

To W.F.

A business man who is also a visionary

FROM CAVE PAINTING TO COMIC STRIP

A KALEIDOSCOPE OF HUMAN COMMUNICATION

by LANCELOT HOGBEN

With 20 pages in full color and 211 illustrations in black and white,
selected by Marie Neurath, Director of the Isotype Institute

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FOREWORD

Though my name appears on the title page as the author of this book, I cannot honestly claim to be the male parent. A suggestion of Marie Neurath was the act of fertilisation whereby I myself, and at first a little coyly, conceived the plan of a script for a picture gallery of her own choosing. Our intention was to publish it only in America, an intention fortified by our conviction that the first priority in our native setting of austerity and paper shortage should be for books to make us laugh again. Subsequently, our publishers convinced us that Britain could take it. We still hope that Americans can.

It is no less what it sets out to be (and at that a book for the bedside), because (and unlike the story of Frankie and Johnnie) it has a moral, being quite blatantly (though incidentally) a defence of the Middle Way. It goes without saying that it will please neither the highbrow nor the lowbrow. Happily for the publisher there are still middlebrows to carry on what may survive of our civilisation, if anything.

Lancelot Hogben

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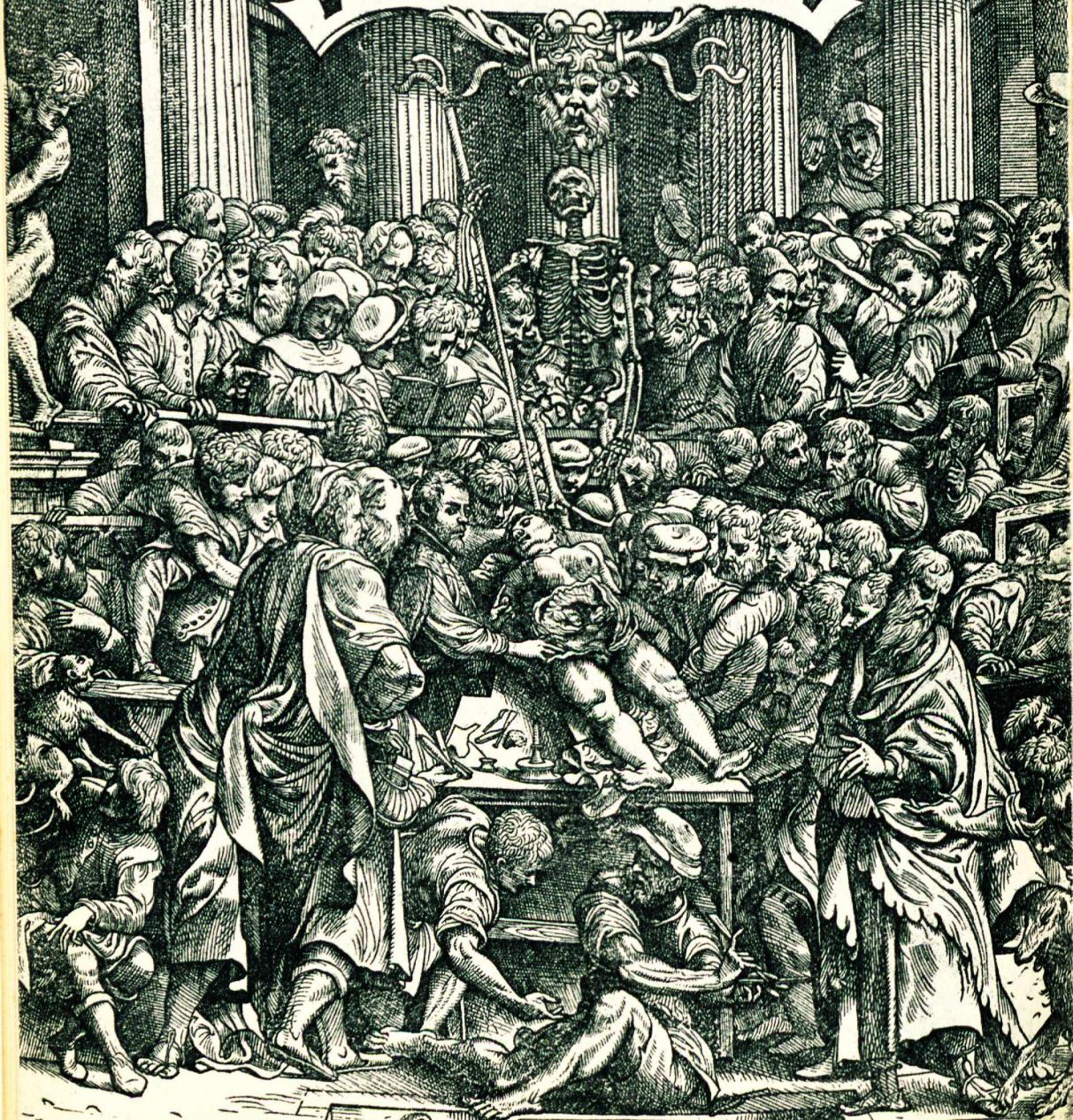
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ILLUSTRATIONS IN ONE AND TWO COLORS

The book contains over 200 illustrations in black-and-white photogravure, including contemporary paintings, engravings and drawings, photographs from a wide range of museum exhibits, facsimile reproductions from early books, and a number of specially constructed diagrams. The map-endpapers in two colors show the approximate extent of the civilisations and the sites of places mentioned in the book. Approximate periods covered by each chapter are compared in the List of Contents

ANDREAE VESALII
BRUXELLENsis, SCHOLAE
medicorum Patauinæ professoris,
Humani corporis fabrica
Libri septem.



CVM CAESAREÆ

Maiest. Galliarum Regis, ac Senatus Veneti gratia et priuilegio, ut in diplomatis corundem continetur.

Art, Anatomy and Advertisement

No account of the origins of printing would be complete without reference to ink, an as yet unmentioned prerequisite of reproduction from metal type. It will make a fitting prelude to a just appreciation of the fruitful partnership between the artist and the master printer in the formative phase of the press. For reproduction from wood blocks, the Chinese had used an ink of lampblack suspended in a water solution of gum. Their European pupils followed the same practice. This serves well enough for wood type; but a water ink runs off a metal surface. Movable type, cast in metal, is therefore useful for its purpose only if it is possible to employ ink with suitable adhesive properties. A circumstance contributory to the success of the invention of printing from movable type was therefore the fact that European painters in the fourteenth century had already begun to use natural oils from hempseed or linseed and varnishes from nut oil as a medium in which to suspend a pigment. Ink suitable for the requirements of metal type was a simple adaptation of the artist's oil paints.

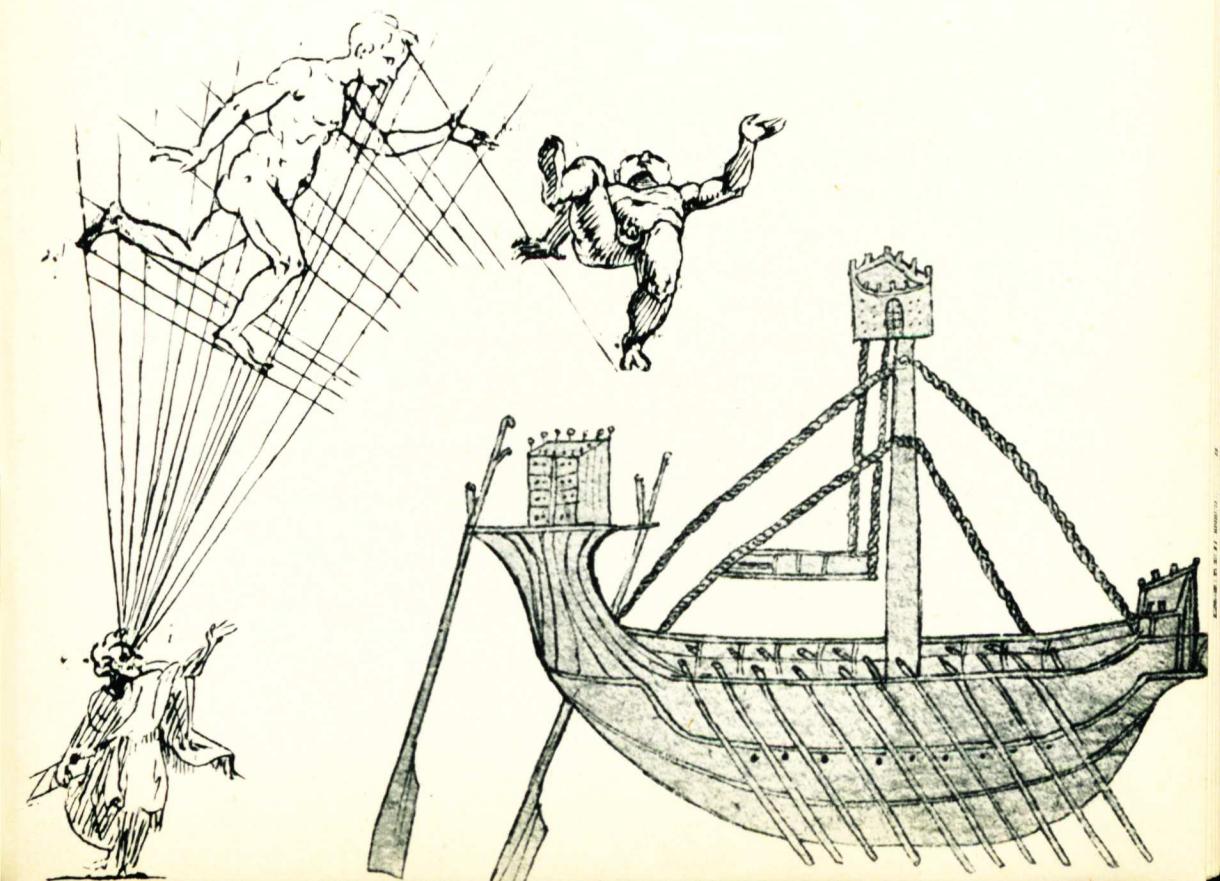
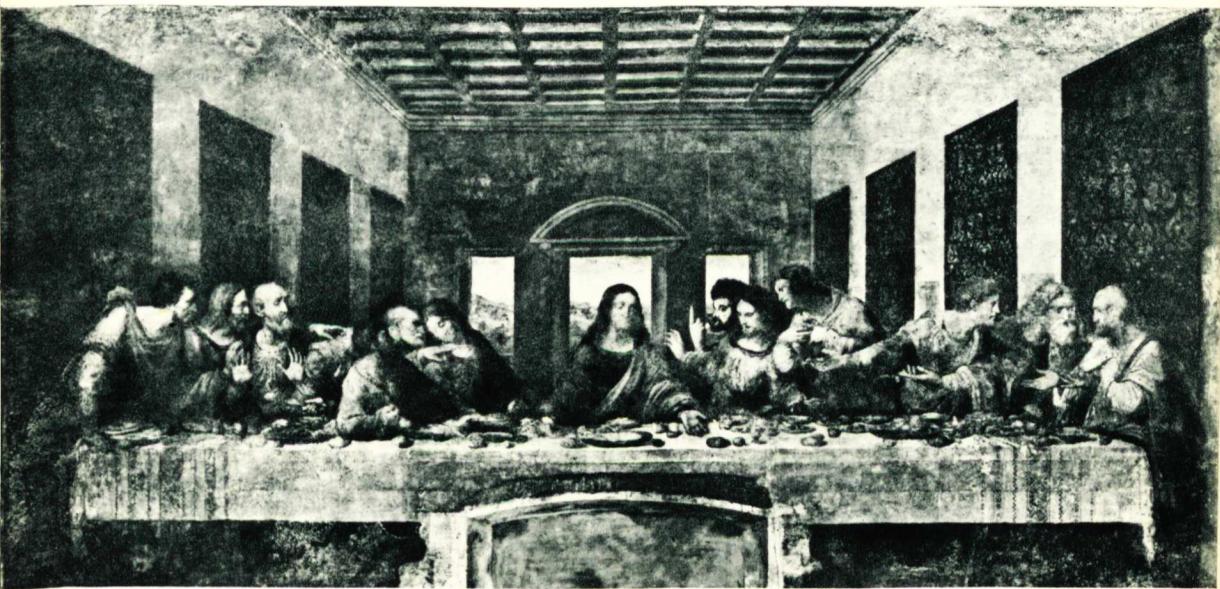
The process of taking satisfactory impressions from type carrying more viscous ink entailed a modification of the pre-existing practice of doing it by rubbing or brushing the sheet against the block. More uniformity of pressure was essential; and the means was at hand. Screw-presses had been in use long since for squeezing the juice from the grape and from the olive, for printing designs on textiles, for expressing the moisture from the fibre suspension of the as yet unformed sheet of paper and for flattening out the covers of hand-written books in the course of binding them. In short, the screw-press was already part of the equipment of the printer's craft before the process of taking the impression from the type by means

