

INDIAN BOTANICAL PAINTINGS

A SELECTION OF LATE 18TH & EARLY 19TH CENTURY

Indian Botanical Paintings

RECORDING THE INDIGENOUS AND INTRODUCED FLORA

OF THE SUBCONTINENT,

COMMISSIONED BY THE HONOURABLE EAST INDIA COMPANY

AND EXECUTED IN WATERCOLOR BY NATIVE ARTISTS,

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WITH ACCOMPANYING CATALOGUE BY PHYLLIS I. EDWARDS,

JAMES J. WHITE, DAN H. NICOLSON & ROBERT W. KIGER,

PREFACE BY JOHN V. BRINDLE, AND INTRODUCTORY ESSAYS

BY STUART CARY WELCH & MISS EDWARDS.

THE HUNT INSTITUTE FOR BOTANICAL DOCUMENTATION

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PREFACE

This exhibition offers a selection of botanical paintings by Indian artists working under English patronage during the late 18th and early 19th centuries. That span of years coincided with a European period commonly termed "the golden age of botanical illustration." The names Ehret, van Spaendonck, Redoute, Turpin and Bauer (both brothers) make up an honor roll of artists in the service of science; the beautifully illustrated volumes from these years are among the most splendid treasures preserved in botanical libraries. It is the more remarkable, then, that a period so rich in botanical art should be further enriched by an unlikely, but fortunate hybrid art, the product of a particular aspect of European expansion in contact with artists whose birthright was the tradition of Mughal miniature painting. At a time when botanical artists-illustrators were well occupied in the European theatre, the enterprising and dedicated administrators and scientists who went out to India from England found a body of trained artists willing and eager for employment in a period of diminishing patronage attending the declining fortunes of the Mughal empire.

Over a period of years, animal and plant illustrations numbering in the thousands were produced — anonymously for the most part — by Indian artists working under the supervision of European patrons whose scientific requirements demanded accuracy and precision of detail to a degree that must have posed a severe challenge to sensitivities and skills developed in a different, more esthetic tradition. The resultant artworks embody essential qualities of their diverse parentage; they earned the praise of the Englishmen who collected them and for whom they constituted a vivid record of the natural resources of the subcontinent. If the distinctive contribution that these works have made in the realms of botany and art has not been widely recognized, in spite of the hundreds of illustrations based upon them that appeared in publications of the period, it is probably because there has been little opportunity for the general public to see the original paintings themselves. This selection, drawn from the vast body of such paintings, is an attempt to provide that opportunity.

ACKNOWLEDGMENTS

This exhibition was made possible through the generous cooperation of the four British institutions which made the Indian paintings available, and with the help of a grant from the National Endowment for the Arts.

I wish to thank particularly the staff members of each institution for their helpfulness in making the selection of treasures so agreeable a task. I owe a special debt of gratitude to Miss Phyllis Edwards, formerly the Botany Librarian at the British Museum (Natural History), who acted as coordinator in the preliminary arrangements, took the responsibility for listing and identifying the chosen subjects, and contributed an essay for this catalogue. Mr. M. J. Rowlands, Head of Library Services at the same institution, arranged for the necessary clearances; Miss Linda Newington gave guidance and help in finding and going through the appropriate folios of the collection; and Mrs. Judith Diment gave prompt attention to subsequent correspondence. Mr. Grenville Lucas, Deputy Keeper of the Herbarium at Kew, was an unfailing source of advice and assistance. Mr. Tudor Harwood, Senior Photographer at Kew, made color slides of the

paintings from three of the lenders; Miss S.M.D. FitzGerald, Chief Librarian, took care of correspondence and arrangements at the Kew Library; Ms. Marilyn Ward and Ms. Atkin gave assistance in finding material there. Mr. Raymond Desmond, Deputy Librarian at the India Office, and Mr. Gavin Bridson, Librarian at the Linnean Society, gave useful advice and laid out the material of their respective collections. I wish to thank Dr. Otto T. Solbrig, Director of the Gray Herbarium at Harvard, for allowing us to borrow N. Wallich's *Tentamen florae napalensis illustrata*. Mr. John Bauer, of Carnegie Institute Museum of Natural History, identified insects on several of the paintings. I am grateful also to Dr. Robert Kiger, Director of the Hunt Institute, for firm support, suggestions and ideas, and to Mrs. Karen Britz and Mrs. Donna Connelly for typing correspondence and catalogue copy.

JOHN V. BRINDLE

Curator of Art, Hunt Institute



Figure I. An autumn crocus, from a manuscript of Dioscorides' *De materia medica*, copied by Abdallah bin al-Fadl, Iraq, 1224; 43.2v Smithsonian Institution, Freer Gallery of Art, Washington, D.C.



Figure II. A tulip, by Mansur, ca. 1620, from an album assembled for Emperor Jahangir; Habibganj Library, Aligarh District, India. After N. C. Mehta, *Studies in Indian painting*, Bombay, 1926, pl. 31.

A CONFLUENCE OF EAST AND WEST, OF ART AND SCIENCE

COMPANY BOTANICAL PAINTING: ITS BACKGROUND AND CHARACTER¹

The catalogue to a recent major exhibition of botanical art describes two pictures of the sort shown here as "among the most beautiful botanical studies ever produced."² Such praise is fully warranted, for the Indian artists-craftsmen employed by the British during the late 18th and early 19th centuries combined extraordinary sensitivity with almost miraculous technical expertise. Their paintings represent a particularly happy confluence of East and West in which the scientific intentions of the British were magnificently implemented by Indians schooled in a long-standing tradition.

More accurately, these delightful paintings reunited two long-separated strands of a single tradition. For both hark back to antiquity, when herbals written and illustrated for medicinal purposes can be cited as the origin of botanical art. According to Pliny the Elder, herbals of the first century B.C. contained illustrations, and it seems likely that versions of these were incorporated into Pliny's own *Natural history* and possibly into Dioscorides' *De materia medica*, both of which date from the first century A.D. A noble copy of the latter work, written and illustrated in about 512 A.D. in Constantinople (*Codex vindobonensis*, Vienna State Library) is precisely the sort used as a model in both the Christian and Muslim worlds, distant descendants of which met again in the paintings here. "An autumn crocus" (Fig. 1), from an Arabic copy dated 1224 A.D. of Dioscorides' work, is boldly simplified but convincingly identifiable. Western equivalents were no finer or more "scientific," and both served their purposes as guides to practicing physicians and chemists into the 17th century. Even now, medical researchers respectfully investigate Dioscorides' ancient wisdom.

In the vast Muslim world, treatises such as Dioscorides' were copied and recopied over the centuries. Usually, they were illustrated in comparably broad, almost folkloristic styles by craftsmen rather than artists. They were books for use rather than aesthetic contemplation.

Of greater artistic interest, and more significant as ancestors of East India Company botanical pictures, were depictions of flowers created for pleasure rather than therapeutic purposes. Among the world's wonders,

flowers rank high. Fragile, ephemeral, stunningly varied in coloring, shapes, and sizes, as agreeable to the nose as to the eyes, and enlightening to the mind, they have never failed to fascinate and delight. From Turkey to India, Persianate patrons and artists doted on them. Although miniatures of flowers in isolation were not painted by court artists, except as "scientific" illustrations, before the late 16th century, few paintings omit them altogether. Gardens, with their fruits and flowers, streams and trees were heavens on earth, and most Persianate miniatures were compact, portable reminders of Paradise.

Certain artists were especially fond of flowers, and painted them with loving accuracy. One such was Mir Sayyid-'Ali, a great master of the Safavi school centered at Tabriz during the first half of the 16th century. Irises, pinks and other blossoms are invariably tucked away in his miniatures, between figures, tents, animals and sumptuous carpets. Very likely, these were fully appreciated by the Mughal Emperor Humayun (1530-1556) during the years of his exile from India, when he was given sanctuary by Shah Tahmasp, the Safavi ruler of Iran. Conveniently for the future of Mughal painting — the crucial ancestor of Company painting — Shah Tahmasp had turned away from his brilliantly creative patronage of painting by 1544 when Humayun visited his court. It was not therefore deemed bad behaviour when the guest offered employment to several of his host's ablest artists, including Mir Sayyid-'Ali, who accepted the invitation and joined the Mughal court at Kabul in 1549. Five years later, in November 1554, he accompanied the Emperor when he set off to reconquer the Mughal domain in northern India.

Humayun's penchant for naturalism, which caused him particularly to admire Mir Sayyid-'Ali, was an inherited trait. His father, Babur (reigned 1526-1530), who conquered parts of northern India and founded the Mughal empire, was also a passionate lover of nature. This descendant of both Chinghiz Kahn and Tamerlane wrote one of the liveliest and most candid of all royal autobiographies, the *Waqiat-i-Baburi* or History of Babur, usually known as the *Babur-nameh*. Although no contemporary illustrated copy is known (nor can any Mughal paintings be assigned to his reign), his writings contain many fulsome and notably visual descriptions of animals, birds, fruits and flowers. Despite the absence of visual proof of Babur's tastes in art, his words alone demonstrate that sensitive, poetic naturalism was already the Mughal preference. The tastes of the empire's founder were followed by Humayun, who is known to have commissioned natural history pictures, although none has survived. All of the miniatures painted at the Mughal court during his troubled reign are finely executed in more naturalistic variants of Persian styles, with

many carefully rendered trees and flowers. Alas, they are extremely rare; for this ill-starred emperor died following an accidental fall from his library steps soon after the return to Delhi.

Akbar (1556-1605), aptly known as The Great, inherited his father's notably insecure kingdom at the age of 14. Temperamentally a conqueror rather than successor, this dynamically effective "philosopher king" was interested in all and everything. A brilliant military leader and statesman, he was also an extraordinary patron, whose wishes were carried out magnificently and promptly by the poets, musicians, architects, scientists, theologians and artists who flocked to his court from all over India and the Islamic world. For him, Babur's autobiography was translated into Persian from the original Chaghatai Turkish, and many illustrated copies were made for the royal library and for distribution throughout the realm. Each contained not only detailed portrayals of battles, court scenes and family history, but also a large number of natural history subjects. In these, animals, birds, fruits, trees and flowers are depicted with ever-increasing accuracy and fineness. So vast were his projects, many of which can be seen as art in the service of the state, that he maintained over 100 master artists, not to mention their followers and assistants. Thanks to Akbar's confidant and virtual amanuensis, Abu'l Fazl, who wrote the lengthy *Akbar-nameh* (History of Akbar), including the *A'in-i Akbari* (Mode of Governing of Akbar), many of the Emperor's views on aesthetics are known. Under his patronage, "minuteness in detail, . . . general finish . . . [and] boldness of execution [became] incomparable; even inanimate objects look[ed] as if they had life." Such was his charisma that 'Abd us-Samad, another artist recruited by Humayun at Tabriz, achieved "perfection . . . mainly due to the wonderful effect of a look of His Majesty, which caused him to turn from that which is form to that which is spirit." Clearly, Akbar inspired his artists to capture essences as well as outer appearances.

