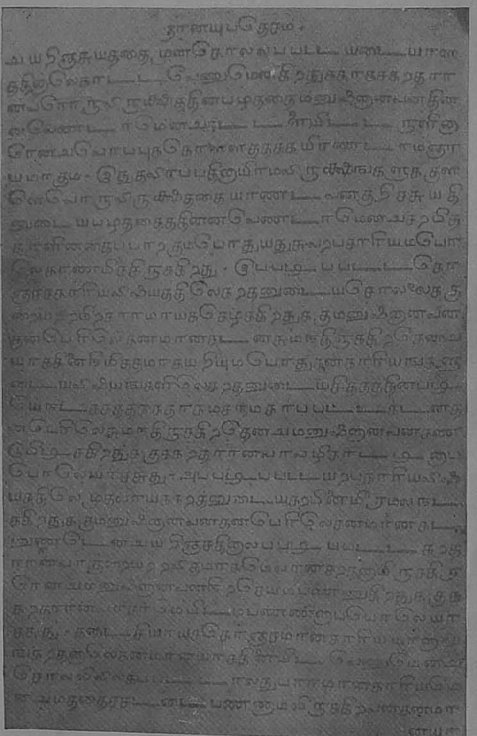

Specimen page of Gnanobadesam
an Ambalakkadu Tamil Book

MEMOIRS

OF THE

MADRAS LIBRARY ASSOCIATION

EDITED BY

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PUBLICATION SERIES

1. **Library movement.**—By Diverse Hands. 1929. *Out of print.*

2. **Five laws of library science** by S. R. Ranganathan. 1931. 10 sh. (Rs. 5 in India).

3. **Colon classification** by S. R. Ranganathan. 1933. *Out of print.*

4. **Classified catalogue code** by S. R. Ranganathan. 1934. 10 sh. 6d. (Rs. 5 in India).

5. **Library administration** by S. R. Ranganathan. 1935. 12sh. 6d. (Rs. 5 in India). *Out of print.*

6. **Prolegomena to library classification** by S. R. Ranganathan. 1937. 10sh. 6d. (Rs. 5 in India).

7. **Theory of library catalogue** by S. R. Ranganathan. 1938. 10sh. 6d. (Rs. 5 in India).

8. **Colon classification** (Second revised edition) by S. R. Ranganathan. 1939. 21sh. (Rs. 7-8-0 in India).

9. **Reference service and bibliography.** Vol. I. Parts I-IV. by S. R. Ranganathan and C. Sundaram. 1940. 15sh. (Rs. 7-8-0 in India).

To follow

10. **Reference service and bibliography.** Vol. II. Part V. A Bibliography of reference books and bibliographies, by S. R. Ranganathan and K. M. Sivaraman.

11. **School and college libraries** by S. R. Ranganathan.

12. **Fundamentals of knowledge classification** by S. R. Ranganathan.

Copies of the above and of the **Memoirs** *can be had of*

(1) The Secretary, Madras Library Association, Triplicane, Madras.

(2) Edward Goldston, Publisher & Bookseller, 43, Russel Square, (Near British Museum), London, W.C. 1.

(3) H. W. Wilson Company, 950-972, University Avenue, New York, U.S.A.

EVERYTHING ABOUT SOMETHING SERIES (Tamil)

1. **Important constitutions of the world** by N. R. Subbier. 1939. Rs. 1|8.

2. **Wonders of electricity** by P. N. Appuswami. 1940. Rs. 1|12.

Copies can be had of

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CONTENTS

MADRAS LIBRARY ASSOCIATION

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FOUNDED IN 1928

The Madras Library Association solicits

(1) Articles for publication

(2) Books and Periodicals for review in the *Memoirs;*

(3) Periodicals in Library Science in exchange for the *Memoirs* and

(4) Review of the Memoirs and other publications of theirs in other periodicals.

All articles, all books and periodicals and all enquiries should be addressed to the Secretary, Madras Library Association, Triplicane, Madras, India.

EDITORIAL

In introducing the first issue of the Memoirs last year, we said, "we send it now as an experiment and if it is appreciated, we shall have no hesitation in making it a regular feature of our activities". We are satisfied with its reception and hope to continue the Memoirs.

This second issue is planned to be essentially a memorial to the invention of printing from movable metallic type, the fifth centenary of which event the Association celebrated in December last. It contains eighteen articles which fall into four main divisions.

The messages that were received and the first six articles constitute a record of the public celebration of the fifth centenary.

The six articles that follow deal with the developments in the technique of printing and book-building. Two of them deal with the history of printing in relation to two Indian languages. Then follows a discussion of the aesthetics of the printed page. But apart from the text, a printed book has today three important features, viz., the preliminary page, the illustrations and the Index. The evolution of these three parts of a book are treated in the other three articles of this group.

The third group bears a local touch. It is concerned with the history of some typical printing presses in Madras and the way in which their productions are brought before the public eye. The

writers have chosen for treatment the press of the Hindu and the Government press. From the point of view of shaping public opinion, the Daily press is the most effective. But the Government of almost every country nowadays, is, so to speak, a national publisher and its output is considerable. Yet its publications are not brought to the notice of the public as they deserve and require to be. The standards, therefore, for catalogues of Government publications deserve investigation and they are discussed in the last article of the group.

The last group of three articles relates to those important facilities with which the seeker after knowledge is nowadays supplied as the result of the invention of printing. Ready Reference books are of immense help to the community and form a peculiar, though essential, feature of present day life. Their production requires broad planning, large finances and the co-operation of hundreds of contributors and correspondents. Further, they speedily get out of date and consequently a machinery for frequent revision and continued maintenance has to be provided for. The experiences of those responsible for two such reference books, indigenous to India, are set out in two of the articles of this group, that they may serve as an example and as an incentive for organising other similar works and in other languages as well. The third article makes a statistical analysis of the British Reference books to indicate the paucity of adequate facilities in our country and the long way that India has yet to cover to bring the benefits of the invention of printing to the service of our countrymen in the fullest possible measure.

The memoirs conclude with some reviews of books of library interest.

MESSAGE FROM
His Excellency, The Governor of Madras,

On the occasion of the celebration of
The fifth centenary of
THE INVENTION OF PRINTING
On 21st December, 1940

I AM very glad to associate myself with the fifth centenary celebrations of the invention of printing, and I wish to congratulate the Madras Library Association on their initiative in this matter. It is only proper that this great milestone in the history of man's culture should be suitably observed.

There has been no single discovery which has had, in the course of half a millenium, so enormous an influence on human progress. Even to-day, when broadcasting has become an established medium for disseminating both education and news, the printing press remains paramount, in its power of spreading knowledge and creating or reflecting public opinion. A tremendous responsibility lies on all those who have control of such an instrument, particularly in times like these.

I wish the forthcoming celebrations all success.

Government House,
Ootacamund,
18-12-40.

(Sd) ARTHUR HOPE,
Governor of Madras.

MESSAGE FROM
His Holiness Sri Sankaracharya
of Kamakoti Pitham.

The invention of printing has enabled the spread of permanent ideas to the people in a much more speedy manner than the previous media. Human nature, as limited by temptations, is likely to cause more harm to the world through the press, if left unguarded. Well-wishers of printing should make efforts to control printing so as to safeguard ethics and morals for the world. Secondly, the ideas contained in the ancient manuscripts preserved with great care prior to the introduction of printing, have been lost to the world since those works have been left uncared for by the common people after its advent. To recoup this loss, at least in part, the promoters of printing should make efforts to get all the available unprinted manuscripts printed before further loss.

WELCOME ADDRESS

BY

RAO BAHADUR K. V. KRISHNASWAMI AIYAR, B.A., B.L.,
President, Madras Library Association

MY LORD, MR. VICE-CHANCELLOR, LADIES AND GENTLEMEN,

As PRESIDENT of the Madras Library Association, I have great pleasure in welcoming you to this celebration of the fifth centenary of printing. When Mr. Ranganathan suggested some months ago that our Association might arrange for this celebration, I was not at first very enthusiastic. Some reflection however convinced me that a library association like ours depended so largely on books—plenty of books and books of every sort. The objective of the Association to make education universal and to get every reader his book would be difficult to realise but for the ease, rapidity and cheapness with which books can be multiplied to-day. Remember that before the invention of printing, it took a lifetime to make a copy of the Mahabharata or the Ramayana or the Talmud or the Koran. When books were so difficult to make, naturally they were regarded as precious property to be preserved rather than to be used or freely given for use by everybody. You remember the medieval habit of chaining books. This preserving and chaining mentality persisted so long even after the invention of printing that it took nearly three centuries for the books to be released from their chains. It is only in our own lifetime that Library Associations are being formed to propagate the idea that the proper destination of books is the readers' hands and not the closed cupboards. It is only now that library authorities are beginning to concede that it is not the scrupulously clean condition and freshness of books that

spell success to a library but their well-thumbed, worn-out condition. It is only to-day that the old Victorian standard of aiming at arithmetical accuracy in the maintenance of stock is beginning to withdraw in favour of pushing the use of books even at the risk of losing some. All this change in outlook and the consequent spread of knowledge have been made possible by the invention of printing 500 years ago.

This year homage has been paid to the inventor of typography in almost all countries. The year 1440 has been somehow accepted as the one from which the beginning of printing from movable metal types can be dated. This date was first fixed by the Venetian printers in 1483. The first and the second centenaries were celebrated in some printing centres of Europe. It received academic recognition from Universities in 1740 and they inaugurated searches for the rescue of surviving specimens of the first printed books—of the incunabula or the cradle books. In 1840 statues were erected and elaborate ceremonies were organised. The Bibliographical Society of America has taken a census of the writings issued during successive centenaries. 39 titles belong to 1640, 120 to 1740 and 226 to 1840.

Thus by precedent and common agreement this year marks a milestone of world progress as the 500th anniversary of the invention of printing from movable metallic types. The Madras Library Association therefore decided upon the observance of this historic and cultural milestone.

We were fortunate in getting the co-operation of representatives of all the trades that work together in bringing out the book and all the trades and the professions that help in the distribution of books considered as materials and as embodied thought. A representative committee was appointed on the 27th October 1940 to be in charge of the arrangements. It consisted of myself as President and Rao Sahib S. R. Ranganathan as Secretary. It included Messrs. K. Ramanathan Chettiar, P. N. Appuswami and K. Swaminathan to represent the Madras Library Association; Messrs. K. Srinivasan, Editor, "The Hindu," A. A. Hayles, Editor, "The Madras Mail" and R. Krishnamurti, Editor, "Ananda Vikatan," to represent newspaper interests; Messrs. K. P. Raghava Menon, Deputy Superintendent, Government Press, Madras, R. Narayanaswami Aiyar,

Proprietor, Madras Law Journal Press, and W. H. Warren, Secretary, Diocesan Press, to represent printers; Messrs. T. A. Subramaniam, Proprietor, Swadesi Type Foundry and C. T. Dibdin of Linotype and Machinery, Ltd., Madras, to represent type-designers and type-founders; Mr. John of Messrs. Klein and Peyerl to represent block-makers; Mr. M. V. Jagannatha Ayyangar, Principal, Government School of Technology, Madras, to represent technical education and Mr. V. O. Oommen to represent the student population.

The Committee met thrice and several people have co-operated to make the celebration and the exhibition a success. The Vice-Chancellor readily gave his consent to have this important cultural celebration in close association with the University.

With these words I welcome your Lordship once again in our midst. Your kindness to this Association and your interest in its activities are well-known and we are proud that you are with us to-day to lead us in paying homage to this great epoch in the world's history. I request you, my Lord, to declare this function open and to preside over its deliberations.

It would be redundant, Mr. Vice-Chancellor, to say that I welcome you in our midst. You are of us. You are one of our foundation members and you have been all along one of our Vice-Presidents. I request you to declare the exhibition open, at the end of the talks scheduled in the programme.

PRESIDENTIAL ADDRESS

BY

THE HON'BLE SIR LIONEL LEACH, *Kt.*, BAR.-AT-LAW,
Chief Justice of Madras

BUT FOR THE invitation of the President and Members of the Council of the Madras Library Association to preside over this function I should have been enjoying the more salubrious airs of Ootacamund. I do not say this with any regret but by way of emphasizing the fact that it gives me great pleasure to be here this morning and take part in this important function.

The invention of printing and its development has conferred on civilization greater benefits than any other invention. At the same time the blessings have not been unmixed and this I will touch on in a moment. As you are all aware printing from movable type dates back to Johann Gutenberg, who was born some time about the year 1398 and died in the year 1468. His father was Friele zum Gensfleisch and his mother was Elsgen Wyrich who had been born at Gutenberg, the name which he adopted and no wonder, for the name Gensfleisch means Gooseflesh. I have been surprised at the lack of really reliable information how Gutenberg went about his work, although I am not suggesting that he is not entitled to the pedestal on which history has placed him. We do know that in 1438 he entered into a partnership with two other people and, from what a witness said in a subsequent law suit, the partnership was concerned with printing. The suit was instituted by two brothers of one of the partners of Gutenberg. The brother of the plaintiffs had died and they sought to force Gutenberg to accept them as partners in his place. How

familiar such a suit is to one who has to sit daily in the Madras High Court! It may be of interest to mention that Gutenberg won the action.

It was not the only law suit in which Gutenberg was involved. He received financial help from Johann Fust who in 1455 demanded the repayment of his advances and as the demands were not met legal proceedings were instituted. Apparently history does not relate the result of this suit. According to Mr. J. H. Hessels no books bearing the name of Gutenberg are known nor is a genuine portrait of him known. Whether Gutenberg played the most important part in the invention of movable type matters not. It was in his day that movable type was invented and this itself is sufficient justification for these celebrations.

It is a long cry from the days of Gutenberg to the present day when we have the enormous rotary presses of the great daily newspapers of Europe and America, turning out copies by hundreds of thousands in incredibly short time. The art of printing has itself placed education within the reach of the masses and it allows developments in thought in every branch of learning to be communicated to every quarter of the globe. These blessings are incalculable.

Then what are the disadvantages? One is the facility which printing gives for the evil minded to spread their evil thoughts. It enables those who are willing to pander to the baser feelings of mankind to amass wealth. It enables false ideals to be fostered, and false teachers and false prophets to mislead. But taking into account all the items to be found on the debit side the items on the credit side leave a substantial credit balance. I have already mentioned one of the greatest items on the credit side, namely, the contribution of printing to the growth of education. Without the printing press only the wealthy would be in a position to experience the joys of an educated mind, but now education is within the reach of all, thanks to the printing press. While the printing press is a dangerous weapon in the hands of the subversive it is an even more powerful weapon in the hands of those who are working for the good of mankind. The printer has enabled great thinkers of the world to impart their thoughts and disclose their discoveries to all the world. But it is not necessary to go on adding to

the items on the credit side because it is obvious that they must largely outweigh those on the debit side.

The Madras Library Association is to be congratulated on having inaugurated this Exhibition in celebration of the fifth centenary of the invention of movable type. It is a fitting occasion for celebration and it is fitting that the Madras Library Association should arrange for the celebration in the way it has. Before the opening of the Exhibition by Sir Mahomed Usman, the Vice-Chancellor of the University, we shall have the pleasure of hearing two lectures, one on the "*Influence of printing on modern civilization*" by Mr. K. P. Raghava Menon, the Deputy Superintendent of the Government Press, and the other on "Printing and the sixth sense" by Rao Sahib S. R. Ranganathan, the University Librarian and Secretary of the Madras Library Association. I should be failing in my duty if I detained you any longer and I now call upon Mr. Raghava Menon to deliver his lecture.

THE INFLUENCE OF PRINTING IN MODERN CIVILISATION

BY

K. P. RAGHAVA MENON,

Deputy Superintendent, Government Press, Madras

THE object of my address is to tell you the many great benefits which mankind derives from printing. Also the extent to which the development in the art of printing has contributed to the high state of civilisation, which we enjoy to-day.

To-day we take Printing for granted, as we do many things with which we have been familiar from early childhood. But Printing as we know to-day has been known to us only since a very brief period—a period infinitely small in relation to the long history of mankind. Yet within this brief period of about five centuries, mankind has changed from a condition in which the large mass of human beings was in a state of barbarity to a condition, to-day, when in most countries of the world, the general level of intellectual development is very high. Intellectual poverty can bring about as much degradation and unhappiness as material poverty. We find, in fact, that the two are closely related. It is no accident that the vastly increased material wealth and the more equal distribution of the good things of life, which has been the feature of the last two centuries, particularly in Europe and America—it is no accident that this growth in the general well-being of the masses in these countries has been in the wake of a rapid development in the cultivation of intellectual culture brought about by Printing. It is also no accident that the richest country in the world, *viz.*, America also produces the largest quantity of printed matter. Next

comes Britain. In these countries Printing is the fifth largest industry; this is an index to their general culture and material prosperity. Modern history provides ample evidence that wherever the printed word has been brought within easy reach of the masses, there, intellectual curiosity, which resides in abundance in every man, has been stimulated. This, indeed, should not surprise us. Nature knows no partiality between the rich and the poor. It is sparing in its gifts, but it distributes them evenly. These gifts which are our human heritage normally lie dormant and inactive. They are like seeds in this respect. In order that they may grow up to be sturdy plants and trees and bear fruit, in other words, in order that they may be able to develop their full potentiality, it is necessary to provide them with good soil, they have to be watered and carefully tended. Planted in barren soil and untended, they shrivel up and die. Where the printed word does not reach, there the soil is barren, there the seeds perish. This is what has happened to humanity during its long history. The gifts in us which have enabled us to control our environments to our advantage have been with us for hundreds of thousands of years. I cannot believe that these have been peculiar to the last few generations among us. But for millions of years these gifts have lain in barren soil and untended. A few seeds by the good fortune of their environments have occasionally blossomed out. But the rest of them perished.

With the growth of printing, the printed word has reached, to a larger and larger extent, an increasingly larger number of human beings. The printed word stimulated the growth of those potentialities which, but for this, would have lain dormant and inactive. How then has Printing worked like the magic wand that has raised humanity from its torpor of ignorance? I shall proceed to explain this.

Man is not essentially different from animals; but he differs from animals in certain important respects. The most important among these is his ability to communicate his experiences to others gained from generation to generation. We all learn wisdom from experience. And so do animals. We can communicate our wisdom to others and learn wisdom not only from our individual experiences, but also from the experiences of others. But animals cannot

do this to the same extent, and hence they do not contain in them the seeds of progress, which we fortunately possess. Our earliest means of communicating with each other was by speech. We had to trust to our memory to take the fullest advantage of all we heard. This was much better than to be without this gift of speech. But it was a very defective means. The number of persons to whom one's experiences could be disseminated was necessarily small; and so long as it was necessary to rely on memory alone to keep safely all that one heard, there was a likelihood of losing much valuable knowledge. It was a great epoch in the history of mankind, when our ancestors developed a system of writing, which enabled speech to be recorded. The invention of the alphabet was the first important milestone in the progress of mankind. Though writing in one form or another has been used by man for many thousands of years, yet the use of a simplified alphabet is of quite recent development, that is, the last five thousand years. Writing was a great forward step from mere speech, and must have been responsible for much progress during prehistoric times. But writing was laborious work, and it reached only a small number of people. The rest were no better than before. Some means had to be found to produce writing in large quantities to reach every man, woman and child. If this were possible, then the accumulated wisdom of successive generations will be easily available to every man. If a man learned something wonderful in the course of his experience, possibly by accident, if he could communicate it to every fellow-being, then the knowledge would become the property of everyone; and not only would the benefit be shared, but the knowledge itself would develop and grow and get perfected by bringing to bear on the subject, the intellects of a vast mass of people of successive generations.

This, then, is what Printing has achieved. It has enabled writing to be produced in mass; it has brought knowledge to the furthest strata of humanity—at least in all self-governing countries and in all communities, where the benefit of mass education has been understood by the governing classes.

Education of the masses will be impossible without printed books, which can be produced cheaply in large numbers. Five hundred years ago, only the kings and noblemen and

the high priests could afford the luxury of books. To-day, we have succeeded, by the developments in the methods of printing and the production of paper, to bring down the price of books within the means of all but the poorest. But we should not be content with this. There should be none so poor that he cannot afford to buy books. I have no doubt that further improvements in Printing and production of paper will enable us to achieve this desirable end before long.

Another important contribution of Printing to modern civilisation is the newspaper. Everyone knows how much we are all indebted to newspapers for the formation of public opinion, which is such an essential factor in the good governance of a country. Few people, perhaps, realise that a modern newspaper is the result of the co-ordinated development of Printing, paper and machinery.

Yet another function of Printing is this:

The complicated machinery of any vast organisation, such as the government of a country, large business concerns, etc., are able to run efficiently and smoothly by the use of abundant printed matter—such as forms, circulars, folders, mail orders, bills, invoices, advertisements, posters and the hundreds of other kinds, without which such large organisations will come practically to a standstill. The amount of printed matter that is used by the government of a province such as Madras is several hundred millions a year. The quantity of printing work used by the Federal Government of U.S.A. runs to several thousand millions. Some important items, which are essential for the running of a government are postage stamps and currency notes, which are required in millions every year. These have been made possible only by the recent advances in the art of Printing.

Another important function of Printing is in the domain of Painting and Music. Paintings of the masters, which gave much delight to those who had the good fortune to behold them were available for view only to a very small number of people who had access to them at Museums and Art Galleries and the homes of those, who were sufficiently rich to be able to buy them. The pleasure in seeing a great painting is acknowledged as one of the most uplifting of human emotions, second only to music. Until recently,

this pleasure was denied to all but a fortunate few. One had to pay fabulous prices for the original paintings. Even copies when available were extremely expensive. It was beyond the means of all but a few people, to possess a copy of a painting by a master.

But to-day, printed reproductions of the great masterpieces, and of all celebrated pictures, nearly equal in quality to the originals are available at a small cost. This has been made possible by the development of that branch of Printing, which is concerned with pictorial reproduction. It may be of interest in this connexion to those not acquainted with the process employed in the printing of pictures to describe briefly how this is done. The principle on which this process is based is that every colour used by the artist in painting the picture, in whatever shade the paints are mixed, can be ultimately analysed into three component colours, *viz.*, yellow, red and blue. Though the artist uses a dozen different colours and mixes them in all proportions to get the colour effect he requires, the printer has found that every one of them can be represented as so much yellow, so much red and so much blue. There must be some means of analysing a picture to determine the quantity of each of these components and afterwards these quantities have to be reproduced in their respective colours. The first of these, namely analysis, is done by the photographic camera by interposing between the picture and the lens a coloured glass. It was found that if a violet coloured glass was used, the negative obtained in the photograph gave a correct analysis of all the yellow contained in the picture; a green glass analysed red, and an orange or more properly red glass analysed the blue contained in the picture. So, the picture was photographed three times using three coloured glasses in succession.

By a certain means, the details of which it will not be possible to bring within the compass of this lecture—by the way, I am giving another lecture this evening here with lantern slides describing in detail how pictures are produced —as I said, by a certain means, these three negatives are finally converted into an engraving in relief, from which by the application of yellow ink, a print was obtained which showed exactly the analysis of the quantity of yellow con-

tained in the picture. Similarly, the engraving from the negative for red, by the application of red ink gave the analysis for red; and the third engraving gave the analysis for blue. The print obtained from red was printed on top of that obtained from yellow; and this was then printed over with blue. So that on the same paper, a print was obtained from all the three engravings—yellow, red and blue. When these fall on top of each other very accurately, then the finished effect is identical with the original. As these prints can be obtained at a very great speed—as much as twenty thousand a day, it will be realised, what a great help printing has been in enabling all of us to derive much pleasure in possessing copies of great paintings. Printing has been in this respect a source of considerable pleasure to millions of people, who find delight in visual art.

In regard to music, time was, before the invention of music Printing, when music books were rare and very expensive. The musical scores of the great composers of classical music, operas, dance music and other kinds of music were difficult to obtain so long as every copy had to be laboriously written by hand. In this respect, it was rather like the difficulty in making copies of the paintings. The scoring had to be written down, by any one who wished to learn music. The result was that very few could afford to learn music. This not only placed great restriction on the development of musical talent, it also placed a bar on the enjoyment of music by the vast majority of people.

Musical talent is very widespread, and the ability to enjoy music is almost universal. The pleasure in listening to music is one of the few things that make life worth living. But very few people know that they are indebted in a large measure to the invention of music Printing—which is a special branch of printing—that they are at all able to buy music books, and are enabled to practise music or to listen to public performances. It was only when the musical scorings of the composers could be reproduced in large numbers and cheaply by the process of Printing that it was possible for people to buy music. Now, as soon as a musical composition—usually dance music—has become a great popular favourite, hundreds of thousands of copies are printed, and made available within a few days in all parts of

the world. This is a great contribution made by Printing to the pleasures of life.

Lastly, I shall conclude this lecture by referring to one particular work, the production of which by the process of Printing, has had the most profound influence on recent European history, and in the shaping of modern civilization. I refer to the printing of the Bible. It was the first book ever to be printed by the process we know to-day—the first well-known book to be printed by Gutenberg nearly 500 years ago—the famous 30-line Bible. In order to realise the importance of this, it is necessary to realise that before Bibles were printed, only manuscript copies of the Bible were available and, not only was there no authorized version, but the few copies that were available were in the hands of the clergy. All others had to know the scripture by what they were told by the priests. It will be easy to understand how much ignorance, superstition and priestcraft existed in those days. Civilization as we know to-day could not have developed until a clearer understanding based on unbiassed study of the scripture became general. For this purpose, it was necessary to enable every individual to possess a copy of the authorised version of the Bible. This would have been impossible but for the invention of Printing. To-day, in spite of the war, three million copies of the Bible are exported from England to all parts of the world, printed in all the civilized languages of the world—thereby spreading the true gospel to the furthest ends of the world—the greatest single civilizing instrument the world has ever known, made possible by the invention of Printing. The breaking away from Popery, the Reformation, the growth of scientific and liberal thought, the general abandonment of outworn customs and traditions, enactment of humane laws and the arrangement of human relationship on happier lines, can all be directly or indirectly traced to this spreading of correct knowledge of one of the greatest instruments of human enlightenment—namely the Bible—made possible by the invention of Printing, the five-hundredth anniversary of which we are happy to celebrate to-day.

PRINTING AND THE SIXTH SENSE

BY

S. R. RANGANATHAN, M.A., L.T., F.L.A.,
Librarian, Madras University Library
and
Secretary, Madras Library Association

IT is usual to speak of the three W's as forming three wonders of human invention. Arranged in order of priority they are Wheels, Wings and Wireless. There is a fourth 'W' prior to all these. It was invented in prehistoric times. And so it has been in use for so long that we have forgotten that it is a far greater wonder than all the three later W's. In fact, we have even wronged it by refusing to pronounce the initial 'W' in it. And yet, is there a greater wonder, I ask you, than the invention of writing? Mr. Menon has anticipated me by giving a similar credit to it. It is this wonderful basic invention that has endowed us with a sixth sense. Just as to light corresponds one sense, to sound another, to taste a third and so on, to writing corresponds the sixth sense. If you back the school of psychologists who count the muscular sense as the sixth one, I have no objection to call the sense that corresponds to writing, the seventh sense and amend the title of my talk accordingly. For definiteness, however, I shall hereafter refer to it simply as the sixth sense.