79 The innovations of the great Renaissance artists, spread by the new craft of printing, profoundly affected the distribution of scientific knowledge, especially in the field of medicine. This frontispiece from Vesalius' treatise on human anatomy was executed by a disciple of Titian.

of it became necessary. The use of oil paint as a necessary part of the printer's equipment was likewise current before the introduction of movable type. Indeed, we have seen that the art of taking an impression from a clear metal surface from ink adhering to the crevices was already in competition with the older and cruder process of taking it from the raised surface of a wood block. The artist of the time had an active interest in promoting engraving as a more sensitive technique of pictorial reproduction; and the craftsmen themselves were usually goldsmiths whose contribution to the invention of movable type has been the theme of earlier comment.

The partnership of the artist with the goldsmith or the jeweller in the half-century before Gutenberg's press got into action is of less interest than the use to which printing on a larger scale could put the artist's talent. After the invention of printing, innovations of artistic technique during the preceding century exerted an incalculably beneficial effect upon the spread of almost every branch of scientific knowledge, especially medicine. Nor was the influence of the artist a caprice of circumstance. In the age of Leonardo da Vinci, he was not a man aloof from commerce, hostile to science, contemptuous of the claims of society, in the modern tradition. Da Vinci himself would have left an enduring name in the annals of science, if he had never painted a successful picture; and the pivotal artistic innovation of the Renaissance is itself a chapter of scientific discovery in which the artist plays the role of investigator.

What was essentially new in the fifteenth century was the investigation of the laws of perspective and their application; and the investigation itself was the signal of renewed interest in experimental optics. In the Greco-Latin murals and vases of antiquity, in Gothic art and in painting of the Byzantine tradition, we meet with various makeshifts to suggest depth, lines converging to a single axis and lines of different plane sections converging to a single point; but the practice of using a single vanishing-point for all straight lines irrespective of the plane was non-existent





81 *The productions of Albrecht Dürer, whose life-work vindicated the new style, illustrate explicitly the artistic investigation and discovery of his time. This Dürer wood-cut of 1525 shows a glass screen and levelling instrument used as aids to perspective drawing.*

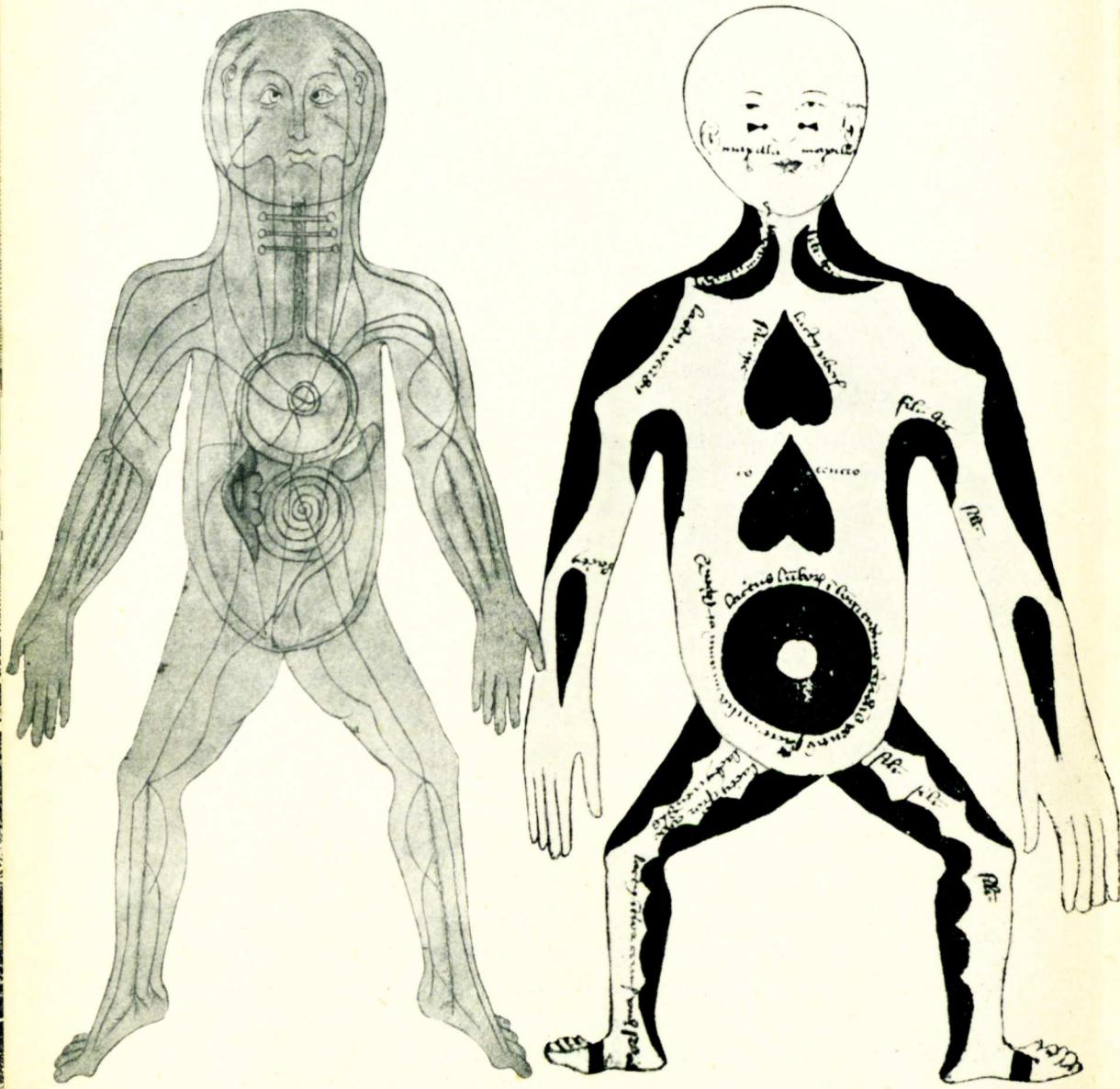
before the end of the fourteenth century. It was the outcome of pains-taking investigation into the laws of optics, to which branch of science da Vinci (1452–1519) himself made a noteworthy contribution; and the productions of Albrecht Dürer, whose life-work signalises the final vindication of the new style, exhibit the artist explicitly in the role of discoverer, disclosing what devices he employed to establish its rationale.

It is not within the prescribed compass of our narrative to record da Vinci's mastery of light and shade to further the stereoscopic illusion, or how Giorgione, Titian and Tintoretto experimented with tonal effects obtainable by playing off opaque and translucent pigments. It suffices to assert that perspective, in the current sense of the term, became the unique feature of European art in an age when the artist was a participant in the advancement of experimental science. Hence it is not strange to record that the artist was also an active partner in the great contemporary awakening of medical science. More than any other circumstance, what makes that great treatise on human anatomy published by Vesalius in 1543 a milestone in the history of medicine is the excellence of its illus-

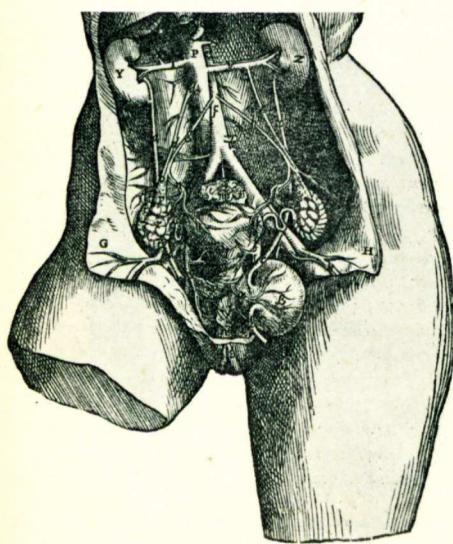
trations executed by one of Titian's disciples. Had the *De Humani Corporis Fabrica* appeared without illustration or with wood-block pictures of the sort current before the century of the artist-anatomist, generations of students and commentators might have found substance for endless disputation concerning the author's meaning. The artist-partner in the new venture laid all the cards of anatomy upwards on the dissecting table; and by so doing called the bluff of the authorities. Authors and disciples could no longer hide ignorance behind a mask of verbal ambiguity.