Mughal culture, as interpreted from its painting, was a complex synthesis of indigenous and foreign elements. Reflecting Akbar's insatiable curiosity and dynamism, it brought together qualities he admired from Persian, European, central Asiatic, Chinese and Tibetan sources as well as those from many Indian schools, both Muslim and Hindu. Just as he designedly married into Hindu families of the Rajput or warrior caste (Kshatriya) in order to unify his empire, and to win over a host of able officers for his armies, so did he actively recruit artists trained in many traditions to staff his ateliers. Many of them were Hindus, whose works, to quote Abu'l Fazl, "surpassed our conception of things." With the elemental power of

a tide, Akbar created a new artistic style in amazingly short order. Almost from the beginning, this art was imbued with his driving vitality. If Babur and Humayun had lent the Mughal ethos *naturalism*, Akbar further charged it with what might be termed *supra-naturalism*, a dash of the other-worldly that lent Mughal art a unique appeal and survived into the British period. Doubtless, it was this elevated, extraordinary characteristic, in addition to the technical excellence of Mughal artists, that attracted the East India Company botanists when they first employed native artists.

Upon Akbar's death in 1605, his son Jahangir (1605-1627) came to the throne. Less of a conqueror than his father, he was a more connoisseurly patron, with a near addiction to painting. He nurtured a small number of greatly talented artists, and released most of his father's, whose work probably struck him as coarse and somewhat vulgar. But he carried on the family enthusiasm for natural history, and one of his favourite artists was Mansur, to whom he gave the title *Nadir al-Asr* or The Wonder of the Age, a specialist in studies of birds, beasts and flowers. Like Babur, Jahangir wrote his memoirs (the *Tuzuk-i-Jahangiri*), in which he says that this artist painted more than 100 studies of the flowers of Kashmir, one of the Emperor's best loved provinces.

Few flower studies by Mansur have survived. Best known is the miniature of a tulip in the Habibganj Library, Aligarh District (Fig. II), which once adorned one of the Emperor's many albums, along with other paintings, calligraphies, and perhaps such exotica as European engravings, each set within richly illuminated borders.³ Characteristic of Mansur's miniatures are the dragonfly and moth, rendered with equal sensitivity. The merest glance at such a picture discloses its ancestral relationship to the botanical paintings made for the British by Indian artists nearly 200 years later. Although smaller in size and scale, and painted in burnished layers of opaque watercolor on Indian paper, their minutiae of handling, close observation and precise articulation affirm comparable devotion. Both patron and artist approached the plant as an enticing specimen, noting its inflorescence with encyclopaedic completeness. But they also succeeded in evoking its delights. One can smell freshness and feel growth. For Mansur lived up to Akbar's principle and painted not only outer forms but inner essences. Seemingly, he became the tulip in order to ensnare it with his brush for Jahangir, whose name means World-Seizer. Gently, delicately, but with utter determination, the Emperor's artists seized all aspects of life he desired — people, animals, trees, even his dreams — and preserved them for his continuing delectation in a microcosmic pictorial universe.

Mansur's tulip also reflects the Mughals' awareness of European botanical engravings. However trenchant and inspired Mughal understanding of nature may have been, it is unlikely that this picture could have been painted without familiarity with earlier European equivalents, such as Pierre Vallet's engravings for *Le jardin de Tres Chrestien Henri IV*, dated 1608 (see Wilfrid Blunt's *The art of botanical illustration*, London, 1950, pl. XVa). Although comparably isolated, moderately accurate studies existed in earlier Islamic art, Mansur's success in showing leaves in depth and his deliberate changes of angle to bring out many views of the tulip argue for knowledge of European prototypes. On the other hand, the coloristic brilliance, sinuous rhythms, suggestive of arabesque, and calligraphic linearism must be ascribed to the Persianate tradition as exemplified at the Mughal court.

Jahangir's particularly Mughal passion for flowers was expressed in gardening and assorted other arts and crafts as well as in painting. Whole palace complexes were enriched with floral ornament, carved in white marble, in *pietra dura* inlays, and painted in colors or in several tones of gold. Carpets, thrones, jade and rock crystal cups, sword and dagger handles, jewels, *kaftans* (robes of honour) and *paijameh* were alike adorned with splendid rows of irises, carnations and many other flowers. Assemblies of the court resembled horticultural celebrations.

Floriferousness increased during the reign of Jahangir's son, Shah Jahan (1628-1657), whose flower painters, however, diverted slightly from sensitively naturalistic interpretations in the direction of formalized and ornamental qualities, with increased borrowing from European botanical sources. Representations of flowers, whether in the borders of albums, on carpets, or wine cups, were becoming less believable, and less vital. Like some vast, courtly, but wilting plant, the Empire slowly weakened, with ever-increasing rigidity. Under Shah Jahan's son, the extremely orthodox Aurangzeb (1658-1707), the Empire became sprawlingly, self-destructively large. Richer than ever, it was nevertheless threatened by constant uprisings. By the reign of garden-loving Muhammad Shah (1719-1748), the secret of Mughal feebleness was out. In 1739, Nadir Shah of Persia invaded, defeated the Imperial armies, sacked Delhi, and triumphantly wended his way home, laden with booty that included the Peacock Throne. The last major Imperial patron of painting, Muhammad Shah, known as *Rangila* (The Pleasure-loving), retreated to the calm of his gardens. As before, the Emperor and his court, all their buildings and appurtenances seemed in constant florescence, a condition which persisted until the dynasty's end in 1858, when the last Mughal Emperor,



Figure III. *Papaver somniferum* cv. Rajput,
School of Kishangarh, ca. 1740; private collection.

Bahadur Shah II (1837-1858), was exiled to Burma by the British in the aftermath of the India Mutiny.

By 1585, when Akbar's conquests and statemanship had consolidated a Mughal Empire worthy of the name and created a new artistic idiom, the Mughal style in painting began to spread, especially to the Rajput courts whose rajas served the Empire. During the 17th and 18th centuries, floral motifs, which had been constants in Indian art from the beginning, were as much in vogue at the feudatory courts as in the Mughal capitals. Mughal cultural prestige, indeed, long outlasted Mughal might. Paradoxically, as the Imperial court weakened, and could no longer maintain armies of artists and craftsmen, men of talent found work elsewhere and further disseminated the Mughal style. After 1739, Mughal governors in Oudh, Bengal, and Hyderabad gained in richness and independence. Their courts, which soon outdid Delhi in magnificence, encouraged new "provincial" phases of Mughal art. Rajputs, too, could now hire skilled painters trained at Delhi. At Kishangarh, in Rajasthan, for instance, Raj Singh (1706-1748) and his son Sawant Singh (1748-1757) sponsored artists some of whom had been trained in the ateliers of Muhammad Shah. At their court a new blend of Rajput and Mughal art flourished, one that re-emphasized the inner understanding of nature as opposed to the outer, a characteristic which we ascribed to Akbar's Hindu artists.

A remarkable flower study (Fig. III) recalls Abu'l Fazl's claim that Hindu paintings "surpass our conception of things." Simultaneously naturalistic and emblematic, with its springy green stalk, marvelously observed spaces between the petals, and hovering, rootless unreality, this hauntingly brilliant red flower confirms its artist's tender response to the subject. While painstakingly building up layers of pigment with tiny brushes, he broke loose from time and space. Virtually hypnotized, and utterly patient, in a mood of awed innocence, he seemingly became the flower. Whether or not the artist, like his patron, was a Hindu, his sensibilities were probably heightened by some form of meditation, a technique shared by Hindus, Buddhists and Muslims. Thus sensitized, it was easier, even second nature, to remain inspired. Whether employed by a connoisseur-emperor, a poetically artistic Rajput prince, a priest, wealthy merchant or Englishman, such artists were keen to please and apparently happy at their often inherited tasks.

Enter the British: They arrived as merchants of the East India Company, from which theater Company Painting was derived, in the time of Akbar. With Mughal toleration, and even cooperation, they established trading

posts. Under Jahangir, in 1627, they were permitted to replace the Portuguese at Hooghly, in Bengal. In 1640, they were granted the site of Madras, and built Fort St. George. King Charles II acquired Bombay in 1661 as part of Catherine of Braganza's dowry. Calcutta, formerly a small town, began its history as a major British center in the 1680s. When the Mughal Empire eased into decay, in the mid-18th century, the East India Company's armies and administrators slowly filled the vacuum of power. The personality of the British presence in India can be traced stage by stage. Queen Elizabeth's ambassador to the Mughal court, Sir Thomas Roe, was a cultivated gentleman with a taste for commerce and insatiable curiosity. His journals and correspondence offer a vivid, foreigner's view of Mughal India, in contrast to Jahangir's *Tuzuk*. Many of the merchant-adventurers who followed him were greedier and less circumspect. But they took pleasure in "native" ways, drank quantities of toddy, and learned enough of the regional languages to trade and mingle with the locals. They were earthy, and at times piratical. By the late 17th century, these hearty tradesmen were better organized. Improvisation gave way to rules and regulations. But free and easy intercourse between Indians and Britishers suffered from institutionalization; and if the *farangi* (foreigners) had improved in behaviour, they were mixing less, clustering in increasingly English ways. Madras and Calcutta became provincial English cities, with prescribed social events, considerable formality, and class distinctions reminiscent of Indian castes.

Lord Clive's military successes (Arcot in 1751, Plassey in 1757, and Buxar in 1764) assured the Company's control over the Carnatic and Bengal. Ironically, his triumphs increased Parliament's interest in India, and led to stricter controls. His free-wheeling, opportunistic attitudes yielded to more sympathetic and cerebral responses to India. Men such as Warren Hastings, who was Governor-General from 1774 through 1785, were genuinely and constructively interested in Indian culture. He established a school for traditional Muslim education in Calcutta in 1781; studied Persian, Arabic and Sanskrit; and was one of the founders of the Asiatic Society of Bengal, which opened in 1784.

Although few English women had ventured to India before the later 18th century, and Company officials had lived as rowdy bachelors, family life now became the norm. Spacious white houses, adorned with classical columns and tastefully furnished in English styles, were solidly comfortable, and staffed with large numbers of Indian servants. Sahibs and Mem Sahibs gave and attended balls, lawn fetes and dinner parties galore. Colonial squirearchy had arrived. And with it came a new phase of Indian art, Company Painting, patronized by the firmly established foreign elite.

Happily, the naturalistic opaque watercolors of the Mughal tradition strongly appealed to the English taste in both form and content. Although perspective and shadowing were not fully understood by "native artists," their talent for portraiture and natural history subjects was duly appreciated. Soon, at such centers as Murshidabad and Calcutta, Mughal-trained artists were kept busy depicting portly, periwigged Englishmen, rather than *nawabs* or *rajas*, smoking hubbly-bubbly while reclining against Mughal bolsters. These amusing likenesses, at first painted in purely Mughal technique, were enthusiastically commissioned, glazed, framed and tacked to the walls of British drawing rooms. To the artists, this treatment of their work must have seemed extremely odd, for in India miniatures ordinarily were stacked and wrapped in cloth, to protect them from insects and fading. But they obligingly adjusted to this foreign whim. They also learned to paint shadows, attempted perspective, and agreed to make copies from imported prints. Soon, they devised new subjects for this eager clientele, which was replacing the now less affluent Indian nobility. Views of local monuments, and whole sets portraying trades and castes — the equivalents of latter-day postal cards and tourists' snapshots — were just the thing to satisfy this ready market.

