ; ए for ॢ; अई for ऐ; अऊ for ओ; ॣ or । for औ; ॥ for anuswar and ० for anunasik. Thus the word दौत will be written as दऊत and the word कौल as कऊल.

ॠ and ॡ in half forms may be used while joining with letters with *kānā* of which *kānā* is removed. They may be used in full form while joining with letters without *kānā*. Thus the *Barakhadi* would be :

अ आ इ ई उ ऊ ऋ ऋ ए ऐ ओ औ अं अः  
 अ आ इ इइ ॥ ॥ ॡ ॡ ए अइ अऊ ॣ ॥ अः  
 का का कइ कइइ क॥ क॥ कॡ कॡ कए काइ काऊ कॣ कां काः

(11) The special sounds in foreign languages अँ, आँ, and e may be written as ॠ, ॡ, and ॢ i.e. by lateral reversal of अ आ and ए

(12) The special pronunciations of च छ ज and झ in Marathi may be shown by placing a *nuktā* under them.

5. P. B. Kale (1914)<sup>7</sup>

P. B. Kale\* agreed with Madhup in his suggestion regarding the construction of conjuncts ; but made a revolutionary suggestion in the writing of the vowel-signs. Instead of *mātrās* going on the top and *ukārs* at the bottom, he proposed that they may be placed after the consonants in the same line. His scheme is reproduced overleaf. Kale also suggested that special signs may be provided for the dental pronunciation of च, छ, ज and झ.

6. Kashinath Waman Lele (1914)<sup>8</sup>

Lele supported Madhup in his criticism of the Roman script. He pointed out that a small sentence तो दादर चढला, if transcribed in the current Roman, would take the form "To dadar chadhala" and can be pronounced in thirty-two different ways as under :

To = टो, तो, टु, तु.  
 Dadar = दादर, ददर, दादार, ददार, डादर, डदर, डादार, डदार, दाडर, दडर, दाडार, दडार,  
 Chadhala = चढला, चाढला, चढाला, चाढाला, चढल, चाढल, चढाल, चाढाल, चधला, चाधला, चधाला, चाधाला, चधल, चाधल, चधाल, चाधाल.

\*See pages 557 to 560 for Kale's recent proposal.



A. Vowels अ आ इ ई उ ऊ ऋ ए ऐ ओ औ अं अः

B. Vowel-signs : . ११ ११ ११ १ १ १ १ ( ) १

C. Some more signs { रेफ चंद्र पायमोड  
 \ उ ॠ

D. Specimen setting कांहीं नमुन्यादाखल शब्द.

का'ह)' नमुन्यादाखल शब्द.

आतां मराठी खिळ्यांत फरक शिक्षणाच्या वाढी-  
 आता' मराठ) ख(ळ्या'त फरक श(क्षणाच्या वाढ)-

साठीं व वाड्मय स्वस्त करण्यासाठीं केलाच पाहिजे !

साठ)' व वाड् मय स्वस्त करण्यासाठी)' कलाच पाह(ज !

पूर्वी बँड गृहलक्ष्मी सूर्यफूल तोंड

प॥ व)' ब'ड गृहलक्ष्म) स॥ य फ॥ ल ता'ड

मनोरंजन इलेक्ट्रिक लायनो टाइप प्रेस.

मना(र'जन इल(क्ट्र(क लायना' टाइप प॥ र॥ स.

Fig. 144. Specimen types according to Kale's suggestion

Lele made the following suggestions :

(1) The *halant*-sign when used should indicate crossing of the verti-bar. It should at least, therefore, touch the verti-bar. The suggestion of placing *halant*-sign after the full consonant, to denote absence of "अ" in letters having verti-bar, will consume much space. Half letters may, therefore, be used by removing the verti-bar.

(2) The small top joint of the letters without verti-bar ड, ट, ठ, ड, ढ, द, ह, may be dropped when they are to be used as first letters in conjuncts ड, ट, ठ, ड, ढ, द, ह. In the alternative, they may be used with the *halant*-sign. In that case it would be necessary to cast separate types with the *halant*-sign at least for द and ह, as placing of the *halant*-sign below them would be difficult in view of the longer descenders.

(3) Vertical stroke with *halant*-sign ऌ and the vertical stroke with ऋ vowel-sign ऍ may be used, dispensing with several *akhand* letters such as न् नृ etc. These half-letter forms and conjuncts can be made as ऌ+ऌ = न् and ऌ+ऌ = नृ. दृ and हृ may be written as दऌ and हऌ (ऋ is not usually joined to ड ट ठ ढ and ढ).

(4) It is wrong to place the *anuswār* on the top of the letters as the order of pronunciation is from left to right and top to bottom. The nasal can be indicated by using *parasa-varna* as in दम्पती for दंपती. In case where the dot, *anuswār*, is necessary, it should be placed with head-line after the letter, as in पांच for पांच.

(5) The vowel signs for उ, ऊ, इ, ई, ए, ऐ, ओ, औ, may be placed after the consonants as in the Fig. 145 above as was the practice in case of स झ क्ष and ज्ञ and still current in र and रू.

(6) The accented र may be represented by र, thus सच for सर्व.

(7) The vowels except ऋ ऋ, लृ and लृ may be represented by joining the vowel signs with अ i.e. अि, अी, अु, अू, अे and अै. (Actually the vowel-signs are to be placed after the letter अ. ).

ऌ ऌ ऌ ऌ  
ऍ ऍ ऍ ऍ

Fig. 145. Vowel-signs suggested by Lele

(8) The set-size of letters may be standardised by groups.

wide = अ क फ, normal = न व प, narrow = र

Owing to the absence of any standardisation in this respect currently the *degrees* are not properly justified.

H 5447-32a

Table 78 : Fount of 125 types suggested by Lele

Vowels	अ ऋ ॠ लृ लृ ॠ	6
Vowel-signs	(for design see Fig. 145 above.)	19
Consonants	क ख ग घ ङ च छ ज झ ट ठ ड ढ ण त थ द ध न प फ ब भ म य न ल व श ष स ह ळ क्ष ज्ञ	35
Half Consonants	क् ळ र ळ ङ च छ ज झ ट ठ ड ढ ण त थ द ध न प फ ब भ म व ळ ल व श ष स ह ळ क्ष	35
Figures	१ २ ३ ४ ५ ६ ७ ८ ९ ०	10
Signs	, ; . ? !      ' ( ) - -	12
Spaces, leaders, etc.		8
		<hr/> 125 <hr/>

Lele stated that in his fount the x-height would be more in relation to the existing founts of the same body and the present 12 pt. face can be cast on 6 pt. body. Lele had with him matrices and punches of English-body face, for casting on 7 pt. body and Long-primer face on 5 pt. body. Lele claimed that the use of his type would make it possible to accommodate fifty percent more matter in the same space.

आजची टी=ट्ट; दु=ट्ट; टे=ट्ट; डे=डड; आहे=आहह;  
जिकडे तिकडे = जडकडक टडकडक; चंद्र=चंदर; ह्या=ह्या;  
द्या=दया; अद्भुत=अदभुत; घट्ट=दध; दीक्षित=दडडित मि.

Fig. 146. Suggestion of Lele (as quoted by Br. Savarkar)

#### 7. Jaoji Dadaji Type Foundry (1916)<sup>9</sup>

The famous Nirnaya-sagar Type Foundry of Bombay which was responsible for the introduction of the classical Devanagari face, made some experiments on the script reforms with the help of Lele Shastri and actually got the punches cut from Ranoji Ravaji Aru. The total sorts in this fount are only 105–110. The vowel-signs in the new style are shown hereunder with the *Barakhadi* of न.

अ ऋ ॠ  
इ ई उ ऊ  
ए ओ औ  
क ख ग घ ङ  
च छ ज झ  
ट ठ ड ढ ण  
त थ द ध न  
प फ ब भ म  
य न ल व श ष स  
ह ळ क्ष ज्ञ

मराठीचा विकास - महाराष्ट्राचा विकास

ि ी ु ू ृ े ै ं ॠ ॡ  
 इ इ उ ऊ ए ँ ऌ ऍ ऎ  
 न्ह न्ह न्ह न्ह न्ह न्ह न्ह न्ह न्ह न्ह अण अण  
 नि नी नु नू नृ ने नै नं नै न् ओ औ

पुस्तक चक्रकशक कल्याशवाय एखाद्यास अपराधक मानून शिक्षा करणे फार वाईट आहे. या प्रकारच्या न्याय करणारांच्या उतावळीपणामुळे खरे गुन्हेगार अजिबात सुटून कित्येक वेळा निरपराध्यास व पुष्कळ वेळ हितकर्त्यांस देखील विनाकारण मोठाल्या शिक्षा झाल्या आहेत. याकरिता बाह्य चिन्हावरून एखाद्यास त्यांच्या कृत्याची चौकशी केल्याशिवाय गुन्हेगार ठरवू नये. तसेच कित्येक अविचारी उतावळीने आपण कृत्य करितात, नंतर त्याचा परिणाम वाईट झाला म्हणजे काही तरी निमित्त काढून दुसऱ्यावर दोष घालितात हा त्यांचा त्यापेक्षाही मोठा मूर्खपणा आहे.

Fig. 147. Specimen of the linear design of Devanagari cut by Ranoji Aru

The matter set above in the Nirnaya-sagar linear type is transliterated below in the conventional Devanagari type (Mono) :

पुस्तकी चौकशी केल्याशिवाय एखाद्यास अपराधी मानून शिक्षा करणे फार वाईट आहे. या प्रकारच्या न्याय करणारांच्या उतावळीपणामुळे खरे गुन्हेगार अजिबात सुटून कित्येक वेळा निरपराध्यास व पुष्कळ वेळ हितकर्त्यांस देखील विनाकारण मोठाल्या शिक्षा झाल्या आहेत. याकरिता बाह्य चिन्हावरून एखाद्यास त्यांच्या कृत्याची चौकशी केल्याशिवाय गुन्हेगार ठरवू नये. तसेच कित्येक अविचारी उतावळीने आपण कृत्य करितात, नंतर त्याचा परिणाम वाईट झाला म्हणजे काही तरी निमित्त काढून दुसऱ्यावर दोष घालितात हा त्यांचा त्यापेक्षाही मोठा मूर्खपणा आहे.

Tukaram Javaji, the proprietor of Jaoji Dadaji Type Foundry has claimed in the note attached to this pamphlet that the new type is useful and convenient. He further states that it is not necessary to cast several types of the same letters; it would suffice to cut only the full letter and half letter and that there are no degrees to spring up or to fall out.

8. Dattatraya Krishna Devdhar (1916)<sup>10</sup>

Devdhar's types are shown in print in a pamphlet published by Nirnaya-sagar in 1916 referred to above. Aru and Devdhar later produced their reformed Devanagari and obtained patent for it (1919). It mainly covered the following:

- (1) The *swarakhadi* of अ.
- (2) Splitting of the conjuncts vertically into half consonants and placing them one after the other.
- (3) Replacing the *Reph* ' ' .
- (4) The letters क, फ and र were provided with *kānā*.
- (5) The letters without verti-bar or with a short joint to the head-line placed in oblique position using the short *kānā*, as a joint and providing a full *kānā* thus अ for ट, अ for ठ, अ for ड.

9. Sundararao Bhaskar Vaidya (1919)<sup>11</sup>

Vaidya, an artist, engraver, calligrapher and printer, put up his fount of 48 types in 1919. His suggestions were :

सुंदारराव भास्कर वैद्य

रे. रे. गी.

लेखक

छापण्याकरितां लागणार्जे काण्ठतंही काम तयाच  
काण्ठ्यांत येतें:

जसें:—१ बुडा ब्लॉक्स-हो लांकडावर कांठले  
जातात.

२ मंथर ब्लॉक्स-हो लांकडावर्जीं यागीप मंथलवर  
कांठले जातात. हो लांकडासाचखंच रून यंस्त  
कींमत लांकडापेक्षां कामी पडाते.

३ स्वीचीयो-हो वरील कांठलेल्या ब्लॉक्सवरून  
तयाच कारीतात. नेह्यां काच्या पृष्ठावर पती  
पाहिले जातात तेह्यां स्वीचीयो तयाच कारीतून घ्यावे,  
हो कींमतीनें पृष्ठावर स्वस्त पडातात.

(1) Introduction  
of *Swarakhadi*.

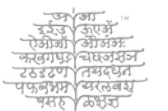
(2) Providing  
verti-bar to all  
letters.

(3) Splitting of  
conjuncts.

(4) Placing the  
short इ vowel-sign  
after the consonant.

(5) Removing the  
joint to head-line  
and providing full  
*kānā* to letters टठ  
etc.

Fig. 148. Specimen of the types designed by Sundararao Bhaskar Vaidya





10. B. R. Shitut<sup>12</sup>

Shitut supported Devdhar-Aru, but emphasised that the letter with short bar may be turned horizontally and provided with a full verti-bar. Thus इ may be written as ँ, ट as ऌ

11. Y. M. Nanal<sup>13</sup>

Nanal of Thana supported Devdhar-Aru but suggested that *halanta* might be retained. Similarly the *Ardha-chandra* and *Reph* may also be used. He states that the *Reph* is particularly necessary to distinguish between the pronunciation between द्या, द्या ; कान्यास, कार्यास etc. He recommended dropping of the short-bar from letters इ, छ, ट, ठ, ड, ढ, ह and ङ, for use in conjuncts. Similarly a verti-bar may be provided to क, फ, = and र. *Mātrās*, *ukārs* etc. may be cast with the short-bar also. Separate types may be cast for *anuswār*, *rafār*, *visarga* and *chandra*. A complete fount according to Nanal, will thus consist of 83 types: 26 vowel-signs, 10 figures, 12 punctuation marks, 34 half consonants and 1 half-vowel.

12. Wasudeo Dhondo Joshi<sup>14</sup>

Joshi of Khanapur-Belgaum laid down the principles underlying his suggestions as :

(a) The reforms should not change the script completely. The method of vowel combination should not be very different.

(b) The method of constructing conjuncts should not be very different.

(c) The number of types required for setting should be reduced to the minimum from the current requirement of 300.

(d) The method of linear setting should be adopted for Devanagari. Specific suggestions put forth by him are :

(1) The type of vowel अ should be without verti-bar इ which can be used for अं and even for इ, ई, उ, ऊ, ए and ऐ, भि, औ, अु, अू, ऐ and औ.

(2) The short इ vowel-sign ि may be written in the *Modi* style by shortening the verti-bar.

(3) The vowel-signs for उ and ऊ, ऋ and ॠ may be cast with verti-bar ः, ऄ, अ and आ. Similarly the *mātrā*-signs ॱ, ॲ and ॳ etc. may also be cast with verti-bar ऴ, व, श etc.

(4) The vowel लृ may be written with ऌ and ऍ i.e. लृ.

(5) The consonants may be cast without verti-bar so that they can be used for conjuncts and the vowel-signs with verti-bar can be joined to them to make full letters.



14. Krishnaji Keshav Gokhale (1927)<sup>16</sup>

K. K. Gokhale was a close friend of the Marathi novelist Hari Narayan Apte, and was himself a novelist and a writer. He came across the articles of Rev. Noels, published in the *Times of India* and got interested in Devanagari script. Gokhale was working as the Jail Superintendent in the princely State of Jat. A printing press was then installed in the State Jail. Shitut head-master of the local secondary school learnt composing and joined Gokhale in the discussions on script reforms. Gokhale was the first script reformer to start discussion on this subject. His articles were published in *Masik Manoranjan* under the name 'Madhup' and are summarised on pages 481-3. Gokhale thought of adopting the overhanging method used for Italic types, for the *Mātrās* and *Ukārs* in Devanagari. He experimented with cardboard models. With the active co-operation of Wamanrao Patwardhan of the Aryabhushan Press he got a complete fount made and obtained a patent for it. He approached late Sir Raghunath Paranjape, the then Education Minister, who agreed to obtain the opinion of the Government Central Press authorities. Gokhale did not however get a satisfactory reply. He continued to experiment. Type matter set up in the type cast by the Aryabhushan Press, was then being published in the *Daily Dnyanprakash* every day. Gokhale approached the Monotype Corporation with his scheme of overhanging types. Initially the Corporation hesitated, as a previous attempt in adopting Devanagari to the Monotype Machine had failed. Ultimately they agreed and a fount was made. The types were sent down to Gokhale and he approved them. He entered into an agreement with the company whereby he was to receive ten percent royalty on the Devanagari equipment sold by the Corporation. No progress was however made as Mr. Dunkan who was looking after this work expired. In the meanwhile the Aryabhushan Press was burnt in the fire that broke out in 1927 and the fount of type made there according to the scheme of Gokhale was destroyed. Gokhale was disappointed but not discouraged. He now gave up his original idea of overhanging characters as the overhangs used to breck and the type soon became useless. He however firmly believed that the only script that could cater to the needs of all the Indian languages was Devanagari and therefore pleaded for its simplification.

Gokhale entered in the discussion of the Devanagari script reforms with his contribution to the *Masik Manoranjan* in 1914, as stated above. The history of his experiment is narrated by him in a paper which he



(9) Gokhale suggested further reduction in the letters by dropping the *t varga* and the aspirated letters, i.e. ख, घ, झ, etc.

(10) Long vowels may be indicated by duplicating the short vowel sign, i.e. ई=ॢ; ऊ=ॣ, ;.

Gokhale considered various script reforms suggested till 1927 and expressed his preference as under :

- (1) The head-line may be dropped as the speed of writing will increase and there will be saving of ink in printing.
- (2) The *Bārākhadi* of अ may be accepted.
- (3) The aspirate ख, छ, ठ, थ, फ, घ, झ, ढ, ष, म may be indicated by a sign, i.e. ख=क<sup>२</sup>, छ=च<sup>२</sup>,
- (4) The distinction in the letters र्व and ख, घ and ध, य and थ, म and भ may be made clear by re-designing the loop.
- (5) The short-bar and middle-bar letters : क, छ, ट, ठ, ड, ढ, द, फ, र, ल, ह, ळ may be used with *halant* in ( ̣ ) conjants.
- (6) क्ष and ज्ञ may be dropped in preference to क्ष and ज्ञ.
- (7) २ may be used in preference to श or ष.
- (8) No distinction may be made in writing र् in आचार्यानि and आचा-याने.

15. Wasudeo Dhondo Gurjar (1929)<sup>17</sup>

Gurjar of Aundh, district Satara, in a paper "The principal drawbacks of the Devanagari Script" published on the occasion of the Marathi Literary Conference held at Belgaum in 1929 enumerated the drawbacks of the Devanagari script as :

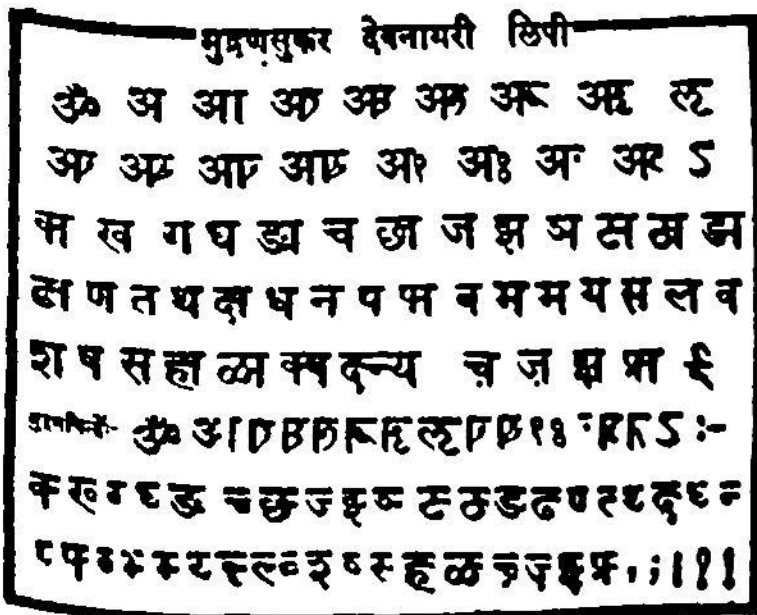


Fig. 149. Gurjar's Devanagari

- (1) the practice of placing vowel-signs at the top and at the bottom of the consonants and
- (2) the method of constructing conjunctions.



after the consonants in the same line. Gurjar advocates the introduction of the Bengali system of indicating the *Anuswār* in 'संसार' etc. i.e. 'संसार'. For *Anunāsik* the present *Anuswār* sign may be used, but it may be placed in the same line. The *visarga* sign in his scheme is different from colon, in that two dots are replaced by two zeros. The half-moon-sign is to be placed after the consonant. The letters without verti-bar or with short *kānā* 'छ ट ह ङ' etc. are to be provided with verti-bar. Their half forms are to be cast with a joining line as 'ट= ह= ङ='. The letter र is altered by placing the vertical upper half in horizontal position and adding a *kānā* thus 'र'. The vowel signs are cast with *kānā* so that by joining them with half consonants, full letters can be made. The full point (.) is replaced by *charan regh* (।). The *avagrih*-sign ऽ is provided in order to indicate the long 'e' (ए) phoneme in Kannada and other languages of the South. *Reph* is to be represented by 'ः' in the same line but before the character and not above it as 'घ=म' for 'घर्म'.

Gurjar, writing earlier from Khanapur-Belgaum, had advocated the use of "ह" for the aspirated consonants, i.e. ख=कह, घ=गह, छ=चह. He admits that this suggestion is based on English spelling, but recommends it and applies it to ten types in the fount.

डाँक्टर व्हिसे हे गृहनस्हन के. गोकहल्ले यांच्या सल्ल्यानं हिंदुस्हानांतून अमेरिकेंत गेले. तेह्मे त्यांनीं अँटोमिडनांभिन ह्या पक्षान्हन शोदहून काडहला आहने. या बद्धतल हिंदूनां अह्निमान घाटत आहने."

Fig. 150. Extract from Gurjar's article in Lokamitra<sup>19</sup>

16. Br. Vinayak Damodar Savarkar (1927-37)<sup>20</sup>

Br. Savarkar joined this campaign in 1927 with a brief for the introduction of *Swarākhadi* and the removal of verti-bar for constructing conjuncts, through the *Shradhdhānanda* and later the monthlies of the *Kirloskar* group. Gadre reproduced Savarkar's articles in *Shrikrishna Sandesh* issued from Calcutta. They were also reproduced by Agarkar in *Swarajya* issued from Khandva. Br. Savarkar later published the articles in a book form. He had published in one of his articles an opinion of Vasudevrao Gandhi, compositor at the Government Central Press, Bombay, to prove that the method of setting Devanagari advocated by him did not require more time.

ज्येष्ठ  
कृष्ण  
शुक्र  
गुरु  
मंगल  
बुध  
शनि  
राहु  
केतु

मराठीचा विकास - महाराष्ट्राचा विकास

‘अ’ च्या बाराखडीचा पाहली प्रसाद  
बॅ. सावरकर यांच्या मुलीलाच मिळतो.

ती गंमत अशी. नगरपालिकेच्या मुलींच्या प्राथमिक शाळेत माझी मुलगी कुमारी प्रभात ज्या वर्गात शिकत होती तींत तिच्यासह दोनचार मुली ‘अ’ची बाराखडी लिहिल्या. त्यांना त्यांच्या शिक्षिकांनी पृष्ठाळ वेळां तसें न लिहिण्यास सांगितलें. मी सांगितल्याप्रमाणें त्यांनीं अतुत्तानों कों ‘बाअी आमच्या पालकांनीं असेंच लिहिण्यास सांगितलें आहे. ही चूक असेल तर तुम्ही आमचे तितके गुण कापा.’ त्याप्रमाणें बाअींनीं अनेक वेळां त्यांचे गुण कापावे. तेवढ्यानें भागेना तेव्हां दोन तीनदां त्या बाअीनें त्या लहान मुलींना अुभे राहण्याची शिक्षाही दिली. पण त्यांनीं पुन्हां ‘अ’ची बाराखडीच शुद्धलेखनांत वापरलेली पाहून बाअी अगदींच संतापल्या आणि अतः मुलींना सोडून सहा सात वर्षांच्या माझ्या मुलीलाच पुढें बोलावून दोनचार चापट्या फाडफाड मारल्या. ती प्रडूं लागली. तेव्हां वर्गांतल्या साऱ्या लहान मुलींनीं त्या बाअीभोंवतीं घोळक्यानें जमून किलबिलाट कोला कीं ‘तुम्ही सावरकरला मारलेंत काय म्हणून !’ हा गोंधळ पाहून मुख्याध्यापिका बाअीही आल्या. माझ्याच मुलीला मारलेंत पाहून त्या चपापल्या. आणि बाअीला बाजूस नेअून म्हणाल्या, ‘लहान मुलींना सहसा शारीरिक शिक्षा करावयाची नसते. त्यांत ती सावरकरांची मुलगी. हे पकारण वाढलें, तर मला निस्तत्रावें लागेल ! तूं मुलीला माझ्याकडे कां आणले नाहीस ?’ बिचारी बाअी. तीही धाबपली. अकडें कु. प्रभात शाळेंतून तडका घरीं आली आणि गाऱ्हाणें मला सांगितलें. मी तिला समजावून दुपारीं पुन्हा वेळेवर शाळेंत धाडलें. तिच्या हातीं मुख्याध्यापिकेला अेका चिट्ठी दिली कीं, “ ज्या मुली नवीन लिपि लिहितात त्या पालकांच्या आशेनें लिहितात. दोषच असेल तर तो पालकांचा, मुलींचा नव्हे. तथापि

Fig. 151. Specimen of Vaidya type recommended by Br. Savarkar 21

अक्षर  
रूप  
कलाप  
रुद्र  
पुस्तक  
चमरे

मराठी विकास महामंडळ

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



# लिपिशुद्धीच्या मूळाक्षरांचे टंका

## स्वनचिन्हे

। ऩ ि ि ि ि ि ि ि  
 ि ि ि ि ि ि ि ि  
 ि ि ि ि ि ि ि ि

## अक्षरं

अ  
 क ख ग घ ङ  
 च छ ज झ ञ  
 ट ठ ड ढ ण  
 त थ द ध न  
 प फ ब भ म  
 य ः ल ळ श  
 ष ह ङ ञ श

टीप—शेंडनीनाल्या छ, ट, द, प्रभृतींचीं  
 व्यंजनरूपें जोडाक्षरादिस्थानीं  
 पायमोड चिन्हानें साधतात.  
 जसें 'ट्या' 'द्या' "

Fig. 152. Vaidya type-fount supported by Br. Savarkar<sup>22</sup>

Savarkar mainly recommended the suggestions of Vaidya. They were :

(1) The vowels इ ई उ ऊ ऋ ॠ ए and ऐ may be replaced by the *Swarākhadi* i.e. अि ओि अु अू अृ अॄ अे and अै.

(2) Conjuncts may be split up and written in half letter forms.

(3) Half consonants may be indicated by removing the *kānā*.

(4) *Kānā* may be provided to क फ र ल i.e. का फान ल.

(5) *Kānā* may also be provided to the letters छ, ट, ठ, etc. and their half forms may be indicated by removing the verti-bar.

(6) The distinction in the following forms may be clear from the context:

*with accent*

- (i) मध्यास (at the centre)
- (ii) कान्यास (कार्यास) for work

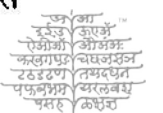
*without accent*

- (i) मध्यास (to Madhu)
- (ii) कान्यास (to *kārā*)

The accented form may be written as कान्यास.

(7) The half forms of ट ठ etc. can also be indicated by using the *halant*-sign.

Commenting on Nanal's reference to the necessity of distinction in the forms of र to represent the distinct pronunciations, Br. Savarkar quoted similar pronunciations, i.e. सत्या plural of सती and सत्यास (to the truth) मध्यावर (on Madhu) and मध्यावर (at the centre).



“कक्त समूहांत ब्राम्हदेवानें प्रारक्तना करान्यास आराक केला, 'हो अत्यत्ती स्क्ती लयकरा परात्परा परामे-  
-श्वरा त्जिन्या शक्तीस पारा नाहीं ।”

“ भक्त समूहांत ब्रम्हदेवाने प्रार्थना करण्यास आरंभ केला. हे उत्पत्ति स्थिति लयकरा परात्परा परमेश्वरा तुझ्या शक्तीस पार नाहीं ”

Fig. 153. A suggestion quoted by Br. Savarkar.<sup>23</sup>

### 17. Gangadhar Abaji Bhagwat<sup>24</sup>

Vowels स्वर. अ, इ, इ, (ई) उ, ऊ (ऊ) ऋ, ॠ, ए, ऐ (ऐ)  
ॐ (ओ) ॐ (औ) अ. (अं) अः

Signs चिन्हें. । काना ('अ') दर्शक) । (अर्धा काना) - (योगचिन्ह)  
। (अनुस्वार).

Conso- क, क, ल, र, ळ, ङ । ट, छ, छ, झ, ञ । ट, ठ, ड, ढ, ण ।  
nants  
Full & त, थ, द, ध, न, । प, फ, फ, व, य, म । य, र, ऌ, ल, व ।  
half  
श, ष, ह, ह, ङ, (ह) क, ल ।

Bārākhadi ख, खा, खइ, खइ, खउ, खउ, खक, खक, खए, खए;  
खउ, खउ, ख. खः

Fig. 154. Fount of Bhagwat type and a specimen Barakhadi  
Bhagwat type

चालू ( हस्तलिपि )	(मुद्रण लिपि)
आई चल	आइ चल
खाऊ खा	खाउ खा
मने वाच	मन् वाच
गाणें ऐक	गाण्. एक
मोहू आला	मउहू आला
औषध पी	अषध पइ
अंबारी आण	अ-बान्इ आण

The suggestion of Nirnaya-sagar (Fig. 147) was further elaborated by G. A. Bhagwat of Bhusawal, who issued a pamphlet on Nagari Script Reform. The date of publication of this pamphlet is not recorded. However, it must have appeared sometime between 1936 and 1941. Bhagwat advocated the placing of the vowels after the half-consonants to construct full letters. In his system there are 13 vowels, 4 vowel-marks and 41 consonants.

Bhagwat has admitted that his reforms would result in introducing the spelling system in Devanagari.

18. Kakasaheb Kalelkar (1935) 25

Kakasaheb Kalelkar, Chairman, *Nagari Lipi Samiti*, issued a note on a common script for Hindi, Marathi and Gujarati for consideration at the Indore Sahitya Sammelan. His suggestions are :

सर्व प्रान्तीय भाषाओ माटे  
 आज अक्षरेो अपयोगमां  
 आवे अे आदर्श छे। अेना  
 प्रान्तीय रूपो घणा होइ शक्रे।

क ङ ग घ ङ ह	अ आ अि अी
च छ ज झ ञ य	अं अ॑ अ॒ अ॑-अ॒
ट ठ ङ ढ ण र	अ॑ अ॑ अ॑
त थ द ध न ल	अ॑ अ॑ अ॑
प फ ब भ म	अं अ॑ अः अ॑
य व र ल ळ श	० १ २ ३ ४ ५ ६
ष स ॐ श्री क्ष श	७ ८ ९

Fig. 155. Kakasaheb Kalelkar's Devanagari

(7) The vowel-signs may be placed after the consonants in linear design.

(8) The *reph* may be placed in the order of pronunciation in the form of diminutive र.

(9) The *Mātrās* of ए, ऐ, ओ and औ are drawn in the fashion of branches on a tree.

(10) ॐ may be used for &, i.e. और in Hindi and आणि in Marathi.

(1) The Gujarati form of ॡ may be accepted.

(2) The short bar of ह ढ ट etc. may be made oblique in order to eliminate the possibility of accumulation of ink near the joints.

(3) The same treatment may be given to ह which will simplify its designs.

(4) The Hindi design of ल is accepted as it is with full verti-bar.

(5) The loops of ॡ, थ, घ, भ and श may be raised above the headline to make the 'look' interesting.

(6) The *Bārākhadi* of अ may be accepted.



(11) The conjuncts may be written in linear design by removing the varti-bar of the first consonants. The letters with small bar and without bar may be joined with ७ sign.

19. S. N. Benare (1939)<sup>26</sup>

Bhaurao Benare, a retired pensioner phadnis of Pandharpur advocated the removal of the head-line. He also suggested the alteration of the design of the verti-bar in order to fit the letters in the *Swastik* sign.

The vowel-signs suggested by him are as under :

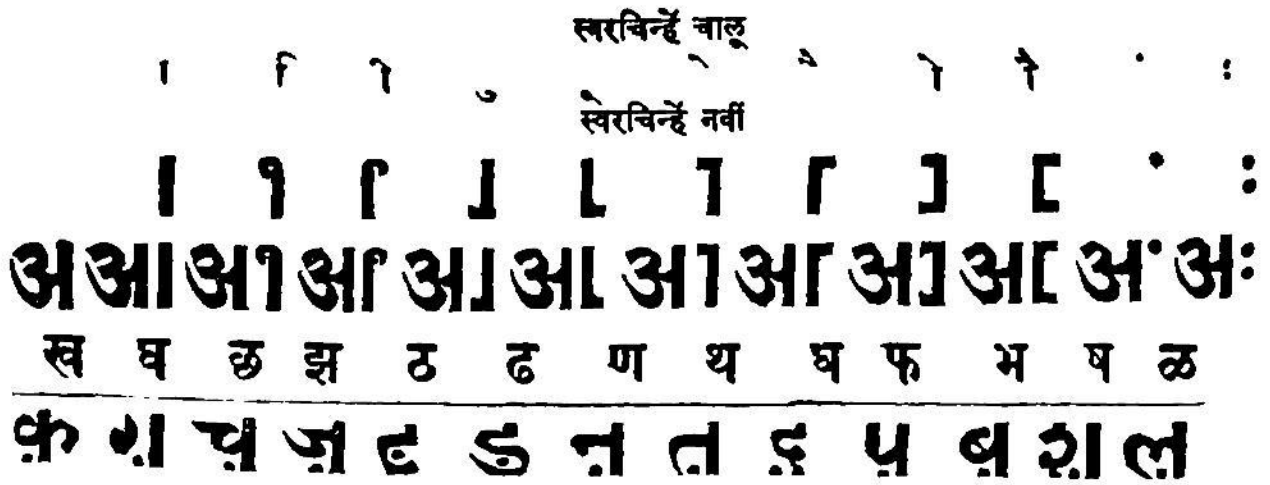


Fig. 156. Vowel-signs and aspirated consonants suggested by Benare

He advocated the representation of the aspirates by adding a point at the bottom as is done in Kannada.

In his system the conjuncts are represented by placing a dot between two consonants to denote the combination

न्य=न.य; टु=ट.ठ; ड्र=ड.र; द्र=द.र; च्य=च.य; वं=व.व; न्ह=न.ह  
ऋ is to be written as अ॰ and ॠ as अ॰

20. Govind Balvant Bakale<sup>27</sup>

Bakale of Shri Lakshmivijay Press, Sholapur, cut new types according to his scheme. He had set out ten guiding principles :

- (1) Eliminate *degrees*.
- (2) Abolish two and three-step setting.
- (3) Construct the half forms of letters by removing the *Kānā*—  
छ, ल, र, व, etc.
- (4) Construct full letters by placing the vowel-signs (*Mātrā*, *Velānti*, *Ukār*) after half forms of the consonants.
- (5) *Mātrās* and *Rafār* should be placed on the top and not after the consonants.
- (6) *Mātrās* should not fall on the right side but should stand on left.

- (7) Overhangings should be avoided.
- (8) Reduce the number of matrices.
- (9) The current *look* of the script should not be altered.
- (10) See that no difficulties are faced by the script reformers.

### टाइपांची संख्या १४० ते १६०

३६ व्यंजने, चाचें क़सरें स्वरूप भ, अ, इ, उ, ए, अगैरें मुख्य ४५ अक्षरें; परलु ती सर्व अर्धी, त्यांचे पुढें व्हाणे ठेवून तीं पुर्ण करण्याकरितां काने ७६. शिवाय १० आंकडे, विरामचिन्हें, गणित चिन्हें आध्याच्या आडव्या उभ्या रेषा, टीपांचीं चिन्हें वगैरें मामूली टाइपासुद्धां जास्तीतजास्त १६० होतात. कमी करूं इच्छिधारांस १५ ते २० कमी करतां येतील. हे टाइप ठेवण्याकरितां आम्हीं लाकडी १५० घरांची मुद्रणम सिंगल' वेंस बनविली आहे. त्यामुळें रंगालच्या केंशीत १२ पॉइंट पेका तर वरच्या केंशीत त्याचा जगा अशी जागेची बचत होते टाइपांची इतकी संख्या कमी असूनही प्र, पृ, वगैरें जोडाक्षरें पूर्वी प्रमार्थ कायम राहतात. टट, ठड, डड, दग, दम, क़, वगैरें जोडाक्षरें होळ्यांस न खूपेल अशा रीतीनें नवीन कंपोजमध्ये कशी दिसतात तें वाखविध्या करितांच व्हाहीं जोडाक्षरें पुढें छापलीं आहेत.

छ ट ढ ह वगैरें पुढें पायमोड चिन्ह आररें जोडचिन्ह घालून छ-ट- अशी अर्धी अक्षरें बनविण्याच्या विकृत स्वरूपापेक्षां आमची हीं अर्धी अक्षरें आणि त्यांच्या साह्यानें बनलेलीं जोडाक्षरें केंषालाही पसंत पडतील असा भरंवसा आहे.

Fig. 157. Type designed by Govind Balvant Bakale

H 5447-33a

Bakale's main suggestion was in respect of the one-fourth *kānā* of the letters like छ ट ठ etc. He pointed out that half-forms of these letters can be made by removing the one fourth *kānā*. In fact this is done in respect of 'छ' and 'ळ'. But Bakale introduced *Kānā-Mātrā* with a horizontal joint. He claims that this innovation allows good joints and helps in retaining the special feature of slanting *mātrās*. His article in *Mudran-prakash* is printed in his own type. The alignment of type in this set-up is bad and the print therefore presents a 'look' full of joints distracting the eye. His font contained 101 types, 45 letters inclusive of half forms of 36 consonants and vowels, 76 *kānā-mātrās*, 10 figures and about 30 other type sorts.

21. Shamrao Shrikrishna Velingkar<sup>23</sup>

Velingkar of Gwalior in his article "Nagari Script in the new style" suggested abolishing the practice of placing the vowelsigns at the top and bottom. According to him 17 vowels should be written as—

Present style अ आ इ ई उ ऊ ऋ ॠ ए ऐ.

Proposed style अ आ इ इ~ अु अ॒ रु रू ए अय्.

Present style ओ औ अं अः अँ अँ आँ.

Proposed style अ॒ अ॒ अ॒ अः अया. अया अ॒आ

His other suggestions are :

(1) The designs of certain consonants may be written in the revised style :

ख = ॡ	ज = द्न्य
न = य० (यं)	ल = ल
क्ष = कष	श = श

(2) The aspirated consonants may be written with "ह" as advocated by Gurjar :

ख = कह	छ = च्ह	ठ = ट्ह	थ = त्ह	फ = फ्ह
घ = ग्ह	झ = ज्ह	ढ = ड्ह	घ = द्ह	भ = ब्ह.

(3) The vowel-signs may be joined to the *Kānā* in the same line as advocated by Gurjar.

(4) The half form of the short verti-bar letters may be written as :

इ, छ, ट्, र् or = ळ् and ह्.

(5) The letters "भ" and "घ" may be written with loop as "भे" and "घे".

(6) The various forms of "R" combinations or *Rafārs* may be written as :

। in प्रकार	may be written as	प्रकार
^ in राष्ट्र	may be written as	राष्ट्र
° in सर्व	may be written as	सर्व
८ in पृथ्वी	may be written as	पृथ्वी.

(7) The *Ukār* "रु" and "रू" may be written as "रु" and "रू".

(8) At certain places the *halant* in "ण् न् म्" etc. may be replaced by half forms. For instance :

ठण्ठण् = ठण्ठण, शक्तिमान् = शक्तिमान्, दुडुम् = दुडुम्.

(9) The letter "ङ्" (in वाङ्मय) may be written as "न" "वाङ्मय".

In the alternative, the Hindi form "ङ्" may be used by placing full point after "ङ्".

(10) Conjuncts should be written in linear form, i.e. परश्न and not प्रश्न.

(11) The quotation marks may be used.

Above reforms should be gradually introduced. The next step would be to :

(12) Join the vowels themselves to the half-letters instead of using the vowel-signs. For instance :

मोरींत = माःरइंत, वृंदावन = वरूदावन.

(13) The letters “श्री” and “ऌ” may be written as “श्री” and “अः”

(14) The *Parasavarṇa* (ङ् ङ् ण् न् म्) may be replaced by *Anuswār* ँ . The total letters in the Velingkar’s system would be only 48 as shown hereunder :

श्री	ऌ																				2	
अ	आ	इ	ई	उ	ऊ	ए	य	ऌ	व	॰	ः	र	र्									18
		.	:	'	,	“	”	.	।													6
क	ग	च	ज	ट	ड	ण	त	द	न	प	ब	म										22
य	र	ल	व	श	ष	स	ह	ळ														48

The *Bārākhadi* in the Velingkar system would be :

क का वइ वइ॰ क॰ वृ वृ कए कय॰ कऌ कव॰ वरू वरू क॰ क॰

The Velingkar Nagari will present the following picture :

दर्शान्द॰ अवग्हड दइसगान्ए॰ कारय अब्ह्यासए॰ सःए॰ जात्ए॰ म्हण॰न  
दहइ॰ए गाडइ॰ हा॰कन्ए !

This sentence in the current style will be :

दर्शनी अवघड दिसगारें कार्य अभ्यासें सोपें जातें म्हणून घीरे गाडी हांकरे.