Thus, the new technique of illustration disseminated by the printing press contributed as much as any other single circumstance of the time to a mounting revolt against a heavy load of dead tradition equally entrenched in medicine and metaphysics; and what is true of human anatomy is equally true of botany, then the handmaid of medicine. Even if the therapeutic claims of their recipes had been authentic, the descriptive pharmacopoeias of Egypt, of Greece, of India and of the Moslem world could have made little contribution of value to sixteenth-century medicine. Men of science did not begin to describe plants recognisably till they could draw them recognisably, and without recognisable illustration the interpretation of a verbal description was an invitation to endless inconclusive debate. The new art of illustration was therefore the parent of botanical, and in its turn of zoological, classification at a turning-point of history when colonisation of, and intercourse with, new continents prompted the scrutiny of rich and unfamiliar floras and faunas, at a turning-point of history when the microscope was about to disclose a hitherto unseen world of creatures, some like and others unlike creatures already known to man.

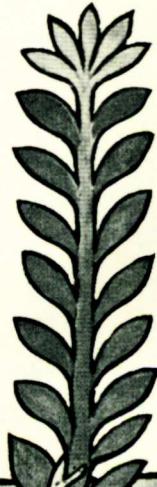
In another field, the master printer had to co-operate with the master mariner and later with the professional astronomer of the learned academies after the partnership of pictorial art and science had run its course. Long before printing of any sort began, map-making was a science; and scientific map-making was from the start a challenge to the illustrator's art. It was so, because the world is not flat like a sheet of paper. The recognition of the sphericity of the earth, foolishly and severally attributed to Pythagoras and to Aristotle by scholars who bask in the self-reflection



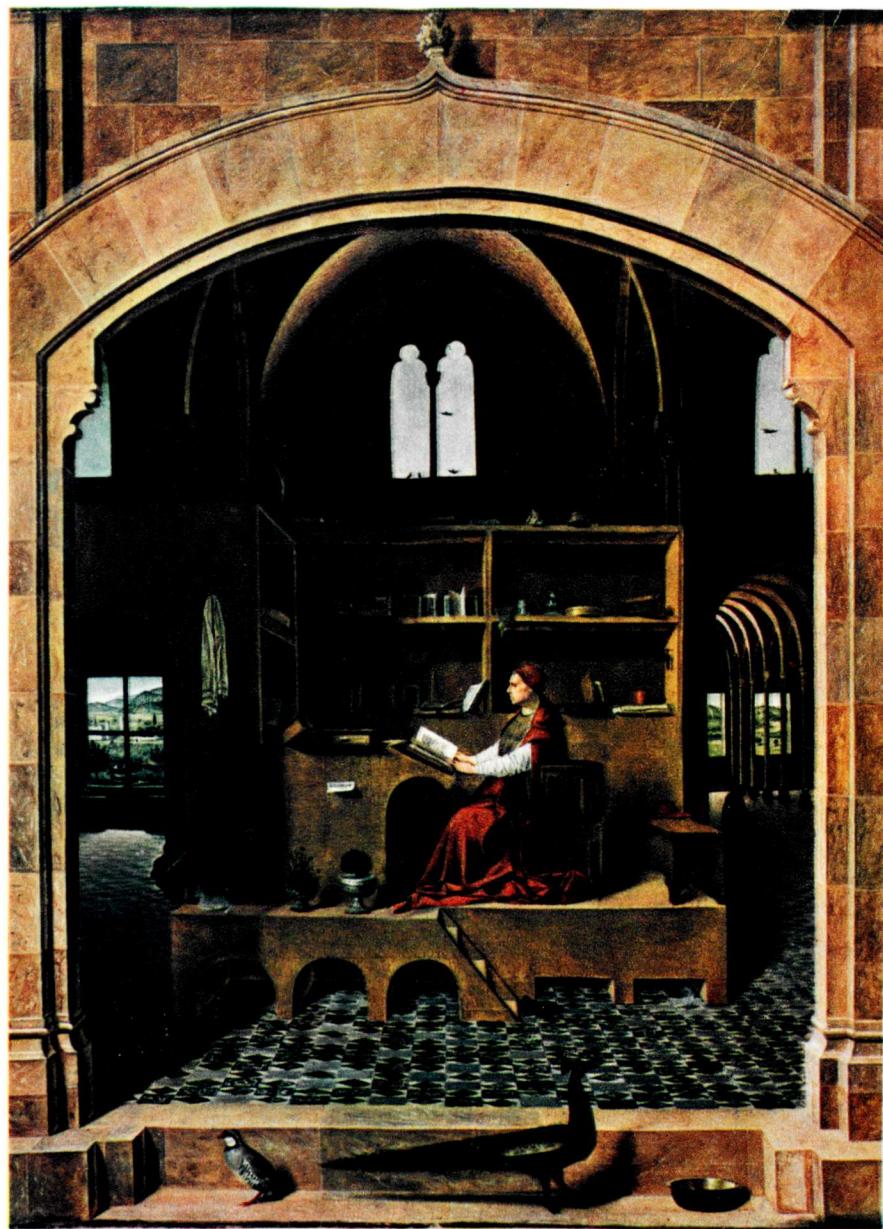
82 The excellent illustrations of the "De Humani Corporis Fabrica", 1543, for the first time gave precision to the teaching of human anatomy. The two illustrations from Vesalius' great work, on the right, contrast with the anatomical drawings of 1298 and 1399.



83 In botany, too, accurate illustration became the ally of science, allowing botanical, and later zoological, classification to go steadily ahead. An Anglo-Norman herbal of the thirteenth century contained the centaury plant (right), whereas John Gerard's "Herball" of 1636 contained the ivy and the bramble (above), and Brunfels' herbal of 1530 the *Viola purpurea* (below).



VII In this age, when the new laws of perspective were introduced into European art, the artist was an active partner in the study of the science of optics. Antonello da Messina (c. 1430–1497), whose 'St. Jerome' is shown here, was one of the pioneers of rational perspective using a single vanishing-point.

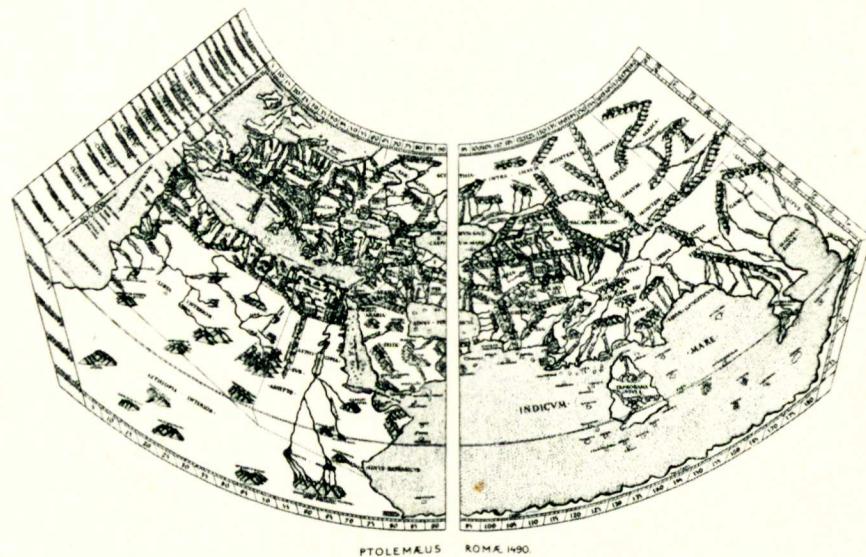




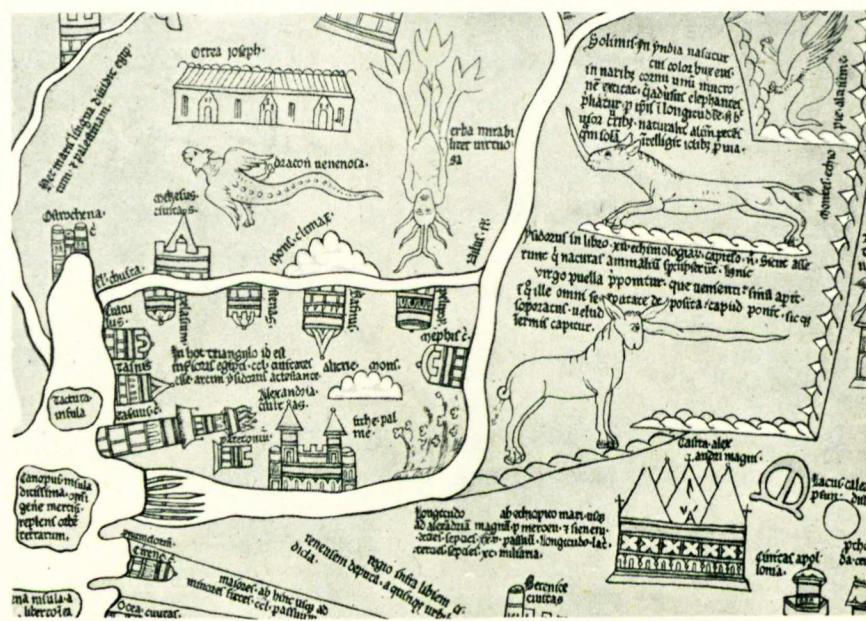
of their own lustre, is of course an unavoidable inference from the experience of pilots who watch the Polar constellations rising or sinking as the ship pushes on its northerly or southerly course. As such, it had forced itself on the consciousness of the practical man so soon as Egyptian ships rounded the Cape in the days of Necho or Phoenician traders went beyond the Pillars of Hercules to the Tin Isles. Indeed, a Phocaean sea captain contemporary with Aristotle gave the latitude of Marseilles correct to one-tenth of a degree. Thus there was a venerable tradition of map-making before printing began.

