Special issue
commemorating the bicentenary of the invention of lithography,
ed. Michael Twyman.

# Lithography at the Crossroads of the East

## IAN PROUDFOOT

From his outpost in Batavia, the missionary-printer Walter Henry Medhurst (1796 -1857) recorded the arrival of lithography in the capital of the Dutch East Indies, now Indonesia, with pragmatic interest. 'This year,' he wrote of 1828, 'the art of lithography was called in to aid the diffusions of Gospel truth...'.[1]

Thus it was that lithography arrived rather late in Southeast Asia, at a time when it was already an evolving technology in Europe.[2] Like his brother evangelicals, Medhurst had great faith in the potency of printing as a means of spreading the word of God. Yet he could not have imagined that the new press he had just received from London would soon become the instrument of immense change, not in his mission, but in the Muslim community which was one of its objects. Medhurst himself moved on to China in 1843, just five years before the implications of the new technology became fully evident in Southeast Asia. It is the purpose of this essay to plot the path taken by this new technology at the crossroads of the East.

This is not a story of technical advances, and in that sense it does not contribute to any general understanding of lithography as a technique. It is rather an account of *applied* technology. In this colonial outpost, where technical knowledge was scanty and equipment sparse, lithography lacked sophistication. The interest of the story lies in how, stripped to its essentials, this simple and supremely flexible technology met local needs, to emerge as the foremost medium for reproducing text.

In Southeast Asia, typography was not entrenched as the dominant printing technology. Until 1806 there had been only two printing preses in Southeast Asia, both under the control of the Dutch East India Company. In 1828 there were still no more than a dozen small typographic presses in the region. European attempts to cut fonts sufficient for printing in Chinese were still under way in the 1830s, and local letterpress printing of Chinese remained at a primitive level. Very little had been printed in Malay.[3] Under these conditions lithography could compete with typography on a more equal footing than in Europe. However it took some time for its full potential to be realized.

*First phase: lithography as cheap typography*
Medhurst had been recruited by the London Missionary Society in 1817 as a printer, and charged with running the printing house at Malacca. There he

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[1] W. H. Medhurst, *China: its State and Prospects, with special reference to the Spread of the Gospel*, (London, 1838), p. 344 (speaking in error of 1829).
[2] M. Twyman, *Lithography 1800–1850* (London: Oxford University Press, 1970), ch. 9, 10.
[3] For the best survey, see A. T. Gallop, 'Early Malay Printing: an Introduction to the British Library Collection', *Journal of the Malaysian Branch, Royal Asiatic Society*, vol. 63, no. 1 (1990), pp. 85-124.

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instructed others in the arts of printing. He worked mainly in the two principal languages of the mission: Chinese, the key for work among the resident Chinese population and in preparation for future mission work in China proper; and Malay, the lingua franca of maritime Southeast Asia, which opened a door to the Muslim majority of the whole region. In 1822 Medhurst, now ordained, moved on to take charge of the mission station in bustling, multilingual Batavia. There he set up his press in a suburb called Parapattan, which aptly means Crossroads. In Malacca he had printed Malay (and a little English) by letterpress, and Chinese by letterpress and xylography.[4] Now in Batavia he desisted from letterpress printing for both these languages. It seems that he had become convinced (for different reasons) of the shortcomings of the fonts available for printing Malay and Chinese, and recognized that there were almost insuperable obstacles to overcoming them in the short term. This made the arrival of lithography in 1828 the more welcome as 'this mode of printing is adapted for any language, or any form of the character ... '.[5] Medhurst believed he had located a source of suitable limestone in the hinterland of Batavia, which he had sawn and polished, 'so that we can now multiply lithography to any extent.'[6]

*Medhurst's printing of Chinese*

For Chinese Medhurst at first relied on the traditional mode of printing using xylography. In this process images are taken off inked wooden blocks which have been cut in relief with a mirror-image of the text. Lithography was readily adapted to achieving the same results. Indeed the technique of preparing the xylographic blocks for cutting is reminiscent of the way transfer paper is used for laying the image on the stone in lithography:

> The paper is waxed lightly and smoothed with a stone burnisher to make the surface easier to write on with a brush. The transcript is placed, written side down, on a block over which a thin layer of rice paste has been evenly spread. The back of the paper is then rubbed with a flat palm-fibre brush so that a clear impression of the inked area is transferred to the block. When the paper has dried, its upper layer is rubbed away with the finger tips and brush to expose a fine mirror image of the characters or designs which have been applied to the block, looking as if they have been inscribed directly on it. The block is then ready for carving.[7]

The calligrapher who wielded his brush to write out the transcript for a xylographic block could do the same on transfer paper for the lithographic stone. But at this point lithography simplified the process greatly, for it completely obviated the most expensive and time-consuming stage of xylography which now followed, the careful cutting away of the background. For Medhurst, lithography

[4] B. Harrison, *Waiting for China: the Anglo-Chinese College at Malacca 1818–1843 and early nineteenth century missions* (Hong Kong, 1979); C. E. Byrd, *Early Printing in the Straits Settlements 1806–1858. A Preliminary Inquiry* (Singapore, 1970), p. 10.

[5] Medhurst, *China*, p. 573.

[6] Medhurst in *The Missionary Herald*, vol. 25 (1829), p. 193.

[7] J. Needham, *Science and Civilisation in China*, vol. 5, part 1: 'Paper and Printing', by Tsien Tsuen-Hsuin (Cambridge University Press, 1985), vol. 5, part 1, p. 197.

meant that he would no longer have to recruit specialist craftsmen from China skilled in the art of block cutting.

Here lay another advantage of lithography. Although the skill of the best wood-block cutters was legendary, xylographic characters are generally cut rather large. The minimum size of the characters will be determined by the most complex of them (and they can be composed of over twenty strokes). When cut into the fine-grained softwood, like pear, which was normally used for xylography, the detail and legibility of characters is lost below a certain threshold. Moreover, the manner of taking an impression from the block was not calculated to convey very fine detail: a press was not used, but paper was laid over the inked block, its back being brushed lightly to ensure all-over contact with the inked surfaces. For these reasons, old-style Chinese books tended to favour characters of 7 to 10 mm high. Lithography was not subject to the same constraints.

Typography could also print smaller, but confronted the huge problem of developing a Chinese font. Continuing Chinese experiments with movable type over many centuries had failed to make headway against xylography. This was despite the fact that Chinese text is very congenial to movable type printing. Text is laid out on the page in vertical linear arrays of discrete characters with common body and set widths. Its great handicap is the huge character set required. Modern Chinese print shops work with about 6,000 characters.[8] When the missionary Samuel Dyer, at Malacca, began to attack this problem in 1827, he estimated that a minimum working font would require 3,240 characters cast in 30,000 types. Dyer experimented with getting characters cut in wood, as if for xylography, then using the wooden block to make a metal cast, and sawing that up to make movable type. Needless to say the results were uninspiring, and moreover this process generated no punches from which additional type could be made. Various strategies were considered to reduce the number of punches required. Component parts of characters could in some cases be cut independently, from which matrices would be composed as mosaics.[9] Alternatively, Medhurst suggested that punches might be made only for the 1,200 most regularly occurring characters, with the others being engraved directly upon steel blanks as the need arose.[10] Whatever strategy was decided upon, the task was enormous, and would have to be repeated for each size of character required. To compose in such a font was a skilled and time-consuming operation.