## 22. Acharya Vinoba Bhave<sup>29</sup>

1. The vowels should be represented in the form of *Swarākhadi*.<sup>30</sup>

2. The problem of the accented ष्य in पुण्याय and simple conjunct ष्य in पुण्याचा is being faced by the scholars since long. Acharya Bhave has offered his solution. He has suggested that the या as in पुण्यास is a vowel and may be termed या-*Kānyā* and may be represented by a special sign to distinguish it from the conjunct ष्या in पुण्याय.

3. The accented pronunciation of ए in “करत्ये, जात्ये” may be represented by a special *mātrā*. करते



4. All the half-consonants in conjuncts may be represented by the *halant*-sign. In justification of the possible pause after the *halant*-sign Acharya Bhave quotes the following words :

### लोक-नागरी लिपि-सुधार थोडक्यांत

- १ वर्ण-सुधार : थ=ख
- २ बाराखडी नीट : रु, रू
- ३ मोडी वेली : की (न्हस्व), की (दीघं)
- ४ स्वराखडी : अ, आ, औ, औ, अ, अ इत्यादि
- ५ बिंदु-जोडी : वेदांत (वेदान्त), वेदांत
- ६ साघात जोडाक्षरें पाय-मोड : स्व-राज्य
- ७ निराघात जोडाक्षरें
  - (अ) 'या'- कान्या : तुमच (च्या)
  - (आ) 'ये'- मात्रा : मोळीवीक (क्ये)
  - (इ) महा-प्राण : 'म (म्ह), 'न (न्ह), 'व (व्ह)
- ८ दंत-तालव्य : च, ज, झ,
- ९ न्हस्व 'अ': दोह-दुःख हें सुख मानरीत जावें
- १० शिरोरेखा छापण्यांत असो लिहिण्यांत नसो.

Fig. 158. Acharya Vinoba Bhave type

the common style रु रू.

7. The short इ *Mātrā* may be written as े and the long ई may be written with a loop at the bottom.

8. The sign of short ए in the letters ( े ) may be written without the top knot. े .

9. The letter ख may be replaced by *Modi* ५ or क्ष may be used for it.

10. The headline may or may not be used. It may be retained in printing but dropped in writing.

11. There should be provision for short ए and short ओ.

12. Two different points may be used for *Anuswār* and *Anunāsik* one of which should be positioned low.

13. The special Marathi pronunciations च ज झ (Dento-labials) may be represented by a Nukta.

विप् to know,  
विप् + र = विप्  
one who knows.

चित् mind,  
चित् + र = चित्  
pleasing to the  
mind.

5. The महाप्राण in the conjuncts ह्, ह्य, हू हू may be shown by indexing an apostrophe to the letters concerned—

कहणे = क'णणे;  
तुह्याला = तु'माला;  
वन्हाड = व'राड;  
नव्हे = न'वे, वल्हवणे  
= व'लवणे.

6. The *Ukār* signs in रु and रू may be written in



## लोक-नागरीतील स्वराधडी

:: अके पंथ दो काज़ ::

[ शीवाजी न. भावे ]

१९४७ साली, 'ग्राम-सेवा मंडळ, नालवाडी, वरधा' या संस्थेने, प. वी. नांबांचे 'लोक-नागरी' हे लीपीविषयक ३० पानांचे लहानसे पुस्तक प्रसिद्ध केले। त्तील २३, २४ पानांवर स्वराधडी हे लहानसे सदर आहे।

तंत - (१) 'अ' च्या बाराधडी अनेकांना मान्य असून तीमधील अघड लाभ।

(२) 'क' मध्ये 'क' वर दोन मात्रा मग 'ऐ' मध्ये दोन कां नाहीत? ही विसंगती समजावून सांगावी लागते।

(३) 'अ' च्या बाराधडीने सर्व स्वर 'अ' च्या बनावटी आहेत असे सुचवावयाचे नाही।

(४) 'इ' आणि 'उ' च्या आकार 'अ' वरून फरकाने बनले आहेत।

(५) स्वराधडीत मुलांची आणि छापखान्यांची फार सांय आहे। - असे पांच मुद्दे आले आहेत। ते सर्व स्पष्ट असूनही, स्वराधडीतील सांय आणि अघड लाभ आणखी स्पष्ट होणे शक्य आहे।

अ, आ, इ, ई, उ, ऊ, ऋ, ॠ, ल, लृ, ए, ऐ, ओ, औ  
ही देव-नागरीतील स्वराधडी। हीमध्ये १० स्वर मुलांना

Fig. 159 Specimen of type suggested by Acharya Vinoba Bhave<sup>21</sup>

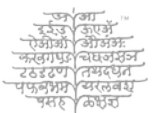
स्वतंत्र शीकावें लागतात । तें लोक-नागरठीतील 'अ' चें स्वराधडीत टळतात; हा अक लाभ ।

व्यंजनाशक्ति स्वर जोडत असताना दव - नागरठीत ि, ी, १, २, ३, ४, ५, ६, ७, ८, ९, १०, ११, १२, १३, १४, १५, अशक्ति आणथी दहा स्वरचीहने शीकावें लागतात । तें लोक-नागरठीतील 'अ' चें स्वराधडीत स्वतंत्र शीकावें लागत नाहींत; हा लोक-नागरठीतील स्वराधडीचा दुसरा लाभ ।

या दोन लाभांत १० वळणें टळून लीपी सुलभ होते; 'मणजे' समृद्ध होते । गुरुचें गौरव यातच आहे की; लघु, 'मणजे' लहान जें मूल तेंना शीक्षणात अडगळ काढून सहजपणें लाघव 'मणजे' प्रावीण्य प्राप्त करून देव । अवेढसाठीच "अकाक्षरलाघवेन पुत्रोत्सवं मन्यते वैयाकरणाः" असं संस्कृतात 'मणतात । अक अक्षर जरी टळले, तरी वैयाकरण पुत्रोत्सवाप्रमाणें आनंद मानतात हा तत्त्वा अर्थ आहे । पुत्रोत्सव 'मणजे' वृद्धीचा, नवीन नीर्मळ माणूस प्राप्त झालाच आनंद । यथे अडगळ जाऊन जें नवीन स्वच्छता आली तीच असाच फार मोठा आनंद आहे ।

नुसती लोकनागरठी स्वराधडी शीकली की, स्वर आणी स्वरचीहने अकत्र येतात; कारण लोकनागरठीत स्वर आणी स्वरचीहने यांत संपूर्ण अद्वैत आहे । तम्हळें 'अक पंथ दो काज' अशक्ति स्थिती नीर्माण होते । 'मणून लोक-नागरठी स्वराधडीला 'अक पंथ दो काज' हे नांव चांगले शोभून दीसते ।

Fig. 160. Specimen of type suggested by Acharya Vinoba Bhave



23. Dr. D. N. Sahasrabudhe<sup>32</sup>

In an article published in the dailies of Nagpur, Dr. Sahasrabudhe stated that 'for printing purposes, both the simplified and standard Devanagari script and the standardised Roman script be allowed to remain current'. He enumerates the following points to be taken note of regarding simplification and standardisation :

(1) The standardised script should be capable of having in print any Indian language including Sanskrit and the *Vedas*.

(2) The present form of the letters should not be changed as far as possible. If necessary new forms based on these principles may be added.

(3) The proposed forms should be distinct from the different signs used for various purposes, including the ones used in the *Vedas*.

(4) They should be such as to form clear compound letters, the pronunciation of which can be effected without any context or habitual use.

(5) The form of the compound letter ख should be replaced by a suitable one as shown in the chart.

(6) Since by addition of अ, a consonant is turned into full letter, the *kānā* sign of अ in each letter must be distinctly seen on its right:

(i) To do this, forms of क फ छ ट ठ ड ढ द र ल ङ ञ have to be suitably modified.

(ii) Since ङ and ञ are used as nasals only, the sign for ङ is not necessary while that in ञ has to be modified.

(iii) Head-line adds to the grace and hence has been retained.

का ख ग घ ङ च छ ज झ ञ न न्न  
 न्न ण त थ द्य ध न प ष ब भ म य  
 ष ल व श ष स ष ष ष ष  
 अ आ इ इ उ ऊ ए ए आ आ अ अः  
 । ॥ प ष ष ष ष ष ष ष ष  
 अ ऋ ॠ लृ लृ ख ग च छ ज झ ञ ष  
 ष ष ष ष ॐ श्री

Fig. 161. Type Fount suggested by Sahasrabudhe

(7) There are eight letters with distinct alternate pronunciations and this distinction is marked by a dot suitably placed in them.

(8) The forms of the two compound letters ॐ and श्री have been maintained.

(9) The standardised Devanagari script should be further simplified by making it a one-tier script.

(10) The vowels and their signs have to be suitably modified:

(i) The forms of the long ई ए ऐ ओ औ अं अः अँ have to be modified.

(ii) The sign ि may be dropped from the letters shown in the chart to indicate absence of vowel अ.

24. Vaman Anant Bhide, Satara (1942)<sup>33</sup>

1. The letters च and ज may be used with a *nukta* to denote the difference in the pronunciation between च in चमचा, ज in जनावर and च in चहा and ज in जपान.

2. ख may be written as कृ to remove the confusion between ख and रव.

3. The long pronunciation of vowels coming at the end of words may be indicated by underline, i.e. बर् झाल.

4. The simplified conjuncts such as क्रान्ती (क्रान्ती), प्रान्त (प्रान्त), फ्रान्स (फ्रान्स्), स्त्री (स्त्री) should not be used as they occupy more space and reading thereof also becomes difficult.

5. The emphasis on words changes the meaning. This may be shown by underline.

6. In *Sambodhan* the last vowel is long. It may be indicated by writing two semi-colons (;;) after the word.

25. Dr. Panalal (1947)<sup>34</sup>

1. Short इ *mātrā* ि may be replaced with the long ई *mātrā* with a short *kānā* े.

2. *Reph* ° may be written as र् i.e. समर्थ for समर्थ.

3. Five nasals ङ ज ण न म may be dropped.

4. Full *anuswār* may be represented by open dot such as सिव्ह and *anunāsik* by dot चांद.

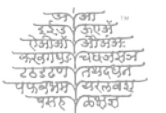
5. The form of ख घ and भ may be changed to remove the confusion with रव, घ and म.

6. क्ष, ज्ञ and ज्ञ may be written in conjunct form, i.e. क्ष, र्ज्ञ and द्न्य, ज्यं, ग्यं.

26. Dr. Gorakha Prasad (1947)<sup>35</sup>

1. The *mātrās* of उ ऊ ए ऐ and अं i.e. ू, ू, ै, ै, ॅ, may be placed after the consonant, a little on the right. The design of the *mātrā* may also be changed by making them rather straight.

2. The head-line may be dropped in 9 pt. and smaller body type.



3. The conjuncts, except those of र्, may be written by placing the consonants one after the other.

4. The conjuncts of र् may be written in the present style, i.e. प्रेम, राष्ट्र, धर्म.

27. Jagannath Joshi, Nainital (1947)<sup>36</sup>

1. The types in the Reformed Hindi Script will be reduced to 55 from the current requirement of 400 letters.

2. By placing a decimal before a consonant it will be read as half ड and ढ, preceded by decimal will be read as ङ and ढ. . will represent half न i.e. nasal.

3. The numerals shall be in the international forms 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

4. The script for typing corresponds to the letters proposed for print. There will be saving of space as there are no ascenders and descenders. However the vowel-signs are placed after the consonants.

5. The script for writing and hand drawn litho work remains the same.

१	क	दन	लंका	मं	रामच.चंद्र	नुसुगड=न
१	एक	दिन	लंका	में	रामचंद्र	ने सुग्रीव
२	स्	कहा	था	ब.धु	भरत	क. समान
२	से	कहा	था,	बंधु	भरत	के समान
३	भा=	.स	सं.सार	म०	कहा०	मल्गा ?
३	भाई	इस	संसार	में	कहाँ	मिलेगा ?

क	ख	ग	घ	ङ
च	छ	ज	झ	ञ
ट	ठ	ड	ढ	ण
त	थ	द	ध	न
प	फ	ब	भ	म
य	र	ल	व	श
ष	स	ह	ज्ञ	ज्ञ
क्र	ख्र	रा	ज्र	फ
प्र	>	<	⊙	:
अ		/	//	७
८	९	॥	)	).

- २— अर्द्ध र जैसे चन्द्र
- >— अर्द्ध अर जैसे सर्प
- <— अर्द्ध ऋ जैसे मृग
- ⊙— अप्रैली ओ जैसे Stop.
- :— ष: जैसे शान्ति :
- अ— जैसे अमहद
- |— आ जैसे आम
- /— इ जैसे इमली, दिवाली
- //— ई जैसे ईख, दीवार
- ७— उ जैसे उपवास, पुराना
- ९— ऊ जैसे ऊन, शूर
- ९— ए जैसे सेर
- \*— ऐ जैसे ऐनक, सैनिक
- )— ओ जैसे ओभा. बोभा
- ))— औ जैसे औरत, दौलत

Fig. 162. New System of Lettering suggested by Jagannath Joshi.

28. Harimohanlal Shrivastav, M. A. Lt., Sahityaratna<sup>37</sup>*Bharatiya Lipi*

Vowels	अ आ इ ई उ ऊ ए ऐ ओ औ अं अः अ॒																
Vowel-signs	। ॱ ॲ ॳ ॴ ॵ ॶ ॷ ॸ ॹ																
Consonants	<table border="0"> <tr> <td>क ख ग घ ङ</td> <td>च छ ज झ ञ</td> </tr> <tr> <td>क़ ख़ ग़ ग़ ख़</td> <td>च़ छ़ ज़ झ़ ञ़</td> </tr> <tr> <td>ट ठ ड ढ ण</td> <td>त थ द ध न</td> </tr> <tr> <td>ट़ ठ़ ड़ ढ़ ण़</td> <td>त़ थ़ द़ ध़ ऩ</td> </tr> <tr> <td>प फ ब भ म</td> <td>य र ल व श</td> </tr> <tr> <td>प़ फ़ ब़ भ़ म़</td> <td>य़ ऱ ल़ व़ श़</td> </tr> <tr> <td>ष स ह क्ष त्र</td> <td>ज्ञ</td> </tr> <tr> <td>ष़ स़ ह़ क्ष़ त्ऱ</td> <td>ञ</td> </tr> </table>	क ख ग घ ङ	च छ ज झ ञ	क़ ख़ ग़ ग़ ख़	च़ छ़ ज़ झ़ ञ़	ट ठ ड ढ ण	त थ द ध न	ट़ ठ़ ड़ ढ़ ण़	त़ थ़ द़ ध़ ऩ	प फ ब भ म	य र ल व श	प़ फ़ ब़ भ़ म़	य़ ऱ ल़ व़ श़	ष स ह क्ष त्र	ज्ञ	ष़ स़ ह़ क्ष़ त्ऱ	ञ
क ख ग घ ङ	च छ ज झ ञ																
क़ ख़ ग़ ग़ ख़	च़ छ़ ज़ झ़ ञ़																
ट ठ ड ढ ण	त थ द ध न																
ट़ ठ़ ड़ ढ़ ण़	त़ थ़ द़ ध़ ऩ																
प फ ब भ म	य र ल व श																
प़ फ़ ब़ भ़ म़	य़ ऱ ल़ व़ श़																
ष स ह क्ष त्र	ज्ञ																
ष़ स़ ह़ क्ष़ त्ऱ	ञ																
Other phonemes	<p>क़ ख़ ग़ ज़ (z) zh इ़ ह़ फ़ (F) ल़</p> <p>ज़. ड. (अक्षर के बाद) ल.</p> <p>क़. (अक्षर के बाद नीचे की ओर)</p> <p>W X</p> <p>क वस्</p> <p>a जैसे Cap में ~ a जैसे War में ॲ</p> <p>n o b</p>																
Special signs.																	
Marks of punctuation	<p>॰ ॱ ॲ ॳ ॴ ॵ ॶ ॷ ॸ ॹ</p> <p>॰ ॱ ॲ ॳ ॴ ॵ ॶ ॷ ॸ ॹ</p>																
Numerals	० १ २ ३ ४ ५ ६ ७ ८ ९																

Fig. 163. Devanagari Script suggested by Harimohan Shrivastav.

29. Navanagari<sup>38</sup>

Table 82.—Navanagari alphabet.

Vowels	अ आ इ इा उ उा ऋ ए एा उ उा अं अः
Consonants	क ङ ङ च ज ञ ट ठ ण त द न प ब म य र ल व श ष स ह
Barakhadi	कअ कआ कइ कडा कउ कउा कऋ कए कएा कउ कउा कअं कः क का कि की कु कू कृ के कै को कौ कं कः

Comparison of the suggested graphemes

Devanagari	ई ऊ लृ ऐ ओ औ
Navanagari	इा उा लऋ एा उा
Devanagari	ख घ छ झ ठ ढ थ ध फ भ श
Navanagari	कह ग्ह चह जह ढह डह तह दह पह बह श

30. Dr. Dhirendra Varma<sup>39</sup>

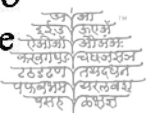
International phonetic script

अ	आa:	इi	ईi:	उu	ऊu:
एe:	ऐAe	ओo:	औAo		
कk	खkh	गg	घgR	ङg	
चc	छch	जJ	झJR	ञJ	
टt	ठth	डd	ढdR	णn	
तt	थth	दd	धdR	नn	
पp	फph	बb	भbR	मm	
यj	रr	लl	वv		
शs	षs	सs	हR		
इt	ढ़dR	मm	:h	ः~	

Fig. 164. Phonetic Script suggested by Dr. Dhirendra Varma.

31. Motilal Gurtu<sup>40</sup>

Gurtu submitted his scheme of *Vishva Lipi* to the Narendra Deo Committee. Gurtu claims that all the languages in the world can be



written with twenty letters (*sanket*). The script suggested by Gurtu which is reproduced below is altogether different from the current Devanagari.

स्वर मात्राएं										विवेक ध्वनियां	किं		
Vowel-signs	ह्रस्व	३	५	७	९	११	१३	१५	१७	१९	महसप्राण	१	Aspirate
	दीर्घ	१	३	५	७	९	११	१३	१५	१७	अनुस्वर	२	Nasal
	गणक	२	४	६	८	१०	१२	१४	१६	१८	अरबी ध्वनियां	०	Arabic phonemes
-: विश्व नागरी :- वर्णमाला										संयुक्त ध्वनियां	+	Compound phonemes	
										शेष ध्वनियां	१'	Remaining phonemes	
Vishva Nagari Alphabet	अ	इ	उ	क	च	ब	द	त	थ	श	Current form of the Devanagari		
	अ	इ	उ	क	च	ब	द	त	थ	श			
	अ	इ	उ	क	च	ब	द	त	थ	श			
	अ	इ	उ	क	च	ब	द	त	थ	श			
	अ	इ	उ	क	च	ब	द	त	थ	श			
	अ	इ	उ	क	च	ब	द	त	थ	श			
विश्वलिपि:- वाज्जि-ह्र													
वज्जम वाज्जम वाज्जम वाज्जम वाज्जम													
वाज्जम वाज्जम वाज्जम वाज्जम वाज्जम													
वाज्जम वाज्जम वाज्जम वाज्जम वाज्जम													
वाज्जम वाज्जम वाज्जम वाज्जम वाज्जम													
वाज्जम वाज्जम वाज्जम वाज्जम वाज्जम													

Fig. 165. Vishva Nagari suggested by Gurtu



The Vishva Nagari is commented upon in the HSST Standardisation Committee Report<sup>41</sup> as under :

“Gurtu claims that there can be one language for the whole world and this can be written in a basic script that shall be the language of the world. We are not concerning ourselves with his ideas of World Script but we would give below his ideas about the *Vishva Nagari*.

He thinks that the following changes must be effected in Devanagari in order to enable it to maintain its existence in a progressive world :

(a) There should be only one basic vowel-indicator उ and all the vowels must be indicated by giving proper vowel-marks to this basic vowel-indicator.

(b) All the vowel-marks should be made to fall to the right side of the letter and not above, below or before it.

(c) The *Māhāprān* consonants must be indicated by giving the ँ at their end, for this is the mark which converts प into फ and can therefore be said to be the basic symbol that converts a *non-Mahāprān* to *Mahāprān*.

(d) He also suggests a change in the shape of the letters so as to make them more fit for printing purposes.

As a result of his proposals he thinks that the total number of letters in the Devanagari script would be reduced to twenty in all and thus Devanagari would become very suitable for all the languages of India.”

### 32. Kamata Prasad Sagariya (1947)<sup>42</sup>

1. In a note prepared for wide publication, K. P. Sagariya states :

(1) To reduce the number of types it is necessary to alter the forms of certain letters and to adopt certain conventions for combining the various letters.

(2) There is no basic form common to all the vowels.

(3) *Mātrās* are not suffixed to the *aswara* (consonant-ending) but added above-and-before, below, or above-and-after.

(4) There is no *aswara* form of consonants ङ, छ, ट्, ठ्, ड्, ढ्, द् and ह्. They are formed by adding a special sign called *halant* to the *akārānta* (ending with vowel अ) form.

(5) The letter र undergoes complete transformation as in क्, प्र, कै, ष्ट्, च्य etc.

(6) Prefixing of the *mātrā* to the *akārānta* form is phonetically incorrect and is very confusing to a compositor, i.e. प्रि = इ+प्+  
र = ि ः ङ.



- ३५ -

### तंबनागरी लीपी में सुधार.

एचलीत लीपी में लिखने, छापने तथा टाईपी  
प्रकार में अभी जो अतीपय असुवीधाय होती हैं अन्तों में  
नूय प्रीया जा सभता है यही अीस नीबन्ध में बताया गया है।

में प्रस्ताव प्रहोतप्र ग्वहाण प्रवत योग्य हैं अीसप्रा  
नीण्य ता तंबनागरी लमी, भावनीय संस्भर्ती प्र सुददा  
बताने में तत्पय वीज्जजन ही प्रवंगे। मया तो अंवल मीतना  
ही नीबतन है प्री सूचीत प्रस्तावों पय यथाचित वीचाय प्रीया  
जावे सुस वीरवास है प्री यती अैसा प्रीया गया तो अन्तों  
स्वीभ्रत प्रवत में प्री अी वीरव आपत्ती न होनी चालीये।  
अी अी अंभ्र ता संशोधित लीपी अर्थप्र वेज्जानीप्र हान से  
अुसप्र सीयत में अर्थप्र सपलता होगी वृत्तव अपा मी  
तथा ताव भंजन में बड़ी सुवीधा हो जावगी।

में तो-अंभ्र प्रस्ताव पहल पहल शुध अवपले से  
प्रतीत हांगे पय शुध ही अभ्यास प्र पश्चात् यही लीपी  
आधी पय चदा जावगी और वीर प्रचलीत लीपी अदती  
लगने लगगी।

अीस प्रभाव प्र पहला प्रस्ताव 'इ' प्री सूचीत  
मात्वा है बह अत्र व्यंजनों प्र पूर न लगप्र, अन्व  
मात्वाओं सदृश अुतप्र पश्चात् लगगी। दूसना प्रस्ताव  
ट ६ ६ और ८ प्री रूप है। मैन अीन्तों ७ ८ और ३ प्री  
तयह ललन माना है अतअव ट ७ ७ और ८ प्री शंभ्रतन  
अभाचान्त माना है। यह शुध लीपी प्र वेज्जानीप्र बताने  
तथा छापने प्री सुवीधाओं प्री ध्यान में रखते अुत अवश्यप्र  
प्रतीत अुभा। शेष प्रस्तावों पय तो अंवल पुवानी लजीनों  
प्र अप्रीय ही आश्रय प्र सभते हैं। अीस पय समालोचना  
प्रवना व्य-प है।

यह सुधारयुग है। पुवानी चूरीयों प्री जो लगने  
प्रे पाया में बाधप्र है वृत्त प्रवना प्रत्यंभ्र नागरीय प्र अलव्य  
है। अतअव आरा है मंची लीपी प्र अपतन में प्री अी  
अनाश्रनी न होगी।

अवी प्री प्रस्तावों अुती पय सूचीत लीपी प्र  
यह अुदाहारण सभात्त प्रवता है -

अुत्तम वीदया लीजीय, यदापी नीच ये हाय।

परा अपावन ठीच में, साना तजे न आय ॥

नीबदाप्र -

आमता प्रसात सागरीय

Fig. 166. Reforms suggested by Sagariya<sup>43</sup>



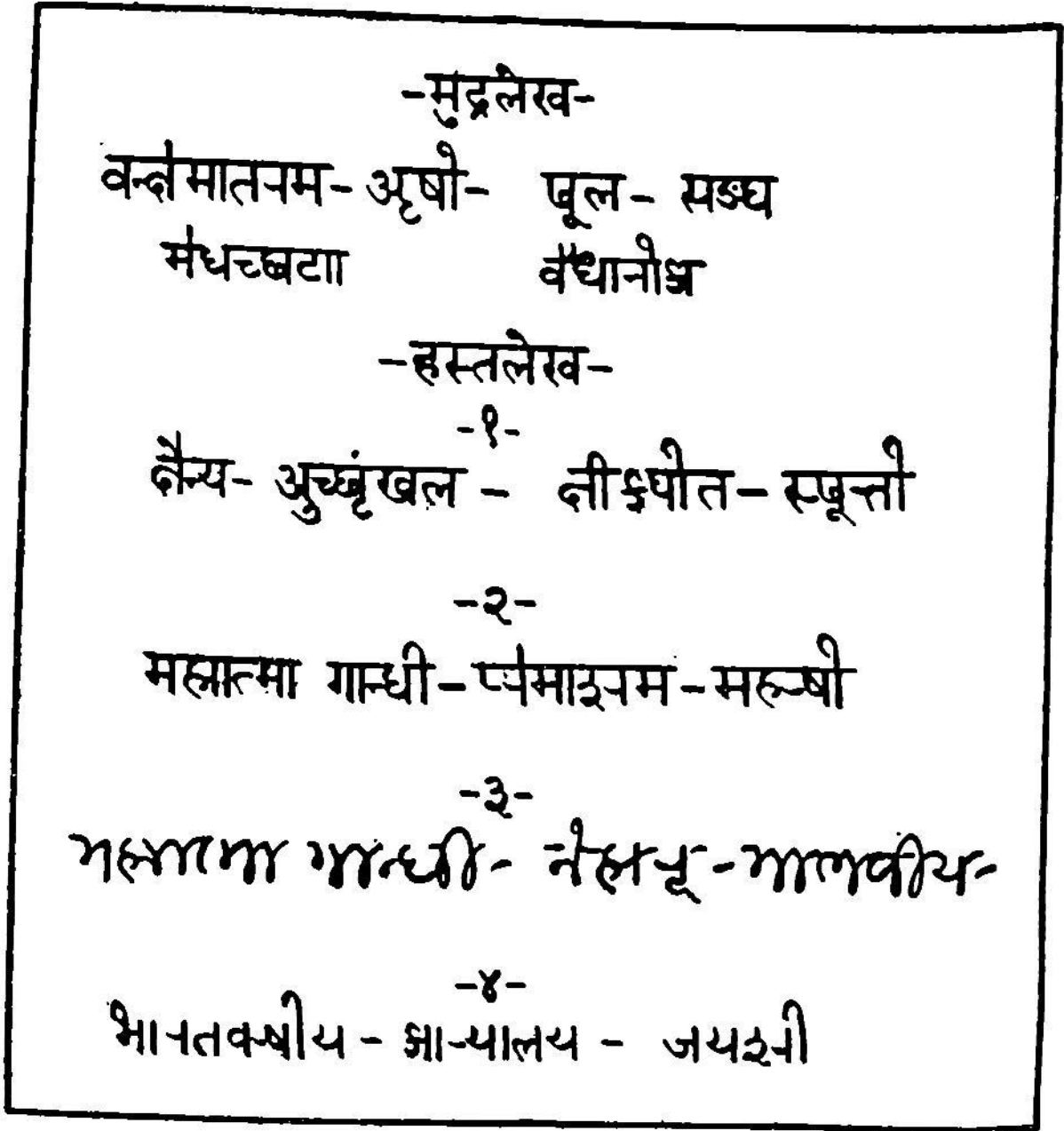


Fig. 168. The Sagariya Lipi : Specimen of handwriting and design for printing types

(8) The letters ङ and ञ always occur in the *aswara* form and not in the *Achanta* form (vowel-ending) except in Pali. As such they could easily be eliminated and instead derived by a combination of types.

2. All the shortcomings mentioned above could be eliminated by adopting the following basic modifications and conventions :

(a) The Marathi अ (or better still य which is simpler) without the end stroke, should be used as the basic form for deriving the vowels by suffixing to it modified *mātrās*.

अ-आ-इ-ई-उ-ऊ-ए-ऐ-ओ-औ-ऋ-ॠ-ॡ-ॢ-ॣ-ऌ-६-७-८-९-॰-ॱ-ॲ-ॳ-ॴ-ॵ-ॶ-ॷ-ॸ-ॹ-ॺ-ॻ-ॼ-ॽ-ॾ-ॿ-॰-ॱ-ॲ-ॳ-ॴ-ॵ-ॶ-ॷ-ॸ-ॹ-ॺ-ॻ-ॼ-ॽ-ॾ-ॿ

मराठीचा विकास - महाराष्ट्राचा विकास

1	2	3	4	5	6	7	8	9	10	11	12
अ	आ	इ	ई	उ	ऊ	ऋ	ॠ	ऌ	ॡ	ॢ	ॣ
13	14	15	16	17	18	19	20	21	22	23	24
ऋ	ॠ	ॡ	ॢ	ॣ	।	॥	०	॥	०	॥	०
25	26	27	28	29	30	31	32	33	34	35	36
म	र	ॢ	ॣ	।	॥	०	॥	०	॥	०	॥

अ आ अँ अीं अॄ आॄ अं अीं अ आ  
 अ० अः अ॒ अँ अॄ अं अीं अ आ  
 अ॒ अँ अॄ अं अ॒ अ॒ अँ अॄ अं अ॒ अ॒  
 अ क्षा ग ग्ना च च्च ज ज्ज च्च  
 अ अ्ना अ अ्ना ण त त्ता त्ता न  
 प प्प थ थ्थ म य यल व्ब व  
 श सस न क्ष च्च ज्ज अ्ना प्प

Fig. 169. The Sagariya Lipi: Print Script A: 36 types

H 5447-34a

- (b) The *mātrās* should be suitably modified and a convention adopted that they shall come wholly after the strokeless अ and the *aswara* consonants, without any part of them overhanging. Suitable *mātrās* should also be adopted for depicting non-Sanskrit vowels.
- (c) The independent shapes of aspirated consonants should be eliminated and these should instead be derived by suffixing a modified symbol for ह to the corresponding un-aspirated consonants. Similarly ष should be obtained by combining *aswara* स (or श) and ह. The modified symbol for ह should be such that the *mātrās* can be suffixed to its *aswara* form and the latter itself can be easily suffixed to the unaspirated consonants to get the corresponding aspirated consonants.
- (d) The modified ड and ब should be formed by combining the modified symbol for *anuswār* and the modified symbol for क and च respectively.
- (e) The modified shapes of *aswara* unaspirated consonants क ग च ज ट ड त द प and ब and the *antastha* and *ooshma* letters य र ल व श ष स and ह should be such that the *mātrās* can always be suffixed to them. This will necessitate change in the shapes of क ट ड द र and ह only. Besides this, the shape of ब should be modified to permit its being written without lifting the pen which is necessary for the addition of the slanting stroke. A convention should be adopted that *aswara* consonant forms will always combine horizontally, namely, that they are to be written in juxtaposition in the order in which they are pronounced, for example प्त and not ष. This will at once eliminate the irregular conjunct consonants like क्र, क्, क, ट्, श्र, क्ष etc.
- (f) The modified *aswara* consonants should be such that when they combine with other consonants the right-hand end of the preceding consonant touches the left-hand end of the succeeding consonant as is the case in the current प्य but not in ज्य where the horizontal bar of ञ is nearer the headline than the tip of य which is a defect from the calligraphic point of view.
- (g) Suitable symbols or combinations of symbols should be adopted for non-Sanskrit consonants such as the Persian *q*, the Marathi *ch* and *zh* and the Tamil trilled and somewhat aspirated *r*. The present convention in Hindi of placing a dot below certain letters

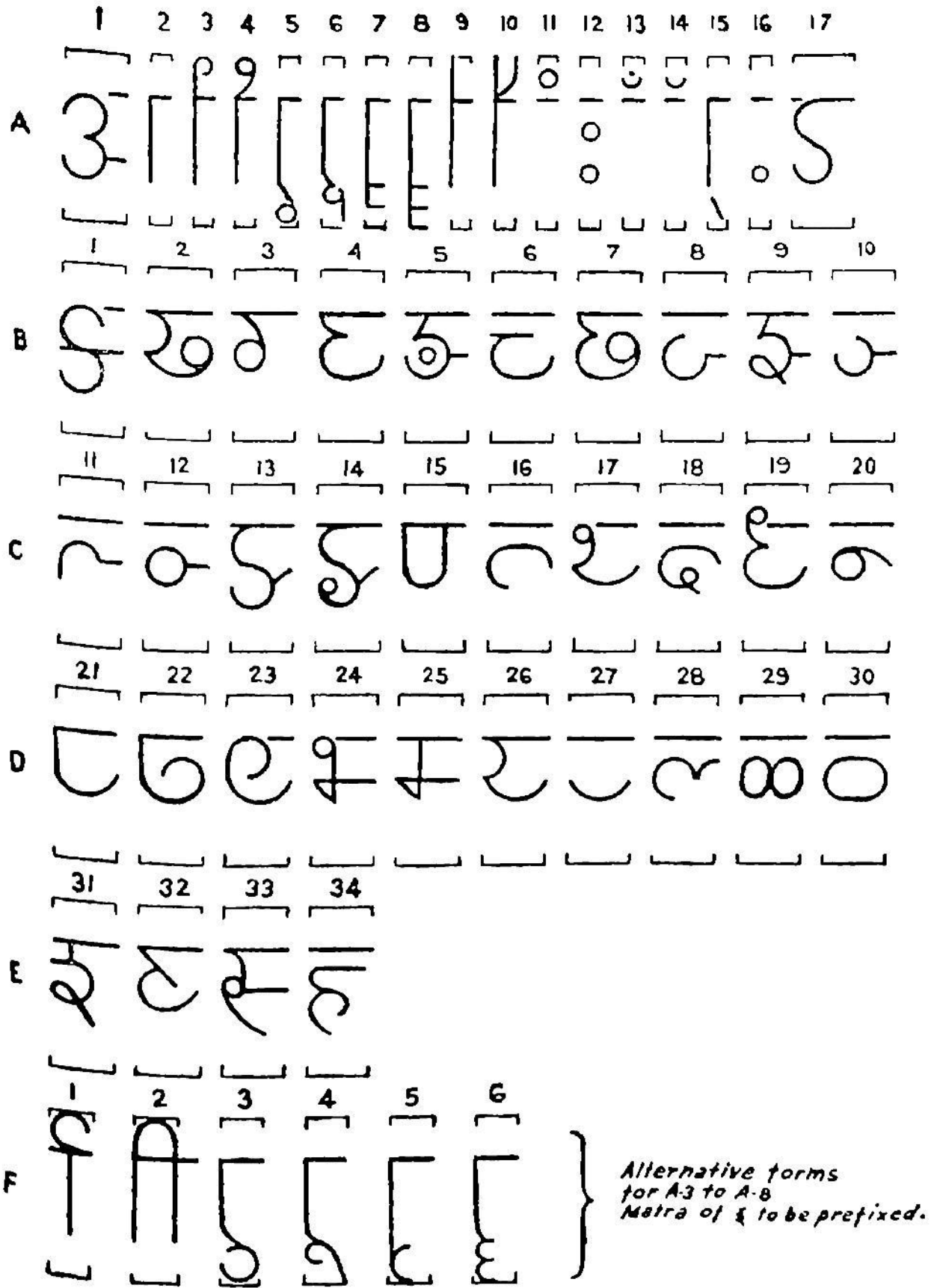


Fig. 170. The Sagariya Lipi: Print Script B: 51 types

as क ङ could be adopted except that the dot might precede instead of being placed below the letter. The Marathi ञ could similarly be derived from ल.

3. *Main Features of the Modified Script.*—If all these suggestions are accepted only 36 symbols would do the work for which at present over 200 are required. This radically modified Print-script and the corresponding alphabet are shown in *Fig. 169*. The main features of it are detailed below. All the types have a solid body, that is, with no overhang. They are also of the same height. The outline of the face of the type is shown in *Fig. 170* by rectangular brackets. The width of the types differs, which is permissible on Linotype machines.

Type 1 is the basic type from which vowels are to be formed by suffixing *mātrās* 2 to 7. Thus 1 and 2 will give अ, 1 and 2 twice will give आ, 1 and 3 will give modified इ. 1 and 6 will give modified ए, 1 and 7 will give modified ओ. Just as 1 and 2 twice gives आ, 1 and 3 twice will give modified ई and 1 and 6 twice will give modified ऐ (compare aa, ee in English). If this is considered too drastic a reform, type 12 may be used to obtain a long vowel. In this case modified ई will be obtained from 1, 3 and 12 and so on.

For additional vowel-sounds, combinations of *mātrās* 2 to 6 and the symbols 10 and 12 could be used ; for example :

- 1 and 2 and 3 for short ए ;
- 1 and 2 and 4 for short ओ ;
- 1 and 3 and 10 for *e* as in *reck* ;
- 1 and 6 and 10 for *a* as in *rack*, ;
- 1 and 7 and 10 for *o* as in *rock* ;

Type 8 is the symbol for *anuswār* which instead of being placed above the vowel is placed after it, thus 1, 2 and 8 will give modified अ ;

Type 9 is the विसर्ग and 11 the अर्धसानुनासिक ;

Type 10 is the sign for obtaining English vowel-sounds ;

Type 13 is the modified क. It is merely the current letter rotated through 90 degrees. The ease with which it can be written and its artistic shape will be readily appreciated ;

Type 17 is the modified ञ formed by rotating the current letter ;

Type 18 is the modified ङ ;





Type 21 is the modified द to which the various *mātrās* can be suffixed ;

Type 24 is the modified ब which is derived from प and is easily written without lifting the pen ;

Type 27 is modified र. This is the form that was current till the thirteenth century. It will eliminate the awkward transformations of the letter as in कँ, प्र, द्र etc. ;

Type 33 is the modified ह which when suffixed to the unaspirated letters will give the corresponding aspirated ;

[Thus 13 and 33 will give modified ख, 32 and 33 will give modified प. In manuscript when writing modified ख either the bar of modified क be lengthened and then cut with a vertical stroke (compare 1 and 2 in English) or else the vertical stroke may be made along with the horizontal bar of modified क as shown in Fig. 172, line 4, symbol 5.]

Type 34 is the sign of *halant* so often needed in writing Sanskrit ;  
[Thus modified द will be obtained from 21 and 34.]

Type 35 is the sign of *avagraha* used in Sanskrit ;

Type 36 is the dot which is to be prefixed to get non-Sanskrit sounds thus :

36 and 18 and 2 for modified ड़ as in बड़ा (Hindi).

36 and 15 and 2 for च़ as in चांगला (Marathi).

36 and 13 and 2 for क़ as in कायदा (Urdu).

36 and 27 and 2 for Tamil trilled r.

4. *Printscript-B*.—If *Printscript-A* is considered too radical a departure from the current script, *Printscript-B* may be adopted. (See Fig. 170).

5. Main features of *Printscript-B* are detailed below. Here also the types (now 51) are made with solid body and are thus adaptable for Linotype printing.

6. The aspirated letters have independent forms as also the modified ड़, ब़ and प़. The *anuswār* is placed above the headline as in the current script. The *mātrās* have remained practically unchanged except that they are all to be suffixed to *aswara* consonant always. The only letters of which the shapes have been modified are क ख ट ठ ड ढ द फ ब र श and ह. These changes will be readily appreciated.



- A. जय शृस्मणायनञाय, तुलसीः शं अवताय तुम ।  
 क्षयनं वास्त्यद्वन्माय, मनाञ्जाव्य नर्मित क्षिया ॥  
 शृस्मण-चरित्य अपाय, पद्यथद्वन् अक्षत्य क्षय ।  
 क्षिया अर्मित अपञ्जाय, मन्दुः मन्दुः मन्द पय ॥  
 - सागर्यःय
- B. जय शृष्णायनञाय, तुलसीः शं अवताय तुम ।  
 क्षयनं वाष्ण्यद्वन्माय, महाञ्जाव्य निर्मित क्षिया ॥  
 शृष्ण-चरित्य अपाय, पद्यथद्वन् अक्षत्य क्षय ।  
 क्षिया अर्मित अपञ्जाय, हिन्दू हिन्दी हिन्द पय ॥  
 - सागरीय
- C. जय कृष्णायनकार, तुलसीके अवतार तुम ।  
 करने राष्ट्रोद्धार, महाकाव्य निर्मित किया ॥  
 कृष्ण-चरित्र अपार, पद्यबद्ध एकत्र कर ।  
 किया अमित उपकार, हिन्दू हिन्दी हिन्द पर ॥  
 - सागरीय

Fig. 171. Specimen setting in the Sagariya type

7. If even the convention regarding *mātrās* is considered too radical a change, the *mātrās* shown against F in Fig. 170 may be adopted and as at present the *mātrā* of इ may be prefixed to the form of consonants. Even so the modified script will be adaptable for Linotype printing.

8. Specimen of modified script is given in Fig. 171, where C is written in the current script, B is written in Printscript-B and A is written in Printscript-A.