The grid which the priestly astronomers of the most ancient civilisations had used to map the celestial sphere necessarily became the pattern of the sphere terrestrial, when Eratosthenes first estimated (*circa* 250 B.C.) the earth's circumference as about 25,000 miles by comparison of the sun's noon altitude at Alexandria and at Syene. Our first information concerning the details of an attempt at global map-making is that of Marinus of Tyre, about A.D. 130. Thirty years later, Ptolemy issued a famous geography, transmitted through Arabic translations to North-West Europe in the thirteenth century, featuring maps with curved parallels and meridians, the latter based on simultaneous observations of records of the local time of eclipses. Between the age of Ptolemy and the beginnings of printing, Moslem astronomers had ironed out some of the gross distortions due to the paucity of such eclipse observations. Otherwise, Ptolemaic geography was the prescribed pattern, when an efflorescence of maritime enterprise initiated by the Columban voyages set new problems to the printer-publisher with prospects of an expanding market for his wares.

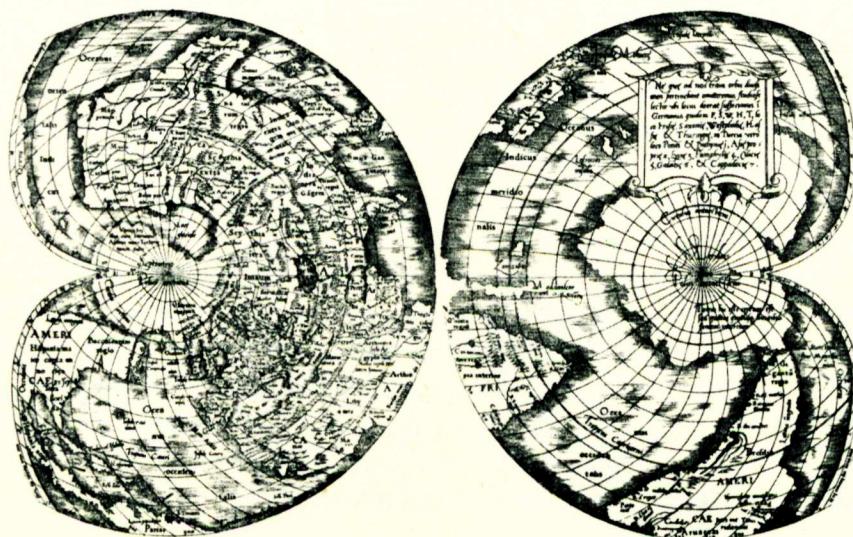
While master mariners of necessity kept alive the knowledge of a science with so long a record, monastic institutions could indulge, and without danger of shipwreck or of failure to bring a cargo into port, in fantasies such as the celebrated *Mappa Mundi* preserved in Hereford Cathedral; but such museum pieces are of little interest except to the psychiatrist. Ptolemy's



PTOLEMÆUS ROMÆ 1490.



84 Long before printing began, the earth's sphericity challenged the illustrator's art, and map-making was a science. Ptolemy's maps, featuring curved parallels, reached North-West Europe, through Arabic translations, in the thirteenth century, when the Hereford Mappa Mundi (c. 1280) was being drawn

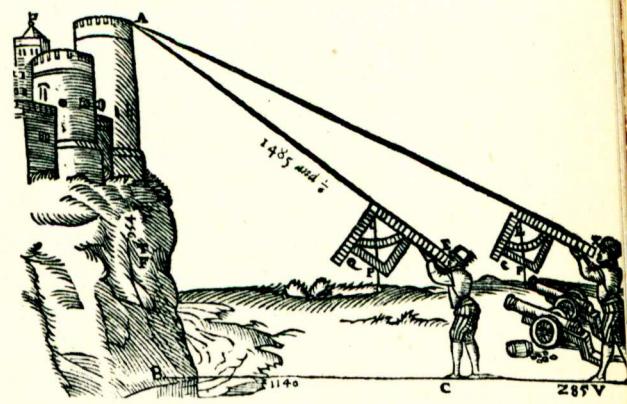
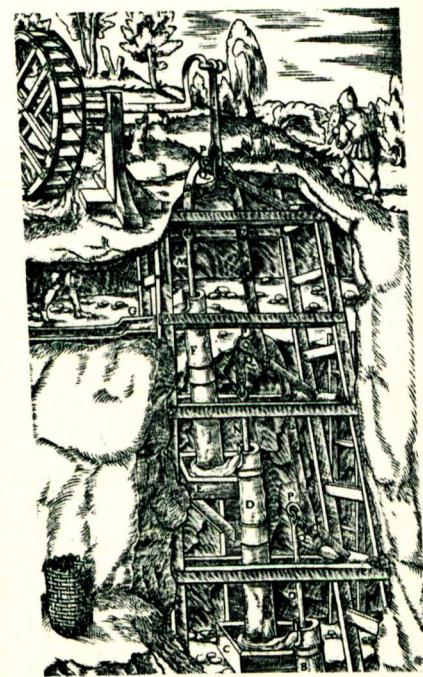
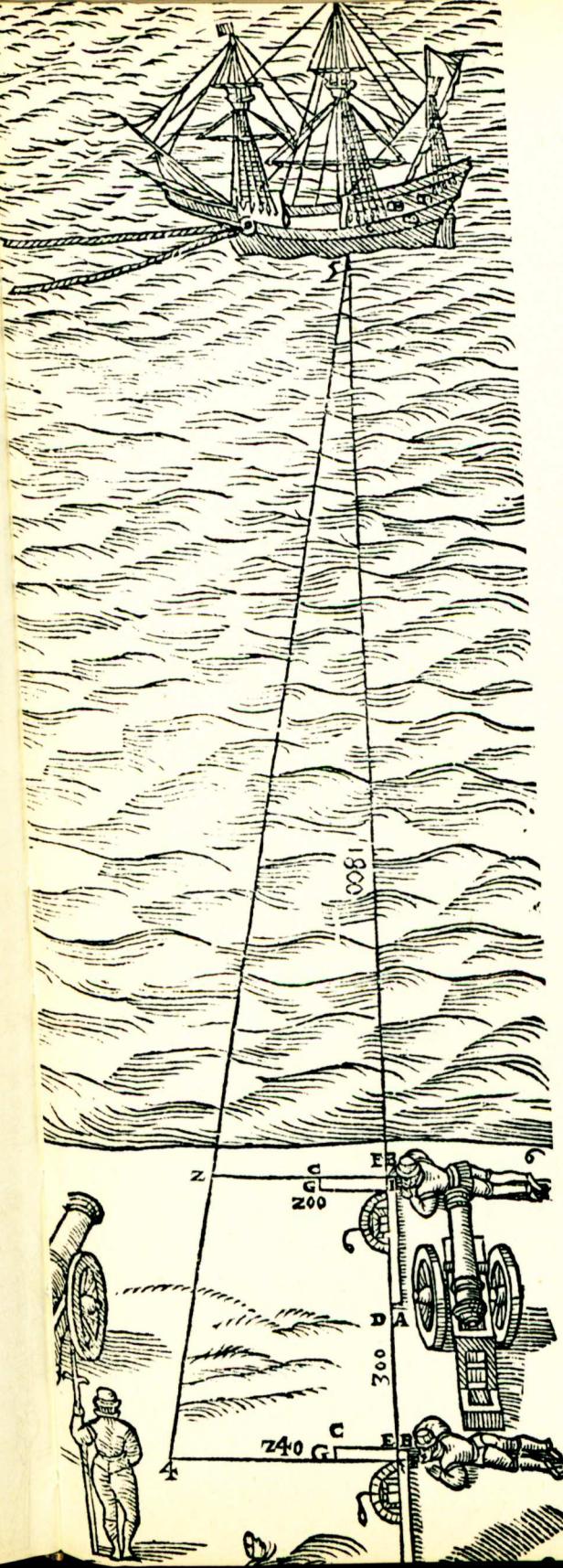


by an ecclesiastic, Richard of Belleau. (Ptolemy, after a version of 1490 ; Mappa Mundi, detail of Nile Delta.) Thereafter cartography developed rapidly. Mercator issued his double cordiform projection (below, right) in 1538, his famous rectangular projection in 1569 (version of 1599 above).

Geographia and *Almagest* were the handbooks of the Great Navigations and the bible of Columbus. A literate class of master pilots of the merchant venturers had their *rutte* books with simple star maps two centuries before the first appearance of Ptolemy's Geography as a printed work in 1475. Thereafter, cartography developed rapidly, especially through the work of Gerhardt Kremer (1512-1594), commonly known as Mercator, who produced the rectangular projection we associate with his name in 1569. A year later his co-worker Ortelius of Antwerp published what we may properly regard as the first modern atlas.

The technical details of the various ways in which cartographers have sought to represent the spherical surface of the earth on a plain sheet of paper would be wearisome to the reader who is not a mathematician. What is important about this opening-up of the mariner-market to the printing trade of the sixteenth century is that it provided a powerful stimulus to mathematical ingenuity in the age of Newton. A by-product whose origin we can trace back to the century of Caxton himself is the new geometry of graphical representation; and this new geometry was to provide a master-key to the problems of mechanics which had arisen through the introduction of gunpowder into warfare, and the improved design of clocks. By circulating maps and illustrated manuals of military ballistics, of mining technology, of architecture and of clock design, as also miscellanies of contemporary crafts, the printing press solemnised a fertile marriage of practice and theory unique in the previous history of mankind and perhaps unique in the historical record to date. The cloistered mathematician of the university now came into courtship with new problems of dynamics, statics, accountancy, surveying and navigational astronomy, hitherto the closely guarded secrets of the craftsman. The child of the marriage was a century of unparalleled intellectual advancement.

When the age of Newton draws to a close, the tempo of scientific discovery has spent its force. The educational significance of the printing trade as a medium of pictorial art henceforth assumes a new aspect, which



Diligence.

Sedulitas.



Diligence 1.
lovethe labours,
avodeth Sloth,
is always at work,
like the Pismire, 2.
qui carrieth together,
as she doth, for her self,
store of all things. 3.
She doth not always
sleep, or make holidays,

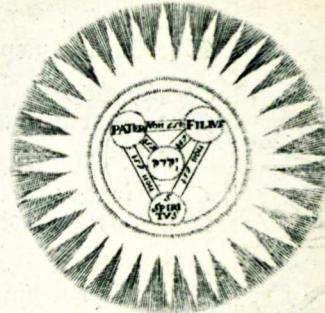
Sedulitas 1.
amat labores,
fugit Ignoriam,
semper est in opere,
ut Formica, 2.
& comportat sibi,
ut illa, (am. 3.
omnium rerum Copi-

Non dormit semper,
aut ferias agit,

as

God.