Perhaps the most successful of Company pictures are those of flora and fauna. Although the earliest dated botanical studies associated with the Company are of the 1770s, an isolated Dutch publication (the *Hortus indicus malabaricus* of 1678-1703) contained engravings based upon Indian work by Malabar artists. Even then, as has been pointed out by Paul Hulton and Lawrence Smith, their pictures "show all the decorative qualities found in the drawings done for the British by Indian artists a century later, and even the details of technique are similar. In particular, the tendency for them to spring straight out of the edge of the paper and to slant diagonally across it are very characteristic of these hybrids of European and Indian art."⁴

One of the earliest English patrons of botanical painting in India was Lady Mary Impey, wife of Sir Josiah, the Chief Justice of Bengal from 1774 to 1782. This prestigious couple lived in Calcutta, where she employed three artists who signed their works "of Patna," a provincial center of the Mughal school. Two of her painters, Bhawani Das and Ram Das, were Hindus; the other, Shaykh Zayn-al-Din, was a Muslim. All worked in a powerfully decorative but closely observing style, as can be seen in the Shaykh's large picture of a *Gloriosa superba* and a double Rose of Sharon (*Hibiscus syriacus*) (Fig. IV). Like the many other natural history paintings made for Lady Impey (formerly in the collection of the

Linnean Society, London), this one represents a transitional stage between purely Mughal and Company idioms. Although it is on imported English paper, and shows the flowers as specimens, with cut stems, inimical insects and a characteristically European arrangement of birds, the pigments have been applied in the very time-consuming, traditional Mughal burnished layers, a method given up for purposes of economy in the later Company studies in this exhibition. Moreover, we sense the artist's Muslim education in the twittering, lively composition, which "reads," like Urdu and Persian, from right to left. Accurately observed, brilliantly colored and exquisitely finished, this picture demonstrates that Lady Mary's atelier established Company botanical painting on a level seldom surpassed.

While this discriminating amateur guided her artists in Calcutta, other Indian draughtsmen worked in Bihar for Dr. James Kerr (1738-1782), Company Surgeon in the Bengal Establishment. Their studies are the earliest official natural history paintings in the collection of the India Office Library (see Mildred Archer, *Natural history drawing in the India Office Library*, London, 1962, pp. 6, 71, 83-84). Already, one can detect differences of approach. Whereas the amateur, Lady Impey, wanted natural history *paintings*, the professional requested *studies*. He demanded greater scientific accuracy, with fewer ornamental addenda, such as butterflies. Officialdom, too, was prone to certain economies, particularly when they resulted in less "Indian" looking work. The Shaykh's laboriously achieved richness of palette was replaced by standard English watercolor washes, with occasional areas of opaque white and, more rarely, applications of varnish to heighten realism in such shiny passages as stems. Like Lady Impey's pictures, the official projects were painted on English papers, which are often watermarked with the makers' names as well as the years of manufacture.

Fortunately, as this exhibition reveals so stunningly, officialdom often succumbed to personal enthusiasms; and the artists continued to paint as brilliantly as they could. Although "science" was the intention, the achievement was art. We fully agree with Messrs. Hulton and Smith that these Company pictures are often "among the most beautiful botanical studies ever produced." We could cite many of those here as "masterpieces" of the genre. That depicting *Aconitum falconeri* (Fig. 55), for instance, is designed to bring out the spectacular interplay of spiky foliage with the small, diminishingly rhythmic blossoms, which seem to reach for the sky. By one of the few artists known by name, Vishnu Prasad, this gloriously honest, utterly simple picture transcends its supposed purpose — documentation in the name of economics. Like many other pictures

here, such as the one of *Momordica charantia* (Fig. 22), it astonishes. Coming upon it in an archive of "studies" would be comparable to reading a dry-as-dust financial report and encountering a passage by Baudelaire. We believe that the sublimity of so many of these pictures is not entirely due to the artists' arduous and infinite devotion, nor even to the terrible discipline that drove them off course into flights of fancy; rather, we suspect that their bliss was fully encouraged by the botanists (who are discussed in Phyllis Edwards' essay) in the vast, sustained projects that must number among the happiest meetings of East and West.

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Figure IV. *Gloriosa superba* and double Rose of Sharon, by Shaykh Zayn-al-Din of Patna, painted at Calcutta for Lady Josiah Impey, ca. 1780; private collection.

NOTES

¹John V. Brindle, Curator of Art in the Hunt Institute for Botanical Documentation, deserves my deep gratitude for asking me to write this essay for the catalogue of a long overdue exhibition. Scarcely able to differentiate a rose from an orchid, I took up the task gingerly. Its completion brought exhilaration — for the pictures seem even more beautiful than before! I am also deeply grateful to my friend Mildred Archer, whose studies of Indian painting during the British period are as fascinating and enlightening as the art itself.

²Hulton, Paul and Lawrence Smith, *Flowers in art from East and West*, British Museum Publications Limited, London, 1979, p. 47. This excellent catalogue accompanied an exhibition held in the British Museum during the summer of 1979.

³We reproduce this miniature from N. C. Mehta, *Studies in Indian painting*, Bombay, 1926, p1. 31.

⁴Hulton and Smith, *op. cit.*, p. 46.

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the materials of watercolor*, Fogg Art Museum, Cambridge,
Massachusetts, 1977.



Figure V. William Roxburgh (1751-1815), from an engraving by Charles Warren Esq. (from a miniature in the possession of Mrs. Roxburgh) in Jane Gray Album, Gray Herbarium, Harvard University; print at Hunt Institute.



Figure VI. Rev. William Carey (1761-1834), from an engraving by W. Worthington (after a painting by Robert Home) at the Royal Botanic Gardens, Kew; print at Hunt Institute.

COMPANY SPONSORSHIP AND THE BEGINNINGS OF INDIAN BOTANY

Among botanists of the mid-18th century there was a growing realization of the value of having accurate drawings of the appearance and structure of newly introduced plants. The draughtsman must be not only a consummate craftsman but one willing to work under the supervision of the botanist who commissioned the work, and to submit to restrictions imposed by the requirements for scientific accuracy. The drawings brought back to England by the young Joseph Banks (1743-1820) and Daniel Carl Solander (1736-1782) from Captain Cook's first voyage (1768-1771) had a tremendous impact not only on scientists, but also among the intelligentsia and through them on art and literature. Drawings commissioned by officers of the East India Company in India, the East Indies and China had a similar, though perhaps somewhat lesser effect. They dramatically revealed, as no written description could, an amazing variety of plant form and structure completely unfamiliar to European eyes. The Company, in general, followed the Banksian recommendation that artists should be associated with explorations undertaken by the Company so that they could draw from living material. The Company established a number of gardens in which their officers could endeavour to grow from seed many of the Indian plants they collected. The range of plants was also extended by seed sent to them by other residents of the sub-continent, thus providing botanists and artists with further living material for study and illustration. There exist in the India Office, the Royal Botanic Gardens, Kew and the British Museum (Natural History) extensive collections resulting from these activities.

The Honourable East India Company was founded in 1600. In the latter half of the 18th century, it was transformed from a 17th century trading enterprise into a paramount power in India, a power whose political role was coming more and more under the influence of Parliament. The appointment, in 1773, of the first Governor-General with authority in Bombay, Madras and Bengal increased still further such control of the Company's activities. The political situation, however, enabled it to undertake extensive surveys which would otherwise have been difficult if not impossible.

The beginnings of modern botany in India probably date from the arrival at the Tranquebar Mission, in Madras, of J. G. Koenig (1728-1785) to serve as surgeon and naturalist. Like Daniel Solander, Koenig had been a pupil of the famous Swedish naturalist Carl Linnaeus (1707-1778) whose

publication *Species plantarum* (1753) marks the advent of modern taxonomic botany. Koenig would have been familiar with the new and revolutionary method of plant description and classification and would, no doubt, have imparted this expertise to his botanic friends, a group who became known as the Madras Brethren.

In 1785 Koenig was succeeded as naturalist at Madras by Dr. Patrick Russell (1729-1805) who served as Company Botanist at Madras (1785-1789). Though he appears to have been more interested in Indian zoology than in botany, Russell recognized the value of Koenig's extensive knowledge of Indian flora and wrote to Sir Joseph Banks in England, suggesting the publication of an account, based on Koenig's notes, of the economic plants of the Coromandel coast, and further suggesting that the selection of drawings to be reproduced and the supervision of the project should be undertaken by Banks. Authorization by the Company's Court of Directors did not come until 1789, after Russell had left India and responsibility for furnishing drawings and descriptions fell to Dr. William Roxburgh (Fig. V), who succeeded Russell as naturalist at Madras in 1789. In July 1794 Banks informed the Company that the descriptions and drawings were of high quality and suggested bi-yearly issues of 25 plates each. The *Plants of the coast of Coromandel* was duly published, "under the direction of Sir Joseph Banks," in 12 parts, between 1795 and 1820. Russell wrote the preface to these sumptuous volumes reproducing some 300 drawings, made for Roxburgh by Indian artists and engraved by Mackenzie, Ferner, Weddell, Girtin, W. H. C. Edwards, P. B. Peake and F. Sanson. The original drawings for this work are at the Royal Botanic Gardens, Kew.

William Roxburgh (1751-1815), the most famous of the medical officers of the Company, was for some years a member of the Madras Brethren and was thus initiated into Linnaean methods by Koenig. Roxburgh was born at Craigie, in Ayrshire, Scotland, and studied medicine at Edinburgh University, where he qualified as a surgeon's mate; in that capacity he entered the service of the Company. He continued his medical studies and in 1776 graduated, whereupon the Company appointed him Assistant Surgeon at their Madras establishment. It was at this time that Roxburgh began his descriptions of Indian plants, for letters indicate he was sending copies of these to Joseph Banks, in 1779. He also sent him drawings; these may have been by himself, as he was a competent draughtsman, but more likely were drawn by an Indian artist. In 1780 he was appointed Surgeon and the following year was sent to the Company's station at Samulcottah where he began the experimental cultivation of a number of crop plants.

In 1789 he was appointed Company Botanist for the Carnatic region; from that date to 1793 he studied, described and illustrated the flora of the northern Sircars and the Coromandel coast. In 1792, when sending more descriptions and drawings to Banks, Roxburgh asked him to comment and point out any defects. Roxburgh was anxious that both descriptions and drawings should reach the high standard demanded of European botanical science. In the same letter he informed Banks that he had nearly 400 drawings. It is not known how many artists Roxburgh had at this time, or who paid their salaries. He would have trained them to draw in European style, but could also have given them some plates from a work such as Curtis's *Flora londinensis* ([1775] 1777-1798) as examples of fine craftsmanship and of the proper method of presentation.