अ अ अ अ अ अ अ अ अ  
 झ ग ङ च ज ञ ल प्र ष  
 त ल न प थ म य न ल व  
 शै अ म ष झ च ष थ

Fig. 172. The Sagariya Lipi : Manuscript

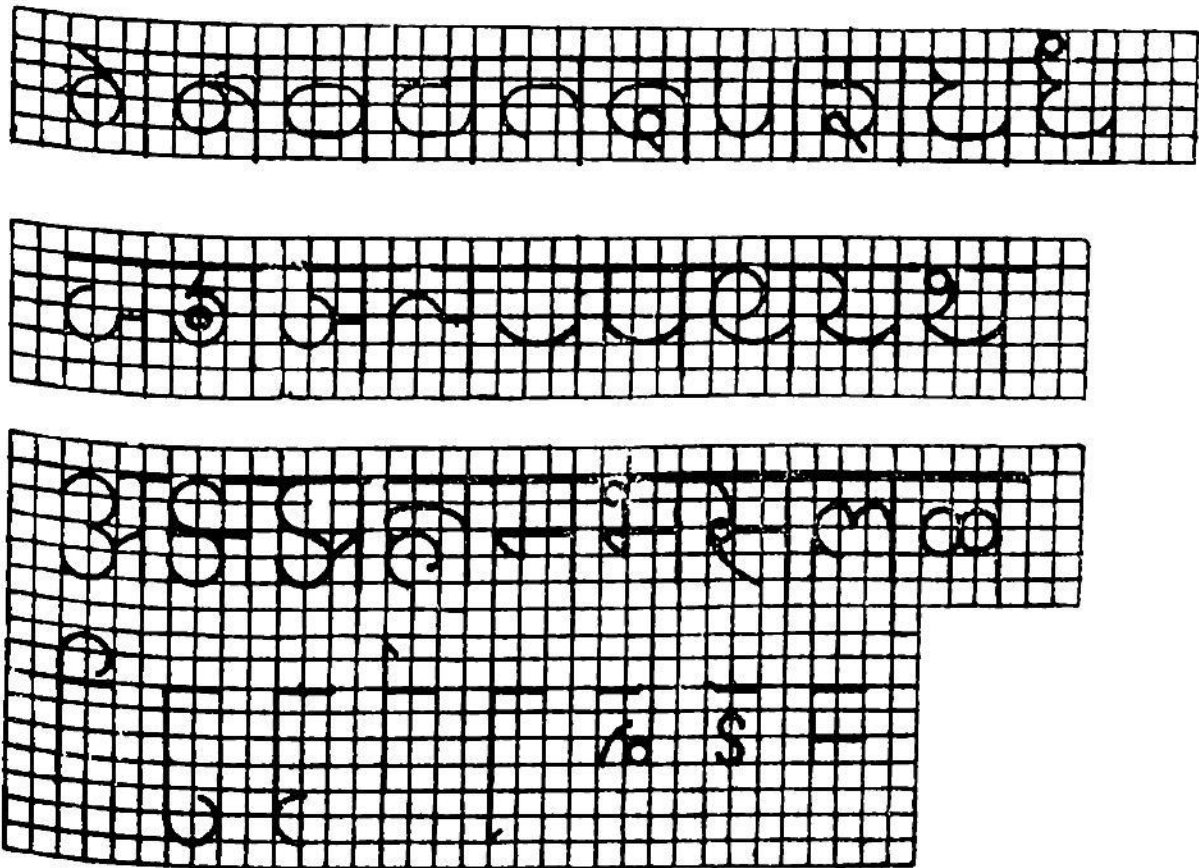


Fig. 173. The Sagariya Lipi : Calligraphy

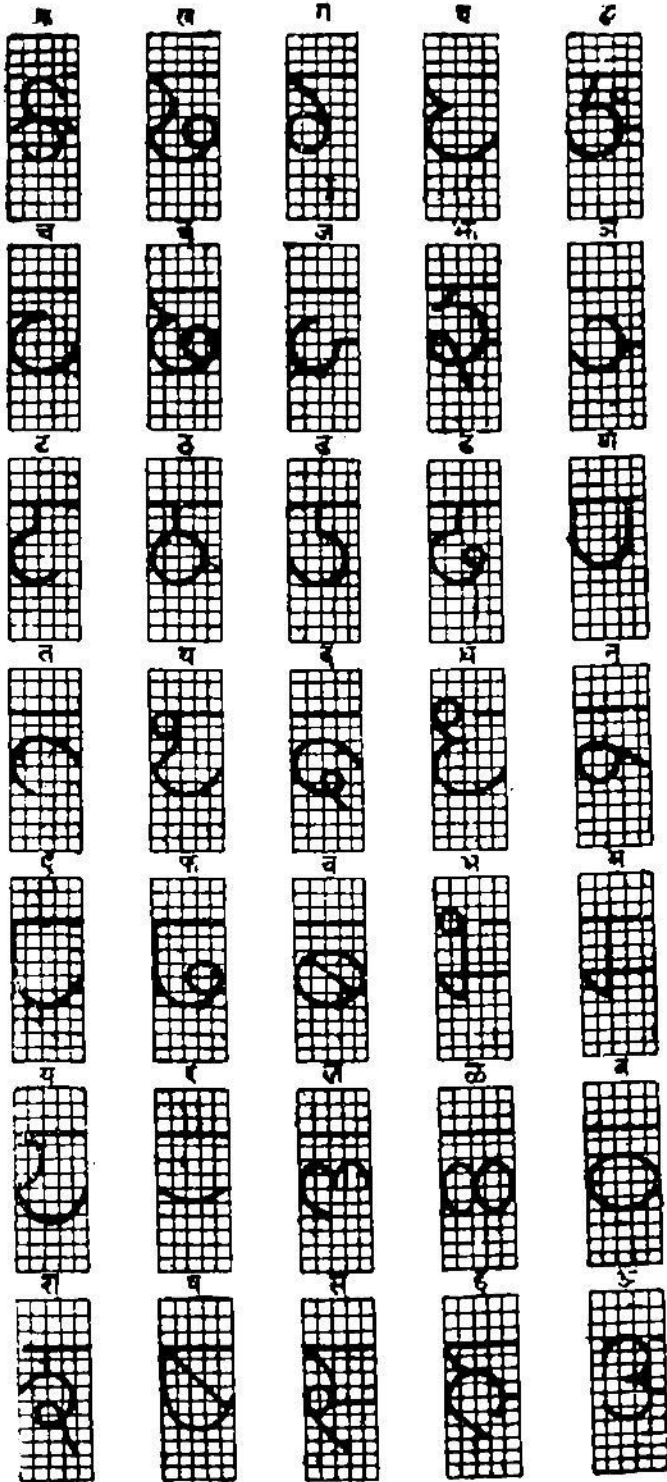


Fig. 174. The Sagariya Lipi : Analysis of the design of Sagariya letters

9. *Manuscript.*—How the proposed Printscript-A should be written is shown in Fig. 172. It will be seen that the modified script can be written more or less continuously without lifting the pen any more than is necessary in writing, say English. The artistic shape of the letters and the uniform method of writing them are self-evident.

10. *Calligraphy.*—A glance at Fig. 173 will show how the various types are to be drawn geometrically. These are line-diagrams. The actual appearance of the letters will depend on the kind of nib used to write them. Examples of writing with NW-SE and NE-SW slanting nibs and with horizontally held and circular nibs (pencil writing) are given in Fig. 176. It will be seen that from the calligraphic point of view the proposed script is definitely simpler and more artistic.



\* These will not operate the spacebar.

Fig. 175. The Sagariya Lipi : Type script B—48 keys

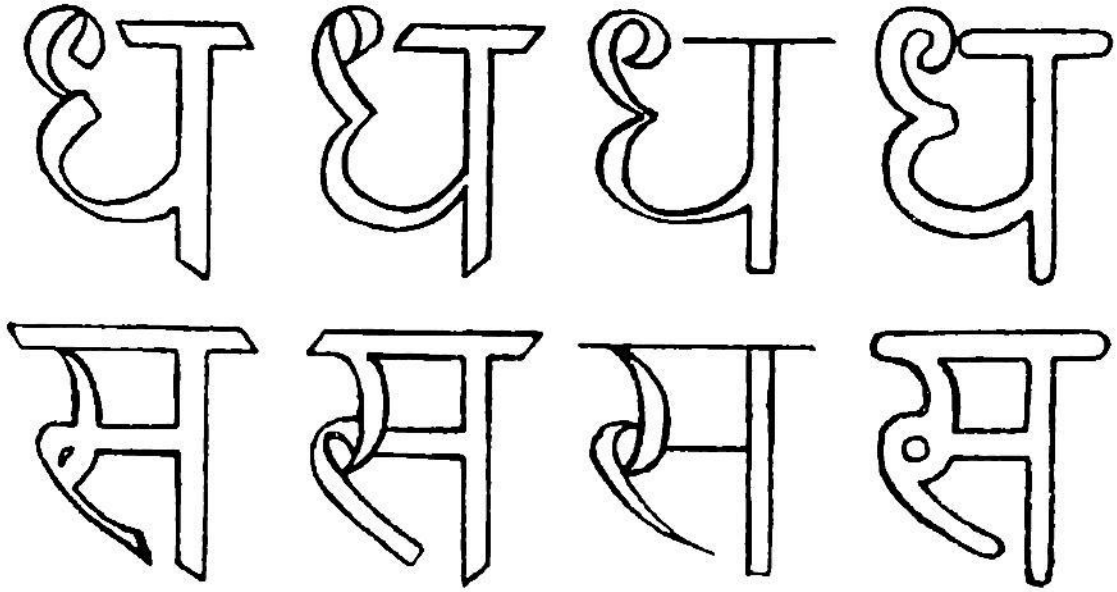


Fig. 176. The Sagariya Lipi : Calligraphy.

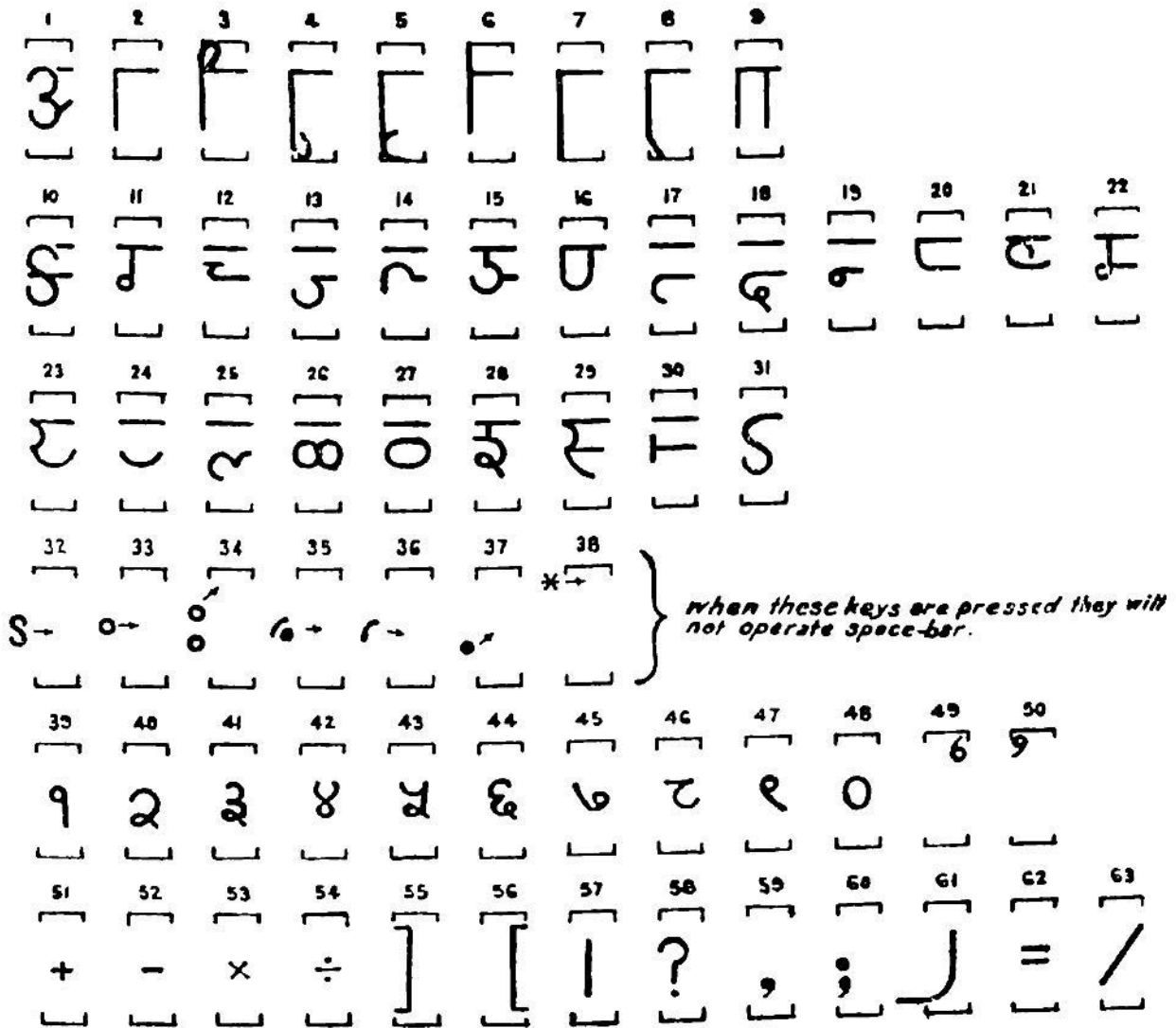


Fig. 177. The Sagariya Lipi : Type script. A—63 types



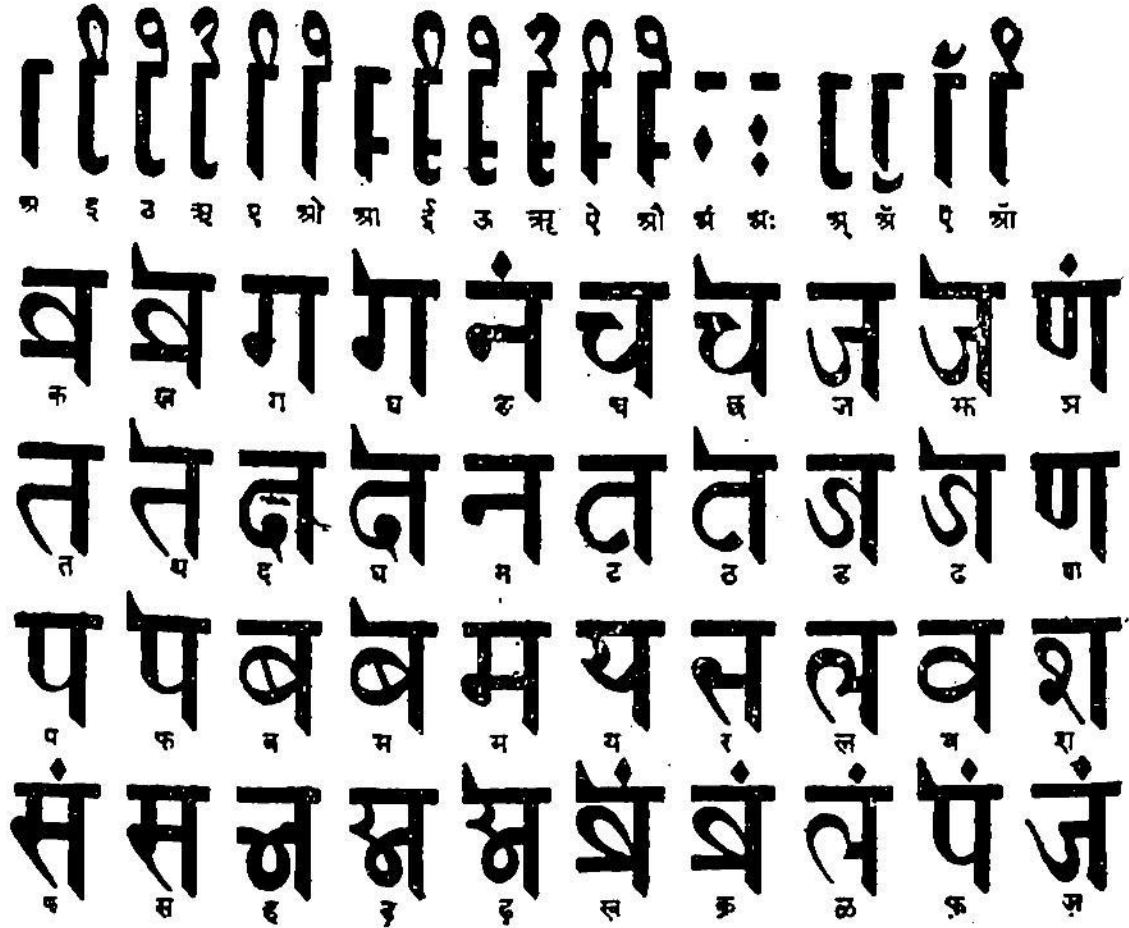
34. Alphabet ख.<sup>45</sup>

Fig. 179. Reformed Alphabet (ख)

35. Script ग.<sup>46</sup>

- I. Drop all common Horizontal Overlines on each letter.
- II. In the next stage, drop all common vertical Full or Half strokes.
- III. Equivalents from other Language Alphabets have been taken at some places for better form.
- IV. Vowels have been formed by adding the present vowel-signs to a very convenient common base o.

## Vowels

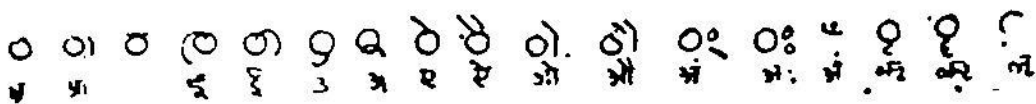


Fig. 180. Vowels in Script ग



CONSONANTS

<p>कं. ch. ञ. .... ञ</p> <p>गं. ङ (MALYALAM). . ङ</p> <p>ङं. ङ. ङ. ङ. . . . ङ</p>	<p>प. . प. . U (TAMIL or BURMESE) . . U</p> <p>ब. . ब. . ० . ० . . . . ०</p> <p>म. . म. (Burmese) . . . . म</p>
<p>चं. च. . ट . . . . ट</p> <p>जं. ज. . ङ . . . . ङ</p> <p>झं. झ. . ङ . . . . ङ</p>	<p>य. . य. . २ . . . . २</p> <p>    " १ (BURMESE YA-GOUK). . १</p> <p>र. . र . . . . . र</p> <p>ल. . ल . . . . . ल</p>
<p>टं. ट. . C . . . . C</p> <p>डं. (To distinguish from S)     ड (Gk. ड) or (Eng. ड) . . . . ड</p> <p>शां. शा . . . . श . . . . श</p>	<p>व. . व . . . . ० ० . . . . ०</p> <p>    To distinguish from Vowels . . . . ०</p> <p>शं. श (Bengali) . . . . श</p> <p>षं. ष . . . . ष . . . . ष</p>
<p>तं. त. . ण . . ण . . ण</p> <p>दं. द. (Rotate 90°) . . द . . द</p> <p>नं. न. (Bengali) . . . . न</p>	<p>स. . स . . स . . . . स</p> <p>हं. (Tedious to write) . . ह . . ह</p> <p>झं. झ . . ङ . . . . ङ</p> <p>ञं. ञ . . ङ . . . . ङ</p>

Fig. 181. Consonants in Script ग.

Here, in reality two forms of scripts are suggested (i) by dropping common horizontal strokes only and (ii) by dropping common vertical strokes also.

The ultimate or penultimate forms may be taken up.

V. For composite sounds like ख formed by the addition of the aspirate ह to the primary sounds, add a terminal loop. Thus :

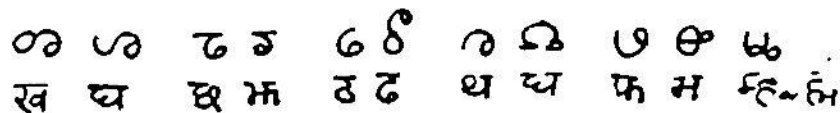


Fig. 182. Graphemes for composite sounds

- VI. For Soft sounds of vowels or consonants add a : , to follow.
- VII. For Extra-Long sounds of vowels or consonants add a र to follow. This doubles the sound.

VIII. In writing, the vowels will have the symbols formed by dropping the common O, when the vowel is not to be read independently.

36. Script घ. 17

1. PRIMARY LETTERS representing elementary sounds into which syllables can be resolved.

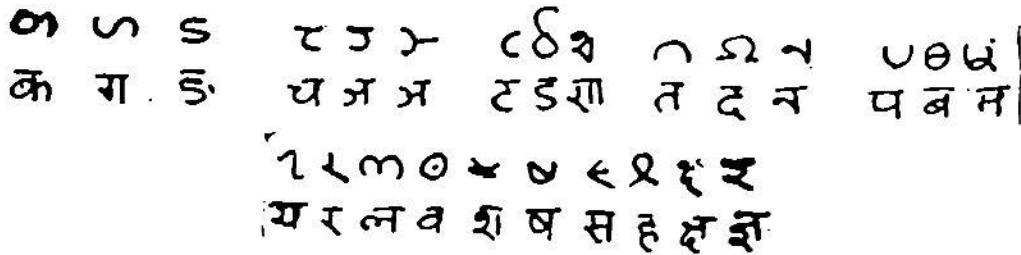


Fig. 183. Primary Letters (Script घ.)

- II. SECONDARY LETTERS representing composite sounds formed by the addition of the aspirate H ह to the primary. They are easily formed by adding a terminal loop to the primary letters.

III. VOWELS



O in Not

Fig. 184. Secondary Letters (Script घ.)

IV. SHORT AND LONG SOUNDS

1. A : after a letter will make it Half ; and after a Vowel will make the vowel Ultra-short.
2. A 2 (Small २ or Double दूना) will placed after a Letter double the letter ; and placed after a Vowel make the Vowel Extra-long.

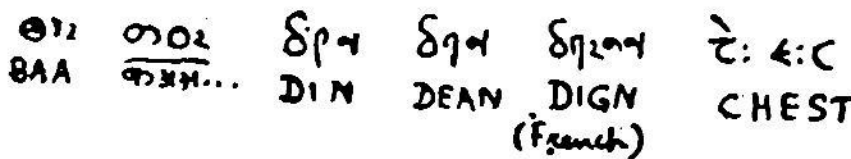
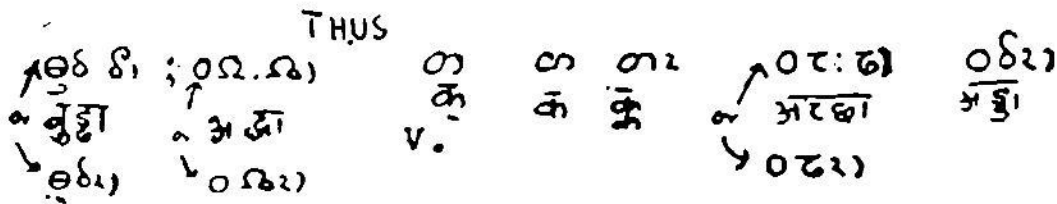


Fig. 185. Short and Long Sounds (Script घ.)

V. VOWEL SYMBOLS

1. In cursive form, the diacritical marks used at present will continue. But the sign of (इ) i.e. ( f ) will not be put before a consonant ;

it will be put after the consonant, which is the correct phonetic way of putting it.

These signs are obtained by dropping the common o (अ) from the above proposed vowels.

2. In typewriting, the vowels will have no representative symbols. They will be used as a whole, after the consonants, as in the European languages with the rule that no vowel will read independently (i) unless it begins a word or (ii) is preceded by a vowel or (iii) is preceded by a hyphen (-).

In every other case, it will change the sound of the preceding consonant by being read with it. Thus in writing we have :

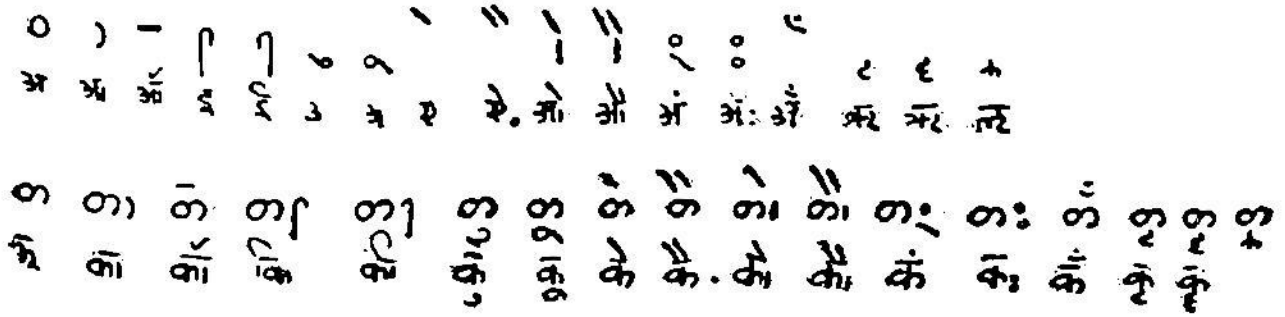


Fig. 186. Vowel Signs and Barakhadi (Script ष.)

37. Dr. M. D. Manohar.<sup>48</sup>

In his 'Reformed Devanagari Script' Manohar suggests that "the Devanagari script would be suitable to printing, typing and teleprinting machines if the following reforms are effected in it" :

(a) The basic vowel indicator should be the symbol ऊ and different vowel-symbols should be formed by combining the distinctive vowel mark of each to it. The vowel marks are to be put after the letter. He gives in his book the different vowel marks that are to be added to this indicator.

(b) Add the short ए and short ओ vowels to the Devanagari script.

(c) Add the vertical line to all the consonant letters which do not have the vertical line at the end.

(d) Represent *mahāprāṇa* by adding a small circle to the *non-mahāprāṇa* consonants of each group. This circle may be added below or above the particular letter. Thus थ would be written as न.

(e) Write क्ष by the combination of क and ष.

(f) Change the form of क फ भ् and ड in order to put the vertical line at the end.

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Manohar thinks that with these changes in Devanagari script, the script would be printed without any difficulty whatsoever.

38. Prof. H. K. Sherwani of Hyderabad (1949)<sup>10</sup>

Sherwani issued a folder in 1949 advocating the adaptation of Roman script for Indian languages. He records the following arguments advanced in favour of the use of Devanagari :

(i) Devanagari is "an Indian script" ; as neo-Hindi has a tendency to become Sanskritic, the sentiment of a section of the people is in its favour.

(ii) It is clear in writing and clear in print.

(iii) It has adapted its letters to certain sounds of foreign extraction current in India, e.g. क ख ग ज ङ thus compensating for the original discrepancies to some extent.

(iv) Most foreign names, etc., can be transliterated with a certain amount of exactitude.

(v) It is allied to many North-Indian and West-Indian scripts.

As against the above, Prof. Sherwani enumerates the following disadvantages :

(1) There are as many as 55 basic letters, and even aspirated sounds are expressed by distinct forms : e.g. aspirated क is represented by क् .

(2) There is always an ultimate short vowel understood at the end of each consonant involving the necessity to have half-letter forms or *Sanyuktākṣaras* for unvowelled sounds.

(3) Symbols for expressing vowel-sounds are placed sometimes before, sometimes after, sometimes above and sometimes below the consonant concerned, and this technique is obviously unsuited for quick printing and typing.

(4) Writing is fairly complicated and even some of the simplest sounds are sometimes expressed by letters of multiple strokes (such as अ with 5 or 6 strokes for perhaps the simplest sound in any language), while some of the cursives are quite complicated, e.g. छ, झ, ह, क्ष ञ. The adoption of Hindi script for the National Language would therefore greatly increase not only the paper space but also the comparative time needed to get through a work.

(5) The script is current only in parts of the North and is not acceptable to the Dravidian South and even to Western Bengal. The total number of persons using the Hindi or an allied script for their mother-tongue is not more than eighteen crores.





it need not be separately provided because as cipher it anyhow occurs among the figures. The *visarga* that is found in Sanskrit can be represented by the colon.

4. The nasal sound which is indicated in Hindi writings by a crescent with a star over the upper horizontal stroke, is indicated in Telugu by the mark ' ( ' as a suffix and it is called the *ardhanuswāra*. This may be taken for Devanagari.

5. On this computation fifty-one symbols for letters and other adjuncts including the long vowel ऌ (which does not exist even in Sanskrit as *deergha* but only as *pluta*), ड which came into vogue at a later time, and क्ष and ज्ञ which are compound consonants.

6. Some of the special letters occurring in other alphabets may be borrowed. For instance short ए and ओ corresponding to 'o' as in 'opinion' the hard 'r' २ called *sakata-repha*.

7. The consonants 'f' and 'z' and the vowel-sound represented by 'a' as in 'man', may be taken from the Roman script. 'f' and 'z' will represent exactly the same sounds as they do in the Latin alphabet.

8. One special letter expressing a special sound occurs in Tamil, is not expressed either by 'j' or 'z'. It may be included in the common script.

9. The upper horizontal bar, which is the characteristic feature of the Devanagari script, may also be added to each of the characters borrowed from other languages, in order to impart to all the characters a certain kind of uniformity of appearance.

10. The letters ए and ओ will be pronounced only as short vowels ; and in order to make them long, the vertical bar ( ि ) will be added as suffix, i.e. एा ओा.

11. Devanagari is much broader script in writing than the Latin alphabet. The Devanagari script with the suggested changes will occupy more space and will take much longer time to write.

#### 40. Satyendra Kumar Gupta<sup>51</sup>

Gupta in his 'Some suggestions for the reform of the Script' states that, "Devanagari would become quite suitable to printing if the following reforms are accepted :

(a) The consonant or consonants combining with another should be written one after the other instead of above or below as is done now.

(b) र when it combines with other consonants is written as ऱ as is done in Marathi and when other consonants combine with it, it is written as ॢ and not ऱ".



**41. Vaman Ramkrishna <sup>52</sup>**

Ramkrishna in his *Balbodh Lipi* suggests that the script can be made suitable for printing if the following reforms are effected in it :

(a) All consonants not having vertical lines at their end are given a vertical line at the end. Thus क should be written as का. In certain cases he would write the letter in a new form in order to give this vertical line at the end. Thus ट would be त्त.

(b) He would like that all the vowels should be indicated by adding a vowel-mark to the basic vowel-indicator which is अ.

(c) The combining consonants should be written in order in which they occur. The *Rafar* <sup>c</sup> should be written in its proper place of pronunciation. Thus अर्थ should be written as अर्थ.

**42. Keshava Chandra Barua <sup>53</sup>**

Barua in his *Borda's Lipi* thinks that the following reform would make the Devanagari script quite adaptable to modern means of Lithography :

(a) All the vowels should be indicated by giving the proper vowel-mark to the basic vowel-indicator ऊ.

(b) The vowel-marks should be altered so as to make them fall after the letter with which they combine.

(c) The consonants when they combine should base between them a *Sanyukt* sign which is ५.

**43. Hari Sharan Singh <sup>54</sup>**

Singh thinks that the following reforms should be made in the Devanagari script :

(a) Short ए and ओ should be included in the Devanagari script.

(b) All the vowels must be indicated by putting a proper vowel-mark to the basic vowel-indicator ऊ.

(c) The vowel-mark for short इ should fall after the letter and not before it and should be changed a little.

(d) The vowel-marks for उ, ऊ and ऋ should fall a little after the letter.

**44. Bansidhar Manoharlal <sup>55</sup>**

Manoharlal suggests that "the following reform would make the Devanagari script very suitable for printing :

(a) All the consonants which do not have the vertical line at the end should be provided with the vertical line and if necessary the way of writing of some of these letters should be changed.



(b) The consonants should combine in their order of occurrence and the half-letter can be written by just omitting the vertical line which stands for the vowel.”

45. Prati Sanskrit Devanagari Lipi of Shri Srinivas <sup>56</sup>

The scheme of Prati Sanskrit Devanagari letters suggested by Srinivas is given below :

अ अ अ अ अ अ अ अ अ अ  
 अ अ अ अ अ अ अ अ अ अ  
 म म ग ग ग व क ज ज ज  
 त त त त त त त त त न  
 प फ ब ब म य र ल व श  
 ष स स स व श ल ष प्र ज

Fig. 187. Prati Sanskrit Devanagari

(1) The form उ which is present in अ may be accepted as a basis for forming the vowel-symbols.

(2) New symbols may be added for the phonemes—*a* in *at* and *a* in *all* (short ए and short ओ).

(3) The second part of the vowel-symbol should be distinct and be considered its *mātrā*. The *mātrā* would be the vowel-symbol minus basic उ. Vowel-symbol for इ = उँ and *mātrā* ँ .

(4) The *mātrās* of इ and ए shall have ascenders and those of उ and ऊ shall have descenders.

(5) The presence of *halant* sign ः will denote one *mātrā* time-unit and its absence will denote two *mātrā* time-units.



(6) The letters of *Bārākhadi* may be constructed by adding the *mātrās*.

(7) The *mātrās* shall be placed after the vowels and consonants and not above, below or before them.

(8) The absence of verti-bar shall indicate pure consonant.

(9) The conjuncts shall be made by placing the consonants one after the other in the order of pronunciation.

(10) The aspirate consonants may be represented by adding the latter half of फ i.e. ि to the consonants, i.e. ख would be क (क) + ि = क िक ; घ would be ग + ि = ग िघ.

(11) The nasals ङ अ ण may be written by adding the open dot ° to the third letters ( ग च ट ); न and ष may be written by adding ° to first letters ( त and प ).

(12) क, श and र may be written as क, श and र.

(13) The forms of ड and ह may be simplified and provided with a verti-bar.

(14) क्, ट्, ड्, द and ह् followed by the vowel अ may be written with full verti-bar.

(15) New graphemes may be added for *f*, *zh* and *z*.

Srinivas claims that all the Indian Languages and Arabic, Persian and English can be written with twelve vowels and twenty-six consonants. *Narendra Dev Committee Report* refers to the suggestion of Srinivas that the *mātrās* of ई and ए should have ascenders while those of ऊ and औ should have descenders.

#### 46. Srinivas on Devanagari for Teleprinter<sup>57</sup>

(1) Vowels may be written with the basic vowel-sign preceding the *mātrā*. Short vowel may be typed with dead key of *halant*.

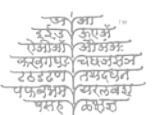
(2) The consonants may be followed by the vowel *mātrā* as in English, i.e. क = Ka.

(3) In case of the *māhāprāṇā* the dead-key of the *māhāprāṇā* may be typed after the *alpa-prāṇā* consonant.

(4) Conjuncts may be typed in order of pronunciation followed by the vowel *mātrā*, i.e. उच्छवास = उच्छवास

(5) ड and ञ may be represented by *anuswār*.

(6) The keys of *anunāsik*, *visarga*, *māhāprāṇā* and *halant* shall be dead.



47. C. Rajagopalachari (1953)<sup>85</sup>

In a letter written to late Pandit Govind Vallabh Pant, Rajagopalachari states :

“I have received some communications about a Conference you have organised for the improvement of the *Nagari* script. I know I am wholly incompetent to offer my suggestions. But even as an ignorant outsider interested in making the Hindi script easier to read for outsiders, a few thoughts strike me which I feel I may communicate to those who are engaged in the work. I thought it best to send them through you. I hope you will forgive me. You may deal with my letter as you think best.

“The printers and publishers are inclined to dominate such discussions a little too much. They are interested in reducing composing labour and easing Linotype technique. We should, however, be more concerned in making the script easier for the unpractised reader. This will serve to spread Hindi all over India more easily.

“There are some letters in *Nagari* which carry the upright stroke as a part of the letter itself. This in close printing, gets mixed up with the upright long आ vowel-stroke. This must be differentiated so as to avoid confusion and to facilitate rapid reading. ग श ण are the letters I refer to. Could they be put in the form ग् श् ष् so that these letters too may have the upright stroke as a conjoint part of the letter form ?

“Again the upright stroke of the short and long vowel combination of the consonants : e.g. कि, की, चि, ची, should be also slightly changed to the same end. We may in these cases have the upright stroke as below :

कि=की, चि,=ची

“The upright stroke in फ and ी need not have the same full length as the ākār stroke. A half stroke would quite do and will eliminate the confusion that this upright stroke in close contact with preceding and succeeding letters may cause. Similarly, we may have the upright strokes of को, कौ, etc., also as को कौ and add a small hook.

*Illustrations:*— अ शो क रता र प्वा स्ता रः                      चर्तुमनिः  
शूर : श्री रि र्ज ने श्व रः                                      प्रा प्प नि ल यः ”

## 48. Invitees to Lucknow conference from Assam (1953)

The invitees to the Lucknow Conference from Assam submitted



a joint memorandum. The points made in this document are summarised below :

Kakasaheb Kalelkar has made an attempt to reform the vowels of the existing alphabets by changing the shapes of seven vowels, i.e. इ ई उ ऊ ऋ ए ऐ and introducing new ones in their places, viz. ओ, ओी अु अू अृ अें. All the 13 vowels of the new system as introduced by Kaka Saheb being virtually modifications of only vowel अ, it will offer obvious advantages to the new learners of Hindi.

2. Attempt should be made to simplify some of the consonants by introducing simplified forms of consonants in place of those which proved to be cumbersome to new learners. For instance, ख ण or ण, घ भ and ह. These letters can be substituted by simple ones,

1. श्न (Assamese) for ख
2. न Do. for ण ण
3. ध for घ
4. भ for भ
5. र (Assamese) for ह

(i) The suggested शृ for ख avoids all complications and is simpler to write and also does away with the *Shirorekhā*, which is a definite advantage.

(ii) The existing ण or ण also appears to be complicated and can be more conveniently substituted by the Assamese न which has the additional advantage of a letter without *Shirorekhā*.

(iii) The present form of ह is really difficult to write with two backward moves, which can be much simplified by using the Assamese र in its place. This has much in common with the Hindi alphabet.

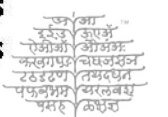
3. The compounds should be formed by placing the first letter of the compound in half, together with the second letter in full, in juxtaposition.

4. As regards *rakar* the same principle may be followed, i.e. ऋ ऋ, ज्ञ ज्ञ.

5. The vowel sign of short 'f' should come after its consonant in order to facilitate forward movement and not before it, as it is now. The sign of short 'f' should follow the consonant with a new symbol, i.e. "f" which will surely be easier to write and can be distinguished from "f" and "f".

49. Haranandan Prasad, Bihar (1953) 59

1. "Reformers seeking to apply one script to the Sanskritic Languages in India have to reckon with the local patriotism of linguistic groups



who have to preserve their regional languages in their distinctive scripts. It is for consideration whether it will be politically expedient for Government to force the adoption of a common script on people intensely attached to their regional languages and scripts.

2. Script is the secondary and language is the primary element. Hindi (as national language) means a definite system of phonetics and distinct syntax. It means a vocabulary made up of the following in descending order of importance :

- (1) *Tadbhava* — derived from Sanskrit words
- (2) *Tatsama* — Sanskrit words themselves
- (3) *Deshaj* — Indigenous words adopted from local dialects
- (4) *Videshi* — Foreign words in the following order of frequency
  - (i) Persian, (ii) English, (iii) Arabic, (iv) Others.

(The question is whether the symbols employed in the Devanagari script are adequate to represent Hindi.)

3. Unless consciously we have taken a decision about how far we are going to change these three distinguishing features of Hindi (vocabulary, phonetics and syntax) by elimination or by borrowing or by adaptation from outside, it is illogical to think of reform in the script.

4. The Devanagari alphabet cannot convey exactly how the *Vedic* hymns have to be recited otherwise than by an accepted phonetic convention of additional accent marks which in upper India we have lost with the result that even a good Sanskrit Pandit in upper India cannot now intone the hymns.

5. Nobody disputes that *Tadbhava*, *Tatsama* and *Deshaj* words current in Hindi are adequately reproduced through the Devanagari script and the phonetical system followed in the Hindi-speaking area. There is a slight difficulty about the foreign words. Thus if we want to reproduce Persian words exactly and rely mainly not on phonetics but on symbols, we will have to find some symbols for consonants and vowels which are not to be found in *Tadbhava*, *Tatsama* and *Deshaj* words which are the main constituents of Hindi. Similarly, English words while they do not make many new demands for consonants also necessitate some new vowel-sounds.

6. It is just an artificial attempt to produce original forms and sounds when foreign words are already absorbed into native phonetics and brought into the Hindi system of pronunciation... (Such an attempt will) clutter our script with new fangled devices which are quite unnecessary and will be a psychological burden on the country. In fact the Hindi Committee of the Constituent Assembly as well as the

Committee set up by the U.P. Government have advised against multiplication of symbols.

7. Bihar Government have given a great deal of thought to this and allied matters and have come to the conclusion that the present symbols employed in the Devanagari script are adequate for our needs in so far as writing Hindi by hand is concerned.

8. The preoccupation of the reformers appears to be really whether the symbols and their combinations are also suitable for writing with mechanical devices such as by typewriters, teleprinters and for Lino and Mono composition.

9. The U.P. Committee wisely declined to accept a script which would look one thing when written by hand and another thing when printed.

10. Many languages of West and East having overlapping symbols, some of them even in larger numbers than in Hindi, have not thought of abandoning their script in favour of Roman for the supposed advantages which reformers of Hindi are seeking to derive. They have, on the other hand, adapted the machines to suit their scripts.

11. The search of reformers of Hindi should have been similarly to *see whether machines could be had to suit our script and not how we should break and mutilate our script to suit the machines* which have been manufactured for the Roman script. Only if no machine could be manufactured or adapted for the Devanagari script, should modification in our script have been considered and recommended.

12. A book written or printed in some of the reformed scripts would be as different in look as the vanished *Kharoshti* script of Sanskrit differed from *Brahmi* script of which Devanagari is a form. *If we make too great a break with our existing script, we would disinherit ourselves and all our children of all the literature printed earlier and extant at present in the hitherto current Devanagari script.* If, therefore, we want to avoid a sudden break in our cultural heritage, we have to keep our script and our way of writing as it has been with the least possible modification.