Dens.



2

GOD is of himself,
from everlasting to
everlasting,

A most perfect and
a most blessed Being.

In his Essence Spi-
ritual, and one.

In his Personality,
Trinitas.

In his will,

DEUS est ex se-
ipso, ab eterno in ete-
num,

Ens perfectissimum
& beatissimum

Essentia Spirituali &
Unus.

Hypostasis,
Trinus.

Voluntate,

The

86 Comenius' "Orbis Sensualium Pictus", 1658, from which these pictures are taken, was illustrated with a realism which sometimes defeated its purpose. But he was one of the great pioneers of educational technique and his book was the first systematic programme of education by visual aids.

we may trace to one of Newton's contemporaries, Comenius, a Bohemian divine feted by the founders of the Royal Society when he visited Britain, and too little recognised as one of the great pioneers of educational technique. He would have been notable, if only because he was responsible for the first systematic programme of education by visual aids, a book which puts before the child a conspectus of contemporary general knowledge in lively contact with the common life and everyday work of mankind, abundantly—though not very attractively—illustrated with a realism which sometimes defeats its end. For it was an error of judgment

to represent celestial beings in fancy dress at a time when Protestant ideology frowned on any deviation into iconography as contrary to the party line.

Some of the sayings of Comenius are well worthy of citation. "Schools", he says, "are slaughter houses of the mind where *ten or more years are spent on learning what might be acquired in one . . .* places where minds are fed on words." The preface of his children's encyclopaedia (*Orbis Sensualium Pictus*) sets out his programme and principles as follows:

I say and repeat with loud voice . . . that we can neither put into effect nor discuss reasonably, unless we have first understood properly all that has to be done or has to be discussed. But there is nothing in the intellect which has not first been in the senses. If the senses are thoroughly trained to understand the difference of the things well, it is practically the same as to lay the foundation to all wisdom, wise eloquence and all clever acts of life. . . . So you see a new aid for the schools, namely the picture and catalogue, for all the fundamental things in the world and acts of life. . . . Prepared in this way this book will serve, I hope, firstly to attract the mind, so that it conceives the school not as a crucifixion but as sheer delight. . . . Secondly the book serves to arouse attention, to direct it to things and to sharpen it more and more, which is something great in itself too. . . . From that the third use will follow, namely that pupils attracted thus far, and thus aroused into attention, will absorb knowledge of the fundamental things of the world by pastime and pleasure.

Maybe Comenius was born too early, maybe too late. Either way, he was born out of his time. The first fine flush of curiosity after the great miscegenation of theory and practice in the preceding century was abating. The century between the publication of Wilkins's *Real Character* and the Declaration of Independence of the Thirteen States is a dreary anticlimax with a bleak prospect for pioneers of any sort. How bleak we can judge from the prose of the man whose pretentious pedantry, sonorous pomposity and moral vulgarity dominates the English scene. Referring to Milton's brief experience as a schoolmaster in Aldersgate, Dr. Johnson (*Lives of the Poets*) pronounces the epitaph of his own on the stillborn impulse to educational reform in the preceding century:

The purpose of Milton . . . was to teach something more solid than the common literature of schools, by reading those authors that treat of physical subjects; such as the *Georgic* and astronomical treatises of the ancients. . . . But the truth is that the knowledge of external nature, and the sciences which that knowledge requires or includes, are not the great or the

frequent business of the human mind. Whether we provide for action or conversation, whether we wish to be useful or pleasing, the first requisite is the religious and moral knowledge of right and wrong. . . . Prudence and justice are virtues and excellencies of all times and of all places; we are perpetually moralists, but we are geometricians only by chance. Our intercourse with intellectual nature is necessary: our speculations upon matter are voluntary and at leisure. Physiological learning is of such rare emergence, that one may know another half his life without being able to estimate his skill in hydrostatics or astronomy; but his moral and prudential character immediately appears.

Much water had to flow under the bridges before it was possible to implement the programme of pictorial education foreshadowed by Comenius. Indeed, it was not practicable before a succession of technical innovations during the nineteenth century provided the tools. In our admiration for the boldness of his originality, we need not therefore shirk the obligations of candid authorship. The truth is that the pictures which adorn the pages of the first children's encyclopaedia and the pioneer primer of education by visual aids are execrable, unavoidably so for two reasons. First for one already indicated, that is to say the limitations of available technique for printing pictorial matter cheaply, but no less also because they are quasi-artistic productions commissioned without regard to principles of design with an educational end in view. Two centuries of progress in the standardisation of symbols, as recorded in our last chapter, must needs elapse before a Neurath could conceive the possibility of a universal picture-language.

Progress of chemical knowledge in the seventeenth century encouraged the substitution of etching by the action of an acid through scratches made on a shellac film for the mechanical device of directly engraving the metal surface as practised hitherto. The invention dates from the first half of the sixteenth century in the context of armoury, and was indeed exploited by Dürer in his later period. The last decade of the eighteenth century sees the beginnings of *lithography*, a process of taking impressions from a smooth fat-absorbing limestone surface which soaks up a greasy ink without smudging. One of the two cardinal advances in pictorial reproduction during the ensuing century was photography, of which we shall have more to say in another setting. The other was the three-color process. Heretofore, the most satisfactory method of colored reproduction

was lithographic, and color lithography itself did not come to fruition until about 1840. The three-color process signifies successive imposition on the same sheet of impressions from different plates or blocks respectively carrying the colors blue, yellow and red. It signalises a new event in the history of printing, inasmuch as theory is now the pacemaker of practice, since the process itself derives its rationale from Newton's own discovery of complementary colors. Among those who actively contributed to its development at the beginning of the second half of the century was indeed Clerk-Maxwell, the founder of the modern school of theoretical physics.

Before such technical inventions could hold out prospects of educational progress now in sight, the printing trade had to find new markets for its wares and especially a new market for illustration through the marriage of advertisement to a sensationalist daily press. This too was essentially a phenomenon of the latter part of the Victorian age, though we may trace its origins to that of Johnson. The century of the mercantile nabobs and the literary mandarins registers no signal advance in science or in education comparable to those of Newton's day or to that of Faraday when theoretical science and the everyday business of mankind re-established contact. It is at best a period of consolidation in which there was steady advance in the crafts of illustration and typography. Towards its end, engraving had reached a higher level than ever before, enlisted more than ever before by artist-printers, such as William Blake, the poet, in the service of a literature for leisure. Baskerville of Birmingham, a friend of Benjamin Franklin and a notable eccentric in the best tradition of English eccentricity, is mentionable as one of those who set a new standard in fine printing; but no incident in the technology of the time is notable in the sense that the cylinder power press, the sulphite wood pulp process or the introduction of the linotype machine is notable as we approach more closely to our own time. In Scotland, with a long start over her southern neighbour with respect to dispersion of educational opportunity, the publisher is an emergent phenomenon of the closing years of the century.

In retrospect, the expansion of a literature of leisure side by side with



*Be calm, my child, remember that you
must do all the good you can the present day.*

Published by S. Johnson Sept'r 1791.

P. VIRGILII MARONIS

AE N E I D O S

LIBER PRIMUS.

ILLE ego, qui quondam gracili modulatus avena
Carmen; et egressus fiori, vicina corgi;
Ut quanvis avido paverent arvo colono;
Gratum opus agricola: at nunc horrentia Martis

5 **A**RMA, virumque cano, Troje qui primus ab oris
Italianam, fato profugus, Lavinaque venit
Litora: multum ille et terris jaclatus et alio,
Vi superum, favea memorem Junonis ob iram:
Multus quoque et bello pafius, dum condiceret urbem,
10 Inferretique Deos Latio: genus unde Latinum,
Albanique patres, atque aliae menia Rome.
Musa, mihi causa memora, quo numine lefo,
Quidve dolens Regina Deum, tot volvere casus
Infigente pietate virum, tot adire labores
15 Impulerit, tantæ animis celestibus ire?
Urbs antiqua fuit, Tyrii tenere coloni,
Carthago, Italianam contra, Tiberinaque longe
Olla, dives opum, fludiisque asperrima belli:
Quam Juno fertur terris magis omnibus unam
20 Polhabita coluisse Samo. hic illius arma,
Hic currus fuit: hoc regnum Dea gentibus esse,

O

Si

87 Dr. Johnson's century, registering no such advance in science or education as its predecessor, was a period of steady consolidation in the crafts of illustration and typography. William Blake's engraving (1791) and the first page of Baskerville's Virgil (1757) are examples.

a literature of political controversy, in contradistinction to a literature of technology and scholarship, is perhaps the most significant feature of the eighteenth century as an episode in the development of human communications. In the English-speaking world we may regard Defoe and Goldsmith as the parents of the fiction-reading habit. Addison and Steele stand out as pioneers in periodical production. Neither the one nor the other registers a signal advance in its own context; but each is an omen of the wider literacy of our own times. If there were still few who read daily or read much by modern standards, though proportionately

far more than had ever read at all in past times and proportionately far more whose reading was mainly secular, there is at least a premonition of reading as a hobby and as a daily routine.

If this were a book with any pretensions to cloistered scholarship, it would be necessary to expand the theme of the preceding paragraph by reference to the picaresque romance of the Middle Ages. It would be essential to comment on the tradition of the broadsheet ballad. It would be fitting to recall the content of the first translations of Caxton himself. We should then be in the respectable tradition of anaemic erudition which turns its face away from the claims of our common humanity; and could go to press with the *nihil obstat et imprimatur* of the Mandarin hierarchy. Our enjoyment of Marie Neurath's picture gallery in this book needs no such indulgence. The writer sees it as a record of how man has become a communicating animal. If it is here appropriate to touch on the lighter side of literature, it is appropriate only because of what it contributes to an understanding of the crowning mercy of universal literacy in our own day and generation throughout the Anglo-American-speaking community.