Who invented writing? When did he do it? Where did he do it? In what language? Each community makes its own guesses. As a type I shall refer to a tradition of the Chinese. Tsai Lun, who flourished in China some thousands of years ago, did a good deal of original work in plant culture. As he grew old, the emperor said to him:

"Tsai Lun, what availeth all thy labours? People will forget. Is there no way of passing on your invention to those who follow?"

Thus reminded of his duty to posterity Tsai Lun switched his brain off from agriculture and turned it on to the invention of paper and writing.

Now I propose to discuss two things about this sixth sense. First I want to deal with what the mathematical world would call the Existence Theorem and secondly I want to examine the development of this sixth sense.

This sixth sense has most of the attributes of the other senses. We shall prove its existence by considering some of the attributes. We have heard that we can sweeten the temper of people, at least of children, by pleasing their aural sense, say by music or even by a rattle in the case of children. We have the evidence of Charles Lamb that a man's temper can be similarly sweetened by appealing to the sixth sense. In one of his letters to Coleridge he says that Walton's *Complete angler* "sweetens a man's temper at any time; to read it would Christianise every discordant angry passion." We have also the testimony of W. B. Yeats who says that the Cobbler of Candalkin always turned to Carlyle when he was about to become wild with his neighbours.

As a good picture or a good tune does, books working on the sixth sense glorify and elevate the spirit of man. "Gentlemen look more like gentlemen when fine books are spread out in rich magnificence before them" and are made to engage their sixth sense says Dibdin.

A third analogy. It is not unusual to keep a party in good humour by an appeal to their aural sense, when there is delay in dinner by turning the radio on, for example. Dibdin speaks of a large party similarly kept in good humour when dinner was twenty-seven minutes late by entertaining the sixth sense with a collection of Who's whos and similar books. Did not Queen Elizabeth ordain that in all churches there should be a desk with a copy of Erasmus for the people to read while waiting for the service?

In some exceptional men the sixth sense got so sharpened that they could even dispense with the services of other senses. Here is an example. Henry Bradshaw, the Cam-

bridge librarian, could find any book he required in his own library or elsewhere at home or abroad with the exact sense for locality of a homing pigeon. Like the owl, its prey he could find books in the dark. He could draw out the lost fragments of ancient manuscripts from their hiding places in the covers of other volumes. He astonished librarians by discovering for them books in their own collections which, they were convinced, were not there.

Such a high development of the sixth sense is unique. Men who have it may be taken to constitute a new species, Biblanthropos, if you like. But the sixth sense has been slow to develop in most men. It has been inordinately slow if we take the average man. But there is ample reason for it.

For writing was a slow process. It was also a costly process. Hence written materials continued to be scarce. The sixth sense had, therefore, not much chance to develop in most people. In spite of writing having been in vogue for thousands of years, 99:5 per cent. of the world's population were illiterate till about five centuries ago.

Rao Bahadur K. V. Krishnaswami Ayyar and Mr. Menon told us that the invention of printing is setting this anomaly right. But after what a length of time? and at what a terribly slow speed?

No doubt printing made written materials plentiful and cheap, thereby increasing the probability for the development of the sixth sense in all; but simultaneously with the invention of printing other forces developed to work against it—social forces and political forces. Aristotle was quoted against the development of the sixth sense in the masses. "It is the intention of nature to make bodies of slaves and of free men different from each other . . . and if this is true with respect of the body it is still more just to determine in the same manner when we consider the soul." These premises of Aristotle led to the convenient conclusion that nine-tenth of the population cannot be allowed to develop the sixth sense. We are even told by D. L. Jackson that vassal fathers were punished for allowing vassal sons to attend school to develop their sixth sense.

This denial of the sixth sense persisted for centuries even after printing was invented. Here is a specimen of

eighteenth century opinion from the *Fable of the bees* of Barnard Mandeville.

"To make the Society happy and People easy under the meanest circumstances, it is requisite that great number of them should be Ignorant as well as Poor. . . The Welfare and Felicity therefore of every State and Kingdom, require that the knowledge of the Working Poor should be confined within the Verge of their occupations and never extended (as to things visible) beyond what relates to their Calling. The more a Shepherd, a Plowman or any other Peasant knows of the World, and the things that are Foreign to his Labour or Employment, the less fit he'll be to go through the Fatigues and Hardships of it with Cheerfulness and Content. Reading, Writing and Arithmetic . . . are very pernicious to the Poor, who are forced to get their Daily Bread by their Daily Labour."

What a benevolent dispensation! What a show of inevitableness in this eighteenth century reasoning! With such ideas running rampant, one can easily imagine how effectively printing was checkmated in its attempt to stimulate the sixth sense in one and all.

We find Thomas Hill Green complaining even later in the nineteenth century that "one of the inconveniences attaching to the present state of society in England is that all questions of education are complicated by distinctions of classes." Even so late as 1918 the *Hansard* discloses that Fisher's Education Bill and the development of the sixth sense in the workmen were vehemently opposed with the words: "How are the horses to be kept at work, the cows to be milked, the sheep to be tendered and the folds to be pitched?" How is the sixth sense going to help a man who has to spread manure in a field?

However the sixth sense slowly found favour in the nineteenth century. Libraries were no longer let go with the simple task of safeguarding books. They were also charged with the function of producing the books for use by those who demanded them for the exercise of their sixth sense. This passive attitude, though it was a welcome change from the obstructive one of the earlier centuries, was not actively helping the cause of the sixth sense.

James Wyer describes this passive attitude of the nine-

teenth century in these pithy words: "Provide the books and keep out of the way of readers as much as possible." It is this attitude that explains the indifference of the public to books, so bitterly bemoaned by the President of the Bangalore Public Library at the recent celebrations of their Silver Jubilee. If the sixth sense should be stimulated in all, experience has shown that libraries should play a positively active, if not aggressive, part. The library profession should be two-headed like Janus. With one head they should persuade the producers of books—the authors, the printers and the publishers—to produce more and more readable books—better printed, better illustrated, better bound books—in all conceivable subjects and in varying standards to suit the varying capacities of the people. With the other head the library profession should canvas for readers, receive them with a kind smile, find out their requirements promptly and exactly, and interpret the resources of the library to them in a sympathetic way.

The second function of librarians which is called reference service is taking shape only to-day. It has not yet unfolded itself fully. It is only the progressive library authorities that are beginning to realise that when the reader comes to the library, there must be some one, with a look of leisure, to say:

"Take my hand;
For I have passed this way,
And know the truth."

The advance made by pioneer libraries in this matter during the last few years makes it possible for us to say: the libraries are now prepared to play their part in exploiting the full potentiality of printing to stimulate the sixth sense of one and all. Progressive library authorities boldly say that it is not books alone that constitute a library, that it is not readers alone that constitute a library and that it is not merely dignified officials unwinding red-tape and called librarians that constitute a library. It is only the energised combination of all these factors—the trinity made up of books, librarians and readers set in active organic relation—that will henceforth be called a library. At any rate the invention of printing will fulfil itself in regard to the sixth sense of man only if the library staff become the

power that mediates between books and readers, and stimulate their integration. Indeed their part is not unlike that of Sakti in the Trinity—Purusha as Akshara Brahma, the scriptal form of manifestation, and the Prakriti as the readers that stand in need of enrichment by Purusha and Sakti the energy principle that activates. The Purusha seeks fulfilment in enlivened Prakriti and the consummation of Prakriti consists in realising Purusha. The descent of Sakti on Prakriti transmutes it and the sublimated Prakriti reaches out to the Purusha. The library profession must be proud of the opportunity to be the instrument of Sakti.

They should strive to acquire the necessary wisdom, strength, fortitude, harmony and perfection to function as a worthy instrument of Sakti. All their life must be an offering and a sacrifice to the fulfilment of the fundamental Laws of Library Science. Then only will the sixth sense be opened in every body and all humanity will get illumined, will lose themselves in universal love and reach a state of bliss and Ananda.

SPEECH

BY

SIR MAHOMED USMAN, K.C.I.E., B.A., M.L.C.,
Vice-Chancellor, University of Madras

LADIES AND GENTLEMEN,

WHEN Rao Bahadur K. V. Krishnaswami Ayyar asked me to participate in the celebration of the fifth centenary of the invention of printing, I readily agreed. It was for two reasons. Mr. Krishnaswami Ayyar is an old friend of mine and I did not like to say 'no' to him. My second reason is the fact that I am the executive head of the University which maintains the biggest and the best library in this part of the country. Mr. Ranganathan said that the library profession is two-headed like Janus and that it looks at the readers of books with one face and at the producers of books with the other. Hence it is appropriate that the Madras Library Association should arrange for an exhibition of book-production on this occasion.

Several are the trades that take part in the production of the book, apart from the author and the publisher. One has to begin with the graphic arts to design type, to cut punches, to justify matrixes and to cast types. Then comes paper-making, then the art of book-illustrations and book-design. Lastly, we have the printing trade itself. I am glad to learn that members of all such trades are taking part in this exhibition. I understand also that the exhibition is only a kind of appetiser. For I am told that arrangements have been made for conducted visits to type-foundries, block-makers, printing presses, binderies and newspaper offices. Hence this exhibition may be taken to be extended from the Senate House to those places also.

Sir Lionel Leach and Mr. Raghava Menon referred to the influence of printing on the growth of civilisation and Mr. Ranganathan went to the length of saying that printing has equipped us with altogether a new sense.

I trust that this exhibition will give you all an opportunity to see how much of varied but co-ordinated activity lies behind the books and the papers you read every day.

I trust also that this exhibition will lead to some constructive work with regard to the future of typography in South India and in India in general. I find from the programme that Mr. Warren will be speaking to you to-night about the "Development of Tamil printing." I think we have just finished two centuries of Tamil printing. Its history needs to be investigated and written out in detail. An accurate history of the past is necessary to plan for the future. I think it will be agreed that the design and production of Tamil type faces have not been as varied as the requirements of the new kinds of books such as reference books and bibliographies. I hope that before long this defect will be remedied by some master printer in Tamil.

The position is even more serious when one turns to Urdu typography. Its history is shorter. For the earliest known printed book in Urdu types is dated only 1795 A.D. These early types were designed by the Christian missionaries of Serampore and the Oriental College of Calcutta. These were known as the Nastalique types. Some insuperable difficulties were met with. The flourishes which extended beyond the body-proper turned out to be fragile and broke easily. The spacing created another difficulty. The printed page was not pleasing to the eye. Nor were the upright Nask types liked by readers. Hence printing from movable types was abandoned by about the middle of the nineteenth century in favour of litho-printing. Even to-day litho-printing holds the field to a large extent.

Indeed the movable metallic Urdu types used by newspapers have been nicknamed "Kanteydar Huroof" or thorny letters. There have been two schools. Sir Syed Ahmed Khan, Sir Zia-ud-din Ahmed and Sir Tej Bahadur Sapru supported the thorny type in spite of the difficulties. Moulana Muhammad Ali and Moulana Abul Kalam Azad supported the upright Nask types in spite of their unpopu-

larity. The Government of His Exalted Highness the Nizam of Hyderabad and the Osmania University are endeavouring to effect a compromise and to secure standardisation and uniformity. Here again we should really look forward to a master printer who will design the right kind of type faces which will satisfy both schools of thought and secure the classic appearance of the litho-print and at the same time avoid the difficulties of the Nastalique types.

Exhibitions like these may give a fillip to the inventive geniuses in the land. Madras is reputed to have the premier school of printing in India. Hence I cannot be said to be too optimistic if I say that exhibitions of this kind have got the most favourable chance to produce that desired effect.

I have great pleasure in declaring the exhibition open.

OUTSIDE BROADCAST OF A CONDUCTED VISIT TO THE PRINTING EXHIBITION AT THE SENATE HOUSE[1]

on 22nd December, 1940

COMMENTATOR: K. P. RAGHAVA MENON

ANNOUNCEMENT: Here we are at the Senate House, in one of the rooms where the Madras Library Association have displayed some exhibits illustrating the progress of printing through the last 500 years since its invention. Here is Mr. Raghava Menon. Good evening, Mr. Menon.

Mr. M. Good evening.

R. S. Will you kindly conduct me through the exhibition and explain the various exhibits for the benefit of the listeners? (Crowd Effect)

Mr. M. I shall be delighted to.
Before I take you around, let me explain briefly what this exhibition is about, and its scope. Your listeners are probably aware that this year, in all parts of the world, people have been celebrating the 500th anniversary of the invention of printing. This exhibition has for its object the presentation in a form easily understood by the lay public, of the various stages in the production of printed matter. 500 years ago, a German, named Johann Gutenberg invented printing by movable types. Five hundred years ago! Seems a long time. But how brief a period, how infinitely small, compared

[1] By the courtesy of the All-India Radio, Madras.

to the long history of mankind! Yet, within this brief period, what a great deal has been achieved through the medium of print! The spread of education, and the dissemination of knowledge, are but two of its many achievements. Even to-day, when broadcasting does much of the work which printing had to do in the past, the Press is still of vital necessity as the torch bearer of knowledge. We are at the close of the 500th year since this great torch of knowledge was first lit. Since then, we have developed it; the torch burns now with a bright flame shedding its light to the far ends of the earth, dispelling darkness, that is ignorance.

We are paying homage to-day to Gutenberg in commemoration of his great invention.

(Walking up)

That picture you see there is of Gutenberg. See his venerable beard, his face lined with deep thought, a round low hat on his flowing locks of hair. That is the man whom we venerate to-day.

R. S. Indeed a venerable figure.

M. Now we will go to the first section here, which is type founding. You see these small pieces of steel? You find at one end of them, letters of the alphabet cut in the reverse way? That is how Gutenberg made his types. It was a very slow task, taking over a day to cut one letter. Every letter of the alphabet had to be cut separately like this. You see, in order to facilitate cutting, the steel was first softened. After the letter was cut, it was hardened. This was then called a 'punch'. This was afterwards driven into a piece of copper. You see, this, here? This was obtained by driving this punch into a piece of copper. The result is an impress of the letter, correct in every detail, in the copper piece. But the letter is now the right way, that is, the way we read. This is called a matrix.

R. S. I see; how were types cast from this matrix?

M. This is done by pouring molten metal through a

rectangular hole at the end of which was placed the matrix. To this day we use almost the same metal as Gutenberg used 500 years ago, namely, an alloy of lead, tin and antimony.

R. S. I see, but Gutenberg's process must have taken a long time, isn't it?

M. But we have long since discarded this slow process of making types used by Gutenberg. It took Gutenberg several years to cast one set of type. To-day, we are able to do it within a very short time. This is how we do it. You see this drawing here.

R. S. Oh! it is a Tamil alphabet!

M. Yes, it was drawn by an artist in black ink. From this, a reduced negative is made photographically, as you see here. This photograph is printed down on a brass plate.

R. S. Yes, I observe it is an exact reproduction of the original drawing.

M. The edges of the design are then made slightly deep by engraving. This is called a master plate. This is placed on a machine called a pantograph. The pantograph is a very ingenious machine. The wonderful thing about the machine is that whatever motion you make at one end of the machine is reproduced at another end, movement for movement in an identical manner, but on a vastly reduced scale, the actual proportion being capable of fine adjustment.

R. S. That is very ingenious indeed. It seems to me that it requires less skill now than was required in Gutenberg's days; then, the artist's medium was the difficult bit of steel; to-day, it is paper. Certainly much easier. Are the types also much superior in workmanship to the old types?

M. The general quality of types made these days is certainly very high; but it is amazing what beautiful types our ancients made with their very crude tools. They took long; but they were great craftsmen.

We will now pass on to the next section, which

is hand composition. (Walking up) Here you see how the types are contained in two large trays, one above the other, mounted on a frame. You notice how the trays are divided into partitions, into numerous small receptacles, like boxes; each of these boxes contains a different letter. Every letter of the alphabet of the small letters is contained in the lower case, and the capitals and figures are contained in the upper case. You will notice that though the capitals are arranged in alphabetical order, the small letters are not. They are arranged in what may appear to you haphazard, but the arrangement is based on the principle rather similar to that employed in the typewriter keyboard. That is, letters required most often, are placed close to each other, from where they can be easily picked out.

R. S. Is that a compositor at work at his case?

M. Yes. Notice how he carries a small brass tray, called a composing stick, in his left hand, the width of the tray adjusted to the width of the page of the book he is now composing. He picks out the types he requires with his right hand.

R. S. How quickly he does it!

M. Yes, you see he does not have to read the letter. He knows where everyone of the hundred or more of the letters are contained. You are scarcely able to follow the movements of his hand, he moves them about so fast; in fact he picks out over a thousand letters per hour, and arranges them in lines in his stick. When his stick is full, he empties it on a galley, which is a long brass tray, and continues composing, till the page is completed.

R. S. But, if a letter is placed turned the wrong way round in the stick, I suppose the letter will print upside down. How does he prevent it?

M. Well, it is like this. Every type has on its front a conspicuous groove or grooves, called nicks, cut on it. If a type is placed with its nicks forward, then it will print right. If it is not forward, then it will

print upside down. Before the man picks up a type his eyes have already spotted its nicks and he so picks it up that the nicks are away from him. It requires skill of course, but it comes with practice.

Before we go to the next section, I would like you to notice that every type in English, Tamil, Telugu and Sanskrit that you see before you, and in fact, every type in the world, at least that used in America and the British Empire, is of one standard height about nine-tenths of an inch, and also that every type in one pair of cases is of the same depth, only differing in width. These two features are essential for printing; otherwise printing from types will be impossible.

You see here this rectangular iron frame. The pages of type, after correction, are placed inside this frame. Usually 8 or 16 pages are placed together, arranged in such order that after printing from it on both sides and folding the sheet, the pages appear in correct sequence.

The next process is to hold the pages tight against the sides of the iron frame, by driving small wedge shaped pieces of wood against similarly wedge-shaped sticks placed all round the pages.

R. S. I suppose this causes all the types to hold rigidly together.

M. Yes, and see how all the pages are held firm, and no letter drops down. That is known as locking up the pages. When so locked, it can be moved about. It is now ready for the printing machine.

R. S. What is this picture here?

M. It is a linotype which is a machine that does most of the composing that used formerly to be done by hand. It is a most ingenious machine.

R. S. How does it work?

M. The operator who works on the machine assembles matrices in one line by pressing the keys on the keyboard. There are twenty matrices of every letter contained one behind the other in narrow channels, one channel for each letter. One of these

drops down and takes its place when a key is depressed, the keys being arranged rather like those in a typewriter keyboard. The matrix drops down to its place simultaneously with the pressing of the keys. When the line is finished, the operator presses a lever, and the line is automatically carried away, and all the later processes I am going to tell you shortly, are done automatically; but in the meantime, the operator carries on with the next line. When the line of matrices is carried away, it comes in front of a mould, which is a rectangular steel aperture. The line is filled out to the full width of the page, and then a quantity of molten metal is pumped into the mould, forming a cast of the whole line. Afterwards, this line of matrices goes to another place, where each letter is put back automatically to its respective channel, from where it is used again. The finished line of type, which you see here, called a linotype slug, is delivered into a brass tray. With the aid of about twenty matrices of each letter—well, there are 40 for letter "e"—the printer is now able to set up his books which formerly required thousands of types of each letter, when it had to be set up by hand. Also, as it is much easier to type a keyboard than pick out letters from a case, one linotype machine does the work ten times as fast as composing by hand. Not only that, the one-piece line is easier to handle than a line composed of twenty or more single pieces. The type face is also always new.

We pass on to another class of machines which are also used to compose types mechanically. This machine is called the monotype. You see this reel of paper, here? I am unwinding it for your inspection.

R. S. I see a number of perforations appearing haphazard here and there; what is the object of these?

M. These perforations in paper have been made on the monotype by pressing the keys on a keyboard. These according to their position along the width of the reel, represent a letter of the alphabet. The

principle employed is rather like that in a pianola which your listeners may be familiar with. You know how in a pianola a tune is represented by perforations on a roll and how when this roll is worked on the pianola, the required tune is played.

R. S. [Walks up] Is this a hand press?

M. Yes, it is similar to the one in use about 300 years ago. Our ancients used to print about 200 copies an hour. To-day printing is done entirely by machinery and the output varies from a thousand to sixty thousand an hour. Some of these larger machines are used to print the daily newspapers in Madras.

[Walks up]

This section deals with duplicating processes called *stereotyping* and *electrotyping*. You see this stereo plate here? It was cast from a matrix obtained by moulding the type page in papier-mache which is made of blotting paper and special tissue paper along with a special adhesive composition. The electrotype is made by moulding the type page in wax in a hydraulic press, coating the wax impression with graphite to make the surface electrically conductive, and then placing it in an electrolytic bath of copper sulphate solution. The other terminal is a copper plate. When an electric current is passed, copper passes from the plate to the wax mould, and a duplicate in copper is obtained about a card in thickness. This is then removed from the wax mould and attached to a sufficient thickness of metal, to form a plate to print from.

R. S. I see.

M. The next section gives a very interesting demonstration by exhibits how pictures and photographs are converted into what are known as line and half-tone blocks, which is a method of engraving on copper and zinc by photographic means.

R. S. Is that how all the great paintings are produced in printing?

M. Yes. In the case of coloured pictures, however, not one but three photographs are taken, after

separating the colours by interposing coloured glasses in front of the lens, violet, green and red. The blocks obtained from these are printed successively in yellow, red and blue, one on top of the other, as you see here illustrated by exhibits showing the different stages.

R. S. [Walks up] What section does this represent?

M. This is the binding section. It is here that printed sheets are folded, usually on a folding machine, so that the pages are now in correct sequence. Each sheet so folded forms what is known as a section. All sections in the book are placed in correct order, and then sewn with thread on tapes, also usually in a machine, which has not been shown here. After sewing, the books are enclosed in cloth cases, or bound, as you see here, in leather and cardboard. That is the finished book to produce which all the numerous complicated processes we have seen had to be gone through.

We have now come to the end of the hall.

R. S. I see here some finished prints.

M. They have been done by the evening class students in printing at the Government School of Technology at Madras. The School is the training ground for good workmen and executives who are very necessary in printing, which is perhaps the most complicated industry we know—it is more than an industry, it is an art.

Well, I think that completes the various sections we have shown here in the exhibition.

R. S. Thank you very much. It has been very interesting to me. I had no idea that there was so much in printing.

Good-bye.

M. Good-bye.

EARLY TAMIL PRINTING

BY

W. H. WARREN,

Secretary, Diocesan Press, Madras

RECENTLY we have been celebrating in Madras the 500th anniversary of the invention of printing in Europe, and we might well have celebrated along with it the 400th anniversary of the introduction of printing into India. It was about the middle of the sixteenth century that the Jesuits set up a press at Goa. At first they printed only in Roman characters, and Fr. Estevao (*i.e.*, Stephens, an Englishman), writing about 1600, speaks of Roman being used exclusively for writing Konkani. In the seventeenth century the Jesuits had two presses at Goa, one in the college of St. Paul and the other in their house at Rachol. Few specimens of their work have been preserved, but they appear to have produced a number of books, some of large size.

The first printing in Indian characters was done at a place called Ambalakkadu in Cochin. The place is now a small village, but about 1550 the Jesuits built here a seminary and a church. Sanskrit, Tamil, Malayalam and Syriac were studied there, and a press was established where several important works were printed. The first 'Malabar' types were cut by a lay brother, Joannes Gonsalvez, in 1577, but there is no evidence left to show whether the characters were what we now know as Malayalam or Tamil. The word 'Malabar' seems to have been used by Europeans to describe both languages, and even so late as 1809 the Tamil-English Dictionary of Fabricius is still described on the title page as a 'Malabar and English Dictionary'. It has not been found possible to trace in India any of the books printed

at Ambalakkadu, but there is in Rome a list drawn up by Fr. Paulinus, and an Indian friend who has seen it informed the present writer that the names of the books appeared in Malayalam characters, and the probability is that normally they were used for printing both Malayalam and Tamil books. If this is the case, then an interesting story lies behind a record left by Fr. Paulinus. He tells us that in 1679 a Tamilian by the name of 'Ignatius Aichamoni' cut Tamil characters in wood for the printing of a Tamil-Portuguese Dictionary compiled by Fr. Antem de Proenca of the Madura Mission. It would seem that the Madura Jesuits had discovered that the Malayalam characters were not understood in the Tamil country proper, and de Proenca insisted on Tamil characters being used. He would probably have sent Ignatius, a local wood-carver, to cut the letters for the key-words. It would have been extremely difficult to produce separate characters in wood, so probably the words were carved on small type-high blocks.

Type was cast at Amsterdam in 1678 to print the names of some plants in the book *Horti Indici Malabarici*. Ziegenbalg, the Danish missionary who worked at Tranquebar on the East coast, mentions the fact that Tamilians could not make them out. Here too it is probable that the first Amsterdam types were Malayalam. If so the claim of Ignatius of Madura to be the first Tamil type-cutter seems well established. Unfortunately Ambalakkadu was destroyed by Tippu when he invaded Cochin and Travancore. He spared neither Christians nor Hindus; church, seminary and press went up in flames, and practically all the books and valuable manuscripts perished.

A new era opened with the arrival of the Danish missionaries, Ziegenbalg and Plutschau, at Tranquebar in 1706. At first they could find no one in the settlement able to teach them Tamil, but they attended a small school, and sat with the children on the ground, tracing out first letters, then syllables and finally words, in the sand. In this way they learned to read, write and pronounce a number of words, but the meanings were still unknown to them. At last they came across an Indian, Aleppa, who was able to translate, and then their progress was rapid. Two years later Ziegenbalg drew up a list of the manuscripts in his

library: 14 he had written himself; 21 were by Roman Catholic authors; 119 by Hindu authors. He commenced the translation of the New Testament in 1708 and finished it in 1711.

In 1711 the Society for the Promotion of Christian Knowledge in London sent out a press with Roman types to Tranquebar. It was accompanied by a German printer by the name of Jonas Fincke. The ship was captured by the French off the coast of Brazil and taken to Rio. It was afterwards ransomed, and thus enabled to resume its voyage, but Fincke died off the Cape of Good Hope. The press and type, together with a stock of paper, were landed at Tranquebar in August 1712, and the missionaries were able to secure the help of a Danish soldier to erect and manage the press. A number of small books were printed in Portuguese. In the meantime, Ziegenbalg had sent specimens of Tamil characters to Halle in Germany, where a fount was cut and cast. The types were then sent out and reached Tranquebar soon after the press. The first book printed entirely in Tamil was the Apostle's Creed. Two more printers were sent out, and one of them, Adler, became of great assistance both as a letter-founder and a mechanic. The Tamil letters sent from Halle were rather large, so he set to work on the preparation of a smaller fount. He also set up the first paper-mill in India at a place called Poreiar.