The Company's main garden, at Sibpur, Calcutta, was founded in 1789 by Colonel Robert Kyd (1746-1793). He was succeeded in 1793 by Roxburgh, under whose dynamic supervision of 20 years the number of species growing in the garden increased from 300 to 3,500. In 1813 Roxburgh left Calcutta for the Cape of Good Hope to regain his health; as this did not sufficiently improve he returned to England, where he died in 1815. While at Calcutta, Roxburgh continued his systematic study of the Indian flora. He had a team of skilled botanical draughtsmen at the Garden recording the new introductions, two of the finest of whom were Vishnu Prasad and Gorachaud. Roxburgh's friend the Rev. William Carey (1761-1834, Fig. VI) published a list of the plants growing in the garden in *Hortus bengalensis* (1814). Roxburgh had drawings made of 2,500 of the species listed. A number of these drawings were copied for eminent personages such as the Marquis of Wellesley and such botanical friends as John Fleming and Patrick Russell. The Company received copies of all the drawings, and these are now at the Royal Botanic Gardens, Kew. Fortunately for taxonomic botany, Roxburgh gave each description a number and gave the same number to the drawing, thus providing botanists with much accurate data regarding the species. Further, as it is not always possible to establish the type specimen of a particular species, in such absence the drawing can serve as the type. The original set of drawings is still at the Calcutta Botanic Garden, bound in 34 volumes. The Botanical Survey of India is currently publishing fascicles of these drawings. Robert Wight (1796-1872, Fig. VII), the greatest collector of Indian plants up to his time, used some 400 of Roxburgh's drawings as the basis of illustrations in his *Icones plantarum Indiae orientalis* (1838-1853). These drawings, with others commissioned by Wight, are in the British Museum (Natural History).

The Marquis of Wellesley (1760-1842) was Governor-General from 1798

to 1805. Besides copies of many of the Roxburgh drawings, the Marquis had copies of those in the collections of Major-General Hardwicke of the Bengal Artillery (1755-1835) and of Francis Buchanan (afterwards Buchanan-Hamilton, 1762-1829). A few drawings were of plants in local gardens and others were of plants supplied by officers of the Company in up-country stations; they were made for the Marquis by the garden artists. A large number of the drawings in the India Office are from the Wellesley collection. The Marquis established an Institution for Promoting Natural History at Barrachpore, in 1804.

Major-General Hardwicke was mainly interested in Indian zoology. There is, however, a fine collection of his plant drawings in the British Museum (Natural History); unfortunately, they are in a large bound volume and therefore not on display in this exhibition.

Hardwicke wrote of John Fleming (1747-1829) as a very great encourager and promoter of natural history. Fleming was educated at Douai and at Edinburgh University where he obtained his doctorate in medicine. He joined the Indian Medical Service, serving in Bengal from 1768 to 1813, when he returned to London. He amassed a large collection of drawings, many of which were copies of the Roxburgh icones. Fourteen volumes were purchased by the British Museum (Natural History) in 1882. Fleming's prime botanical interest was in drug plants, and he published a "Catalogue of Indian medicinal plants" in volume 11 of *Asiatic researches*.

After Roxburgh left Calcutta in 1813, the garden had a succession of superintendents, one of whom was Nathaniel Wallich (1786-1854, Fig. VIII), who had come to India as a physician to the Danish settlement at Serampole, near Calcutta. When the settlement was taken over by the Company he joined their service. Wallich was first appointed sometime between 1815 and 1817 but was forced to resign through the allegations of a certain Dr. Hare. He was reinstated in 1817 through Banks's intercession with the Company. In the 1820's the garden was the great pleasure ground of Calcutta. The Company, ever mindful of the economic value that could accrue from exploration of the economic resources of an area, sent Wallich on a number of important surveys — to Nepal in 1820-1821, Singapore and Penang in 1822, and the foothills of the Himalayas in 1826. The Nepal area had been initially reconnoitered by two gardeners in 1818. Wallich also received a continuous supply of seed (packed in brown sugar!) from the Resident, the Hon. Edward Gardner. The description and pictorial recording of new species gained a new impetus through Wallich's efforts. He took Vishnu Prasad, the best of the

artists, with him on his survey tours. The first part of a selection of Wallich's descriptions and illustrations of Nepalese plants appeared in 1824 under the title *Tentamen florae nepalensis illustratae*; the final part was published in 1826. The original drawings by Vishnu Prasad and Gorachaud were lithographed by the Government Press, Calcutta. Wallich retired to England in 1828 with a large collection of specimens and drawings and began the preparation of his *Plantae asiaticae rariores*, published between 1829 and 1832. The plates were lithographed by M. Gauci and Weddell from drawings by Vishnu Prasad and Gorachaud, C. M. Curtis, Miss Drake, R. K. Greville and John Lindley.

Between February and December 1815, Francis Buchanan was Superintendent of the Calcutta garden. Born in Branzett near Stirling, Scotland, he attended Glasgow and then Edinburgh Universities and obtained his medical doctorate in 1783. He did not enter the Navy, as some authors have stated, but served as a surgeon on East Indiamen before joining the Company's service as Assistant Surgeon in 1794; he too was sent out on survey work. He was a member of the Embassy to the Kingdom of Ava in 1795. The plant specimens he collected on this journey, the descriptions, and 53 fine drawings were sent to London and passed on by the Company to Sir Joseph Banks; they are now in a large bound volume in the British Museum (Natural History). Eight of the drawings were published in Symes's account of the Embassy published in 1800.

Either at Roxburgh's or Sir James Murray's suggestion, Buchanan was sent on a survey of Mysore, Canara and Malabar (1800-1801). This led to his great interest in Rheede's *Hortus malabaricus* and the publication of a commentary on that great work in volumes 12, 14, 15 and 17 of the *Transactions of the Linnean Society*. On his return to Calcutta he joined the Embassy to Nepal (1801-1802). In 1803, he was appointed Surgeon on the Governor's staff. Attached to the Marquis of Wellesley's Institution for the Promotion of Natural History at Barrackpore was a menagerie and aviary. Appointed its first (unpaid) superintendent in 1804, Buchanan prepared descriptions and illustrations of the animals during the next two years. After spending a year back in England, he was on survey work from 1806 to 1814 in Bengal, Bihar and the United Provinces, one of the most thorough surveys undertaken by a Company officer. Buchanan's Nepal collections were passed on by the Company to his life-long friend Sir James Edward Smith (1759-1828), eminent botanist and founder of the Linnean Society of London. The Nepal drawings in this exhibition and those relating to Buchanan's manuscript



Figure VII. Robert Wight (1796-1872), from a lithograph by Allan and Ferguson at Royal Botanic Garden, Edinburgh; print at Hunt Institute.



Figure VIII. Nathaniel Wallich (1786-1854), from a lithograph by M. Gauci at the British Museum (Natural History); print at Hunt Institute.

animal and plant descriptions are from the Smith collection now at the Linnean Society.

Although nothing is known about the salaries paid to the Calcutta garden artists, we do know that Buchanan was allowed 100 rupees a year to employ an artist to accompany him on his survey work. In 1820, Buchanan-Hamilton returned to England with a view to publishing an account of his collections. Because he was unable to gain access to those in the possession of Banks and Smith, as he states, and because the drawings made on his last survey were, by order of the Governor, to remain in Calcutta, he decided to abandon the plan. He did however publish a number of papers on particular genera.

The major collection of plants from the northwestern Himalayas was made by John Forbes Royle (1799-1858), who was born at Cawnpore. He came to London to obtain a medical degree and then returned to India, where he joined the medical service of the Company. He was initially stationed in Bengal, but in 1823 he was transferred to the Company's station at Saharunpore in the North West Provinces. His assignments were as Surgeon to the station and two hospitals, and as Superintendent of the Company's garden, which was primarily concerned with the cultivation of medicinal plants for supplying drugs to the Company. Finding that he could not successfully grow some essential plants, Royle suggested to the Company the development of a garden at Mussoree, near Dehra Dun, where Aconite, *Digitalis* and Valerian soon flourished. He collected plants from around the two gardens and from the region between them. For the period 1829-1831 he employed native collectors travelling with merchant convoys to collect far to the north in Kashmir. Victor Jacquemont, a naturalist from the Museum Nationale d'Histoire Naturelle in Paris, wrote in a letter from Kashmir, that in 1831: "At Saharunpore I saw hundreds of plants from Kashmir." A Lt. Maxwell, between 1825 and 1826, added to Royle's collection with specimens from Kunawar.

Royle had a considerable knowledge of plants, being especially interested in plant distribution, in particular the relationships between native species and others that grow elsewhere and which yield or might yield substances of medicinal value. Royle returned to England in 1831 and in 1837 was appointed Professor of Materia Medica and Therapeutics at Kings College. In 1833 he began publishing the results of his botanical researches in India, *Illustrations of the botany of the Himalayan Mountains and of the flora of Cashmere*, a work issued in 11 parts over the next six years. Like other officers of the Company, Royle employed native artists to make drawings of the new species collected. As he was not satisfied

with their work, the Governor-General, Lord Amherst, allowed Royle to borrow, when Wallich was on leave in 1828, some of the Calcutta garden artists, including two of the finest, Vishnu Prasad and Lakshman Singh. Their beautiful drawings and those of Ferner, Capt. Cautley, C. M. Curtis, Miss Drake, J. T. Hart, W. Saunder, J. de C. Sowerby and J. O. Westwood were brilliantly lithographed by M. Gauci. Sir Joseph D. Hooker in his *Himalayan journals* (1855) stated that Royle's work "contains the first and only attempt to demonstrate the prominent features of the geographical distribution of North Indian plants and the botany of the surrounding countries." The original drawings for the *Illustrations* are in the City of Liverpool Public Museums. The Royal Botanic Gardens, Kew and the British Museum (Natural History) have related collections inscribed in pencil "Royle, Carey and others" (this is incorrect — it should be Royle and Wallich).

Succeeding superintendents of the Saharunpore garden continued the practice of having drawings made of new species. In the British Museum (Natural History) is a collection of drawings made at the garden around 1855 under the supervision of Deputy Surgeon-General William Jameson (1815-1883), Superintendent from 1844 to 1875. Jameson played an important part in the development of tea cultivation in India.

Also in the British Museum (Natural History) is a fine collection of natural history drawings, mounted on very large paper, whose provenance is not known. As the botanical drawings so closely resemble those in the other collections at the Museum, at Kew, and in the India Office, one can be certain they were executed by the Calcutta garden artists. The same is true of another collection of drawings in the Museum, also of unknown provenance.

