



## **Minding the Machine: Technological Change, Typographic Resistance and Print Journalism in Pre-Independence India**

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Beginning in the 1930s, fonts of type for the various scripts used in the Indian periodical press went from being pieces of metal cut by a punch cutter, cast by a type founder, and then hand-set by a compositor, to pieces of metal cast and set by mechanical means. This technology of "hot-metal" typesetting and mechanical composition promised speed and efficiency by changing some of the key elements in the process of print production.<sup>1</sup> Instead of picking and setting type by hand and redistributing it in cases after use, a compositor would now sit at a keyboard and the "Linotype" machine would assemble entire lines of type (known as slugs, and the process itself known as "line casting"), which could be melted after use and recycled without having to be redistributed. For Indian scripts, this technological "transition"—coming more than three decades after Linotypes were first introduced in the offices of the *New York Tribune* in America<sup>2</sup>—was neither comprehensive nor entirely effective, neither widely celebrated nor fully rejected.

However, extending an alphabetic paradigm on a morphologically different set of syllabic scripts, the introduction of the Linotype and its keyboard composition for Indian scripts resulted in a host of contentions—technical and otherwise. Deriving from what a standard Latin



Linotype keyboard (with 90 keys) could accommodate, the new machinery brought with it a drastic reduction of the number of characters in Indian scripts, often in the name of modernization and economy, and accompanied by the rhetoric of technological progress.<sup>3</sup> In addition, the unconventional appearance of mechanically composed text in Indian scripts immediately established the materiality of mass communication as a site of contestation on multiple levels beyond the technological. In some ways, this was in contrast to other contemporary instances of technological change and resistance based on political or ideological differences. Typographic technology afforded ideological stances on culture or tradition tangible expressions to contend with, and specific oppositions to deploy. The material aspects of language-technology that were thus brought into the debate were the design of the typefaces carried on the machine, and the appropriate formation and expected visual representation of the scripts in question—aspects at the critical intersection of textual traditions and technological interfaces.

In the production of Indian-language print journalism, as the hand-compositor faced the keyboard operator, the publisher/proprietor the machine manufacturer, and the social-reformer the technocrat, the impending contest between human and mechanical aspects of communication were nowhere more clearly expressed than in the material production of newspapers in the subcontinent. Yet the processes of typographic design and technology, instrumental in the production of text in the numerous languages of the region, have remained at the periphery of critical scholarship in social history as well as in general narratives of media and communications. This paper calls into question their marginal location by examining how not only the materiality of print journalism but also the related technological change at large was negotiated precisely through the processes of design—processes initiated by local institutions, driven by local causes, but accomplished in collaboration with an international network of agents. Focusing on the introduction of mechanisation in the two decades preceding India's independence, this paper examines how typographic negotiations and technological contentions—whether as abstract ideas or specific incarnations, or as embodied in organized bodies and social groups—permeated political, commercial, and creative networks that shaped printing in a multilingual environment. A combination of local and international actors, these networks functioned not only as catalysts in the realisation of print through technical expertise, but also as channels for political and communal agendas manifested in the prioritisation of languages and scripts. Against this backdrop, the processes of material production and technological intervention throw new light on the



nuances of power struggles inherent in typographic and technological change.

### **Introducing the Linotype: mechanisation for Indian-language newspapers**

The last decade of the nineteenth century saw the invention of the "Linotype" in America, a machine that redefined typographic technology and the extant processes of production for print journalism. It did so by shifting the focus from the composing stick to the keyboard; from the craft of the metal worker to the skill of the draftsman and precision engineering; from individual pieces of type to a full line-of-type (hence the name Linotype), and in the process revolutionized the production of newspapers across the world. Thomas Alva Edison famously called the Linotype the 'eighth wonder of the world', and its invention was indeed an achievement of significant import. How the Linotype machine and its manufacturing concern, the Mergenthaler Linotype Company of Brooklyn, New York, collided with the demands of newspaper production in India is a story that has remained obscure so far, but it is one that deserves critical attention for the unique process of technological intervention, the concessions and negotiations that it entailed, and the lasting impact it has had on newspaper typography in South Asia.<sup>4</sup>

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Devanagari was the first Indian script to be adapted for Linotype composition in 1933, designed and made entirely at the Mergenthaler Linotype Company in Brooklyn, New York (henceforth Mergenthaler). The Devanagari machine was followed by projects for Gujarati (1934, unfinished), Bengali (1935), and Tamil (1936) that were developed through a different process: that of collaboration with local printing establishments in the region where the languages were spoken.<sup>5</sup> In April 1932, Hari Govil—a graduate of the Banaras Hindu University, and an Indian entrepreneur in America—had been officially retained under contract from Mergenthaler to provide his services in adapting Devanagari to the Linotype according to his 'scheme', which consisted of splitting the letters of Devanagari into component parts in order to fit it on a standard Linotype keyboard. Govil's first action was to 'order several fonts of foundry type from Bombay', for the purpose of experimentation and study in preparation of the design of the Devanagari face for Linotype.<sup>6</sup>