The printing of the Tamil New Testament was completed in 1715, and the translation of the Old Testament followed. This was completed after Ziegenbalg's death by Schultz, and printing was completed in 1727. A copy of this first edition, in five volumes, is still extant, in the possession of the British and Foreign Bible Society, Madras. The Tranquebar Press continued to function for nearly 200 years, and the bulk of Tamil printing was done there during the eighteenth century.

The Tamil type used at this period was upright and somewhat square in appearance. The characteristic slope and more rounded appearance seems to have been introduced by the Dutch East India Company's Press at Colombo. There is a fine quarto volume produced there in 1748, now in the possession of the Diocesan Press, Madras, which shows a very high standard of workmanship. Another ex-

cellent piece of printing is in Arndt's *True Christianity,* but this was printed at Halle in 1751.

Printing in Madras started in rather a curious way. In 1761 Sir Eyre Coote captured Pondicherry from the French, and in the Governor's house was found a printing press and some types. These were brought back to Madras as part of the loot, but the Fort St. George authorities were unable to make use of them as they had no printer. Fabricius, the great Tamil scholar, was then living at Vepery, and the equipment was handed over to him on condition that if at any future time the Company should require any printing done, he would do it for them. This was the commencement of the S. P. C. K. Press at Vepery, now known as the Diocesan Press. It can thus claim to be, by many years, the oldest existing Press in India.

It was at Vepery that Fabricius printed his hymn book, and also his Tamil-English Dictionary (1779). The original wooden press was replaced by an iron lever press in 1826. It is uncertain when Tamil types were first cast in Madras, but it must have been somewhere about the beginning of the nineteenth century. A new face was cut which was a great improvement on the Halle face, and this was used by the S. P. C. K. Press up to 1870.

Up to 1835 there were few presses in the country owing to the severe restrictions imposed on printing by the Company. In that year Sir Charles Metcalfe removed these restrictions, and Indian-owned presses began to be established. By 1863 there were ten such presses in Madras city, printing in Tamil on a small scale. Most of them were set up in family houses, and owned in common, some members of the family acting as printers, others attending to sales. In 1872 three or four printers had iron presses, and some even hot-pressed their sheets. Some books printed by them were of very good workmanship.

We now come to what may be termed the peak of Tamil printing under the old conditions of hand-cast type and hand presses. The American Mission had set up a press in Broadway, and for many years it was under the management of a very fine printer, Mr. P. R. Hunt. About 1850 the question arose of the printing of a new and large Tamil-English Dictionary which was being prepared by the

Rev. Miron Winslow. It was the biggest venture so far attempted by any press in South India, and Hunt was dissatisfied with the existing Tamil type-faces. He taught some of his workmen the difficult art of cutting type-punches by hand, and himself designed a new face. To some extent it followed the lines of that produced at the S. P. C. K. at Vepery at the beginning of the century, but he gave the letters a more regular slope, more even spacing, better alignment, and introduced a new and beautiful serif which greatly added to the appearance of Tamil type. Three founts were produced, Pica, Long Primer and Brevier. Printing was commenced in 1853, but owing to the reasons given in the Preface of the Dictionary, it was not completed till 1862. Both composing and printing were of a very high standard indeed, and will, even to-day, stand comparison with the work of any press in the world. In the middle of the nineteenth century there can have been few productions to equal it.

A close examination of the Tamil type reveals the fact that, if anything, it is superior to the Roman characters, which were the best imported type of the period. A few years ago, when an expert from the American Linotype Company visited Madras to make enquiries about the most suitable Tamil type-face for reproduction on the linotype machine, it was the unanimous wish of leading Indian printers and scholars that Hunt's designs should be used, a striking tribute to the affection in which they are held a hundred years later. The original punches were therefore sent to America, and in making new matrices the characteristics of the faces were carefully preserved, experts declaring that they could not be improved on.

To-day, when people talk about the inferiority of printing done in India, and in their minds attribute it to a lack of ability on the part of the Indian workman to rise to the excellence of his brother craftsmen in Western countries, we can re-call with pride that 100 years ago a Madras press was the equal of any press in the world, and in the difficult art of cutting punches by hand, Madras workmen were probably superior.

EARLY BENGALI PRINTING ON PAPER

BY

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THE Chinese had anticipated the occidental discoverer by centuries both in woodcut reproduction known as block printing and in movable types called typography. Printing on paper in that great country was in use during the Han dynasty of kings between 202 B.C. and 221 B.C. From China the art was learnt by Korea, Japan, Tibet and also by the Manchu and Mongol races.

It is rather strange that India, having direct business and cultural relations with China and the other countries mentioned, more specially with Tibet to which many a Buddhist scholar went from our universities and monasteries hardly furnishes evidence of printing on paper having been in vogue for purposes of document or dissemination of ideas or knowledge. We have no doubt of our very old inscriptions on stone and metal, manuscripts on paper[1] or like substance, coins with fine imprints cut out of the mint, but we can hardly find any printed book like what we get in ancient China. Printed designs and illustrations were, however, found on calico or other sorts of woven material, cotton or silk, which used to be worn in very ancient days.

Let us now see how and when printing on paper in the

[1] Use of paper was in vogue during Alexander's campaign in 327 B.C. as chronicled by his companion who wrote that paper made from cotton was used for writing. (G. H. Ojha's *Prachinalipimala*, p. 144.) Max Muller has also said the same thing in his *History of ancient Sanskrit literature*, p. 367.

modern age was introduced in the matter of Indian languages in general and Bengali in particular.

In 1497 the Portuguese led by Vasco da Gama came to India for the first time and the first printing press was established by them in Goa in the middle of the sixteenth century. From Europe they brought the Roman types which were used in the first instance for the Indian languages also so far as printing was concerned. By printing in the Roman script the Portuguese were instrumental in developing a literature in the local vernacular, the southern branch of Marathi, known as *Konkani*.

Of Indian scripts Tamil had the good fortune of leading the printing of books in any Indian language in India, for whatever printing we find in earlier days was from woodcut blocks having designs symbolic or illustrative on the one hand, and on the other prayers, mantras, and repetitions of divine names in Kharoshti, Brahmi and Bengali scripts for printing not on paper but on calico or silk. In 1577 Tamil script was first printed in Cochin by a Jesuit missionary Father Joannes Gonsalves, who prepared the types[2] in Tamil for the first time and since then Tamil printing has been growing steadily till to-day.

A Bengali grammar as also a Bengali-Portuguese vocabulary, both in the Roman script, had been prepared by a Portuguese missionary Father Manoel da Assumpcum in 1734, and printed in 1743 at Lisbon. A facsimile reprint of that grammar in the "Original Portuguese with Bengali translation and selection from his Bengali-Portuguese vocabulary" was published in 1931 by the Calcutta University under the joint editorship of Prof. S. K. Chatterji and Prof. P. Sen.

The first regular Bengali book in the Bengali script is at Hugli. Sir Charles Wilkins[3] had prepared a set of Bengali punches with his own hands[4] for founding Bengali lead-types. He is therefore virtually the founder of modern Bengali

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[2] *Linguistic survey of India*, Vol. IV, p. 310.

[3] Sir Charles Wilkins as one of the earliest Sanskritist-Indologists was co-worker with Sir William Jones in founding the Asiatic (now Royal Asiatic) Society of Bengal.

[4] Sen (Dr. D. C.) *History of Bengali language and literature* Cal. 1911, pp. 848; 848-849.

printing.[5] Sir Charles had especially trained a local artisan Panchanan Karmakar for this handicraft. On his retirement from India this Panchanan Karmakar was engaged by Dr. William Carey of the missionaries of Sarampur and typefounding as a trade has been going on in Bengal since then.

"Through the labours of Panchanan Karmakar and his relative and colleague Manohar the art of punch-cutting became domesticated in India." Dr. D. C. Sen also quotes from the *History of Sri Rampur mission,* Vol. I, p. 179, to show that to Panchanan's assistant, Manohar Karmakar, who served the Srirampur Press for forty years "Bengal is indebted for the various beautiful founts of the Bengali, Nagari, Persian, Arabic and other characters which have been introduced into the different printing establishments."[6]

Before 1778 we have only specimen illustrations of the Bengali script in two or three books in European languages.

(1) In 1725 George Jacob Kehr had his Latin book on oriental numismatics, dwelling on Aurangzeb's[7] mints for silver and other coins at Delhi or Jehanabad. It was published from Leipzig, Germany. On page 48 of this book the numerals are shown in the Bengali script, and elsewhere a plate (opposite page 51) consists of the Bengali consonants, with an example of the transliterated form of a German name, Sergeant Wolfgang Meyer. The British Museum in London has a copy of this book.

(2) In 1748 Johann Friedrich Fritz published from Leipzig his German work entitled *Orientalischer und occidenttalischer Sprachmeister.* In this book the illustration of the Bengali consonants was reproduced from G. J. Kehr's Latin work.

(3) In 1743 from Leyden (Holland) was published David Mill's work in Latin *Dissertatio selecta* in which we

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[5] Dr. D. C. Sen however maintains that the art of printing in a crude form was known in Bengal before Charles Wilkins came to the field. "We have come across a manuscript two-hundred years old which was printed from engraved wooden blocks. But the art was not in general use." *History of Bengali language and literature,* p. 849.

[6] P. 852.

[7] 'Aurenk Szeb' and 'Dshihananabad' in original.

find illustrations of finely drawn Bengali and Devanagari scripts.

The first illustrative reproduction of Devanagari script was however found as early as in 1667 in Athenasius Kirchar's *China illustrata* published from Amsterdam, in 1667. Printing from movable types in Devanagari and Kaethi scripts is however found[8] in 1761, being seventeen years before we get Halhed's *Grammar of the Bengali language* (1778) and one hundred eighty-four years after we had the first Tamil print in Malabar as we have seen.

It will be worth while to note that Father Assumpcam's Bengali grammar and Bengali-Portuguese vocabulary were written by him while at Bhawal in the district of Decca. The small town of Bhawal was in those days a great centre of Portuguese Christian missionaries. It is also known that Father Assumpcam was also the translator of a Portuguese work into Bengali under the title *Crepar Xaxtrer Orthbed* an incomplete copy of which is in the library of the Asiatic Society of Bengal, and a second copy is found in the Public Library at Avora in Portugal. Assumpcam was also intimately connected with another early Bengali work in the form of a Christian dialogue by a Bengali convert who had adopted the name Dom Antonio de Rozario. The manuscript of this latter is found in the Avora library. Evidently he had taken the manuscript to his own country either for printing or for other reasons.

[8] Cassiano Beligatti's *Alphabetum Brahmanicum seu Indostanum Universitatis Kasi Ramae*, 1761. (*Linguistic survey of India*, Vol. IX, Part I, pp. 4, 9-10.)

THE AESTHETICS OF THE PRINTED PAGE

BY

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THE printed page is the medium by which the reader gets into communion with the thoughts of the author. The medium is a means to an end; its duty is done when it has interpreted the thoughts and feelings of which it is but a symbol. Like all things which are merely means to achieve certain ends, most people are content to look at the printed page from a strictly utilitarian point of view. Provided it is readable, that is all they are interested in. But there are others who are not only anxious to read and understand, but are very particular that this process of reading should be a source of pleasure to the eye and to the mind, while it instructs and educates. They understand rightly that noble thoughts clothed and presented in shabby print is like choice dishes served in dirty plates by unclean hands. This article is not addressed to these discriminating people but to the large number of people in this country who buy and read books but have not cultivated their tastes to the extent of looking at a printed page, not only for the purpose of education, but also to derive pleasure by admiring the beauty that a well-printed page presents.

The principal factors that make for beauty in a printed book are the following:

(*a*) the shape of the page;

(*b*) the proportion of the margins round the type matter;

(*c*) the size of type with respect to the size of the page;

(*d*) the space between successive lines;
(*e*) the paper that is used;
(*f*) the design of the type; and
(*g*) the neatness of printing.

(*a*) *The shape of the page.*—Most books are longer from top to bottom than along the width. This is because the eye is pleased more by a rectangular shape than by a square. But the difference between the depth and width should not be very great either; then also, the eye is dissatisfied. A proportion of three to four between width and depth gives a most pleasing appearance. This proportion is found in the size known as a crown quarto which is 7½ in. × 10 in. But this size is used principally only for expensive editions. For the ordinary classes of work, the two octavo sizes, demy octavo and crown octavo are more commonly used. Demy octavo has a proportion of three to five and crown octavo three to four-and-a-half neither of which has an unattractive shape.

(*b*) *The proportion of margins round the type matter.*—The type matter differs in colour tone from the surrounding paper; and the type matter should be set on the background of paper in the same manner as setting a photograph in a mount. One does not feel happy to see a large photograph mounted with narrow margins all round; nor does one like to have the photograph centred on the mount. The same thing applies to a printed page. Firstly, the shape of the printed matter should harmonize with the shape of the page, and more or less in the same proportion, though not necessarily exactly so. The margins all round should be ample in the case of large sizes such as quartos, and in like proportion in the case of octavos. In all cases there should be enough to allow the type matter to stand out in a pleasing manner against the white paper as a background. Secondly, these margins should not be equal all round, nor even should the margins on either side along the width or at the top and bottom along the depth be equal. This rule is not often observed, with the result that the printed page is most unpleasing to the eye. It is not sufficiently well realized that the margins form one of the most important factors that go to beautify print. A page crowded with type is like a room filled with furniture. Furniture can be

a source of great beauty to the room, provided the pieces are chosen tastefully and arranged neatly, and if their size and number are made to suit the size of the room. Space is an integral part of the design, and should be given its due place in any artistic arrangement. Having got the necessary margins, they should be arranged *unequally* all round. Printers call the four sides surrounding the type matter thus, the side close to the stitching as back, the top part as the head, the outside of the page away from the stitching as the foredge, and the bottom of the book as the tail. The margins should be so allocated that there is least in the back, more at the head, still more at the foredge, and the most at the tail. The proportion in which these are allocated, is a matter on which all are not agreed. Tastes differ considerably in this respect. Some of the proportions commonly advocated are, in the order of back, head, foredge and tail, as follows: (*a*) 1 : 1 : 1½ : 1¾; (*b*) 1: 1¼ : 1½: 2; and (*c*) 1: 1¼: 1½: 2½. The famous artist, poet and printer William Morris used for some of the famous books *printed by him at the Kelmscott Press*, rather narrow back and head, fairly broad foredge, and a very considerable tail margin. Between this extreme and the modest margins in which the margins are but 1/6 in. more progressively as one proceeds from the back to the tail, there is room for considerable freedom to choose the extent of the margins and the proportion in which they are arranged, to suit different tastes.

What I myself do, is to take the open pair of blank pages, cut two rectangular pieces out of an old print, of the shape that appears to harmonize well with the shape of the book, and also sufficiently small to allow a liberal margin, and then to move these two pieces on the pages on either side, till their positions give the most pleasing appearance. They are then pushed in position. The margins are then measured out from the position of these pieces on the page. I think this is much the most satisfactory way, provided one has trained one's eye to view the page from an aesthetic point of view.

(*c*) *The size of type with respect to the size of the page.*—Good taste requires that large type should be used for large books and small type for small books. Even so,

it is often not easy to find out what size of type will harmonize best with any particular size of book. Printers have types varying in size between each other by about 1/72 in. and, at a glance, the difference between two very near sizes is not easily apparent to the layman. Yet one size may be right and the other may not be for any particular book. As a general rule, however, quartos should not be printed in type below 1/6 in. and not above 7/36 in. in depth, known among printers as 12 point and 14 point types respectively. 12 point type will be too large for octavos. A royal octavo 10 in. × 6¼ in. may be printed in 11 point type (11/72 in.) and demy octavo and crown octavo in 10 point (5/36 in.) type. Types below 10 point and above 14 point are distressing to the eye, if in large masses, and should not be used for books, if possible.

(*d*) *The space between successive lines.*—William Morris preferred to have lines following each other closely with little or no space between successive lines. But in this, he had few supporters even in his time. Though every one acknowledges Morris as the greatest modern aesthete of printed books, one finds it impossible to share his liking for lines closely packed together. The general feeling in this matter is that the lines should be spaced whenever the margins are large —and the longer the margins, the greater the space between lines; but it should not ordinarily exceed 1/18 in.; 1/36 in., however, is the most pleasing spacing for a large octavo or crown quarto. Too much line spacing will produce a certain lack of cohesiveness, which is as unpleasing, if not more so, as lines set close up. Also, the larger the type used, the greater the space required between the lines.

(*e*) *The paper that is used.*—From an aesthetic point of view this is very important. However much all the other factors are arranged artistically, if the paper used is unsuitable, the whole effect is ruined. Papers that are unsuitable aesthetically are, those with a dirty or imperfectly bleached surface; thin paper which allows print to show through; flimsy and transparent paper; those that have a highly smooth polish which causes light to be reflected therefrom; and finally, those with an exceedingly pure white surface, which dazzles the eye with its acute contrast with the black type matter. Papers that are considered to be the most

pleasing by book-lovers, are, soft, fairly thick, all-rag (that is, cotton, preferably old cotton rags) paper, creamy toned, with a rough surface (called in the trade, antique finish), which is either ribbed (called "laid") or not ribbed (called "wove"). If one can afford the luxury of hand-made paper, then that is the ideal paper to use. But imitation hand-made paper complete with deckle edges are now available, which are within the means of most people who cannot afford the real stuff. The very fastidious book-lover prefers to have untrimmed edges, and he likes to cut the folds (called bolts) at the head and side himself. With the wavy deckle edges, and the roughness caused by cutting the bolts with a paper knife, the edges are rough and uneven. There is undoubtedly beauty in this rugged irregularity at the edges, though they are notoriously bad traps for dust. From a utilitarian point of view, deckle edges and uncut bolts, should be discouraged, and aestheticism in this respect is gradually giving way to utilitarianism. However, I personally would put up with dust-laden edges than see an otherwise beautiful book spoilt by the trimming machine.

(*f*) *The design of the type.*—This is a subject about which the layman, even the aesthetic one, looks to the printer for guidance. The subtle differences between one type design and another escape the notice of the ordinary buyer of books. But that does not mean that he does not notice the difference between one design and another, when the types are assembled together in pages. He is able to see that, in some subtle way, one is different from another. Types have firstly to suit in their design, the surface of the paper, and secondly, the subject of the book. Generally speaking, a type with fine lines will not print to advantage on paper of rough or antique finish; smooth paper is best for that sort of type. As we have decided that paper of antique finish is the most pleasing in appearance for good books, the type that will go best with this paper is one in which the thick and thin lines do not vary very greatly in thickness and which has graceful rounded curves. Some of the well-known type faces which are greatly liked by book-lovers are Garamond, Caslon, Goudy and Baskerville, all named after the artists who designed and cut these type faces which are marvels of beauty, grace and legibility.

These are, however, considered too artistic for books of serious study. For the latter, types of more severe shape and design, with sharp differences between the thick and the thin lines and free from embellishments of any kind, are more favoured. Of these, Bodoni also named after the artist, who designed it, is the most pleasing in appearance. But these lose their effectiveness and neatness—on which qualities greater stress is placed in the case of serious books rather than on their beauty and gracefulness—when printed on rough paper. They require a smoothly finished paper in order to appear to the best advantage.

(*g*) *The neatness of printing.*—We have placed this as the last factor which contributes to the beauty of the printed page. But it is also by far the most important. It is like securing all the necessary ingredients for a highly delicious dish, but whether it is going to be delicious, or uneatable, depends entirely on how they are cooked. Much can be done by a good cook with bad or insufficient ingredients, but no quality will make up for bad cooking. This is equally true in the case of books.

How often one sees books in which type, paper and margins are all correct, but the lines are not straight and therefore the margins are askew or the trimming is faulty with the same result; some letters do not print legibly; certain portions of the page are darker or lighter than others; some pages are very dark and others very light, there is a lack of uniformity of colour; the types are pressed very hard into the paper and the letters appear to stand out in relief, causing the most acute distress to the eye; the ink not being dry has set off by pressure; and, finally smears here and there.

These are quite inexcusable, and every buyer of books has a right to demand that his books shall be well and neatly printed, so that he may appreciate in full the great beauty that resides in a printed page.

EVOLUTION OF THE PRELIMINARY PAGES OF A PRINTED BOOK

BY

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To THE bibliographer and the cataloguer the title-page is a vital constituent of a book. To the former, it is an essential part of the very personality of the book—as essential as the face of the man. To the cataloguer its importance is due to the Canon of Ascertainability.[1] The heading of the main entry of a book in a library catalogue is, according to this Canon, largely, if not solely dependent on the title-page. Hence the elaborate notes published in the *A. A. code*,[2] for determining the title-page, especially when it is more than one in number and for reconstructing it, if it be absent. In spite of the title-page having so much importance in modern library practice, its origin did not synchronise with the printed book.

It is proposed to examine in this paper the evolution of the preliminary pages of a printed book, the title-page no doubt forming their focal point. The title-page seems to have been also the nucleal part of the preliminary pages which first made its appearance, naturally containing within

[1] Ranganathan (S.R.). *Theory of library catalogue.* (Madras Library Association, publication series, 7). Pp. 62-67.
[2] *Ibid.*, Pp. 44-45.

itself most of the other pages constituting the preliminary pages, in a potential form.

Pre-natal Stage

Perhaps it may be well to begin even by referring to what may be called the pre-natal stage of the title-page. To get an idea of it we should examine the pre-natal state of the book itself, in other words manuscript book.

For it is a matter of common knowledge that the printed books of the incunabula class closely imitated the manuscript in the form to which they had evolved at the time of Gutenberg. These manuscripts did not even possess a title-page—still less the preliminary pages. Some of the barest of information we are accustomed to look for in a title-page and the neighbouring pages was given at the end of the manuscript. Indeed the portion giving this information had a special name of its own, *viz.*, Colophon. In fact 'colophon' is defined in the *New English Dictionary* as "The inscription or device, sometimes pictorial or emblematic, formerly placed at the end of a book or manuscript, and containing the title, the scribe's or printer's name, date and place of printing, etc. . . . In early times the colophon gave information now given on the title-page".

For instance, Jacob de Voraigne's *Golden legend*[3] printed by William Caxton has the following colophon. The book contains 448 leaves with head lines and foliation. The matter is printed in two columns in each page, each column being made up of 55 lines. The colophon reads:

> 1 *blank.* 2[a] [*wood cut*] 448[b]. *Col.* 2: Thus endeth the legende named | in lateyn legenda aurea | that is to saye | in englysshe the golden legende | For | lyke as golde passeth in valewe alle | other metals | so thys legende excedeth | alle other books | wherein bencontey= | ned alle the hygh and grete festys of | our lord | the festys of | our blessyd 1a | dy the lyues passyons and myracles | of many other sayntes | and other hys | toryes and actes | as al alonge here |

[3] Duff (E. Gordon). *Fifteenth century English books.* (Illustrated monographs of the Bibliographical Society, 18). 1917, Item 409.

afore is made mencyon | whyche werke | I haue accomplished at the commau== | demente and requeste of the noble and | puyssaunte erle | and my specyal good | lord wyllyam erle of arondel [and] haue | fynysshed it at westmestre the twenty | day of nouembre | the yere of our lord | M | CCCC | lxxxiij | [and] the fyrst yere | of the reygne of kyng Rychard the | thryd | | | By me Wylyam Caxton.

This is what we have referred to as the pre-natal stage of the title-page and the preliminary pages. For under the imitative influence of the manuscripts some of the earliest printed books did thus give, a fully worked out colophon featured prominently and resisting the appearance of the title-page which would throw its importance to the shade.

Incipient Stage

After labouring in this pre-natal stage for about a quarter of a century the title-page in the front had its small beginning. It was indeed as puny as a new-born. Though a separate page was devoted to it, it was rendered similar to the half title-page of our days. It did not however remain long in this puny form. For, even the third quarter of the fifteenth century witnessed the printing of a book which had the title-page expanded to a more respectable dimension, almost suggestive of the modern title-page.

New Born

In 1470, Arnold ther Hœrnen at Colougne printed a long paragraph, on an otherwise blank page, giving the title of the book *Sermo ad populum predicabilus in festo presentacionis Beatissime Marine Semper Virginis.* Besides such a long title, the title-page contained also some eulogistic remarks regarding the book. The year of publication was also given. As a matter of fact, this book is said to be unique in the respect of transferring bodily the information contained in the colophon to a page at the beginning of the book.

Another improvement was made in the display of the legends in the title-page in the Italian edition of the *Calendar* of Regimontanus printed in 1476 by Erhardt Ratdolt. Here the title-page was elaborated further by the insertion of the

imprint near its tail margin. Thus, even in the early sixteenth century we have the prototype of the modern title-page. But these were isolated examples. It was only about the middle of the sixteenth century that the practice came virtually into universal vogue.

Godfather

In those days it was the printer rather than the author that was the godfather of the title-page. This led naturally to the dominance of his interests in the legends that were allowed to appear in it and the way in which they were rendered. For instance, the title appended to an edition of the life of Sir Philip Sidney by Sir Fulke Greville published in 1652 may be cited. The following is a transcript of the title-page in question:

> The *life* | of the Renowned | Sr Philip Sidney with | The true Interest of *England* | as it then stood in relation to all For- | rain Princes: And particularly for sup | pressing the power of *Spain* Stated by Him. | His principall Actions, Counsel, | Designes, and Death. | Together with a short Account of | the Maximes and Policies used by Queen | *Elizabeth* in her Government. | Written by Sir Fulke Grevil | Knight, Lord Brook, a servant to Queen | *Elizabeth,* and his companion and friend. | London, printed for *Henry Seile* over | against st. | *Dunstants* Church in Fleet Street. | MDCLII.

It is observed by an editor of a later edition of this work that it was "First published in 1652, twenty-four years after its author's death and the title 'The life of the renowned Sir Philip Sydney' (with other matters . . . ,) was given to it presumably by the unknown P.B., the editor, certainly not by Greville himself. In a manuscript copy of the work . . . the title is simply 'a Dedication'.[4]

Here is the opinion of an Elizabethan critic on the matter of godfathership of the titles which corroborates the above statement. The critic says that "On the title-pages of the

[4] Greville (Fulke). *Life of Sir Philip Sidney* (Tudor and Stuart library), 1907, P. v.

old editions of the separate plays designations are used which appear to have been chosen at random by someone other than the author".[5]

These statements lead us to guess that the title-page was the creation of the publisher or someone else connected with the book and not the author. Taking advantage of this fact the publishers tried to make use of the title-page for advertisement. As a natural consequence of this, much of the contents of the book began to appear on the title-page itself. Here are a transcript of the title-page of such a work and that of the title-page and the contents pages of the same work printed at a later date:

> The | Rare and most wonderful | thinges which Edward Webbe | an Englishman borne, hath seene and passed | in his troublesome trauailes, in the cities of Jeru- | salem, Dammasko, Bethelem and Galely: and | in the Landes of Jewrie, Egipt, Grecia, | Russia, and in the land of Prestor John, | Wherein is set foorth his extreame flauerie sust | ained many years together, in the Gallies and wars | of the Great Turk against the Landes of Persia, | Tartaria, Spaine, and Portugall, with the | manner of his releasement and comming | into Englande in May last. | London, | printed by Ralph Bolwer for Thomas Passier, and | are to be solde at his shop in Cornhill, at the signe of the Cat and | Parrats over against Popeshead alley, near the Royal Exchange.