Before we seek for clues to this essentially novel feature of our contemporary common civilisation, we must get the culture of the nineteenth century into focus anew. The nineteenth century witnessed an unprecedented tempo of changing social *mores* under the impact of two new sources of power, first steam, later electricity; and in England, where steam power came into use in a big way during the closing decades of the eighteenth century, one may surmise that the immediate effect of driving the already semiliterate craftsman from his home into the new factories, where married women and children toiled with no restrictive legislation on long hours, was a setback in the national standard of literacy for the better part of seventy years after the partnership of Boulton and Watt began. What emerges clearly from the work of public commissions which reported from time to time on the state of English education is that illiteracy was still widespread both among the unskilled section of the labouring population and throughout the countryside in the eighties of the last century.

The pedagogue and the scholar may deny that subsequent change calls

for any explanation other than more ample provision of schooling facilities for the population as a whole by government intervention under the pressure of scholarly philanthropists, employers with a realistic view of the requirements of a wage economy, religious denominations competing for converts, and the several interests of a rapidly expanding trade in printed matter. This is true in the sense that no animal species comes into the world with a knowledge of letters; but zoology also teaches us a truth enshrined in the English proverb: you can take a horse to the water but you cannot make it drink. From about 1860 permissive education Acts, consolidated in the compulsory powers of the Act of 1902, took the English horse to the water; but only those who believe that the cane is a sufficient safeguard of educational progress will feel satisfied with an explanation of the rapidity with which England became a literate nation unless it also offers a recipe for getting the horse to drink. Only those who enjoy a high standard of leisure with an assured income off-stage will be satisfied with an *ex*-planation which fails to furnish an answer to the question: by what means is it possible to give an as yet underprivileged segment of the population an ever-present incentive to cash in on what little they reluctantly learn at school?

It would be a pleasant gesture, if also true, to record that contemporary humanistic scholarship has undertaken an accessible and comprehensive survey of the progress of literacy in western civilisation as a whole; but the writer is unable to assure himself that humanistic scholars in our western universities have indeed profaned the gentlemanly tradition of Cambridge and Harvard, Oxford and Yale by extensively investigating an issue so relevant to the needs of mankind on the threshold of the Atomic era. Unhappily, it is impossible to find any adequately documented statistical account of the way in which western nations have severally solved an as yet unsolved problem of a not inconsiderable slab of living humanity. For lack of it, one has to rely on the experience of a lifetime during which those of us now in our fifties have enjoyed the role of spectator.

What incentives to this wider literacy were more or less decisive in different countries were certainly various. In America, the frontier tradi-

tion fostered an eagerness for self-betterment and for the betterment of one's children peculiar to the local scene. Even in the British Isles the main outlines are quite different on the two sides of the Tweed. In his own setting, John Knox, who regarded a free passport to Bible reading as the birthright of every child, set before his contemporaries a goal beyond the imaginative reach of his southern neighbours two hundred years later; and if he did not live to see the end of the game, it is likely enough true to say that the Scotland of 1700 was vastly more literate than England in 1800. By 1800 Scotland had endorsed book learning with a peculiar reverence which Englishmen as a whole have never shared.

This remarkable enthusiasm illustrates a thesis brilliantly documented in *Growing-up in New Guinea*. Maybe it is good for the morale of the schoolteacher to spread the belief that the technique of instruction fashions the environment in which the appetite for knowledge thrives; but experience of educational progress in communities with different *mores* discloses a different picture. For the school environment can offer little incentive to study, if society as a whole fails to do so. Against its own hope-generating background of frontier tradition and rugged individualism, the American schoolchild suffers no apparent handicap from liberties which others would call licence and self-indulgence. Scottish school discipline has been, and still is by American standards, harsh; and Scottish children seem to thrive on it. For Scotland in a different sense had a frontier to conquer.

The repressive Acts of the reign of Charles II deprived the English nonconformist of the right to hold public office till 1824 and from the right to university residence till 1870. Hence the great English scientists of the Industrial Revolution, recruited from a rising middle class so largely Methodist, Quaker and Congregationalist, were seldom university men, as were the leaders of science in Newton's time. Priestley was not, neither were Davy, Dalton, Faraday, Henry and Joule. Positions of professional prestige in their time were for Scotsmen who benefited from the Union of 1707, because the Deity entertains different views about church government and predestination in different parts of the British Isles. In virtue of the fact that the King is alike head of the English and



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LONDON, THURSDAY, NOVEMBER 7, 1805.

The LONDON GAZETTE EXTRAORDINARY
WEDNESDAY, Nov. 6, 1805.

ADMIRALTY-OFFICE, Nov. 6.

Diapatches, of which the following are Copies, were received at the Admiralty this day, at one o'clock A.M. from Vice-Admiral Collingwood, Commander in Chief of his Majesty's ships and vessels off Cadiz:—

SIR, Euryalus, off Cape Trafalgar, Oct. 22, 1805.

The ever-to-be-lamented death of Vice-Admiral Lord Viscount Nelson, who, in the late conflict with the enemy, fell in the hour of victory, leaves to me the duty of informing my Lords Commissioners of the Admiralty, that on the 19th instant, it was communicated to the Commander in Chief, from the ships watching the motions of the enemy in Cadiz, that the Combined Fleet had put to sea; as they sailed with light winds westerly, his Lordship concluded their destination was the Mediterranean, and immediately made all sail for the Straights' entrance, with the British Squadron, consisting of twenty-seven ships, three of them sixty-four, where his Lordship was informed, by Captain Blackwood (whose vigilance in watching, and giving notice of the enemy's movements, has been highly meritorious), that they had not yet passed the Straights.

On Monday the 21st instant, at day-light, when Cape Trafalgar bore E. by S. about seven leagues, the enemy was discovered six or seven miles to the Eastward, the wind about West, and very light; the Commander in Chief immediately made the signal for the fleet to bear up in two columns, as they are formed in order of sailing; a mode of attack his Lordship had previously directed, to avoid the inconvenience and delay in forming a line of battle in the usual manner. The enemy's line consisted of thirty-three ships (of which eighteen were French, and fifteen Spanish), commanded in Chief by Admiral Villeneuve: the Spaniards, under the direction of Gravina, wore, with their heads to the Northward, and formed their line of battle with

in their country's service, all deserve that their high merits should stand recorded; and never was high merit more conspicuous than in the battle I have described.

The Achille (a French 74), after having surrendered, by some mismanagement of the Frenchmen, took fire and blew up; two hundred of her men were saved by the Tenders.

A circumstance occurred during the action, which so strongly marks the invincible spirit of British seamen, when engaging the enemies of their country, that I cannot resist the pleasure I have in making it known to their Lordships; the Temeraire was boarded by accident, or design, by a French ship on one side, and a Spaniard on the other; the contest was vigorous, but, in the end, the Combined Ensigns were torn from the poop, and the British hoisted in their places.

Such a battle could not be fought without sustaining a great loss of men. I have not only to lament, in common with the British Navy, and the British Nation, in the Fall of the Commander in Chief, the loss of a Hero, whose name will be immortal, and his memory ever dear to his country; but my heart is rent with the most poignant grief for the death of a friend, to whom, by many years intimacy, and a perfect knowledge of the virtues of his mind, which inspired ideas superior to the common race of men, I was bound by the strongest ties of affection; a grief to which even the glorious occasion in which he fell, does not bring the consolation which, perhaps, it ought: his Lordship received a musket ball in his left breast, about the middle of the action, and sent an Officer to me immediately with his last farewell; and soon after expired.

I have also to lament the loss of those excellent Officers, Captains Duff, of the Mars, and Cooke, of the Bellerophon; I have yet heard of none others.

I fear the numbers that have fallen will be found very great, when the returns come to me; but it having blown a gale of wind ever since the action.

JULY 30, 1910

5.0 A.M. EDITION.

HOW CRIPPEN WAS DISCOVERED.

COMPLETE STORY

FROM CAPTAIN OF THE
MONTROSE.

BY MARCONI WIRELESS TO
“THE DAILY MAIL”

A week ago we telegraphed to Captain Kendall, of the steamship Montrose by Marconi wireless, asking for an account of the identification of Dr. Crippen and Miss Le Neve. Yesterday afternoon we received the brief message printed in another column, and this morning after the ordinary edition of *The Daily Mail* had gone to press we received the following detailed message from the captain giving the story of the fugitives' life on board his steamer:

CAPTAIN'S TELEGRAM.

SURPRISE FOR CRIPPEN.

“NO SUSPICION.”

CAPTAIN'S MESSAGE
TO “DAILY MAIL.”

INSPECTOR DEW'S
ARRIVAL.

ARREST EXPECTED
TO-MORROW.

Crippen and Miss Le Neve, on board the Montrose, are now in the Gulf of St. Lawrence, and due at Father Point, near Rimouski, 170 miles from Quebec, at 10 a.m. (3 p.m. Greenwich time) to-morrow.

Inspector Dew, in the Laurentic, arrived at Father Point at 4 p.m. (9 p.m. Greenwich) yesterday, and awaits the fugitives.

SLEEPLESS AT NIGHTS.

CAPTAIN'S FIRST STORY OF
THE FUGITIVES.

By MARCONI WIRELESS.

S.S. MONTROSE, Thursday.

(Received via Belle Isle and Montreal.)

TO THE EDITOR OF “THE DAILY MAIL.”

I am still confident Crippen and Le Neve on board.

Crippen has shaved his moustache, and is growing a beard.

of the Scottish established Church, Scotsmen were immune to the operation of the Clarendon Code, and being exempt from the restrictions of the religious Test Acts, Scotland was able to establish a flourishing export trade of university graduates to fill posts of influence, when English universities, whose standards declined steeply in the century before Test Act repeal, could not provide the necessary personnel. This circumstance sufficiently explains the unshakable, whimsical and still extant conviction among Scotsmen that education is a grand thing.

Within the limitations of a Mandarin tradition England has made substantial progress towards a conception of education *en rapport* with the democratic way of life during the course of the last generation, though Britain as a whole has still much to learn from the State universities of the Middle West. How far her southern neighbours trailed behind Scotland is evident from the following citation representative of the employer's viewpoint in 1807:

"It is doubtless desirable that the poor should be generally instructed in reading, if it were only for the best of purposes—that they may read the Scriptures. As to writing and arithmetic, it may be apprehended that such a degree of knowledge would produce in them a disrelish for the laborious occupations of life."