These were six sets of types from the foundry of the Nirnaya Sagar Press and were listed as: Great Primer no.4 Marathi Degree; Great Primer no.4 Marathi Akhand; Pica no.1 Marathi Akhand; Pica no.3 Marathi Akhand; Pica Black no.1 Marathi Akhand; and Pica Black no.2 Marathi



Akhand.<sup>7</sup> Remarkably, the first in the list was the 'degree' type—a particular method of composition of Devanagari text using small divisions called 'degrees'—suggesting that Govil was looking not only at the design of the faces but also the customary way of handling components in hand-composition. The design of the typeface was chosen from a specimen book of the same foundry. Mergenthaler made 'photostat enlargements of a complete set of Devanagari characters shown in a type specimen book which Govil requested for use in connection with his studies.'<sup>8</sup> A copy of these enlargements was then sent to Harold Bender, Professor of Indo-Germanic Philology at Princeton, who acted as the chief consultant on the project. William Norman Brown, first Professor of Sanskrit at the University of Pennsylvania subsequently joined Bender as a specialist consultant.

Bender had already formulated and proposed a plan for the design and manufacture process in a feasibility report that he had prepared for the project in 1932. Surprising as it may seem, his suggestion was not to seek approval for Govil's scheme from potential clients in India before Mergenthaler had developed the machine and had it ready for demonstration:

Mr Govil could not possibly explain his scheme, in the form in which it is at present, to any ordinary Indian in any ordinary interview. The Indian would almost certainly reply that it seemed all right in principle, but that he would have to see it in operation before expressing an opinion.<sup>9</sup>

As the first step in explaining his scheme to Bender, Govil had been asked to make a list of characters in four groups: the unbroken characters, the left half of split characters, the right half of the same, and combination characters which were to be printed as separate (i.e. not as traditional conjuncts). Following this, Bender, in going over the list, suggested some further reductions and 'preservation of un-split characters that are very common'. The characters were to be designed under Govil's supervision. Govil prepared sketches which were then translated into scaled drawings by the staff of Mergenthaler.<sup>10</sup> The design of the first keyboard layout—a vital part of the process, as it had a significant bearing on the scheme of character division—was left entirely to Govil with no external involvement or evaluation of this process. In relation to this crucial aspect of the development for mechanical composition, it has been observed that:

The keying method indubitably governed the design of the characters. Its size determined the number of sorts, and thereby the fount conspectus. Its manner of composition ... affected the actual shape of the letterforms, as well as their spacing which was



also governed by the channel sizes. [...] In short, until the keyboard was conceived at least in draft form, no artwork should be designed; until it was completed, no fount could be manufactured. (Ross 1999: 144)

Govil's list of characters and Bender's revision of it appears to have constituted part of this process, but the layout itself was not formalised till Govil finally submitted a tentative keyboard to Mergenthaler on 7 October 1932.<sup>11</sup> The move from the type-case to the keyboard was certainly a radical departure in the composition of text and the effective layout of the keyboard mattered immensely in making mechanical composition a viable alternative to hand composition, especially for scripts with a significantly large character set that faced considerable modification in the process. The relative lack of evaluation in the preparation of the keyboard layout in the initial stages of the project would prove a particularly intractable problem for Mergenthaler in the subsequent stages of its Devanagari development.

A booklet produced by Mergenthaler in 1933 entitled *Keyboard operation: Devanagari Linotype*, presented the first finalised keyboard layout made by Govil with some input from Bender and Brown.<sup>12</sup> After describing the machine's principles of composition the booklet goes on to make it clear that,

In illustrating the method of combining the various sectional characters, attention is directed to the fact that only a few typical examples are indicated. The operator, who should be well acquainted with the Devanagari alphabet and the vernacular or language in which he is going to compose type, will find that all the various combinations and conjunct consonants can be built up on the Linotype from characters provided on the keyboard, and an occasional matrix from the side sorts.<sup>13</sup>

This was certainly a small but significant indication of changes in work practices, requirements of literacy, as well in the technological focus. The machine was geared towards a specific market and, perhaps for the first time, directly addressed the indigenous—and individual—user. Both Bender and Brown took an optimistic view of the eventual acceptance of the keyboard and the willingness of Indian typesetters to recognise its apparent advantages:

We must compare the [keyboarding] system with the system of hand setting [i.e. the degree system] that now prevails in India. There is no doubt that even with these broken characters, setting will be very much more easy and rapid than setting by hand. As I have suggested, Indian typesetters are already more or less familiar with the idea. There is also no doubt that no difficulty will



be found in India in obtaining typesetters sufficiently adaptable to learn the new system. Brown thinks they will take to it eagerly.<sup>14</sup>