This is the title page of the work printed in 1590.

Here is the transcript of the 1902 edition of the same work included in the Arber's *English reprints*.

> English reprints | Edward Webbe | Chiefe Master Gunner | His trauailes | 1590 | edited by Edward Arber | F.S.A., etc., late examiner in English | Language and literature | to the university of | London | Westminster | A. Constable & Co., Ltd., 1902.

The verso of this title-page is made use of as the contents

[5] Creizenach (Wilhelm). *The English drama in the age of Shakespeare, tr. from Geschicte des neueren Dramas*, 1916, p. 236.

page. Here is the transcript of a portion of the same:

EDWARD WEBBE'S TRAVELS.

It would be observed that much of the contents of the 1590 title page find a place here. Further the contents page itself serves as a sort of an index to the book.

The Family of Preliminary Pages

The widespread patronage of authors by Royalties and noblemen in the Elizabethan days led to the transfer of the dedicatory part of the legend on the title-page to a separate

preliminary sheet and the transfer of the contents to another preliminary sheet. This was perhaps the next move in book building. At about the same time the author was given a share of the preliminary pages, to introduce the work briefly to the reader. In fact what we now call the preface was then entitled 'To the reader'. Thus by the middle of the eighteenth century the title-page became simpler as a result of its having shared its original contents with a family of preliminary pages. Besides the title, the title-page contained only the name of the author, publisher, the imprint and sometimes the publisher's device.

Now the author was given the privilege of occupying more of the title-page itself. This was used to indicate his qualifications, profession and status in life. About the beginning of the nineteenth century it became common for the author to use his region of the title-page for mentioning his other works. Naturally this was not objected to by the publisher if he himself had published these works; even otherwise the description of the author as having brought out so many books was not without its advertisement value for the publisher.

This again naturally crowded the title-page too much. This additional matter on the title-page was slowly transferred to an additional preliminary sheet—the half title-page—which began to appear in the latter half of the nineteenth century. Similar to the present practice the list of the other works of the author found a place on the back of the half title-page. This page is in the alternative used to mention the different books of the series, if any, to which the book in question may belong.

Another tendency in adding to the family of preliminary pages is occasionally perceptible. Generally the preface contains also the acknowledgment of the author. But in some publications, as in those of the Madras Library Association publication series, the acknowledgment is separated from the preface and is given an independent status and an exclusive page. This is not the only possible addition to the preliminary pages. Foreword by a distinguished personage and the general preface to the series, if any, to which a book may belong often get some pages in the preliminary forme.

Beyond the Family

In our own days some further developments are taking place. The developments are not without relation to some peculiarities found in the early forms of title-pages. A reference to the transcript of the title-page of Edward Webb's *Travels* given already will show that it contained an estimate of the book. During the years when the title-page was progressively simplified by the transfer of some of its contents to different preliminary pages, the estimate part of its contents was left out. It was not only ejected from the title-page but was denied a place even in the family of preliminary pages. This wrong done to it is now-a-days sought to be redressed by allowing it a place at least outside the family of preliminary pages. That place is the flap of the jacket or the dust cover of a book which came into existence just at the beginning of this century. No doubt the dust jacket is not an organic part of the book and hence short-lived. Even a transient something is better than nothing and a compensation is that when a book is fresh, it is the habit of the modern reader to peruse the flap of the jacket first.

This in short is the ontogenesis of the preliminary pages of a book in the European countries.

Tamil Books

When one turns to Tamil books it is difficult to collect the necessary material for a similar study. However, the Printing Exhibition held under the auspices of the Madras Library Association celebrating the Fifth Centenary of the Invention of Printing afforded an opportunity to examine some early printed books. The oldest Tamil book exhibited was one printed in 1726. There were twenty other books whose dates of publication ranged between 1726 and 1811. In his day to day work the writer has had an opportunity of handling many Tamil books printed between 1850 and the present day. With this experience a mere outline of the history of the title-page is attempted.

Conflict of Languages

Probably, the earliest Tamil books had their title-pages in Latin, English or some other language. The first Tamil

work printed in 1578 bears the following title:

"O Flos sanctorum, a doutrina christæ hu copios Confessionaris and outras livros."

Copies of this do not appear to be available. It was again printed in 1579. No copy even of this is now available in India. However, through the courtesy of the Rev. Father Vice-Principal of the Sacred Heart College, Shembaganur, Madura District, the Secretary of the Madras Library Association was able to get a photograph of the title-page and the colophon of the only copy now extant in the National Library at Paris. These are reproduced in the adjacent plates.

Here is another example

"Vocabulario Tamulico coma dignificacao Portugueza comp-de Jesu, Mission de Madure."

This work was probably printed in 1647.[6]

Then came the bilingual title-pages. At the next stage of evolution, the title-pages were rendered into more than one language, of course one of the languages used being Tamil. The rendering in the two languages appeared either on the same page or in adjacent pages. Here is an example of a title-page rendered in Tamil and another language in adjacent pages.

IOANNIS ARNDTII

Sacrorum Per Principitavum Lune- | Burgensem olim Antistitis, | de | Vero Christianism. | Liber primus.

Ex germanico in Tamilicum | Convertit | Beniamin Schulzivs, | Missionarius Evanzelicus | (Design) | Halæ Magdeburgicæ | 1751

The following is the transcript of the Tamil title-page

உணமையுளள | கிறீஷ்துதி யாததினுடைய | மகிமையை | தெளிவாக காணபிகிற | ஞானகணணடி | அதினுடைய முதலாம பொஷ்தகதிலே | அடஙகியிருகிற சூஉ-அதி காரஙகள.

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[6] BURNELL (A.C.). *Elements of South Indian paleography.* Edn. 2. 1878. P. 44 note. *The Indian antiquary.* V. 2. 1873. Pp. 180-181.

கிறீஷ்தது பிறந்து நூளாறுக வருஷமாகிற பொதுச்ச சொன்மேலேயிருக்கும ஆல்ல | எங்கிறபடடணதிலே | யிது அசிலே பதிகபடடது |

Or as in the following case, on one and the same page we may find the rendering of the legends in two languages:

தமிழும இங்கலேசுமாயிருகிற | அகராதி |
A | Malabar and English | dictionary, | wherein the words and phrases | of the Tamulian language, commonly called | by Europeans the Malabar Language, | are explained in English | By the English Missionaries of Madras. | Printed at Wepery near Madras in the year 1779. |

This amphibian stage appears to have been common in the case of many translations before 1800.

Again most of the Tamil books published before the nineteenth century were religious tracts published by missionaries and their title-pages contained many puffs. Here is an illustration

மனுஷச சாதி இரடசிகபடுவதறகாக | சறுவலோக தயாபரரான கறதா | அருளிச செயத | சதியவேதம | பழைய உடனபிடிகைகயின | மூனறும பங்கு | இதிலே அடங்கியிருகிறது | ஞானசங்கிதங்களுகு, சாலோமோனின | வாகியங்களும், பிறசங்கியின | பொஸ்தகமும, சாலோமோனின | பாட்டு ஈதானே | முநினதிலதிருதத லான இரணடாம பதிதல.

இது கிறிஸ்தது பிறந்த | ஆயிரததேழு நூறறு தொண ணுதேராம | வருஷம | தரங்கனபாடியிலே | மிசியோன அசங்க கூடதில பதிகபடடது.

Meanwhile, it has to be stated that a single press came to wield a great influence on Tamil printing. It was the press made over by the Government of Madras in 1761 to the Vepery Mission. From that year to this day it has been active except between 1810-1819 and 1861-1866[7]. Tarde's[8] laws of imitation seem to have set in and several presses were established in emulation of this press. But many of

[7] *The Indian antiquary.* V. 2. 1873. P. 181.
[8] Tarde (Gabriel). *Laws of imitation.* 1903.

these indigenous presses which had neither a tradition nor a standard to follow, simply drifted in regard to the art of book-building particularly the title-page. At the one extreme many books appeared without title-pages and at the other extreme we had hold-all title-page similar to that of Edward Webb's travels, a transcript of which is already given.

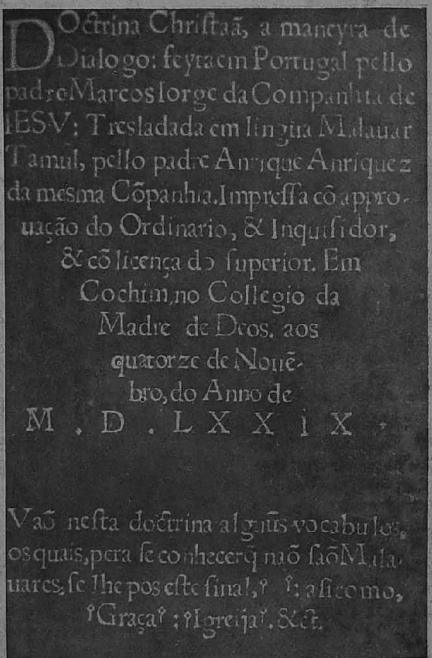
Here is an example illustrating the point:

—| ஸ்ரீராம ஜெயம் | இராம நாடகமென்று | வழங்கு கின்ற | குசலவ நாடகம் |—| இதனுள் ஸ்ரீராமர் அசுவமேத் தல்—சீதை பிரிதல் | வால்மீகராசிரமத்திற் பிள்ளை பெறல் | லவன்—குசலன்—உயுத்தம்—அஸ்வமேத யாகம் | குசலவ னுக்குத் திருக்கல்யாணமும், இளவரசு பட்ட | மும் அடங்கி யிருக்கின்றன. | இஃது | திருவண்ணாமலை | வேங்கடாசல முதலியார் | அவர்களால் | பரிசோதித்த பிரதிஷ்டணங்க | கோகுலாபுரம் அருணாசல முதலியாரால் | பார்வையிடப் பட்டு | சேலம் | சுப்பராய பிள்ளை அவர்களால் | கொண் ணூர் | மாணிக்க முதலியார் | கம்பெனியாரவர்களது மனேன்மணி விலாச அச்சுக்கூட்டத்திற் பதிப்பிக்கப்பட் டது |— | ஈஸ்வர—வைகாசி | [Block] | ரிஜிஸ்தர் காப்பி ரைட் | ஐந்தாம் பதிப்பு—காப்பி 1000.

In the case of the above title-page it may be noted that the author's name is conspicuous by its absence.

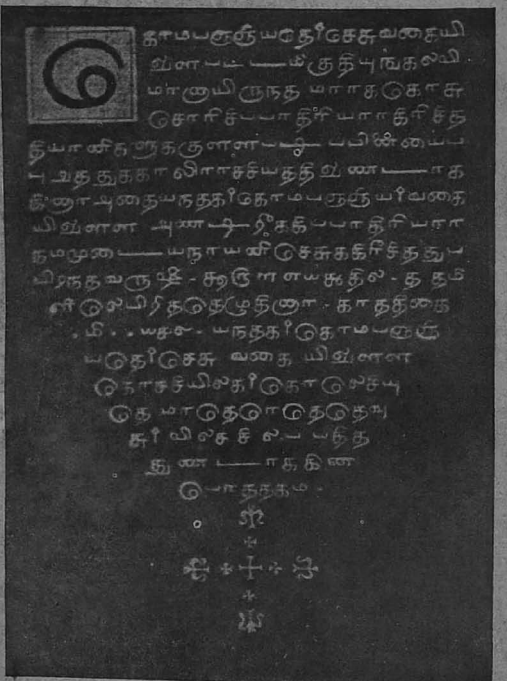
This involved and unbalanced state of the legends in the title-page might be traceable to the inexperience of the printers in the art of book-building. Also, not infrequently one meets with title-pages wherein the author's name is altogether hidden away in small type whereas the name of the patron or some other influential person is rendered in display type.

But from the beginning of this century a change is noticeable. It is perhaps due partially to the influence of western methods of book-building on the authors. For now-a-days the author himself plays the part of the publisher and hence has much freedom in the matter of designing the title-page of his work. For example the later works of Mahamahopadyaya Dr. V. Swaminatha Iyer show the way in simplicity and directness in the matter of the pieces of information on the title-page. It would add to the convenience of both the public and the librarians if the publishers conform to an


DOctrina Christaã, a maneyra de Dialogo: feyta em Portugal pello padre Marcos Iorge da Companhia de IESV: Tresladada em lingua Malauar Tamul, pello padre Anrique Anriquez da mesma Cõpanhia. Impressa cõ approuação do Ordinario, & Inquisidor, & cõ licença do superior. Em Cochim, no Collegio da Madre de Deos. aos quatorze de Nouẽbro, do Anno de M . D . L X X I X .

Vaõ nesta doctrina alguũs vocabulos, os quais, pera se conhecerẽ q̃ naõ saõ Malauares, se lhe pos este final, ? ; a saber mo, ?Graça? ; ?Igreja?, &c.

Title page of the
First printed Tamil book extant



Colophon of the
First printed Tamil book extant

accepted standard in this matter. A standard might be set up on the following lines.

The preliminary pages should be made up of one or more formes and should consist of the following in order;

1. Half title-page and its verso,
2. Title-page and its verso,
3. Dedication, if any, and its verso,
4. Acknowledgment and its verso,
5. Preface,
6. Contents,
7. Foreword, if any,
8. Introduction, and
9. Other matters such as a key to references in the text, errata, etc.

As a sort of experiment which is applicable to English books as well as Tamil books, the volumes of the publication series of the Madras Library Association have been consistently following the above standard. The verso of the half title-page may be used to indicate the series, if any, to which the book may belong and other volumes belonging to it. In the alternative it may give a list of the works of the author. The title-page should not contain anything but the title, the name of the author and his collaborators, if any, specification of the edition, if it is not the first one, the name of the publisher and the place and year of publication. The year of publication may in the alternative be given in the verso of the title-page, the verso may also contain the years of earlier editions. It may be emphasised here that in no case should the year of publication be omitted both from the recto and verso of the title-page.

In the case of Tamil books there is another possibility which should be avoided. If the year is mentioned in any era other than the Christian, the name of the era should be given. Also it is by no means sufficient to mention the name of the year in the sixty years cycle, Prabhava, Vibhava, etc. Printing has been in vogue in the Tamil country for many such cycles and for aught we know, it will be continued through many such future cycles.

PRINTING OF PICTURES

BY

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THE purpose of this article is to give the layman an idea of the various processes employed by the printer to reproduce pictures of different kinds.

There are three main processes in common use, depending upon the nature of the surface from which prints are taken. The surface which takes the ink may be above the rest of the surface which by being low does not take ink—this is known as the Relief Process. The surface that takes the ink may be below the rest of the surface—this is known as the Intaglio Process. And, finally, the surface that takes the ink may be at the same level as the rest of the surface—this is called Planography.

But, whatever the process used, all designs or pictures are made in lines, dots, flat tints and tints of varying intensity and all forms and values of light and shade are expressed in the arrangement and gradation of these elements. We will take them one after the other.

The Relief Process

This is the simplest of the three processes. In the olden days the surface on which the picture was engraved was wood, usually boxwood. The picture is first transferred to a smooth level piece of wood, in reverse, and then the wood is cut away in the places which are not to print. A roller charged with ink passed horizontally over the surface of the plate will rest only on those lines and dots representing the design which is in relief. The roller cannot touch the

remainder of the plate which is depressed below the surface of the line and dot. After inking, a sheet of paper is laid over the block and pressure is applied to the back of the sheet by pressing with a suitable tool or by a flat metal surface or the rotating cylinder of a printing press. On lifting the sheet, the paper bears an impression of the design which is raised in relief. Hence the name, relief plate or block.

A relief plate must have sufficient depth in the portions below the surface so that the inking roller cannot touch the depressed parts; and each line or dot must have sufficient space between it and the nearest line or dot to prevent the shallow intervening engraved space filling up with ink from the roller. It will be obvious that the quantity of ink used can be but slight, because being on the *surface*, if any considerable body of this soft, yielding substance is applied, it will be squeezed out by the great pressure required in printing and driven from the relief portions it covers, into the depressed portions, and the result will be an impression lacking in clearness and decision. As the ink is applied to the entire surface of the block it necessarily is of even thickness over the entire printing portion. In addition, the fine dots and lines required to represent the high lights, that is, bright parts of the picture, should not be so fine as to get damaged by the pressure of printing. This places a certain limit to the fineness possible in practice. The defects of the relief process are, therefore, a lack of intense depth in the shadows (on account of the necessity to apply only a thin film of ink) and the lack of softness in the high lights (being obliged to maintain a certain size of line and dot, even in the brightest parts of the picture).

Relief-block-making was at first used for simple designs of various kinds, usually in heavy black lines on white ground and from these simple forms of expression it has finally developed until at the present time, by the process of engraving the lines and dots photographically instead of by hand, some of the most important works in beautifully graded tones, such as the paintings of great masters, are reproduced by this method. There can be no doubt that the process can portray in a most satisfactory manner any design or drawing in lines, subject to the limitation that the

lines shall not be so fine as to break down under the pressure of the press or so close together that the ink will spread into the engraved spaces between them. Relief printing can only imitate the continuous tones seen in a photograph or a wash drawing. The subtle shading which is so frequently present in shadows must be expressed by little white dots in a black ground or by narrow white spaces between black lines. Neither of these methods will produce the unbroken modulated tones.

Relief printing, therefore, is not adapted to reproduce in an entirely satisfactory manner a drawing or painting in which the toning is an important feature of the original.

To-day there is very little hand engraving on wood or metal for making relief blocks. This is now done by photo-mechanical means. The process is slightly different depending on whether (*a*) it comprises tones of varying depth brought about by lines or tints of varying intensity of tone or (*b*) it comprises lines and dots of the same intensity of colour throughout. The former kind is reproduced by the half-tone process, and the latter, by the line process. In either case, the original should preferably be, if in monochrome (that is, one colour), in black, or purpletone sepia (if a photograph) on a white ground.

Half-tone

In the case of half-tone, a photographic negative is made by interposing between the lens and the negative a screen consisting of two plates of glass cemented together, each containing black opaque parallel lines engraved on it diagonally, very close to each other, the lines crossing at right angles in the two plates. The number of lines to an inch varies from 50 to 200. The image of the original on the sensitized plate, as a result of passing through the screen, is broken up into dots and squares, instead of the continuous unbroken tone obtained in an ordinary photograph taken without the screen. The negative after development is placed over a polished plate of copper on which a solution of potassium bichromate and fish glue has already been applied evenly and dried. This is then exposed to light. The action of light on bichromate and fish glue is to decompose the water-soluble bichromate into insoluble

chromic oxide. The negative is removed and the plate is washed, when the image broken up into dots and squares alone remains on the surface, the unaffected parts (that is, the opaque parts of the negative which correspond to the white parts of the original) being dissolved by water. The plate is then soaked in violet aniline dye, which colours each dot and makes the picture show clearly on the metal. The print is next "burnt in" or heated over a gas stove and then cooled slowly. This turns the coating into a hard acid-proof enamel. The "burnt-in" plate is now cleaned carefully with a mixture of acetic acid and salt to remove all traces of coating from between the dots. The plate is next placed in a bath of ferric chloride which eats away the unprotected copper between the dots, leaving the dots in relief; or it is placed in an electric etching machine which dissolves the exposed copper between each dot. After the preliminary etching is over it is re-etched by carefully painting over the dark portions of the picture with an acid-proof coating and then etching the rest of the dots again (this time etching sideways in addition to etching for depth) so that those in the lighter parts of the picture become smaller with more white space between them, adding greatly to the tone values of the picture. It is then mounted on a block of wood to the required height for printing, namely, .918 inch.

Line Blocks

In the case of line blocks, no screen is used. The negative is printed on a zinc plate which has been sensitized with bichromate and egg albumin. It is then rolled with a leather roller charged with stiff greasy ink. The print is washed with water, when the image alone remains (now covered with ink) while the rest of it is washed away. The zinc print is now slightly warmed and then is dusted over with a resinous powder which only sticks to the inked portions of the plate. It is then heated over a stove till the resin melts and incorporates with the ink which, when cooled, forms an acid-proof coating over all the lines in the picture. The plate is next placed in an etching bath containing dilute nitric acid which eats away the unprotected portions of the zinc-plate. The etching is periodically interrupted to give

the plate additional dusting of resin, so that when melted it will flow over the side, thus protecting the sides of the lines in the picture from being eaten away by the acid. The etching is continued till the plate is etched to a fair depth. Large open spaces are removed afterwards on a routing machine. The plate is mounted to ·918 inch, which is the printing height.

Coloured Pictures

For reproducing coloured paintings in oil colours or water colours, half-tone blocks are made by the trichromatic process. This process is based on the theory that every conceivable colour can be produced by suitable intermixture of the three primary colours yellow, red and blue. The original is photographed three times, one to record all the yellows contained in the picture, the second for the reds and the third for the blues. This recording is made possible by interposing in front of the lens, pieces of celluloid or glass, coloured violet for the yellow plate, green for the red plate and red for the blue plate.

Blocks are made as already described from the three negatives, and the yellow block is printed in yellow ink, the red block is then printed on top of the print already obtained in yellow, and finally the blue is printed on top of both the other colours. If the blocks had been made properly and the correct colours of inks used, and the printing done in such a fashion that the three printings fell exactly on top of each other, then the final result will be a more or less exact reproduction of the original.

Half-tone blocks made with the use of screens of 50 to 80 lines in an inch can be printed on paper of rough surface such as newspapers and ordinary book papers; but finer screens will not print satisfactorily on rough paper and they require a highly polished surface of paper, the smoothness varying in proportion to the fineness of the screen. If every detail and tone in a photograph has to be reproduced in the block, then screens of 150 and 175 lines to an inch have to be used. These require special papers such as those which have a coating of china clay on top of them and are highly polished, called art or coated papers. As these are glossy and reflect much light, it is greatly disliked as a background

for pictures, but it is a necessary evil for printing by the relief process.

The blocks are fairly expensive, and three-colour blocks beyond a certain size will be almost prohibitive in price. Therefore, apart from other considerations, for pictorial work of large size relief process is not the best suited. We have to select one of the other two processes namely Intaglio or Planography, for the larger sizes especially Planography. But of this later on.

Intaglio Process

Line Engraving

If a smooth plate of copper is taken and a line scored on the surface with a sharp instrument so that every part of the line is below the surface of the plate, then the line is said to be engraved intaglio. Supposing now we take some thick and stiff ink and apply it to the surface of the plate. The ink will fill inside the engraved line and the surplus ink remains on the surface. This surplus ink is removed with a cloth, taking care not to remove the ink contained inside the line. A sheet of moistened paper is placed over the plate and pressure is applied. The ink is drawn out of the line through the adhesion brought about by the heavy pressure and the suction of the wet sheet. The line that is printed on the paper will be of the same width as the engraved line, and the intensity of the colour of the line will depend upon the depth to which the line is engraved. The most complicated design in fine line can be engraved in like manner. All degrees of width of lines (with the limitation that no line be too wide that the ink will wipe out of it) and great variety of depth of printing lines can be made on the copper. The finest line that the human hand can engrave is the only limit to the degree of fineness of intaglio line engraving, for if the ink is of the proper quality it will fill in the merest scratch on the copper. Furthermore, the finest line will stand up under the pressure of the press and a series of such fine lines, however near together, may be printed so that each one is sharp and firm on the impression. The thick dense body of ink gives richness to the impression which gains an additional soft mellow quality from the shadows cast by the printed lines which are in perceptible

relief on the paper. The lines in the shadows may be engraved very close together, sufficiently so almost to touch one another and yet their separation can be preserved on the impression, thus enabling the engraver to obtain a luminous quality in large masses of shadows, which in relief printing would appear dull and lacking in richness. While in relief printing it is necessary to maintain the same quantity of ink all over the surface, and only the thinnest film is possible, if it is not to be squeezed out into the depressed parts, in intaglio the quantity of ink carried over the surface can be made to vary by varying the depth of the lines. The ink that is carried by the printed lines in the shadows is not a thin film as in the case of relief printing, but a thick layer, which gives the shadows a depth and velvety richness unequalled in any other process. Great smoothness of silken texture is obtained in the high lights by the tiniest scratches on the surface. This smoothness is also unobtainable by the relief process.

One can see, therefore, that intaglio line engraving is superior as a process to relief-block engraving for obtaining depth of colour and delicacy and smoothness of the lighter tones.

Very little of line hand engraving is, however, practised to-day. It requires great artistic skill, and many years of practice; and, as there are mechanical means available to-day to achieve nearly the same standard of result, no one has attempted to acquire the skill required for hand engraving. But till photo-mechanical processes displaced hand engraving some extremely beautiful work have been produced by great artists such as Foriguevia, Baccio Baldin, Boticelli and Albrecht Durer. The Italian Marc Antonio Raimondi engraved Raphael's work under his personal direction. They all found in copper and steel, an alternative medium to paper and canvas to express their artistic ideas. There were a number of celebrated Flemish engravers at the time of Rubens—some working under his direction. A great school of portrait engravers existed in France about the time of Louis XIV. Jacobus Houlnaken (1698-1780) in Holland, was renowned for his wonderful texture of flesh and hair. Many of the beautiful prints of those days are preserved as art treasures, and some of them fetch very

considerable prices at the present time. Since 1830, no line engraving of conspicuous merit has been produced. Long before photo-mechanical processes became common, there were no skilled artists who could produce engraving such as were produced at the end of the eighteenth century. Ruskin referring to the line engravers says that they themselves ruined their own craft by vulgarizing it. "Content in their beautiful mechanism, they ceased to learn and feel as artists."

Photogravure

Intaglio printing at the present time is an adaptation of the process described above by photo-mechanical means called photogravure. When the printing is done from a cylinder engraved for photogravure, the process is called rotary photogravure. Almost all pictorial work by the intaglio process is at present done by rotary photogravure. Any sort of copy such as a photograph, line, wash or a coloured picture can be successfully reproduced, though some reproduce better than others.

The engraving is done on a copper cylinder which may either be drawn copper tubes or have bases of steel and cast iron according to size. The steel sleeves and iron cylinders must have a coating of copper deposited on them, which is carried out by electro-deposition from two copper anodes while the cylinder is kept revolving. It takes several days to get a depth of coating of about an eighth of an inch. The cylinder when taken from the bath is in a very rough state, and it has to be turned in a lathe to make it perfectly round. It is ground with stones of varying degrees of hardness and finally polished. A very high finish, free from the most minute scratch is essential to the successful working of this difficult process. The cylinder is then ready for the image to be transferred and etched.

The picture is photographed in the usual way, without the use of a screen such as is used in making half-tone blocks. All high lights are made completely opaque by spotting up the negative, and it is also retouched in the other tones. A positive is taken from this negative. The shadows are spotted up in this. The positives of all the different pictures that have to be printed together on one cylinder (such as in an

illustrated magazine) are gummed in position on a large glass plate, making up a composite positive.