Medhurst offers a comparison of the relative costs of the three available methods of printing Chinese: xylography, lithography and typography. His figures make an interesting counterpoint to Hansard's well-known comparison of typography and lithography made some fifteen years earlier and half a world

[8] J. Norman, *Chinese* (Cambridge University Press, 1988), p. 73.

[9] L. O'Sullivan, 'The London Missionary Society: A Written Record of Missionaries and Printing Presses in the Straits Settlements, 1815–1847', *Journal of the Malaysian Branch, Royal Asiatic Society*, vol. 57, no. 2 (1984), p. 64.

[10] This method was used by Robert Morrison for his *Dictionary of the Chinese Language* (Macao, 1815); its title page is reproduced in Needham, *Science and Civilisation*, vol. 5, part 1, p. 193.

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away.[11] Medhurst's comparative costs are based on 'a definite number of some large work, say two thousand copies of the Chinese bible, in octavo', and are as follows:[12]

| 1. By Block Printing, at Malacca:· | £. | s. | d. |
|---|---|---|---|
| The passage of nine workmen, to and from China | 72 | 0 | 0 |
| Two thousand blocks, at 1l. per hundred | 20 | 0 | 0 |
| Tools, engravers, &c. | 10 | 0 | 0 |
| Transcribing 2,689 pages, at 9d. per page | 100 | 16 | 9 |
| Engraving, 1,160,548 characters, at 1s. 3d. per hundred | 725 | 6 | 10 |
| Printing and binding 5,378,000 pages, at 1s. 8d. per thousand | 448 | 3 | 4 |
| Two hundred and ten peculs[13] of paper, at 2l. 10s. per pecul | 525 | 0 | 0 |
| | £1901 | 6 | 11 |

This work would employ nine type-cutters and five printers and binders over about three years.

| 2. By Lithography, at Batavia:— | £. | s. | d. |
|---|---|---|---|
| For two lithographic presses, with stones | 100 | 0 | 0 |
| Materials, repairs, &c. | 100 | 0 | 0 |
| Transcribing 2,689 pages, twice over, at 9d. per page | 201 | 13 | 6 |
| Printing 5,378,000 pages, at 1s. per thousand pages | 268 | 18 | 0 |
| Binding the above, at 3d. per thousand pages | 67 | 4 | 6 |
| Paper, the same as in the first statement | 525 | 0 | 0 |
| | £1262 | 16 | 0 |

Medhurst comments that 'folding and collating would cost less for sheets worked off at a press, than for separate pages printed by the hand, according to the Chinese mode', that is: on one side of the sheet only, which was then doubled back to expose a pair of printed pages. The work would employ one transcriber, four pressmen, and one binder for two years.

| 3. By Typography:— | £. | s. | d. |
|---|---|---|---|
| Cost of three thousand punches, or matrices, furnished by Mr. Dyer | 425 | 0 | 0 |
| Ditto, of one thousand pounds weight of metal, at 2s. per pound | 100 | 0 | 0 |
| One iron press, cases, furniture &c. | 100 | 0 | 0 |
| Composition of 2,689 pages, at 2s. per page | 268 | 18 | 0 |
| Printing 5,378,000 pages, at 6d. per thousand pages | 134 | 9 | 0 |
| Binding the above, at 3d. per thousand pages | 67 | 4 | 5 |
| For 168 peculs[14] of paper, at 2l. 10s. per pecul | 420 | 0 | 0 |
| | £1515 | 11 | 6 |

Typography would engage four compositors, two pressmen, and one binder for one year.

11 T. C. Hansard, *Typographia. An Historical Sketch of the Origin and Progress of the Art of Printing* (London, 1825), p. 909.
12 Medhurst, *China*, pp. 569–71.
13 That is: 28,000 lb.
14 That is: 22,400 lb.

It will be evident that these figures cannot be taken wholly at face value. Medhurst's estimates are specific to conditions in Southeast Asia. For instance, Medhurst assumes the presence without cost of compositors capable of setting Chinese, but not of xylographic block-cutters. He later concedes that typography requires the presence of a European printer who knows the Chinese language. He also comments on xylography that, 'In China prices to Europeans are about 2/3 of the above.' Medhurst's estimates of the time that would be needed for printing must also be taken as applying specifically to printing done under his supervision, that is among the multitude of other tasks involved in running the mission station.

Yet even when local circumstances are allowed for, there remain anomalies in the figures. Since xylographic books were printed on one side of the paper only, this method should consume about double the amount of paper needed in the other methods, raising its costs very considerably. With typography Medhurst assumes a saving of paper because the characters can be made smaller than in xylography or lithography [!], but does not carry this through to the costs of composing and printing; to do so implies a further saving of about £80. On the other hand there are additional costs of typography that Medhurst has not included. The figures he gives for punches and cast type would pay for only one font, whereas at least two are needed, a larger one for text and a smaller for commentary. The cost of another, smaller set of matrices obtainable from Paris would add £400 to the total, without casting. It is also doubtful that the amount allowed for composition includes distribution of used type which, with a Chinese font, is not a trivial matter.

For lithography, Medhurst's figures seem particularly unjust. There seems no need for transcribing pages twice over (a draft and a copy on transfer paper?), implying an unrealized saving of just over £100. Nor is it clear why Medhurst assumes that lithographic text must be the same size as xylographic. Medhurst's own uses of lithography demonstrate that reproduction of quite small text is feasible and would bring even greater savings of paper than was possible with contemporary typographic fonts. This should have reduced lithography's cost by some £500. Together these two adjustments just about halve Medhurst's estimate, leaving lithography very clearly the cheapest technology.

Medhurst had reason for being unkind to lithography. His aim in providing these figures was to argue for the large capital infusion which would allow the mission to print Chinese by letterpress. It will come as no surprise then that he concludes, rather in the face of the evidence, that 'the entire cost being reckoned, the balance will appear at first in favour of lithography, but permanently in that of typography'. His reasoning is that

[w]hen the first two thousand copies are struck off, if executed means of xylography, we possess a set of blocks adapted for printing the scriptures alone, already much worn, and capable of working only five more editions, at one half the original cost. If the work be performed at a lithographic press, we possess after its completion, only the presses and the stones, very much the worse for wear. But if metal types be employed, we have, when the work is done, a set of punches and matrices,

from which millions of type may be cast, sufficient to supply the whole world; besides an iron press, and a complete fount of types, from which fifty more editions can be taken, at a lower rate, than that at which each edition could be printed from the wooden blocks.[15]

No suitable Chinese font was forthcoming. So, for all the time he was in Batavia, Medhurst printed Chinese with either xylography or lithography.