The machine was thus made ready in New York and dispatched to the Calcutta office of the company in September 1933. American technological enterprise and its widening commercial empire had already established a strong foothold in the South Asian market by this time—from bicycles to sewing machines<sup>15</sup>—and Mergenthaler's intervention attests to the significance of transnational flows between colonial India and the United States. The connections constitute a history not only of invention *in* the United States but also of inventing *from* the United States—a history of design and technology directed outward, initiated by emigre inventors and mediated through immigrant networks vying for agency in distinct colonial contexts of their own. These connections also form a complex and often deeply contradictory contribution to the expansion of American commercial and technological empire in the twentieth century, particularly where such interventions came in conflict with nationalist sentiments or colonial administrations. Given that the 'national sentiment [was] not very cordial to British business', in launching the machine in the Indian market Mergenthaler's representatives decided to maintain distance from the British branch that controlled operations in India, and made it a point to emphasise the fact that Linotypes for Indian scripts were American products, not British ones.<sup>16</sup> However, upon the machine's introduction in 1933 most Indian newspaper proprietors immediately cast aspersions on the machine's affiliations, suggesting that the British branch and not the American one had organised its publicity, and the development was characterised as yet another 'foreign' imposition to be resisted. In addition, stakeholders in the Indian-language press,

[...] could not understand [...] why such an experiment was made in this country without previously referring the all-important matter of the type face to printing experts in the territory into which it was proposed to introduce the machine.<sup>17</sup>

Other more enterprising printing and publishing establishments, however, took the opportunity to engage directly in shaping the course of mechanisation for Indian scripts. The Sri Gouranga Press of Suresh Chandra Majumdar—who also initiated and guided Mergenthaler's Bengali development—produced the first book with text composed on the Devanagari Linotype in 1934.<sup>18</sup> This was a small trilingual publication in English, Bengali, and Hindi, titled *The teaching and the asram of Sri Aurobindo*.<sup>19</sup> The Hindi section was composed on the Linotype at the Prabasi Press, who had bought the first Devanagari machine, using the face designed under the supervision of Govil in New York. The



manager of the Prabasi Press, Kedarnath Chatterjee, was to play an important role in further developments and the transformation of this design.

The criticism of and opposition to the Linotype across the periodical press sector derived in large measure from the fact that it had been developed independently, with no input and involvement of prominent Indian institutions or individuals. Despite the fact that the Devanagari Linotype had been initiated and developed in collaboration with 'one of their own countrymen' in America, the point of contention was that the technological entrepreneurship had not come from within the local printing and publishing networks.<sup>20</sup> In terms of the machine's utility, however, the criticism was based largely on two fundamental issues related to the typeface it offered.<sup>21</sup> One, the weight of the face, which most potential customers found much too light, hindering legibility. And two, the position of the superscript vowel signs, which appeared too separated and did not extend over the base characters as required—a consequence of the mechanical limitations of the Linotype. This of course was the primary characteristic of syllabic Indian scripts: the vowel signs extend over other characters, unlike alphabetic characters that sit next to each other.

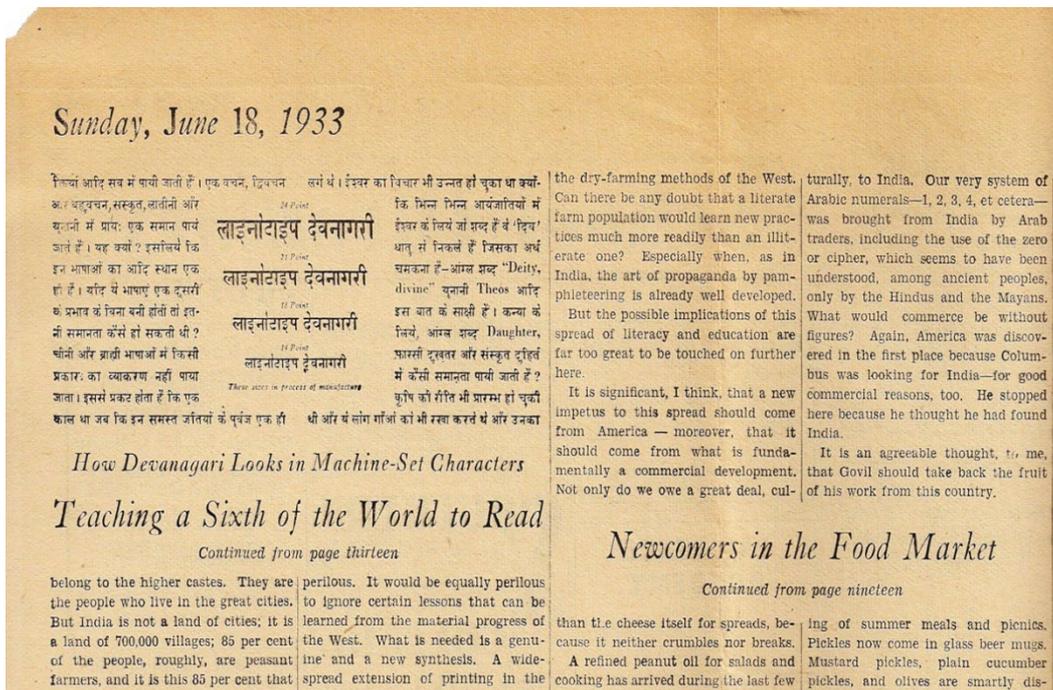


Figure 1, source: from the author's private collection. The first appearance of Linotype Devanagari in print, in *The New York Herald Tribune* of 18 June 1933. While 14-pt, 18-pt, 21-pt, and 24-pt sizes are displayed as 'in process of manufacture', only the 12-pt size of this type was produced.