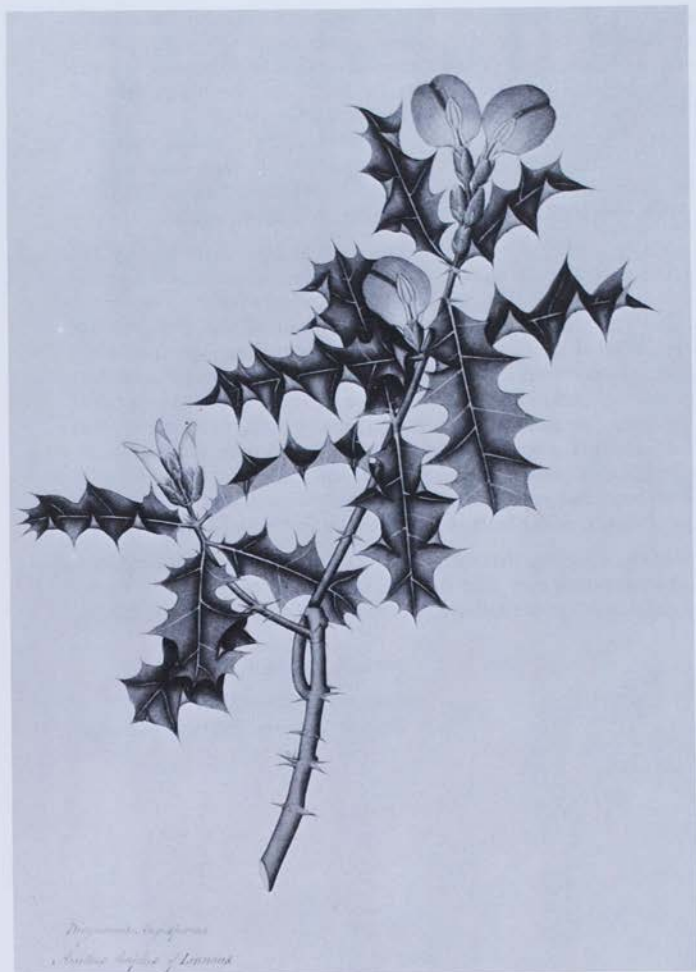
The beautifully illustrated works of Roxburgh, Wallich and Royle made not only botanists but also the general public aware of the nature and beauty of the Indian flora. These three officers of the Company laid the foundation of Indian botany. Before he left India, Roxburgh enabled Carey to acquire a copy of his manuscript "Flora indica." Part of this manuscript, edited by Carey and with additions by Wallich, was published in two volumes (1820, 1824). Later (1832) Carey published the whole manuscript without additions, in three volumes. Roxburgh's *Flora indica* justly entitles him to the title Father of Indian Botany.

In 1792, Carey, with others, founded the Baptist Missionary Society. He was the first missionary to go out to India and became a renowned orientalist and teacher. With William Ward he founded what soon became a famous college at Serampore. He also set up one of the first printing presses in India; it published Wallich's Nepalese flora. His friendship with Roxburgh and other officers of the Company led to his great interest in natural history and to the foundation of a museum and botanic garden at the College. The botanic garden, with many introduced plants, was second only to the Company's Sibpur garden in Calcutta. Carey, in fact, superintended that garden for some 6-12 months after Roxburgh left and before Buchanan was appointed. In 1828, he presented a collection of 35 drawings of insects and plants to the Linnean Society of London.

Very few of the drawings that were commissioned by officers of the Company and others have ever been on display. This is the first time, to my knowledge, that a representative selection has been put on public exhibition.

PHYLLIS I. EDWARDS

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British Museum (Natural History)*



1. *Acanthus ilicifolius* L.

CATALOGUE

Paintings are listed by the modern botanical names of the species depicted, to the extent that we have been able to determine their identities. Following those are their English common names, if any. We have made no attempt to list the almost innumerable common names that have been applied in the many Indian dialects. Any botanical names appearing as annotations on the paintings and differing from the binomials under which those are listed here appear in parentheses.

ACANTHACEAE

1. *Acanthus ilicifolius* L.

The leaves of a related species from southern Europe are reported to have been the inspiration for the ornamental design of the Corinthian capital.
BM(NH)

2. *Justicia andersonii* Ramamoorthy
(*Justicia interrupta* B.)

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

ALISMATACEAE

3. *Sagittaria sagittifolia* L. Old-World
ssp. *leucopetala* (Miq.) Hartog Arrowhead
(*Sagittaria sagittifolia* Willd.)

Plants of this species (several varieties) are often used as ornamentals around ponds and pools.

RBG Kew, William Roxburgh collection

AMARYLLIDACEAE

4. *Crinum latifolium* Roxb.

BM(NH)

5. *Curculigo orchhioides* Gaertn.
(*Gethyllis fusiformis* B.)

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

ANACARDIACEAE

6. *Mangifera indica* L. Mango

Native to northwest India and Burma, the Mango has been cultivated there for at least 4,000 years; its well-known fruit is eaten

fresh and in curries, preserves, pickles, chutnies and custard. The timber is soft and not durable, but has been reported to be admirable for tea and opium boxes.
BM(NH), John Fleming collection

APOCYNACEAE

7. *Nerium indicum* Mill. Sweet-scented
(*Nerium odoratum*) Oleander
According to Cowen (1950), "Women in India driven to suicide by jealousy, misery or sickness have been known to eat Oleander roots." All parts of the plant are poisonous, containing among other substances a cardiac glycoside. The bark and wood are used in the manufacture of rat poison. Medically, various parts of the plant have been used to treat ringworm, leprosy and boils. Although this Asian species is often cultivated, the Mediterranean *N. oleander*, the common Oleander of horticulture, is perhaps better known. The insect depicted here is *Euploea core*.
Linnean Society, Rev. William Carey collection

ARACEAE

8. *Arisaema speciosum* (Wall.) Mart.
(*Arisaema speciosum* Wall.;
Arum speciosissimum Wall.)
This illustration was published as plate 20 in Wallich's *Tentamen florum nepalensis* (1824), where the species was first described, under the genus *Arum*.
RBG Kew, John Forbes Royle collection

9. *Sauromatum venosum* (Ait.) Kunth
(*Arum guttatum* Wall.; *Sauromatum guttatum* Schott)
Wallich described this plant under the name *Arum guttatum* in his *Plantae asiaticae rariorae*, vol. 2 (1831), plate 115 there being based on this painting. He reported that the root is strongly poisonous, and that the spathe sometimes reaches two feet in length.
RBG Kew, John Forbes Royle collection

10. *Typhonium trilobatum* (L.) Schott
(*Arum orixense* Roxb.)
The insects depicted here are *Rhyncholaba acteus* Cramer and *Theretra oldenlandiae* Walker.
Linnean Society, Rev. William Carey collection

ARECACEAE

11. *Arenga saccharifera* Labill. "Sago Palm"
(*Saguerus rumphii*; *Borassus gomutus* Loureiro)
The various parts of this valuable plant have been put to many uses, including filtering water, covering submarine telegraph cables, and making brushes, ropes, sandals, food (sago), palm wine, sugar, vinegar, troughs and water channels. The "true" Sago Palm is an entirely different species, *Metroxylon sagu*, also highly useful.
BM(NH), John Fleming collection

12. *Corypha taliera* Roxb.
The first description of this palm appeared in Roxburgh's *Plants of the coast of Coromandel*, vol. 3 (1819), the accompanying illustration (plate 255) being based on this painting. Roxburgh noted that the leaves were employed by natives to write on and also that they were split to tie the rafters of houses together. The note on the painting, apparently in Roxburgh's hand, refers to use of fronds for fans.
BM(NH), John Fleming collection

ASCLEPIADACEAE

13. *Marsdenia ?tenacissima* (Roxb.) ?Rajmahal
Wight & Arn. Hemp
Mountaineers of Rajmahal use the fiber of the species apparently depicted here to make bow strings. The beautiful silky fiber is elastic, durable, and resistant to alkali, so it is also used for netting and cordage.
BM(NH), Saharunpore Garden collection

ASTERACEAE

14. *Echinops echinatus* Roxb. Globe Thistle
RBG Kew, William Roxburgh collection

BEGONIACEAE

15. *Begonia barbata* Wall. ex A.DC.
(*B. palmata* Don ?)
RBG Kew, John Forbes Royle collection

CANNACEAE

16. *Canna nepalensis* Wall.
(*Canna coccinea* Roscoe)
This is a close relative, and perhaps only a variety, of *C. indica* L., Indian Shot, one of the cannas earliest cultivated.
RBG Kew, Nathaniel Wallich collection

CASUARINACEAE

17. *Casuarina equisetifolia* L. Beefwood, Horse-tail Tree, She-Oak, Australian-Pine (*Casuarina muricata* Roxb.)

Roxburgh described this plant under the name *C. muricata*; it is now regarded as belonging to the widely distributed Linnaean species cited here. The wood is used chiefly for fuel, and also for poles and rafters, the bark as a tanning agent. These trees make excellent windbreaks and are often employed in reclamation of land near the sea.

RBG Kew, William Roxburgh collection

CLUSIACEAE

18. *Mammea suriga* (Buch.-Ham. ex Roxb.) Kosterm.
(*Rheedea*; *Calophyllum* ? *suriga*)

Roxburgh was the first to publish a description of this tree, under the genus *Calophyllum*, based on a manuscript description by Buchanan. Subsequently, the species has been recognized as belonging to *Mammea*, which includes the widely cultivated West Indian Mamey (*M. americana*).

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

CONVOLVULACEAE

19. *Ipomoea* ? *asarifolia* (Desr.) Roem. & Schultes
(*Convolvulus rugosus* B.)

Belonging to the same genus as the cultivated Morning Glory (*I. purpurea*), this species is also related to the Sweet Potato (*I. batatas*) and to *I. purga*, the source of the cathartic jalap.

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

CUCURBITACEAE

20. *Coccinia grandis* (L.f.) Voigt
(*Bryonia grandis*; *Coccinia*; *Momordica*; *Coccinia grandis* (L.) Kurz)

This gourd was described originally by Linnaeus *fil.* in the genus *Bryonia*. Unlike many other members of the family, it is of no particular economic importance.

BM(NH), Calcutta Garden artists collection

21. *Luffa graveolens* Roxb.
(*Cucumis* n.sp.; ? *Luffa echinata* Roxb.)

Since no specimen associated with Roxburgh's original description of this plant is extant, this drawing serves instead as the nomenclatural type of the species. A close relative, *Luffa cylindrica*, is the source of the well-known Loofah vegetable sponge — the dried "skeleton" of its fruit.

BM(NH), Calcutta Garden artists collection

22. *Momordica charantia* L. Balsam-Pear, Bitter Melon

Many members of the gourd family contain bitter substances, known chemically as cucurbitacins, which render them inedible. Some of those species which are edible, such as this one, have both bitter and non-bitter varieties.

BM(NH), Saharunpore Garden collection

23. *Momordica dioica* Roxb. ex Willd.

The fruits of this species are used as a "vegetable" in India. In this family the flowers are almost always unisexual — with either "male" or "female" reproductive structures only. Those depicted here are "female," from which the fruit is produced.

BM(NH), Calcutta Garden artists collection

24. ? *Trichosanthes* sp.
(*Trichosanthes nervifolia* of Linnaeus ?; *Trichosanthes oleracea* of Roxburgh)

A later annotation on the drawing attributes this plant to Roxburgh's *T. oleracea*; it has also been identified as *T. dioica* Roxb., but that too is uncertain. BM(NH)

DILLENIACEAE

25. *Dillenia indica* L.