The instances in which Medhurst combined a European language with Chinese are particularly interesting. For this he invariably relied upon lithography as it allowed him to combine typeset Latin script with brush-written Chinese. His method was first to compose the Latin-script portions of the text, leaving blank spaces where Chinese characters were needed. The Latin part was then printed on to transfer paper, and the missing Chinese characters were added manually by a calligrapher. The whole was then transferred to the stone and printed off lithographically. In 1829 he printed the *Hollandsch en Chineesch Leer-Boekje* in this manner, and the following year *An English and Japanese and Japanese and English Vocabulary*. He was not happy with the results, which he blamed upon his inexperience, the warm climate, and the lack of suitable or even uniform stocks of paper.[16] Nevertheless he persisted with this mode of typolithography for his greatest enterprise, and in 1842 began printing his *Chinese and English Dictionary, containing all the words in the Chinese Imperial Dictionary ...*, a project which ran to 1567 printed quarto pages in two volumes printed over two years (fig. 1).

The great scope of Medhurst's undertaking made lithography doubly indispensable. As the full Imperial Dictionary contained 47,035 distinct characters,[17] letterpress printing would require both an enormous font of characters and the ability to reproduce them at a small point size. The new Paris font of the Société asiatique aimed to meet this need with punches for 7,600 characters and a further 9,000 punches which could be composed to strike matrices for the remaining 39,400 characters. But this font lay beyond Medhurst's grasp. The only font he could lay hands on was Dyer's, too limited, and at 24 point about the size of Medhurst's headwords, and far too large for the 12½-point roman type of his entries. By turning to lithography Medhurst was enabled to reproduce the huge variety of characters in any size required to complement his typography; some fine brush work was required, but the results are legible.

Medhurst continued to be dissatisfied with the results of this typolithography, but on aesthetic rather than utilitarian grounds. In his introduction, a section prefixed to the first volume but printed last, he remarks:

A method has been adopted, which though not exhibiting a page of such beauty and perfection as could be wished, was yet found to answer the purpose of speed, cheapness and legibility. ... He believes that it is capable of great improvement, and he himself has found that by practice a clearer impression can be produced, as a comparison of the latter part of his work with the former can testify. With more care

15 Medhurst, *China*, p. 571.
16 K. S. Diehl, *Printers and Printing in the East Indies to 1850*, vol. 1 (Batavia/New York, 1990), p. 297.
17 Norman, *Chinese*, p. 72. Medhurst estimated their number at 40,000.

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himself 釁 羋 hín loò, to perfume with fragrant herbs. To fumigate. 釁 面 吞 炭 hín mèèn t'hun t'hán, he smeared his face and swallowed charcoal, in order to disguise his countenance and voice. Also to be moved, as 釁 於 勇 hín yû yùng, to be moved by bravery. An animal aroused to rapidity and active motion. A surname. Used for 釁 hín, variance. 釁 釁 shing hín, to take advantage of a quarrel. Used for 衅 hín, a tiger's skin used for covering weapons in a war-chariot.

醻 Tseaóu, To drink up all the wine, to finish the glass 使 其 醻 非 則 灌 之 szè hè tseaóu fei, tsîh kwàn che, he ordered him to finish the glass, and when he refused, took and poured it down his throat.

NINETEEN AND MORE STROKES

醨 Se, To draw off wine; to let it off through a sieve or basket. Also to divide, as streams of water. 醨 五 湖 se woò hoo, he divided the five lakes. Used for 釃 sze. Read le, to wash grains with water.

醯 Yen, Pickle, vinegar; very sour liquor.

醶 Leih, As 醨 醶 leih meih, the curds of milk.

THE 165TH RADICAL.

采 Pèen.

采 Pèen, To divide, to separate, as the claws of wild

beasts are divided : to distinguish.

采 Ts'haè, To gather, to pluck. 采 采 卷 耳 ts'haè ts'haè keuen ûrh, pluck and gather the curled-ear vegetables. Also to select. 納 采 nå ts'haè, to select proper days on which to perform ceremonies. 采 色 ts'haè sîh, variegated colours. 五 采 woò ts'haè, the five hues. 物 采 wûh ts'haè, the colour and complexion of things. 天 子 大 采 t'hёen tsze tà ts'haè, the emperor appeared in full dress. 光 采 kwang ts'haè, elegant, splendid. 文 采 wăn ts'haè, adorned. 符 采 foò ts'haè, the transverse marks in a gem. 采 事 ts'haè szè, business; an office, or employment. 九 采 之 圖 kèw ts'haè che toò, a figurative representation of the nine offices, or engagements. 采 地 ts'haè tè, territory, allotted to great officers for the disposal of their posterity : also a cemetery 采 飾 ts'haè shîh, ornament. 禮 失 而 采 lè shîh ûrh ts'haè, too much ceremony loses itself in mere ornament. 風 采 fung ts'haè, elegant, splendid. 采 采 ts'haè ts'haè, full, abundant. 采 采 衣 服 ts'haè ts'haè e fûh, splendid, flowing robes. 采 幣 ts'haè pě, wealth. 采 薺 ts'haè tse, the name of a section of the odes. A surname. 采 桑 ts'haè sang, the name of a place. The name of a gem, of a tree, and a plant. Read ts'haè, a city allotted to a minister for his support. 入.

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Figure 1. W. H. Medhurst, *Chinese and English Dictionary*, 2 vols. (Batavia, 1842). Produced throughout by transfer lithography. The Latin-alphabet text was printed on transfer paper from type, with spaces left for the Chinese characters; these were added to the transfer paper by a calligrapher and the whole then transferred to stone for lithographic printing. Note that the sheets were signed. Page size 207 × 125 mm. (National Library of Australia, 495.132 MED).

in taking the proofs on transfer paper, and with a superior knowledge of the art of lithography, it is possible that as beautiful an impression may be produced by this means as by letter press or lithography separately.[18]

Examination of a surviving copy of the *Chinese and English Dictionary* will reveal that Medhurst is not falsely modest on the question of quality. A persistent flaw is that the Latin type, which was printed on to the transfer paper first, is rather faint while the Chinese characters, which were added in the second stage, have more body. Presumably the printing ink was allowed to dry to some degree before the Chinese brushwork was added. The best definition is achieved in the few sections for which the transfer paper did not pass through the two-stage process. The warm climate may indeed have caused problems, as Medhurst suggests. Ideally the ink should be reasonably thick to achieve crisp images. The softening of the inks, and perhaps a tendency to under-ink in the printing process as compensation for the rapidly drying surface of the stone, may explain the frequent hollowing of the outlines of both Latin and Chinese characters. The transfer paper has not always been pressed carefully on the stone, as evident from the penumbras attached to characters on many sheets, also a flaw more likely to show up with softer inks. The earlier sections are further marred by blotting and the ghosting of print across facing pages of the bound volume, suggesting that Medhurst was finding his inks particularly intractable in the early stages.