In addition, for some other commentators the size of the Devanagari typeface too was insufficiently large and appeared too cramped.<sup>22</sup> The



weight of the face had been a conscious but general decision: both Bender and Brown thought that the tendency in modern printing was to prefer a light face.<sup>23</sup> Moreover, they had thought that a heavier face would have been open to criticism as old-fashioned and preferred to advance the argument for economy of space in setting text using a lighter weight. Mechanical limitations, on the other hand, were not something that could be overcome by the design of the typeface itself. The composition of the script required overhangs and overlaps, something the Linotype machine could not accommodate, and the issue had been side-stepped by providing the closest approximation that could be made.

For Mergenthaler, the possibility of investing further in the project depended largely on the machine's sales, which could not be made easily in view of the opposition to the existing face, and lack of consensus on a generally acceptable one.<sup>24</sup> As the list of objections to the machine grew, it turned out that the splitting of characters, the very basis of Govil's scheme of adaptation, was also a hindrance in the speed of composition. Requests for more 'complete characters' and fewer components meant that the keyboard too required an overhaul.

In this situation, a serendipitous but immensely consequential event for Mergenthaler's immediate and future projects in the subcontinent was William Norman Brown's year-long stay in India starting in August 1934.<sup>25</sup> Brown was travelling to India for his own work, related to archaeological excavations, and Bender had persuaded him to visit Linotype's India offices in order to obtain a better view of the situation on the ground. Mergenthaler, however, proposed a more formal arrangement, through London, hoping for Brown's greater involvement in the continuation of the project.<sup>26</sup> Brown was entrusted with the job of observing and making independent reports, on the possibilities of Devanagari Linotype in India, against which those from the Calcutta office could be judged.<sup>27</sup> In a time of general scepticism and uncertainty about the success of Mergenthaler's endeavours, in London as well as in India, Brown played a pivotal role in bridging the gaps in communication between the various parties involved in debates around the Devanagari machine. He laid the foundations for further development of mechanical composition through channeling the demands and objections of potential clients towards constructive ends—not just in India but also in other parts of the subcontinent, like Ceylon and Burma.<sup>28</sup>

Brown had acquaintances among the most prominent leaders of the national movement in India, as well as among members of the British administration, and his objectives were clearly outlined for him by Bender and Mergenthaler. He was to work primarily in the role of 'an



interested individual scholar rather than as a representative of the Mergenthaler Linotype Company.<sup>129</sup> This was on the one hand, a sensible strategic position and on the other, it afforded Brown a level of independence from the complications of official approvals through London in assessing the situation and proposing actions. This did not mean excluding London from the development, however. As Bender put it, 'the American company can not operate in that country without the support of the India offices of the British company. And they can not operate without the support of the British company'.<sup>30</sup>

On arriving in Bombay, Brown immediately addressed a meeting of printers organised by Linotype's local representatives. He proceeded to note their objections, most of which concerned the weight of the face and the non-kerning vowel marks and assured them that a solution could be devised to overcome these issues. In his very first report, Brown registered that he got the impression that Govil had taken 'an uncompromising stand on the matras [vowel signs] saying that they could not possibly be improved.'<sup>31</sup>

Brown also intimated to Bender that the prospects for Devanagari 'are simply brilliant.'<sup>32</sup> He found that the Calcutta office was willing to help, though initially there had been 'a bit of pique that the Devanagari was developed and put on the market without any consultation or seeking of advice from them.'<sup>33</sup> Brown had set in motion plans for a demonstration of the Devanagari Linotype at a forthcoming meeting of the Indian National Congress. In his second report to Mergenthaler, he outlined the possibility of setting one of Gandhi's books on the Linotype—he noted that Gandhi had reportedly seen articles about the machine, especially those in the newspaper *Vishal Bharat* published by Kedarnath Chatterjee, and the latter was to publish Gandhi's book. Chatterjee claimed that Gandhi had 'specified that the book shall be set by linotype [sic].'<sup>34</sup> However, as Brown would find out later, it had been a 'misunderstanding'—Gandhi had no part in it, Chatterjee was merely reprinting a work of Gandhi's. Irrespective of the veracity of the assertion at the time, the prospect was far too important to ignore: for Mergenthaler, Gandhi's book composed on Devanagari Linotype would have, in effect, amounted to national approval for both the machine and the typeface it was set in. This, more than anything else, proved to be the turning point that resulted in Mergenthaler's abandonment of the original Devanagari face.<sup>35</sup>

Kedarnath Chatterjee was one of the few, if not the only printer/publisher initially, from whom any constructive criticism on the design of the face was forthcoming.<sup>36</sup> No doubt this was partly because he had



acquired the first Devanagari Linotype machine, and with it a considerable measure of agency in its modification and satisfactory functioning based on his own evaluation. Brown's questions on the 'outlines and styles of characters' were addressed with directness by Chatterjee, who also suggested ways to improve the design of the vowel signs.<sup>37</sup> However, in the absence of definite information regarding 'the face preferred by Gandhi', he was not able to initiate the preparation of drawings for the new design until February 1935.