13. The second major aim is that the script should be such that in writing it whether by hand or mechanically there is as great a saving in space, that is, in paper, stationery and printing, as possible. The secret of this economy is that we have adopted as the unit of our writing a syllable rather than a letter. Thus, in Roman the smallest syllable with a consonant sound will be of two letters occupying two spaces. In Nagri it just occupies one space. A consonant combined to a consonant



gives a 'sanyuktakshara' which is often accommodated in one space and a consonant linked with vowel symbols ॠ ॡ etc., also occupies only one space, and if linked with other vowel-symbols occupies one and half space only.

14. Third major aim of script reform should be to achieve speed. To this end the number of strokes should be reduced by reducing the number of symbols and configurations used and by avoiding shifts as much as possible."

50. Dr. Kripanath Mishra's Devanagari for Hindi (1953)<sup>60</sup>

Dr. Kripanath Mishra, Professor in the Science College, Patna, considers Nagari a perfect script except for the following defects :

- (a) Graphic defect : Writing of the full graphic symbol for half sound and half graphic symbol for full sound, i.e. half ॢ and full व in व् or half ॣ and full म in म्.
- (b) Phonetic defects : No means of distinguishing the sound of vocalised middle and devocalised final न in the word मनन.
- (c) Sequential defect : The cerebral group of consonants ढ which should follow the first group of क is currently placed third.

Prof. Mishra explains the difference in Nagari and Roman, thus :

In Roman, consonants are modified by vowels which are written in full. In Nagari consonants are modified by vowels which when thus modifying consonants, are shortened into signs called *Mātrās*.

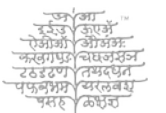
In Roman, the full vowels modifying consonants always follow consonants separately or apart ; in Nagari, the shortened vowel-signs, *Mātrās*, modifying consonants rarely precede, sometimes follow, but generally overlap or fall at the top or bottom of the consonants they modify.

Roman script has rectangular bodies and not angular bodies as Nagari script.

The problem of Nagari is to reduce the Nagari fount to about 100 pieces and to devise a method of forming, out of full basic letters, the consonants vocalised by overlapping symbols or *mātrās* which method should apply uniformly to all letters.

Dr. Mishra formulated a scheme under which the number of types is reduced considerably :

- (a) Teleprinter 52 (b) Typewriter 84 (c) Linotype 87



“ How best to break up the existing script into symbols and configurations, which should be as few as possible and which on combination, should give us the familiar form of writing ? This is an empirical search and a Bihari scholar Prof. K. N. Mishra has realised the dream of the reformers by breaking up the scripts into symbols and configurations which reduce the number of strokes required remarkably. . . . ”<sup>61</sup>

*Typewriters.*—Bihar Government took comprehensive view of all problems which face Devanagari today and decided upon a typewriter which should incorporate the following features :

- (i) The configuration of letters should be those at present in use for the Devanagari script so that the current way of writing in which all our literature is contained and to which all the writing devices are adapted may be continued.
- (ii) The number of configurations should be adequate enough to give all the familiar forms of letters and punctuations current in Hindi without requiring us to modify the mechanism of the modern typewriters.
- (iii) The position of the letters should be fixed from the point of view of the number of times strokes could be given to any key of the typewriter in one minute, of the frequency of occurrence of each particular letter in the Hindi language and of the strength of each of the figures of the hands.
- (iv) The psychological strain and fatigue on the typists in putting the vowel-mark first and then the consonant should be avoided by normalising typewriting.
- (v) The typewriter should be adapted to meet also the needs of regional languages.
- (vi) The keyboards should be complete in forty-four or forty-six keys.

Five existing typewriters and two other keyboards proposed and exhibited on converted machines were examined and that devised by Prof. Mishra was accepted. The Committee that examined the keyboards awarded it 77 marks out of 100 as against 38 to Remington, 34 to Underwood (1), 37 to Underwood (2), 44 to Olivetti, 44 to Ajanta, 38 to Corona and 46 to Mr. Ajit Singh's adaptation of the Remington Keyboard.

Apart from the facilities provided by Prof. K. N. Mishra's inventions, the manufacturers introduced certain novel features on the suggestions of the State Governments. *The provision of half spacings and dual*



*control made it possible for Devanagari characters to have proportionate width as in Hindi print.*

*Mechanical composing.*—The problems in respect of line composing as enumerated by Haranandan Prasad are :

(a) how to frame a keyboard which will provide all basic letters in Hindi so placed in the keyboard lay-out as to give maximum speed;

(b) how to make the overlapping vowel-symbols visually inoffensive and uniform in application to all letters ;

(c) how to devise a keyboard which may successfully accommodate all the Hindi characters, full letters and half letters, the vowel-symbols, the necessary punctuation marks—all in the standard magazine of ninety channels which is good enough for English, together with a very few Pi-characters.

“ All the above problems have been tackled by some patents of Prof. K. N. Mishra. Some of his six patents, already sealed, have been used for Hindi typewriters.”

“ What Prof. Mishra has done, first of all, is to create space in each letter by slightly elongating the top bar rule to the left and not to the right as hitherto. This little change, apart from removing a phonetic anomaly, has almost revolutionised the typing and printing of Hindi. For, among other things, this invention makes it possible for overlapping vowel-symbols to fall adjacent or immediately next to the Hindi character, thus making these characters inoffensive to the eye, and fulfilling the dream of reformists.”

“ The invention of Prof. Mishra makes it possible to operate the vowel-symbols of all kinds, overlapping or non-overlapping, by modifying the basic letters themselves, and not the half-letters as in the Linotype scheme in existence.”

“ Since the basic letters and the vowel-symbols of Hindi can easily be placed in the six rows of the Linotype keyboard both vertically and horizontally, and since only these rows can effectively come within the range of fingering or speedy operation, the problem of working out the same speed for Hindi as for Roman has been successfully solved.”<sup>82</sup>

#### 51. Yatharth Darshin (1956) <sup>83</sup>

1. In the Dravidian (and English) languages there are the short and long ए and ओ. There is a different symbol to write ‘ tell ’ from ‘ tale ’ ; ‘ past ’ from ‘ paste ’ ; ‘ most ’ from ‘ post ’. Devanagari should devise new symbols for the short ones and add to its series.

अ	आ
इ	ई
उ	ऊ
ए	ऐ
ओ	औ
क	ख
ग	घ
ङ	च
ट	ठ
ड	ढ
ण	त
प	थ
फ	ब
भ	म
य	र
ल	व
श	ष
स	ह
ळ	ळ
वळ	वळ

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



2. Similarly it should adopt a new symbol, for phonetically pronouncing 'a' in 'bank', 'bat', etc., or the 'o' of 'mob' or 'morning' and 'a' of 'hall'. In the absence of a symbol for these, Hindi and Gujarati people pronounce and write these in a highly distorted manner, taking the forms 'baink', 'bate', 'mobe', 'mourning', and 'hole'.

3. Marathi has adopted the mark of the crescent "◌̣" to be put on ब, मा, हा so that the above words are written as बैक, बैट, माँब, माँनिंग and हाँल् and not as बैंक, बेट, मोब, मोनींग and होल् necessitating the pronunciation to get highly distorted! The Devanagari script and the other languages should also adopt this sign.

4. For the short ए (e), of 'tell' and for the short ओ (o) of 'most' I would suggest the symbol ◌̣ which is the vowel-sign of उ i.e. अँ and औँ

5. The vowels should be written as the *Pandharakhadi* as below :—

अ आ अि अी उ ऊ अँ अे अै औँ ओ औँ अँ अं अ :

क का कि की कु कू कै क कै कौँ को कौँ कँ कं क :

52. Dr. R. J. Phadake (1956) <sup>64</sup>

1. The following aspirated (*mhaāprāṇa*) consonants may be represented by adding ह to the unvoiced and voiced unaspirated consonants:

ख ध छ झ ठ ढ थ ध फ भ

क्ह ग्ह ङ्ह ञ्ह ट्ह ड्ह ढ्ह त्ह द्ह प्ह ब्ह

2. ङ and ञ may be dropped. वाङ्मय may be written as वांग्मय.

3. The compounds क्ष, त्र and ज्ञ may be replaced with conventional conjuncts.

4. Either of the consonants श and ष may be retained.

5. क and र may be written as क् and र्.

6. The total types in the fount for typewriting will be 29 as under:

Vowels <i>mātrās</i>	अ	आ	इ	ई	उ	ऊ	अँ	अै	औँ
Consonants—	क	ख	ग	घ	ङ	च	छ	ट	ड
	ठ	ड	ढ	ण	त	थ	द	ध	न
	प	फ	ब	भ	र	ल	व	श	ह
								क्ष	त्र

53. Rao Bahadur N. S. Joshi, Poona (1957) <sup>65</sup>

The arrangement of letters in the Roman script is irregular. The vowels are far too less, only 5 to represent 16 vowel-sounds.

In Roman the vowel *a* represents the following vowel-sounds:—

अ in Postman

आ in Father

औँ in Fall

अँ in Fat

ए in Fate



On the other hand the sound अ is represented by all the vowels in the Roman alphabet.

(a) Postman ; (e) Her ; (i) Bird ; (o) Ton, and (u) Fun.

In Devnagari also the vowels fall short of the vowel-sound commonly used in the South Indian languages and also English. The transliteration of *Bell* and *Bail* in Devanagari is बे and *Tell* and *Tale* is टेल. Short अ cannot be represented in Devanagari.

ए (अई) and औ (अऊ) are *Sunyukta Swar* and therefore should not have been classed with basic vowels. The writer feels that ऐ and औ represented the sounds ऐँ and औँ. The vowels and vowel-signs suggested by Joshi are reproduced below:—

ओष्ठ्य		जिह्वा-मूर्धन्य	
ह्रस्व	दीर्घ	ह्रस्व	दीर्घ
ॐ	ॐ	ॐ	ॐ
आ	आ	अ	अ
ओ	ओ	ए	ए
ऊ	ऊ	इ	इ
ॐ	ॐ	अ	अ
ऐ	ऐ	ए	ए
औ	औ	इ	इ
	●	ॐ	ॐ
	○	ॐ	ॐ
		ॐ	ॐ
		ॐ	ॐ

केवल देवनागरीसहित

Fig. 188. Joshis vowel-marks

The use of new *swara lipi* as suggested by Joshi is indicated below:—

हे लेपे-सँ धी रं णी सँचं वेणयते लं मँ खयं  
 ही लिपि-सुधारणा सुच विष्याती ल मु ख्य  
 इदं दे शं हे केँ छं पं तं रं सै पं वहँ वै  
 उद्वै श हा कीं छ पाई तर सोपी व्हावी  
 मँ तरं तं सैँ करं तं नं दे वं नं गं रं तं लं तं रं  
 मात्र तसैँ कर तां नां दे वनागरीतील इतर  
 गुणं नं हेँ सैँ हेँ तं नं ये तं  
 गुण नाहीं सैँ होँ उं न ये तं

THIS NEW ALPHABET HAS BEEN  
 THIS NEW ALPHABET HAS BEEN

Fig. 189. Joshis Swaralipi

54. Rambhau Mhaskar, Wardha (1961)<sup>66</sup>

The Roman type in 10 pt. can be read with ease but not the Devanagari in 10 pt. as the Devanagari letter is only 5 pt. and the remaining 5 pt. space is occupied by *Mātrās* and *Ukārs*.

The speed of writing is reduced to one-fifth in writing the head-line. The Gujarati letters look longer as the head-line is dispensed with.

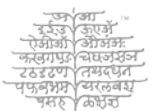
The occurrence of *Ukārs* (descenders) is in the rules of only 1 to 6 *Mātrās* (ascenders) (i.e. 16%). If the *Ukārs* are placed after the consonants in the line as is done in case of ह and ह्र the body size of the type can be reduced by 20% without reducing the size of the letters.

55. Pandit Keshavaram Shastri, Ahmedabad (1962)<sup>67</sup>

Shastri, a Member of the Bombay Government Script Reforms Committee, states :

- (1) Only four vowel-symbols अ इ उ and ऋ may be retained.
- (2) The *anuswār* may be written as ॠ and *anunāsik* as ॡ
- (3) The vowel-signs or *mātrās* may be placed in the same line after the consonants.
- (4) र may be written in the conjuncts as half र् in कर्ण = कर्ण and full र in नम्र = नम्र. A new type with *halant* may be provided र्.
- (5) A new type of *kānā* with *halant* may be cut for setting verti-bar letters with *halant*.
- (6) ख may be taken from Gujarati and घ and भ may be written as ध and भ.
- (7) The Bombay Style design of अ, क, झ, ण, फ, ल and श may be adopted.
- (8) च (three-fourth च) may be used in conjuncts of the consonants without the verti-bar, i.e. नाटच.
- (9) श्र may be retained; झ may be retained for *tatsam* words only ; but झ may be replaced with ञ, ञ may be added.
- (10) Additional types of ड, छ, ट, ठ, ड, ढ, द, र and ह may be cast with *halant*.
- (11) क फ ल and ञ may also be cast in half forms क् फ् ल् and ञ्.
- (12) *Nuktā* letters of अ and those of क, ख, ग, ज, ड, ढ, स in both full form and half form may be provided.
- (13) The total number of types with figures, punctuation marks and signs may be 149 as shown in Fig. 190.

H 5447-36





Trivedi, however, recommends :

1. The addition of the vowels—आँ, ऐँ, ओँ and consonants—ळ क ख ग ज ट ड ढ फ़ ल
2. The *mātrā* of इ may be placed after the consonant in the form of *velānti* and half-*kānā* ि.
3. The revised form ख may be used.
4. The conjuncts of र may be made by using *halant*.
5. For क्ष and त्र the simple forms of conjuncts क्ख and ल्ख may be used.
6. One of the two forms of the letters अ अ, ल, ल, श, श, झ, झ; ण, ण may be used.
7. घ and भ may be written as घ and भ.

57. L. A. Ravi Varma (1962) 69

The scheme of Ravi Varma is explained in the chart given hereunder :

1. The number of vowel-signs is reduced to अ, इ, लृ, ए, ऐ.
2. The long vowels written by adding a *kānā*, i.e. ई = इा ; ऊ = उा .
3. Short इ *mātrā* ि shall be joined from left. The type will therefore be cut without shoulder or bevel. All other *mātrās* shall be joined from right.
4. Special signs are suggested in the chart as follows :
  - No. 8 for *Samvarta-U-Kāra* from Malayalam.
  - No. 12 for short 'e' of Dravidian language.
  - No. 15 for short 'o' of Dravidian language.
  - No. 21 for Gingivial 't' of Dravidian language.
  - No. 43 for Gingivial 'n' of Dravidian language.
  - No. 44 for Gingivial *Ardhakshara*.
  - No. 49 for hard R of Dravidian language.
  - No. 58 for special *zh* sound of Dravidian language.
  - No. 62 to make vowel-free consonant at the end of words.
  - No. 63 sign for Sanskrit only.
5. *Anuswār* shall be replaced by the half nasal consonant कं = कम्.

H 5447-36a

1	अ		22	त	ट	43	न	ना
2		ट	23	प	प	44		नु
3	इ	पि	24	ख	ख	45	म	भा
4		फ	25	छ	छ*	46		मू
5	उ	७	26	ठ	ठ*	47	य	य
6		७	27	थ	थ	48	र	श
7		७	28	फ	फ*	49	र	श
8	श्र*	७	29	ग	ग	50	उ	उ
9		७*	30	ज	ज	51		अ
10	लृ		31	ड	ड	52	व	व
11	ए	७	32	ढ	ढ	53	श	श
12	एँ	७	33	ब	७	54	ष	व
13	ऐ	७	34	घ	घ	55	स	स
14		७	35	झ	झ*	56	ह	ह
15		७	36	ढ	ढ*	57	ळ	ळ
16		७	37	ध	ध	58	म्	म्
17		०*	38	भ	भ	59	क्ष	क्ष
18	क	श	39	ड	ड	60	ज्ञ	ज्ञ
19	च	च	40	अ	अ	61	श्री	
20	ट	ट	41	ण	प	62		२*
21	ट	द	42	न	न	63		२*

Fig. 191. Alternate forms of Devanagari letters suggested by Ravi Varma

6. The conjuncts shall be made by placing the consonants one after the other. The design of half forms of the following consonants is changed to suit the conjunct formation :—

No. 18 क्	No. 28 फ्	No. 39 झ्	No. 56 ह्
No. 20 ट्	No. 32 द्	No. 48 र्	No. 57 ङ्
No. 26 ठ्	No. 36 ढ्	No. 50 ल्	

It may be noted by reference to the chart that in case of क् and फ् the central bar is dropped. In case of ठ् a dot is placed in the counter and in all other cases including र्, the small bar or the joint to headline is omitted.

7. The *rafār* in कर्क, घर्म etc. shall be written as = i.e. कक्, घन्म. The full र in conjuncts shall be written in original form ग्रह = ग्रह.

58. Vaidya Narayan Tatu Thakur (1964)<sup>70</sup>

- (1) The *Bārākhadi* of अ may be accepted in replacement of 11 signs.
- (2) ऋ, ॠ, ॡ and ॢ may be omitted.
- (3) क्ष and ज्ञ may be written as क्श and द्ज्.
- (4) ङ may be constructed by placing full point after ङ.
- (5) ञ may be replaced with य followed by dot.
- (6) The variations of the conjuncts of र may be dropped. But special forms र्, ऋ, and ॠ may be provided for.
- (7) स may be written as र न = स.
- (8) The letters ख, घ etc. may be written by adding ह sign as ख, घ, छ, झ, थ, ष, ठ, ढ, फ, भ, ष.

59. L. S. Wakankar (1964)<sup>71</sup>

L. S. Wakankar was calligrapher to the Script Reforms Committee appointed by the Bombay Government in 1949-50. He was once in the reformist camp but after close examination of the palaeographic evidence on evolution of the Devanagari and sustained study of the research work of the veteran epigraphist, Shri A. B. Walawalkar, he was converted to the traditional school. He disapproves the *Swārākhadi* of अ and the Lucknow ख. He has come to the firm conclusion that the traditional designs of Devanagari characters, as far as they are scientific, should not be altered, as he says that the Devanagari script can be (and he asserts has already been) successfully adapted to mechanical composing machines.



मन्त्रजप 1200 अहक 4/5 के अंत सक्सेना गोपबन्धुनगर 8 दोपते शब्द 139 पृ 1/1 ...  
 युगवार्ता बंबयी अञ्ज युगवार्ता नागपूर ....

गोपबन्धुनगर आठ जनवरी वीरराम प्रधानमंत्री श्री नेहरूके स्वाध्यायमें पर्याप्त सुधार हो गया है  
 अनुच्छेद दीखलीसे आये डाक्टरोंके उपचारके बाद अन्होंने कल रात डाक्टरोंसे प्रसन्न मुद्रामें  
 बातचीत की और रातभर अच्छी नींद सोये अनुच्छेद अदीरा गांधीने पत्रकारोंको पण्डालके बाहर  
 बताया की श्रीनेहरू कमरेमेंही कुर्सीपर बैठकर पढ़ और बात कर रहेहैं वीरराम साथही आपने क्हाकी  
 आज बहुसे नेताओंनेभी श्रीनेहरू से भेट की और श्रीनेहरू ने श्रीकामराजसे सवीस्तर चर्चियें करनी  
 चाहें पर श्रीकामराज समयका अभाव बताकर स्वयं वहांसे खीसक गये ताकी श्रीनेहरूको कष्ट न हो  
 अदीराजीने यहभी बतायाकी प्रधानमंत्री अभी यहीं छड़े हुअे है और यहांसे नीघरिरीत समयसे  
 पूर्व जानेका अुनका कोजी कार्यक्रम नहीं है दूसरा समाचार पता चला है की महाराष्ट्र व म्हैसूर  
 सीमाके वीषयमें महाराष्ट्रके मुख्य मंत्री श्रीनायक व म्हैसूरके मुख्य मंत्री श्रीनीजलिंगअप्पाने  
 प्रधानमंत्री श्रीनेहरू व गृहमंत्री श्री नंदाकी उपस्थितीमें परसो यहां राजभवनमें प्रायह घंटाभर  
 बातचीत की अनुच्छेद बातचीतका यह सलसीला जारी रतनेके लीये दूसरी बैठकी  
 अुनकी यहां कभीभी हो सकती है अतीती .... क स 4/1

Fig. 192. Current method of setting Devanagari on the teleprinter.

राज्य  
 विकास  
 संस्थेद्वारे  
 संगणकीकृत



Original contribution was made by L. S. Wakankar to South Asian Epigraphy in establishing the origin of the Koranic Arabic Script (as opposed to the Aramaic-origin of scripts Sinai, Lihayan, Thumidine, Sabian and Proto-Hebrew) from the Proto-Girnar Script of Asokan Brahmi in 1950-51. His another research paper on evolution of Devanagari script, developed under the guidance of A. K. Priolkar, appeared in *Marathi Sanshodhan Patrika*. Wakankar came to the limelight when he delivered a talk on Devanagari Script and its Typography in 1961 at the Government Institute of Printing Technology, Bombay. Later, he collected valuable data on type-founding and mechanical composition during his tour of the Continent of Europe in 1962. It was after a comparative study of Roman Typography and Indian Calligraphy, that he wrote a series of articles on 'Characteristics of Devanagari<sup>72</sup>' and its sign-list. Just as the European and American Typographers have always remained faithful to the basic characteristics of the Trojan Column Roman Inscription, Wakankar believes that adherence to fundamental Brahmi Phonography as reconstructed by A. B. Walawalkar should remain the pre-requisite of Indian script designs. Wakankar has studied the present method of setting Devanagari on the teleprinter (see Fig. 192). He has made a novel suggestion in this regard which is referred to in Chapter XIII.\*

60. M. N. Gogate (1964)<sup>73</sup>

1. Gogate states that the Devanagari is not logical, is inconvenient for printing and indexing and is inferior to the Roman script. The defects in the Devanagari script are enumerated by him as under :

- (1) Only one superior dot is used for the nasals ङ्, ण्, न्, म्.
- (2) The phoneme र is written in different ways, i.e. राम, ट्रक, अग्र, कार्य and च्स्व.
- (3) The word संत is also written as सन्त or सन्त and लौकर is written as लवकर. This is against the principle of one grapheme for one phoneme.
- (4) The pronunciations सर्कार, शाम्, दुक्ख, अवश्श are wrongly written as सरकार, श्याम, दुःख and अवश्य.
- (5) The rafār between two letters in the word मूर्ति is written last.
- (6) The graphemes of conjuncts ट्च, द्व, etc. are irregular in that the full letter is written in half form.

\* Chapter XIII, pp. 341-63.

(7) The placement of vowel-signs is not convenient for printing.

(8) Pronunciation Tru (ट्रु) is required to be set as टरु.

(9) The method of writing conjuncts of the three groups, i.e. verti-bar letters, small-bar letters and central-bar letters differ.

(10) Compounds are provided for conjuncts कष=क्ष व्ह=भ, but not for व्य, कल etc.

(11) Alphabetic order is not standardised.

2. Gogate advocates the acceptance of Roman script for Indian languages. He also suggests some modifications in the Devanagari :

(1) International forms of numerals may be accepted in Devanagari.

(2) Distinction between short and long vowel-signs may be dropped.

(3) The distinction in the meaning of सुत and सूत; विचार (ask) and विचार (thought) will be clear from the context.

(4) Writing should be according to the pronunciation, i.e. रूषी for ऋषी; म्हा for मृग; त्रितीया for तृतीया; विष् for विष; चन्चल् for चंचल; दुक्ख for दुःख; सिन्ह for सिंह; ह्व्स for हंस; पुण्ण्य for पुण्य; साहित्य for साहित्य.

(5) ऋ, ष, ज, Visarg (: ) may be omitted.

(6) The graphemes च etc. are used for two distinct phonemes. They should be represented by separate graphemes.

(7) Graphemes should be provided for the foreign pronunciations, अँ, आँ etc.

3. Gogate recommends the following lower-case roman letters for Marathi, arranged in alphabetic order :—

Table 83 : Gogate's Roman Alphabet

a	ā	b	c	c̄	d	ḍ	e	ē	f	g	h
अ	आ	ब	च	च्	द	ड	ए	ँ	फ	ग	ह
i	j	j̄	k	l	ḷ	m	n	n̄	ṅ	o	ō
इ	ज	ज्	क	ल्	ळ	म्	न्	ङ	ण	ओ	ऑ
p	r	s	s̄	t	t̄	u	v	y			
प	र	स्	श्	त्	ट	उ	व	य			

*Ardhanunasik.*

4. For Sanskrit the following additional symbols may be used :—

ī	ṛ	ṣ	ū	ȳ	:
ई	ऋ	ष्	ऊ	ब्	Visarga

5. The new letters (with diacritics) may be named as a = ए; ā = A-bar; c̄ = C-bar; ḍ = D-dot.\*

\*Gogate has since recommended the substitution of Roman capitals for 'bar' and 'dot' letters.

6. Typical Marathi words are written in Gogate's Roman as under :—  
 मराठी = marāṭhi; दिल्ली = dilli; श्रीकृष्ण = srikrisna; जॉन केनेडी = Jon kenedi; मेष = mes; सिंह = si'vha; मे = me; ऋषि = ruṣi.

61. P. B. Kale's Reforms in Devanagari (1962/64) 74

P. B. Kale who wrote an article in the *Masik Manoranjan* in 1915 on script reforms reverted to this subject again after forty-eight years. Kale states that in comparison the time and space required for setting Devanagari is of the order of thirty per cent to forty per cent more than that of Roman script. If vowel-signs could be developed for setting, along with consonants in the same line, after the consonants as per pronunciation, the difficulty in composing Devanagari script would be eliminated.

अक्षर-पत्रिका.

- १ वर दाटून प्रकारचा कळफलक दील आहता. पहील्यात संपूर्ण व्यंजना व ११ स्वरचींही दीली आहता. दु-
- २ सव्या कळफलकातील अक्ष्या व्यंजनाचा "अ"कारान रूप करण्यात आघात जास्त लागतील. १०० शब्दांत
- ३ असत आघात ८४ यंतात. त्यामळी ह्या पध्दतीत जागा व वाळ जास्त लागतील. दाटनीतील फरक, अक्षरा-
- ४ अक्षरातील अंतर वगैरेंचा दृश्य डाळ्यात अकदम भरावा म्हणून काही मजकूर दाटनी पध्दतीनी
- ५ वर छापला आहता. तसंच स्वरचींही पंथाय रूपां दीली आहता. त्यातून अथवा ग्रामनाम नीराळी रूपां
- ६ तव्यानी, साई-दव्याची दृष्टी असणारांनी नीवडावीत. फक्त तत्व हा की, ही चींही व्यंजनानंतर त्याच
- ७ आळीत ट-कलीचीत झाली गाहीजता. त्यात "अचल अनगामी" कळा नकारत, म्हणजे गती कठीत हा
- ८ णार नाही छापण्याकरता १०८ जीळी लागतील, हा वर स्पष्ट कळत आहता. त्यामळी सबंध देवनागरी-
- ९ तीले काणताही शब्द छापता यंतीस आणि तां सजलम वाचता यंतीस. शिवाय टाजीप जळणां साईप
- १० जाऊन कागदाची व छपाची बचत हातीस. पुरस्तकाच्या किमती कमी हातीस. कागदाकरिता लागणारा
- ११ फा-रती अक्षर-ज कमी लागतील हा फायदा महत्वाचा आहता. ही छत्रची मला १९०९-१० साली सृजली;
- १२ व ती मी "मासिक मना-र-जना"तून प्रसिद्ध केली. दुंदईवानां काणत्याही स-शाईकाचा लक्ष हा तत्व
- १३ वीं शकल नाही. ५० वषाच्या आटाकाट पयतनानंतर ही देवनागरी लिपीची यांत्रिक कायस्थमता
- १४ (Efficiency) अजूनपयत वाढली दीसत नाही. हा तत्व अंगीकारल्याशिवाय देवनागरीचा प्रवीतव्य
- १५ घाक्यात आहता, असत मला नीकपून सा-गावसत वाटत. ५० वषाचा अतिहास आज हीच सांगत आहता.
- १६ काणालाहा हा लया व तया पध्दत आणत छत्रचा याचा सारास अणयाण करता यडाल. लनाटाअण,
- १७ मानाटाअण, ट-कलछन ह्याच्या यंत्र-कारजानदारा-नाहा वापरता यडाल. फक्त अशा न्यापार कपन्या-
- १८ न "डा-दळवा स्मारक शाशा, सणालय" आतवाण, नागपूर, ह्या संस्थेला स्वच्छनड याण्य वाटाल तड म-
- १९ नदान व्यावह, हा अष्टा मा ता-२५-८-१९६२ राजज पणट कळत आहता.
- २० शिवटी ही लिपी व तीची पध्दत आणी छत्रची मी भारताच्या अकात्मतांचा आजचा पतीक पडीत
- २१ जवाहरलाल नहर याच्या चरणी वीनमरपण अक्षर पत्रिका करीत आहता.
- २२ नागपूर, रामनवमी, साईर चंद्र, १२.१८८५, तारीख २-४-१९६३.

टीप- टाजीप बा- डी १ पा-जी-ट; अक्षर ४॥ पा-जी-ट; वला-टी २ पा-जी-ट; अक्षर १॥ पा-जी-ट.  
 स्वरचींही-आळी १ तड १-१, १, १, १, १०-१५ १, १, १, १, १६-१९ १, १, १, १, १; शिवटी-१, १, १, १.  
 शिवाय पध्दती अक्षर आ घनाट नीचा, नागपूर.

Fig. 193. Linear design of Kale's Devanagari

All efforts to make the Devanagari a fit script for mechanization, according to him, have failed, in spite of dissecting the letters in all sorts of ways both horizontally and vertically. Kale states that these years

have not been lost in vain because he claims that people have come to the conclusion that the present Devanagari script is not capable of being mechanized in the modern sense.

According to Kale mechanization means the following :

(a) Reduction in time and space to the minimum and ease of composing or typing. Unless the script submits itself to these three factors efficiency cannot be achieved and the script cannot be put on par with the Roman script.

(b) Devanagari is phonetic and therefore if proper vowel-signs are evolved, it will be more efficient than the Roman script for all the Indian languages except probably for Tamil.

Kale has evolved after four decades of silence, vowel-signs which he feels are not unfamiliar to our present Devanagari. The only thing he has done, he states, is that vowels are put after the consonants according to the pronunciation of the word. The case put up by him is summarised below in his own words :

### *The Problem*

In the matter of typewriting or composing with three-step composition in Devanagari the efficiency is reduced by about 40%, white space wasted is about 30% which results in the increase of cost for typing and printing. Books and newspapers should be as cheap as English books and newspapers are, for the same coverage of contents of the subject-matter. Today this difference is about 40%. Text-books will be required by crores as we have set our goal to achieve compulsory primary education within the next fifteen years.

The cost and time involved in using Devanagari in teleprinting is about 30% more than that required by using Roman script.

The object of mechanisation is not for achieving overall efficiency including economy of time and saving of expenses after providing for interest, depreciation and maintenance cost of the machinery.

### *The Requirements*

(a) The script should be the same for both Printing and Typewriting so that a standard script for all purposes could be used.

(b) This limits the number of characters to 92 only for typewriters.

(c) There are only 90 matrices available on the Linotype or Intertype machine (also Photon).

(d) The side magazine of these two machines could be used for sparingly used characters, such as ?, +, ÷, =, s, and \*.





## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

### The Solution

- (a) Just as Government of India has accepted the principle of linear composing of conjuncts in Devanagari, if they so approve the same principle for forming syllables in Devanagari by linear composing, the problem is solved. This means the method of joining vowel-signs to consonants should be linear and according to pronunciation. The method of joining signs like *rafār*, *ardhachandra* and *halant* should necessarily follow the same pattern, i.e. linear composing according to pronunciation.
- (b) The method of joining य and र to all consonants should be standardised by the use of च and ञ, e.g. त्याग should be composed as तयाग and राष्ट्र as राष्ट्र or प्राण as पशण. The short horizontal line below the head-line represents the *halant* form of the preceding consonant.
- (c) By using these two forms च and ञ about 40% to 50% of the problem of forming conjuncts in any write up in Hindi will be solved and all conjuncts with च and ञ, which are after all half-vowels, will look alike. In Marathi 65% of this problem will be solved.
- (d) By adopting this method, the use of ङ, ञ, च, झ, ङ, ट, ढ, फ, ब, म, र, श्र, त्र, ष, and ण could be eliminated. The conjuncts of these letters with consonants other than य and र are so small, that they could be formed in *halant* without affecting the beauty of the script. However to make the fount of 96 types, two out of च, ब, ढ, ढ, and श्र could be retained.
- (e) When we accept the principle of forming conjuncts of य and र as mentioned above the problem of conjuncts श्र and त्र is solved. श्र will be written like this श्र or श्र, and त्र in त्र्यंबक like तश्चंबक. The consonant श्र can be taken in either form श्र or श्र but only one form and not two.
- (f) Similarly the adoption of ख in its present form does not solve the problem of distinguishing it from र and व. Vinoba's ख which is taken from Gujarati or *Modi* script is more rational.
- (g) The conjunct क्ष and ज्ञ should be composed as conjuncts on the principle of standardised formation of conjuncts.
- (h) The consonant ङ seldom occurs either in its full form or *halant* in Hindi or other Indian languages. It could be taken as one complete letter in *halant* like इ or full consonant like ङ.
- (i) The use of *Swarākhadi* as suggested by *Swatantrya-Vir* Savarkar, i.e. "अि, अी, अु, अृ, अॄ, अॆ, and अॆ" should be accepted as we are already using "अ, आ, औ, औ, अं and अः".

(j) If one accepts the above proposals we can reduce the number of characters to 92 (composed of 33 or 34 consonants, 17 or 16 half consonants depending upon what form of ङ is accepted, 9 vowel-signs including अ, 10 figures, 19 punctuation and other signs including *halant*, *ardhachandra*, decimal sign, etc. 3 signs for the letter र viz. *rafār* in वर्ग, तन्हा and राष्ट्र or प्राण by the use of इ and one sign for च; Total 92).

(k) The use of decimal sign . for *Anuswār* and of colon : for *Visarga* will solve this question of mechanisation.

(l) Lastly the four signs of + ÷ = and ?, which will be less on the typewriter, and whose use is very limited in ordinary typing, could be formed by the combination of - and | for +, - and : for ÷, — and — by little turn to the roller for = and ? plus . for ?. Thus the types for typewriter could be 96 as equal to the fount of matrices for Lino or Intertype machine depicting all characters that occur in Hindi or any other Indian language.

### The Results

(a) Types in smaller sizes up to 5 pt. in the suggested script could be perfectly legible and could be read with the same ease as the Roman script is read without affecting the eyesight.

(b) By use of smaller type or by avoidance of white space between lines or by both, the consumption of paper could be reduced by 30%.

(c) This will virtually effect, in not only saving of foreign exchange for paper, but in reducing the cost of books and newspapers which will be of the order of 40% to 45% (30% accounts of saving in paper and 10% to 15% in printing).

(d) Typewriting in the script could be as quick as with Roman script if not quicker and therefore commercial offices, Government departments could adopt the script for Indian languages in all their offices, without any loss of efficiency in either cost or time.

(e) Teleprinting in the script could be done with as much ease and cost as is possible with Roman script.

### 62. V. V. Shirvadkar

Kale was very studious and took note of any new suggestion which was made in regard to the scripts and their reforms. Recently Poet Kusumagraj (V. V. Shirvadkar), president of the Maharashtra Sahitya Parishad, made certain suggestions in regard to the linear setting of Devanagari. Kale immediately reduced them to graphic forms and



published his comments thereon. Kale's version of the suggestions of Poet Kusumagraj is produced in Fig. 195.

हमारु परमपरीय परधानमंतरी शरी लालबहादुर शास्त्री जी क  
लीयठ अश्वर करु यह शुभ दीन बार बार आयठ.  
नाथपर, ता. 2-10-64. पुरुषोत्तम वीळकृष्ण काळठ  
टाटा मरसीडीस-वठस गाडीयां, अ-व-सडर कार, आटेर जीप  
क वपोरि आटेर दठवनागरी टाजीप क कपा-झीटर, अीलकटरीकल  
अजीनीयर तथा टकलठक, अधीकतर 'भारती लीपी' क  
सशुधक (जीसठ चालू दठवनागरी लीपी की छपाजी, टकलठकन  
आटेर टठलीपरी-टी-ग सुलभतासठ तथा कारचक्षमतापरवक हाठता ही  
हठ. लठकीन राठमन लीपी सठथी 12 परतीशत जयादा कारचक्षमता  
वठती ही).

'र'कार'उ'र as suggested by Kusumagraj: 'र'कार'ठ'रे' from Bengali and Asamese Scripts

Fig. 195. Kale's Version of Linear Devanagari suggested by Poet 'Kusumagraj'

Shirvadkar's proposals were later circulated to the Maharashtra Mudran Parishad's Session held at Nanded. They are :

(1) New symbols are suggested for vowels except अ. They are based on the vowel-signs which can be set linearly.

(2) The *Rashtra-Chinha* is  $\wedge$  proposed to indicate conjuncts i.e.

र = दूर.

(3) The headline is dropped.

(4) The number of Devanagari sorts is rendered to only 48.

The use of vowel-signs and the conjunct sign is indicated in Fig. 196.

63. S. K. Toshakhani<sup>75</sup>

Toshakhani believes that "If the Devanagari consonantal characters are given the value of pure consonantal sounds the whole trouble vanishes (क=K and कअ=Ka). He points out that र in कर stands for 'r' but in रख it stands for 'ra' which is not logical. In Braja Language the final अ in words like च, ल, त is pronounced while in Khari Boli final अ in words like च, ल is not pronounced but no distinction is made in writing of Devanagari" which Toshakhani considers confusing.

अ	आ
इ	ई
उ	ऊ
ए	ऐ
ओ	औ
क	ख
ग	घ
ङ	च
ट	छ
ठ	ज
ड	झ
ण	झ
त	ड
थ	ण
द	त
ध	थ
न	द
प	ध
फ	न
ब	प
भ	फ
म	ब
य	भ
र	म
ल	य
व	र
श	ल
ष	व
स	श
ह	ष
ळ	स
ळ	ह

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

## स्वरचिन्हाचा वापर

जोडाक्षराची जोडवूण: १

उदा. क - क१२, ख - ख१२, व्य - व्य१२३.

स्वरचिन्हे	अ	क	ख
आकार १	आ आ१	का का१	खा ख१२३
इकार १	इ आ१	कि का१	खि ख१२३
ईकार १	ई अ१	की का१	खी ख१२३
उकार ३	उ अ३	कु क३	खु ख१२३
ऊकार ३	ऊ अ३	कू क३	खू ख१२३
ऋकार ४	ऋ अ४	कृ क४	खृ ख१२४
ऐकार ४	ए अ४	कै का४	खै ख१२४
औकार ४	ए अ४	कै का४	खै ख१२४
ओकार ४	औ अ४	को क४	खो ख१२४
औकार ४	औ अ४	कौ क४	खौ ख१२४
अनुस्वार ४	अं अ४	कं क४	खं ख१२४
विसर्ग ४	अः अ४	कः क४	खः ख१२४

Fig. 196. Shirwadkar's suggestions : Vowel-signs and the Conjunct sign.

He considers “*mātrās* a great source of trouble to the compositor and make the task of inventing a simple typewriter in Hindi well-nigh hopeless.”

Toshakhani says that with his method “morse-code can be adopted letter for letter, the long being denoted by a repetition of short vowels and the dots and bars for x, g, w will do duty for क्ष, ज्ञ, and औ, ऐ, will be denoted by dots and bars used for ‘ai’ and aspirates like ख by dots and bars used for ‘k’ and ‘h’.

Toshakhani’s method is illustrated below :

Hindi-Khadi Boli—

‘वह धन ही क्या जो पडा रहे  
धरती में गड कर दब जाये’ (श्री गोपाल प्रसाद)  
‘वअह धअन हई कयआ जओ पअडा रअहए  
धअरतई मए गअड कअर दअब जआयए’

*Braja Bhasha*—

‘गल तुलसी की माल बनी जोहत मन मोहन’  
गअलअ तअलअसई कई मअलअ वअनई  
जओहअतअ मअनअ मओहअतअ

#### 64. Shankar Anant Atreya<sup>76</sup>

1. ऋ, ॠ, लृ, and लॄ, are not pure vowels. (र्+ऋ=ठ, र्+ॠ=ड; ल्+लृ=लॢ; ल्+लॄ=लॣ). In their place ऋ and ॠ may be substituted as pure vowels.

2. The present form of consonants such as र, द may be considered vowel less or *halant* forms. This convention will eliminate conjunct forms, i.e. बुद्धी=बुदधी, अर्धचंद्र=अरधचनदरा. The *halant* forms of verti-bar letters may be made by removing the verti-bar.

3. The central-bar letters and short-bar letters may be provided with a *Kānā* to represent vowel ending forms. क=क, का=क, फ=फ, फा=फ.

The vowel-ending forms of other short-bar the letters are :

डा, छा,, टा, ठा, डा, ढा, दा, रा, हा, ळा  
ड छ ट ठ ड ढ द र ह ळ

4. The letter ज्ञ may be used for ख .

The list of type-sorts may be reduced to 53 as under :—

(1) डा ता पा १ ति [ [ ५ [ १ १ १ १ १ :

- (2) क इ र ष ड , च छ ज झ ञ  
 ट ठ ड ढ ण , त थ द ध न  
 प फ ब भ म , ळ ळ ळ ळ  
 ष = ल ळ इ (१), ळ र ह ल

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The *Bārākhadi* of the central-bar and short-bar letters will be as under :

- क का कि की कु कू के कै को कौ कं कः  
 = का काा की की कू कू को की को कौ कां काः  
 ट टा टि टी टु टू टे टै तो टौ टं टः  
 = टा टाा टी टी टू टू टी टौ टौ टां टाः

The short 'i' forms of verti-bar letters may be written as चि=ची, ति=ती  
 नागरीचें नियमन प्रात्यक्षांत आणण्याच्या झटापटीतले पहिलें पाऊल म्हणून  
 प्रास्तुत पुस्तिकेचें लोढाणे महाराष्ट्रीय जनतेच्या गळ्यांत बांधण्यांत येत आहे.  
 नागरीचें नियमन प्रात्यक्षांत आणण्याच्या खटपटीतले पहिले पाऊल म्हणून प्रस्तुत  
 पुस्तिकेचें लोढाणे महाराष्ट्रीय जनतेच्या गळ्यांत बांधण्यांत येत आहे.