This tree reaches a height of 40 feet, its leaves a length of a foot, and its flowers a diameter of eight inches — the latter among the largest known in the plant kingdom. The wood is used for gunstocks and helms, and in the construction of boats and houses. The fruit is edible and the sepals are eaten raw or cooked in curries. Dried older leaves are used like sandpaper for polishing horn and ivory.

India Office, Marquis of Wellesley collection

DIPTEROCARPACEAE

26. *Vateria indica* L. White Dammar of South India, Piney Varnish, Indian Copal, Malabar Tallow

Various members of this family of trees are the predominant species in many of the lush

lowland rain forests of the Asian tropics. The resin of this one is used as a varnish and, mixed with coconut oil, for making candles. A "vegetable butter" — the solid oil from the seeds — is known as Piney Tallow and used in lamps and for flavoring food. Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

EUPHORBIACEAE

27. *Sapium insigne* (Royle) Benth.
(*Sapium canapudium* B.)
Royle originally described this plant as a species of *Falconeria*.
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

FABACEAE

28. *Bauhinia purpurea* L.
These flowers are used not only decoratively, but also as a pot herb in curries. As buds they are also made into pickle (chutni).
BM(NH), John Fleming collection
29. *Caesalpinia sappan* L. Sappan-wood Tree
(*Caesalpinia sappan* Willd.)
Plate 16 in Roxburgh's *Plants of the coast of Coromandel*, vol. 1 (1795) was based on this painting. The species depicted was frequently mentioned in letters from East India Company employees at the beginning of the 17th century, when it was already well known in trade. The heartwood is the source of a valuable red dye. Roxburgh noted that the living plant itself seemed to be "a very proper prop for pepper vines to run on."
RBG Kew, William Roxburgh collection
30. *Caesalpinia mimosoides* Lam.
(*Casalpinea simora* Buch.)
Under the name *C. simora*, this illustration was published as plate 392 in Wight's *Icones*.
RBG Kew, John Forbes Royle collection
31. *Canavalia gladiata* (Jacq.) DC. Sword or Sabre Bean
(*Dolichos*; *Canavalia gladiolata* G.Sauer)
Like those of the related Jack Bean (*C. ensiformis*), the seeds of this species are edible. Wight reported that the pods sometimes reach a foot and a half in length.
BM(NH)
32. *Cassia surattensis* Burm.f.



2. *Justicia andersonii* Ramamoorthy

- (*Cassia biflora* L. ?)
In India, this is sometimes planted as a garden hedge.
BM(NH), John Fleming collection
33. *Cylista scariosa* Ait.
This illustration appears as plate 92 in Roxburgh's *Plants of the coast of Coromandel*, vol. 1 (1795). The descriptive notation on the painting is Roxburgh's and is essentially repeated in his published account that accompanies the plate.
BM(NH), John Fleming collection
34. *Desmodium concinnum* DC. var. *amoenum* Wall. ex Baker
(*Desmodium amoenum* Wall.)
The familiar Tick Trefoils or Tick Clovers are

relatives of the species shown here, one of many in this worldwide genus.
RBG Kew, Nathaniel Wallich collection

35. *Dioclea reflexa* Hook.f.
(*Dolichos hexandrus* R.)
Described by Roxburgh in his *Hortus bengalensis* as *Dolichos hexandrus*, this species was omitted in both editions of his *Flora indica*.
RBG Kew, William Roxburgh collection

36. *Erythrina variegata* L. Coral Tree, Mochi-
(*Erythrina indica* Lam.) wood Tree
Cultivated as a shade tree and for living support and protection of betel leaf, peppers and grape vines, pumpkins, jasmynes and climbing roses, this plant is also grown by tea planters to enrich the soil. Its roots, like those of many other leguminous species, form nodules which harbor symbiotic nitrogen-fixing bacteria, making it a living fertilizer.
BM(NH), John Fleming collection

FAGACEAE

37. *Quercus spicata* Sm. Oak
This was published as plate 46 in Wallich's *Plantae asiaticae rariores*, vol. 1 (1830), where he noted that, "By an oversight an erroneous representation of the male flowers has been copied on the plate." According to Wallich this was "one of the largest as well as the commonest sort of oak in Nipal."
RBG Kew, Nathaniel Wallich collection

LAMIACEAE

38. *Coleus barbatus* (Andr.) Benth.
(*Plectranthus dodiputra* B.)
Many species of this tropical genus have become popular as house plants in temperate zones. Together with the closely related *Plectranthus*, this is among the best-known genera of cultivated mints.
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"
39. *Eustalis tomentosa* (Dalz.) Majumdar
(*Mentha stellata* B.)
Described by Buchanan as *Mentha stellata*, this species is now attributed to one of the many genera that have been segregated from Linnaeus' broadly conceived *Mentha*.
Linnean Society, Buchanan-Hamilton collection

tion related to his ms. "Animal and plant descriptions"

LECYTHIDACEAE

40. *Careya arborea* Roxb. Slow-match Tree,
(*Cumbio gaula* B.) Wild Guava
Roxburgh named this genus for his good friend (and posthumous editor) The Rev. William Carey. This species yields a durable timber (tummy wood) which stands up well under water and has a great many, diverse uses. The bark is employed to make brown paper, coarse cordage and sacks, and the leaves are fed to tassar silk worms.
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

LINACEAE

41. *Hugonia mystax* L.
(*Hugonia obovata*)
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

LOGANIACEAE ?

42. ?*Fagraea* sp.
(*Atropa dichotoma*; *Hunteria corymbosa* Roxb. ?)
The genus *Fagraea*, to which this plant probably belongs, is native in India only along the Malabar coast. A note on the painting indicates that this species, then attributed erroneously to the *Belladonna* family (*Apocynaceae*), was brought from Penang, probably meaning the small island off the west coast of the Malay Peninsula formerly known as Prince of Wales Island, now part of the Malaysian state of Penang. That island was the site of the first British settlement in Malaya and was ceded to the East India Company in 1786.
BM(NH), Calcutta Garden artists collection

MALVACEAE

43. *Gossypium hirsutum* L. Upland Cotton
Although cotton is native to India, this particular species was introduced there from the New World, via Philip Miller in London, who sent seed to the United States, from whence Egyptian and Indian cultivated stocks of it were derived. The first Indian cotton mill was built in 1818, near Calcutta.
BM(NH)

44. *Abelmoschus moschatus* (L.) Musk
Moench Mallow
(*Hibiscus abelmoschus* of Linnaeus)

The seeds of this plant have a musky constituent sometimes used in perfumery. The genus *Abelmoschus* has been segregated from *Hibiscus*, to which this species is often alternatively assigned.
BM(NH)

45. *Hibiscus cannabinus* L. Deccan Hemp,
Rose Mallow

Introduced from Africa, this plant has been cultivated widely in India for its economic value. The bark is a hemp substitute, the tough fiber is used in sackcloth, ropes, cordage, canvas, fishing nets, and paper, the leaves are eaten as a vegetable, and an oil derived from the seeds is used as a lubricant and in the manufacture of soaps, linoleum, paints and varnishes.
BM(NH), Calcutta Garden artists collection

46. *Hibiscus rosa-sinensis* L. Rose-of-China,
Chinese Hibiscus, Shoe Flower

Shown here is a double-flowered Indian cultivar of this widely introduced Asian native. Besides its ornamental value, it yields a juice from the petals which aids in blacking shoes and dyeing hair, and, when rubbed on paper, forms an excellent substitute for Litmus paper, used to determine acidity.
India Office, Marquis of Wellesley collection

47. *Malva sylvestris* L. Mallow
(*Malva lacera* B.)

Called *M. lacera* by Buchanan, this may belong to *M. sylvestris*, elsewhere widespread in Europe and naturalized in North America. Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

MORACEAE

48. *Ficus hispida* L. Fig
(*Ficus oppositifolia* of Roxburgh)

Roxburgh, who described this fig under the name *F. oppositifolia*, reported that its fruit is seldom eaten.
BM(NH)

49. *Ficus* sp. Fig
(*Ficus racemosa* of Linnaeus)

Although the painting is annotated *F. racemosa* L., it surely does not depict that

species. We have been unable to associate it definitely with any other of the 100+ species of fig native to India.
BM(NH)

NYMPHAEACEAE

50. *Nymphaea lotus* L., Lotus
or *N. pubescens* Willd.

The Lotus, or Water-Lily, may be regarded as the floral emblem of Hindu India.
BM(NH), John Fleming collection

51. *Nymphaea lotus* L. var. *rubra* Roxb. Lotus

The roots and seeds of Lotus species are eaten by the Indians, and dried stalks of the leaves and flowers are used in cooling medicines.
India Office, Marquis of Wellesley collection

ORCHIDACEAE

52. ?*Cymbidium aloifolium* (L.) Sw.
(*Epidendrum borassi* B.; *Aerides*)

Buchanan attributed this plant to *Epidendrum*; however, as presently understood, that genus is confined to the New-World tropics. A definite association with some Indian orchid species has eluded us.
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

PANDANACEAE

53. *Pandanus laevis* Lour. Screw-Pine

Closely related to and perhaps not distinct from *P. odoratissimus*, this plant is grown for its fragrant flowers, used to make kenda attar, a perfume popular in India. The fibrous leaves of this and other screw-pines are used widely for thatching, matting and weaving.
RBG Kew, Nathaniel Wallich collection

POLYPODIACEAE

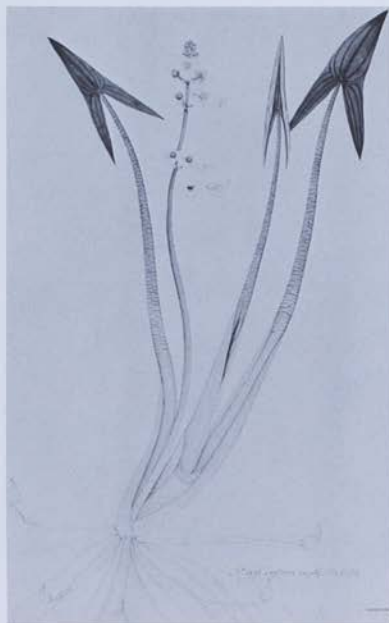
54. *Microsorium scolopendria* (Burm.f.) Copel
(*Polypodium scolopendrium*)

Linnean Society, Buchanan-Hamilton collection related to his ms. "Flora nepalensis"

RANUNCULACEAE

55. *Aconitum falconeri* Stapf. Monkshood
(*Aconitum ferox* Wallich; *Aconitum venosum* ? Don)

Like other members of the genus, this plant is violently poisonous in all its parts.
RBG Kew, John Forbes Royle collection



3. *Sagittaria sagittifolia* L. ssp. *leucopetala* (Miq.) Hartog Old-World Arrowhead



4. *Crinum latifolium* Roxb.

56. *Aconitum ferox* Wall. ex Seringe Monkshood

This illustration appears as plate 41 in Wallich's *Plantae asiaticae rariores*, vol. 1 (1830). He reported that it contains "probably the most deleterious vegetable poison of continental India," used to poison arrows and kill tigers.