Towards the end of 1934, while Brown was investigating further development in Calcutta, Govil left America to take up residence in India. Although his contract with Mergenthaler had come to an end, he was retained by the company mainly in view of his usefulness in training operators in India. In addition, Mergenthaler, on Brown's initiative, was probing the practicality of adapting other Indian scripts and Govil's technical knowledge was important if any work was to be carried out in India.<sup>38</sup> Govil's activities subsequent to his first trip, on which he publicised the Devanagari Linotype, had not been particularly transparent—nor his communication with any of the offices involved. On his arrival in Calcutta, he was asked to concentrate on the Bengali Linotype—which had been in development under the guidance of S. C. Majumdar—instead of the Devanagari. Despite numerous protestations from prospective clients, Govil had 'always been disinclined to accept [...] diplomatic compromises with his definite scheme of split characters.'<sup>39</sup> However, with the slow but steady rise in the number of newspaper offices composing text on the Devanagari machine, it had become clear that the number of split characters would have to be reduced for the ease of composition. As Bender observed, the situation was at a juncture where general appearance and consistency were the things to consider, not the principle of division, or the original idea.

By February 1935, Kedarnath Chatterjee had managed to ascertain the 'fount of type selected by Mahatma Gandhi' for his book, which in all likelihood was Chatterjee's own selection of one of the many popular foundry types produced by the Nirnaya Sagar Press in Bombay.<sup>40</sup> A local artist (unnamed in the company correspondence) was installed at the Calcutta office to prepare drawings. Brown had only intended that the new design of the 'matras' would replace the original ones in Govil's design to address the points raised by the newspaper proprietors, but Chatterjee had initiated the process of drawing the entire face anew. Chatterjee Devanagari (as the second face was known) was meant to be both larger and heavier than Govil's design.<sup>41</sup> On 8 July 1935, drawings received from Calcutta were turned over to August Capitanio at Mergenthaler's letter drawing department in New York for the new



Devanagari and the original Devanagari face of 1933 was discontinued on all subsequent machines.

The introduction of Mergenthaler's new Devanagari typeface in 1935 was only the first step in an extended process of revisions and contestations that was to follow—and to continue for as long as the hot-metal Linotype machines were in use by a substantial number of Indian newspaper<sup>42</sup> The process of this early revision had indeed foreshadowed the nature of debates that would be involved—debates that revolved around local agency and participation more than technical limitations or possibilities. In the absence of consensus on most aspects of the script, reservations and protestations about the level of agency accorded to the local press in the machine's functioning, coupled with the mechanical limitations of the Linotype, Mergenthaler effectively provided customised machines with variations on the same basic principles to its users: accommodating disparate preferences of publishers for the design of specific characters as well as for the keyboard layout. Govil ran into disagreements with Mergenthaler regarding the method employed in designing the new face, which he felt should have been left to his judgement:

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Prof. Brown had already arranged through Mr Chatterjee and Mr May for an artist to make the drawings of the new face. My sole function [has been] to check on the drawings and see that the artist finishes enough sketches every week. [...] There was no question as to whether the artist was qualified, whether the designs would be acceptable to other publishers as well [apart from Chatterjee]. I had no way to check up, to compare and to correct the designs by placing all of them together and see whether they balance, since according to instructions here [Calcutta], the drawings were being rushed piece-meal each week [to New York].<sup>43</sup>

Govil's own proposals for subsequent modifications were increasingly radical. This was partly the result of his involvement in the various committees formed under the auspices of the nationalist movement in India to 'modernise' Devanagari and propose its countrywide adoption. In embracing this cause, Govil, and many others involved, believed the script needed 'reform' and adaptation to the limitations of the technology of production, not vice versa. This reform movement—though it had already been kindled in the early decades of the twentieth century—gained considerable momentum in the decades following the introduction of the Devanagari Linotype.

Mergenthaler found themselves in the same situation of uncertainty as before, as one script reform committee's recommendations were supplanted by another's, while individual publishers followed their own preferences. Citing the call for 'modification and reform' of the script



across the country by nationalist leaders, Govil asserted that 'Devanagari as adapted on the Linotype has already provided for many of these modifications'—which he claimed to have anticipated. This raises an interesting point, which Bender keenly observed: many of the reform schemes were 'as if made for the Linotype'. The extent to which these schemes for simplification of Devanagari were driven by the limitations of the Linotype machine was indeed significant. Govil's active participation and influence in some of the early script committees is all the more reason to believe that the 'simplification' of Devanagari was geared towards very specific ends. However, weathering a long period of experimentation and recommendations, by individuals as well as committees as to how the script should function, Linotype Devanagari largely retained its revised 1935 incarnation.