Professor Henry Hamilton offers us one reasonable account of the imposition of an incentive to daily reading as a habit of everyday life throughout a large and hitherto largely letterless section of the English community in the closing years of the nineteenth century:

The working class were now politically powerful, and the newspapers of influential individuals and groups fought for their support. Alfred Harmsworth, afterwards Lord Northcliffe, was the first to sense the drift of changing conditions. His entry into journalism in 1885 marks the beginning of a new phase in the history of the Press. . . . Following the example of his first employer, George Newnes, founder of the weekly *Tit-Bits*, Harmsworth set out to capture the interest of the new public, whose intellectual attainments were those of the elementary school pupil. In 1888 he started the weekly *Answers to Correspondents*, and in 1896, along with Kennedy Jones, launched the *Daily Mail*. Its circulation rapidly rose from a daily average of 202,000 in the first year of its career, to 543,000 at the end of the third, a figure far in excess of any other newspaper. . . . Since the main source of a



THE NEWEST FRENCH FASHIONS
Modelled for
THE YOUNG ENGLISHWOMAN

S. O. Beeton 248 Strand London W.C.

An Adjective expresses the quality of a thing



A sweet Plum.

A fine Rose

A good Girl

A poor Man.

Verbs



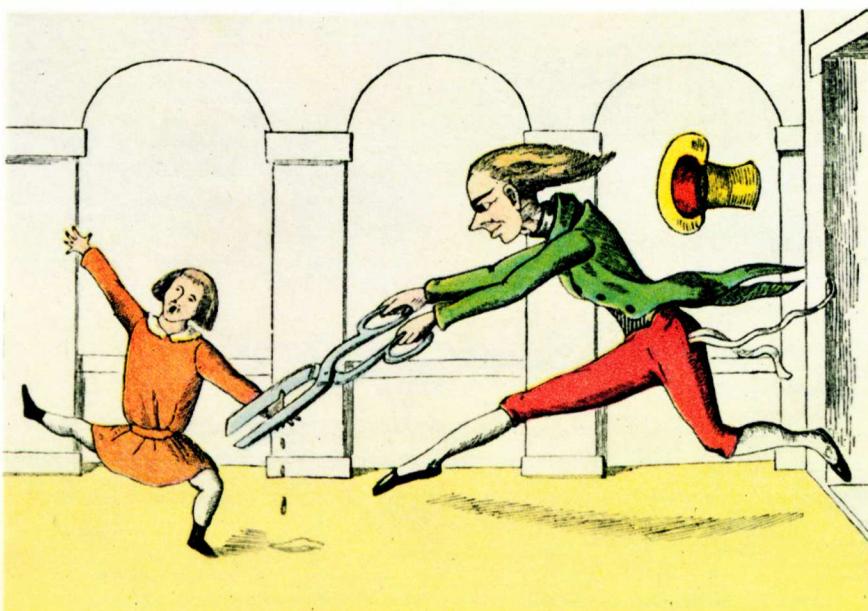
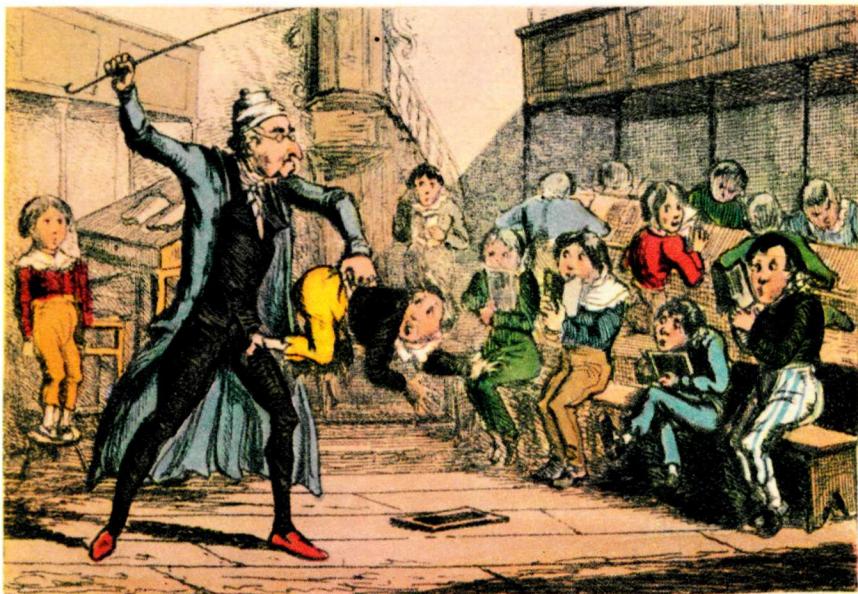
Passive

Active



Neuter

X Comenius had his followers among the early Victorians, but the quality of their visual aids, and their improving educational purpose, are already strange a century later. These, from a child's grammar published in the first half of the nineteenth century, were hand-colored.



XI "He that chastiseth one amendeth many." The virtues of chastisement, and the wages of juvenile sin, were publicised among children by artist and printer. (Above) Engraving by H. Heath, 1831, later hand-colored. (Below) Printed lithograph from a late nineteenth-century edition of *Struwwelpeter*.



THE OLD MAN OF THE NAME OF TULKINGHORN.

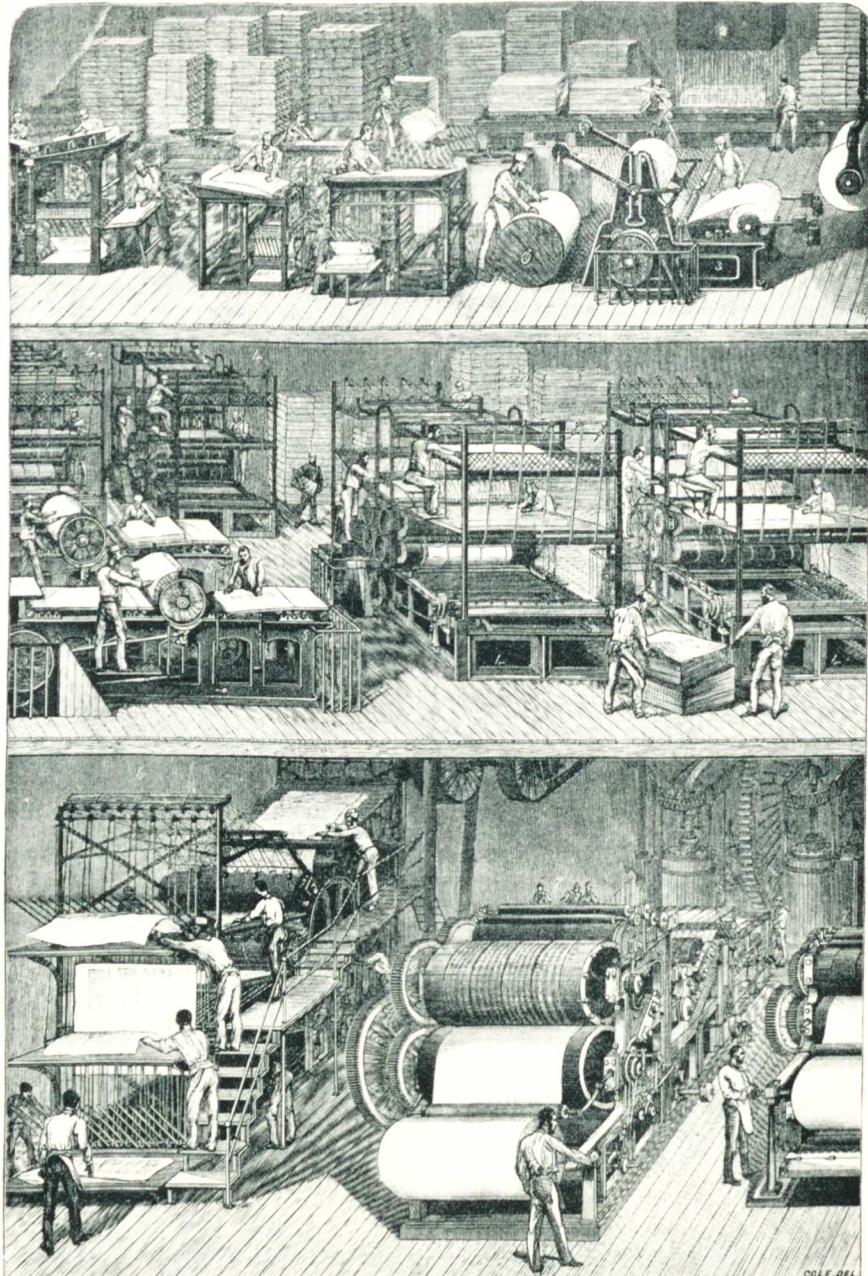
newspaper's revenue is advertisement, the paper with the largest circulation not unnaturally attracts the biggest advertisers. Papers with smaller circulations quailed before so formidable a competitor with no appreciation of the educative role a Press might play in the new age of a nation-wide reading public. The technique of the *Daily Mail* was different from that of its predecessors and contemporaries. It had an attractive form to catch the attention of those who wished to get news in short, snappy paragraphs and flaming headlines. News was not served raw. It was cooked, overdone, and heavily spiced.

The emergence of the Press as an advertising medium with a working-class public has a special relevance to the role of the printer as illustrator, and other remarks of the author last cited in the same context bring us back to the same issue more explicitly:

Before 1900, newspapers had been for men only. In 1904 women were becoming a force to reckon with in politics, and Harmsworth started the *Daily Mirror* as a woman's journal. It soon established itself as a cheap picture paper. Four years later, Harmsworth (later Lord Northcliffe) achieved his greatest ambition when *The Times* passed under his control. Each successive year saw the tentacles of the great newspaper proprietors extend over the country. Printing and distribution of newspapers had become a highly capitalized industry, and the companies in control counted their capital in millions.

The significance of the pictorial newspaper and of illustrated commercial advertisement through the medium of a popular press resides in the fact that it forces on the daily attention of a personnel not as yet accustomed to reading long, or to reading often, as much written matter as the appetite can assimilate. That such a powerful instrument of education became available when and where its effect was most significant was a painless and inescapable consequence of technical advances in the art of printing during the lifetime of Dickens, himself a pioneer of the periodical press.