A thin film of gelatine, known as carbon tissue of even thickness slightly coloured with pigment and adhering to a paper backing is sensitized by drawing it through a bath of about 2% to 3% solution of ammonium bichromate. It is then dried. A piece of this film is exposed with a screen in close contact. The screen used is quite different from that used for making half-tone blocks, and is for a different purpose. The screen consists of a glass plate with transparent lines at right angles, the intervening squares being opaque. Printing the screen on the sensitive gelatine tissue ensures the cell formation on the cylinder which subsequently holds the ink, and makes possible mechanical photogravure.

The screened tissue, as it is now called after the above printing, is again printed in contact with the sheet of positives long enough for the gelatine to get hardened by light falling on it, but not so as to harden the whole thickness of the gelatine right up to the paper backing. In the shadows, which are opaque on the positive, the gelatine will be little affected, while in the high lights, the gelatine would have been hardened to an appreciable depth; the intermediate tones would be affected between these two extremes, in proportion to the depth of the tone.

After the light exposure the tissue is wetted and pressed in position on the copper cylinder. The cylinder is placed in a tank of hot water which soon dissolves that part of the gelatine directly in contact with the backing paper, and this allows the paper backing to be peeled off. The soluble gelatine is then all washed away by continual laving with the hot water, which leaves an insoluble gelatine image in relief.

The cylinder is cooled down in very cold water and afterwards dried. The exposed portion of the copper cylinder, or any portion not covered with the gelatine—resist; is carefully protected with an acid-resisting varnish; the cylinder is now ready for being etched.

The etching fluid that is used is ferric chloride which dissolves copper that is not protected by an etch-resist such as hardened gelatine. Though concentrated ferric chloride cannot attack copper which has a coating of hardened

gelatine on it, the dilute solution penetrates through the gelatine, the time taken to penetrate and reach the copper depending upon the depth to which the gelatine has been hardened. Therefore, when the cylinder is placed in a tank containing dilute ferric chloride, it penetrates quickly through the thin parts of the gelatine which correspond to the parts least affected by light, that is, the dark parts of the positive, or shadows. These parts are attacked first by the acid (that is, the etching fluid). As the etching proceeds, the acid will bite deeper and deeper into the blacks and will also begin to bite in the next lighter tone where the gelatine is hardened to a greater depth. As the process continues, the etcher gradually diminishes the strength of the acid from 40° or 42°. Baume' to 39° then to 38° and goes downward until in the lightest tones, he has weakened his acid to 35° or 34°. The darkest tones etch the longest time, the next tones somewhat less and the lightest tones but very little, and not only has the grading in the time of biting from blacks to lights preserved the modelling, but the etcher has continually weakened his acid, so that all the tones lighter than the extreme black have been bitten in weaker and weaker acid, as they graded from dark to light, and hence are etched shallower and shallower as the acid is weakened.

The etching completed, the plate is removed from the acid, the film removed, and the plate is now ready for printing. In the printing machine, a roller which revolves in a trough of semi-fluid volatile ink, is in contact with the engraved cylinder which thereby gets flooded with this almost watery volatile ink. By suitable adjustment of a flexible steel blade which is in contact with the engraved cylinder, all the superfluous ink is wiped from the surface which drops back into the ink trough. A sheet of paper, usually fed from a reel passes between the engraved cylinder and a rubber-covered impression roller which depresses the paper into all the hollows in the engraved cylinder. Thereafter the printed paper runs over steam drums which ensures rapid drying.

The resulting print has nearly all the perfection already described for intaglio line engraving. As the screen consists of squares of the same depth of tone throughout, it is not noticeable; there is a certain amount of ink squeezed out

which combines with the ink from the adjacent tones, so that there is a blending of tones; both these qualities give photogravure prints an appearance of continuity of tones which no other process can produce. Photogravure prints, therefore, resemble the original such as a photograph or a wash drawing, closer than by any other process. This is the reason why photogravure is so much favoured for popular pictorial magazines, for reproducing portraits, landscapes and pictorial photographs generally.

The details are not so sharp as in half-tone printing, but the general effect is very much more pleasing. It is much more expensive, however, unless the number of copies is sufficiently large. After each printing, the copper cylinder has to be turned in the lathe and polished. If anything goes wrong in any one part of the cylinder (one cylinder will contain many pictures), the whole work has to be done again. However, successful work has been done recently with thin, flexible sheets of copper which are clamped round a cylinder.

For work in many colours, the three colour process already described under relief printing applies also to photogravure. Three cylinders are engraved for printing from yellow, red and blue, and sometimes a fourth cylinder for printing from black, if there are much greys and shadows in the picture. They are printed in superimposition in the same way as for half-tone printing. Results are extremely pleasing, and often much more so than by relief printing, but it is not always as faithful in reproduction as by the latter process, largely because relief printing offers better scope for retouching and for greater control of every stage through which the work has to pass through.

Planography

Lithography—Direct

This is a process which is very widely used for pictorial work. I think it will be correct to say that nearly all large pictorial work is done by this method.

Planography is often referred to as chemical printing because the principle is based on the chemical property (some scientists claim that it is physical and not chemical) of certain calcareous stones and such metals as zinc and aluminium which are in a chemically clean condition to

undergo certain peculiar changes when brought into contact with organic fatty acids. The fatty acid is absorbed (or adsorbed as some scientists would have it) by the stone or metal and unless forcibly removed, it becomes a part of the stone or metal and such parts have the property of all fatty acids in that they are greasy and attract similarly any greasy substances that are applied over them, while they repel water or watery substances.

We will take the stone first. The *lithographic stone* as it is called (*lithos* means, stone, and *graphos* means, I write) is quarried in Germany. It is calcareous, that is, it is composed largely of calcium carbonate, and is porous. A thick slab of this stone is levelled on both sides, and the side that is to be printed from is ground with sand for purposes of cleaning and to give a grain to the surface. There should be no scratches on the face of the stone. The stone is dried. On this the artist draws the picture in the reverse way, with a special crayon, the grain giving the necessary tooth for the crayon. The crayon to all appearances is like the crayon used by artists for drawing on paper. But it contains greasy fatty acids. Fatty acids are substances of vegetable or animal origin which are derived from the heavy hydrocarbons of the paraffin series, such as oleic acid (from olive oil) palmitic acid (from palm oil), linoleic acid (from linseed oil) and animal products such as lard, tallow, etc.

When the artist has finished his drawing, the stone is coated over with a mixture of gum arabic and dilute nitric acid. The nitric acid attacks the bare parts of the stone (being made up of calcium carbonate) but the acid is not strong enough to etch it to any depth. The purpose of the acid is not to produce any depression in the non-printing parts. It is not necessary in planography (which when applied to work on stone, and even on metals, is more commonly referred to as lithography) to produce any difference in level between the printing and non-printing parts. The purpose of the acid is to produce a granulated surface in the non-printing parts, so that water can collect in small quantities in the hollows of these granular parts. The object of the gum arabic is to make the non-printing parts insensitive to grease. Gum arabic also contains an organic acid in it, namely, arabic acid which acts on the stone in the same

manner as the greasy fatty acids. After absorbing arabic acid, the stone behaves in the opposite way to that of the greasy parts—it repels grease and attracts water. Thus stones (and also metals) have the property of being rendered grease-attracting and water-repelling by the initial application of greasy fatty acids, and water-attracting and grease-repelling by the initial application of gum arabic. The way the stone will behave in any part of its surface will depend on whether a fatty acid or gum arabic came into contact with it *first* while in a chemically clean condition. Once this change has occurred, nothing can alter the behaviour of the stone or metal, till that layer is removed by mechanical or chemical means. The theory is that the surface of the stone in a chemically clean condition contains (as opposed to acidic) a basic substance which in this case is calcium carbonate, and metals such as zinc and aluminium which are used in the place of stone, contain zinc oxide and alumina. A few molecules on the surface undergo chemical or physical change when these basic substances come into contact with acidic substances. The change is permanent, until the molecules are bodily removed or are acted upon by strong acids.

When the gum is dry, the stone is washed with water which removes all the gum on the surface (the stone has already absorbed what it required and what is absorbed cannot be washed away). The picture drawn in crayon is still there on the stone. This is washed away with turpentine. Now the picture has disappeared, as turpentine has dissolved away all the grease with which the picture was drawn. The stone looks to all appearance as it did soon after it was grained and polished, that is, a surface completely bare. Yet, it is by no means bare. Invisible though it may be, the picture has been indelibly fixed on the stone, as we shall presently see. The stone is damped with a wet cloth, and while still wet (the granular surface produced by the nitric acid helps to retain the water on the surface) the stone is rolled with a roller charged with stiff greasy ink (the ink is ground in linseed oil which contains the fatty acid, *viz.*, linoleic acid). Gradually the picture comes back to sight; for, the stone in those parts are grease-attracting, and therefore, the greasy ink particles collect on those parts, making the picture visible.

The parts which have absorbed gum are grease-resisting and therefore ink particles are unable to adhere to those parts *so long as such parts continue to hold water.* That is why the stone will have to be frequently damped while being rolled. If the water evaporates leaving the stone dry, then ink particles will stick to the stone; but this will not do any permanent damage. When damped again and rolled, the ink particles come away from those parts, as grease can never remain there in the presence of water. When the picture has been fully charged with ink, the stone is dried by fanning it. A sheet of paper is placed over the stone, and pulled through under pressure in a lithographic press. When the sheet is taken out, a print of the picture is obtained on it. The stone is damped again, rolled with ink, and the printing continued.

This is not only a very interesting way of printing but it will be noticed, that it is a quick and comparatively inexpensive way of obtaining prints of pictures or for the matter of that, any other kind of matter.

What about the quality? The main defect is a lack of brilliance on account of a thin film of water that often gets mixed with the ink. Otherwise the result is quite satisfactory. Even this defect has been largely got over by certain recent improvements.

What has been described regarding stone applies equally well to the metals, zinc and aluminium which possess similar properties. Nowadays these metals have superseded stone. Because metal sheets are easier to handle, they can be wound round a cylinder and printed on the rotary principle. They are not liable to get broken as stones are. They are cheaper and large sizes can be used, which will be impossible with the stones on account of their huge weight.

There is not much direct drawing on metal or stone done these days. The drawings are made on grained "transfer" paper (like "transfer" pictures used by boys to affix pictures to books, these "transfer" papers have a coating which can be transferred to other surfaces) and transferred to metal.

Most lithographic work today is done from prints obtained from photographic negatives. The metal sheet is coated with egg albumin and ammonium bichromate and allowed to dry. A photographic negative is made of the original

and this is placed in contact with the sensitized metal and exposed to powerful arc lamps or bright sunlight for about three or four minutes. The negative is taken out, and a cloth soaked in printing ink diluted with turpentine is passed over the plate. It is then washed with cold water which dissolves away all parts not affected by light. In those parts which have been rendered insoluble by the action of light, the image remains in the plate. The non-printing parts are desensitized with gum, and the plate can be printed from, as if the image was directly drawn on the plate with greasy ink.

One advantage of this process is that any number of prints can be taken on one plate from a single negative. Thus if a hundred duplicates were required on one plate, the negative is exposed a hundred times, taking about five or six hours. This produces a plate from which each copy that is printed from it can be made to give a hundred copies by cutting it into a hundred pieces. If one million copies of a picture were required only 10,000 copies will have to be printed from the large composite plate. Neither relief nor intaglio will enable duplication of printing surfaces to be made so quickly and cheaply.

Pictures containing tones such as paintings, photographs, wash and pencil drawings can all be produced by lithography. Screens such as are used in relief process for making half-tone blocks have to be used in lithography except when the picture is drawn direct on stone or transferred from paper, in either of which cases, the grain is obtained by rough graining the stone or paper. Negatives for different colours are taken by the interposition of colour filters, and these are printed down on metal.

The three-colour process (that is, printing in yellow, red and blue in superimposition) while it gives excellent results by the relief process, and fairly good by photogravure is unsatisfactory by lithography. This is mainly because the correct colour values of yellow, red and blue cannot be obtained each time, as the prints lack in depth and brilliance. The defects have to be made good by overprinting with other colours, principally pink, a deeper blue, brown, black and sometimes, grey. Ten and twelve printings on top of each

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Offset Lithography

There are certain defects in printing direct from stone or metal on to paper. As the printing surface is on the same level as the non-printing parts, very considerable pressure is required for the transference of ink, unlike relief process or intaglio in which a difference of level makes it necessary to use but little pressure in printing. Another difficulty is that fine screen half-tone images require a smooth coated paper for printing. Coated paper is affected by moisture, as the coating is fixed by a water-soluble adhesive, and it comes away on being wetted. As the printing plate is damp, coated paper is ruled out for printing direct from metal. Hence half-tones of fairly rough screen which do not require a coated paper have to be used.

All these and other difficulties are overcome by taking a print from the plate on a smooth rubber sheet in the first instance, and then printing on to paper from rubber, in other words, printing not directly from metal but from an offset impression on rubber. This process is known as offset lithography. As rubber adapts itself as readily to the irregularities in the metal plate as to those in the paper, comparatively little pressure is required, and there is a full transference of ink. Also half-tone images can be printed on paper of however rough a surface, even fine line work, if printed by offset.

The metal plate is clamped round a cylinder which is in mesh and contact with a cylinder of the same diameter round which the rubber sheet is stretched. In mesh and in contact with this cylinder is the impression cylinder, also of the same diameter. The paper passes between the rubber cylinder and the impression cylinder.

As there are two transferences in the course of printing, needless to say, the image of the picture on the plate should be in the same way (not in reverse as in direct lithography) as it should appear in print. Most lithographic work is done by offset at the present time. The chief defect is that on account of the double transference there is a certain lack of depth of colour. By the use of highly concentrated inks,

this defect is largely got over. A new development combining offset lithography with intaglio called "offset deep" promises to make up for all the disadvantages of lithography in comparison with intaglio printing, while retaining the qualities which are peculiarly its own.

The chief uses for lithography are pictorial work of large size, work requiring the use of many colours, prints on tin and other metals and for all pictorial posters.

Beautiful work can be produced by all the three processes; but one process is probably better suited than the other two for any particular work, and it is best to consult the printer before the artist commences to draw his picture in the case of pictures drawn specially for printing.

INDEXES TO PRINTED VOLUMES[1]

BY

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ACCORDING to classical usage, the Latin word *index* denoted a discoverer; a catalogue or list; the title of a book; and the fore or index finger. Cicero (106-43 B.C.) used the word to express the table of contents of a book, and explained his meaning by the Greek form *syllabus*. Shakespeare, in the sixteenth century, used the word in the general meaning of a table of contents or preface.

Table was the usual English word, and *index* was not thoroughly naturalized until the beginning of the seventeenth century. In the present English usage, *table* is reserved for the summary of the contents as they occur in the book, and the word *index* for the arranged analysis of the contents. The words calendar, catalogue, digest, inventory, register, summary and syllabus are also used to denote *index*. Another old word occasionally used in the sense of an index is " pye ". The French occasionally use ' index ', but generally employ the expressions: " Table de noms des auteurs " and " Table de sujets "; the German expressions are " Autoren Register " (author index) and " Sach Register " (Subject index); and the Italian term is " tavola ".

The *New English Dictionary* affords an interesting study of the many meanings with which the word *index* is associated—in anatomy, mathematics, mechanics and music. But the main definitions with which we are concerned are:

[1] I am indebted to Sri S. R. Ranganathan, University Librarian, Madras, for help in developing the subject.

(*a*) A table of contents prefixed to a book and (*b*) An alphabetical list placed (usually) at the end of a book, of the names, subjects, etc., occurring in it, with indication of the places in which they occur.

History

"There is no greater literary sin than the omission of an index", declares E. B. Osborn in his essay on indexing.[2] The need for an index and its usefulness are recorded from the earliest days.

Seneca (4 B.C.—65 A.D.) in sending certain volumes to his friend Lucilius, sent along with them notes of particular passages, in order that "he who only aimed at the useful might be spared the trouble of examining them entire".[3]

Thomas Fuller (1608-1661) fully realised the value and importance of indexes. He says, "An index is a necessary implement, without which a large author is but a labyrinth without a clue to direct the readers within."[4]

In 1750 Dr. Johnson wrote to Samuel Richardson entreating him to add an *index rerum* (index of subjects) to each volume of *Clarissa Harlowe*. He says, "When the reader recollects any incident, he may easily find it,"[5] with the aid of an index. The value of the index was recognised not only by individuals but by the whole nation. This is substantiated by the fact that in 1778 a sum of £12,900 was volted for indexes to the *Journals of the House of Commons*.

Isaac Disræli's (1766-1848) praise of the inventor of indexes is worthy of quotation: "I for my part venerate the inventor of indexes; and I know not to whom to yield the preference, either to Hippocrates, who was the great anatomizer of the human body, or to that unknown labourer in literature who first laid open the nerves and arteries of a book."[6]

While the eighteenth century was an age of advocacy, the

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[2] Osborn (E.B.). *Literature and life*. 1921. P. 91.
[3] Clarke (A.L.). *Manual of practical indexing*. 1933. P. 10.
[4] Edwards (Tryon). *Comp. Useful quotations*. 1936. P. 284.
[5] Hill (George Birkbeck). *Ed. Letters of Samuel Johnson*. 1892. Vol. 1. P. 22.
[6] Osborn (E.B.). *Literature and life*. 1921. P. 93.

nineteenth was one of agitation in favour of indexes. It has been said that the "omission of an index, when essential, should be an indictable offence."[7] Both British and American lawyers have proposed that any author who published a book without an index should be deprived of the benefits of the Copyright Acts. Lord Campbell (1779-1861) once proposed to bring a bill into Parliament to implement this idea.[8]

The great delay in the setting in of the practice of providing the printed book with an index is largely traceable to late appearance of universal education. Though printing was invented in the fifteenth century and books were made comparatively cheap and plentiful, the conservatism and bigotry of the literate and educated few were indifferent, if not obstructive, to the spread of literacy among the masses. Even in England it was only seventy years ago that elementary education was made compulsory by legislation. We do not know when we shall have universal literacy in India. The percentage of literacy has not yet reached two digits.

When only the select few use books the probability is that they are men belonging to the uppermost centiles of the community. This implies that the select literate few who alone use books have an unusual memory and a remarkable familiarity with literature. Such people do not depend very much on indexes. No wonder the need for indexes was not felt for nearly three centuries after the invention of printing.

But when the lower quartiles of the community became literate and began to use books and books themselves became far more numerous overreaching even the memory of the uppermost quartile, the index naturally became a necessity. This social change set in only in the nineteenth century, and it accounts for the index tending to become a normal feature of the printed book more definitely after the commencement of the last century. If we remember this dependence of the evolution of the index-consciousness on the spread of literacy and couple with it the fact that 90 per cent. of our countrymen are illiterate, is it a wonder that

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[7] *Ibid.* P. 92.

[8] *Chambers's Encyclopaedia* (new edition). V. 6. P. 96.

even the few worthwhile books produced in India, often go without an index?

Quantity

Even in this period for a long number of years the index has been very meagre. Sir Humphry Davy's *Elements of agricultural chemistry* (1813) has an index of four pages to a text of 386 pages. A. H. Bleeck's *Avesta* (1864) whose text covers 211 pages devotes only a page and three quarters for the index. In G. Maspero's *Struggle of the nations* (1896) the index occupies only six pages whereas the text runs up to 788 pages. This meagreness persists even to-day in several books. W. T. Jackman's *Economic principle of transportation* (1935) whose text occupies 881 pages devotes only eight pages and a quarter to the index. Findlay Mackenzie's *Planned society* (1937) has but an index of eleven pages to a text of 978 pages. Walter E. Lagerquist's *Public utility finance* (1927) devotes but four and a half of its 671 pages to the index.

At the other extreme we have a book which provides an index of two pages to a text of two pages. It is T. T. Sharman's *Kannada poets mentioned in inscriptions* (Memoirs of the Archæological Survey of India, 13), 1924. Verily it has virtually repermuted the words of the text in an alphabetical order to form the index.

The correct quantity surely is between these two extremes. In the eight volumes of the publication Series of the Madras Library Association the question of determining the most helpful quantity of index had been borne in mind. Indeed in several senses their indexes constitute experiments in indexing. They would indicate a proportion of 1 : 8 as the norm for the proportion of the length of index to that of the text.

Occurrence

Usually the index occurs at the end of a book. The only cause of occasional confusion is due to appendices, annexures and supplements either preceding or following the index without conformity to any accepted convention.

But in periodicals the index may occur either at the end

or at the beginning though the former is more often the case. Here are five periodicals to illustrate the occurrence of the index in the preliminary pages:

1. *Nature*;
2. *Annals of botany* (New series);
3. *Annals of applied biology*;
4. *Lancet*; and
5. *British medical journal.*

Law books present another deviation from normality. They often present an index of cases in addition to the general index. A rigid convention has not been established in regard to the position of the index of cases. Earl of Birkenhead's *International law* (1927) gives the table of cases at the end of the book just before the general index. On the other hand in K. V. Krishnaswami Ayyar's *Professional conduct and advocacy* (1939) the index of cases occurs before the text of the book.

Multi-volumed books give rise to another kind of lack of uniformity in the occurrence of indexes.

In some cases each volume has its index but the set as a whole is left without a cumulative index. An example is B. A. Yeaxlee's *Spiritual values in adult education,* 2 V. (1925).

In other cases there is cumulative index at the end of the last volume but no index in each volume, *e.g.,* J. D. Hooker's *Himalayan journals,* 2 V. (1854).

In rare instances the cumulative index is repeated in all the constituent volumes as in J. A. L. Waddell's *Bridge engineering,* 2 V. (1916).

It is not unusual for each volume except the last having its own index and the last volume giving the cumulative index of the set as a whole. This is illustrated by J. W. Mellor's *Comprehensive treatise on inorganic and theoretical chemistry,* 16 V. (1922-1937).

A still another variety of occurrence is each volume having its own index and the cumulative index of the set forming a separate volume by itself. A well-known example of this is the *Cambridge modern history,* planned by the late Lord Acton, 13 V. (1907-1911).

Apart from these simple types we may have various complications, *e.g.,* J. G. Frazer's *Golden bough* (1911-1915)

which is in twelve volumes devotes the whole of the twelfth volume partly for bibliography and partly for the cumulative index of the set. In addition, Vols. 3, 4 and 9 have each their own exclusive index, while the remaining volumes fall into four pairs, the volumes of each pair sharing a common index.

Another example is M. Guizot's *History of France,* 8 V. (1882). Here the index of the first five volumes occurs at the end of the fifth volume, while that of the last three volumes occurs at the end of the eighth volume.

Usually each volume of a periodical has its own index. The ideal is to provide a cumulative index at stated intervals, say, once in ten years or twenty-five or fifty years. Such cumulative indexes occur as extra volumes of the periodical. In actual location on the shelves they are best kept at the head of the volumes of the periodical. A periodical that is most regular in this is the *Chemical abstracts* published by the American Chemical Society. It brings out a volume of cumulative index every ten years. So is the case with *Annalen der Chemie* and the *Berichte der deutschen chemischen Gesellschaft.*

Some periodicals give a cumulative index of a number of consecutive volumes at the end of the last of them, *e.g., The American journal of science and arts,* issues a cumulative index for ten volumes at the end of every tenth volume and these indexes are inseparable from the regular volumes of the set. This practice is a source of irritation.

But a far more deceptive and hence dangerous occurrence of the cumulative index will be found in the *Journal of the American Oriental Society.* Here one of the regular volumes (Vol. 21 first half) of the periodical is converted into a cumulative index of the volumes going before it. In such a case it is awkward to lift this cumulative index from its proper numerical order to the head of the set. At the same time if we leave it where its volume number indicates, readers often miss the existence of the cumulative index. In V. 44, pages 313 to 384 are devoted to the cumulative index to volumes 21-40. Here even the choice of removing the volume to the head of the set is denied and the index is destined to lie hidden in the shelves along with the other volumes of the journal.

Kinds of Indexes

Classified Index

A rare form of index is the classified one. Paul Monroe's *Cyclopedia of education* provides such an index. Classified arrangement may have its value in a bibliography or a library catalogue. But it must be held to be rather out of place in the index to a book. There are two reasons for this. In the first place the index to a book is in actuality to be used by every reader of the book whereas a bibliography or a library catalogue has only a much smaller number of users. A select small class of people can with ease acquire the special skill for using a classified arrangement but not everybody. Secondly even in the case of such a select and small class of readers the tempo in which they are at the moment of turning to the index of a book, while reading or consulting it, is seldom one that will tolerate anything more than a simple alphabetical arrangement. No doubt, an alphabetical arrangement is not after all so simple. In spite of it, one has the belief or illusion that it is something very simple and this is what counts for the tempo. Even apart from this, in spite of its pitfalls and idiosyncrasies, the alphabetical arrangement may not be as difficult to use as a classified arrangement.

Multipartite Index

Another class of index which often proves to be irritating if not deceptive is the multipartite alphabetical index—an index in which the entries are not given in a single alphabetical sequence but are broken into a number of sequences. The greater the number of such sequences the more ineffective the index becomes. Bipartite form is the more common one, *e.g.*:

(1) H. N. Russell's *Astronomy* has a name index and a subject index;

(2) S. R. Daniel's *Case for electoral reform* is provided with a subject index and a personal index; and

(3) L. H. Haney's *History of economic thought* calls its two sequences " Index to names " and " General index ".

If bipartite index is bad a tripartite one is worse. The editor of the 1939 edition of Leonardo Da Vinci's *Literary*

works would have helped the reader better if he had coalesced the following three indexes into a single one:

(1) Names and bibliography;
(2) Topographical index; and
(3) General index.

It is hardly possible to guess the motive behind the breaking up of the index of Watkin Williams' *Saint Bernard of Clairvaux* into three sequences like, index of persons, index of places and index of manuscripts cited.

This purposeless dissection of a homogeneous alphabetical structure reaches as it were its extreme form in G. C. Wheeler's *Mono-Alu-folklore*. For he provides no less than four indexes, *viz.*, index to motives, index to flora, index to fauna, and index to places.

Relative Versus Block Index

It is believed that it was Melvil Dewey, the father of modern librarianship, that first advocated and practised, if not invented, the relative index. Here is an example of relative index entry taken from S. R. Ranganathan's *Classified catalogue code* of 1934:

> "Index entries, for—artificial composite books, 623; multivolumed books, 523; ordinary composite books, 613-61384; periodical publications, 73-7323; simple books, 3-336; number of, 02 *comm*; types of, 3."

Here the main entry word is "Index entries". The entry shows that this word occurs in seven different places in the book. Actually it furnishes more information for it indicates what aspect of "Index entries" is dealt with in each of the seven places, *e.g.*, one interested in the number of index entries is told straight away that he will find his information in the *comm.* to rule 02.

The block index form of the above relative index entry will be—

> "Index entries—02 *comm.*; 3; 3-336; 523; 613-61384; 623; 73-7323."

If the index entry were of this block type the reader who is interested in the number of index entries may be baffled as to which of the references he should look up. Perhaps, he will try each one systematically. If so, he will consider himself lucky since the very first reference will give him

what he wanted. But if his interest centred round "Index entries for periodical publications" he would have to meet with disappointment in the first six attempts of his and find what he wanted only in the seventh attempt if he is of dogged nature not easily scared away by failures. A colossal instance of this fault of a block index entry will be found in Ayscough's *Index to the gentleman's magazine* where all the references under one surname are placed together undifferentiated even by the Christian name. There are 2411 entries under "Smith" and it has been calculated that to go through this mass in order to find a specific reference would take the consulter eight days of ten hours a day!