### **Conclusion: adapting, resisting, and mediating technology**

The processes of design involved in the introduction of typographic and technological change in print journalism have functioned, for the most part, as largely invisible sites of struggle and negotiation of agency. These processes, however, had significant implications for the reification of cultural hierarchies in the linguistically diverse Indian subcontinent. Language and script acted as key elements in the larger discourse of region and nation, and the formation of identities across a period of political awakening, where local institutions asserted their presence and participation in technological ventures. The networks of individuals and institutions involved in typographic design in India had a crucial role in shaping, and prioritising, the possibilities of print journalism in the country's many languages. Mechanisation was certainly not extended to all the scripts of the region, and the technological developments mirrored—and sometimes functioned in tandem with—the strongest or most influential communal agendas, such as the Hindi-Devanagari lobby in colonial India.

It is important to note that in the absence of technical and manufacturing capabilities within colonial India, the notion of technological modernity—as far as it related to print journalism in Indian scripts—was largely interpreted through the existing offerings of machine manufacturers. In a contradictory approach, the 'reform' and 'standardisation' of Indian scripts in this period was driven by typographic handicaps and shortcomings in faster production, but it ended up subsuming and incorporating the same limitations in the process of mechanisation by portraying them as necessities of modernisation. The typographic problems introduced by mechanical typesetting of Indian scripts also set in motion a comparative and adaptive process



that linked the composition of the alphabetic Latin to the syllabic scripts of the Indian subcontinent. In this framework, not only was the speed and ease of Latin typesetting placed in direct comparison with that of syllabic Indian scripts—which thus justified simplification—but their typography too was characterised in terms of Latin styles and features. Unsurprisingly in this context, 'adaptation' was the principal response: when manufacturing companies or local entrepreneurs started considering the mechanisation of Indian scripts, they did so within the distinct and unmistakable vocabulary of adaptation, not innovation.<sup>44</sup> This approach derived partly from a lack of local technical resources, and partly from the prevailing order where hot-metal technology was not only proprietary, but governed in a manner reflecting colonial dispensations: companies with their center of operations in one location, with outposts in the rest of the world. These outposts functioned largely as the 'representation' of the companies, with technical and creative operations located elsewhere.<sup>45</sup> This also meant that most developments related to design and technology for scripts around the world were conducted largely from 'central units'—for instance, the type drawing office, or typographic departments in Britain and America. These units in turn were often overtaxed and unable to address all demands, and thus often prioritised projects based on their own assessment of the 'value' of individual scripts.

The principal consideration in this context thus turned—both in India and abroad—not on questions of appropriate or alternative technological solutions for the desired representation of a script, but that of control over the script's representation within existing possibilities. Nationalist printing and publishing establishments could not counter the technical capabilities of British and American manufacturers but nor could they summarily accept their offerings without a measure—or at least a demonstration—of agency and control in the process. The machine manufacturers could not resolve the problems of syllabic composition using alphabetic provisions, but nor could they afford to experiment in the absence of local consensus on how a script should be composed and represented in print. Paradoxically enough, control—effected through nationalist politics or commercial interests, professional bodies or cultural institutions—could still only be exercised within the technical constraints set forth by the "foreign" manufacturers themselves.

This meant, for example, that if the machine could not be made to accommodate the requirements of a script's composition for fundamentally technical reasons, the script itself had to be subjected to modification—which could then be translated into a plausible set of instructions issued by local controlling bodies, to be followed by manufacturers. This resulted in absurd scenarios where the ordinary or



'acceptable' typographic representation of Indian scripts became an extraordinarily fluid and ambivalent matter dependent on the circumstances of such negotiations.

In the few accounts that address the technological and typographic history of print journalism in India, new developments and the related practices have been, more often than not, treated as chronologically self-evident phenomena. This is because most technology-oriented narratives have situated the impetus for technological change outside the social and political contexts, viewing technology as an autonomous force. However, as the example of Devanagari Linotype's introduction demonstrates, technological interventions could not be assumed to have considerable appeal in a region where labour was cheap and plentiful, where quandaries of ideology and struggles for agency—political or otherwise—were integral to any transformation of practice. In other words, technological change and its possibilities often meant something entirely different to manufacturers, publishers, workers, and readers in the context of print journalism. There is indeed very little that is self-evident about the chronology of and motivations behind the development of typographic technologies for Indian languages—why such projects were initiated, when they were introduced, or how such adaptations were mediated through the production of newspapers and periodicals. A closer investigation into some aspects of these developments reveals a far more complex history—one that calls for a re-evaluation of common frameworks of understanding the interaction between technology and print journalism in India.