#### 65. Shankar Ramchandra Date

Date is one of the few typographers who has been continuously working on the Devanagari type-setting. His Monotype Devanagari brought out 35 years ago is currently in universal use and still remains the only method of setting Devanagari mechanically in its traditional design with minimum distortions. Date is opposed to alterations in the present 'look' of the script. He advocates minimum changes necessary for mechanical setting with full utilization of the keyboard capacity. His current proposal is as under :

1. The vowel-symbols इ ई उ ऊ ऋ ए ऐ may be replaced with *Bārākhadi* of अ i.e. अि, अी, अु, अू, अृ, अे, अै. The *Bārākhadi* of अ may be used in the text-books.

2. The *Rafār* may be replaced by half र i.e. = (सू-य=सूर्य. षू-व=पूर्व.). The unaccented र् in सू-यास may be written as २ i.e. सूर्यास and accented र् may be written as = i.e. नि-भीड, भू-दंड

3. The *Rafār* preceding ऋ may be written as रृ as in नैरृत्य, निरृति.

4. In the conjuncts with short i, the short i of F may be written before the last member in the conjunct i.e. उद्भिज.

5. *Halant* is not used at the beginning of the word. व्वाड, व्दितीया, व्वेष, may be written द-वाड दि-वतीया, द-वेष ह-या.

6. Conjuncts with र as last member may be written as ख्रिस्त=ख्रिस्त, ग्रास=ग्रास, क्रम=क्रम. The *Rāstra* sign ( ॡ ) may be retained in words like राष्ट्र, द्राक्ष.

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## APPENDIX B

### DECISIONS OF THE COMMITTEES APPOINTED BY THE LITERARY ASSOCIATIONS AND THE GOVERNMENTS

#### 1. Maharashtra Sahitya Parishad (1931-35)<sup>1</sup>

The Maharashtra Sahitya Sammelan in its Annual Conference held in 1927, appointed a committee to consider the standardisation of the Devanagari script. A conference of the script reformers and those interested was called at Poona by N. C. Kelkar, the chairman of the committee (1931) when the following decisions were taken :

- (1) The vowel-symbols may be formed by attaching the vowel-signs to the basic vowel. अ. i. e. अि. अी. अु. अू.
- (2) The construction of the conjuncts in the ligature form should be discontinued in favour of linear setting.
- (3) The principle of providing a *kānā* to क फ and र (i.e. क्क, फ्फ and र्र) is accepted but may not be put into practice immediately.

The Maharashtra Sahitya Sammelan again in its Kolhapur Session, presided over by the Maharaja Sayajirao Gaikwad *in absentia*, passed a resolution on the script reforms and a committee was appointed to go into the problem again. After much deliberation the following decisions were taken in the meeting (25th December 1935) :

- (1) Attempts should be made to eliminate the head-line as it is not essential in Devanagari letters.
- (2) The vowel-symbols इ ई उ ऊ ए ऐ may be replaced by *swarākhadi* of अ i.e. अि, अी, अु, अू, अे, अै.
- (3) The vowel-signs of ई (long *velānti*) उ ऊ (*ukār*) and ए ऐ (*mātrā*) may be placed after the letters and not exactly above or below (क<sup>१</sup> क<sub>२</sub>).
- (4) The vowel-sign of short इ (short *velānti*) should be placed after the letter and joined below the verti-bar.
- (5) The consonants in conjuncts should be placed one after the other.
- (6) The forms of the consonants in conjuncts may be made by removing the verti-bar while the consonants like ट ठ etc. may be joined with ~ to the next letter. The absence of vowel in the last letter may be shown by *halant*.

- (7) The *reph* २ may be placed between two letters in the form of small २ cutting the head-line, घर्मं=घरम.
- (8) Open dot • may be used for full *anuswār* and a dot for *anunāsik*. They should be placed after the letters (क० and क.).
- (9) The *charan-regh* १ may be used for the full-point.
- (10) The letters ञ, झ, ण, may be written in the Bombay style, i.e. ञ, झ and ण, श may be written with loop श, i.e. and ल may be written in the Hindi style ल.
- (11) The pronunciation of short ए and short ओ in the South Indian languages may be indicated by *mātrās* of special design.
- (12) All the figures should be in the Bombay style.
- (13) The dento-palatal, च and other pronunciations may be indicated by a point before the letters touching them.
- (14) The present forms of letters ॐ, ज्ञ, श्री and क्ष used in Algebra may be retained.
- (15) Kakasaheb Kalelkar, Y. R. Date and S. R. Date were requested to propagate these recommendations.
- (16) When the above reforms receive general acceptance the *mātrās* may be written as [ १ २ ३ ४ ५ ] in the same line.

## 2. Hindi Sahitya Sammelan (1934)<sup>1</sup>

The script reforms were discussed in the Annual Conference of the Hindi Sahitya Sammelan held in 1934 at Delhi when Late Sayajirao Gaikwad was the President. A committee of the following persons was appointed:

- (1) Prof. Virendra Varma, Prayag,
- (2) Dr. Sunitikumar Chatarji, Calcutta,
- (3) Dr. Nalinimohan Sarkar, Calcutta,
- (4) Br. Vinayak Damodar Savarkar, Ratnagiri,
- (5) M. M. Pandit Gaurishankar Oza, Ajmer,
- (6) Shri Anand Shankar Dhruv, Kashi,
- (7) Shri Satyanarayan Sinha, Madras.

In its 24th Conference held, at Indore in 1935, personnel of the committee was revised under the convenorship of Shri Kakasaheb Kalelkar as under :

- (1) Shri Kakasaheb Kalelkar, Wardha (Convenor),
- (2) M. M. Pandit Gaurishankar Hirachand Oza, Ajmer,
- (3) Shri A. C. Bulnar, Lahore,
- (4) Dr. Sunitikumar Chatarji, Calcutta,
- (5) Shri Pisharoti, Madras,
- (6) Shri Babu Ram Saksena, Prayag,
- (7) Shri Kishorlal Mashruwala, Wardha,

- (8) Shri Lalataprasad Shukla, Calcutta,  
 (9) Shri Hari G. Govil, Calcutta,  
 (10) Shri Shankar Ramchandra Date, Poona.

The committee held its meetings at Wardha on 25th June 1935 and at Prayag on 23rd April 1936. Laxman Swaroopji, Lahore, Dr. Raghuvverji, Lahore, and Yashvantrao Date, Poona, were co-opted and Sarvashri Mukunda Das-Gupta, Kashi, Ranajeet Sitaram Pandit, Prayag, Kedarnath, Kashi, Baba Ragavdas and Purushottamdas Tandon were present by invitation. The committee circulated a draft for public opinion. The final report was presented to the Nagpur session of the Sammelan and subsequently adopted by the standing committee in its meeting held on 24th/26th March 1937.

The decisions of the standing committee are given below :

(1) The head-line is not necessary in writing ; in printing it should be retained except where, in certain cases, distinction is aimed at. In the small type, where head-line reduces clarity, it may be dropped.

(2) The letters may be written in the order of pronunciation.

(a) The short ' i ' sign ( ı̇ ) may be written before the consonant till a satisfactory solution is found.

(b) The *mātrās* for vowels ए, ऐ, ओ and औ may be placed on the top, but after the consonants on the right as व<sup>॑</sup>त्ता, अ<sup>॑</sup>कणे, आ<sup>॑</sup>ला, आ<sup>॑</sup>रत्त .

(c) The signs for ' उ, ऊ ' and ' ऋ ' may be written in the same line and after the consonant : क<sup>॑</sup>ट्टील, प<sup>॑</sup>जा, स<sup>॑</sup>ृष्टि.

(d) The sign for *anuswār* and *anunāsik* may be written after the letter as अ<sup>॑</sup>श for अंश.

(e) The half ' र् ' expressed by *rafār* ( ˘ ) may be written in order of pronunciation as ध<sup>॑</sup>र्म for धर्म.

(f) In conjuncts ' र् ' coming as second consonant, may be written in full form as in प्रकार for प्रकार, त्रण for त्रण.

(g) In conjuncts, the consonants may be placed one after the other. द्वारका for द्वारका, विद्वत्ता for विद्वत्ता, समाप्त for समाप्त.

(3) The *swarākhadi* or *barākhadi* of ' अ ' may be adopted in place of the existing style of writing separate symbols, i.e. अि, अी, अु, अू, अे, अै for इ ई उ ऊ ए ऐ.

(4) In the languages spoken in the South short ' ए ' and short ' ओ ' are used. They may be represented by placing the *mātrā* in a little different way.

(5) The full *anuswār* may be represented by open dot ' ॰ ' and *anunāsik* by dot ( ˙ ) i.e. सि<sup>॰</sup>ंह, चा<sup>॰</sup>ंद. ड्, ञ्, ण्, न्, म् may be written as



च०चल for चञ्चल, प०थ for पन्थ, प०प for पम्प, except in cases such as वाङ्मय, तन्मय, etc.

(6) *Nuktā* or a point under the letter, may be used to denote separate pronunciation such as क ख ज झ in Persian, च in Marathi and ज in Sindhi.

(7) The punctuation marks may be used as in English except that *charan-regh* 1, (*Pai*) may be used for full-point.

(8) The figures may be written in the Bombay style :

१, २, ३, ४, ५, ६, ७, ८, ९, ०.

(Later in the Sub-Committee meeting, dated 5th October 1941, it was decided to retain the Hindi form of figures ५ and ६).

(9) It is necessary to replace the 'ख' with 'ध'.

(10) The Bombay style letters 'अ, झ, ण' may be used for अ, झ and ण while the Hindi style letters ल श may be used for ल and श. 'क्ष' may be used for 'क्ष' except in Algebraic writing where 'क्ष' may be used.

(11) The letter 'ळ' may be added for writing the Marathi, Gujarati, Kannada and Tamil words.

(12) Since there is difference in the pronunciation of 'ज्ञ' its present form may be retained. Both forms ओ३म् and ॐ may be used. श्री may be written as इरी or श्री.

(13) Conjuncts may be made by removing the verti-bar from the letters having one. The half-forms of क and फ may be written as व and फ. The conjuncts of the letters with short-bar छ, ट, ठ etc. may be made by placing a joining sign (hyphen), i.e. विठ-ठल, उच्छ-वास बुड-डा, ब्रह्-मा.

(14) भ and घ may be differentiated from म and घ by using a revised design with a loop भ, घ.

### 3. Baroda State Script Reforms Committee (1936)<sup>9</sup>

The report of the Script Reforms Committee appointed by the Boroda State Government has been published in the State Gazette of 2nd July 1936. The object of setting up this committee was to recommend a common script for Hindi, Marathi and Gujarati. The fact that in the absence of a common script inter-State exchange of views and undertaking becomes difficult, has been accepted in the Royal order. The committee set up the following aims and objects of script reforms :

(a) A common script will bring the Hindi, Gujarati and Marathi-speaking people together.



(b) The 'look' of the current script should not be altered beyond recognition.

(c) Reforms are aimed at the facility in writing and printing.

(d) The beauty of the letters should be preserved.

The Committee made following recommendations :—

- (1) The head-line may be removed.
- (2) The vowels इ, ई, उ, ऊ, ए, ऐ, and ऋ may be replaced with *swarākhadi* of अ.
- (3) The vowel-signs may be placed after the consonants, slanting towards right, i.e. सैवक, सुचक.
- (4) The vowel-signs may be set up according to the order of pronunciation except that the short इ sign ि may be retained till satisfactory solution is found.
- (5) The conjuncts may be set in linear style, i.e. द्वारका
- (6) The verti-bar may be dropped when the consonant is used without a vowel.
- (7) The consonant forms of क and फ should be क, फ,
- (8) Short-bar letters may be used in conjants with a joint ७
- (9) The *halanta* sign may be used for consonant-ending words.
- (10) The *Reph* ( ° ) may be replaced with र् i.e. कार्य-कार्य.
- (11) The *anuswār* be placed after the consonant i.e. संशय संशय
- (12) 'Half' *anuswār* may be indicated by consonant, i.e. ड, ञ, etc.
- (13) *Danda* or *Khadi-pai* may be used for fullpoint.
- (14) All other punctuation marks may be continued.
- (15) The letter अ, ऋ, ए, be wirtten in the Bombay style अ, झ, ण,
- (16) The Hindi form श may be used.
- (17) The Hindi-Gujarati form of ल be used in preference to ल.
- (18) Devanagari ख be replaced with old Marathi-Gujarati form ॡ.
- (19) The short ए and ओ occurring in the South Indian languages be indicated by a horizontal *Mātrā*.
- (20) The figures may be written in the Bombay style.
- (21) A dot may be placed on the left of the letter to indicate different pronunciation, i.e. .क, .ख, etc.
- (22) The current forms of उ, श्री, and ज्ञ may be retained. क्ष may be written as क्ख except in Mathematics.



#### 4. Government of Bombay (1939)<sup>4</sup>

Fresh attempt to standardise the Devanagari at State level was made in 1939 by the then Bombay Government when the following resolution was issued :

The type to be used in the Devanagari edition of the Hindustani text-books should be that which is used in the Hindi publications except for the following necessary alterations :

- (1) The letters अ, झ and ण must be of the Bombay type.
- (2) The letters ल and श must be of the Calcutta type ल, श, (which is known as the usual Devanagari type).
- (3) In order to express the different pronunciations of the following Urdu letters a dot should be placed under them :

ख़ ज़ श ड़ ढ़ क़ ग़

(4) The figures of the numbers must conform to the Bombay mould.

०, १, २, ३, ४, ५, ६, ७, ८, ९.

Following is the table of the letters :

Table 84. Table of letters showing alternate letter forms.

अ must be	अ (Bombay type)	ल must be	ल (Calcutta type)
आ	आ	श	श
इ	अि	ख	ख
ई	अी	ख़	ख़
उ	अु	ख़	ख़
ऊ	अू	ख़	ख़
ए	अे	ख़	ख़
ऐ	अै	ख़	ख़
ओ	अो	ख़	ख़
औ	अौ	ख़	ख़
अं	अं	ख़	ख़
अः	अः	ख़	ख़
अ्	अ्	ख़	ख़
अ	अ	ख़	ख़

The transcription of the Hindi words like *prakār*, *kṛipā*, etc., should be made thus : प्रकार پرकार कृपा करपा प्रेमी प्रीमी i.e. the first letter should have a *jazm* over it in order to help the students in forming the correct pronunciation.

In the particular cases of conjunct consonants mentioned below, the component letters should invariably be placed one after the other in the

order of pronunciation linearly when the following changes will take place in the usual letters :

The letter having a pai (i.e. a perpendicular stroke as in ग, म, प, स, ख, घ, च, ज, झ, ञ, त, थ, ध, न, प, व, भ, य, ल, व, श, स, क्ष, ज्ञ) where it forms the first letter of a conjunct consonant and is, therefore, half letter, should drop its pai and be joined to the next following letter, with the exception of र linearly.

In the case of क and फ their half forms would be क and फ respectively as the first letters of conjunct consonants. Hence,

शुक्र	must be written as	शुवल	कृतज्ञ	must be written as	कृतघ्न
प्राप्त	"	प्राप्त	कुमाराष्टा	"	कुमाराप्पा
अन्न	"	अन्न	हिजे	"	हिज्जे
पक्क	"	पक्व	बच्चा	"	बच्चा
मल्ल	"	मल्ल	अश्व	"	अश्व
शक्ति	"	शक्ति	दत्त	"	दत्त

When Yā-e-Marūif occurs in the middle of a word, it should be expressed by putting a short line under the two dots, e.g. نیلی (nili) = نیلی while Ya-e-Mujhul, by a Jazm over it, e.g. تهیلی (thaili) = تهیلی

Waw Maruf should be expressed by an inverted pesh over it, e.g. دور (dūr) = دور

Nun-e-ghunna in the middle of a word should be expressed by an inverted Jazm, e.g. هنسو (hanso) = هنسو

Zer and pesh must be used to express the correct pronunciation of every difficult word.

#### 5. Nagari Pracharini Sabha \*

In its meeting held on 24/25 Jyestha Samvat 2002, the Script Sub-Committee of the Nagari Pracharini Sabha adopted certain principles governing the changes in the script.

(1) It is necessary to reform the Nagari script from the utilitarian point of view.

(2) New graphemes may be evolved to represent the phonemes from other languages, as well as from Hindi, which are not provided with symbols.

(3) While effecting the changes in conjuncts etc. for facilitating writing and printing, care should be taken to preserve the beauty of the script and not to change the face of the current script beyond recognition.

(4) Before finalising the changes, the efforts so far made towards the script reforms, should be studied.

The Sub-Committee later adopted the following line of action :

(1) To begin with the Devanagari should be reformed for Hindi and Sanskrit only.

(2) The design of the writing and printing scripts should not be different from each other.

(3) For facility in printing, the linear method may be adopted in arranging consonants. The *mātrās* may be placed after the consonants in the same line.

The Sub-Committee after examining the suggestions it received, recommended the scheme of Srinivas which is summarised in Appendix A at page 529.

#### 6. Narendra Dev Committee (1949) \*

The Government of U.P. appointed a Committee by an order dated 31st July 1947 to consider :

- (a) the script-reforms suggested by the Nagari Pracharini Sabha,
- (b) particularly from the point of view of their adaptation for composing, typing,
- (c) its suitability for Sanskrit,
- (d) the necessity of changes in the Devanagari script, and
- (e) the facilities and usefulness of the reformed script for the languages other than Hindi and also languages like Marathi which use Devanagari alphabet.

The following was the composition of the Committee :

#### *Chairman*

1. Acharya Narendra Dev.

#### *Members*

2. Dr. Dharendra Varma, Prayag University.
3. Pandit Ramshankar Dwivedi, Lucknow University.
4. Pandit Chandrashekhar Shastri, Principal, Shri Baladev Sahay Sanskrit College, Kanpur.
5. Pandit Bhau Shastri Baje, Brahma Ghat, Banaras.
6. Dr. Mangal Dev Shastri, Government Sanskrit College.
7. Rai Bahadur Pandit Shri Narayan Chaturvedi, Special Officer, Education Department (*Secretary*).

M. M. Pandit Narayan Shastri Khiste was later nominated on the Committee.



The Committee in its report stated that the number of the advocates of Roman script for Indian languages was increasing in the country. It was therefore necessary to reform the Devanagari script to adapt it to the new printing era. Such changes were not new. They have been made in the past. The general conclusions of the Committee in relation to the terms of reference are given in Chapter 9 of its report at pages 63 to 79 and are summarised below :

(a) The recommendations of the Nagari Pracharini Sabha are not acceptable *in toto* at this stage although some of them are useful, logical and scientific.

(b) Acceptance of the *Prati-Sanskrit Lipi* of Srinivas will create difficulties in actual practice as it would be necessary to learn it afresh. Although the number of types in it is much reduced, it is not acceptable for printing as its 'look' is quite different from the current script.

(c) The *Prati-Sanskrit Lipi* is not suitable for writing grammatically correct Sanskrit.

(d) The change in the script should not be such as to make it necessary to learn it afresh. Within this limitation minor changes may be effected to facilitate its adaptation to mechanical composition.

(e) The reformed script will be useful for writing other Indian scripts such as Marathi and Gujarati.

Negative decisions of the Committee<sup>7</sup> are :

(i) The subtle difference of one *mātrā* and two *mātrās* (the time units) in the pronunciation of the vowels, may not be recorded in writing.

(ii) The *swarākhadi* of अ is not acceptable.

(iii) There should be no change in the vowel-*mātrās* except in short इ *mātrā*.

(iv) The consonants in conjuncts should be placed one below the other.

(v) Changes which are undesirable should not be accepted only for the facility of mechanical setting.

The positive decisions of the Committee<sup>8</sup> are :

(1) The vowel-*mātrās* may be placed after the consonants on the right, in their present design, i.e. कंङल, क<sup>॥</sup>क<sup>॥</sup>यी, संपूण.

(2) The open dot ° (*shunya*) may be used to represent pure *anuswar*. Except in cases like वाङ्मय, तन्मय etc. the nasals इ वृ ण् न् म् may be represented by the *shunya*. The *anunāsik* may be represented by dot : i.e. हंसना, हंस.

(3) The head-line may be retained.



(4) The *mātrās* of ऋ and ॠ may be placed on the right in their present design.

(5) The conjuncts of the consonants with verti-bar may be made by removing the verti-bar ग → र, र → ॠ (and not ॡ), वक्र=वकर; धर्म=धम; वस्त्र=वस्तर.

(6) Except क and फ, the consonants without verti-bar may be used with *halant* in conjuncts in their half forms, i.e. राष्ट्र=राष्ट्रर विद्या=विद्या बाह्यण=बाह्यण.

(7) The short इ *mātrā* may be written after the consonant. Its form will be modified by turning the *kānā* to make a loop at its foot.

(8) The script for composing shall be as detailed below :

(a) The vowel-*matrās* of इ, ई, उ, ऊ, ए, ऐ, ओ, औ, अं, ऋ, ॠ, and the *halant* sign, may be placed on the right of the consonant to facilitate line composing.

(b) Diacritical marks may be used to represent the new phonemes.

(c) Conjunct forms of conventional design (क्ष, त्र, ज्ञ etc.) may be replaced in due course.

(9) Other recommendations of the Committee :

(a) The form of अ shall be in the Bombay style अ.

(b) The form of the consonants छ, झ, ञ घ भ र ल and ह shall be as under :

छ, झ, ञ, घ, भ, र ल, and ह

(c) The short इ *matrā* shall be as: ३

(d) त्त and त्र may be written as त्त and त्र.

The revised alphabet shall be as under :—

१	२	३	४	५	६	७	८	९	०					
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	ऋ	अं	अः		
क	ख	ग	घ	ङ	च	छ	ज	झ	ञ	ट	ठ	ड	ढ	ण
त	थ	द	ध	न	प	फ	ब	भ	म					
य	ॠ	ल	व	श	ष	स	ह	ज्ञ	ळ					

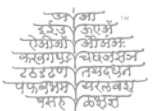
(e) The punctuation marks as used in English may be accepted except the full-point for which the *Kadi-pai* shall be used.

The marks shall be :

। - — , ; : ! ?

(f) The following signs may be provided on the typewriter keyboard :

... / \ ' ^ % " " ( ) + × ÷ \* = †



The fount of Devanagari according to the system of Dr. Gorakha-  
prasad<sup>9</sup> accepted by the Narendra Dev Committee is given below :

Table 85: Founts of 110 types suggested by Dr. Gorakha-  
prasad.

(i) Full letters					
Vowels	अ, इ, ई, उ, ऊ, ए, ऐ.				7
Consonants	क, ख, ग, घ, ङ    च, छ, ज, झ, ञ ट, ठ, ड, ढ, एण    त, थ, द, ध, न प, फ, ब, भ, म य, र, ल, व, श, ष, स, ह, ञ, ञ				35
(ii) Half letters	क्, ख्, ग्, घ्, ङ्    च्, छ्, ज्, झ्, ञ् ट्, ठ्, ड्, ढ्, एण्    त्, थ्, द्, ध्, न् प्, फ्, ब्, भ्, म्				26
(iii) Conjuncts	श्च				1
(iv) <i>Mātrās</i>	। १ ी २ ३ ४ ० १ २ ३ ४ ५				14
(v) Marks of punctuation	.. .. ..				9
(vi) Figures	.. .. ..				10
(vii) Miscellaneous	.. .. ..				8
					110

It is claimed that composing in the above fount can be done in 70 per cent of the time required for composing in the conventional fount.

The Narendra Dev Committee was not opposed to changes but it said that the changes should be gradual and that when they are brought about Devanagari will gain international acclaim.<sup>10</sup>

#### 7. Bombay Script Reforms Committee (1949)<sup>11</sup>

The Government of Bombay appointed a Committee to suggest reforms in the Devanagari (*Bālbodha*) and Gujarati scripts consisting of the following members :

1. Acharya Kakasaheb Kalelkar, Chairman.
2. Shri G. P. Vijapure, Karhad.
3. Shri Y. R. Date, Poona.
4. Shri Keshavram K. Shastri, Ahmedabad.
5. Shri Kishorlal Mashruwala, Wardha.
6. Shri Shivaji Narahar Bhabe, Dhulia.
7. Shri H. K. Fhirodia, Bombay.
8. Shri Bachubhai Ravat, Ahmedabad.
9. Shri Dhirajlal C. Modi, Bombay.

अ आ अ<sup>१</sup> अी  
 अ<sup>२</sup> अ<sup>३</sup> अ<sup>४</sup>  
 अ<sup>५</sup> अ<sup>६</sup> ओ औ  
 अ<sup>७</sup> अ<sup>८</sup> अ<sup>९</sup>

Fig. 197. Vowels with the head-lines

Reformed letters

अ आ अ<sup>१</sup> अी अ<sup>२</sup> अ<sup>३</sup>  
 अ<sup>४</sup> अ<sup>५</sup> अ<sup>६</sup> अ<sup>७</sup> ओ औ  
 अ<sup>८</sup> अ<sup>९</sup> अ<sup>१०</sup>

Fig. 198. Vowels with serifs

क ख ग घ ङ  
 च छ ज झ ञ  
 ट ठ ड ढ ण  
 त थ द ध न  
 प फ ब भ म  
 य व र ल ळ  
 श ष स ह  
 क्ष ज्ञ श्र ॐ

Fig. 199. Consonants with the head-line

क ख ग घ ङ  
 च छ ज झ ञ  
 ट ठ ड ढ ण  
 त थ द ध न  
 प फ ब भ म  
 य व र ल ळ  
 श ष स ह  
 क्ष ज्ञ श्र ॐ

Fig. 200. Consonants with serifs



Prof. K. B. Vyas, Elphinstone College, and Prof. N. R. Parasnis, S. T. College, Bombay, were appointed Joint Secretaries to the Committee. L. S. Wakankar was appointed official calligrapher to the Committee. The recommendations of the Committee<sup>12</sup> are :

1. The design of the Devanagari letters should be such as it will render itself to the retention or removal of the head-line without creating any confusion or any difficulty in joining *mātrās*, etc. The head-line should be omitted from words and passages proposed to be emphasised.
2. The Devanagari letters may also be designed with serifs, i.e. by breaking the continuity of the head-line in words (*see Fig. 200*). Such letters can be used for emphasis. They may be introduced on typewriters first in order to popularise them.
3. (a) Devanagari घ and भ may be designed with a loop घ, भ.  
(b) The Hindi ल with the verti-bar may be accepted in place of *Bālbodh* ल.
4. *Bālbodh* ख may be replaced with Gujarati ખ (*see Fig. 199*).
5. The conjuncts may be constructed by placing the consonants one after another, such as : रक्त = रक्त, शुक्ल = शुक्ल, क्रम = क्रम.
6. र coming as first consonant in the conjuncts is written as र or ° and in the full form coming as last member in the conjuncts is written as र or र. It may be written in the order of pronunciation in one form only. *Halant* र is not recommended as the *halant* sign is likely to slip. Instead the half form र as used in र्हास may be used for the *reph.* i.e. सुर्यास=सुर्यास. Unaccented र in conjuncts with य may be written with three-fourth य.
7. In order that writing may be according to the phonetic sequence, short इ *mātrā* should be placed after the consonants in a diminutive form of काना ई.
8. It would be ideal to set up Devanagari in only one line instead of its present three-step arrangement. However, as the first step, the *mātrā*, *ukār* and *rukār* coming in the bottom line may be moved up in the central line. The white space which would be created by placing *ukārs* after the consonants may not be disturbing in Marathi and Hindi, owing to the presence of the head-line. This cannot, however, be said of Gujarati where there is no head-line. In order not to be far away from the conventional placement of *ukārs* under the consonants, it is suggested that they may be designed slightly descending below the base-line.
9. The hyphen sign may be attached to the letters without verti-bar such as ट, ठ, ड etc.; so that they can be joined with another consonant

अ आ इ ई उ ऊ ऋ ॠ ऐ ए ओ औ अं अः  
 अ आ अं अी ऋ अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ ओ ओ औ अं अः  
 अ आ अं अी ऋ अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ आ आ औ अं अः

Fig. 201. Kalelkar's suggestions on vowels and Vowel-signs .

अ आ अं अी अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ आ आ औ अं अः  
 अ आ अं अी अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ आ आ औ अं अः  
 अ आ अं अी अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ आ आ औ अं अः  
 स सा स॑ सी स॒ स॒ स॒ स॑ स॒ स॒ स॒ सा सा सः सः

Fig. 202. Kakasaheb Kalelkar's suggestions regarding linear setting of Devanagari.

० १ २ ३ ४ ५ ६ ७ ८ ९  
 स सा स॑ सी स॒ स॒ स॒ स॑ स॒ स॒ स॒ सा सा सः सः  
 द दा द॑ दी द॒ द॒ द॒ द॑ द॒ द॒ द॒ दा दा दः दः  
 ट टा ट॑ टी ट॒ ट॒ ट॒ ट॑ ट॒ ट॒ ट॒ टा टा टः टः  
 र रा र॑ री र॒ र॒ र॒ रे रे रे रो रो रौ रं रं  
 अ अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ अ॑ अ॒ अ॒ अ॒ आ आ औ अं अः

Fig. 203. Kalelkar's suggestion on consonants-Vowel-sign combinations.



to form conjuncts without using *halant*. Half forms of छ and ङ may be made by removing the joint to the head-line. The *swarākhadi* of अ may be used.

10. The Devanagari letters may be designed with uniform set-width for the typewriters. The Hindi style design of ण i.e. ए may not be accepted.

11. The designs ओ and औ in the form of *Bārākhadi* of अ are current in Marathi. Gujarati has accepted ऐ and औ. The remaining vowels इ, ई, उ and ऊ may also be accepted in *swarākhadi* style, i.e. जि, औ, अु and अू. The *swarākhadi* of अ may be written as shown in Fig. 201.

12. A *nuktā* may be placed little before the consonant instead of placing it right below the consonant for expressing the linguals च, ज, झ.

13. The figure २ may be simplified. Design of figure ९ may be made horizontal.

Gujarati style figure 5, i.e. ५ may be accepted for Marathi. Figures ३ and ६ may be simplified by dropping the loop at the foot.

8. S. H. S. H. T. Committee and Parliamentary Committee (1951)<sup>13</sup>

Late Dr. Rajendra Prasad, the President of India, appointed a committee in 1948, on behalf of the Constituent Assembly, to report on Standardization of the Hindustani Shorthand and Hindi Typewriter of which the following were members:

#### Chairman

1. Shri Kakasaheb Kalelkar, Vice-President, Hindustani Prachar Sabha, Wardha.

#### Members

2. Shri M. Satya Narayan, Secretary, Dakshina Bharat Hindustani Prachar Sabha, Tyagaraj Nagar, Madras.
3. Shri Kripa Nath Mishra, Professor, Patna Science College, Patna.
4. Acharya Shri Sriman Narayan Agrawal, Principal, Govind Ram Seksaria Commerce College, Wardha.
5. Dr. Babu Ram Saksena, Principal, Kayastha Pathashala University College, Allahabad.
6. Bhadant Anand Kausalyayan, Secretary, Rashtra Bhasha Prachar Samiti, Wardha.

Prof. Balkrishna was appointed the Secretary to the Committee.

The Committee was charged with the task of reporting on (a) a suitable system of Hindustani Shorthand, (b) efficient arrangement of Keys for a Hindi typewriter, Teleprinting in Devanagari and (c) Reform of script. The Committee had joint meetings with the Devanagari

अनुक्रमिका  
१. अक्षर  
२. अक्षर  
३. अक्षर  
४. अक्षर  
५. अक्षर  
६. अक्षर  
७. अक्षर  
८. अक्षर  
९. अक्षर  
१०. अक्षर  
११. अक्षर  
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९५. अक्षर  
९६. अक्षर  
९७. अक्षर  
९८. अक्षर  
९९. अक्षर  
१००. अक्षर

Script Reforms Committee appointed by the Government of Uttar Pradesh. It submitted its report to the President of India on January 17, 1949. This report was referred to a Parliamentary Finalising Committee, consisting of Kakasaheb Kalelkar as Chairman, and M. Satyanarayan and Dr. Babu Ram Saksena as members. The Committee reported to the Speaker on February 18, 1951.

The recommendations of these Committees are published by the Parliamentary Secretariat. They are summarized below as far as they relate to the script reforms.<sup>14</sup>

(a) The *velānti*, *mātra* and *ukār* may be written and printed after the consonants. This improvement may be executed in instalments beginning with *ukārs* or the 'bottom floor.'

(b) The *Swarākhadi* is accepted for ओ and औ. It is also accepted for ऐ and ऐ in the Gujarati and *Modi* scripts. This principle may be extended to अि, औ and अु, अू.

The Chairmar, Kakasaheb Kalelkar, appended a note to the H. S. and H. T. Committee report.<sup>15</sup> Three charts (*Figs. 201, 202, 203 and 204*) are given in the report with descriptions thereof.

क छ ग घ ङ

च = ज झ ञ

ट ठ ड ढ ढ

त थ द ध न

प फ ब भ म

र य ल ल ळ

र श ष स ह

Fig. 204. Kalelkar's suggestion of half letters

1. The letters ख व भ and ल may be written as ख or क्ष, ध, भ and ल.

2. The letters छ and श may be written as छ and श.

3. The contours of the letters र, ळ and ह may be made to conform to the general height and width of the Nagari letters.

4. The half forms of letters without *Kānā* ट, ठ, ड, ढ, द and ह may be written as ट- ठ- ड- ढ- द- ह- by using a link in *jod chinha*. Halant is called *Tod Chinha* (see Fig. 204).

5. The letter र and य change their form as last members of conjuncts, i. e. प् + र = प्र; ट् + य = टय.

अ/आ  
इ/ई  
उ/ऊ  
ए/ऐ  
ओ/औ  
क/ख  
ख/ग  
ग/घ  
घ/ङ  
च/छ  
छ/ज  
ज/झ  
झ/ञ  
ट/ठ  
ठ/ड  
ड/ढ  
ढ/द  
द/ध  
ध/न  
प/फ  
फ/ब  
ब/भ  
भ/म  
र/र  
र/य  
य/ल  
ल/ल  
ल/ळ  
ळ/ह  
ह/ह

मराठीचा विकास - महाराष्ट्राचा विकास



6. The vowel-marks for *Bārūkhadi* may be reformed as shown in the second line and their ultimate forms are shown in the third line (Fig. 199). Note the addition of short अे and short ओ. Konkani uses a long अ which may be shown by raising the *pāi* or *kūnā* upwards.

7. The vowel-signs, vowel-combinations and the numerals in the reformed style are shown in (Fig. 199).

8. The Rafar <sup>ˆ</sup> (see Fig. 200) may be replaced by the *halant* र्.

9. The middle row (in Fig. 198)\* gives the alternate vowel-signs. They show short ः and long ऄ as also of ऽ (ः) as they are accepted by the committee.

10. "It has been universally accepted that the present three-storied composing of *Nāgari*-letters is its greatest handicap. Vowel-signs for <sup>ˆ</sup> <sup>ˆ</sup> <sup>ˆ</sup> <sup>ˆ</sup> <sup>ˆ</sup> and the *anuswār* <sup>ˆ</sup> are written on the top of letters, thus creating the necessity of the top floor. The *reph* also occupies the top floor. The vowel-signs for <sup>ˆ</sup> and <sup>ˆ</sup> and the sign for <sup>ˆ</sup> as in राष्ट्र and the *nuktā* are placed below the letters, thus necessitating the bottom floor. It is accepted that these vowel-signs etc. should be written after the letters and not above or below the letters. There is no objection if these vowel-signs go above the head-line as in the case of <sup>ˆ</sup> <sup>ˆ</sup> provided they do not come on the top of a letter.

11. "It is proposed, therefore, as the first instalment in script reform to remove the bottom floor by writing signs for short <sup>ˆ</sup> long <sup>ˆ</sup> and <sup>ˆ</sup> after the letters and not below them. This has been accepted by our committee and the U.P. committee. I have slightly changed the angle of <sup>ˆ</sup> so that they may look better and occupy some space after the letter. Otherwise the blank space becomes quite ugly, the vowel-signs must clearly show to what letter they belong. This shape is accepted by our committee as also by the Bombay committee.

12. "Further changes in the vowel-signs at the top are, as I said, mere suggestions, they can be considered when it is time for the second instalment in script reform.

13. "It is necessary even after accepting the reform of writing the vowel-signs after their letters, to make them go up the head-line and slightly below the length of the *pāyi*, to give relief to the eye and make them easy to read."

9. Bihar Government on the decisions of U.P. Committee <sup>16</sup>

1. The recommendations of the U.P. committee, that *mātrās* should be shifted to the right, avoiding the overlaps, will produce a disjointed effect and the writing will be offensive to the eye and straining to the mind.



It will mean enormous waste of space and of paper and stationery. It is evidently intended to eliminate dead keys; but dead keys have been avoided on the machine devised by the Bihar Government. The writing is normal. There is no waste of space and there is no disjointed effect. Bihar Government, therefore, do not support this recommendation.

2. It is agreed that there should be two different symbols (*Suddha Anuswār* “ ° ” *Anunāsik-svara* “ · ”) but Bihar Government prefer to “write *Ganga* as गंगा” and not as ग०गा, *Hansnā* (to laugh) not as हंसना as proposed by the U.P. committee, but as हँसना. It would have been preferable to have the *Anunāsik-svara* shown by ˘ rather than by ˙. But the latter is being suggested only because its use in connection with five different diphthongs (*Ardha-Vivrit*) sounds which have gained currency may be possibly obviated by adoption of ‘ ˘ ’ which has been adopted by the International Phonetic Association. Thus, while at present “College” is rendered into *Nagri* script as कॉलेज it would be written as कॉलेज if the symbol employed by the International Phonetic Association is adopted. If, however, the International Phonetic Association symbol is not adopted the ‘ ˘ ’ will still be available for five diphthongs and the *Anunāsik-svara* will use ‘ ˙ ’ with a dot on the top middle i.e. is, ‘ ˙ ’.

3. Top bar (*Shiro-rekha*) should be used.

4. *Mātrās* for “Ree”, “Lree” need not be shifted to the right from the point of view of technical suitability of writing.

5. In case of letters which have a full vertical bar the half letter may be formed by removing the bar, with the exception that in case of “र” which as full letter, unattached to another consonant, should be continued to be written as र. As half letter it should be ‘ ॠ ’ at the top and as full letter joined to a half letter it should have the form ॠ placed at bottom.

6. Letters not having a vertical bar on the right should form the half letter by use of *halant*.

7. The Bihar Government do not agree to the suggestion that *mātrā* or “*Hrasva-ikār*” should be placed on the right and instead of the existing form “ ॠ ” a new form “ ॡ ” should be used. In no Indian language is the *mātrā* for short *ikār* written on the right. In Oriya, Tamil, etc. it is written at the top on the left. In fact it is wrong to imagine, on the analogy of Roman, that *Nagri* character which is allied to the Bengali, Oriya and other scripts in the Sanskritic group of languages writes consonant first and vowel thereafter. Instead the unit of writing in Devanagari and other scripts derived from *Brāhmi* is a syllable and it is the syllable as a composite whole for which the symbol has been devised

अ	आ
इ	ई
उ	ऊ
ए	ऐ
ओ	औ
क	ख
ग	घ
ङ	च
ट	छ
ठ	ज
ड	झ
ण	झ
त	थ
द	ध
न	न
प	फ
ब	भ
म	म

मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

The symbol is called *Akshar* which means it cannot be broken further. The great merit of our forefathers was that syllables having similar vowel sounds came to be represented in a similar way which reduced the number of configurations required for our script. It could have been different as it became different in Chinese and some other languages where syllable with similar vowel sounds came to have entirely different representations. As soon as this is conceded, it would be futile to assert that *mātrās* placed on the right have any greater logic than *mātrās* placed at the top and at the bottom and on the left. When we have adopted *mātrās* for top and bottom, it is nothing illogical to adopt *mātrās* also on the left. It does not create any problem for mechanical writing and to put the *mātrās* for *Hrasva-ikār* on the right will be a most distasteful innovation without any good justification. It has only to be realised that tenacious opposition will be met if we suggested to Bengalis and Tamils to abandon their left *mātrās* which they use not only for 'f' but also for " ॰ ", " ॱ ", " ॲ " and " ॳ ". In fact for " ॲ " and " ॳ " they have to use *mātrās* both on the right and on the left. The attempt at uniformity is misconceived.

8. For new sounds diacritical marks should be used rather than new configurations devised. In particular use of diacritical marks at bottom will enable us to have a large number of Arabic and Persian sounds to be reproduced in Hindi. This is also the convention.

9. Independent forms for *Sanyuktākshar* should be done away with. This incidentally renders futile existing keyboards such as of Remington.

10. In *Svara* " अ " should be used rather than " अ़ ".

11. Bihar Government do not agree to the suggestion regarding the *mātrā* for " *Hrasva-ikār* ".

12. " क्ष " should be written as " क्ख " and " त्र " as त्र.