Medhurst credibly maintains that the disappointing results are not due to any weakness of the typolithographic technique he had invented, but rather his lack of experience in adjusting its processes to local conditions and variable materials. (His contemporary letterpress printing was no less spoiled by uneven inking and blotting.[19]) For all its faults, he offers his *Chinese and English Dictionary* to the public 'as a specimen of a new mode of introducing Chinese, or any strange characters, among Roman letters, where the foreign types are not procurable.'[20] As to the novelty of Medhurst's technique, we must remember that he had first used it as early as 1829.

Coincidentally, problems analogous to Medhurst's were being addressed in Europe at about this time with the printing of Champollion's *Grammaire égyptienne*, which Twyman has called 'among the most ambitious of all lithographed books produced in the age of the hand press'.[21] Its principal solutions were different to Medhurst's. In the earlier sections of the *Grammaire*, the letterpress was transferred to the stone first and then the Egyptian hieroglyphics were filled in directly on the stone. This method gave crisper results than Medhurst could achieve, but were impracticable for him because no Chinese calligrapher with xylographic training could write characters in reverse. (For a European, drawing Egyptian hieroglyphics in reverse made no difference.) In later sections of the *Grammaire*, the sheets were overprinted by letterpress and lithography in separate

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18 Medhurst, *Chinese and English Dictionary*, p. iv.
19 Cf. *Perhentian Orang Koedoes* (Batavia, 1842) [a translation by Medhurst of Richard Baxter's *The Saints' Everlasting Rest*].
20 Medhurst, *Chinese and English Dictionary*, p. iv.
21 M. Twyman, *Early Lithographed Books* (London: Farrand Press, 1990), pp. 134, 142.

workings. Medhurst's method has a significant advantage here, in that it avoids
the registration problems which plague overprinting, especially when damp
paper is used for the lithographic working.

During 1842, while Medhurst was engaged in printing his *Chinese and English
Dictionary*, a second lithographic press was set up in Batavia, under the superin-
tendence of the Commandant of Engineers. By the end of that year, we are told,
the 'true causes to which the earlier unhappy results should be attributed' had
been uncovered and, a contemporary observer informs us, it became possible to
produce illustrations to 'rival the output of most lithographic presses in the
Netherlands.'[22]

## Medhurst's printing of Malay

The mission stations in Penang, Malacca, Singapore and Bencoolen all printed
Arabic-Malay using type fonts based on the Arabic font cut at Serampore (the
mission station near Calcutta). Medhurst had done so too while in Malacca, with
some variants he cut himself. Yet, after taking charge of his own station in
Batavia, Medhurst refrained from printing in Malay until 1828, when the litho-
graphic press arrived. He explains how lithography made the difference:

> I have found it of peculiar advantage in printing in Malay, in which language I have
> long wished to produce a work on a larger type, and more like their own written
> books. The Malays have few or no printed books; and when they are presented with
> one executed by letter press, they find it altogether so unlike their own, and so for-
> eign in its appearance, that they are inclined to reject it on this ground alone.[23]

Medhurst describes an initial reaction to typography commonly found across
the Muslim world. Typographic print was less densely clustered than readers
were accustomed to, comprising lines of dark, stilted and uniform units, not the
subtly varied strokes and styles of the manuscript.[24] The natural Arabic hand is
a typographer's nightmare. It not only uses variant forms of letters in initial,
medial and final positions, but abounds in ligatures and conjunctions of letters
strung together diagonally and vertically, with multi-character kerning and dia-
critics at variable heights above and below the line. It seems that Medhurst was
one of only a few European printers to understand the degree to which the typo-
graphic artefact was distasteful to Muslims. But at the same time he seems to
have been so much a captive of his own upbringing in a typographically-domi-
nated culture, and perhaps his own early training in the art of typographic print-
ing, that he was unable to shake off his own prejudices. He saw as a drawback of
lithography 'the irregular appearance of a book thus printed',[25] while that was
precisely the quality which fitted lithography to reproduce the untamed lines of
the manuscript hand. When Medhurst did use lithography to print Arabic-

22 W. L. Ritter, 'Lythographie', *Tijdschrift voor Nederlandsch-Indië*, vol. 5, no.1 (1843), pp. 782–83.

23 Medhurst in *The Missionary Herald*, vol. 25 (1829), pp. 192–93.

24 I. Proudfoot, 'Mass Producing Houri's Moles, or Aesthetics and Choice of Technology in Early
Muslim Book Printing', in P. G. Riddell and T. Street (eds), *Islam: Essays on Scripture, Thought, and Society*
(Leiden, 1997), pp. 171 74.
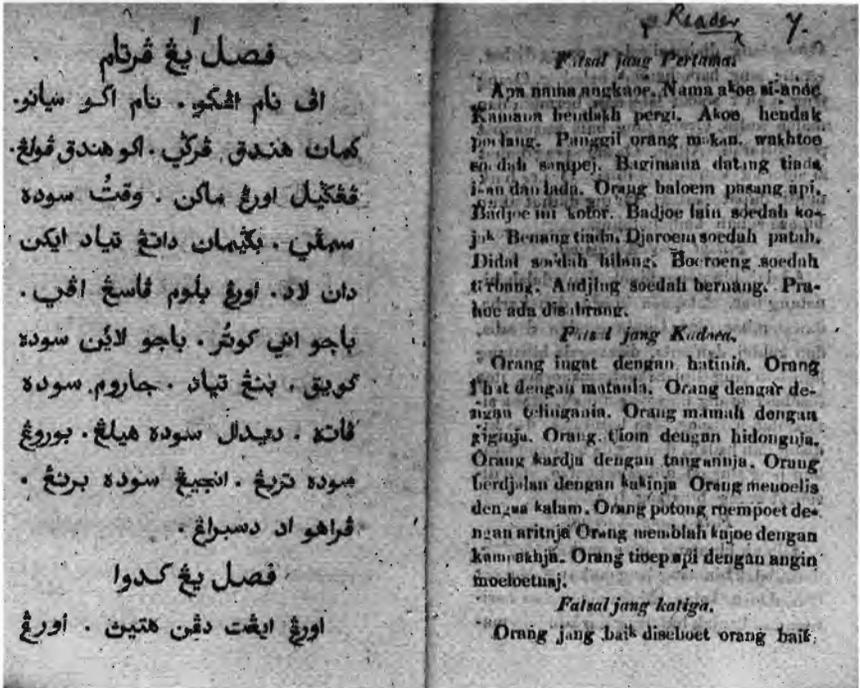
25 Medhurst, *China*, p. 573.