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### Endnotes

<sup>1</sup> See for instance, the June 1933 Mergenthaler Linotype Company booklet titled 'Announcing Devanagari Linotype: for composing Sanskrit, Hindi, Marathi, Gujarati, and various other vernaculars of India, with the ease, speed and economy of English'.

<sup>2</sup> Text in the Latin alphabet composed on the Linotype machine first appeared on page 4 of the 3 July 1886 issue of *New York Daily Tribune*.

<sup>3</sup> The number of characters in syllabic Indian scripts like Devanagari, Bengali, etc. varied between 300 to 800 in foundry type, depending on the language and context of use. For instance, the greater prevalence of distinct 'conjunct' characters in Sanskrit text composition demanded a larger number of type sorts.

<sup>4</sup> Aspects of this developments have been addressed elsewhere in Singh. 2018. The machine in the colony: technology, politics, and the typography of Devanagari in the early years of mechanization. *Philological Encounters*, 3 (4), pp. 469-95.

<sup>5</sup> For a detailed overview of the development of the Devanagari Linotype see Singh. 2017. *Devanagari type in the twentieth century: motivations, imperatives, technology, and the design process*. Unpublished PhD thesis.



<sup>6</sup> Letter from C. H. Griffith to T. J. Mercer (vice-president in charge of audits), 5 April 1932. Box-P3627, File 919-1, MLCR. Govil was given an advance of \$100 to order the necessary types from Bombay.

<sup>7</sup> Bill no. 171, Nirnaya Sagar Press, 19 April 1932. Box-P3627, File 919-1, MLCR.

<sup>8</sup> Letter from H. H. Bender to C. H. Griffith, 17 May 1932. Box-P3627, File 919-1, MLCR.

<sup>9</sup> H. H. Bender, 'Devanagari on the Linotype', 25 January 1932. p.21. Box-P3627, File 919-1, MLCR.

<sup>10</sup> '[...] a great deal depended on your [Mergenthaler's] designers. I think that they have met their problems with great success, and that the product is admirable.' Letter from H. H. Bender to C. H. Griffith, 13 December 1932. Box-P3627, File 919-1, MLCR.

<sup>11</sup> Letter from C. H. Griffith to W. A. Truesdell (Superintendent Matrix Dept.), 7 October 1932. Box-P3627, File 919-1, MLCR.

<sup>12</sup> 'I am assuming that the proposed keyboard will meet all demands of Devanagari. As I recall, we went over all that ground once before.' Letter from W. N. Brown to H. H. Bender, 18 March 1933. Box-P3627, File 919-1, MLCR.

<sup>13</sup> *Keyboard operation: Devanagari Linotype, for composing Sanskrit, Hindi, Marathi, Gujarati & other vernaculars of India.* Mergenthaler, New York, 1933. p. [9–10].

<sup>14</sup> H.H. Bender, 'Devanagari on the Linotype', 25 January 1932. p. 19. Box-P3627, File 919-1, MLCR. As it turned out, the training of operators was one of the biggest challenges faced by the company through the first decade of the Devanagari machine's introduction in India.

<sup>15</sup> Arnold (2013) p. 44. Modern machines had entered the South Asian market in the early 1900s and by 1914 products derived not only from European technical expertise but also from American enterprise. In the field of print, besides inquiries from Indian printers and publishers to prominent manufacturers like Linotype and Monotype, the demand for mechanization also fuelled experiments like the Bhisotype, and adaptations of the typewriter and the varityper to compose various Indian scripts.

<sup>16</sup> Letter from H. G. Govil to C. H. Griffith, 18 June 1934. Box-P3627, File 919-1, MLCR.

<sup>17</sup> The newspaper proprietors who specifically raised this point were 'Mr Sinha (*Hindustan Times*) and Mr Kohli (*National Call*)'. Report by Tom King, 11 May 1934. Box-P3627, File 919-1, MLCR.

<sup>18</sup> Majumdar was also the proprietor of the influential Bengali newspaper *Ananda Bazar Patrika*. See Ross 1999: 144.

<sup>19</sup> *The Teaching and the Asram of Sri Aurobindo, with Translations in Bengali and Hindi*, Rameshwar & Co, Chandernagore, August 1934. See also, Letter from A. J. May to C. H. Griffith. 11 October 1934. Box-P3627, File 919-2, MLCR.

<sup>20</sup> Letter from H. G. Govil to C. H. Griffith, 18 June 1934. Box-P3627, File 919-1, MLCR.

<sup>21</sup> Letter from V. E. Walker to Norman Dodge, 6 June 1934. p. 2. Box-P3627, File 919- 1, MLCR.

<sup>22</sup> This had been intended specifically to effect economy in newspaper composition: 'In designing the general effect will have to be that of a compressed rather than of an expanded type.' H. H. Bender, 'Devanagari on the Linotype', 25 January 1932. p. 18. Box-P3627, File 919-1, MLCR.