Much less formidable examples of ineffective block index entries are scattered throughout volume 15 of *The Cambridge history of English literature* which is entitled *General index*. Under "Shakespeare" we find one column of references—nearly four hundred in number. To look up these references will take about twelve hours. Surely, human inertia and impatience are not going to stand this nonsense. Further, they will be egged on by disgust, as many of these references will turn out to yield nothing more than the name "Shakespeare".

A few weeks ago a young man wanted the significance of *Pranava—Aum*. The student was given the three volumes of Bhagavandas's edition of Gargyayana's *Pranava veda* under the title *The science of the sacred word* (1913). Not finding an index entry under *Pranava* he turned to *Aum*. He had a feast of sixty-six references. He looked very pleased and settled down at a desk. By the time he looked up the first twenty of these references his patience left him and, alas, along with it even his interest in *Aum*! Surely, what is the purpose served by such block index entries? No doubt, some indexers try to make the best of a bad bargain by printing in antique type the references which give more sumptuous information or by putting such references prior to all the others.

It is extraordinary to think that this obvious futility of block index entries came to be realised only so late as the days of Melvil Dewey. But now that he has shown us the way by devising this extremely simple trick of relative index, there is no excuse whatever for any author to give a mere

block index and claim to have indexed his book, at any rate no more excuse than for leaving the book without any index.

The index to E. T. Cook's library edition of the *Works* of John Ruskin (1912) is an admirable example of relative index.

It was stated that a particular reference may contain nothing more than the mention of the name indexed. In such cases a reader may well have the feeling of one on whom a fraud has been played. This fault is not peculiar to block indexes only. Even relative indexes may have such disappointing references, *e.g.*, in the index to Ruskin's *Works* above referred to we find the entry:

> " Hunt, William Holman (2) *Characteristics, etc., of his work*:—R's lecture on (1883), 33 xlvi., 267."

On turning up these pages we find but the bare mention of the topic in the former page, *viz.*, " In the Lent Term, however, he delivered only the first lecture—on Rossetti and Holman Hunt ". But on turning to the latter page we find that it commences the lecture itself which extends up to the end of page 286. It may be argued that the fact that the first reference is only to a preliminary page should be sufficient to warn a wary reader that he should expect in it nothing more than the mention of the name.

But here is another example:

> " Milton, John (2) *General criticism*:—flowers, 4, 255 25, 245, 393."

The first of these references gives nearly a full page comparison of " Milton's flowers in Lycidas with Perdita's ". This page quotes seventeen lines of poetry. In the second reference we have but the mere mention of the word " flowers " in the following sentence: " Milton fills his Paradise with flowers; but no flowers are spoken of in Genesis " and the related footnote contains three lines from *Paradise lost* IV. In the third reference we have more than one page on the treatment of violets and pansies by Shakespeare and Milton with just a few lines of quotations but with the focus on how the lines of the two poets " are dragged from hand to hand along their pages of pilfered quotations by the hack botanists ". This aspect of flowers—comparing the poets' and botanists' way of handling the subject is continued through a number of succeeding pages. Here certainly it

cannot be maintained that the reader gets any clue in the index entry in spite of its being relative, that the second reference merely contains the mention of the word, that the first is largely made up of quotations and that the last is not only focussed on something else but is an elaborate description of the handling of the theme of flowers.

The next step to be taken in improving the indexes of books is to indicate such differences in treatment—differences which are not brought out by the ordinary relative index.

In the indexes of the later volumes of the Publication Series of the Madras Library Association there is evidence of some new experiments of indexing with a view to solving this difficulty. The experiment consists of a very simple device. It elaborates Dewey's method of relative entry by introducing in appropriate places the four following descriptive symbols which stand for the ideas shown against them:

d.i.r.t. = described in relation to,
i.r.t. = in relation to,
q.i.r.t. = quoted in relation to,
r.i.r.t. = referred in relation to.

How these symbols help us out of the difficulties mentioned above will become clear by the following examples taken from *Reference service and bibliography*, V. 1, of Ranganathan and Sundaram.

(1) "Shaw, Bernard, incident, 12331. Ex. *r.i.r.t.* Multi-worded entry words, 221218."

(2) "*New English dictionary—d.i.r.t.* Scope of dictionaries, 22114. Ex. 1. *q.i.r.t.* Definition of bibliography, 4013. Definition of library, 112. *r.i.r.t.* Genesis of reference service, 11224. Reading lists, 411."

(3) "*Dictionary of national biography—d.i.r.t.* Author's bibliography, 4121. Ex. 1. Scope of biographical reference books, 221114. Ex. 1. *i.r.t.* Iconographical information, 2322. Ex. 2. *r.i.r.t.* Devil worship incident, 344. Professor of Economics incident, 2322. Ex. 1. Scope of reference books, 2211 Ex."

In the first mentioned example it should be obvious that

the second reference contains the name of the incident while the first gives a full account of it. In the second example it would be obvious that the last two references contain merely the name of the book; the first reference gives a description of the book while the remaining two references contain quotations from the book. Similarly in the third example the first two contain a description of the book; the third reference evaluates the book from a particular point of view; and the last three references merely mention its name. All such helpful information is furnished with the aid of the simple symbols *d.i.r.t.*; *i.r.t.*; *q.i.r.t.* and *r.i.r.t.*

This is by no means the last word in the evolution of an index to a book. When this experiment is perfected then only further lacuna will be disclosed calling for further attention. Indexing is thus by no means an exception to the general rule that so long as man continues his thinking there will be opportunity for every one of his ideas and tools to be progressively improved *ad infinitum*.

It must be realised however that there are some intrinsic reasons for slowness of progress in the improvement of the index. So long as only individual readers use index the difficulties they meet with in the existing indexes, however formidable and exasperating at the moment, are soon forgotten. There has been till now no means of so cumulating all such experiences as to lead to a concerted attack on the difficulties. However the advent of reference service is full of potentialities for providing such a means. As reference service gets properly evaluated and gets widely and intensively established in all libraries the reference librarians will be not only the custodians of the difficulties experienced by individual readers but also the persons who depend on indexes for the moment-to-moment discharge of their duties. The difficulties of inefficient indexes cannot be forgotten by them. They will have to be removed by them. Thus Reference Service will lead not only to a better fulfilment of the Laws "Every reader his book" and "Every book its reader," but it will also lead actively to the improvement of the indexes of printed volumes.

THE HISTORY OF "THE HINDU"

(Contributed)

THE circumstances that led to the founding of the *Hindu* and its early history are best told in the words of Mr. M. Viraraghavachari, one of the founders of the paper from whose account in the Silver Jubilee issue of the *Hindu* the following is extracted:

"Towards the middle of the last century" wrote Mr. M. Viraraghavachari, "a band of patriotic citizens of Madras constituted themselves into an association under the leadership of the Hon'ble Mr. Lakshminarasu Chettiar, and by petitions to the Court of Directors, to the Viceroy and to the Governor of Madras, ventilated the grievances of the Indian population and obtained no small amount of success. For some reason or other, which I am not aware of, the Native Association as it was called became defunct and with it its organ, the *Crescent,* a newspaper the first of its kind conducted by Indians. Presumably, it died for want of sufficient support from the educated Indians. It must also be remembered that English education was then but in its infancy and the mission of the press could hardly have been recognized. An organ to voice forth the wants and aspirations of the people was still a desideratum; and with the support of that distinguished statesman, the late Raja Sir T. Madhava Row, and his coadjutors and compeers, Dewan Bahadur Ragoonatha Row and the late lamented Rânganada Mudaliar, the *Native public opinion* was launched and subsequently incorporated with the *Madrasee,* started by Mr. A. Ramachandra Aiyar, now Chief Judge of Mysore. After some time this organ which was avowedly started in

the interests of the Indian population, passed into undesirable hands.

"About this time the administration of India was in the hands of Lord Lytton, whose despotic sway was anything but popular . . . One of the greatest impediments to the advancement of the population was the absence of an organised public opinion. Calcutta and Bombay had their associations and journals, but Madras could boast of neither. Among the literary associations in the metropolis, the Triplicane Literary Society, which had been started many years before, contained among its members six ardent youths just out of college, who conceived the idea of supplying this want and gave it effect. These were: Mr. G. Subramania Aiyar, Mr. T. T. Ranga Chariar, Mr. P. V. Ranga Chariar, Mr. D. Keshava Row Pant, Mr. N. Subba Row and myself.

"The brunt of the work fell upon Mr. Subramania Aiyar and myself; and it was therefore not possible for us to start anything more than a weekly paper. We arranged for its publication at the *Srinidhi* Press, Mint Street, and the first issue was placed before the public on the 20th September, 1878, this day twenty-five years ago. . . . . For about a month, the *Hindu* was issued from the *Srinidhi* Press, and on the 25th October 1878 the printing of the paper was entrusted to the *Scottish* Press.

"In September 1883 the scene of action was transferred to Mylapore, and the *Hindu* was published at the *Hindu* Press established by our distinguished countryman, Mr. Ragoonatha Row who, while in and out of service, materially helped us with his valuable advice and by contributions to our columns.

"At this time it was found that the appearance of the paper once a week considerably detracted from the full value of the journal. . . . We accordingly resolved to issue the paper thrice a week, and in this form the paper was first launched on the 1st October 1883 printed at the *Empress of India* Press as it was found that the *Hindu* Press was unequal to the task. On the 3rd December 1883 the *Hindu* turned over a new leaf in its successful career. The present habitation of the *Hindu*, 100, Mount Road, was then rented and the National Press which, as its name implies,

the current literature of the day. In 1889 we decided to run the *Hindu* as a daily paper, and accordingly from the first of the official year the paper took this form. I need hardly state that this new venture was not financially as successful as was anticipated. Though many of the subscribers to our tri-weekly gladly consented to pay the additional subscription, still there was considerable diminution in the number of subscribers, and we had for a long time to conduct the paper irrespective of financial considerations."

In 1892 the building at 100, Mount Road where the *Hindu* and the National Press were located was purchased and extensions were built out of loans raised with the help of H. H. Ananda Gajapati Raj, the Maharaja of Vizianagaram. The partnership between Mr. M. Viraraghavachari and Mr. G. Subramania Aiyar was dissolved in 1898. The conduct of the business fell on Mr. Viraraghavachari who found the financial burdens increasing year after year.

* * * * *

The celebration of the Silver Jubilee in 1903 left the *Hindu* undisputed indeed in the esteem and influence which it commanded with the public, but did not enable its proprietor, Mr. M. Viraraghavachari, to place it financially on a sound business footing. Attempts to convert it into a limited liability concern or convey it to a group of public-spirited friends with a view to attracting additional capital to pay off its accumulated liabilities and improve its news and editorial services did not materialise, until Mr. S. Kasturiranga Iyengar, who had become its legal adviser about that time conceived the bold project of buying the paper on behalf of himself and a few select friends of his and conducting the paper himself after relinquishing his profession and practice at the bar.

Negotiations were started for this purpose early in 1905 and, after initial difficulties were surmounted, the sale was completed on the 31st March 1905. Mr. Kasturiranga Iyengar formally took charge of the paper on the 1st April 1905 retaining the services of the late proprietor Mr. Viraraghavachari as Manager and of Mr. Karunakara Menon as Joint-Editor. There were then many among his friends and relations who considered this step, taken by one who was known in his affairs to be cautious and careful, as rash

THE HINDU.

PUBLISHED EVERY WEDNESDAY.

Vol. IV. } MADRAS:—WEDNESDAY, AUGUST 31, 1881. { *Per annum in advance.*
No. 35. } { TOWN ...Rs 8 0
MOFUSSIL ... 8 0

News and Notes.

THE Indian Salt Revenue for the first three months of the current financial year, compared with the corresponding period of last year, shows an increase of Rs. 96,000.

THE total value of the thirty-two Khillats given at the Viceregal darbar at Lahore last November, for services rendered by native gentlemen and officials in connection with the Afghan war, amounted to Rs. 34,790.

FOR the next two years there will, it is stated, be no competitive examination for the Indian Medical Service. This will be a great disappointment to Indian candidates who have proceeded to England to pass the examination.

THE Government of India has issued imperative orders, under a heavy penalty, against the transmission of *ganja*, opium or other A REMARKABLE escape was made from the Umritsar Jail the other day. A prisoner, condemned to be hanged, and within twenty-four hours of execution, quietly walked out of the main gate of the Jail, clad in a suit of warder's clothes. No trace of the missing man has since been discovered. His keeper states that he had fallen asleep, and that when he awoke his charge was gone.

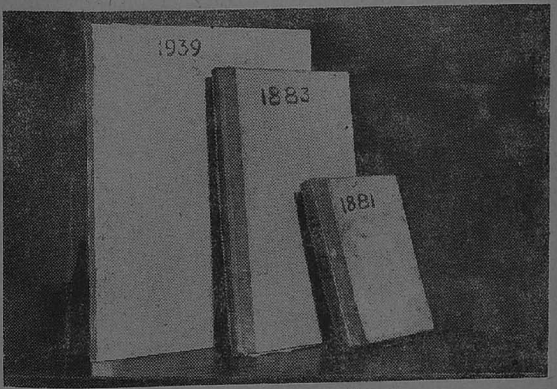
MADAME BLANC, the owner of the gambling house at Monaco, has just died, worth, it is said, £4,000,000, and aged forty-eight. Two of her daughters married Princes. It is stated that she never entered the gambling saloons whence her enormous fortune was derived; and that a man who was a frequenter of them was not readily admitted to her circle of friends. She had no objection, however, to add to her "pile" by means of the "establishment."

A CORRESPONDENT at Hyderabad informs a Bombay paper, that the Nizam is now enjoying excellent health and strength, and is more likely than he has been for a long time past to form some of pay for the whole Civil Service of India.

MR. WILFRID S. BLUNT, in a paper contributed to the last number of the *Fortnightly Review*, on the "Census of the Mahammadan World," estimates the total number of Mahammadans at 175 millions, and he subdivides them into four sects, as follows:—The Sunites or Orthodox Mahammadans 145,000,000. The Shiites Sect of Ali 15,000,000. The Ahadites (Anabiptsts) 7,000,000; The Wahabites 8,000,000. The number of Mahammadans in India, who are British subjects, he estimates at 40 millions.

WE give prominent insertion to the following incident relating to an act of humanity on the part of Mr. Beverley, Civil and Sessions Judge of Patna. The object of his sympathy and tenders was a Syce, who it was reported to him at night was dying from the effects of strong drink. He himself harnessed his horse, and in the absence of the coachman drove his groom with the sick man to the hospital. In

(FROM AN ISSUE OF 1881)



(THE GROWING SIZE OF THE HINDU)

and hasty. Its financial and political responsibilities were, moreover, considerable and there were some who actually tried to dissuade him from it. But Mr. Kasturiranga Iyengar, who though he had thriven fairly well at the Bar had never felt attracted to it in the way some of his contemporaries were, knew his vocation all along and found it perhaps at a period in his life when others may have hesitated to make so comprehensive and risky a change in occupation and ways of life. With the firmness and faith that was inborn in him, he took the plunge and swam through the eddies and currents manfully and left the *Hindu* in the haven in which it finds itself to-day.

The year 1905 saw in the Bengal partition agitation the birth of that great national consciousness which, in due time, was to revolutionise the aims and methods of political and public agitation in India and quicken the pace of national self-realisation.

The *Hindu* took a leading part in the publication and discussion of the events of this period. The old methods of news service by post and occasional telegrams were replaced by the starting of a daily telegraphic news service that later on grew into what we know now as the Associated Press Service and also through special correspondents.

In all the controversies and contentions of that time the *Hindu*, while scrupulously fair in the presentment of news as well as views of all parties, steadily supported in its editorial columns the aims and aspirations that grew with the new national spirit in India and it did not flinch for a moment from outspoken criticism of such policies and programmes inconsistent therewith propounded by the overcautious mentality of many elder politicians.

The firmness, fearlessness and dignity with which Mr. S. Karturiranga Iyengar conducted the paper through these strenuous and anxious days was all the more remarkable for the reason that the internal economy and management of the paper were also causing him anxiety and taxing his resources to the utmost. Mr. Kasturiranga Iyengar was also able to pay off the accumulated liabilities that had been left as a mortgage on the paper by the previous proprietors and by the beginning of 1910 he felt himself entirely out of the wood so far as the legacy of business anxieties went. The

growing support of the public to the paper was seen not only in the steady increase of its circulation notwithstanding severe competition but also in the equally steady increase in its advertisement clientele which comprised both European and Indian businessmen and firms that appreciated the value of the paper as a medium of business as much as of public opinion.

The growing popularity and success of the *Hindu* even during the period of depression, or differences of views and programmes within the Congress itself is testified to by the fact that its circulation grew so large that steps had to be taken for entirely re-modelling the methods of production and circulation of the paper. The premises were again expanded and a full complement of linotype machinery was installed followed by the erection of a high speed rotary press. The installation of the new plant and machinery was completed towards the close of 1921.

The premises were again extended and the old methods of hand composing and flat bed printing were abandoned. Machine composing and a rotary printing machine with the necessary stereo and plate-making plant were installed towards the end of 1921 and the paper was enlarged to its present size. Mr. S. Kasturiranga Iyengar found the arduous work telling on his health and after a short illness died in December 1923.

The management now devolved on his two sons Mr. K. Srinivasan and Mr. K. Gopalan, both of whom had joined the business some time before their father's death. Mr. Kasturiranga Iyengar's nephew, Mr. S. Rangaswamy became the editor. The business having been stabilised a new era of progress commenced and the new proprietors were fully alive to the growing demands necessitated by business expansion. More and more modern machinery was introduced in all departments and the business and administrative departments were overhauled and organised. Mr. S. Rangaswamy died in 1926 when Mr. K. Srinivasan assumed the editorial duties also. In 1928 Mr. A. Rangaswamy Iyengar joined the office as editor.

The Golden Jubilee of the paper was celebrated in 1928; but the machinery already put in was found inadequate and a 24 page Duplex tubular rotary printing machine turning

out 30,000 copies an hour was put in with its own stereo equipment. About this time also the paper established its own process and photographic departments and the weekly and the annual numbers were remodelled and published on entirely new lines. In all these instances the *Hindu* has maintained itself in the van of progress. Offices were opened in London, Bombay, Calcutta and other places and staff-correspondents were appointed in almost every principal country in the world and every important town and city in India. The volume of news service thus received by the office grew to enormous proportions and difficulties were felt with the Government Telegraph office being located in George Town so far away from the journalistic centre. After protracted correspondence and negotiations Teleprinter machines were installed in the office and telegrams came directly to the paper from the regular news agencies and its own staff correspondents. These are not in any way mysterious Morse codes or messy tapes but are neatly typed scripts which have greatly eased the work of news editing. Apart from the post and the telegraph a new means of news communication also came into existence about this time. It is the telephone. The growing popularity of this may probably tend in course of time to replace the older methods. Long distance telephone calls from staff correspondents are recorded by an instrument known as the "Telecord". The records are made on wax cylinders like gramophone records and could be played back when necessary. One of these instruments has been installed in the office and the *Hindu* was perhaps the first newspaper in India to do so.

Mr. A. Rangaswamy Iyengar died early in 1934, and Mr. K. Srinivasan resumed once more the editorial duties.

With the passage of time and the growth of the paper the old premises at 100, Mount Road, became totally inadequate and great inconvenience was felt because of the necessity to house many of the large departments in different quarters round about the locality. The need for a large and properly designed modern office became pressing and the extensive area opposite Government House was purchased and the handsome new premises specially designed to suit the newspaper's needs was built. Kasturi Buildings, as the new premises was appropriately called, was occupied on

15th December 1939 and all the major plant and equipment were transferred practically in three days without any interruption in the publication of the paper. Highlights of the building are the administration and editorial offices, reception rooms, library, process and photographic studios, composing and rotary printing rooms, the despatch hall, foundry, stores and the paper's own electric sub-station, wide open lawns, cloak rooms for workmen, a staff co-operative canteen and a modern kiosk are the other noteworthy features. A new 32 page Duplex balcony type unitubular rotary with all the latest gadgets and a full colour printing equipment specially designed to suit the needs of the *Hindu* were installed in the new building. Conveyers help to take the printed paper from the machine itself to the despatch hall on the ground floor. Printing history was made when for the first time in the East the *Hindu* printed in full colours at the regular publication speed of 25,000 to 30,000 copies an hour. Also the Hindu is one of those very few modern newspapers to be entirely slug set without loose or hand set types.

THE HISTORY OF THE MADRAS GOVERNMENT PRESS

BY

K. P. RAGHAVA MENON,

Deputy Superintendent, Government Press, Madras

THE development and growth of the Madras Government Press from its very small beginning in the early years of the last century to the large and well-equipped factory of to-day has followed in the wake of the gradual progress in the administration of this province during the last hundred years. This relationship between the complicated structure of the administration and its increasing activities in many directions, and the size and magnitude of the Printing Press which supplies this administration with the vast quantity of printed matter required for very nearly every governmental activity, are, indeed, to be expected. In the early days of the administration of this province, the activities of the Government did not reach the dimensions they do to-day. Their need for printed matter was then small. The Government had no press of their own till 1831. Till then, by an order of Lord Clive in 1800, all its work was done in the Madras Male Asylum Press, who also published under special arrangements, an official and general newspaper called the *Government Gazette*. In 1831, the Government ceased their contract with the Male Asylum Press, and distributed the bulk of their work among various private firms. It was in the Male Asylum Press that Anglo-Indian orphans from the Orphan Asylum were taught a trade and given employment. It enjoyed, I believe, a subsidy from the Government.

In the same year, the Government opened a small press of their own called the Fort St. George Gazette Press, in

the secretariate office in the Fort St. George. The first number of the *Gazette* was issued on January 4th, 1832. Later on, the Board of Revenue installed a small press in its office to print its proceedings. This was amalgamated with the Fort St. George Gazette Press in 1859. A commission for investigating public establishments then reported that it would be more economical to do the entire government work in their own press than getting it done by private firms. This was accepted by Government; and from then, work was gradually withdrawn from private firms and the Government Press was gradually enlarged to undertake the additional work. Surplus work which could not be dealt with was, in later years, entrusted to the Male Asylum Press, which eventually became amalgamated with the Lawrence Asylum.

Some ten years later, the Government decided that convicts especially those sentenced to long-term sentences could be usefully employed in the Government Press. A branch of the Press was established in the Madras Penitentiary and from three hundred to four hundred convicts are employed there to-day. Though the convicts come under the disciplinary control of the prison authorities, the technical administration is under the supervision and control of a few paid employees of the Government Press. The work done there is almost exclusively blank forms and registers.

At that time, every district had its own Government Press under the control of the Collector of the district. The District Press printed the *District gazette* issued by the Collector once a month, and also much of the Government work for all departments in the district. There was a considerable amount of the same work which was printed at different presses. This was undoubtedly uneconomical, but the lack of proper railway communications and other difficulties stood in the way of one central organisation doing the work for the whole province. This was however done when conditions improved, and the bulk of the work was ordered to be done in the Central Press at Madras. At the same time, the Government brought about a uniformity in the forms used by their officers in the different districts. Their sizes were also made into multiples and sub-multiples of one standard size of paper, namely, foolscap. This

standardization of forms was a necessary prelude to an economical printing of the vast quantity of printed forms required by the different departments of the government in one central press.

In 1917, Government found it unnecessary to retain the District Presses and twenty of them were abolished, and their work was transferred to the Central Press at Madras. To-day District Presses exist only in North Arcot (at Vellore Jail) Coimbatore (at Coimbatore Jail) and Malabar (at Cannanore Jail). They employ convict labour. Other jails except the Penitentiary at Madras do not do any printing work, but some of the larger jails do binding work for the government departments of the district or districts close to it.

In 1905 a branch press was opened at Ootacamund, which worked as a district press for the greater part of the year, but did also secretariate work when the government moved to the hills. This was abolished in 1937. The small amount of work for the Government House at Ootacamund which used to be done at this press till its abolition is now done in a small press attached to the Military Secretary's Office.

Up to the year 1888, the Government Press was located on the ground floor of the secretariate in the Fort, when more spacious accommodation was found in a portion of the old Mint Buildings in Washermanpet vacated by the Army Clothing Department. Owing to increasing congestion and the inconvenient arrangement of the mint premises, plans for the construction of a new government central press were prepared and approved in 1912. But about that time opportunity was afforded to acquire at a cost of three lakhs of rupees the plant and premises of the Lawrence Asylum Press in Mount Road (which is, to-day The Industrial Museum and Government Book Depot, the press having been removed from there recently), and this transaction was carried through in preference to the construction of a new building.

The introduction of the reform in 1920 brought very heavy work to the press especially in Tamil and Telugu. At the beginning of 1923 the press was called upon to take over the major portion of the High Court printing, which, from 1862 had been in the hands of a private contractor. This necessitated further expansion in machinery and staff. The Mint

Building was found not large enough for this expansion and it was decided to enlarge the Penitentiary Branch Press to enable the employment of a larger number of convicts, and the use of a larger number of machines. A new building was constructed inside the Penitentiary and it was occupied in 1933-34. The existing building in which the central press was housed, being ill-suited for a large press, a part of the building was demolished and a large new two-storied building was constructed inside the old premises. This was occupied last year, thus relieving considerable congestion that existed till then.

The branch at Mount Road was abolished and amalgamated with the central press in 1937, leaving the book depot at Mount Road itself, which is more convenient than Washermanpet, for the members of the public who wish to buy books at the counter.

The government work that used to be done about seventy-five years ago in about thirty different presses, under as many different managements, is now centralised in two large presses, the Central Press and the Penitentiary Press. The centralisation of so much work has brought about many problems connected with organisation, equipment, management and the prompt and economic execution of the tens of thousands of different orders that have to be executed in the course of the year. This is a matter of recent history and the problems are being solved one after another satisfactorily.

The Stationery Office is separate from the press, and is under a different management, though the press consumes the bulk of the paper bought by the Stationery Office. In this respect, Madras is different from other provinces and the Government of India, all or nearly all of which have pursued their scheme of centralisation to the extent of combining the Stationery Office with the Press.

The Government Press employs about 1,700 workmen, excluding about 300 convicts. Many of them are well educated, and the bulk of them are literate. Thus the Press has not only the distinction of being the largest manufacturing concern of the Government but also, it has the distinction of being one of the largest employers of educated and literate workmen in the province. The Press employees have a Worker's Union, registered under the Trade Unions Act,

and recognised by the Government. It has been formed with the object of looking after the interests of the workmen. They have also a Co-operative Credit Society with a large membership, which is of great benefit to them in relieving their urgent necessities for small loans, and for clothing, etc. They have also a Death Benefit Society, membership of which entitles one's relatives to receive a certain fixed amount at one's death by contributions from other subscribing members.