Figure 2. Untitled Malay reader, printed by W. H. Medhurst in 1834. Parallel text in Arabic
script (printed lithographically) and Latin-alphabet type (printed letterpress).
Page size 162 × 95 mm (British Library, 14620.b.12(9) ).

Malay, he spoiled the effect by reproducing 'round, clear, almost print-like letters' ironically faithful to the limitations of contemporary Arabic type-fonts (fig. 2).[26]

### Second phase: lithography mimics the manuscript

Medhurst was pushing lithography up a dead end. For this frustrated typographer, lithography was as a godsend for cases 'where the foreign types are not procurable.'[27] His student in printing, Benjamin Peach Keasberry (1811–75), came from a rather different background, which gave him a more adventurous attitude to lithography. He was less afflicted by Medhurst's European prejudices. Keasberry belonged to what was known in the Indies as 'Indo' society, that is the circles of European families, often of mixed blood, who were born in the East and felt more at home there than in their distant European lands of origin. Keasberry was born in India, and raised in Java, where his mother remarried a local English businessman. His two brothers ran businesses in Surabaya, on the north Java coast, and after his own concern in Singapore failed to thrive, Keasberry came to work as a clerk in a commercial house in Batavia. There he

26 Gallop, 'Early Malay Printing', pp. 94, 113 n.14.
27 Medhurst, *Chinese and English Dictionary*, p. iv.

lodged with Medhurst, learnt 'printing, bookbinding and lithography,'[28] and discovered a calling to mission work. After three years studying at a seminary in the United States, Keasberry returned to Singapore to take up mission work, and printing.

Keasberry's bolder understanding of what lithography could achieve probably flows from three main sources. He learnt printing far away from the European heartland of typography, and at a press where lithography was the current medium for printing Malay. He was, furthermore, an artist of some accomplishment. For a time he supported himself and his young wife in Singapore by giving drawing lessons. And finally, Keasberry's background put him more in touch with the Malay community than any of his predecessors. When the London Missionary Society closed the Singapore station in 1846, Keasberry chose to stay on, and supported himself and the mission school largely from the proceeds of his press.

He formed a particularly close working relationship with the Malay agent employed by the mission, Abdullah bin Abdul Kadir (1797–1854), who had also learned printing from Medhurst. Abdullah plays a pivotal role in nineteenth-century Malay cultural history. He was fluent in Tamil and Malay, and competent in Arabic, Hindi and English. His father had trained him as a notary public, and he was engaged as a clerk, language tutor, translator and school inspector by Sir Thomas Stamford Raffles and a succession of missionaries. In his autobiography, Abdullah gives an enthusiastic account of how he learnt the basic skills of casting and composing type, imposing pages and inking from Medhurst.[29] Abdullah was enamoured of any new technology and also gives an account of how, with Keasberry, he witnessed a demonstration of the first photography to reach Singapore, a Daguerreotype apparatus, in 1841. It seems out of character that he never mentions lithographic printing, but the reason for his silence may become evident later.

When Keasberry took over the Singapore printery he inherited a run down lithographic press, on which he began his first experiments. Up to this time the missions in Penang, Malacca and Singapore had been making do with two sizes of ungainly Arabic typeface, apparently not sharing Medhurst's well-grounded reservations about the acceptability of these fonts. The first sign of the break-though was a single-sheet poster printed in 1838, Keasberry's first year in Singapore. The poster was an open letter printed in an edition of 500 copies to be displayed around the streets of Singapore and distributed to neighbouring countries, advertising the Singapore Institution Malay public school. Its text was printed in typeset Arabic-Malay. Below the text were appended the names of certain Singapore luminaries (in Latin type for the Europeans, in Arabic type for the Malays), together with a reproduction of the Malay ruler's seal, lithographed (fig. 3). It appears that the ruler's seal had been inked and applied either directly

28 C. B. Buckley, *An Anecdotal History of Old Times in Singapore*, 2 vols (Singapore, 1902), pp. 322–33.

29 [Abdullah bin Abdul Kadir], *The Hikayat Abdullah, an annotated translation by A. H. Hill* (Kuala Lumpur, 1970), pp. 123–24, 188.
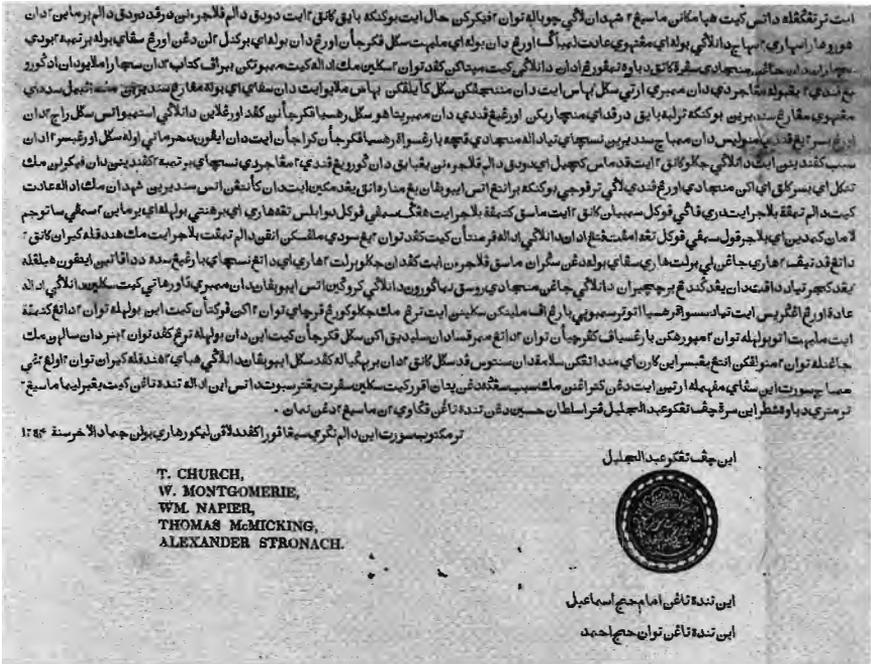
Figure 3. Surat Tuan Church [Singapore, Institution Press], bottom part of broadsheet [1838]
in Malay. Set in Arabic type and printed letterpress, apart from the image of the ruler's seal,
which was overprinted by lithography. Size as shown 225 × 297 mm.
(British Library, 14629.c.42(3)).

to the lithographic stone or to transfer paper, its image being added to the letter-
press sheet by overprinting. This is an interesting use of lithography to capture
the image of a real object; it is also significant because the central component of
the ruler's seal is his inscribed name, so that the resulting illustration is in fact
comprised largely of Arabic text.[30]

Medhurst had realized early on that the mission's publications would gain
credibility with Muslim readers if they had a more Muslim appearance: 'with a
Mohammedan inscription at the beginning, our publications find as ready
admittance among the people as their own.'[31] Keasberry went further. By over-
printing lithography and typography Keasberry could provide a typeset tract
booklet with an ornamented Arabic title. Hitherto titles had been supplied very
crudely using woodcut blocks which were composed along with metal type and
printed letterpress. To take one example, Keasberry used lithography to provide
a small letterpress tract he printed in 1841 with a calligraphed title, a small illus-
tration, and an ornamental initial.[32] In other cases, lithography provided a
decorated title page which sugar-coated the indigestible typography within.