<sup>23</sup> 'The general tendency in the adaptation of any script is in the direction of fineness of line and in the reduction of space, and India is already going in this direction.' Letter from H. H. Bender to C. H. Griffith, 19 May 1934. Box-P3627, File 919-1, MLCR.

<sup>24</sup> 'It is also strongly recommended that no new face be produced until it has proved acceptable to at least the majority of the printing offices in India which could use the machine.' Report by V. E. Walker, 'Summary of the Linotype Devanagari situation', 9 October 1934. p. 8. Box-P3627, File 919-2, MLCR.



<sup>25</sup> Letter from H.H. Bender to C. H. Griffith. 25 June 1934. Box-P3627, File 919-1, MLCR. Brown had secured funding from the Museum of Fine Arts, Boston, for one year of excavation at a site in the Indus valley.

<sup>26</sup> Letter from C. H. Griffith to V. E. Walker. 6 July 1934. Box-P3627, File 919-1, MLCR.

<sup>27</sup> Letter from H. H. Bender to C. H. Griffith. 14 July 1934. Box-P3627, File 919-1, MLCR.

<sup>28</sup> In addition, Brown took an active part in the development of the Burmese typewriter produced by the Underwood Corporation, and from 1938 onward wrote to all the major typewriter companies urging them to consider adapting various Indian scripts to the typewriter. Box-10, Folder-3, WNBP.

<sup>29</sup> Letter from H. H. Bender to W. N. Brown, 20 August 1934. Box-P3627, File 919-2, MLCR.

<sup>30</sup> Letter from H. H. Bender to W. N. Brown, 20 August 1934. Box-P3627, File 919-2, MLCR.

<sup>31</sup> W. N. Brown, Report no.1, September 1934. Box-P3627, File 919-2, MLCR.

<sup>32</sup> Letter from W. N. Brown to H. H. Bender, 8 October 1934. Box-P3627, File 919-2, MLCR.

<sup>33</sup> Letter from W. N. Brown to H. H. Bender, 8 October 1934. Box-P3627, File 919-2, MLCR.

<sup>34</sup> W. N. Brown, Report no.2, 8 October 1934. Box-P3627, File 919-2, MLCR.

<sup>35</sup> '[Kedarnath Chatterjee] is planning to get out a 10,000 edition of the large Gandhi book, all to be set on the Linotype Devanagari [sic], and he does not want to risk the book's prospects and his own investment by using unreadable type. He says he gave this criticism to Mr Govil.' W. N. Brown, Report no.8, 3 December 1934. Box-P3627, File 919-2, MLCR.

<sup>36</sup> 'During the course of our [May and Brown] conversation with him [Chatterjee], ... we were given such useful criticisms and constructive suggestions that we left full of optimism for the future of the Devanagari Linotype.' Letter from A. J. May to C. H. Griffith, 6 October 1934. Box-P3627, File 919-2, MLCR.

<sup>37</sup> Ibid. 'The most important suggestion which Mr Chatterjee offered [...] is: The "matra" must be improved. It should be thicker at the tip tapering down to the line. [...] It should also be slightly higher.'

<sup>38</sup> Letter from C. H. Griffith to V. E. Walker, 30 October 1934. Box-P3627, File 919-2, MLCR. Also see, letter from H. H. Bender to C. H. Griffith, 26 October 1934: 'I imagine that if he [Govil] were dropped outright at this time, he would become a dangerous enemy in India.'

<sup>39</sup> Letter from H. H. Bender to C. H. Griffith, 21 February 1935. Box-P3627, File 919-2, MLCR.

<sup>40</sup> Letter from A. J. May to C. H. Griffith, 21 February 1935. Box-P3627, File 919-2, MLCR.

<sup>41</sup> The new face in fact turned out smaller than the original 12-pt design despite being a 14-pt type. The drawings for Chatterjee's Devanagari were intended for 16-pt results, but on being reduced to 14-pt the base height of the characters, as well as the weight of the stems, were marginally reduced. Letter from A. J. May to C. H. Griffith, 12 April 1935. Box-P3627, File 919-2, MLCR.

<sup>42</sup> Several newspaper offices, well into the 1980s, depended on Linotype's hot-metal machines despite the introduction of subsequent advances in printing technology. See for instance, Jeffrey (2000). The design of the hot-metal Linotype Devanagari face was actively revised up to the late 1960s.

<sup>43</sup> Letter from H. G. Govil to C. H. Griffith, 31 January 1936. Box-P3618, File 920, MLCR.

<sup>44</sup> For instance, the question of developing a machine specifically to set Devanagari or to supply alternatives to existing systems was never in view—rather, the script was envisaged as being adapted to existing technology. The expression often used for Devanagari project was 'yantra-siddha' (which roughly translates as fit, prove, or accomplish on the machine). Govil described his Devanagari as having been 'prepared' for the Linotype.




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<sup>45</sup> Representatives of manufacturers of typesetting machinery functioned mainly within the 'sales office' structure. Though plans for Linotype and Monotype 'schools' were discussed at various points, no such institutions appear to have materialised under official sanction.

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