13. Punctuation as current in English should be adopted but for the full-stop the *Khadi Pai* should be used.

14. Bihar Government have no strong views regarding the suggestion that certain *Vyanjanas* should take a different form but they have suggested that there is no harm in continuing the existing forms. Their suggestions in this connection are indicated below :

Existing forms	अ	छ	छ	ण	भ	ल	श	क्ष	त्र	त्त	क्त	ज्ञ	ख	ध	र
U.P. Govt.	अ	छ	छ	ण	भ	ल	श	क्ष	त्र	त्त	क्त	ज्ञ	ख	ध	र
Bihar Govt.	अ	छ	—	ण	भ	ल	श	क्ष	त्र	त्त	क्त	ज्ञ	ख	ध	र

10. Government of Madhya Pradesh (1953)<sup>17</sup>

1. " It will not be possible for Hindi to spread quickly unless we adapt the Devanagari script to such mechanical contrivances as the typewriter,

अक्षर  
रूप  
को  
उपयोग  
करना  
संभव  
नहीं  
है  
क्योंकि  
यह  
संकेत  
सिस्टम  
केवल  
लिखित  
शब्दों  
के  
लिए  
बनाया  
गया  
है

भारतीय विकास - महाराष्ट्र का विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

the Monotype, the Linotype and the Teleprinter, for it is on the increased use of these contrivances that the industrial, cultural and scientific advancement of any country depends in the modern age. The problem is not without difficulties because these contrivances have been devised with an eye on the requirements of the Roman script, which differ considerably from Devanagari. It is, therefore, absolutely necessary *to effect improvements in these machines to suit our special requirements and make suitable changes in our script, where unavoidable.\** There is little doubt that Devanagari script is basically scientific and phonetically sound ; yet it has to face the challenge of modern requirements of speed, mechanical facility and simplicity—a challenge which has been successfully met by Roman script particularly in the field of business, education and journalism. It is my conviction that Devanagari is capable of meeting this challenge with slight modifications in its form without sacrificing its basic character. To the last point we attach considerable importance as the language and script of a people are an expression of their distinctive character and are deeply rooted in their native genius. From accounts about similar efforts in Japan for the adaptation of mechanical devices for their own script, a very useful lesson can be derived. *As far as possible, the machine should be adapted to the script and not the script to the machine.\** It is in this background, that we have to consider the question of effecting reforms in Devanagari script.”

2. “ In 1950, the Madhya Pradesh Government sponsored an all-India Conference which was inaugurated by Dr. Rajendra Prasad, then President of the Constituent Assembly, for standardization of Hindi vocabulary, spelling, grammar and script. Among other things, it was agreed in this conference that the general principle in standardizing the Devanagari script should be to retain the existing symbols and conventions as far as possible and yet adapt it for use on modern printing and typing machine either as such or with such slight alterations in the mechanism as are inexpensive and feasible.”

3. “ Our stand on the recommendations of the Narendra Dev Committee is as follows :

- (i) We are in agreement with the Committee’s view that any basic change in the character, form or symbols of the Devanagari script would shut out our future generations from our great intellectual and cultural heritage in the Devanagari script and cannot, therefore, be acceptable. We cannot agree to the Nagari Pracharini Sabha’s proposed changes in the script.

\* Italics mine : Author.

- (ii) Kakasaheb Kalelkar's *swarākhadi* of अ is also not acceptable to us on the same ground.
- (iii) The proposed changes regarding इ *mātrā* and र do not appear to be absolutely essential, although it is true, these would facilitate speed in typing. In spite of the inconveniencel it would be advisable to retain both of them in their origina, forms as two exceptions, in accordance with the principle already accepted of not interfering with the basic form of Devanagari script.
- (iv) The forms suggested for अ and छ, झ, ण, ध, भ, ल and ह are acceptable to us as also the suggestions regarding '०' for pure *anuswār*.
- (v) We agree that क्ष and त्र can be written as conjunct क्ख and त्र, though perhaps it would have been more desirable if they could be retained as such.
- (vi) The present form of the Devanagari script with the head-line should be continued, although in the cursive form, Nagari script without the head-line may also be permitted.
- (vii) The suggestion to do away with independent conjunct forms and the use of *halant* is acceptable and the extra letters श्र, ओश्म् and ष are also acceptable.
- (viii) For new sounds, diacritical marks rather than new signs should be used where necessary. For the present, however, the use of diacritical marks need not be encouraged in the interest of simplicity.
- (ix) The punctuation forms and such other forms as asterisk, etc., current in Roman may be accepted in addition to the *pai*.
- (x) Provision should be made for इ and ढ also.

4. We accept the principle to utilise the existing 90 channel Lino and commend for the consideration of the conference the scheme submitted by N. L. Prayagi (excepting the *swarākhadi* part of his scheme) for a Lino-keyboard of 90 main and 34 auxiliary keys.

5. The scheme for improving and simplifying Devanagari hand-composing given by Dr. Gorakh Prasad with the suggestions of the Narendra Dev Committee is acceptable to us in principle. In this connection, Shri Prayagi's improvements may also be considered.

#### 11. Lucknow Conference (1953) <sup>18</sup>

An all-India Conference was called at Lucknow (November 28-29, 1953) under the presidentship of Dr. Radhakrishnan, when over sixty



delegates participated from fourteen States of the Union and a steering committee of the following distinguished delegates was elected :

(1) Pandit Govind Vallabh Pant, (2) Shri Morarji Desai, (3) Pandit Ravi Shankar Shukla, (4) Dr. Bidhan Chandra Roy, (5) Acharya Badrinath Varma (Bihar), (6) Shri Kakasaheb Kalelkar, (7) Acharya Narendra Dev, (8) Shri Omeskumar Das (Assam), (9) Shri Harekrishan Upadhyaya (Ajmer), (10) Shri Anant-Sbhayanam Ayyangar, (11) Shri Ramkrishna Rao (Hyderabad), (12) Dr. Raghuvir. (13) Dr. Dharendra Varma, (14) Dr. Suniti Kumar Chatterji, (15) Prof. K. S. Ayyar (Lucknow University), (16) Dr. Babu Ram Saksena (Allahabad), (17) Shri Kakasaheb Gadgil, (18) Dr. Satya Narayan Sinha, (19) Dr. Sampurnanand, (20) Dr. Panna Lal, Delhi, (21) Dr. Kailas Nath Katju, (22) Dr. B. V. Keskar, (23) Shri Kamalapati Tripathi (U.P.), (24) Shri Vishwa Bandhu Shashtri (Punjab), (25) Shri Raj Bahadur, (26) Shri Hargovind Singh, (27) Shri L. M. Chakra Deo.

An exhibition of the work done in connection with the script reforms was arranged under the guidance of Shri J. Scheimel.

In his message Pandit Nehru advocated the use of two scripts, Roman and Urdu. Dr. Radhakrishnan opined that changes in the script may not be made only to suit the convenience of the composing machine and the typewriters. Dr. K. M. Munshi was of the opinion that extra simplicity may mar the dignity of the script.

The decisions taken in the conference regarding the Devanagari alphabet are :

(a) The forms अ झ ण ल and क्ष may be accepted in preference to अ ऋ ए ल and ऋ.

(b) The letter forms ख छ ध and भ may be accepted in place of ख छ घ भ.

(c) The letter 'ळ' may be adopted for all the Indian languages.

(d) The figures १, ५, ८ and ९ be accepted in preference to १, ५, ८ and ६.

(1) The following basic alphabet was thus adopted :

Vowels : अ आ इ ई उ ऊ ऋ ॠ लृ ए ऐ ओ औ अं अः

Consonants : क ख ग घ ङ च छ ज झ ञ ट ठ ड ढ ण त थ द ध न  
प फ ब भ म य र ल व श ष स ह ळ क्ष ज्ञ

Figures : १ २ ३ ४ ५ ६ ७ ८ ९ ०

(2) Use of head-line should continue.

(3) (a) All the vowel-signs will continue to be used in the present style except that of short 'इ'.

(b) The vowel-sign of short 'इ' should be placed on the right side instead of left.

(c) The design of the short 'इ' vowel-sign will be the same as the long 'ई' vowel-sign except that the vertical stroke should not extend full length, i.e. १ (की).



(4) (i) Except full-stop and colon, the punctuation marks will continue as in English — , ; ! ?

(ii) The full-stop will be represented by *khadi-pai* | (straight line).

(iii) The following signs may be accommodated on the typewriter keyboard as far as possible :—

. / ' % " " ( ) - × ÷ \* = +

(5) The conjuncts should be constructed in two ways :

(i) by removing the vertical stroke of the consonants, i.e.,

ख र द च etc.

(ii) by attaching the *halant* sign to the first letter in the conjunct, i.e., ठ्ठ for ठु.

In case of “क फ and ह” when they are first in the conjuncts, the existing method of combination may be continued : वाक्य, फ्याड, सुसह्य.

Vowels:	अ	इ	उ	ऋ	ॠ	ए	ऐ	ऒ											
Vowels, Accents & Spl. letters:	।	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰
Punctuation Signs:		।	।	।	।	।	।	।	।	।	।	।	।	।	।	।	।	।	।
Figures:	१	२	३	४	५	६	७	८	९	०									
Consonants:	क	ख	ग	घ	ङ	च	छ	ज	झ	ञ	ट	ठ	ड	ढ	ण	त	थ	द	ध
Full letters	त	थ	द	ध	न	प	फ	ब	भ	म	य	र	ल	व	श				
Half letters	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰	॰				
Full letters	ष	स	ह	॰	॰														

Fig. 205. The Lucknow Devanagari



(6) The suggestion to omit one of the two, *Anuswār* and *Anunāsik* should not be accepted.

### 12. Government of Bombay on the Lucknow Reforms, 1954<sup>19</sup>

“Government is pleased to accept the recommendations made in accompanying resolutions adopted at the Devanagari Script Reform Conference held at Lucknow in November 1953. Steps should be taken to implement the decisions and to incorporate the changes in the Devanagari script for purposes of Hindi in this State.”

### 13. Madhya Pradesh Government (2-10-1955)<sup>20</sup>

The comments of the Government of Madhya Pradesh on the Lucknow reforms are published in a pamphlet issued in October 1955. It asserts “One has to be cautious, that the reforms do not conflict with the scientific nature of the script, that they do not lack aesthetic appeal, that they are logical and are in accord with the traditions and the genius of the script.”

The Madhya Pradesh Government accepted the Lucknow reforms with the following changes :

- (1) The vowels short लृ and long ऋ may also be omitted.
- (2) It is not necessary to retain the *rāstra* sign ्र for typewriter as it can be typed by using the half र् sign ्र and the *halant* ् sign together.
- (3) The ‘R’ combinations can be made by using the *velānti* ्र which is retained for making ई from इ.
- (4) There should be no change in the current method of writing short इ vowel-sign ि. The short verti-bar suggested in the Lucknow reforms is difficult to write and the precision may not be observed in writing.
- (5) The use of *halant* may be accepted in case of ह i.e. चिह्न for चिह्न.
- (6) The present practice of writing the conjuncts of र् may be continued. श्र should be written as श्र.

If all the forms of र् in conjuncts are written with *halant* र्, it would be difficult to pronounce them correctly. For instance प्रार्थना will be written as प्रार्थना, ग्रहण as ग्रहण, मित्र as मित्र and so on. The *halant* is likely to be dropped in writing corrupting the pronunciations. Besides the letters will occupy more space in printing and the very purpose of the reform is likely to be defected. Not merely mechanical convenience but considerations of space, logic and neatness should be given due importance while forming conjuncts like क्र, त्र, बं, ष्ट्र, etc.

“...any acceptance of a change which conflicts with the genius of our language will only lead to its corruption. It is admitted on all hands



that present Nagari is faultless and wholly scientific and is free from the defects found in other scripts. It provides a separate sign for each vowel and each consonant, and it is as a result of this excellence that our language has maintained its purity to the present day. *It cannot therefore be too strongly emphasised that if the purity of language is to be ensured it is the machines which should be adapted to the script. A research into this question is urgently needed\** and there is not the slightest doubt that our unremitting efforts in this direction will demonstrate that the difficulties with which we are faced today can be surmounted."<sup>21</sup>

The Language Department of the Government of Madhya Pradesh has argued at length in favour of the use of the current method of writing short इ vowel-sign and the conjuncts of र्. In doing so the historical evidence is recorded which is made use of by the Author in an earlier Chapter.

The Language Department of the Government of M.P. was thus the first to critically examine the decisions of the Lucknow Conference. The decisions of the Government of Madhya Pradesh are listed in G.R., L.D. No. 1015-192-A-27, dated 2nd September 1955.

1. Vowels : (a) अ आ इ ई उ ऊ ऋ ए ऐ ओ औ अं अः  
(b) Out of the two forms अ and ऋ the form अ may be retained.
2. Consonants : (a) The new forms of ख, छ, घ and भ may be accepted, i.e. ख छ घ and भ.  
(b) The new consonant ऌ may be added to the Nagari script.  
(c) Out of the two forms of ए ण, झ झ, ल ल, श श, and ळ क्ष only one may be retained, i.e. ण, झ, ल, श and क्ष.
3. Numerals : Out of two forms ६ and ९ one may be retained, i.e. ९.
4. Head-line : The present practice of head-line may be retained.
5. Vowel-signs : The recommendations of the Lucknow Conference regarding the short i sign ९ may not be accepted. The current form ि may be continued, i.e. कि and not की.
6. Conjuncts: (a) While forming conjuncts from letters with verti-bar, i.e.  
ख, ग, घ, च, ज, झ, ञ, ण, त, थ, ध, न, प, ब,  
भ, म, य, ल, व, श, ष, स and क्ष.

*Halant* may not be used but the verti-bar may be removed i.e. उत्तर, मज्जन, गन्ना etc. (not उत्तर, मज्जन, गन्ना or उत्तर, मजन, गन्ना) (the form श्र may be used in श्र).

\*Italics mine : Author.

(b) The present method of using the forms क and फ as first member in conjuncts may be continued, i.e. संयुक्त, दफ्तर (not संयुक्त, दफ्तर).

(c) ह may be joined as first member in conjuncts according to the present method and also by using *halant*, i.e. चिह्न or चिह्न (not चिह्न).

(d) While forming conjuncts from letters without *verti-bar*, ड, ङ, ञ, ठ, ड, ढ and ढ *halant* may be used, i.e. गढा, बुढा, विद्या (not गढा, बुढा, विद्या).

(e) The present method of forming conjuncts from र may be continued, i.e. नम्र, गर्व, राष्ट्र, श्रीमान्, पत्र (not नम्र, गर्व, राष्ट्र, श्रीमान्, पत्र).

7. Signs—The vertical line (*khadi pai*) may be used for full-stop.

8. The following punctuation marks may be used in the Nagari:

- — , ; ! ?

9. (a) In typewriting the following signs may be used:

. / ^ % “ ” ( ) + × ÷ \* = †

(b) The sign ( ^ ) may be separated ( ^ and ^ ) for making conjuncts like न्र, ढ्, etc.

(c) The rounded design of *halant* may be allowed to the short oblique ( ^ ).

(d) The र in the *Rastra* sign ( ^ ) may be made by joining ( ^ ) with ( ^ ).

10. The forms of *Anunāsik* Nasal mark and Nasal consonant ञ, ञ may be continued to be used.

#### 14. Government of Bombay <sup>22</sup>

The Bombay Government commented on the Lucknow reforms as under :

(1) The forms “ श ” and “ छ ” are the improved designs of “ श ” and “ छ ” and should not have been discarded.

(2) The new form of र is inconvenient in casting types and also printing.

(3) The use of the *charan-regh* for full-point is not convenient with use of English punctuation marks.

(4) The placing of the short ‘ इ ’ sign ि after the letters, though scientific, does not facilitate writing or setting.

(5) The loop of ‘ घ ’ may fill in while printing.

(6) The *swarākhadi* of ‘ अ ’ is in use for some years now. Gandhiji and Mashruwala are for it. It is convenient to write and should, therefore, have been retained.

(7) The use of *halant* may be alright for typing but will not facilitate printing. Certain words will look ridiculous thus स्वास्थ्य = स्वास्, थ्, य्

In this way the set-space will increase resulting in more consumption of paper. It would also be difficult to join *halant* to letters like क, फ and ह. If it is decided to join the *halant* mark with the letters, it would be necessary to cast all the letters with *halant* mark.

The Government of Bombay, however, accepted the Lucknow reforms for Hindi language in the State and further ordered that the text-books in Hindi must be printed according to the Lucknow style.

#### 15. Maharashtra Mudran Parishad, 1958 <sup>23</sup>

The Lucknow Script Reforms were discussed in the Seventh Conference of the *Maharashtra Mudran Parishad* held at Dhulia in 1958. In a resolution adopted in this conference the following observations were made :

- (1) The new design of “ ॠ ” is inconvenient to write and to print.
- (2) The ‘इ’ sign ‘ ी ’ with half *kānā* is inconvenient to write and would be difficult for the young students to recognise.
- (3) The suggestion to use ‘ ृ ’ for all ‘ R ’ combinations will result in wastage of space. It is, however, necessary to introduce uniformity in the ‘ R ’ combinations.
- (4) The use of *halant* in conjuncts will occupy more space.
- (5) The number of types will increase due to the *ukāri* letters.

The Conference opined that the Lucknow script is more suitable for typewriting and it was necessary to effect necessary alterations for making it suitable for printing.

#### 16. The Standard Script as accepted by the Government of India <sup>24</sup>

Government of India, Ministry of Education, accepted the final recommendations made by the Education Ministers’ Conference on Standard Script with slight modifications.

##### 1. The Alphabet :

(a) *Vowels* : अ आ इ ई उ ऊ ऋ लृ ए ऐ ओ औ अं अः

(b) *Mātrā (Vowel-marks)* : ा ि िी ं ः ऌ ऍ ऎ ऑ ऒ ओ औ क ख ङ ञ ण णः णः

(c) *Consonants* :

क	ख	ग	घ	ङ	ट	ठ	ड	ढ	ण	च	छ	ज	झ	ञ
त	थ	द	ध	न						प	फ	ब	भ	म
य	र	ल	व	श	ष	स	ह	क्ष	ज्ञ	श्र	इ	ढ़	ळ	

(d) *Figures* : १ २ ३ ४ ५ ६ ७ ८ ९ ०

*Explanation* :

Long ऋ does not occur in Hindi; therefore it is not included in the list of vowels.

## 2. Conjuncts :

(i) *Consonants with vertical stroke (Khadi Pāi) :*

ख ग घ च ज झ ञ ण त थ ध न प व भ म य ल व श ष क्ष ञ

When conjunct letters are to be formed from consonants having vertical stroke, the vertical stroke shall be deleted :

ख्याति, लग्न, विघ्न, कच्चा, छज्जा, व्यञ्जन, नगण्य, कुत्ता, पथ्य, ध्वनि, न्यास, प्यास, डिब्बा, सभ्य, रम्य, शय्या, उल्लेख, व्यास, शलाक, राष्ट्रीय, स्वीकृत, यक्ष्मा।

(ii) *Other Consonants :*

(a) The present method of forming conjunct letters from 'क' and 'फ' be continued, e.g. संयुक्त, पक्का (and not संयुक्त, पक्का).

(b) Conjunct letters ड, छ, ट, ठ, ड, ढ and द may be formed by adding plough sign of *halant* mark (The oblique stroke below a consonant), e.g. वाङ्मय, लट्टू, बुद्धा, विद्या (not वाङ्मय, लट्टु, बुद्धा, विद्या).

(c) The old three forms of र in conjunct letters be continued to be used, i.e. प्रकार, धर्म, राष्ट्र.

(d) The form of 'श' as it appears in 'श्री' may be retained.

(e) The conjunct letter व्र made from त and र be written as व्र.

(f) Conjuncts from 'ह' may be written by using *halant* mark as in the current method. चिह्न ओर चिह्न (but not as चिह्न).

(g) Sanskrit conjunct letters may be written in the old style.

4. The other decisions taken in 1953 will not change, i.e. (1) the use of head-line will be in force.

(2) (a) The punctuation marks, except full-stop, may be accepted as in English : , ; ! ? ! :

The colon sign (:) may be used for 'visarg'.

(b) For full-stop (.) vertical stroke (i) shall be used.

(c) As far as possible the following marks may be provided on the keyboard of typewriting machines :

˘ ˙ ˚ ˛ ˜ ˝ ( ) + × ÷ \* = ˘

(d) Nasal mark and Nasal consonant ( ँ ॑ ) will be continued to be used.

17. The Standard Devanagari Script as adopted by Government of Maharashtra <sup>23</sup>

Government of Maharashtra accepted the Standard Devanagari script with certain modifications :

*Vowels* : अ आ इ ई उ ऊ (ऋ) ए ऐ ओ औ अं अः

*Mātrās* : । ि ी ु ू ॑ ॒ ॑ ॒ ॑ ॒ ॑ :



**Consonants :**

क	(ख)	ग	घ	ङ	च	(छ)	ज	झ	ञ		
ट	ठ	ड	ढ	ण	त	थ	द	ध	न		
प	फ	ब	भ	म							
य	र	(ल)	व	(श)	ष	स	ह	ळ	क्ष	ज्ञ	श्च

**Numerals :** १ २ ३ ४ (५) ६ ७ (८) ९ ०

**1. Conjuncts :****Consonants with verti-bar :**

ख	ग	घ	च	ज	झ	ञ	ण	त	थ	घ	न
प	ब	भ	म	य	व	श	ष	स	क्ष	ज्ञ	

While forming conjuncts from the consonants with verti-bar, the verti-bar of the latter should be dropped; as :

ख्याती, लग्न, विघ्न, कच्चा, सज्जा, माझ्या, व्यञ्जन, नगण्य, सत्ता, पथ्य, ध्वनी, न्यास, प्यादे, डब्बा, सभ्य, रम्य, शय्या, व्यास, श्लोक, राष्ट्रीय, स्वीकृत, यक्ष्मा.

**2. Other Consonants :**

(A) The present method of forming conjuncts from 'क' and 'फ' should be continued; as : संयुक्त, लफ्फा.

(B) The conjuncts from the alphabets ङ, छ, ट, ठ, ड, ढ, द, ल, ह and ळ except ल should be formed by using their *halant* form as and when necessary. The present method of forming conjuncts from 'ल' should be continued. च form should be used when the above consonants are to be conjoined with य, e.g. :

वाङ्मय, खट्टू, अड्डा, विद्या, पाल्य, गोळ्या, गोळ्या or गोळ्या etc.

(C) The present forms of र in conjuncts should be retained, e.g. प्रकार, घर्म, राष्ट्र, वैयाने. There should be no objection to using the forms रु and रू instead of र and रू.

(D) The form 'श्च' in 'श्री' should be continued.

3. (1) The practice of using head-line (शिरोरेखा) should be continued.

(2) (A) The following punctuation marks should be adopted :

. - , ; ! ? :

(B) In addition to this, the following signs should, as far as possible, be provided for on the typewriting keyboard and for mechanical and hand composing :

( ` " % " " ( ) + × ÷ \* / = ~ )

The Hindi forms of ख, ल, and श (i.e. ख, ल, श) were accepted by the Government of Maharashtra in a subsequent resolution.<sup>26</sup>

\*Note : The letters, figures and signs in parenthesis differ from the Standard Devanagari accepted for Hindi.

## अनुक्रमणिका



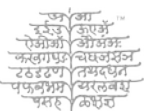
मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

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## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



## APPENDIX C

### DR. BHAGWAT ON EVALUATION OF THE DEVANAGARI CHARACTERS FROM THE POINT OF VIEW OF WRITING FACILITY

“It is seldom realized that the static character of Balbodh is due to its imperviousness to any structural modifications. The present structure of Balbodh came to be stabilized over six centuries back and ever since it has refused to admit of any basic changes. Perhaps one single factor which played a decisive role in shaping the structure of Balbodh was the material of writing available in those days. Balbodh was designed to be *scribed* in a hard surface like stone, metal or a tough tree-bark. This may be called the hard stage of writing-material. By its very nature this hard stage could only give out hard *inscripts* for being engraved in a hard surface. Such hard scripts required a considerable amount of pressure of cutting characters. And wedge-like straight strokes, angles and detached diacritics are easier for in-cutting than circles and curves. Balbodh possesses in a full measure these main characteristics of a hard script.”

“Today a soft stage of writing-material has been reached. We now write with a pen or pencil ‘on’ paper requiring the least amount of writing pressure. We *onscribe* and not *inscribe*. A soft script is needed for *onscription*. And rolling curvilinear shapes is the sole characteristic of a soft *onscript*. Balbodh was designed to be hammered in a hard-surface. The intervening centuries have brought about a complete change in the writing-material. But, there is no change in the structure of Balbodh, which goes ill with the soft material.”<sup>1</sup>

#### SPEED IN WRITING DEVANAGARI

“An average Balbodh letter has a speed of 59 points against the 91 of an average English letter.”

“While structurally Balbodh letters are about  $2\frac{1}{2}$  times of a more complex nature than English letters, their capability for movement is in the ratio of 59 : 91, i.e. English letters are about 54 per cent more facile for writing than Balbodh letters.”<sup>2</sup>

Dr. Bhagwat carried on an experiment in writing a Marathi passage of 117 words in five different scripts in order to test the speed which can be achieved. The result of the experiment tabulated by him is given overleaf<sup>3</sup>

“अज्ञानं  
रक्षतु  
एतन्मया  
कलामपुत्रः  
२६३४०  
पुस्तकालय  
बम्बई

“अज्ञानं  
रक्षतु  
एतन्मया  
कलामपुत्रः  
२६३४०  
पुस्तकालय  
बम्बई

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Script	Average time of writing	Speed in words per minute
Balbodh	.. 9 minutes and 40 seconds	.. 12 words.
Gujarati	.. 8 minutes and 50 seconds	.. 13 words.
Modi	.. 6 minutes and 40 seconds	.. 17½ words.
Urdu	.. 6 minutes and 20 seconds	.. 18½ words.
English	.. 5 minutes and 30 seconds	.. 21 words.

“In a machine age, however, a script must answer to the needs of printing and typewriting as much as to those of handwriting. It is this factor of commonness of script for all types of writing which has brought back Balbodh to serve the scriptal needs of Marathi.”<sup>4</sup>

#### USE OF DIACRITICS

“Cursive Roman for English has two minor diacritics. A tick in ‘t’, a dot in ‘i’ and ‘j’. Of these two, the tick is ordinarily blended with the body of the letter, and, thanks to scriptal redundancy, non-placement of dots over ‘i’ and ‘j’ rarely leads to illegibility. The natural run of Roman is not impeded by these diacritics.”

“On the other hand, cursive Roman for Marathi is heavily saddled with bulky diacritics at both its flanks. The fit of 38 Marathi phonemes to just 26 Roman graphemes makes this improvisation inevitable. Our experiment shows that with these diacritics, Roman writes 21 Marathi words per minute for 12 of Balbodh. That, despite this diacritical drag, cursive Roman should write about 1.34 times faster is undoubtedly indicative of its superior scriptal mechanism.”<sup>5</sup>

#### PERFECT ALPHABET AND MARATHI

“Phonemic system of a language has a number of sub-systems which are distinguished as vowels, consonants, stress, pitch, tone and other prosodic features. Alphabetic writings usually represent the vowels and consonants, sometimes tone and stress, but rarely other features. . . .

. . . The purpose of writing is to convey the exact thought content of the spoken word. The innumerable nuances of the spoken word need not encumber it in its graphic form. Any attempt to reflect fully the spoken word in writing will take away the simplicity of an alphabet. An ideal alphabet is one which has adequate provision for representing the vowels, consonants and other absolutely essential phonemic features of a language. Each phoneme should be represented by one grapheme and one grapheme should stand for one phoneme alone. A perfect graphemic fit with the phonemic structure of a language expects a one-to-one correspondence between its phonemes and graphemes. . . . Thus considered, Devanagari alphabet may reasonably be said to be phonemic for Sanskrit. However, the very concept of ‘phoneme’ rules out the possibility of its being

*adequately phonemic for all the middle and modern Indo-Aryan languages which are using that alphabet for their script. In Marathi, for example, we have seen that there are just six vowels and 32 consonants which have to find a place in a sound Marathi alphabet. 38 graphic symbols, judiciously chosen, are sufficient for this purpose. However, Marathi continues to employ all the 52 Devanagari symbols devised for Sanskrit; this is clearly an excess of 14 symbols. This excess has not unnaturally given more than one grapheme for some Marathi phonemes, e. g. /i/ or /ś/. And when there is no phonemic compulsion in the alphabet itself the alternative scriptal forms are often confused by writers. A lay Marathi writer is thus not always certain whether for the final /i/ in *vinanti* he has to use इ or ई or whether the sibilants in /vises/ are daggered (ष) or pegged (श)... Unless the phonemic base of the alphabet is adequately re-formed, this type of confusion will continue to exist. It looks as if the narrow-gauge stock of Marathi is set rolling on the scriptal broad-gauge of Devanagari entailing all the waste and disconform that it does.”<sup>6</sup>*

#### PHONEMIC SYMBOLS IN BALBODH

Table 86. Phonemic symbols in the Balbodh alphabetical order<sup>7</sup>

Vowels : 6

अ	आ	इ-ई	उ-ऊ	ए	ओ
a	ā	i	u	e	o

Consonants : 32

क	ख	ग	घ	ङ
k	kh	g	gh	ṅ
च	छ	ज	झ	
c	ch	j	jh	
ट	ठ	ड	ढ	ण
ṭ	ṭh	ḍ	ḍh	ṇ
त	थ	द	ध	न
t	th	d	dh	n
प	फ	ब	भ	म
p	ph	b	bh	m
य	र	ल	व	
y	r	l	v	
श	स	ह	ळ	
ś	s	h	ḷ	

Diphthongs

ऐ  
ai

औ  
au

Conjuncts

क्ष  
kśa

ज्ञ  
dnya

ऋ  
ru

visarga  
ā



“English is eking out its graphic existence with just 26 Roman letters for its 36 consonants and vowels, not to speak of a few other essential phonemic features so characteristic of the language. Marathi has a wasteful excess of 14 graphic symbols while English is short of at least as many ! Thus, phonemically neither English nor Marathi has a sound alphabet. . . . In Marathi, unlike Sanskrit, length of vowels is not phonemic. However, Marathi employs for its script all the long and short vowel-symbols of Sanskrit resulting in vagaries of spelling at every stage. If the alphabetic coat of these languages is cut to their correct phonemic size, most of the present orthographical eccentricities, irregularities and complexities are likely to disappear for both.”<sup>8</sup>

#### SCRIPTAL MOBILITY OF ROMAN AND DEVANAGARI

“Though the English alphabet has a very unsatisfactory phonemic basis, it commands scriptal mobility for all its letters. Any of its 26 letters is free in its standard form to combine with any other of the remaining 25 or to reduplicate itself. Thus the phonemic value of English letters a, i, u, c, t, s, etc., is mutable but the graphic forms of these letters are immutable. This has imparted perfect scriptal mobility to the English script. . . . Scriptal mobility has conferred on English vast possibilities of development in handwriting, printing and typing. . . . As for Devanagari, it serves as a good phonemic alphabet for Sanskrit, but compared to the English alphabet, it has a very low scriptal mobility. . . . Structurally speaking, the graphic signs chosen for Devanagari letters are all extra-size, ponderous, straggling and complex. Imagine for a moment that this principle of scriptal way as it works through the Roman alphabet. The two words प्रभू श्री. रामचंद्र would then appear as पर्भूश्री र्श्रीराम् च्चन्द्र. (*Prabhu Shri Ramachandra*). Obviously, this is a graphic monstrosity, an impracticability in writing.”<sup>9</sup>

“This orthographic capriciousness is increased by the awkward structure of Devanagari letters. A Devanagari writer is not always certain about (1) the allographic forms of phonemes and (2) their position and order in the script. For a truly phonemic script the simple rule should be to write the phonemes one after another in their natural sequence. This demands mobility for its alphabet. Even a glance at Devanagari consonantal allographs is enough to indicate that Devanagari does not possess this mobility so essential for an alphabet.

1	क्	क	क्ख	क्क	क्क	क्क	क्क	क्क	क्क	क्क	क्क	क्क
2	त	त्क	त्त	त्र	द	द्	द्य	द्र	द्र	न्द्र	व्	व्
3	म	म्भ	म्भ	म्भ	श्	श्च	र	र्क	कृ	र्च्य	श्च	ष्ण्य
4	ह	ह्	ह्य	ह्व	प्स	स्त्र	स्त्र	स्त्र	न्व्य	द्व		

In this way one comes across a number of allographs for a single consonantal phoneme and occasionally it is not rare for a writer to take liberty to bring in an altogether new allograph to suit the structure of the adjoining graphemes. *Devanagari alphabet is phonemic in conception, but the resulting script is syllabic in action.* Proper placement of allographs is the first concern of Devanagari.”<sup>10</sup>

#### PHONEMIC ALPHABET USED FOR SYLLABIC WRITING

“The phonemic Devanagari alphabet is grafted on the syllabic branch of writing. A syllabary is an outmoded form of writing now. It is at a much lower stage of evolution. It cannot keep pace with the requirements of writing in the modern world. The very appearance of ALPHABET, i.e. writing by acoustic impression, is to get over this difficulty. Once this fact about Devanagari is recognized, script reform in India will be real and objective. Shifting of a *mātrā* here and a slight change in a letter-face there is to give a very superficial treatment to the ailments of our script. No amount of manicure and pedicure is ever likely to put in any soul in an essentially inert body which is crying aloud for major orthopaedic surgery ! . . .

. . . When we are out to spread literacy among our teeming millions our prime requirement should be a streamlined script, basically the same for handwriting, printing and typing . . . .

. . . Our national script must be simple for learning, facile for writing, brief for composing and swift for typing.”<sup>11</sup>

“Script is a conveyer to store and carry language over space and time. It is not an integral part of language ; it is external to it . . . .

. . . The technique of writing by sound, i.e. alphabetic writing, is slowly reaching perfection over centuries. Of the two essential features of a good script, the phonemic aspect has attained near-perfection for a few languages like Spanish. The other essential feature, viz., mobility of letters, has, however, not adequately engaged the attention of grammatologists. Very little experimentation has been done in the field and even widely used scripts like the Roman and Devanagari have yet to be fully analysed from this angle.”<sup>12</sup>

#### EFFICIENCY OF DEVANAGARI GRAPHEMES FOR WRITING

Dr. Bhagwat has carried out an experiment<sup>13</sup> by assigning graphemes of higher facility value to the more frequent phonemes. Although it does not appear practicable to effect such a radical change, the results of the experiment are very interesting. When the frequent phonemes such as *a*, represented by grapheme आ which takes more effort





experiment rather than a categorical assertion that Roman is the last word in the matter of scripts whether for Marathi or for any other language.”<sup>17</sup>

“Ease and speed in writing are as much dependent on the exact phonemic base of letters as on their compact size. Our study has indicated that the Roman letters do possess this compactness as compared to Devanagari letters which are straggling and ungainly. Roman is about three times more compact than Devanagari and it can be made exact to the phonemic requirements of an individual language. Besides Roman letters are mobile for writing. Phonemically, letters must be exact and mobile ; graphemically, they must be compact. The greater the degree of exactness and compactness of graphic signs greater is the promise of ease and speed for a script.”<sup>18</sup>





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9. *Ibid*, page 175-76.
10. *Ibid*, page 177.
11. *Ibid*, page 178.
12. *Ibid*, page 179.
13. *Ibid*, Table XIV, page 181 and Table XV, page 183.
14. *Ibid*, page 182.
15. *Ibid*, page 184.
16. *Ibid*, page 186.
17. *Ibid*, page 182.
18. *Ibid*, page 186.





८ स्वस्तिशकसंवतु १८२ शर्वरीशंवत्सरे मा  
 र्ग शिर पौर्णमास्यां शुके ॥ श्रीस्त्रिपुरिची दो  
 नि शासनं वासुदेव रुद्रं वीषेष्टं गविरिशियप  
 षैसास शीवूषं गविरत्प्रमुखं स्नानं मालवम  
 टं पाशेः ठवियली ॥ तथा सातावीशं शत सुवर्णः दा  
 वोदरः पाशि ठवियलं । मु० गाः १२७ सुर्वः योगक्षे  
 मुश्चानहचा । दीवेचे रिसियपै पौवदेव षडं वि तिकै  
 षडंगवि जीवल्ले नागरुद्रमृ मधुवै षडंगवि मधुव  
 य देवलु हे जा लति । जं सुवर्णं लिहलं कांठेशः समेतः  
 ( वाचनः - स.रा. = श. स. ल. प. रु. थ. ह. थ. व. ष. )

ॐ श्रश्चित शक संवतु १८२ शर्वरी शंवत्सरे मा  
 र्ग शिर पौर्णमास्यां शुके ॥ श्रीस्त्रिपुरिची दो  
 नि शासनं वासुदेव भद्रवांये षडंगविरिशियप  
 षैसास शीवू षडंगविएतत्प्रमुखं स्नानं मालवम  
 टं पाशेः ठवियली ॥ तथा सातावीशं शत सुवर्णः दा  
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 षडंगवि जीवणै नागरुद्रमृ मधुवै षडंगवि मधुव  
 य देवलु हे जाणति । जं सुवर्णं लिहलं कांठेशः समेतः

Fig. 206. Dive Agar Copper-plate 1960 A.D.

Brahmi moulding. He realised that the suggestion of 'अक्षराणाम् अकारोऽस्मि' in *Bhagavadgita*, X-33 refers to the inherent 'Alif', the full verti-bar of ग ण श त न प म etc. or the small top-bar of the archaic letters ट ठ ड ढ etc. He further realised from inscriptional evidence, that the class ड ञ ण न म of the *Māhesvari Sūtras* is evolved from क च ट त प, the first letters, so also फ from प and ठ from ट.

3. The Dive-Agar copper plate (A.D. 1060) discussed by M. G. Dixit in "*Sahyadri*", June 1949, gives the clue to the evolution of म न ग श ण स छ ह य र and the *Mātrās*.<sup>\*</sup> Further light was thrown on this subject when the *Serpentine* (नागबंध) inscription of the 10th/11th century from Bhojashala Dhar, was discovered. In these inscriptions, the *Pratyaya*-ending on the *Serpentine* chart are depicted with a single serpent entangling and the *Atmanepadi-parasmepadi* charts are depicted with entanglings of two serpents, the latter containing the *Mātrās* in place of vowels. These charts were given to A. B. Walawalkar by L. S. Wakankar of Dhar, whom he met accidentally in 1949 at a lecture meeting of Dr. S. Mahadi Hassan at the Prince of Wales Museum, Bombay. The forms of व and ण of the Dem Bhoopal's Copper-plate of 1263 A.D. and the *Samāngarh* Copper-plate of 753 A.D. threw light on the evolution of *Prīshtha-Mātrās*; The copper-plates of Kadamb Kings of Goa are also in the Bharati style of inscriptions. †

#### MAHESHVARI TECHNIQUE OF DEVANAGARI WRITING

4. The study of the mysterious *Māhesvari Sūtras*, which provided a clue to the systematic technique of the Brahmi script, was the subject of a paper read by Walawalkar, first in Marathi at the Bharat-Itihas Samshodhak Mandal, Poona and then in English at the 15th Oriental Conference, held in Bombay in 1949. The organizers were not able to include the same in their publications, as it was a lengthy paper but allowed Mr. Walawalkar to publish it separately. After a proper revision it was published separately under the title "Pre-Asokan Brahmi" in 1951.

#### WALAWALKAR ON PRE-ASOKAN BRAHMI

5. Reconstructing the *Māhesvari-Brahmi* phonographs on the epigraphic background, A. B. Walawalkar published in his *Pre-Asokan Brahmi*, the guide-charts of *Māhesvari* technique, developing through *Paninian* Brahmi into the Bharati or Devanagari script in North India and the Telegu-Kannad Script in the Deccan plateau. The book carried a critical preface by Calligrapher L. S. Wakankar in which Walawalkar's

<sup>\*</sup> See fig. 206 on opposite page.

† भारती लिप्याऽनयैव लिखितं पुराणंतु प्रशस्यते ॥ पद्मपुराण, पातालखंड, अ. १०० श्लो ५०.

A

ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
		क	ख	ग	घ	ङ		
		च	छ	ज	झ	ञ		
		ट	ठ	ड	ढ	ण		
		त	थ	द	ध	न		
		प	फ	ब	भ	म		
य	र	ल	व	श	ष	ह	ळ	
,	/	;	ॐ	ॐ	ॐ	.	'	
-	0	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
१	२	३	४	५	६	७	८	९
*	"		)	?	=	x	6	(

Fig. 207. List of Modi characters for Marathi Typewriter (Balbodh).

hypothesis was compared to the Mendeleeff's chart of periodic classification which forecasted the existence and properties of elements which were discovered later on and ended with his lexicographic references to Indian writing. The publication was hailed by scholars from India and abroad, and was mentioned in the Script Exhibition Bulletin, published in 1956, by the All India Library Conference held in Calcutta, together with the thesis by Dr. Buehler, Sir John Marshall, Pandit G. S. Ojha, Dr. Barnet, Rajabali Pande, Dr. David Diringer and Dr. Hasham.

6. Walawalkar endeavoured to discover and develop a Marathi typewriter. The Nagari characters recommended by him are simple, clear and suitable to the English typewriters of 42 keys. After sustained study of notation of every letter of the Indian scripts, he came to the conclusion that the *Modi* script of Maharashtra is the only script that can be used for alphabetic writing. He, therefore, set out to devise a 'Sulabha' *Modi* typewriter based on a script formulated by him from the Devanagari

।शी।  
~~कदरद७ म्कदमयांतील प्राणीजादीयाकका दादीच दादयानां कीरीच—  
 रुपयं २४५५४९ यणं रेकन प्राणरीनं फे कली गाहीं यानकरीगां वा  
 पारंटावरुन ह७क७न करणयांग यती कीं प्रतीलादी याद उरुन कदि-  
 कुटं तांनच माहं केगवट कन १२७७ ययते अफामा.~~

।शा।  
~~काटदाउं द्वाडांगफुज म्नीं मदीरतीग अकां, नाटक महणं वीनीराला  
 ती अक तफिनी कागारउ हाय, कापयही दैदक वीनीरालया द्वापरीनं अक-  
 तारी हाय, अकतारी ठाल्लरी फन करीतांगं दमाही लागं शबल.~~

।त्र।  
~~कांदि नराभगादी ए७७ ७७७०।७ बाय. बाटं नं कथेय ३।५७७ नळ  
 तीं ३।७६ गावत.~~

।री।  
~~कां रायानं रई जळं॥ रंकां पनीतं गाळं॥ हं न म्परीनी कपानु  
 ॥ प्राण दंगा ॥३॥~~

Fig. 208. 'Sulabha' script for Marathi, Gujerati and Modi.