The press is equipped with modern labour-saving machines in all sections. There is a very large battery of linotype and monotype composing machines enabling urgent work to be done at short notice; printing machines of different types including a rotary machine and several ingenious binding machines to do the various intricate operations in that section. The Press casts all the types it requires, having a large and complete type-foundry of its own. For work running into many hundreds of thousands of copies, there are the stereo-typing and electro-typing equipments which make duplicate plates in a very short time.

On account of the considerable quantity of electric power consumed by the Press it was found economical to purchase power at high tension. This is rectified by a pair of rectifiers and stepped down by transformers to the required voltage at the Power House which was installed in the Press nearly two years ago. This along with a fairly well-equipped mechanical workshop for doing all the ordinary repairs, and a carpentry shop makes the press a self-contained organisation, able to meet all normal requirements without outside help.

Every year the press turns out many tens of millions of copies, comprising books, gazettes, leaflets, forms, and the orders and proceedings of government departments. It binds thousands of books and supplies the entire quantity of rubber stamps required by government offices. The total annual cost of work done in the press is about Rs. 17 lakhs.

[No authority of government attaches to any statements contained above.]

STANDARDS FOR CATALOGUES OF GOVERNMENT PUBLICATIONS

BY

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THOUGH printing from movable metallic types was invented five-hundred years ago it took long for governments to begin to exploit this new invention to their advantage. However, practically every government now owns its press and has become perhaps the most voluminous if not the most influential publisher in its own territory. The central government and the different provincial governments in India bring out hundreds of publications every year. The government of the United States of America which is perhaps the most prolific governmental publisher in the world issues thousands of publications every year. That government has also adopted every possible publicity method open to a publisher. It has seen the wisdom of making a complete free deposit of its publications in large libraries in different centres not only in its own territory but also in foreign countries like India. Its catalogues are far more numerous, far more exhaustive and far more scientifically prepared, timed and cumulated than any other. We have much to learn from its example.

So far as the governments in India are concerned, though they have entered the sphere of printing and publishing they do not appear to have yet adopted the helpful, though apparently aggressively commercial, outlook and methods of the government of the United States of America. In this

paper I propose to confine myself to one of the vital tools necessary for marketing publications effectively and widely —I refer to the catalogues of government publications. It is no longer wise to prepare these catalogues without regard to standards.

Various causes have contributed to the government publications gaining in value in our times.

(1) In the social sciences, there is an increasing tendency to use primary sources and original data in preference to secondary and theoretical materials. Hence libraries feel the need for making a complete collection of government publications and serving them to readers without waste of time;

(2) The content of such publications has greatly increased as a result of most governments having entered upon scientific research on a large scale. Their findings are indispensable to a pure scientist and are of practical value in nearly every walk of life; and

(3) With the rapid growth in the complexity of modern life government itself has become a problem calling for serious research as a basis for legislative, executive and administrative action. The help of universities is frequently sought in addition to that of *ad hoc* research institutions established by the government itself. This is reorienting and concretising research outlook involving an intimate knowledge and use of government publications.

The result is that government publications have to be acquired by research libraries to a greater extent than before. But the existing trade catalogues of them are found to be inefficient as checklists at the book-selection stage. Government publications should therefore be classified and catalogued more fully and exactly than before. Neither the publications themselves nor the trade catalogues are adequate to ascertain the dates of commencement and discontinuance of government serials. This makes the work of classification and cataloguing difficult and calls for a lot of time. Even so problems relating to changes in name and scope and various other idiosyncrasies either go unsolved or get only partially solved after arduous work and inordinate waste of time.

The fact is that the catalogues published by the govern-

ments, particularly in India, are not adequate for the purposes to be served now by the larger libraries which cater to the needs of research workers. They disclose an amazing lack of uniformity in form and completeness of entry and of bibliographical information. Too frequently, vital bibliographical details are lacking.

To illustrate these observations examples are given under different heads from the following six catalogues published by different governments in India:

(1) INDIA. Catalogue of publications, etc., 1932;
(2) MADRAS. Catalogue of government publications, etc., 1939;
(3) BOMBAY. Catalogue of publications, etc 1939;
(4) PUNJAB. Government publications, general catalogue, etc., 1939..
(5) ASSAM. Catalogue of books and publications, v. 2. 1940; and
(6) CENTRAL PROVINCES. Catalogue of publications, etc., 1936.

Main Entry

Heading

Practically all these catalogues choose for their main entries neither the name of the author (personal or corporate) nor that of the specific subject. Nor is there any similarity among them in the choice of the main heading. The Central Publication Bureau of the Government of India chooses either the title of the book or sometimes even the name of the serial to which the book may belong; occasionally it also chooses for the heading the dominant word or words in the title

e.g. 1. GRANT-IN-AID TO SCHOOLS IN BRITISH INDIA —by J. A. Richey, C.I.E. (Title heading).
2. FAUNA—The fauna of British India including Ceylon and Burma. Coleoptera by W. W. Fowler (Series heading).
3. PROVIDENT FUND. Scheme for provident fund for teachers in aided schools in Secunderabad and in Residency Bazars (Dominant word entry).

The Government Publication Depot of Madras generally

chooses for heading either the dominant words in the title or the names of the departments responsible for the publication or sometimes words indicating the form of exposition of the publication in preference to the dominant word

e.g. 1. INDUSTRIES. Preliminary report on the survey of cottage—in the Coimbatore district (Dominant word heading).

2. INDUSTRIES, DEPATRMENT OF. Administration report of the—for the year ending 31st March, 1935 (Corporate author heading).

3. REPORTS. Report of the Committee on the indigenous system of medicine by Dr. Oosman Sahib Bahadur, pt. 1.—Report with appendices. 1923 (Form division heading).

The office of the Government Printing and Stationery, Bombay, generally chooses for heading the dominant word of the title not necessarily a noun. Occasionally it also chooses the name of the corporate author or a form division

e.g. 1. INDUSTRIAL. Report of the Industries Committee (Dominant word heading in the adjectival form).

2. COURT OF WARDS. Report on the estates under management under the Bombay Court of Wards Act and the Gujarat Talukdars Act in the Bombay Presidency (including Sindh) for 1934-35. (Corporate author heading).

3. RULES. Smoke Nuisance Act with rules (Form division heading).

The choice of heading in the catalogue of the Punjab Book Depot is nearly on the lines of that of Bombay.

In the catalogue of the Assam General Book Depot there is a far greater tendency to make the entries title entries, although here and there we find examples of preferring the dominant word of the title.

e.g. 1. ACCOUNT. Account of the Chittagong hill tracks (Title entry).

2. CHANG GRAMMAR. Outline of the—by J. H. Hutton, Esq., I.C.S.

In the catalogue of the Government Press Book Depot of the Central Provinces, we find that the choice of heading

falls on names of subjects or form divisions

e.g. 1. EXAMINATION. Result of high school entrance and scholarship examination of the Nagpur Circle for 1935 (Subject heading, though not specific subject).

2. RULES. Compulsory education rules, Berar.

Canon of Consistency

Even the few examples cited are sufficient to show that the Canon of Consistency is thrown to the winds practically in all catalogues. In such a situation one would expect cross reference index entries to give relief to the bewildered user. But such entries are conspicuous by their absence except in the case of the Madras catalogue. While there is such scant respect to the Canon of Consistency even in the choice of the heading one need not wonder at finding something worse in the rendering of the heading, and in the style of printing it.

Canon of Prepotence

The Canon of Prepotence suffers even more in these catalogues. It is often the most impotent word, which can be associated with a book, that gets perched up as the first word of the heading.

1. Here is an entry in the Government of India catalogue:

REPORTS, DEVELOPMENTS IN LOCOMOTIVE PRACTICE. Report of the handling of fuel, layout of engine, changing stations and other miscellaneous developments in the United States of America, by R. C. Case. A.M.I.C.E.

The propotential words in this entry are "Case" for author entry and 'Locomotive Practice' for subject entry. Either the one or the other should be given the leading position according to the Canon of Prepotence. The former comes last and the latter comes after the two impotent words "Reports" and "Developments".

2. The Madras catalogue has the following entry:

COLLECTION, ART LOAN. Art loan collection at the office of the Director of Public Instruction, Madras.

The Canon of Prepotence would give the leading position

to "Art Loan", if this is either a subject entry or a first-word-of-title entry. It cannot accept the promotion of the important word "Collection" to the dignity of entry word on any ground whatever.

3. One example from the Bombay catalogue:

MANUALS AND HANDBOOKS. Manual of the index slip system of conducting, registering, titling and indexing of official correspondence by F. G. H. Anderson.

Here a phrase describing the form of the book is given the privilege of occupying the prepotential position in the entry. Certainly the names of the author and of the subject have every right to lodge a protest by referring to the Canon of Prepotence.

4. A similar remark applies also to the following entry of the Assam catalogue:

HANDBOOK. Assam Police motorists.

5. The Central Provinces Catalogue has several such entries which offend the Canon of Prepotence. Here is an example.

REPORTS ON CENSUS. Census of India, 1911. V. 10. Central Provinces and Berar. Part 2. Tables.

Here the word "Report" is improvised from outside the title of the book and made to usurp the prepotential position in the entry in defiance of the Canon of Ascertainability also.

The Punjab catalogue appears to show a greater regard to the Canons of Prepotence and Ascertainability.

Main Entry

Bibliographical Details

There is great paucity of bibliographical information practically in all the six catalogues—no format, no size, no collation and no date of publication. But what is more tantalising, here and there we find an occasional entry showing some of these details. A series note is however given wherever necessary.

Added Entries

Except for the cross-reference index entries in the Madras catalogues there is no evidence of added entries of any well known type like author index entries, collaborator index entries and series index entries in any of the catalogues.

For example the Government of India catalogue does not help one to find out readily what publications had come out so far, say in the Educational Pamphlet Series. Here again the Madras catalogue appears to be slightly better. For it has certain series entries like the records of the Madras Government and the Teachers' College bulletins. But there is a snag even here, because these series entries happen to be the sole entries for the publications brought together under them. Again research publications like Hirananda Sastri's *Bhasa and the authorship of the thirteen Trivandrum plays,* for which obviously and rightly the Archæological Department declines to take any authorial responsibility do not get an author-entry, under Hirananda Sastri at least as an added entry, the main entry having chosen Bhasa as the heading—perhaps meant to be subject heading. Hirananda Sastri does not get even an index entry in what is called the alphabetical index at the end of the catalogue. In the suppression of the author entry all the six government catalogues appear to act alike.

Arrangement

The catalogues of Madras and Bombay are strictly alphabetical. This statement should not however credit them with the merit that is popularly attached to an alphabetical catalogue, *viz.,* easy location by a man in the street. This merit they loose as a result of inconsistency in the choice and rendering of headings. Still since they are of the alphabetical form there is no alphabetical index nor is there a classified index. Thus these two catalogues are of the unipartite variety.

The catalogues of the Assam and Central Provinces are also of the unipartite type but for different reasons. The Assam catalogue breaks the entries in five alphabetical sequences corresponding to the five broad divisions into which the books are grouped—the divisions however having no subject import whatever. It is an unnecessary meaningless breaking of the alphabetical sequence. In a case like this one would expect a consolidated alphabetical index covering all the five parts. This is missing and hence the unipartite nature of it.

The catalogue of the Central Provinces again breaks the

alphabetic sequence into not merely five but twenty-five bits, one bit corresponding to each department or sub-department of the government. It is notorious (from the cataloguer's point of view) how unstable the names and groupings of the government departments are. The Canon of Permanence is spited beyond measure by giving so fundamental a place to the names of the department in the arrangement of the entries. This however is an aside. This catalogue passes for a unipartite one by refusing to provide a consolidated alphabetical index for all the entries.

The catalogues of the Government of India and the Punjab are bipartite ones. The first part which is made up of the main entries, which occupy the major portion of the catalogue is syndetic. From another point of view it may be described as alphabetic-classed; for, the classes that follow are not in a systematic order but in an alphabetical order so far as the major classes go. Within each major class there are sub-classes whose order is non-descript. For example in the Government of India catalogue there is a major class entitled "Agriculture and forestry". The sub-classes in it are general, agricultural ledger, Pusa bulletins, forestry, forest commercial products, insect pests, memoirs, records of the Botanical Survey, commercial collections and reports and proceedings.

Again 'Agriculture' is a main class in the Punjab catalogue. But its sub-classes are general, seasonal notes, fisheries and horticultural.

It need hardly be mentioned that neither the main classes nor the sub-classes are in conformity with any accepted scheme of classification. The index part which formally renders them a bipartite type of catalogue is only of nominal value. It is very scanty and cannot be of much value.

Periodicals and Serials

Another matter in which one who seeks light from the government catalogue is vexatiously disappointed is that of giving the pedigree of governmental periodical publications which are as prone as any other periodicals to the ills of births, deaths, resurrections, marriages and divorces and in fact to all the eighteen complexities or disorders enumerated in the *Classified catalogue code.*

One example will do. It is learnt[1] that the Imperial Council of Agricultural Research took over the publications previously issued by the Imperial Department of Agriculture. This Council which was established in 1929 introduced several changes in the publications with effect from January, 1931. One of these changes is the continuation of the *Bulletins* and *Memoirs* (in several series) issued by the Agricultural Research Institute, Pusa, and by the Department of Agriculture respectively in the form of two new periodicals, *viz., Indian journal of agricultural science* and *Indian journal of veterinary science.* All these four sets find a place in the Government of India catalogue. But there is nothing whatever to indicate either their pedigree or their inter-relations. There is surely nothing gained by withholding this information from the users of the catalogue be they engaged in book-selection or cataloguing. Nor can it be claimed that it uniformly abstains from such pedigraic annotation. For in another page of the same catalogue we find under *Agriculture and livestock in India* the useful and complete pedigraic annotation "issued bimonthly from January 1931. This supersedes *Agricultural journal of India.*".

The entry under the latter also has the half-hearted annotation " discontinued with effect from 1931 " without any indication of the new name under which it persists in continuing as so definitely stated in the earlier annotation mentioned above.

Such considerations indicate the need for

(1) the formulation of a set of standard rules for the preparation of the catalogues of the publications of the central and provincial governments, local bodies and government institutions;

(2) a scheme for the issue of a co-ordinated set of periodical catalogues of current publications with cumulations at convenient intervals and of periodical catalogues of publications in prints; and

(3) the publication of an exhaustive retrospective catalogue of all the publications of the government,

[1] *Review of agricultural operations in India, 1928/29.* 1931. P. 186.

to the extent to which it does not exist.
The last mentioned work will involve search in all libraries which have stock of government publications.

Some Suggestions

Every catalogue, whether it belongs to category 2 or 3 mentioned above, should readily show each publication under

(1) its specific subject;
(2) its corporate governmental author; and
(3) its personal author, if any, or its title, if it is fanciful and not significant, or any catchword under which it is likely to be called for, as in the case of reports of government commissions which come to be called for under the name of the chairman.

One form of catalogue which can answer all such questions is the dictionary catalogue; another form which is gaining ground and is advocated in the publications of the Madras Library Association is the classified form with an alphabetical index. In fact, the present plea is that the catalogues of the government publications should conform to the standards of library catalogues except for the complete omission of analytical entries. This cannot be called a tall order. Enterprising quasi-governmental corporate publishers like the Columbia University Press have already recognised the wisdom and the necessity for conforming to such standards.

The Columbia University Press has adopted the dictionary form which is the fashion in America. For the classified form with alphabetical index the printed catalogues of the Madras University Library may be taken as showing the way. Such a form of trade catalogue should be tripartite, that is, should have three parts:

(1) a schedule of such classes as get represented in the catalogue;
(2) the classified catalogue in which the books are arranged in a filiatory order on subject basis; and
(3) the index giving in one alphabetical sequence all added entries such as author entries, personal or

corporate, collaborator entries, title entries, series entries and cross reference index entries.

The first part is not to mention any publications. It should be merely a list of the chief classes under which the publications are grouped in the second part. Except in the cumulated catalogues of some considerable size this part will be so small that it need not be fitted up with an alphabetical index of the classes. But in all annual volumes or catalogues covering a large range of time, the schedule of classes is likely to be very long and it will add considerably to convenience if an alphabetical index of classes is provided.

In the second part each publication is to receive one and only one entry. It may be called the main entry and it is to be as full as possible.

Its leading section is to be the call number of the publication by the ordinal values of which alone the entries of this part are to be arranged.

Its heading should be in order of preference the author of the book, corporate or personal as the case may be, a collaborator, pseudonym or first word of title.

The title-part is to be a faithful transcript from the relevant part of the title-page of the publication, with indicated omissions of puffs if necessary, but never mutilated or transformed or reconstructed in any manner. Then should follow the edition if it is not the first; then the year of publication except that in the case of annual catalogues the year may be omitted unless the publication was actually published in some other year though included in the catalogue of a different year for special reasons. Then should follow format and collation with full details about pagination, illustrations, maps, plates, etc. The name of the printer or publisher need not be given except in the case of the few government publications which occasionally get printed and published by other than government agency.

Then the series note should come, if the book belongs to a series. It should show the name of the series, sub-series, etc., and the serial number of the publication in them. This note should be put in circular brackets.

Lastly a brief annotation may be added in smaller type if the value of the publications is not readily inferable from the name of the class in which it is placed and its title.

If the publication is a periodical one, be it a periodical or a serial, an additional note should be added in square brackets showing the periodicity of its volumes and of its fascicules (in case of periodicals), the year of its commencement, and the year of its termination if any.

Further hardly any periodical publication persists for any appreciable length of time without developing some idiosyncrasy or another.[2] All such idiosyncrasies should be indicated in the form of an additional note enclosed in crooked brackets in some standard manner.

The third part should consist of all the added entries which have been named Book Index Entries and Cross Reference Index Entries in the *Classified catalogue code.*

They may be brief consisting of shortened heading, followed by shortened title and ending with call number in the case of books and class number in the case of periodical publications.

A complete set of rules for the preparation of Main Entries as well as Added Entries is given in the *Classified catalogue code* except for format and collation.

Whatever inner form is adopted for the catalogue, the physical make up of the page should be carefully designed to make the catalogue easy to use, pleasing to the eye, and, at the same time, not unduly expensive. Variety in type to distinguish headings, sub-headings, etc., and skilful display of class headings will make the catalogue easy to use but add to the cost. A moderately wide margin should be allowed, partly to give the catalogue a pleasing appearance and partly to allow space for notes.

It must be admitted that any satisfactory scheme of catalogues for government publications will cost the government more money than the lists published at present. The scientific preparation of catalogues with full entries will involve a staff of permanent trained classifiers and cataloguers, so that correct methods may be introduced and continuity in practice maintained. Not only the cost of preparation will thus increase, but also the cost of printing. In times such as the present it would seem unreasonable to

[2] Ranganathan (S.R.) *Classified catalogue code.* (Madras Library Association, publication series, 4). Section 81.

suggest such expenditure except that catalogues are urgently needed. But some governments are already finding that satisfactory catalogues greatly increase the sale of their publications and so, to some extent, pay their way. Furthermore, the governments have assumed the responsibility of issuing information on a wide range of subjects; the small relative cost of improved catalogues for this information would so increase the value of their publications as to be worth the additional expense.

Before closing we cannot refrain from making an appeal to the Government of India and the governments of the several provinces to reorganise the catalogues of their publications along helpful lines.

If necessary, a committee may be appointed, in the first instance, to examine the question and make concrete proposals. The question of profit and loss should take into consideration the human value of the enterprise. The function of government as national publisher is to make known as widely as possible essential facts and problems affecting the community—national and international—which they investigate, print and publish. Viewed as business proposition, the practice of the forward business-houses like the Columbia University Press shows the way in such matters.

MARATHI ENCYCLOPÆDIA

BY

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THE idea of preparing an encyclopædia in Marathi had originated in the beginning of the twentieth century. Stray attempts were made by issuing a monthly serial. One such serial actually ran for more than two years. But the articles were quite elementary.

Dr. S. V. Ketkar, M.A., PH.D., while he was in America came across some publications of this nature and particularly the *International encyclopaedia* which made an impression on him. He had also worked there, while taking his education, as a canvasser for the same for some time. He then studied the comparative merits of different encyclopædias that were published in the English language and noticed that an English encyclopædia was not helpful to the American as it was written from the English point of view.

This led him to conclude that knowledge in all possible subjects must be made available to our people by our writing in our own language from our own point of view.

The main idea of preparing an encyclopædia from an Indian point of view was not in the beginning quite clear to many scholars. It had therefore to be pointed out that an encyclopædia written in the English language like the *Encyclopaedia Brittanica* actually gave much information which may be useful to an English reader but an Indian reader may have very little interest in most of them. For instance, nine-tenths of the biographical articles like those of musicians, dramatists, actors or persons known in various fields in Europe can hardly be of any use or interest

to an Indian reader. Similarly nearly half the articles of geographical interest would be of little use to an Indian. Articles on Christianity, its various sects and topics could hardly be intelligible to the majority of people in India belonging to the Hindu and other religions.

The Marathi encyclopædia was intended to be a meeting place for the traditional knowledge of olden ages and the modern scientific ideas. It had to present to the reader in a nut-shell the substance of all the knowledge of the Maharashtrian scholars in their own tongue. It was also intended to help the unification of eastern and western civilisations. The object in view was further to widen the sphere of work of the Maharashtrians by giving them knowledge of various trades, crafts and industries in their own tongue. The Hindu society was also to be made cognizant of its interests in the world struggle and its proper position in the world.

While Dr. Ketkar travelled in India he delivered lectures on different subjects and also talked about his plan of the encyclopædia especially in Poona and Nagpur. But as he himself belonged to the Central Provinces he preferred to start the work in Nagpur instead of in Poona. Besides he had more friends in the Central Provinces than in Bombay. So he thought he could get more help and support there than in Poona.

His first supporters in Nagpur were Dr. Munje, Dr. Cholkar and Mr. M. K. Padhye. He also secured the support of the leaders in Maharashtra like Lokmanya Bal Gangadhar.

In the beginning the idea of financing this work was to create a Trust by collecting donations and subscriptions. But actually Dr. Ketkar found that it was easier to collect advance subscribers for the work on the instalment system.

Later, he thought it more advisable to form a joint stock limited company, the amount of each share being equal to the price of one set of the Encyclopædia. Those who took 15 shares or more were to be permanent directors of the Company. In this way he secured subscribers to the book as well as the initial finances for production.

The Company was registered with a capital of Rs. 50,000 divided into 500 shares of Rs. 100 each; which was also fixed as the advance price of a whole set of the Encyclo-

pædia consisting of 20 volumes of about 500 pages each.

An additional amount of Rs. 50,000 was to be collected by enlisting 500 subscribers from amongst those who wanted the work but were not willing to run the risk of being a shareholder.

The idea in the beginning was that this amount of Rs. 1,00,000 would be enough to finance the whole scheme; Rs. 40,000 being required for printing and Rs. 60,000 for the preparation. But actually the expenditure ran much above the initial estimate. The capital of the company was therefore raised to Rs. 1,00,000 by issuing 500 shares more, the additional amount being collected from advance subscribers to the work. The rates of paper and printing also rose very high on account of the war and consequently the rates of subscription had to be raised so as to bring the price up to Rs. 175. 3,000 copies were printed and subscribers were registered. The work actually took 12 years and the period being a long one some subscribers dropped out in the middle of the work. However, we managed to make both ends meet. Some members of the staff had to be paid the balance of their outstanding salaries in the form of sets of the Encyclopædia that were lying on hand.

No donation from either the Government, the University or any State was received. In fact the idea of receiving donations was studiously avoided, as it was felt that all possibilities of influence being brought to bear upon the Editor should be avoided. The Bombay Government and the States were approached to support the scheme by purchasing a number of sets in advance to be distributed to schools and libraries in their territory. The only State that responded to this appeal was the Government of Baroda who purchased 20 sets for the advance price of Rs. 100 each. The Government of Bombay very reluctantly purchased 15 sets after the last volume was actually out. No other State contributed any substantial amount.

The whole work was to consist of 20 volumes of 500 pages each of super royal octavo size. Out of these 5000 pages were to be given to general subjects and 5000 pages to scientific subjects. Out of the first 5000 pages, 3500 pages were to be devoted to subjects concerning India and Indian Civilization generally and 1500 were reserved

for articles on foreign countries, etc. Before the topics under which information was to be given were selected books on different subjects were read and analysed, and the topics found after such analysis were selected as subjects for articles. A general scheme of the distribution of the 10,000 pages was however prepared and printed and was sent for criticism to various newspapers and scholars. No criticism however was received.

Various scholars in different subjects were approached to contribute articles and section editors were appointed especially for scientific subjects. These latter were to find their own contributors and were to be responsible for their own subject. However it was ultimately found that outside help could not be relied upon to any great extent. We received articles only on about 4 or 5 sciences from outside and the rest had to be done in the office itself. The general portion was wholly compiled in the office. On an average a staff of some twenty was engaged for twelve years in the editorial branch under a managing editor. Special attention was paid to such subjects about Indian culture and Civilization are are not found in the English and the Western Encyclopædias; for instance, the whole of Vedic literature was analysed and a full knowledge of the sacrificial system was acquired by employing Shastris who were well versed in the Vedic lore and ritual and who had actually taken part in performing various sacrifices. Also books on Indian architecture and astronomy in Sanskrit were studied under expert guidance and articles were prepared with their help. More attention was paid to topics of Indian interests than general subjects about Western countries which can be found in any English Encyclopædia.

After discussing the scheme with various scholars and after working for two or three years it was found that to create a general interest in the readers it would be better to put certain subjects in the form of monographs than deal with them under different topical heads. It was, therefore, planned to publish about five volumes as introductory volumes, *viz.*: (1) India and the world (2) Vedic lore (3) World before Buddha (4) World after Buddha (5) History of Science. In these volumes the relation of India with the world, the present position of India in the

world politics and the social condition in India have been discussed and a general history of the civilization of the whole world is given in narrative form. Special stress was laid on Vedic civilization about which a great research on quite new lines based on the ritualic literature and sacrificial system has been given, and a detailed analysis of all the Vedas illustrating the social condition of those times is also given. One volume has been devoted to the history of various sciences.

Thus about 3000 pages were taken by the introductory volumes. So the topical articles could not be accommodated in the remaining 15 volumes. The number was, therefore, increased to 21, and an extra volume was added as the general index. Besides, a separate supplementary volume was devoted to India and a similar volume was planned for Maharashtra which, however, did not come out.

The incidental benefit derived by the Marathi language from the completion of the Encyclopædia was also not small and could be stated as follows:—

(1) A group of scholars was created in Maharashtra, that were taught and became well versed in modern methods of research and the preparation of reference books. These actually continued the traditions of the Encyclopædia by bringing out reference works in Marathi like the Marathi Lexicon, the Biographical Dictionary and books on ritual and other topics.

(2) A bibliography of all the Marathi books published so far and the articles in important periodicals was prepared and published as a first step to know the extent of Marathi literature.

(3) A scientific terminology on systematic lines was prepared and used in the articles in the Cyclopædia which led to the growth of scientific literature in Marathi. Efforts are still carried on to complete the scientific terminology and bring uniformity in the same.