RBG Kew, Nathaniel Wallich collection

ROSACEAE

57. *Rosa ?involuta* Roxb.

(The common white rose of Bengal n. sp.?)

The common rose of Bengal mentioned in the annotation on this painting is known as *R. involuta* Roxb. The plant illustrated

here, if it does belong to that species, is an uncommon doubled form.

BM(NH), John Fleming collection

58. *Sibbaldia cuneata* Hornem. ex Kuntze (top left)

59. *Potentilla ?cantleyana* (top right) (*Potentilla pteropoda*)

60. ?*Sibbaldia* or ?*Potentilla* sp. (bottom left)

61. *Sibbaldia purpurea* Royle (bottom right)

This appeared as plate 40 in Royle's *Illustration of the botany and other branches of the natural history of the Himalayan Mountains, and of the flora of Cashmere* (1839).

BM(NH), Royle and Wallich collection

47. *Malva ?sylvestris* L. Mallow5. *Curculigo orchioidea* Gaertn.

RUTACEAE

62. *Aegle marmelos* (L.) Correa Wood-Apple,
(*Crataeva marmelos*) Bael Fruit

Plate 143 in Roxburgh's *Plants of the coast of Coromandel*, vol. 2 (1798) was apparently based in part on this painting. Linnaeus had originally described the species under the genus *Crataeva*. The fruit of this tree, sacred to the Hindus, is eaten as marmalade, sherbet, syrup and pickle, and is also used medicinally. Mucilage from the seeds provides a cement. The fruits, filled with gunpowder, served as bombs in fireworks exhibitions.

India Office, Marquis of Wellesley collection

SAPINDACEAE

63. *Lepisanthes fruticosa* (Roxb.) Leenh.
(*Harrisia stipulacea* B.)

This plant was introduced into India from

the Moluccas by Roxburgh himself, under the name *Sapindus fruticosus*.
Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

SAXIFRAGACEAE

64. *Ribes glaciale* Wall.

This is a relative of the currants and gooseberries familiar from cultivation.

BM(NH), Royle and Wallich collection

SCROPHULARIACEAE

65. *Wightia speciosissima* (D. Don) Merrill
(*Bignonia taiabu* B.)

Assigned by Buchanan to *Bignonia*, this plant is now recognized as a species of *Wightia*, named by Wallich in honor of Robert Wight.

Linnean Society, Buchanan-Hamilton collection related to his ms. "Flora nepalensis"

SOLANACEAE

- 66.
- Datura metel*
- L.

Wight (1850) reported that robbers in India almost daily victimized the unwary by utilizing the narcotic properties of the seeds and roots of various species of *Datura*, which they would powder and, for example, bake into bread.

BM(NH)

STERCULIACEAE

67. ?
- Pterygota alata*
- R.Br.

(*Sterculia frondosa* Roxb.)

Roxburgh's "*Sterculia frondosa*" is an unpublished manuscript name.

BM(NH), Calcutta Garden artists collection

TILIACEAE

- 68.
- Corchorus ?capsularis*
- L.

Jute

Although the first commercial use of the term "jute" was not until 1828, Roxburgh used the word in 1795 in a letter to the Directors of the East India Company, who were making an effort to discover a substitute for the "Russian hemp" used for ropes and cordage on the Company's ships. The insect shown belongs to the family Arctiidae.

Linnean Society, Rev. William Carey collection

VERBENACEAE

- 69.
- Clerodendrum serratum*
- (L.)

Glory Bower

Moon var. *dentatum* H.J.Lam

(*Volkameria serrata* Lin.?)

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

- 70.
- Lantana indica*
- Roxb. var.
- albiflora*
- Wight ex C.B. Clarke

(*Lantana alba* B.)

Maheswari (1963) reported that children eat the fruit of this species; otherwise, it apparently has no economic use. A number of other species of *Lantana* are grown as ornamentals in warm regions of the world.

Linnean Society, Buchanan-Hamilton collection related to his ms. "Animal and plant descriptions"

- 71.
- Stachytarpheta mutabilis*
- (Jacq.) Vahl

The moth depicted is *Acherontia styx styx* Westwood, the Death-Head Sphinx.

Linnean Society, Rev. William Carey collection

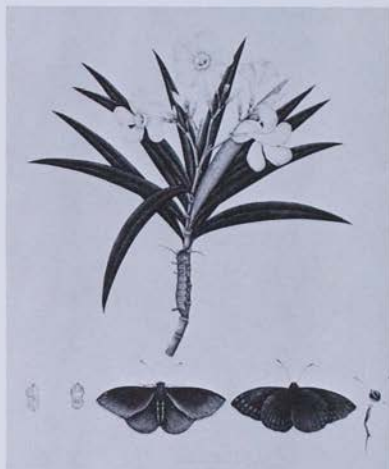
ZINGIBERACEAE

- 72.
- Curcuma petiolata*
- Roxb.

(*Curcuma cordata* Wall.)

As *Curcuma cordata*, this illustration appeared as plate 10 in Wallich's *Plantae asiaticae rariores*, vol. 2 (1830). Another species of the genus, *C. longa*, is the source of the chief ingredient in curry powder.

RBG Kew, John Forbes Royle collection



7. *Nerium indicum* Mill. Sweet-scented
Oleander



6. *Mangifera indica* L. Mango



9. *Sauromatum venosum* (Ait.) Kunth



8. *Arisaema speciosum* (Wall.) Mart.



10. *Typhonium trilobatum* (L.) Schott



11. *Arenga saccharifera* Labill. "Sago Palm"



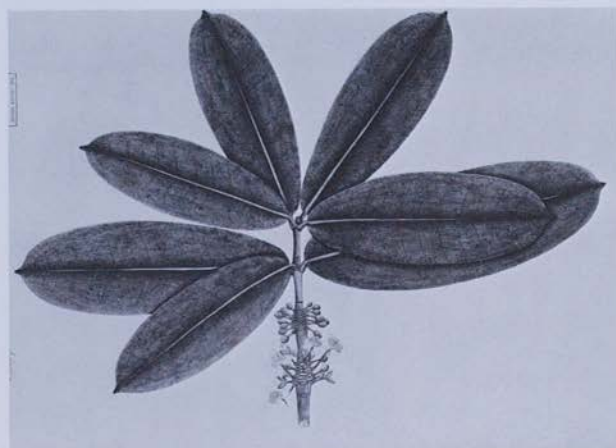
13. *Marsdenia ?tenacissima* (Roxb.) Wight & Arn. ?Rajmahal Hemp



14. *Echinops echinatus* Roxb. Globe Thistle



16. *Canna nepalensis* Wall.



18. *Mammea suriga* (Buch.-Ham. ex Roxb.) Kosterm.



12. *Corypha taliera* Roxb.



15. *Begonia barbata* Wall. ex A.DC.



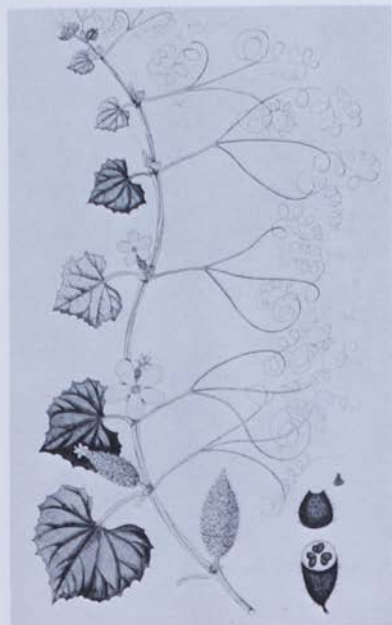
19. *Ipomoea ?asarifolia* (Desr.) Roem.
& Schultes



17. *Casuarina equisetifolia* L. Beefwood,
Horsetail Tree, She-Oak, Australian-Pine



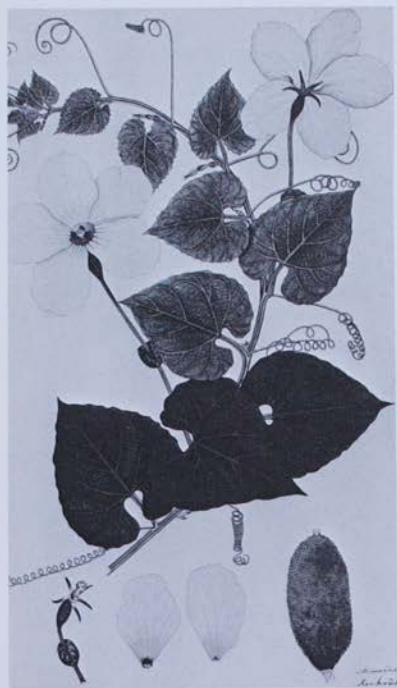
20. *Coccinia grandis* (L.f.) Voigt



21. *Luffa graveolens* Roxb.



22. *Momordica charantia* L. Balsam-Pear,
Bitter Melon



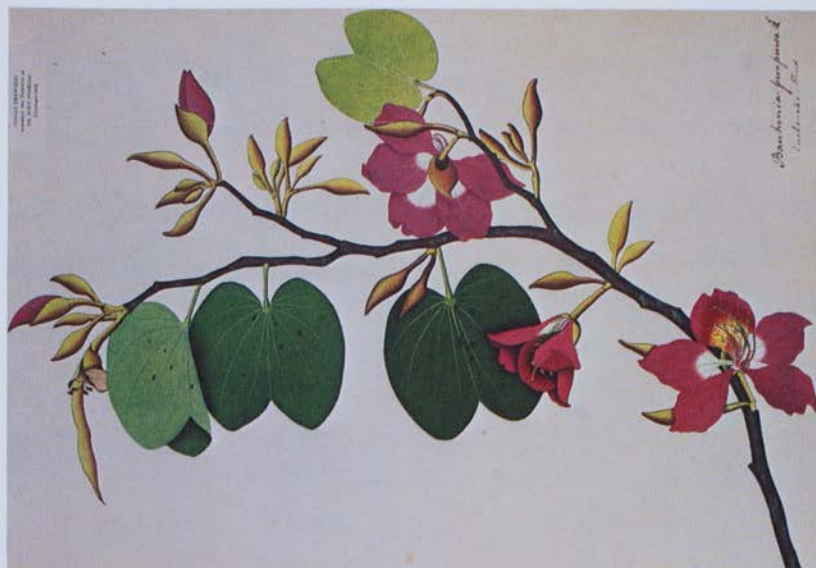
23. *Momordica dioica* Roxb. ex Willd.



24. ?*Trichosanthes* sp.



25. *Dillenia indica* L.



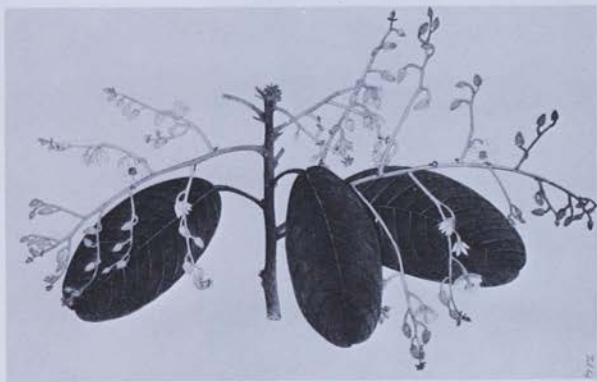
28. *Bauhinia purpurea* L.