A

ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
		ॐ	ॐ	ॐ	ॐ	ॐ		
		ॐ	ॐ	ॐ	ॐ	ॐ		
		ॐ	ॐ	ॐ	ॐ	ॐ		
		ॐ	ॐ	ॐ	ॐ	ॐ		
		ॐ	ॐ	ॐ	ॐ	ॐ		
ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ
,	/	;	ॐ	ॐ	ॐ	.	'	
—	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	—
१	२	३	४	५	६	७	८	९
*	"		)	?	=	×	6	(

Fig. 207. List of Modi characters for Marathi Typewriter (Balbodh).



hypothesis was compared to the Mendeleff's chart of periodic classification which forecasted the existence and properties of elements which were discovered later on and ended with his lexicographic references to Indian writing. The publication was hailed by scholars from India and abroad, and was mentioned in the Script Exhibition Bulletin, published in 1956, by the All India Library Conference held in Calcutta, together with the thesis by Dr. Buehler, Sir John Marshall, Pandit G. S. Ojha, Dr. Barnet, Rajabali Pande, Dr. David Diringer and Dr. Hasham.

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।शी।

कदरह, ककदर्यांतीत प्राणजाचीयाकका दादीच दादयान क्रीनेत —  
 रूपय २४५६७९ बणं अकन प्राणजादीनं फुं कली नाहीं. यानकरीणां या  
 पारंटावरुन हक, क करणयांग यती की प्रतीजादी याद एका कदि-  
 चूटं तांगठ नाहं आगत कन गदणु पयतं आझाम.

।शा।

कादयाचं द्वीडांगफुड कनी मदीरती अकां, नाटक म्हणत वीकीराला  
 ती अक तफिनी जगारज हाय, कापवही कळक वीनांजायदा द्वापटीनं अक.  
 तारी हाय; अकतारी वाक्यारी फुन करीतांनां दमाटी लागं शक.

।त्र।

कां/५ नराजगारी एकां गदणु हाय. वाटं नं कथयत अ/५कां मळ  
 रीनां अ/५ हाय.

।री।

कां रायानं रई जळं॥ रंकां पनीतं गाळं॥ हां न म्हणुनी कपानु  
 ॥ दाद फगा ॥३॥

Fig. 208. 'Sulabha' script for Marathi, Gujerati and Modi.



इनीगर्णशायनमः शीनामासीधं ।।  
 "शाई तइया जीर्ला पाय शार्हीत?"  
 "छी बीता, जीर्ला क्वर्व पाय शसतात?"  
 "नाहीं काल बाबा म्हणत शीर्ती की,  
 - उजा बल्या पासुन संध्या आव पयंत  
 तइशी जीप्त शीकसानजी चालली शसती".

१ २ ३ ४ ५ ६ ७ ८ ९ ०

श्री. न. जगदावल्लभ  
 लेखक. श्री. न. ज. गण  
 मसो १८५०

आभारः

Fig. 209. Suggestion of letter-designs for a Marathi Typewriter, 1930.

क्ये का  
 रकेरु कोरके  
 रेकोको कोरके  
 केलोपु कोरके  
 रकेरु कोरके  
 पकेरु कोरके  
 चकेरु कोरके

मराठीचा विकास - महाराष्ट्राचा विकास

महाराष्ट्रराज्याच्या लक्षणाचा - समुहः  
 नवीन रीत परवारात आणवारांनी कालचकराचा,  
 कीर्तना वस्तुला पाहिल्या जावज्या दादाज्या  
 ३० | नमो भगवते वासुदेवाय || ईना कषरसमाभनायम् .  
 घृगमयमहेश्वरात | कस्तुभनं वयाकरणमपरोक्तं तथम्  
 प्रचीपाणीनेषु नमः || अइउए | मूलक | एउड | ऐउच |  
 का० रायावरे दरेह याळू० रडकापरउतरे० गाळू० |  
 हरे० न महणरेचनी कपुपाळू० | पराण पड० गा || शो  
 स० . अ० जगुंन बाज्या विलावलकर, लीपिका र  
Abulabha-17/1/59

Fig. 210. Sulabha-Modi revised.



and *Modi* (See Fig. 207 and 208). This design was registered by him in 1940, but in the meantime the Bombay Government discarded *Modi* script in the Government offices and discontinued its study even in schools. Walawalkar, therefore, had to revise his Nagari scheme. He simplified the 'Sulabha' script for application to the typewriter and the Monotype machine (Fig. 210). He produced two other schemes based on the medium of Nagari and Devanagari with independent *Mātrā* signs (Fig. 211 and 212). Some of the designs, though in crude form, are very

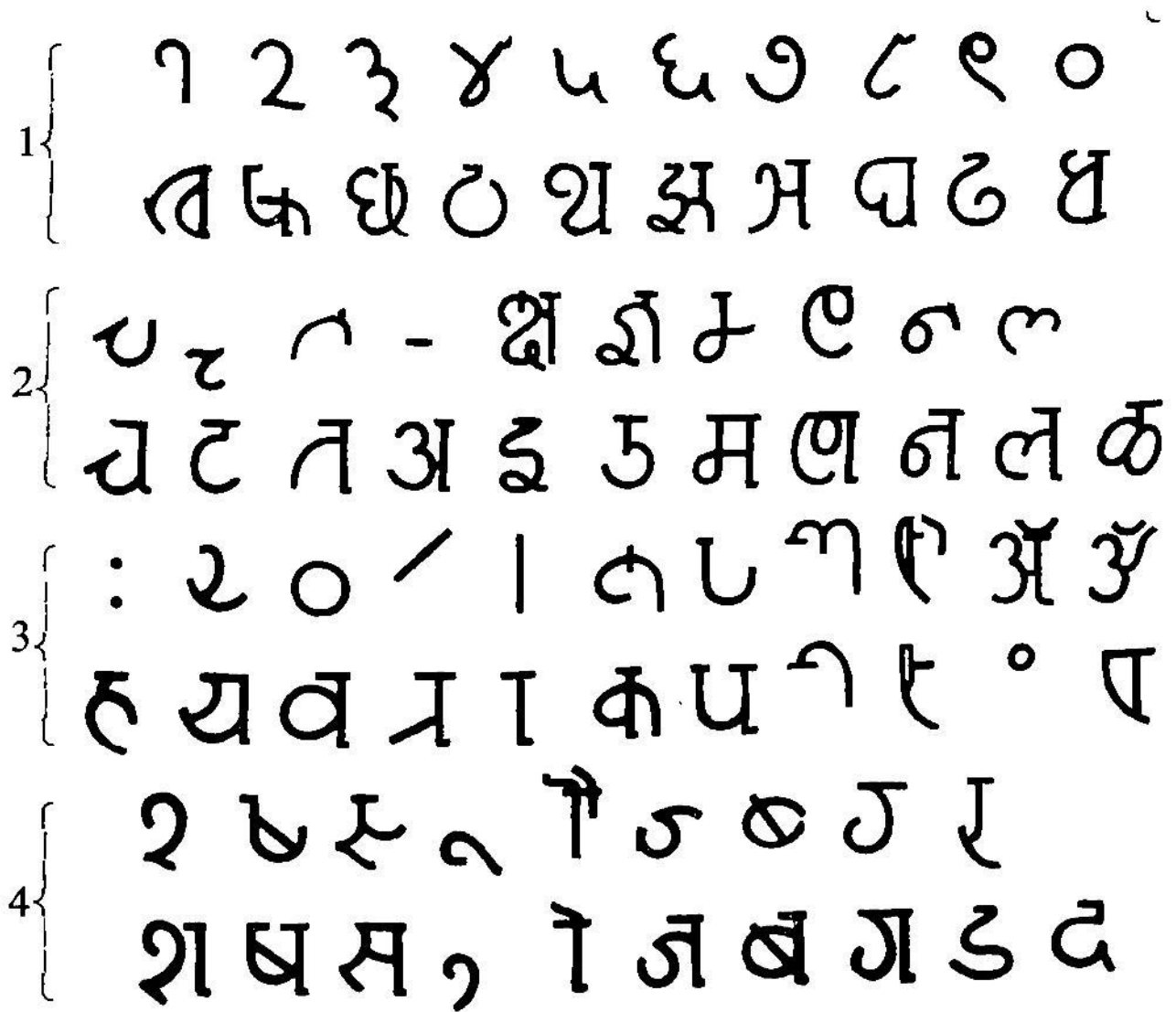


Fig. 211. Walawalkar's Standard Nagari Typewriter keyboard layout, 1964.

[Note.—The horizontal arrangement of signs conforms to the Māheshwari Sutras, making memorization easy.]



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

## भारती संघ गीत

जय भारत जीस की कीर्ती सुरां ने गाड़ी।  
 हम हैं भारत संतान कर्ताडों भाड़ी ॥१॥  
 हां गूँज गुठे आकाश अनील के धारा ।  
 अणुगत कंठों से बहे एक रीवर धारा ।  
 कह दां पुकार कर सुने चराचर सारा ।  
 हमें भारत राष्ट्र रीतें अजेय हमारा ।  
 अब तक भी है कुलकीर्ती हमारी छाड़ी ॥१॥  
 बस इसी दीशा से प्रथम प्रकाश हुआ था।  
 शुभ्र साम गान से मरिह वीनाश हुआ था ।  
 पृथ्वी तल को पशुभाव हताश हुआ था ।  
 मानव कुल में मनुज व विकास हुआ था ।  
 हम से जीवन की ग्यांती जगत ने पाड़ी ॥२॥  
 सब कार्यां में हम सदा रहे आगे हैं।  
 वीपनां के भय से कभी नहीं भागे हैं।  
 सदीयां से त्रिपु हात्र हात्र भागे हैं ।  
 अब भी हमने वे भाव नहीं ध्यागे हैं।

M.S.

By

A. B. Walawalkar  
 13 Burrows Lane  
 Bombay 2.

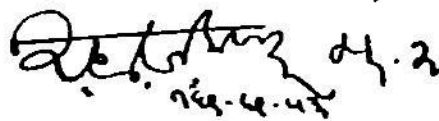
 १९५५-५६

Fig. 212. Walawalkar's Linear Devanagari.

शुं

काव्यात् क्रीडांगण्य मन्की मयादीन. सुसर्, नायक मधुपल  
 वीनोदाया नी शुं नर्तकी सगरुय होय, कावय ही क'य  
 वीनोदाय्या दूषयिन् शुंनारती होय, शुंनारती वानयिन-  
 ही भनन करीताना समाशी हागण शक'य, पय नर्तय्या सगरती-  
 यरुवी वीनोदायी रागदाती नीय्यावर वानयिनां य'णार  
 नापी नरीपय या शुंनारतीवर शापी यमक व वृत्तन यांयिं  
 य'नं सोसुनयि गडक, यानि शापय्या कवीनांनयन वीनोदा-  
 या पीगा धानडा थाय. गदाधरथाय "शुंक समसया" "पीपीपी-  
 यी कडकडाव" "पीगार" "काय कराव" "शुंठय्यांयि माठ" व  
 पीकक'पीककिक या कवीना वानय्या सुसर्नां कावय्यपी वीनोदा-  
 य्या कायाडा कस' सुंनयन थापनां य'नं व' दीसुन य'य'क.

शुंकरथाशीप धकादीनं द'यनामरीडा मराठी कोडी वळय  
 हावुनयि थापयि गिण्टे जेड काटकनिनी पुनीभा, ८००श' व'डा-  
 यीवी मधाराधय्याय्या पयनी पडयि थाय. थापी नयाय  
 धकाडपननीपी ही पुनीक'नी मराठी वाक्ययाभी व'दयय'य' "ग-  
 य'य' रायवर" व' य'य'यासाव' कियीन शोक द'नय सुंनयन नय-  
 य'न' व'दीयि थाय.

~~सदरुची म्नीकदक्यांनरिड प्रा वादीयानकाड' वादीनं दावया  
 व' फंडीनं रीपय' २४५७६९ य'य' सुंनयन प्रा वादीनं फंड क'यि ना  
 छिं. दानकरिनां या वारवावरुन छीक'क'क करय्यांत य'नो कीं,  
 प्रावादी यास थरुन कोडाप'न' ता १० मार्च सागड'र सन  
 १८७३ प'द'त थाजावा.~~

Fig. 213. Walawalkar's version of Modi with and without head-line.



कल्याणी लीपीचा नमुना  
 वैकुंठवासी श्रीनाथाय-  
 णनी शपनी भक्तका छल  
 समक्षपत्र शंख पुकारा.

स मधिप - *Sh. Malawalkar*

Fig. 214. Kalyani Lipi I.

कल्याणी लीपीचा नमुना  
 वैकुंठवासी श्रीनाथाय-  
 णनी अपनी भक्तका छल  
 समभक्तत्र शंख पुकारा.

*Sh.*  
 67-18

*Sh. Malawalkar*  
 1-5-49

Fig. 215. Kalyani Lipi II.

Table 87. Orient Script for Short Hand : Table of Consonants.

CLASS	SIGN	DIRECTIONS	LETTERS OF		AS SOUNDED IN	
			HAGARI	ROMAN	SANSKRIT	HINDI
Gutturals HARD	⤴	FORWARD	क	K	काकः	कोक
SOFT	⤵	"	ग	G	गगनम्	गगनी
Palatals HARD	⤶	UP & DN	च	CH	चर्चा	चाय
SOFT	⤷	DOWN	ज	J	जनः	जमाई
Linguals HARD	⤸	"	ट	T	टीका	टट्टी
SOFT	⤹	"	ड	D	डमरुः	डुगन
Dentals HARD	⤺	"	त	T	तडित्	ततनी
SOFT	⤻	"	द	D	दर्दुरः	दादना
NASAL	—	FORWARD	न	N	नमनम्	नाणक
Labials HARD	⤼	"	प	P	पपीः	पपीहा
SOFT	⤽	"	ब	B	बिल्वम्	बाबत्
NASAL		DOWN	म	M	माया	ममता
SEMI VOWELS	/	UP	य	Y	यमः	यान
"	\	DOWN	व	W	वनम्	वानन
"	ı	"	ऋ	V	ऋ	जिह्वा
"	/	UP	र	R	रामः	राय
"	⤶	UP & DN.	ल	L	ललितम्	ललक
"	(	DOWN	ह	H	हरः	हान
SIBILANTS	)	"	भ-ष	S	सामः	साँस
"	)	"	श	SH	शुशीः	शशक



Table 88. Table of Nasal Compounds.

GUTTURALS HARD & SOFT	—	FORWARD	ङ् ङ्	NK, NG	शङ्करः, भङ्गः	संका, गंगा
PALATALS HARD	/	DOWN	ञ्च	NCH	मञ्चकः	चञ्ची
SOFT.	/	"	ञ्ज	NJ	कुञ्जरः	जंजाल
LINGUALS HARD	॥	"	ण्ट	NT	कण्टकः	उण्ट
SOFT.	॥	"	ण्ड	ND	अण्डम्	चण्ड
DENTAL HARD	/	"	न्त	NT	अनन्तः	दन्त
SOFT.	/	"	न्द	ND	मन्द	छन्द
LABIALS HARD & SOFT		"	म्बम्ब	MP, MB	कम्पः, अम्ब	कम्बल

interesting and exhibit a novel but scientific approach to the Devanagari typography. Walawalkar suggested a printing type for ministerial work (Fig. 214 and 215). He has also invented a short-hand script for the use of Indian languages, which deserves close study (Table 87 and 88).

महाराष्ट्ररी लक्ष्मणाया नमःना.

नवनीन रीत पर्यारत जाण्णारानी कालचकराचा  
कीतता वरतला पाहीअरे. जावजणी दादाजणी.  
ॐ | नमो भद्रवते वासुदेवाय || शिवाकषरसमाहनायम-  
योगमयमहेश्वरात | कृतकनं व्याकरणमपरोक्तं तस्यै  
स्त्रीपाणीनै नमः || उइउए | मूलक | एउउ | ऐउँव |  
का° रायाचरे दरेन चाळू° रशकापरउतरे° जाळू° |  
हरे° न अहणरेयी कृपाळू | पराष पइ° गा || शो  
स° उ/जजुन बाजणी वालावलकर, लीपीकार.

Fig. 216. Sulabha Modi of 1929.

7. The work of Shri Walawalkar remained unnoticed as he worked far away from the scholarly world. Particularly, since 1946, he devoted himself to the transport problems of the city of Bombay and the Maharashtra. He is considered an authority on Railway Projects, Yards, Docks and Plants and their colony layouts, in India. He has participated

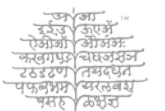


in formulation of various schemes for the development of Bombay and Maharashtra. Among these schemes, the 'Konkan Railway', 'Churchgate-Museum under-ground Railway', 'Quadrupling rails between Grant Road and Churchgate' and 'Mahim-Kurla Connection' on the Central Railway in Bombay, are highly appreciated in well informed quarters. Walawalkar at an advanced age had to divert his attention to the subject of Typography of Devanagari, owing to the pressure brought on him by his friends.

8. Walawalkar believes that there is no necessity to change the ancient Devanagari script at this stage of its development. It has reached a respectable standard in Indian Literature. Any modification in the Devanagari syllabary would deprive the Indians of the vast literature, ancient and modern very soon and would be a great loss which India cannot afford. No further modifications to Nirnaya-sagar Devanagari would be tolerated, he says. It is a treasure-trove of Bharat and must be preserved with the Sanskrit literature permanently. He warns that for Maharashtra the *Modi* script is the only solution and must be re-introduced very soon. *Modi* is a script that helped Maharashtra in the days of its political supremacy and it need not be discarded, 'Sulabh *Modi*', Walawalkar hopes, would bring Maharashtra on the right path.\*

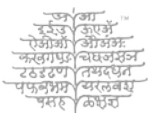
[*Note.*—The maheshvari chart prepared by Walawalkar is reproduced in Fig. 7 at Page 50. The technique of Brahmi letters is illustrated in Plate 31 at the end of Chapter III.]

\* सुलभा मोदी टंक लेखिका, *Vividha Vrita*, April 13, 1941.



f

## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

## I

## A NOTE ON DJOKHA (UMMA) SEAL OF TELLOH BY A. B. WALAWALKAR

(*Epigraphic Relic of Brahmi Writing of Twenty-fourth Century B.C.*)

(1) Brahmi script of the third millennium B.C. has been discovered among the archæological finds in the Assyrian excavations in Mesopotamia at Telloh (Lagash). A site in the extreme south of Sumer, has furnished monuments anterior to 3000 B.C. The find is a clay tablet similar to those found at Mohenjo-Daro and Harappa of the Indus Valley civilization. It exhibits a specimen of true Brahmi writing explored by the author in his "*Pre-Asokan Brahmi*", a booklet published in 1951. The tablet is in dual script, with Indus Valley ideograms and a picture of a standing ox or buffalo, with a cane basket and stand in front. There are four Brahmi letters, followed by two ideograms of the Indus Valley script, in a sentence written from right to left, very distinctly according to the Brahmi technique of the phonetic notation. Here is the evidence of Indian Epigraphy, contemporary or perhaps earlier than the Indus Valley script, and certainly prior to any linear script, such as the Aramaic, Phoenician, Greek, Etruscan, etc., or even the pictographic writing of Egypt by a thousand years.

(2) This wonderful find was already published by Sir John Marshall in his second volume on the *Indus Valley Civilization*, after the excavations carried out between 1922-27 in Sind under him, as the Director-General of Archæology in India. Sir John Marshall could not make out its meaning, but published this tablet in his second volume, to show some evidence of Indus Valley script and tablets found, in earlier excavations, carried out in Mesopotamia in or about 1921. Sir John writes about the tablet in his post-script to the publication.

(3) The impression on clay of a similar seal was found at Djokha (Umma) near Telloh, a site which has supplied no antiquities later than the twenty-fourth century B.C. This seal has the usual horned bull over a bowl-shaped stand sur-mounted by a box as in Seals 40 and 115. The reverse of this clay tag from Djokha is impressed with another seal bearing the same simple design of a surface ruled in small square as found on the Indian seals.\* Professor Scheil, however, thinks that this is only the impression made by a coarse cloth.

\*See *Revue d' Assyriologie*, XXII, 56 and compare Seals 524, 525, 526 and 528.



The inscription on the Djokha seal is as under :

𑀠 𑀡𑀢𑀣 𑀤𑀥𑀦𑀧𑀨

Here the text ends with the post fix No. 96. \*

𑀠𑀡𑀢𑀣𑀤𑀥𑀦𑀧𑀨𑀩𑀪𑀫𑀬𑀭𑀮𑀯𑀰𑀱  
𑀲𑀳)𑀴𑀵𑀶𑀷𑀸𑀹𑀺𑀻𑀼𑀽𑀾

(4) Sir John also remarks that this seal and the other four found in the temple of the war-God, Ibaba, at Kish, may have come to Mesopotamia and Elam from outside and are *pre-Sargonic*, that is, earlier than the twenty-eighth century B.C. Consequently the civilization of the Indus Valley may be as old as that of Sumer and Egypt. (Please see the pictures of the Indian Seals Nos. 115, 40 and 524 reproduced below) :



Seal No. 115  
(Marshall)



Seal No. 40 (Marshall)



Seal No. 524  
(Marshall)

(5) Scholars including Sir John Marshall, Rev. H. Heras, Rhosny and others, who must have had occasion to inspect the tablet, did not notice that a considerable part of the writing on it varies largely from the Indus Valley script, and therefore, they did not find special investigations necessary. Fortunately while passing over it, I was struck with the find which made me to pause for a while, when I noticed and recognised the writing. The writing is partly in the Indus Valley script and mainly in Brahmi, fully developed in its technique and easy in its strokes. Surely I was looking at the very Brahmi writing of the Vedic period embodying

\* Mohenjo-Daro and the Indus Civilization, Vol. II, pp. 425-426.

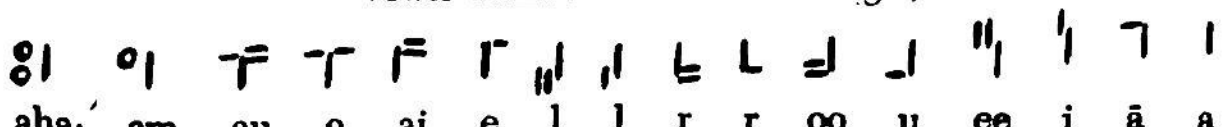
the *Maheshwari* technique. The text is very simple and short, befitting a tag, pertaining to the shipment of cargo from India in the third millennium B.C. The writing on the clay tablet if read from right to left, makes sense as "MARIMALA  $\text{||} \text{||} \text{||} \Psi$ ". This is a bill of lading issued from some Indian port on the West Coast of India to the port and market place of Mari, a well-known Biblical flourishing city on the banks of the Euphrates in Syria. The emporium of Mari was an ancient capital of Syria, and a famous market-place, trading with the ports on the eastern coast of the Mediterranean and those of Palestine, Syria and Egypt of the Fertile Crescent.

(6) The first letter is 'Ma' with the original labial classic crescent stroke without the inherent *mātrā-laxion* of 'a', or alif absent, as was the practice laid down later and supported by the great grammarian Panini in his *Astadhyayi*. The letter 'Ma' is in the perfect stroke of the class consonant 'P' with the additional circle of the nasal sign. There is no calligraphic change in this letter. The same is found in Asokan Brahmi even after two thousand years, without any change.

(7) The second letter is 'R' or 'Ri', a formation of vertical line 'alif' with the *mātrā-laxion* of the vowel R. This is a special system of formation of vowel-signs, following the consonants and merging with them to form syllabic letters. It must be noted that the writing of this tablet is from right to left. The *mātrā-laxions* added to the vertical line of 'alif' also follow a system of phonetic notation. In Nagari or Devanagari, this 'alif' formation of the merging vowels has been changed from left to right.

  
 a ā i ee u oo r r l l e ai o au am aha.

Vowel formation from left to right.

  
 aha. am au o ai e l l r r oo u ee i ā a

Vowel formation from right to left.

(8) In Brahmi the letter 'R' is generally written by the vertical line and the *mātrā-laxions* are added to, as found in the Babylonian tablet, *Ra*  $\Gamma$  \* In Nagari or Maharashtra *Modi* 'Ra' =  $\lambda$ , which is also always seen in Nagari conjunct consonants such as श्र ष्र प्र क्र भ्र etc.

\* Please refer to the decipherment of a Pre-Asokan Brahmi Writing by the author, *Journal of the Bombay Branch of the Royal Asiatic Society*, Vol. 29, Pt. I, 1954, page 62.

(9) 'R' of the Nagari writing is generally found in all the North Indian scripts written with the vertical line and the *mātrā-laxions*. 'Ri' of this inscription shows an ancient system of vowel formations, i.e. a vertical line receiving *mātrā-laxions*. Phonetically 'R' (ऋ) is changed to 'Ri' or 'Ru' in all Prakrit languages derived from Sanskrit. In Marathi of the 12th century A.D. and in Marathi Konkani dialects the word 'कृष्ण' (*Kṛiṣṇa*) takes the form as क्रिष्ण or कृष्ण (*Kṛiṣṇa* or *Kṛuṣṇa*). The second letter 'R' may be pronounced as 'Ri' or 'Ru', and the word of the first and second letters can be deciphered as *MARI* or *MARU*; of these I select the former 'MARI'.

(10) The third letter is 'Ma'. It exhibits a calligraphic change in outline of 'M' very much on the lines of the ideograms of the Indus Valley script. It must be presumed that the scribe knew both the scripts, and of course while writing hurriedly he produced such a sign with the *mātrā-laxion* of 'a' and the flattened cipher and crescent of 'M' in a continuous line. An important point of notation of *mātrā laxion* seen in this outline of 'Ma' is that they are attached to the letters directly, without the medium of the 'Alif', as found in Nagari and allied scripts. This system has been followed in all South Indian and Further-Indian scripts, which shows a traditional Vedic system of writing. Phonetically the *mātrā-laxions* of vowels, following and merging with consonants in syllabic writing, must be attached directly to the symbols of consonants. The medial 'Alif' or 'Kānā' of the Nagari Devanagari is a superficial one; as the 'Kānā' represents 'a', which was originally not to be shown in the characteristic sign. It has, therefore, been dictated by our grammarians that a consonant must be shown with an apostrophic sign on top or at the bottom. In Tamil this apostrophic dot is found on the top while in Devanagari it is at the bottom of the character. It is a false notation to show the inherent 'a' by a *Kānā* and then to show the non-existence of the same in that letter by an apostrophic mark. This letter therefore definitely proves that Brahmi syllabary has been in use in the third millennium B.C. or even before that; but was written from right to left. The letters of the Eran coin boldly support this fact.\*

(11) The fourth letter is 'La' which is an extraordinary character showing an antique development of the original Brahmi 'La' by

\*See Dr. D. Diringer, *The Alphabet*, p. 332.





centuries. The Asokan Brahmi 'La' is an exact mirror image of this. The 'La' and 'Ha' of Brahmi writing of the post-Vedic Brahmi are the 'Ha' and 'La' of the Asokan Brahmi respectively, as illustrated below :

$\text{U} = La \quad \text{U} = Ha$  of the post-Vedic Brahmi written from *R* to *L*.  
 $\text{U} = Ha \quad \text{J} = La$  of the Asokan Brahmi written from *L* to *R*.

In Phoenician-Greek, written from *R* to *L*, these peculiarities are found, viz.,  $\text{J J N} = ELK$  where the letters are laterally inverted. It is interesting to see how the letter 'La' and 'Ma' of this inscription are developed from the original writing.

Period	Direction Right to Left	Left to Right	Period
I stage	.. $\text{U} \text{U} \text{L} \text{U}$	$\text{U} \text{L} \text{U} \text{U}$	12th c. B.C. (approx.)
II stage	.. $\text{U} \text{U} \text{L} \text{U}$	$\text{U} \text{J} \text{U} \text{U}$	4th c. B.C.
III stage	.. $\text{U} \text{U} \text{L} \text{U}$	$\text{U} \text{J} \text{U} \text{U}$	1st c. B.C.
IV stage (about 30th c. B.C.).	$\text{U} \text{U} \text{L} \text{U}$	$\text{U} \text{J} \text{U} \text{U}$	2nd c. B.C. to 2nd c. A.D.
V stage (24th c. B.C.)	$\text{U} \text{U} \text{L} \text{U}$		

The existence of Brahmi of a mixed but stylised calligraphy and of variants in the same character of a palaeographic nature of 24th century B.C. pre-supposes traditional writing of a long past.

(12) The fifth is a numeral ideogram of six vertical dashes, two on the top and four at the bottom. It may mean  $20+4$ ,  $20 \times 4+2$  or  $20 \times 2+4$ , 400+20 or 200+4, cases or bales of cargoes, shipped to the port and market-place of Mari in Syria.

(13) The sixth letter is a trident, a sacred sign of navigation, a Sumerian ideogram at the end of the sentence meaning picture of *Bel*-tree ; and may be taken as bales. This trident ideogram was used by the people of the Fertile Crescent, India, as well as in the Indus Valley seals and the tablets found at Ur and Mohenjo-Daro.



(14) I assume that this tablet is a bill of lading for a shipment of fabrics from India. The screen of vertical and horizontal lines inscribed on the back of the seal probably indicates a definite commercial trade mark of cotton fabrics. The inscription may be deciphered as 'Mari Mala 204 bales', i.e. "Two hundred and four bales of cargoes bound for Mari".

(15) This Djokha tablet is a precious epigraphic evidence of Brahmi writing of the third millennium B.C. confirms the ancient trade communication of the East with the Fertile Crescent and Biblical references thereto. This inscription of the Vedic Brahmi and the Brahmi letters found on some of the Indus Valley tablets further establishes that *the Brahmi writing was in existence in the third millennium B.C. in India*. Thanks are due to Sir John Marshall's labours and production of this tablet\* in The Post-script of his publication as a contemporary evidence.

A. B. W.

Bombay, 6th September 1962.

## II

### A NOTE ON THE INDIAN ORIGIN OF THE URDU SCRIPT BY A. B. WALAWALKAR

(1) Urdu is an Indian script descended from Brahmi. Arabic, Persian and Urdu are generally considered as Aramaic scripts of the semitic family. But in my observations I found certain similarities in the outlines of characters, their variants, dots, *mātrā* signs called *nuktās* and their original consonantal writing exactly similar to the Pre-Asokan Brahmi. Since 1949 when I came in contact with Dr. S. Mahadi Hassan, now Deputy Director of Industries, Pakistan, and Shri L. S. Wakankar, savants of the Arabic, Persian and Urdu calligraphy and the investigators of its origin, I learnt a lot and was happy to arrive at a definite conclusion, that the Arabic or Persian or Urdu scripts are the original writings of Brahmi written from right to left.

\*The two views of this seal are reproduced on page 41, from sketches brought by L. S. Wakankar, in 1962, from the Musee de Louvre, Paris.



Table 89. Chart of different South Asian and Mediterranean Scripts showing lack of resemblance of Nabatean with other scripts, but remarkable resemblance with Gnarar Brahmi (Reprinted from 'Indian Origin of Arabic Script' by L. S. Wakanekar, 'United Asia', Bombay).

PRON.	HEBREW	ANCIENT-ARABIC	PHOENICIAN	LATER ARABIC	URDU	KAROSHTHI	PRAKRT	BRAHMI	GUPTA	NEUVARMA	DEVANAGARI	CURRENT
A ALPHA	א	𐤀	𐤀	ا	ا	𑀀	𑀀	𑀀	𑀀	𑀀	अ	अ (अ)
B BETA	ב	𐤁	𐤁	ب	ب	𑀁	𑀁	𑀁	𑀁	𑀁	ब	ब
Γ GAMMA	ג	𐤂	𐤂	ג	ג	𑀂	𑀂	𑀂	𑀂	𑀂	ग	ग
Δ DELTA	ד	𐤃	𐤃	ד	ד	𑀃	𑀃	𑀃	𑀃	𑀃	घ	घ
E EPHAION	ה	𐤄	𐤄	ه	ه	𑀄	𑀄	𑀄	𑀄	𑀄	ङ	ङ
Z ZETA	ז	𐤅	𐤅	ז	ז	𑀅	𑀅	𑀅	𑀅	𑀅	च	च
H HETA	ח	𐤆	𐤆	ח	ח	𑀆	𑀆	𑀆	𑀆	𑀆	छ	छ
Θ THETA	ט	𐤇	𐤇	ט	ט	𑀇	𑀇	𑀇	𑀇	𑀇	ज	ज
Ι IOTA	י	𐤈	𐤈	י	י	𑀈	𑀈	𑀈	𑀈	𑀈	झ	झ
Κ KAPPA	כ	𐤉	𐤉	כ	כ	𑀉	𑀉	𑀉	𑀉	𑀉	ञ	ञ
Λ LAMDA	ל	𐤊	𐤊	ل	ل	𑀊	𑀊	𑀊	𑀊	𑀊	ट	ट
Μ MU	מ	𐤋	𐤋	מ	מ	𑀋	𑀋	𑀋	𑀋	𑀋	ठ	ठ
Ν NU	נ	𐤌	𐤌	נ	נ	𑀌	𑀌	𑀌	𑀌	𑀌	ड	ड
Ο OMIKRON	ו	𐤍	𐤍	ו	ו	𑀍	𑀍	𑀍	𑀍	𑀍	ण	ण
Π PAI	פ	𐤎	𐤎	פ	פ	𑀎	𑀎	𑀎	𑀎	𑀎	त	त
Ρ RHO	ק	𐤏	𐤏	ק	ק	𑀏	𑀏	𑀏	𑀏	𑀏	थ	थ
Σ SIGMA	ר	𐤐	𐤐	ר	ר	𑀐	𑀐	𑀐	𑀐	𑀐	द	द
Τ TAU	ש	𐤑	𐤑	ש	ש	𑀑	𑀑	𑀑	𑀑	𑀑	ध	ध
Ξ XI	ז	𐤒	𐤒	ז	ז	𑀒	𑀒	𑀒	𑀒	𑀒	न	न
Ω OMEGA	ח	𐤓	𐤓	ח	ח	𑀓	𑀓	𑀓	𑀓	𑀓	प	प

Source: *Journal of Indian History*, Bombay, India.

मराठीचा विकास - महाराष्ट्राचा विकास  
 कलिंगपुत्र  
 २०२०  
 पृष्ठभूमी  
 चमर







Dr. S. Mahadi Hassan and Shri Wakankar are the pioneers of this discovery and I fully agree with them that the Arabic Alphabet does possess the basic strokes of the Devanagari and the mother script Brahmi.

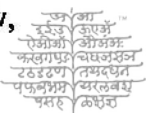
(2) Shri L. S. Wakankar has shown that the modern Arabic script is a direct adoption of Brahmi. I reproduce a chart prepared by him in order to explain his theory. Both Dr. S. Mahadi Hassan and Shri Wakankar agree that Arabic script has an Indian origin and it can be traced in Nagari or Brahmi. Shri Wakankar shows in his chart by tabulating Aramaic, Hebrew, Nabatean and Kharoshthi that only Arabic and Urdu scripts do possess elements from the Indian Alphabet. I, however, see a concealed lineal flow of a system of strokes of the Brahmi Alphabet written from right to left. The Arabs who were in constant touch with the Indian culture, developed this script under the impact of Indo-Iranian culture, when Persians established their political superiority by supporting Abbasid Khilafat.\* The Persians collected the "Suras" of Kuran wrote them in the revised script which became common to Arabs as well as the Persians. Umayya also had to adhere to this revised script introduced by the Abbasids. We see two fashions of Arabic script, i.e. Kufic and Naskhi, The system of Hebrew writing was also revised after the Khalif's Koranian writing. The Arabic, Persian, Sindhi and Urdu are sister scripts. Urdu is therefore an Indian script worth encouraging for a fast writing in India. I propose to deal with this subject in my revised edition of pre-Asokan Brahmi and show that Urdu script is an Indian script written from right to left and not a semetic one.

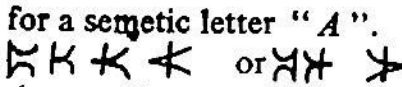
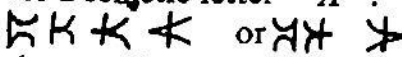
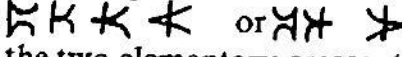






(3) The following are very brief notes on this subject :

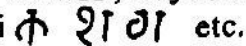
1. Alif " / ", Kaf " ك ", Gaf " گ ", " ع " Ain, " ع " Gain.









Alif of the Arabic alphabet is not the letter " A " but a diacritical mark or a vertical line added to a consonantal letter, in order to form an 'Akshar' i.e. a letter having an inherent " A " to be pronounced along with the consonant. The original vowel letter " A " of the Indian Alphabet Brahmi contains two crescents placed like this . This they used to write without lifting the pen "  " or "  ". It is a vowel of the guttural class and has a phonetic value of " K " pronounced softly as Ain. The Phoenician Traders adopted this Indian 



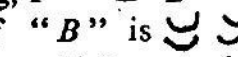
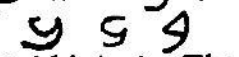








\* See 'Persian Element in Islam' by M. L. Roy Choudhary Shastri, *United Asia*, Vol. III, No. 4.





for a semetic letter "A". The stages in the formation of this  are  or . In early and also in modern Hebrew, the two elementary crescents of the Brahmi technic are clearly seen. This Hebrew  is a direct adaptation of the Brahmi Alphabet. The variations of these two letters are  = K and  A. The 'K' of the Semetic alphabet is a combination of *Alif* and *Kaf* i.e. the angle stroke for *Kaf* and the vertical line for *Alif*. The formation of the "K" was originally divided into a disconnected sign  = | and . Further with an addition of a dash on the *Kaf*, it was converted into *Gaf* . Therefore, the Arabic Script adopted the vertical line for *Alif* and *Ain* for "A", but softly pronounced as "K".

It may be taken as *Alif* or *Alif*. In Nagari script and other north Indian Alphabets which are the derivations of the Brahmi, *Alif* has been maintained as a vertical line \*as it is e.g. Nagari  etc.


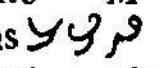




(2) *Be* , *Fe* , *mim*  , *Se*  (PSH),  
*Pa* , *Ta*  (PT) and *Waw* .

In the Semetic languages there is no difference in *Ba* and *Pa* just like Tamil. *Ba*, *Pa*, *Fa*, *She*, *Mim* and *Waw* are of the Labial class and have a common basic crescent stroke well balanced "  ". This stroke has been developed into class letters by the addition of top and bottom dots. From *Pa* of the Nagari or Brahmi or of the Greek and Latin we get *Ba*. The Greek "  " is a conversion of "P" similar to Brahmi or Nagari. 'B' is always pronounced as 'W' in all the Indo European languages as well as Semetic languages, e.g. *Wadi* and *Badi* or *Cardova* and *Cardoba* and hence the outline of *B* and *W* are similar in the beginning,  $P = \cup B = \cup W = \cup$  or  $\cup$  and therefore, the formation of "B" is  or  is seen in Semetic, Arabic, square Hebrew and Rabbinic. † The double crescent of 'B' was later converted into a dot by the scribe for his convenience in order to apply *Alif* to the basic stroke and not to the additional stroke e.g. to write *Ba*   i.e.   are the obvious stages. *Fa* is also a doubling of *Pa* but in a different way, which is similar to *Wa* and to distinguish it from 'Wa' the scribe put, a dot on top of 'Waw' i.e.  *Fa*, while  is a 'Waw'. It is a general practice of applying *Alif* to the upper crescent and not the lower one which has been taken as a mark of phonetic conversion. *Fa*  



(Nagari — is a Brahmi 'F', adopted with the original outline



















\*Vide of Dr. D. Diring. *The Alphabet* Fig. 110 and 132

†See Fig. *Ibid* 128 and 132

of 'P' and with the additional stroke of the Aspirate. The letter 'M'  is also a direct formation or conversion of 'P' or 'B' into nasal with an additional nasal sign attached on the top where 'P' or 'B' has been converted into 'M'.  $P = \cup$   $B = \cup \text{ with a dot above}$   $M = \cup \text{ with a dot above and a vertical stroke to the right}$  but later on these forms  or  of M came in use. "M" is therefore, the formation of P into M. W is a doubling of P and it is a labial semi-vowel and always confounded with B. The doubling of  $\cup$  is B  or W, P, and B show a system. The Semitic W "𐤨" has got also elementary strokes of P. To differentiate 'B' from W they wrote  for B and  for W. The development of W and the same of B clearly defines the transitions.

(3) Nun "𐤎" of the Arabic resembles the 'N' of the Brahmi. In early Arabic and Kufic N "𐤎" had been used for N directly. Afterwards they found it more easy to adopt this "𐤎" than "𐤎" (N).

(4) Dal  and Ra .

D and R are of the same class and they had their original form somewhat similar. The Bengali 'R'  may be taken for comparison.\* In all these representations one may observe that the Dal and Ra had one and the same outline. In Brahmi there are two Da and Da i.e.  or . The basic crescents of both these lingual and dental are  $\cup$  and  $\cup$ . We find them in Brahmi as well as in South Semetic and Sabaean script adopted as   and further   (Rabbinic)† Dal is a definite  
 adoption of Brahmi. The elimination of the top stroke of Dal   created the dot on the top of . This resembles Nagari  or  and  shows the origin. Ra  is also the original Dal. The Semitic while adopting the Indian Alphabet were not very particular about the minute shreads of the pronunciation as originally the Semetic script was required to keep books of accounts of the merchants and traders in order. But when they wanted to use the script for notations for higher culture and literature like the Bible and the Koran they became very particular in writing. The formation of  and  are practically the same. The lower portion of  i.e. dotted stroke as shown here  being dropped ; and "𐤎" thus came in use. Whenever the Alif is added to 'R' and 'D' it is never attached to the stroke but kept aloof to indicate

\*See Dr. D. Diringer, *The Alphabet* Fig. 103 Canaanite, 114 Phoenician, North Semetic Fig. 109 Sabaean Fig. 110. Early Hebrew Fig. 118, 128, 132 and 136.