What the unprecedented sales of Charles Dickens owed to his illustrators and how a new market for illustrated books goaded his fertile pen into action is a well-thumbed brief; but our story would be incomplete, if we failed to take stock of the increasing popularity of illustrated books in the half-century before the linotype machine enlisted an appetite for sensation *en rapport* with a new time-consciousness in the habit of rapid and constant reading. The *penny dreadful* propagated the fiction-reading



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89 Pictorial journalism, which caught the interest of a public not yet accustomed to reading long, became, through the technical advances in the art of printing, a powerful potential instrument of education. A page from the "Illustrated London News" (1879) and a page from "Life" (1948).

SCIENCE



WHEN A SMALL PERMANENT MAGNET IS HELD OVER THE MIXTURE OF OIL AND IRON POWDER, THE FLUID WITHIN ITS FIELD ADHERES TO IT AND BECOMES SOLIDIFIED

MAGNETIC OIL

A new iron-containing mixture which solidifies when magnetized is basis of experimental clutch

The solid-looking mass clinging firmly to the magnet above is magnetic oil, a newly devised substance which promises to be of great importance in mechanical engineering. Made by mixing light oil with fine iron powder, the new fluid normally looks and feels very much like dirty crankcase oil. But when placed in a magnetic field, the thin liquid suddenly thickens into a tough semisolid. Its millions of microscopic iron particles become strongly attracted to each other and bind the fluid between them into a dense, homogeneous gel. This

binding action is the basis of magnetic oil's practical importance. Used as the main element in a revolutionary type of automobile clutch invented by Jacob Rabinow of the National Bureau of Standards, it serves to transmit power smoothly from engine to wheels. When the oil is unmagnetized it permits the engine to turn independently of the wheels, as when the clutch is released in an ordinary car. When the magnetic field is turned on, the oil solidifies to connect the moving parts just as a standard clutch does when it is engaged.

PUTTING BACK THE CLOCK

**VOTE
LIBERAL**
AND
PULL HIM OFF
THAT CHAIR



habit in the immature male age-group by investing it with the attractions of disapproval by parents who had some of them enjoyed the benefits of a prophylactic alternative. Such illustrated anthologies of moral maxims for the young antedate the Victorian parent by nearly a century. According to a genial essay by Janet Adam Smith, John Newberry, for whom Goldsmith wrote *Goody Two-shoes*, started the fashion in London when he set up as a publisher in 1744; but one may suspect that rich rewards for the publisher of bedside books for the bairns were few till Lewis Carroll hit on the formula. If the parent pays the piper, the parent must call the tune. Accordingly, a successful children's book will be one which parents can read aloud painlessly, the child's own enjoyment being less relevant to the content as such than to the amount of parental attention evoked thereby.

Among showpieces of a period which registers regulation of human life by the railway time-table, books for children have a fascination of their own, if only for the eloquence with which they vindicate the use of chastisement to a juvenile public, apparently unconvinced. It is a far cry from these edifying productions to the programme conceived by Comenius two centuries earlier; but it signalises a new source of profit for the printing trade with incalculable possibilities ahead. At least, it encouraged mothers of modest means to read, as did later another circumstance after cheaper paper became available. Patterns for home dressmaking, attributed to the husband of Mrs. Beeton of cookery-book fame, exacted the penalty of deciphering instructional print at a time when women of the artisan and lower middle classes had scanty educational opportunities. Commercial advertisement, especially fashion catalogues, and political cartoons, alike for reproduction and for exhibition at election times, are more notable precursors of a modern programme of education by visual aids, because they nursed a demand for colored reproduction at cheap rates.

McFADDEN'S ROW OF FLATS.

By E. W. TOWNSEND, Author of "CHIMMIE FADDEN."

Illustrated by R. F. OUTCAULT,

MARY ELLEN MURPHY! Mary Ellen Murphy, hasten quickly, dear, and tell the Fresh Cup from Oak street to turn in a hasty ambulacrum call. And—continued Mary Ellen, glancing up the street from under—had a fire alarm. Hasten quickly, dad, break your face, don't!

What for? demanded Mary Ellen; but just then he caught the amazing sight her mother, from her window, had seen first. Tim and Mary Ellen uttered a whoop of joy and started up the stairs, yelling to the Dusnappa Twins, who were both to sit on Congo's head. Come on, yous. It's a circle, and a cheerleader and a mad dog and a fight!

Tim's delighted announcement brought all the inhabitants of Tim's block to the door and windows. Truly it was a sight as wondrous as it was cheering. There came down the street, up the steps, a shaved youth, arrayed stately in a sack of such yellow lass as have excited the envy of Li Hung-chang. By his side pranced a know-all great sandwich between two dogs, the three drawing a cart, laden with the trimmings of a mad dog's feast, a black cat, whooped and yowled convulsively in the general racket with a bass drum and a tenor. There was a girl near the yellow lad with hair of such redness once, when I saw her, only slowly reverting from his embrace, who would have been the most brilliant sight in radiant beauty. There were banners and flags and streamers and hats; there were fights and laughter, and everything, indeed, calculated to excite the curiosity and enthusiasm of McFadden's Row of Flats.

No shoulder hairy, said Kramer, the grocer, in high excitement, nonpareil hat, steadily. Don't it, Kelly? By the way, what's the occasion to offer? He was dumbfounded, as was McFadden, the postboy man. They could only amuse themselves, and naturally join with Mrs. Murphy and Riccadonna girls in a chorus of demands for Tim McFadden.

Look here, Tim, you should have been in or near the Flats that night, I suppose. There was even one in the crowd, Tim McFadden, cried Mrs. Murphy. Tell me what is this coming? Hasten ye, Tim, for the love of him, and tell me what is this coming before I hear of this windy wild wonder?

I gathered about Tim, who was standing on the stoop of his Flats, a crowd, but not excited. Tim never that.

A friend, said McFadden, what you observe and hear coming down next is a mirrortime.

It was a moment's lull, until Mrs. Murphy called down to Kelly, the porter.

What's a mirrortime?

Migration, replied Kelly, bound not to be again caught in ignorance migration in a Barker Law Idol when it's pulled.

It so bad for you, boy, asserted McFadden. The celebration, goward as now, which, by the same token, is now headed by the can Twins and Mrs. Murphy's Mary Ellen, is the pick and flower of All—

know, four thousand," interrupted Riccadonna. "Hogan's Alley is

now moving out, and if you, Casey, have a care with the slaves you are putting out of your house, will be hard to mend. The vacancies thereof, according to due process of law, will be filled, habited, and occupied by the affectionate Bowler and pride of Hogan's Alley."

"Tell you bout dese ting," cried Riccadonna. "McFadden is gonna marry dan deese Garibaldi. I second da motion to elect him—

"Murder alive!" broke in Mrs. Murphy. "What's this the Dusnappa Twins has been them? Is it a little Li Hung-chang, or a kid, or a whalebone, or something the quartereon face him? Hasten quickly, Kramer, and inform me before I die with wermann."

"Die kid mit de yellow night," added Kramer.

"The same," Mrs. Murphy said—"the little one vid de shaved patate on him."

It was a grand day for McFadden's Row of Flats. All four of the Riccadonna girls came down to the entrance to join the Reception Committee, headed by Tim himself, and including Mrs. Hogan, Kelly's wife and three children, not forgetting Congo, with eyes looking like two hard-boiled eggs, spotted with ink.

The procession swept into the block with a shriek and a cheer and a song and a hurrah. The Fresh Cup from Oak street looked

Originator of "HOGAN'S ALLEY."

"I bid you, citizens, to come to the Flats to-morrow, when the Fresh Cup will stage a bonfire ball organized by the Dusnappa Twins, the Yellow Kid, Mary Ellen, and Congo, who were fighting for possession of the parent. I bid you welcome to McFadden's Flats by proclamation, all laws to the contrary being repealed therof."

At noon, says the paper, George was still in a sleep that fell with Mary Ellen. She was main chancery, I and had a great eye for the main chance. She used to say, "I am a woman, and all and need to happen is to bring Mrs. Murphy's sons when she makes a show with her grouch."

The disturbance between Congo and the yellow Kid was called off, compare to solve the problem. Mrs. Murphy was acquainted with Little George, a red-headed girl, Terence McSwatt, and other companions, who were distributed according to family connections in the recently opened up of a row signed to the Yellow Kid, but he discovered



down by da law," Tim explained. "The inmates of Hogan's Alley, right here are free. The Health Board in or finance, assembled, therewith being

as if he thought of calling out the reserve, and Riccadonna hastily threw a tarpaulin over his fruit. The discarded ones who were

Then there were introductions, which did not, however, disclose the identity of the Yellow Kid.

closet in the hall adjoining the door to Tim's

Such was the migration of Hogan's Alley.

Back to Comenius from the Comics

Within the Anglo-American speech-community of to-day, and especially in Britain where paper shortage limits the publication of books with no assured prospect of sale, an author who writes at all does so for a reading public on both sides of the Atlantic. Mostly, this is no source of embarrassment to the author, especially when the British author can reflect with moral satisfaction on his dual contribution to the export drive after the Inland Revenue has deducted from his royalties everything except the fees of the accountant who arrives at a settlement of his indebtedness to His Majesty's Treasury. Still, the taboos of the sister cultures are not co-extensive; and there are two which no author can disdain without losing the good-will of his publisher. The British, or rather the English, veneration for cricket as a technique for propelling spherical objects around the landscape is one which puzzles other world citizens, even nationals of countries where there is a two-party system with a prospect of another innings for both; and it is no less true that the vogue of the Comic Strip in the contemporary American scene baffles any literate European, including the British.

Even in America the stupendous popularity of the Comic sometimes inspires sentiments akin to awe, as is evident from the following citation from an article by John Bainbridge in *Life* (14.8.44):

... Chester Gould, creator of the strip called *Dick Tracy*, must rank as one of the great writers of our time. . . . He has a following far larger than any author whose books are featured on the best-seller lists. In recent months a consistent best-seller among fiction titles has been the novel *A Tree Grows in Brooklyn*. It has sold over 900,000 copies and been read, at a generous estimate, by 4,000,000 people. *Dick Tracy* is bought every day in the year by 13,500,000 people and is probably read by twice that number. Literary critics were ecstatic about the Brooklyn book, finding it, as one said, "profoundly moving". Although

91 In 1896 R. F. Outcault's bald, flap-eared, precocious Yellow Kid, making his first appearance in the New York "World", marked the beginning of the Comic era. Newspapers had discovered that the public preferred pictures to words. Here the Kid transfers his baggage to McFadden's Flats and his allegiance to the "New York Journal".