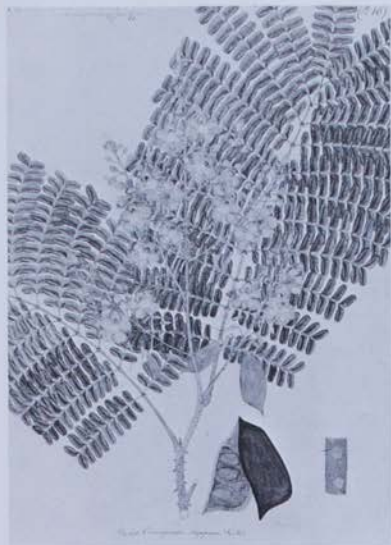
31. *Canavalia gladiata* (Jacq.) DC. Sword or Sabre Bean



27. *Sapium insigne* (Royle) Benth.



26. *Vateria indica* L. White Dammar of South India, Piney Varnish, Indian Copal, Malabar Tallow



29. *Caesalpinia sappan* L. Sappan-wood Tree



38. *Coleus barbatus* (Andr.) Benth.



32. *Cassia surattensis* Burm.f.



30. *Caesalpinia mimosoides* Lam.



33. *Cylista scariosa* Ait.



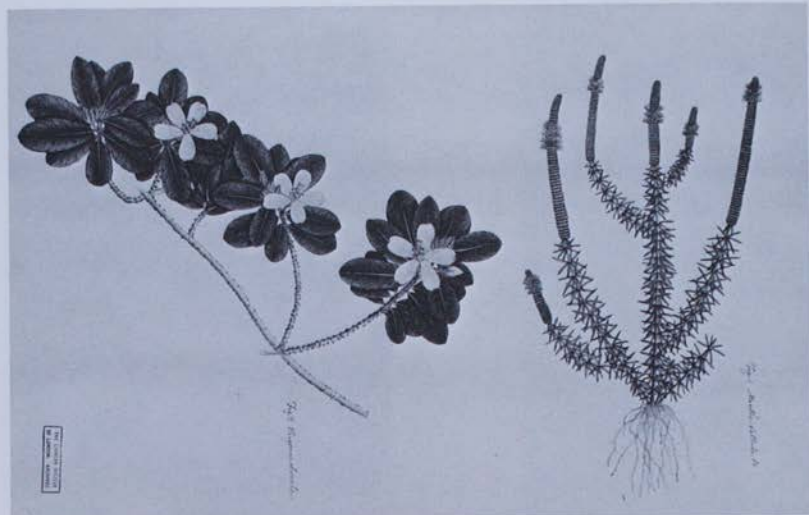
35. *Dioclea reflexa* Hook.f.



34. *Desmodium concinnum* DC.
var. *amoenum* Wall. ex Baker

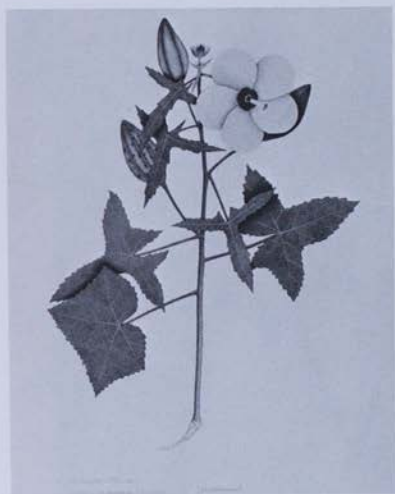


36. *Erythrina variegata* L.
Coral Tree, Mochi- wood Tree

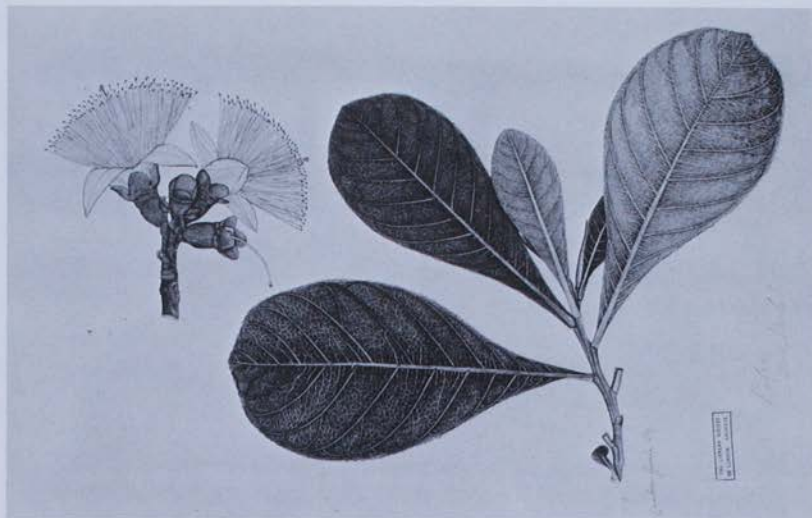


41. *Hugonia mystax* L.

39. *Eusteralis tomentosa* (Dalz.) Majumdar



44. *Abelmoschus moschatus* L. Moench Musk Mallow



40. *Careya arborea* Roxb. Slow-match Tree,
Wild Guava



45. *Hibiscus cannabinus* L. Deccan
Hemp, Rose Mallow



42. ?*Fagraea* sp.



37. *Quercus spicata* SM. Oak



43. *Gossypium hirsutum* L. Upland Cotton



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Chinese Hibiscus, Shoe Flower



48. *Ficus hispida* L.f. Fig



49. *Ficus* sp. Fig



53. *Pandanus laevis* Lour. Screw-Pine



50. *Nymphaea lotus* L., or *N. pubescens*
Willd. Lotus



56. *Aconitum ferox* Wall. ex Seringe
Monkshood



67. ?*Pterygota alata* R.Br.



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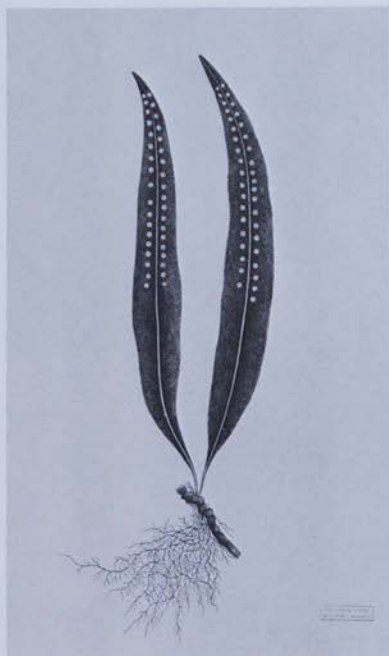
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ex C.B. Clarke



52. ?*Cymbidium aloifolium* (L.) Sw.



57. *Rosa ?involucrata* Roxb.



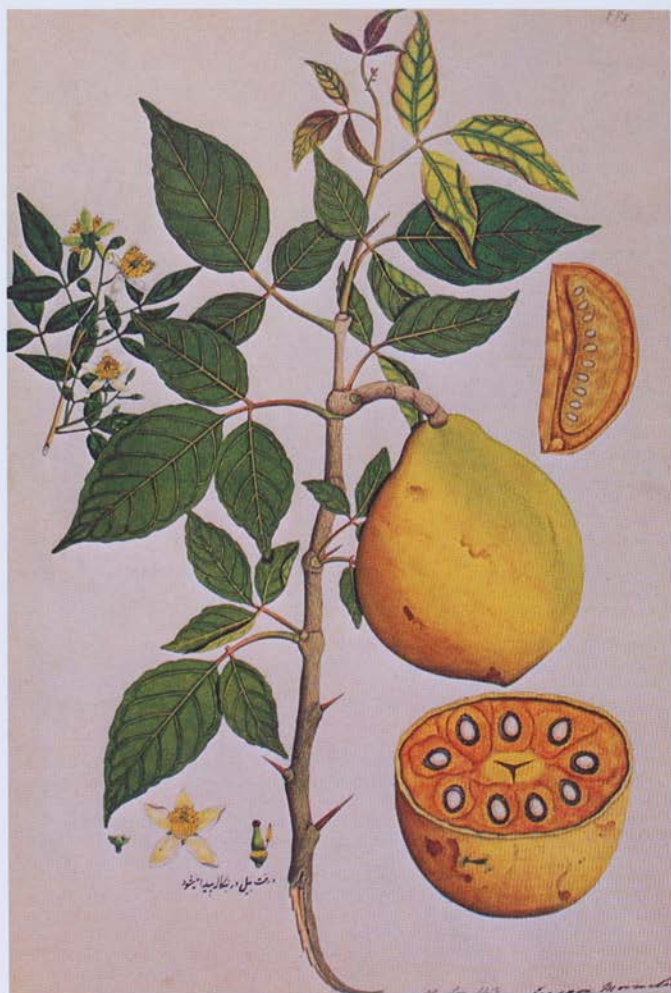
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55. *Aconitum falconeri* Stapf. Monkshood



51. *Nymphaea lotus* L. var. *rubra* Roxb. Lotus



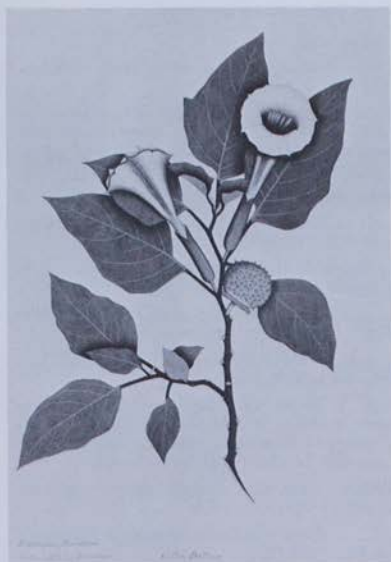
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63. *Lepisanthes fruticosa* (Roxb.) Leenh.



66. *Datura metel* L.



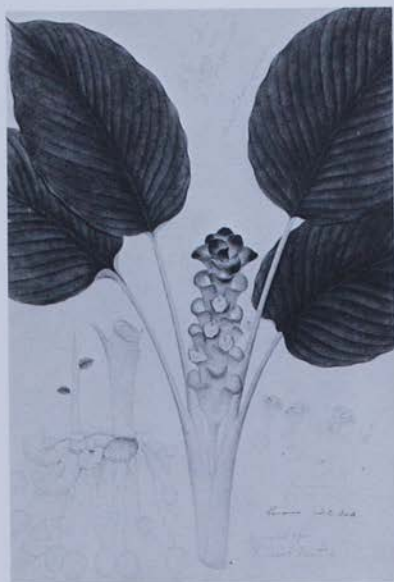
68. *Corchorus capsularis* L. Jute



71. *Stachytarpheta mutabilis* (Jacq.) Vahl



64. *Ribes glaciale* Wall.



72. *Curcuma petiolata* Roxb.

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