(4) This big work created a confidence in the public that even such huge undertakings could be brought to a successful end through the efforts of scholars on the strength of the support of the middle class alone without relying for help on the Government, Universities or States or even the rich public.

ROMANCE OF LAL KITAB[1]

Some Musings

BY

C. F. H.

THACKER'S Indian Directory was first started in 1863. There had been a Directory before Thacker's; it was published by a firm called Samuel Smith and Company at the Bengal Hurkaru Press, Hare Street, Tank Square, now called, Dalhousie Square. It was subsidized by the old John Company, and when its charter was cancelled, the Directory came to an end.

The Directory of 1863 was a small affair of 512 pages brought out by my grandfather, Mr. William Spink, who had established a printing office in Fancy Lane. The venture was successful and the whole edition was sold out in a very short time.

The success of the new Directory brought a rival into the field. It was promoted by a Mr. Roussac. Unfortunately for the new-comer the laws of copyright were transgressed and in the law suit that followed Roussac lost his case and his Directory disappeared.

Thacker's Bengal Directory, as it was then called, came out regularly, year by year. In many ways it was a model of careful compilation and has been often cited in the law courts. I remember once getting a subpœna to give evidence regarding a disputed succession to a Raj. The case turned

[1] Adapted by kind permission, from *Indian print and paper* Sept. 1940. Pp. 39-40.

on the documentary evidence of a return submitted by the Raj about three years before and it happened that we had the particular document in our possession.

There were no further attempts at rival publications until McCluskie, a house agent in Calcutta, made one. There is no doubt that his was a good Directory but Thacker's was too firmly established to be dethroned. A good deal of money must have been lost in this enterprise.

The labour of compilation of such a voluminous work of reference was great and necessitated a permanent staff working all the year round. Daily papers had to be studied for notices of deaths, changes in appointments, etc. The work was continuous and most laborious.

In the very early editions of the Directory, class distinction was obvious. Merchants and agents had a section to themselves and any one connected with trade went in under the heading of "Trade List". But this had to give way to a more liberal distinction as complications arose. The matter came to a head in a case that was filed in the High Court, where a firm of agents claimed damages for being included in the "Trade List". The case did not go up for hearing as it transpired that the firm in question had sold cigars in retail. After that these distinctions were swept away and everybody doing business in Calcutta went in under the general heading "Commercial".

The title of the directory was changed in 1885 to *Thacker's Indian directory*. In that year Bombay and Madras were added, with all the machinery of their respective governments and all professional and mercantile classes. In 1887 the newly acquired country of Upper Burma was also included.

In 1887 there was added an innovation that proved a success. In that year was included for the first time an alphabetical list of Indian inhabitants. The publishers had an idea that this new feature might prove popular and they printed an extra 5,000 copies. This was taking a risk as every copy printed cost twenty rupees, apart from overheads. The profits came from advertisements. Results, however, showed that the new extensions were justified, as the Directory for 1887 sold out shortly after publication and copies were hawked about at fifty per cent. above the published price, which was twenty-five rupees.

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ALL KINDS OF BANKING BUSINESS TRANSACTED

After that the sale of the Directory settled down to a steady issue of about 2,000 copies annually. But in the temporary boom that followed the close of the Great War the sales rose to 5,000.

For fifty years at least, the printing was hand-set with minion type specially cast for the purpose by Miller and Richards. But at long last, hand-setting became too great a labour, and now the whole book is, I believe, set on the Linotype.

For years there was a system whereby Government offices were supplied from the first supplies, the order being placed *en bloc* by the stationary office. This used to bring in a bumper cheque annually of about Rs. 12,000.

During the last Great War difficulties arose with regard to materials. Imported paper was not easy to obtain and local mills were overworked. However, we succeeded very well with Titaghur paper and the issues that were printed at that time have lasted well. It was a big job and we were grateful to the mill for helping us out of a difficulty at the time. This certainly established the merit of the Titaghur enterprise.

A worse problem than paper was ink. There were no local manufacturers and raw stocks were at a premium in England; so that printers' ink became not only difficult but almost impossible to procure. At last a combination of Calcutta printers imported large quantities of ink from America. The ink came duly to hand but it was not so suitable for tropical use as British brands. I refer to the first lot that arrived. Later the quality improved and became more suitable.

Looking through the earlier issues of Thacker's Bengal Directory as it was then called, one cannot help being struck by the way in which the ink and paper have stood the test of time. My grandfather brought out with him as a speculation a large quantity of very high grade ink and this was used in the first issues and for many years afterwards, and the brand became firmly established in the Indian market.

In those days gold blocking was a difficulty and for years covers were made in England. But later facilities in India enabled this work to be carried out equally well locally.

There was one curious difficulty that arose in the eighties. The amount of handling that individual copies received made them not only shabby but fall to pieces. The result was that

special Martini binders were imported, which gave the necessary resistance for standing up against rough usage.

A humorous incident happened when these Martini machines arrived. They were in pieces and no one could put them together. At least three engineering firms in Calcutta tried their hands at it and gave it up. Then just as the situation looked quite hopeless an elderly maistry from the Singer Sewing Machine Company came in and within a couple of hours the binder was working like a pipe dream. The maistry's bill of five rupees was paid and he departed perfectly happy. I believe the makers had omitted to send one small part and the maistry's knowledge of sewing machines enabled him to discover the omission and supply the defect.

The growth of the Directory has been remarkable. The first issue in 1863 consisted, as I said, of 512 pages, printed in large open style. Thirty-six years later it had expanded to 1,437 closely printed pages. To-day it is over 2,000 pages.

HIGHWAYS AND BYWAYS OF REFERENCE BOOKS

BY

S. R. RANGANATHAN AND K. M. SIVARAMAN

IT is a matter of common knowledge that the invention of printing from movable metallic types five hundred years ago has so cheapened reproduction of books that the dissemination of knowledge among contemporaries has become easy. Perhaps it is also equally well-known that printing has similarly rendered transmission of knowledge and culture from generation to generation far more easy and accurate than in the days of manuscripts and oral tradition. But perhaps it is not so widely recognised that printing has stimulated the coming into existence of new types of books. One such is the periodical publication. It has been treated in an article entitled *Nascent thought from Madras*,[1] in our first volume. The main purpose served by that type is the facility it gives to get one's mental tension released as continuously as it gets set up by one's creative thought. Another use is that it makes it possible for thinkers to specialise in topics of great intension without being obliged to pile up their findings in their minds or in manuscripts until they cover an extent of knowledge or reach a size warranting appearance as a book. It is a type designed to relay and broadcast the results as and when each little idea gets developed. But for printing, this monumental achievement of modern man in co-operative thinking would perhaps have been impossible.

[1] *Memoirs of the Madras Library Association*, 1940. Pp. 85-97.

Value

We propose to devote this paper to a consideration of another new type of books *viz.*, reference books. Perhaps their chief value is in the relief they give to the load on memory. They not only take the place of memory but also extend it to a dimension which would have been impossible but for their invention. Again the possibility of cheap revised editions assures for us that what is fed to memory by these books can be kept ever accurate and up-to-date. This type of books is responsible for a subtle form of co-operation in collecting and assembling facts and figures from every possible source.

Major Groups

We may recognise three broad groups of reference books:

(*i*) Encyclopædias and dictionaries;

(*ii*) Year books, directories, almanacs and similar annuals; and

(*iii*) Bibliographies.

The first group may be said to give something about everything and the second, everything about something. The third group is altogether of a different nature. It comprises, so to speak, books on books. Its function is not so much to give information either on one or on many topics but to inform us what books give such information. The output of the printing press is so great to-day and covers so wide a field of knowledge that it is beyond the capacity of any single individual to know what all is said from time to time on a given topic or what all topics get enriched by new books and contributions to periodicals. And yet it would be futile for any serious worker to pursue his study and investigation without a knowledge of them. Division of labour is indicated as the only solution and so we have a new sub-profession attached for the time being to the library profession—the profession of bibliographers. Just as it is the business of the encyclopædia to digest known knowledge for the benefit of others and just as it is the business of the compiler of annuals to assemble the latest information on given subjects for the benefit of others, it is the business of bibliographers to search for, analyse, taste, evaluate and list in a filiatory manner the

published literature on different topics for the benefit of others.

Definition

The above three groups do not, however, exhaust every possible type of reference books. There are also other forms like tables, atlases, handbooks, statistical data and digests. By mentioning all these we have incidentally given an enumerative definition of the term ' reference books '. It is doubtful whether a more satisfactory definition of the term has yet been arrived at. It may, however, be noted that one common feature of all the enumerated forms of reference books is that they do not admit of continuous reading. But they are designed to facilitate reference as and when some specific piece of information is needed.

Quantity of output

We in India have not yet become sufficiently accustomed to the use of reference books. We have not realised the great contribution which this type of books makes to national efficiency and economy. At any rate we do not have a sufficient number of persons set apart among us to produce the three kinds of reference books described above. The correlation table at the end will give an idea of the extent to which reference books have developed in a community in which books play a considerable part. It gives the number of reference books of different forms which existed in print in Great Britain in 1938. 2,500 is their approximate number. A more significant figure is the proportion this number bears to the total number of different books in print in that year. It is estimated on the basis of the *Reference catalogue, 1938* that the number of different books (excluding periodicals) that were available for sale first hand in Great Britain during that year was 1,50,000. Thus the proportion of reference books to the total number of books was approximately 1·7%

Linguistics

A closer scrutiny of the correlation table would yield some further results. Naturally the main subject, Linguistics, is the richest in reference books. It has 765 to its credit or

roughly 31% of the total number of reference books. Excepting for one linguistic atlas and one cyclopædia all the rest are dictionaries. This is but natural. For the need for looking up meanings of words and phrases in one's own language and in other languages would arise more frequently than any other form of reference-requirement. In reality linguistic dictionaries are even more numerous. For dictionaries that specialise in terms belonging to specific subjects have been counted in the correlation table with those subjects and not with Linguistics. Nevertheless they are linguistic dictionaries. Hence their total number should really be taken from the foot of the column headed 'Linguistic dictionaries' rather than the end of the row labelled 'Linguistics'. If we do so we get 939 for their total number. This will raise their percentage to 38.

Literature

Next in order of richness of reference books comes the main class Literature. It has to its credit 8% of the total number of reference books or 189 in absolute figures. One interesting feature is observable among its reference books. They are more or less evenly distributed among the three forms: bibliographies, cyclopædias and anthologies. This may be considered a natural distribution.

Economics

Economics occupies the third place. It accounts for 7% of the total number of reference books or 178 in absolute figures. This figure of Economics should not however be taken at its face value. Because 96 out of the 178 reference books are tables—tables of interest and exchange rates used in banking and tables for the calculation of wages and salaries used by accountants in all economic and other organisations. While the use of these 96 tables are in the sphere of economics, their contents are naturally of an arithmetical nature. Excluding these tables the majority of reference books are of the nature of dictionaries of economic terms. Cyclopædias also are nearly equal in number.

Engineering

Next in order comes Engineering. It has 160 reference books to its credit. They form a little over 6% of the refer-

ence books in print. Here also 'tables' account for more than half of them. Next in numerousness come handbooks and cyclopædias. Dictionaries of engineering terms are also as many as nine in number.

Geography

Geography claims 5% of the reference books as 129 belong to it. But 86, forming two-thirds of these, are atlases. Next in order of numerousness come cyclopædias with 19 items, dictionaries of technical terms and guide books for travellers each claiming 8 to its share and bibliographies of which there are 7.

Useful Arts and Religion

Useful Arts and Religion compete for the next place as they have 111 and 115 reference books respectively. In other words, each accounts for 4½% of the total number of reference books. There is however one fundamental difference between these two subjects. Nearly half the number of books in religion are cyclopædias. About a fifth are dictionaries of technical terms and about an eighth are bibliographies. But in useful arts the first place goes to dictionaries of technical terms. They account for nearly a fourth. Cyclopædias, tables and yearbooks come next in order accounting for 27, 21 and 14 respectively.

Medicine

Medicine has 103 reference books which work up to nearly 4% of the total number. 41 of these are cyclopædias and 33 are anatomical or pathological atlases. There are eleven dictionaries of technical terms, thus leaving very few volumes for other forms of reference books.

Mathematics

Turning our attention to subjects which have scored less than a century, Mathematics comes first among them. It has 93 reference books, but 83 of them are tables of various kinds and 5 are star atlases and 3 are bibliographies.

Law and other subjects

Law comes next in order with 32 cyclopædias, 24 digests, 11 bibliographies and 6 dictionaries of technical terms. Cata-

logue of manuscripts and printed books come closely thereafter with Fine Arts in their wake. Each of the remaining subjects accounts for 1% or less of the total number of reference books.

Linguistic Dictionaries

We shall get another view of the picture by examining the proportion in which the reference books are distributed according to their forms. As stated already linguistic dictionaries are 939 in number and form 38% of the total. Excepting Mathematics, and Zoology all other sciences have one or more special dictionaries of technical terms. Useful Arts have 32, Medicine has 11, Science General and Engineering have each 9 and the others have a smaller number. Among the humanities all but Philosophy and Education have special dictionaries of terms. Barring Linguistics which is a subject *par excellence* for dictionaries, Economics comes out first with 26 special dictionaries of technical terms. Religion comes closely after it with 24 to its share. There are only very few special dictionaries falling within the purview of the other subjects.

Cyclopaedias

Next in order come the cyclopædias which are 408 yielding 16% of the total. These 408 cyclopædias are shared by different subjects in a disproportionate way. Religion scores most. It has 63 cyclopædias which work out to 15% of the total. Literature is a close second accounting for 59. Medicine comes as the third with 41 cyclopædias which work up to 10%. Law comes thereafter with 32 to its share. Then come, in order, Useful Arts with 27, Fine Arts with 26 and Economics with 24. The rest of the subjects have each less than 20 cyclopædias. It is strange to find that Education has no cyclopædia to its credit published in Great Britain.

Bipliographies

The third most popular form of reference books is bibiliography which has 370 volumes which work up to 15%. Leaving aside catalogues of manuscripts and printed books of libraries which account for 146, that is, confining

ourselves to subject-bibliography proper, the main class, Literature has the greatest number of them to its share. In fact literary bibliographies are 83 in number. Next comes History with 37. Then follow, in order, Fine Arts and Religion each with 14, Law with 11, Economics with 9, Education with 8, Geography and Periodicals each with 7 and the rest with a smaller number.

Tables

Mathematical and computation tables together with dictionaries of dates, tables useful in Geology, Useful Arts, Fine Arts and various other subjects make up a total of 350.

Atlases

There are 135 atlases which works up to 5½% of the total number of reference books. 86 of these belong to Geography and 33 to Medicine. The remaining 16 atlases are shared by several subjects.

Hand Books

Hand books also form a considerable number. They are as many as 104. It is Engineering that contributes most to this form of reference books.

Other Forms

The form, directories, year books, etc., has 64 items to its credit which make up nearly 2½% of the total. This form of reference books is more or less evenly distributed among the different subjects except for the fact that the miscellaneous class Useful Arts claims 14 of them. The remaining forms of reference books have only an inconsiderable number to their share except for anthologies which are 48 in number.

Dictionaries in India

This statistical analysis of reference books in print in Great Britain cannot be concluded without some reflection on their position in our own country. It goes without saying that we are awfully poor in reference books of our own. No doubt we have a few linguistic dictionaries. Perhaps even

there not more than one or two for some of the languages and none for many. The immensity of British effort in this matter is indicated by the fact that there are among the British publications of to-day 132 English to English dictionaries and 807 other dictionaries linking up English with 82 languages of the world. It may be argued that the number of linguistic dictionaries produced in a country is dependent upon its extra-territorial activities and interests. The British being the most ubiquitous nation to-day and the Indians perhaps the least, one may not wonder at the disparity in the dictionary output of the two countries. To put it in the converse way, the poor figure that India cuts in the world of dictionaries acts as a reminder of her dependent position and the low level in which she lives. It is extraordinary how, turn where you will, we are brought face to face with the political and economic plight of India. When we began a statistical examination of the varieties of reference books, an apparently academic subject of the severest type, we least expected to be landed ultimately in such a reminder of our helpless state. Whenever the educational and economic ills of India are mentioned we are accustomed to hear from a section of our countrymen "Let us get independence first, then these things will follow." Is that going to be the burden of the song even in the matter of dictionaries?

Cyclopaedias In India

Of complete cyclopaedias we have only one or two of a general nature. Mr. Y. R. Date's article gives a graphic picture of the difficulties encountered by the *Marathi encyclopaedia* which is perhaps the only complete one of its kind in a modern Indian language. Abortive attempts have been made in one or two other languages but the problem has never been thought of in any other Indian language.

Tables in India

Mathematical and computation tables do not exist. It is no wonder because the economic organisations of the country, which alone require them, are mostly in the hands of foreigners who import their own tables.

Bibliographies in India

Perhaps we have even fewer bibliographies prepared and published in India. While we agree that knowledge knows no national boundaries we hold that each nation should have sufficient self-respect to make its own distinctive contribution in every sphere of knowledge and that bibliographies should not be an exception to the rule. Our international civic conscience should feel hurt to benefit ourselves by the one-way flow of bibliographical literature from foreign lands into India. When we say that we want healthy *swadeshi* spirit in bibliographical literature and that we should replace 'Made in America' and 'Made in England' brands by 'Made in India' ones, we hope that it will not be attributed to any narrowness in us, but to the desire that we should not always be receiving but that we should also give.

To make the production of bibliographies in India possible the library authorities should give facilities and positive encouragement to their staff. For as we have shown elsewhere[1] and as it has been confirmed by others[2] it is the reference librarian who has the necessary range of knowledge and kind of training that is needed for the production of subject-bibliographies. Further they are most used either by reference librarians themselves or when used by others they are often used in their presence. Hence they know best what subjects are in need of bibliographical enrichment and how bibliographies should be compiled and featured so as to be most serviceable. As the saying goes

"The toad beneath the harrow knows,
Exactly where each pin point goes."

Hence the staff time-table in libraries should provide for the periodical withdrawal of reference librarians to behind the screen, where they can utilise their experience and devote their time to this important work of compiling bibliographies.

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[1] Ranganathan (S.R.) and Sundaram (C). *Reference service and bibliography*, Vol. 1. (Madras Library Association, publication series, No. 9). S. 4671.

[2] Article by Samuel Clement Bradford, Keeper of the Science Museum and Vice-President of the British Society for International Bibliography, in *Engineering*, Vol. 135. 1933. P. 120.

Colon Number	Name of the Subject	*a* Bibliographies	*e* Tables	*f* Atlases	*g* Handbooks	*k* Cyclopædias	*Pk* Linguistic dictionaries
	GENERALIA :—						
1	Bibliography ..	1	..	..	..	..	..
11	Tablets ..	1	..	..	..	..	..
12	Manuscripts ..	81	..	..	..	..	..
14	Printed-books ..	65	..	..	..	1	..
2	Library science ..	..	..	..	..	..	..
3	Encyclopædias ..	..	..	..	..	10	..
5	Periodicals ..	7	..	..	..	..	..
7	Who is who ..	2	..	..	..	18	..
8	Year-books ..	..	..	..	..	..	..
A	Science (General) ..	1	3	..	..	..	19
B	Mathematics ..	3	83	5	..	1	..
C	Physics ..	2	10	..	..	1	..
D	Engineering ..	2	97	..	28	17	9
E	Chemistry ..	1	7	..	1	7	7
F	Technology ..	1	5	..	7	6	5
G	Natural Science ..	1	..	..	..	..	1
H	Geology ..	..	6	1	1	2	3
I	Botany ..	1	..	..	..	1	6
J	Agriculture ..	4	4	2	1	14	2
K	Zoology ..	4	..	1	..	1	..
L	Medicine ..	4	4	33	7	41	11
M	Useful Arts ..	2	21	4	8	27	32
Δ	Spiritual Experience ..	1	..	..	..	9	..
N	Fine Arts ..	14	5	..	10	26	6
O	Literature ..	83	..	..	1	59	6
P	Linguistics ..	..	..	1	..	1	763
Q	Religion ..	14	..	..	2	63	24
R	Philosophy ..	5	..	..	..	2	..
S	Psychology ..	2	..	1	..	1	1
T	Education ..	8	1	..	..	..	..
U	Geography ..	7	1	86	8	19	8
V	History ..	37	4	..	14	11	2
W	Political Science ..	1	..	..	..	2	1
X	Economics ..	9	96	..	12	24	26
Y	Other Social Sciences ..	5	..	1	1	12	1
Z	Law ..	11	3	..	3	32	6
	Total ..	380	350	135	104	408	939

Year-books	Statistical tables.	Periodical surveys	Allusion-books	Anthologies	Digests	Nomenclature	Systematic accounts	Pictures	Lists	Chronologies	Total
..	..	..	..	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	..	..	..	81
..	..	..	..	..	..	..	..	..	..	..	66
3	..	..	..	..	..	..	..	..	..	..	3
..	..	..	..	..	..	..	..	..	..	..	10
2	..	..	..	..	..	..	..	..	..	..	9
1	..	..	..	..	..	..	..	..	..	..	21
9	..	..	..	..	..	..	..	..	..	..	9
..	..	..	..	..	..	..	..	..	..	..	23
1	..	..	..	..	..	..	..	..	..	..	93
1	..	..	..	..	..	..	..	..	..	..	14
6	..	..	..	..	1	..	..	..	..	..	160
1	..	2	..	..	..	..	..	..	..	..	26
1	..	..	..	..	..	..	..	..	..	..	25
1	..	..	..	..	..	1	..	..	..	..	3
..	..	..	..	..	..	..	1	1	6	..	14
1	..	1	..	..	..	..	1	1	8	..	16
..	..	..	..	..	..	1	..	..	..	..	30
2	..	..	..	4	..	3	..	..	..	..	15
14	..	..	..	..	..	..	..	..	..	..	103
2	..	..	1	39	..	..	..	..	..	..	111
..	..	..	..	..	..	..	..	..	..	..	14
3	..	..	..	5	..	..	..	..	..	4	63
..	..	..	..	..	..	..	..	..	..	..	189
..	..	1	..	..	1	..	..	..	..	..	765
2	1	..	..	..	..	..	..	..	..	6	115
1	..	..	..	..	..	..	..	..	..	..	7
4	3	1	..	..	3	..	..	..	..	..	5
8	..	..	..	..	..	..	..	..	..	..	10
1	..	..	..	..	24	..	..	..	..	..	129
											78
											5
											178
											28
											80
64	4	5	1	48	29	5	2	2	14	10	2,500

REVIEWS

REFERENCE SERVICE AND BIBLIOGRAPHY Volume I, Parts 1-4: Theory—by Rao Sahib S. R. Ranganathan, M.A., L.T., F.L.A., and C. Sundaram, B.A., with a Foreword by Sir Maurice Gwyer, K.C.B., K.C.S.I., D.C.L., (Madras Library Association —Publication Series, 9) Demy 8 vo., *1940 Pp. 642. Price Rs. 7-8-0 or sh. 15.*

Mr. S. R. Ranganathan is not only a specialist in the theory and technique of librarianship but a scholar with a resilient and enthusiastic mind, while Mr. C. Sundaram is well-known to all serious visitors to our University Library as both quietly helpful and uncannily well-informed. The book under review is thus finely philosophical as well as severely practical and will be of interest not only to professional librarians but to all students accustomed to use a library.

Reference service is the process of establishing contact between the right reader and the right book at the right time by personal service. Open access, classified arrangement, cross-reference entries in the catalogue, etc., are all designed, no doubt, to establish contact between reader and book, but these are mechanical and inadequate aids and have to be completed and animated by a human agent, the reference librarian. For reference service four categories of readers are recognised, freshmen, general readers, specialists requiring ready reference service and specialists requiring long-range reference service; and accordingly we have four aspects of reference service treated clearly in four different chapters.

Initiation of freshmen should properly speaking be done in school libraries; but as our school libraries have not yet become "the heart of the school", which they ought to be, the reference librarian even in adult libraries has to spare

the time to attend to freshmen. In the chapter on general help to general readers, the authors describe several situations in which a general reader may find himself dependent upon the reference librarian for help.

Part II of the book deals with ready reference service, which should consist " mostly in helping the enquirer to help himself ". But this general policy may have to be given up in circumstances which are indicated by the authors, who also describe the inner structure, scope and utility of classes of books that are indispensable for ready reference service. They display effectively the diversity in the arrangement of material in different classes of reference books and prove by numerous examples that ready reference service is a *necessity* and not a mere luxury.

In Part III the complexity of information and the long and devious search for recondite facts which distinguish long-range reference service are well brought out. This part contains a set of interesting test questions for the beginner in reference service.

Part IV is devoted to " Bibliography ". The evolution of the catalogue is traced at some length as well as the history of subject bibliographies.

The book is a sharp reminder of the passive and undeveloped condition of most of our public and college libraries, where reference service is not even thought of, much less organized. Stacks of books which are not used are, except from the point of view of the author and publisher, sheer waste of money. Classification, cataloguing, etc., which tend to bring books into use, reduce this waste. Expenditure on the provision of reference service, by increasing the use of books and reducing the time spent by visitors, would amount in the truest sense to economy. Money spent on improving the man-power and the service of libraries is not money thrown away, for it will yield a rich return in increasing the knowledge and saving the time of the visitors and thus increase national efficiency.

A unique feature of the book, and one that must recommend it even to persons who are unconnected with libraries, is the treatment of a number of case studies, many of them humorous, to illustrate the topics. The book reveals an original outlook, independent thinking and a steady judgment

in the selection and the presentation of details. Its refreshing individuality is seen, for example, in the attack on the system of lectures ("as much of an anachronism as the wax-tablets and stylus") and the extract from Sri Aurabindo's *Mother* describing the four aspects of Sakti.

We eagerly look forward to the promised Second Volume which will give a classified bibliography of important reference books and of bibliographies.

K. S.

East Indian Railway. Indian Institute. *Lillooah*. Catalogue of English books classified under Dewey's Decimal system of Classification, annotated and indexed. Part 2. 1939. Pp. 27, 181.

The index occupies the last 37 pages and lists give only the names of authors and classes. Titles are omitted even under author's names, with the result that in the case of an author who has two or more books to his credit, the index is not of help in readily finding the exact call number.

The classified part has been printed with care and with a helpful typographical display. There are, however, some faulty placings. For example, the Canon of Context has been lost sight of in placing *Devastated Behar* in 551·22 (Geology of earthquakes) instead of 361·51 (Charitable organisation connected with earthquakes). A careful observance of the Canon of Enumeration would have led to the correct placing of *Modern treatment of gonorrhœa* at 616·952 instead of at 614·5. The oblique title *Revolt against mechanism* of L. P. Jacks has led to its being wrongly classed with Engineering. A serious error is that of classing Charles Lamb's *Letters* under the literary form 'Letters' instead of under 'Private correspondence'.

Evidently an old edition of Dewey was used. Hence violence is done to the Canon of Reticence by branding Sanskrit and Bengali as 'Minor Indo-European languages'.

Such faults are, however, not many and the catalogue is on the whole a helpful one.

S. R. R.