30 *Surat Tuan Church*, [Singapore, Institution Press], n.d. [1838].
31 Medhurst in *The Missionary Herald*, vol. 25 (1829), p. 193.
32 British Library, 14620.b.14(2), 14654.b.19.

Keasberry's intimacy with the local Malay community must have made him aware of the contemporary boom in Muslim printing in India, as native Muslim printers there discovered how they could apply lithography to publishing in the Arabic script. With such possibilities in mind, in 1839 he printed a 60-page book-let entitled *Khabar Baik*, 'The Good News',[33] which was unlike any previous mission publication. Each page was ruled up with a surrounding frame, and the text was written out in a fluent and handsome Arabic scribal hand. Here litho-graphy escaped the straight-jacket of typography. Keasberry demonstrated that lithography could produce a printed book little different in appearance from the manuscripts his readers were comfortable with.

This was still the exception. In the main lithography continued to be used as auxiliary to typography: supplying interleaved illustrations, diagrams, and maps. It seems that the inadequacy of Keasberry's lithographic equipment stood in the way of more extensive and adventurous productions. In 1842, he petitioned the directors of the London Missionary Society for new lithographic equipment thus:

> But the Lithog[r] press is very deficient in materials which cannot be had here and without which I am very much hindered from succeeding with it to my satisfaction I am enduced [*sic*] therefore to solicit the aid of the Directors to supply these defi-ciencies. They are as follows; viz. ·
>
> 2 stones of 1 feet by 10 Inch
> 2 do. 1½ do. by 1 feet
> 2 canisters of printing ink
> 2 doz. do. of writing do. [*sup.lin.*:] also extra fine for drawing
> 6 do. chalk for drawing
> ¼ ream transfer paper
> a few pounds of Gum Arabic
> 3 rollers of different hardness
> ½ doz. leather for tympans
> ½ do. calfskin for rollers
> a few steel pens for writing on stone, and some camel hair pencils
> 1 bottle of Nitric acid
> 2 sieves of different texture
> 1 box wood scrapers (to 1½ feet long)
>
> and any other materials which have been more recently introduced into use to facil-itate the printing on stone.[34]

Keasberry's request for stones from Europe indicates that the limestone Medhurst had found in the hinterland of Batavia had not after all proved suit-able. Keasberry now asked for only a pair of imported stones in a given size, indi-cating that he envisaged printing only a section of a book before erasing the work. This was a modest request. Nevertheless the Directors were unresponsive, compelling Keasberry to make private arrangements to procure similar equip-ment on his own account from Germany.[35]

[33] National Library of Singapore, microfilm NL9717 [original lost].
[34] Archives of the Council for World Mission, Ultra-Ganges, Singapore 2/4/A/1, Keasberry to Directors 14 March 1842.
[35] O'Sullivan, 'London Missionary Society', p. 86.

When this new equipment arrived in July 1843, he further extended his lithography by printing for the first time in colour. The elaborately ornamented title-page of a major treatise on Geography was presented lithographically in black and red.[36] The choice of red was not fortuitous, for it was the colour favoured by manuscript copyists for rubricating their manuscripts. Both the ornamentation and now the use of colour were steps taking the printed book closer to the style of the manuscript.

During the next decade Keasberry and Abdullah pushed further in this direction. Exploiting Abdullah's fine scribal hand, Keasberry produced some elaborately ornamented and multi-coloured lithographed books which achieve a creditable imitation of superior manuscripts. The paradigm of this innovative printing appeared in 1849. It is Abdullah's autobiography in his own hand[37] - polyautography indeed! Its subject matter was radically new, as of course was the use of printing press, but the physical aspects of the text, its layout, its script, its ornamentation were as traditional as could be, and would themselves not arouse anxieties in any reader accustomed to the manuscript tradition.

From this point on, Keasberry consistently used lithography to print in non-Latin scripts. Titles that had earlier been printed in typography were now
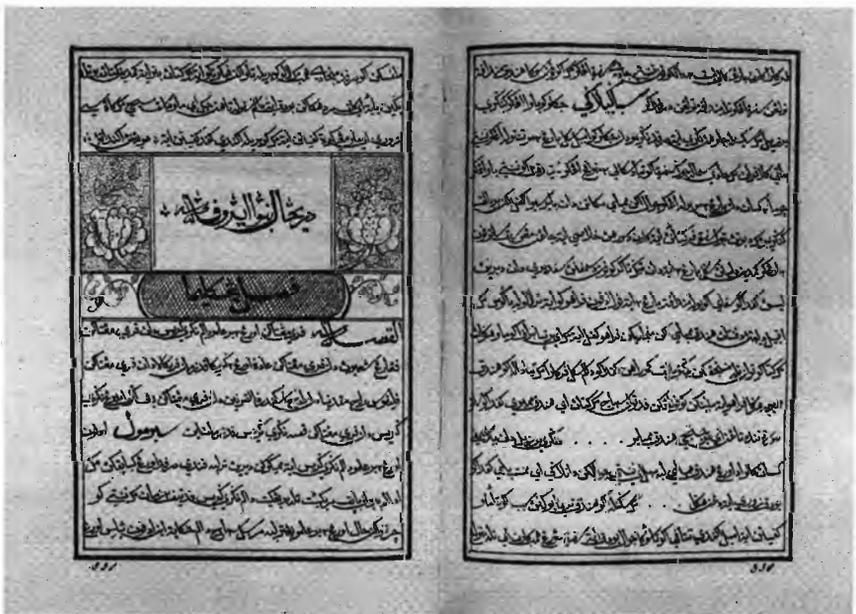


Figure 4. Spread from *Cermin Mata* [The Eye-Glass], a magazine lithographed by Keasberry 1858–59 (vol. 2, no. 7). On the left is the beginning of the fifth instalment of an article on European civilization. The text is printed in black, the borders and key words in red, and the cross-hatching around the heading in green. Page size 208 × 150 mm.
(British Library, 14632.b.1).