† Maghribi see fig. 132 col. 7.



that there is something dropped of the stroke and therefore the Ra and Da are written as '।' ।'. It should be remembered that whenever the vertical line of the Alif is found detached from the consonantal stroke, the consonantal letter lacks some stroke which has been dropped in the resilient writing. D and R therefore are thus the adaptations of the Indian Alphabet.

### 5. Qaf ڦ = Q

The formation of Fa ڦ has been discussed above. ڦ is a conversion of ڦ and has got no other derivation. The Cannanite "𐤒" and the Aramaic "𐤒" are the direct borrowings of the Indian Alphabet 𐤒. The guttural of K and Kh are also obvious in the Rabbinic (Rashi writing).

### The formation is very clear 𐤒 𐤒 𐤒

But this letter presented difficulty to adopt for *Maskhi* writing and therefore the scribe preferred to conversion of ڦ to ڦ and there is no other solution for this form.

### 6. Ye ڤ = Y

This letter is also adopted from the Indian Alphabet 𑂔. The development of this Y is very clear. The lineal sign 𑂔 = Y resembles "𑂔" dal and therefore the lower dots of Y came in practice to differentiate from the *Dal*.

Bombay, December 20, 1960.

A. B. W.



## APPENDIX E

### DEVANAGARI ON THE TYPEWRITER\*

Although the idea of typing characters mechanically was patented on July 7, 1714 by Henry Mill, the first workable gadget was made only in 1833 by Xavier Progin, a Frenchman. In 1866, C. Latham Sholes and W. Soule perfected a device for printing numbers on Bank-notes. These two, together with Glidden, were inspired by a paper in *Scientific American*, on a typewriter perfected by John Pratt. They started work on the invention of a workable device and actually produced a typewriting machine in September 1867.

Latham Sholes, in collaboration with James Densmore, later prepared some 25 different models and presented a good prototype to the Remington Small Arms Factory in 1872. In 1873 the first typewriter was produced in U. S. A. A machine with visible types was put on the market in 1896. The first "Portable" was marketed in 1910, followed by a "Noiseless" in 1914. The American production was closely followed by production of Typewriters in Germany, Italy, Sweden, France and England. The first electric typewriter was put on the market in 1930.

Remington and other manufacturers soon started supplying typewriters with Indian Scripts. Paillard (Switzerland), in collaboration with the house of Tatas, did original work on Hindi Typewriters. They prepared four different models for the Kalelkar Committee. None of these efforts were supported by the official agencies and thus the labour was wasted. The most useful Devanagari typewriter was made in Germany, which was designed by V. M. Atre, under the name *Nagari Lekhan Yantra*. It worked on three shifts, four bank system. The German firm, Bureau Machinanfabrik "Olympia", made the Mishra-Hindi Typewriter, on two shifts, four bank system, using the half-space movement, for certain narrow-set letters.

#### ATTEMPTS TO STANDARDISE THE HINDI KEYBOARD

By 1950, more than 18 different Devanagari Keyboards were on the market. Dr. Rajendra Prasad, early in 1948, wrote to Pandit Jawaharlal

Adapted from the articles "Devanagari-Characteristics and Mechanisation," by L. S. Wakankar. *Bulletin of Federation of Master Printers*, October 1962, December 1962, February 1963 and October 1963.



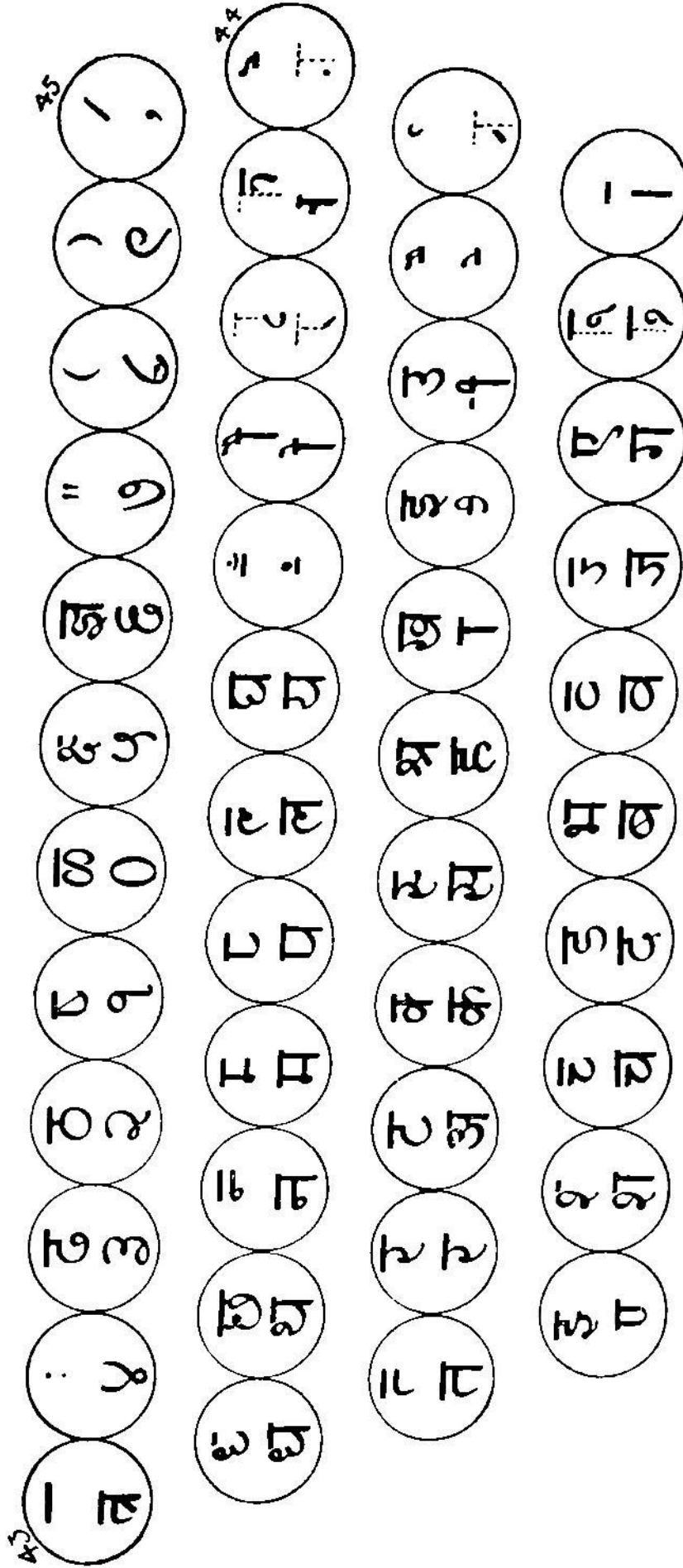


Fig. 218. Revised Keyboard supplied by the Finalising Committee (Appendix C, D, Report of the Standardization Committee, page 138)

Nehru on the need of a Standard Devanagari Keyboard for administrative purposes. Pandit Nehru wrote back, (11th April) "I think that you might appoint a Committee on behalf of the Constituent Assembly of India", and as a result a Committee, consisting of the following members, was appointed by the Constituent Assembly :

- (1) Shri Kakasaheb Kalelkar, Hindustani Prachar Sabha, Wardha, (Chairman).
- (2) Shri M. Sathyanarayana, Dakshina-Bharat Hindustani Prachar Sabha, Madras.
- (3) Prof. Kripanath Mishra, Science College, Patna.
- (4) Shri Shrimannarayan Agrawal, Wardha.
- (5) Dr. Babu Ram Saksena, Allahabad,
- (6) Bhadant Ananda Kausalyayan, Wardha.

Preliminary report submitted by this Committee was published on February 8, 1951. The Ministry of Education, Government of India then appointed an Expert-Committee to design the Hindi Typewriter and Teleprinter keyboards. The Committee consisted of :

- (1) Shri S. M. Agarwal, Director-Telephones, Post and Telegraph Department.
- (2) Shri A. C. Sen, Controller of Printing, Printing and Stationery Department, Government of India and
- (3) Dr. Yadu Vanshi, Central Hindi Directorate.

The Experts Committee brought out its first report in May 1952. The report advocated the provision of half-movement keys and introduced the principle of arranging the keys according to the propitiousness of the characters and the frequency of their occurrence. The typewriter manufacturers, however, pointed out that in this keyboard the dead-offset keys were dispersed and their inclusion in a typewriter segment was not mechanically possible. An improved design of the standard Keyboard was finalised in 1962, by grouping the dead-offset keys on the left-hand side. This keyboard was however criticised in informed circles, as the half-forms of letters ढ, ढ, ढ, ॢ, ॣ, ।, ॥, ०, १, २, and ३, were not provided, which necessitated using *halanta* even in case of these vertical letters in conjuncts. Many words could not be typed accurately on such a machine. This design was thus not in conformity with the official resolution on Standardisation of the Devanagari Script, adopted by the Education Ministry.

#### *Ad-Hoc* COMMITTEE OF THE MAHARASHTRA GOVERNMENT

In view of the shortcomings of the above 1962-Keyboard, the Government of Maharashtra felt that the problem required further study. (continued on page 643).

(Vide Communication to States by the Ministry of Education, New Delhi, No. F. 4-7/57/H-12/of 21st January 1960).

HINDI TYPEWRITER

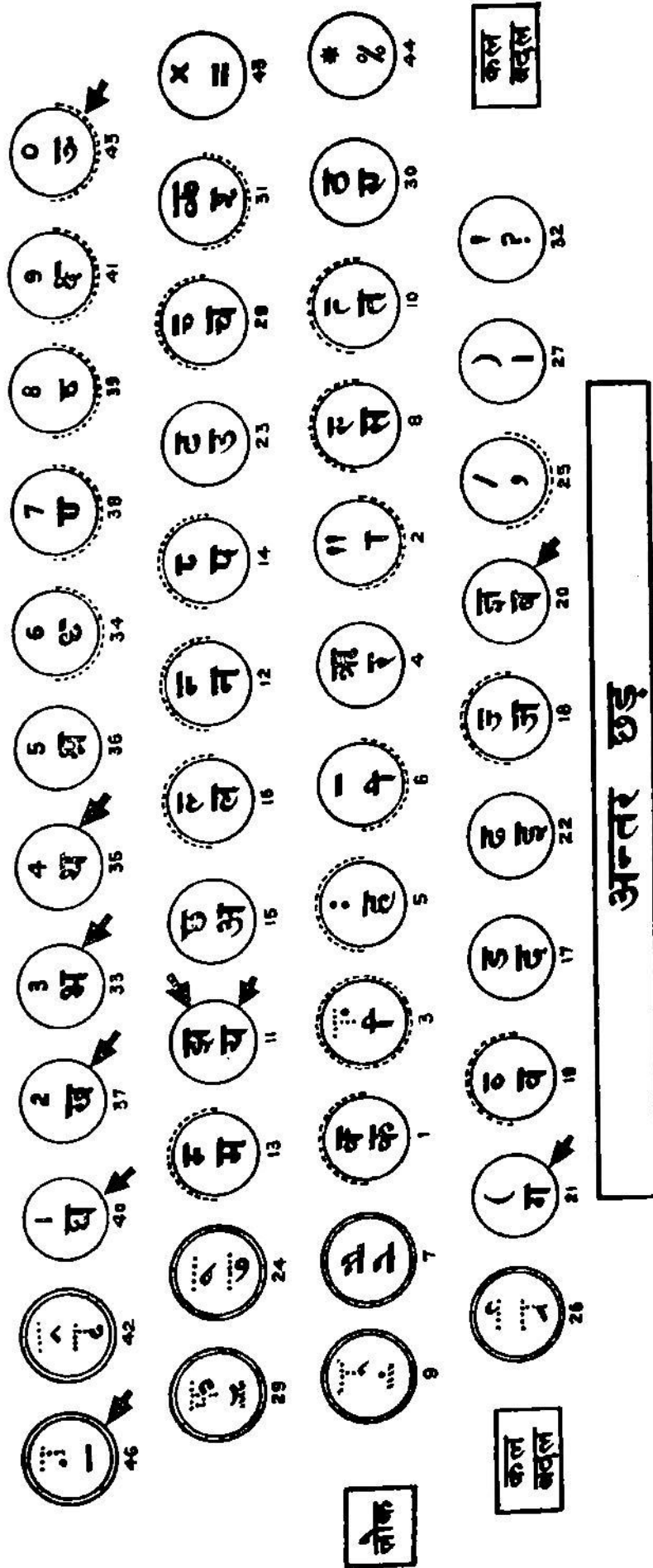















Fig. 219. Final Keyboard layout for Hindi 1962  
(Shortcomings are indicated in the chart by arrows)

*Legend :*

1. Number below the keys indicate their relative order of propitiousness.
2.  Dead and offset keys.
3.  Keys having half movement in upper shift.
4.  Keys having half movement in lower shift.
5.  Keys having half movement in both shifts.

*Notes :*

1.  Dot in upper shift of key No. 3 is the multipurpose dot for making—ड from ड, ; from , and to be used as a decimal sign.  
3
2.  In upper shift of key No. 6 is the hyphen.  
6
3.  In the upper shift of key No. 9 is the *halant* sign.  
9
4.  In upper shift of key No. 29 is the special sign for making फ from प, क from उ and र from र.  
29
5.  *Mātrā* for long आ in lower shift of key No. 2 is to be used also for making full consonants from half consonants व, ष, ङ, ञ, ण, and ॠ in keys.  
2
6.  In lower shift of key No. 46 is the under lining dash.  
46
7.  In upper shift of No. 46 is the bottom dot for making ड़ from ड, ढ़ from ढ etc.  
46
8.  Sign in lower shift of key No. 26 is the form of र to be used with प etc. as in प्रेम.  
26
9.  Sign in upper shift of key No. 42 is the form of र to be used with ट etc. as in ट्रक.  
42



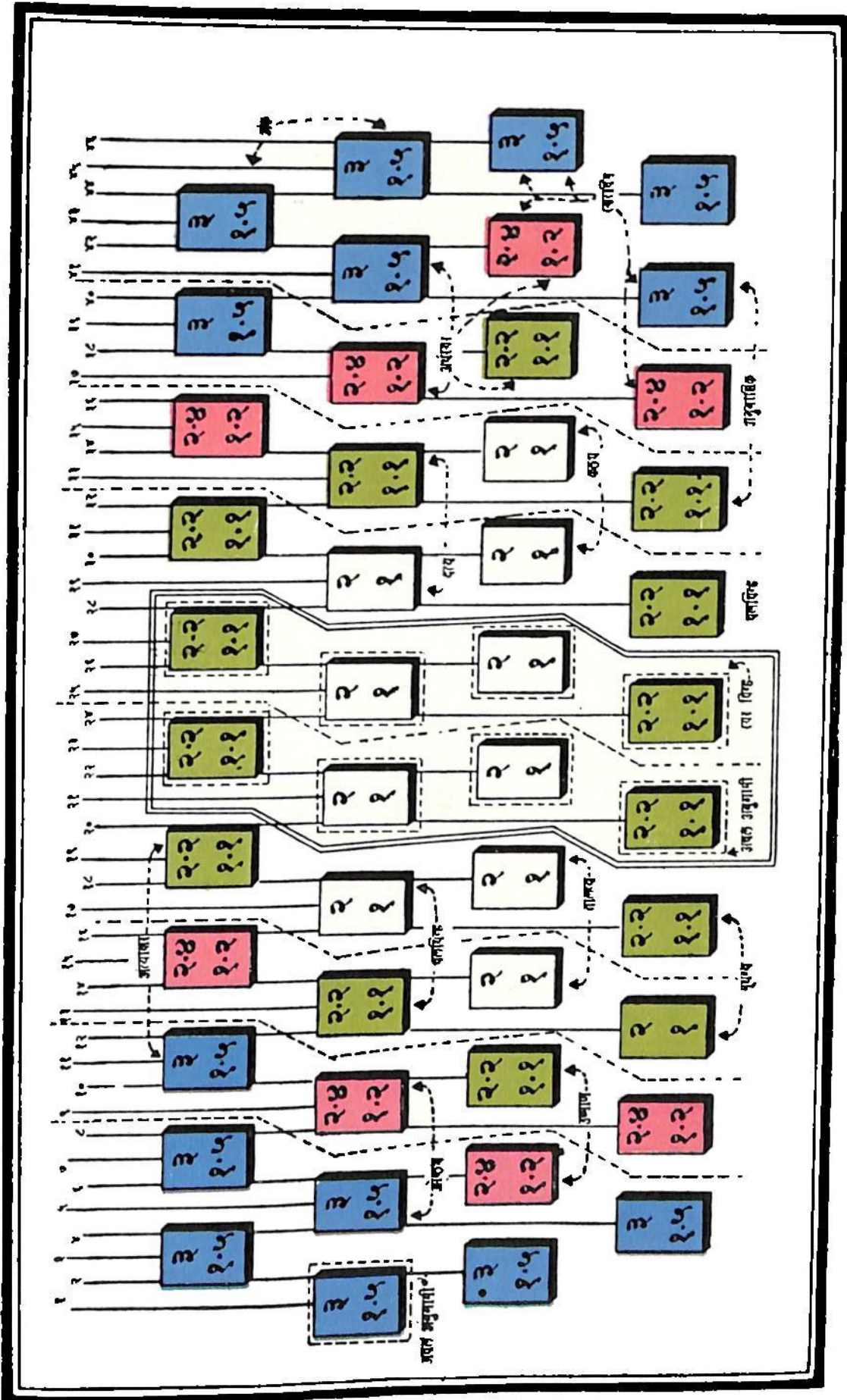


Chart showing (i) Most propitious (White); (ii) Propitious (Green); (iii) Less propitious (Red); and (iv) Least propitious keys (Blue). The lower figures show effort value for normal position and upper for shift position.

## अनुक्रमणिका



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत



An *Ad-hoc* Committee with the following members was appointed by the Government of Maharashtra :

*Chairman*

- (1) Dr. W. N. Pandit, M.A., PH.D., Director of Languages, Government of Maharashtra.

*Members*

- (2) Shri B. S. Naik, B.A. (HONS.), M.I.P.T.G.M., F.R.S.A. (LON.). Deputy Director Government Printing and Stationery, Government of Maharashtra.  
 (3) Shri S. A. Sapre, B.A. (HONS.), B.SC. (HONS), Principal, Government Institute of Printing Technology.  
 (4) Dr. S. V. Bhagwat, M.A. PH.D., Registrar, Nagpur University.  
 (5) Shri L. S. Wakankar, B.SC. (TECH)., Proprietor, Kromo Prints Corporation (India).

*Secretary*

- (6) Shri N. K. Upasani, M.A., M.ED. (ARIZONA, U.S.A.) Deputy Director of Languages Government of Maharashtra.  
 Shri G. P. Vijapure, ex-Manager of the Kirloskar Press, was later nominated on the Committee.

The Committee set before itself the following guiding principles, in evaluating various suggestions on the standard keyboards :

- (a) *Orthographic Test* :—To examine conformity with the Standard Script approved under Government Resolution, E. & S. W. D. No. TBK/1762-G of 20th July 1962 which was based on the Government of India, Ministry of Education, Communication No. F. 4-7/57-H/2 of 21st January 1960.
- (b) Ninety-two *Graphemes* were selected as essential and they were arranged in order of their 'graphemic' frequency evolved from the studies conducted by Dr. S. V. Bhagwat at the Deccan College Post-graduate Research Institute, Poona. System of lateral conjugation was prepared (क्क, क्व, छ्व, दय, र्न, ह्न, etc.) to replace the manuscript system of vertical conjugation of consonants. (क् क, छ्, य, र्न, ह्, etc.)
- (c) *Effort-saving signs*, such as ण, णी, णि, णे, णै, ण, ण, etc., were considered added convenience.
- (d) *Conversion-potential* : The Standard Keyboards should be such that it should be possible to convert the existing English Machine to the Hindi Keyboard.
- (e) *Relative merits* of different keyboards were to be judged by assigning effort values to the finger-movement regions, obtained from the propitiousness charts, prepared by the Agarwal Committee of the Government of India.

Government Of Maharashtra

DEVANAGARI TYPEWRITER KEYBOARD

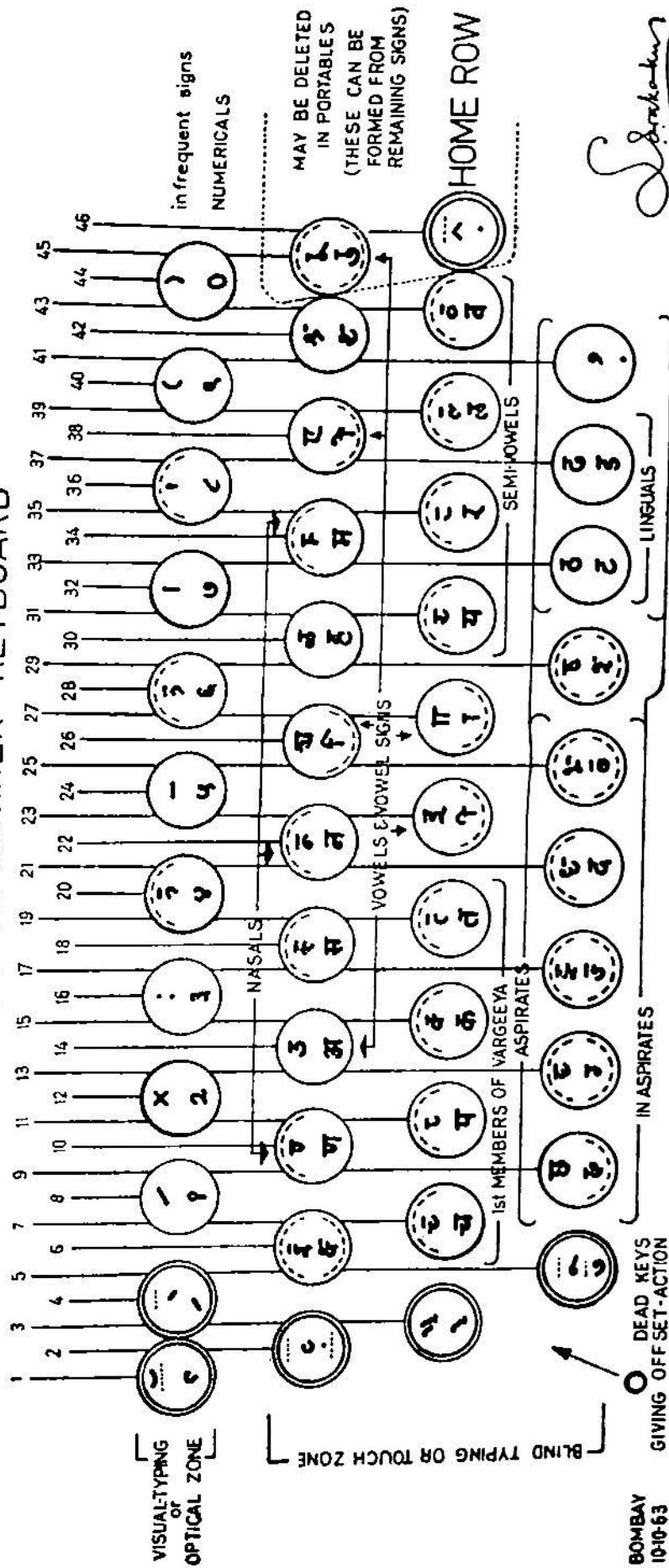


Fig. 221. Devanagari Typewriter Keyboard (Provisional) (1963)

Following formula suggested by S. A. Sapre was accepted for relative evaluation of different Keyboards :

Total Effect Value 'E' =  $\sum fx$ ,

where f = frequency of use, x = positional value.

Effort value total will be inverse of relative efficiency.

#### EFFORT-VALUE DETERMINATION

Increasing effort values were assigned to the keys placed away from the 'home row positions'. Positions in shift were given double the value assigned to unshift positions as extra effort has to be put in for :

(i) Pressing of shift-keys, (ii) Striking the character-key, (iii) Release of movement of finger to next typing key.

TABLE (APPENDIX 4 AND 5).

Region movement	Colour allotted	Row	Operating finger	Effort-values	
				Un-shift	Shift
Most Propitious ..	White ..	Home ..	1st-2nd	1.0	2.0
		Upper ..	1st only		
Next Propitious ..	Green ..	Top ..	1st	1.1	2.2
		Upper	2nd		
		Home	1st		
		Bottom.	2nd		
Less Propitious ..	Red ..	Top ..	2nd	1.2	2.4
		Upper	3rd		
		Home	4th		
		Bottom	3rd		
Least Propitious ..	Blue ..	Top ..	3rd	1.5	3.0
		Upper	3rd		
		Home	4th		
		Bottom	4th		

#### FREQUENCY OF NUMBERS

Frequency counts of characters in 1,00,000 words were reproduced. They were based on the study conducted by Dr. Bhagwat at the Deccan College Post-graduate Research Institute, Poona.

#### MAHARASHTRA COMMITTEE'S CRITERIA

The proposed Keyboards were compared by the Committee by applying the following criteria :

- (1) *Preliminary Test*.—The keyboards which did not provide for all the essential characters were rejected.
- (2) *Orthographic Test*.—(a) Provision for constructing complete vowelisation series (*Bārākhadi*) of all characters, consonants and conjuncts. (continued on page 651).





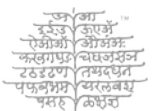


*Legend*

1. Numbers below the keys indicate their relative order of propitiousness.
2. ☉ Keys which are dead and offset, they are so in both shifts.
3. ☉ Keys having half movement in upper shift.
4. ☉ Keys having half movement in lower shift.
5. ☉ Keys having half movement in both shifts.

*Notes :*

1. T *Mātrā* for long अ in lower shift of No. 2 is to be used also for making full consonants from half consonants ष and ष located in upper shift, of key Nos. 3 and 6, ण located in lower shift of key No. 27 and ष and ष, ष and ष, ष and ष, located in lower and upper shifts of key Nos. 30, 31 and 32 respectively.
2. .: Sign in the lower shift of key No. 9 is the *anuswār*.
3. † In upper shift of key No. 9 is the *halant* sign.
4. † Sign in lower shift of key No. 26 is the form of र to be used with प etc. as in प्रेम.
5. † Sign in upper shift of key No. 42 is the form of र to be used with ट etc. as in टक.
6. फ In upper shift of key No. 29 is the special sign for making फ from प, ऊ from उ and रु from र.
7. .: Dot in lower shift of key No. 44 is the multipurpose Dot to be used as a decimal sign and for making ड from ड and ; (semicolon) from , and
8. .: In lower shift of key No. 46 is the bottom dot for making ड from ड, ढ from ढ etc.
9. - In upper shift of key No. 36 is the hyphen. Using the variliner. This will also be used as the underlining dash.
10. | The numeral | in lower shift of key No. 40 will also be used as the Viram sign.
11. † Sign in the upper shift of key No. 34 is the inverted Comma.



*Numerals :*

12. The keyboard standardised by the Central Government incorporates international form of Indian numerals. If any State or any other body uses any other form of numerals, the sign of Interrogation ( ? ) located in the upper shift of key No. 40 would be replaced by the Viram sign.

*In Marathi Typewriter :*

13. ऩ in upper shift of key No. 41 and ऩ in upper shift of key No. 27 will be half characters.

*In Portable Typewriter Keyboard :*

14. (i) Keys No. 45 and 46 shall be dropped.  
 (ii) Key No. 44 shall be positioned to the extreme right of the bottom row *i.e.* next to key No. 32.  
 (iii) % sign in the upper shift of key No. 44 shall be omitted and instead bottom dot . of key No. 46 shall be provided (in place of % sign) on key No. 44. The key No. 44 shall thus bear the characters as shown here :





- (b) Provision of maximum number of character-signs as given in Appendix 3.
- (3) *Speed-Test*.—Effort-value totals were calculated and the keyboards arranged in order of lowest to highest efforts. On the basis of the above tests the committee tabulated the various keyboards :

<i>Keyboards Compared</i>	<i>Total Effort Value</i>
(1) Remington " Superwriter " Keyboard ..	9,20,000
(2) Ministry of Education-Key-board ..	7,66,200
(3) Maharashtra Keyboard-1962 ..	8,98,200
(4) Revised Maharashtra Keyboard* ..	6,80,000

The fourth keyboard was formulated by the committee on the basis of various suggestions received. The effort requirement was reduced by the removal of graphemes like ऩ, ऩ, ॢ, ण, ण, etc., from the earlier keyboard and substituting highly frequent full-consonants. Two sets of key-heads were actually made locally, one with photo-etched copper-blocks welded on to the type-heads and the other with mildsteel heads engraved on Dekel Panto-graph Engraving Machine from brass masters. The designs were drawn by L. S. Wakankar a member of the Maharashtra Committee and types were pantographed by Desai on the heads prepared by S. K. Khandekar of Vanaz Engineers Ltd. The types were mounted at the Government Stationery Department. These types were taken to Berlin by Wakankar for test, where he studied the procedure of typewriter type-designing and type-cutting. The designing of the Halda Devanagari, Halda Gujarati and Godrej Fine line Devanagari type face, by L. S. Wakankar, is based on this experience.

#### REVISION OF HINDI KEYBOARD

The Ministry of Education, Government of India, was apprised of the work done by the Maharashtra Committee. After studying the same the Government of India invited the representatives of the Government of Maharashtra to New Delhi for discussion, with a view to evolve a common keyboard for Hindi and Marathi. The meeting was held at the Secretariat, New Delhi and at the Telephone Directorate, on 5th, 6th and 7th November 1963. The following members participated:

##### *Chairman*

Shri R. P. Nayak, I.C.S., Joint Secretary to the Government of India, Ministry of Education.

\* *Devanagari Typewriter Keyboard* Directorate of Languages, Government of Maharashtra, Bombay, 1962.



मराठीचा विकास - महाराष्ट्राचा विकास

राज्य मराठी विकास संस्थेद्वारे  
संगणकीकृत

*Government of India Representatives*

- (1) Dr. Bishwanath Prasad, Director, Central Hindi Directorate.
- (2) Shri S. M. Agarwal, Director of Telephones, Post and Telegraph Department.
- (3) Dr. Suresh Awasthi, Deputy Director, Central Hindi Directorate.
- (4) Shri Jailalji Gaktoo, National Institute of Audio-Visual Education.

*Maharashtra Government Representatives*

- (1) Dr. W. N. Pandit, Director of Languages, Government of Maharashtra.
- (2) Shri B. S. Naik, Deputy Director, Government Printing and Stationery, Bombay.
- (3) Shri L. S. Wakankar, Proprietor, Kromo Prints.
- (4) Shri N. K. Upasani, Principal, S. M. T. T. College, Kolhapur.

After detailed discussions, a common keyboard was evolved with minor variations in the Hindi and Marathi keyboards. Instructions were then sent to the manufacturers for production of Proto-type Machines. In 1965 members of the Maharashtra Committee met the technicians of Remington Rand at Calcutta on January 4, 1968 and considered the changes that were thought necessary.

## DESIGNING OF THE TYPEWRITER FACE

Following mechanical limitations were considered, while designing the characters for the Devanagari Typewriters :

*Spacing.*—The spacing effected by the carriage-movement in the mechanically operated conventional typewriters is constant in English-typing machine. This has resulted in squeezing of 'W' and 'M' and wider white-spacing in case 'i' 'j' and 'l'. This does not much, affect the look of the typed matter in Roman letters as they stand apart in linear setting. Unlike this, the Devanagari letters in a word are constructed by combining the vowel-signs and joining with the head line. The consonants are therefore provided in half form i.e. without verti-bar on half movement and the vowel-marks combined with verti-bar on movement key. Such a device was invented by the manufacturers of the Arabic typing-machines.

Spacing between typed lines varies with the 'size' of type face (*see* accompanying Table and Illustration), as well as, with typists, requirement of spaces between two lines :

## TYPICAL MECHANICAL SPECIFICATION

<i>Model</i>	<i>Size</i>	<i>Spacing</i>	<i>Motion</i>
Remington/Underwood	.. Pica	.. 2·54 MM. ..	6·65 MM.
Remington/Underwood	.. Elite	.. 2·12 MM. ..	6·6 MM.
Court-Documents model	.. Large Pica	.. 2·60 MM. ..	6·6 MM.
Shipping Documents Model	.. Medium	.. 3·00 MM. ..	6 6 MM.
Godrej (Devanagari Fine-line)	.. Pica	.. 2·6 MM. ..	8·0 MM.

N.B.—Height of the type 4·8 mm. maximum, inclusive of the ascending and descending overchanges of accents.

## TYPE-HEAD PARTS

*Motion.*—Motion is the distance by which a roller lifts up or the type-bar-basket goes down, when the shift-key is pressed. This puts a limit (4·8 mm.) on the maximum height of characters. If the height exceeds this limit the parts of the ascenders or descenders will overprint in the legitimate regions of other lines above or below.

*Dead-keys.*—As the type-bar recedes after striking of a type, a projection near its lever kicks the escapement lever, which releases the spring-controlled roller by one space movement. If this projection is filed off, there is no kicking during the return-movement and the roller does not move to the left. Such a key is called a 'dead' or non-movement key. In the earlier models it was necessary to type the dead-keys before a character, but the newly invented offsetted keys have 'normalised' the vowelisation procedure. These dead offset keys strike through an alternate type-guide on the left-side of the usual type-guide.

Sign on the 'dead-offset' keys are :

Medial Point		for making	ड	from ड
Lower Point		”	ख, ड, ढ,	” ख, ड, ढ,
<i>Rastra</i> Sign	^	”	ट्र, ड्र,	” ट, ड,
<i>Ṛ-Kār</i> Sign	ˆ	”	कृ, सृ	” क, स,
<i>Pra-Kār</i> Sign	ˆ	”	प्र, म्र	” प, म,
<i>Reph</i> Sign	ˆ	”	व, म	” व, म
<i>Mahāprān</i> Sign	ˆ	”	फ, ऊ, ह	” प, उ, र
<i>Short-Ukār</i>	ˆ	”	कु, तु, डु	” क, त, ड,
<i>Long-Ukār</i>	ˆ	”	कू, तू, डू	” क, त, ड
<i>Single Mātrā</i>	ˆ	”	के, ते, टे	” क, त, ट
<i>Double Mātrā</i>	ˆ	”	कै, तै, टै	” क, त, ट
<i>Anuswāra</i>	ˆ	”	कं, ढं	” क, ढ
<i>Virām-Mātrā</i>	ˆ	”	कँ, मँ	” क, म
<i>Halānt</i> Sign	ˆ	”	ट्, ड्	” ट, ड

*Half-movement.*—This improvement in the gear-mechanism includes the device of doubling the teeth of the ratchet-wheel and adjustment with fixed-levers which presses a universal bar that helps escapement by one-half space only, while the fixed-levers of the 'full-characters' escape by two half-spaces. (continued on page 657).



**Legend :**

1.  $\bigcirc$  Characters in figure shift (total 28).
2.  $\odot$  Dead keys (total 10).
3.  $\circ$  The positioning of characters on these keys is different from the layout on the Typewriter keyboard.

**Notes :**

1. The keyboard has no "shiftkeys", automatic shift shall be provided.
2. Teleprinter code for the characters may be decided by the manufacturers according to their convenience.
3. Position of key Nos. 15 and 45,  $\oplus$  i.e., मैहूँ and  $\odot$  i.e. बार बार may be changed according to the convenience of the manufacturer.
4. Key No. 59.  $\text{Ⓢ}$  shall perform the function of both carriage Return and line feed.
5. The key No. 30 " $\text{✱}$ " shall perform the function of "who are you" key in the telex service. In addition it would print oblique ( / ) instead of the recognised sign (  $\text{✱}$  ) used in English teleprinters so that in teleprinters in telegraph offices where "who are you" and "answer back" facilities are not required. This key could be used for printing oblique ( / ).
6. Character घ and bell  $\text{Ⓢ}$  are provided on the same key No. 58. Every time घ is typed bell shall also ring.
7. Half characters have not been provided on the keyboard. They shall be formed by use of halant sign "ँ", key No. 43 e.g. पंक्ति would be typed as पंक्ति.
8. ऋ, ए and ऐ have not been provided on the keyboard. They would be typed as अ, ऐ and औ respectively by combining अ with the appropriate mātrā.
9. The following characters shall be formed in the manner indicated below :

$$\begin{aligned} \text{क्ष} &= \text{क्} + \text{ष} \\ \text{त्र} &= \text{त्} \\ \text{ज्ञ} &= \text{ज्ञ} + \text{यं} \end{aligned}$$

10. Sign ॠ is not provided. sign ॠ̣ (key No. 48) shall be used in place of sign ॠ also e.g. प्रेम shall be typed as प्रेम̣.
11. Key No. 16 ॠ̣ is used to form फ from प and ठ from ट.
12. The shape of ऋ in the keyboard is different from shape of ञ in the typewriter keyboard. ऋ will be formed by combining भ of key No. 28 with ॠ̣ of key No. 16.
13. The following characters are not provided on the keyboard ड, ञ, ॠ̣, ॠ̣ and ॠ̣̣
14. Key No. 55 is for the decimal sign.
15. Figure ॠ (key No. 4) shall be shaped so as to serve the function of Viram also.

The half-space characters on the shift are :

ऌ ऍ ऒ ओ औ ख ङ ऐ ऑ ऒ ओ औ ख ङ ऐ ऑ

The half-space characters on the un-shift are :

ि, ी, ी, इ, े, ै, ॊ, ो

### ORTHOGRAPHY OF CHARACTERS

Universally acceptable Nirnayasagar face is followed on the Russian Slug Casting Machines and by the U. S. Army Natick Laboratory. The same face is adapted to the Type-writer with only four exceptions, viz. ख, श, ल and ऋ Language Advisory Committee of the Government of Maharashtra has now accepted revised ख and the Calcutta-type forms श, ल and ऋ.

The Roman punctuations are generally acceptable, although option has been provided in case of the *Charan-regh* (1) for orthodox Hindi and Sanskrit work. The Constituent Assembly has recommended ' International form of Indian Numerals with Devanagari. The State Governments of Maharashtra, Gujarat, Madhya Pradesh, Rajasthan, Uttar Pradesh and Bihar have however, retained the Hindi numerals already in use in the scripts concerned.

Thus, after years of controversy and discussion on standardisation, it is a matter of satisfaction that, the Ministry of Education, Government of India has been able to standardise the keyboard for Devanagari Script.

The sign-list of the Standard Typewriter Keyboard (Final-1965) conforms to the Standard Devanagari approved *vide* Government of India, Ministry of Education, Circular No. G.C.-F.4-7/57-H-2, dated 21st January 1960, (see pages 355-361). The same is classified below :

### VOWEL-FORMS

	Guttural	Palatal	Lingual	Dental	Labial	Mixed	Non-joining
<i>Initial Vowels</i>							
Short :	अ	इ	ऋ	ॠ	उ	ए ऐ ओ औ	अं अः
Long :	आ	ई			ऊ		
<i>Medial Vowel signs</i>							
<i>Mātrās</i> :	।	ि	ी	ॄ	ॠ	ॡ	ॢ

## CONSONANTAL FORMS (FULL AND HALF)

	HARD		SOFT		Nasals	Semi Vowels	Sibilants	Others	
	Inaspirates	Aspirates	Inaspirates	Aspirates				*	†
Gutturals :	* † क क्	* † ख ख्	* † ग ग्	* † घ घ्	* † ङ ङ्		* † ह ह्	* † ळ ळ	* † क्ष क्ष्
Palatals :	च च्	छ छ्	ज ज्	झ झ्	ञ ञ्	य य्	श श्	ज्ञ ज्ञ्	श् श्
Liaguals :	ट ट्	ठ ठ्	ड ड्	ढ ढ्	ण ण्	र र्	ष ष्	ड्	
Dentals :	त त्	थ थ्	द द्	ध ध्	न न्	ल ल्	स स्	ड्	
Labials :	प प्	फ फ्	ब ब्	भ भ्	म म्	व व्		त्र त्र्	ः

*Note.*—The *Sa-swara* letters are shown below \* and *A-swar* under † (Graphically all Consonants with Vertibar (अत्यदंडित) assume, for conjugational purposes, 'half-Forms' by removal of the Vertibar. Consonants with Top-bar (शीर्षदंडित) assume 'half-Forms' by addition of = *Halant*, at their base. The Central-bar 'Half' forms of क and फ appear as क and फ)

## NUMERICAL SIGNS

Hindi Forms :	१	२	३	४	५	६	७	८	९	०
International Forms :	1	2	3	4	5	6	7	8	9	0

*Explanatory Notes :*

1. The *Shiro-Rekha* (Head-line) will continue to be used.
2. Punctuation Marks : *Charan-regh* (।) and other signs as in English , . ; : - ! ?
3. Other signs : . / “ ” % ( ) \* + × ÷ =
4. Nasal Mark : ँ , Nasal Consonantal Sign ँ will be used.

## OTHER SIGN-LISTS AND KEYBOARDS

The present English Typewriter keyboard is not based on the frequencies of the characters. It is *ad hoc* arrangement which has been accepted under convention. Different keyboards have been designed by experts on the basis of frequencies but unfortunately they have not met with acceptance. Since the Indian languages using Devanagari are undergoing change every day as new words are being coined, the frequencies naturally change. However, for practical purposes the present frequency study on which the standard keyboard is based should hold good.





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