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[36] *Bahwa ini Hikayat pada menyatakan perihal Dunia serta Keadaan dengan Segala Isinya* (Singapore, 1843).
[37] *Hikayat Abdullah bin Abdul Kadir* ( Singapore, 1849).

re-issued using lithography. The use of colour becomes more pervasive, culminating in the magazine *Cermin Mata*, or 'The Eye-Glass' (fig. 4), which has rightly been described as a 'most spectacular imprint'.[38] Keasberry did not draw overlays with great accuracy, nor achieve accurate registration in his multi-coloured printing, producing a result that is showy rather than fine. This, perhaps, suited his audience.

All this printing was done in Keasberry's school. The printery was an adjunct to the school, with printing and book-binding as subjects in the curriculum. Using his pupil-apprentices, Keasberry did some commercial jobbing (letterheads, bills of lading, police regulations, etc.), and lithographed Singapore's first two Chinese newspapers.[39] The lithographic reproduction of text was done with transfer paper. There is no evidence that the 'mirror writing' developed in India to reproduce very high quality Arabic calligraphy by writing in reverse directly on the stone[40] was ever practised in Southeast Asia. Illustrations were sometimes drawn directly upon stone, though the accompanying caption might be applied subsequently using transfer paper.[41]

*Third phase: lithography reproduces manuscripts*
One last step in the acclimatisation of lithography to the Southeast Asian cultural scene remained. Keasberry and Abdullah were employing lithography to print in the manuscript style, but not to print exisiting manuscript material. This was precisely the use to which the lithographic press was put once it passed under local control.

The first book ever published by an indigenous Southeast Asian appeared in 1848 when Muhammad Azhari committed the Quran to print. Azhari was a native of Palembang, in south Sumatra, not far from Singapore. Returning from a long stay in Mecca, he had stopped over in Singapore where he purchased a lithographic press for £45, perhaps from Keasberry himself, and took the press and a trained lithographer across to Palembang. His printer, Ibrahim bin Hussain, must have been one of the pupil-apprentices who worked under Keasberry and Abdullah in the Singapore school. Once back home in Palembang, Azhari printed at least two editions of the Quran, the second in 1854 (fig. 5), and other Muslim religious books which he had copied by hand while in Mecca.[42]

Azhari took care to replicate the conventions of the manuscript as closely as possible. To his Qurans he added hand-stamped verse markers, red in the first edition, gold in the second, in the manner of the better Quran manuscripts. The

38 Gallop, 'Early Malay Printing', p. 98.

39 K. Y. Chng *et al.* (eds), *Pages from Yesteryear. A look at the printed works of Singapore, 1819–1959* (Singapore, 1989), p.5. Apparently no copies of the Chinese newspapers survive.

40 A. H. Sharar, *Lucknow: The Last Phase of an Oriental Culture*, tr. & ed. by E. S. Harcourt and Fakhir Hussain (London, 1975), p. 108.

41 *Cermin Mata*, vol. 2, no. 6 (Singapore, July 1859). Compare the text in the drawing (with 'N' reversed) and the caption.

42 J. Peeters, 'Palembang Revisited: Further notes on the printing establishment of Kemas Haji Muhammad Azhari, 1848', *International Institute for Asian Studies Yearbook*, 1995, pp. 186–87.
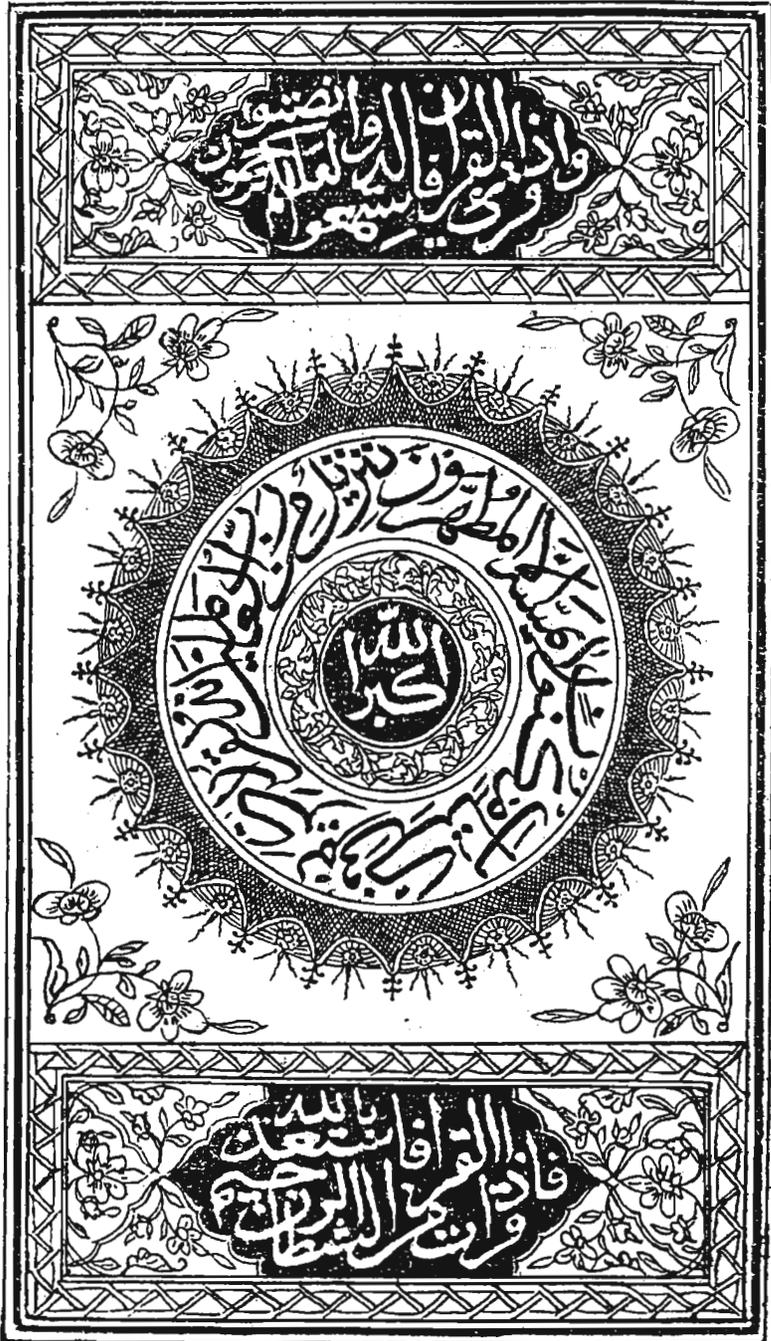
Figure 5. Title-page of an edition of the Quran printed lithographically by Muhammed Azhari in Palembang in 1854. Image as shown, 215 × 125 mm. (National Library of Indonesia, XXXVI 38).

degree to which he succeeded is indicated in the following description of his second edition by a contemporary Dutch scholar:

> The script is quite clean and neat, in the so-called Lahore hand ... . The text itself is written in frames, in the usual way. The pages are numbered continuously by numerals at the foot; at the head of each page is the name of the Surah [book]. The thirty Juz' [sections] are indicated in the margin. The end of each verse is marked by a small golden circle above the line of script. The verses are not numbered, that practice occurring, if I am not mistaken, only in Qur'ans printed in Europe. On the second side of each leaf, outside the frame on the lower left hand corner, is the catchword (*rakibah*).[43]

Azhari's manual finishing reminds us how blurred the line was between the lithographic reproduction of text and manuscript copying. The same scribal skills, indeed the same scribes, were employed in both processes. Not only the products of the lithographic press, but the process itself could readily been seen as an extension of the hallowed manuscript tradition. (Is this why lithography was not mentioned by Abdullah, otherwise so intrigued by novelty?)

The colophon printed on the last two pages of the 1848 Quran is worth quoting in full, because it reveals so much about how the new medium was understood:

> To begin with, this holy Quran was printed by *lithographic press*, that is to say on a stone press in the handwriting of the man of God Almighty, Haji Muhammad Azhari son of Kemas Haji Abdullah, resident of Pelambang, follower of the Shafi'i school, of the Ash'arite conviction [*etc.* ...]. The person who executed this print is Ibrahim bin Husain, formerly of Sahab Nagur and now resident in Singapore, a pupil of Abdullah bin Abdul Kadir Munshi of Malacca. The printing was finished on Monday the twenty-first day of the month of Ramadan according to the sighting of the new moon at Palembang, in the year of the Prophet's Hijra – may God's blessings and peace be upon him – twelve hundred and sixty-four, 1264. This coincides with the twenty-first day of the month of August in the Christian year eighteen hundred and forty-eight, 1848, and the sixteenth day of the month of Misra in the Coptic year fifteen hundred and sixty-four, 1564 [*etc.*...]. The number of Qur'ans printed was one hundred and five. The time taken to produce them was fifty days, or two Qurans and three sections per day. The place where the printing was done was the city of Palembang, in the neighbourhood of the Third Upstream Village, on the left bank, going upstream from the settlement of Demang Jayalaksana Muhammad Najib, son of the deceased Demang Wiralaksana Abdul Khalik. May God the All-Holy and Almighty bestow forgiveness on those have copied this, who have printed this, and who will read this, and upon their forebears and upon all Muslim men and women and their forebears.[44]

Shining through this statement is a heady sense of the power of the new medium (its speed), and the significance of the event that has just taken place, so meticulously dated and located. There is also care to justify this new medium as fit for printing the Holy Book of Islam. Azhari's detailing of his religious standing, the affiliation he gives the printer, and perhaps also the details of where the

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43 Dewall, 'Eene Inlandsche Drukkerij te Palembang', p. 194 [my translation].
44 After Peeters, 'Palembang Revisited', pp. 182–83.

press was located, are not mere verbosity or vanity. Azhari has to reassure those who use this printed Quran that it is a respectable Muslim creation, despite the new technology. He does so by mentioning his title and his impeccable qualifications. He is the writer, his printer is a Muslim who learnt the trade from a Muslim, and the locale of the printing is far from any alien European environment. All these are relevant concerns, particularly in view of the verse of the Quran which, conventionally, adorned the centre of both the cover and title page of Azhari's edition:

> That this is indeed the glorious Qur'an
> (Inscribed) in the well-kept book.
> Only those can touch it who are clean.
> It has been revealed by the Lord of all the worlds.[45]

Both copyist and reader should be in a state of ritual purity. Calligraphers who copied the Quran by hand continually performed the required ablutions. For nineteenth-century Muslims here lay an important *technological* advantage of lithography: not only could it reproduce the elegant Arabic script of the calligrapher's pen, but it allowed this to be done through a process which could be transparently in Muslim hands. This was no less necessary than competent printing if the product was to be useable.

We happen to know a little about Azhari's printing activities because a copy of his 1854 Quran was presented to the Batavian Society of Arts and Sciences. The Society immediately requested further information from the Assistant Resident, who made a visit to the press. His report included the following:

> The written text was applied to the stone by means of specially prepared paper. The operator has achieved an astonishing speed in writing out the pages. As evidence of this, I enclose a little piece of poetry which was prepared and printed in my presence in a matter of moments.[46]

Just as in 1806 Senefelder had demonstrated lithography by reproducing a note written by the crown prince of Bavaria in court before his very eyes,[47] so now, not fifty years later in Sumatra, Azhari would unconsciously repeat this novel display for the visiting Dutch Assistant Resident.

The reason for the Batavian Society's interest in Azhari's Quran was that they saw in it the beginning of a revolution such as Gutenberg had brought to Europe with his printing of the Bible. Their expectations were amply borne out. Azhari's venture was very profitable. By 1854 Azhari had printed 'several hundred Qurans, for which he finds ready buyers at 25 guilders per item.'[48] After allowance for paper and the blocked and gilt leather bindings in which the Qurans were sold, a handsome profit remained. Azhari will easily have recovered the capital cost of the press from the proceeds of the first edition. In general, lithography reduced

45 Surah 56:77–80, trans. Ahmed Ali, *Al-Qur'ân: A Contemporary Translation* (Princeton, N.J., 1984).

46 H. von Dewall, 'Eene Inlandsche Drukkerij te Palembang', *Tijdschrift voor de Indische Taal, Land-en Volkenkunde uitgegeven door het Bataviaasch Genootschap van Kunsten en Wetenschappen*, deel 6 / n.s. deel 3 (1857), pp. 196–97.

47 A. Senefelder, *A Complete Course of Lithography* (London: Ackermann, 1819), p. 65.

48 Senefelder, *Complete Course*, p. 196. That is, about £2/3/6d. per copy.

the cost of reproducing manuscript text to about one-tenth of the price of manuscript copying.[49] Through the rest of the century lithography flourished in the hands of Muslim printers in Southeast Asia, as in India and beyond, bringing an end to centuries of manuscript culture.

## Conclusion

These developments amply support Twyman's position that '[t]here is good reason ... to see the printing of non-latin texts as one of the longstanding specialities of lithographic printing in the age of the hand press.'[50] The Southeast Asian case is particularly interesting because it lets us watch lithography's early progress step by step through three generations of printers, in a process through which it was gradually liberated from typographic conventions in order to meet the needs of local cultures. For Muslim Asia, particularly, lithography eased the transition from manuscript to printed word, and provided the first effective means of mass book publishing. Thus a new printing technology which enriched the European repertoire of illustration and the graphic arts had, in the Muslim world, an impact comparable to that of Gutenberg's typography in the West.

49 I. Proudfoot, *Early Malay Printed Books* (Kuala Lumpur, 1993), p. 89, n. 338.
50 Twyman, *Early Lithographed Books*, p. 145.