

SIR JOSEPH BANKS, P.C., K.C.B.,  
F.R.S. (1743–1820)

By JOHN D. GRIFFITH DAVIES

THE works which this man leaves behind him occupy a few pages only: their importance is not greatly superior to their extent; and yet his name will shine out with lustre in the history of the sciences."

With those words Cuvier opened his *eulogium* on Banks at a meeting of the Académie Royale des Sciences at Paris on April 2, 1821. On such an occasion extravagant language is to be expected; but Cuvier spoke no more than the simple truth when he placed the Academy's former foreign member high on the roll of those who have made history in science; and the rightness of his judgment has not been varied in the passing of the years.

Whether Banks is to be accounted a man of science, as this term is now understood, is a debatable point. He described himself as a *botanizer*—a status now to be regarded as inferior to that of botanist. Nevertheless, there are some present-day botanists who are convinced that, when judged against the background of botanical science in his times, the botanizer Banks can justly be acclaimed a competent botanist.

Personal fortune undoubtedly made it easy for him to indulge his life-long interest in natural history. Born in Argyle Street, London, two hundred years ago this month, the son of a wealthy Lincolnshire landowner, he inherited an estate worth £6,000 a year when he came of age in 1764: a princely income in those days when money bought more than it does now, and when the State made far fewer incursions into a man's pocket. Harrow and Eton (he went to both schools), and later the "House" at Oxford, brought him no academic distinctions. Indeed, he had little liking for the customary classical studies. In 1807 he confessed to a correspondent: "I am scarce able to write my own language with correctness, and never presumed to attempt elegant composition, either in verse or in prose, in that or any other language". For that reason, he went on to say, it was improper for him to agree to become a member of the projected Belles Lettres Society: "It is fitting, therefore, that I continue to confine myself, as I have hitherto done, to the dry pursuits of Natural History".

Natural history was his absorbing interest both as a schoolboy and undergraduate. Though Oxford had a chair of botany, its occupant in Banks's time was Humphrey Sibthorpe, of whom it is recorded that he delivered but one lecture on his subject in thirty-five years. It was characteristic of Banks, always the man of action, that he should ask Sibthorpe's permission to import into Oxford the self-educated young Cambridge man, Israel Lyons, recommended to him by John Martyn, professor of botany in that University; and it was under Lyons's direction, and with the enthusiastic support of Banks and his friends, that there was revived in Oxford a lively interest in botanical studies.

Even as a young man Banks must have possessed an attractive personality. He made friends easily, even among men older than himself; and, when shortly after coming down from Oxford he acquired a town house in New Burlington Street, he entertained them with that hospitality which was later to make him famous when he removed to Soho Square. He was elected into the fellowship of the Royal

Society in May 1766; among his sponsors were James West, later to be president of the Society, Charles Morton, principal librarian of the British Museum, and William Watson, distinguished both as physician and botanist.

A love of adventure was in Banks's blood. In 1766 he sailed in the fishery protection vessel, the *Niger*, to Newfoundland and Labrador. He at once proved himself to be a good sailor (later he was accused by his enemies of preferring the company of sailormen), and also a skilful collector of botanical specimens, though some of his collection was destroyed by heavy seas on the homeward journey. Two years later he sailed with Lieutenant Cook in the *Endeavour* to Otaheite to observe the transit of Venus, and thus took part in one of the memorable voyages in British naval and exploratory history. When the Council of the Royal Society petitioned the Admiralty for permission for Banks to accompany the expedition, they described him as "a gentleman of large fortune, who is well versed in Natural History", and declared that his going would be "for the advancement of useful knowledge". No doubt the petition was the more favourably received because one of Banks's Lincolnshire neighbours, Sandwich, who was particularly identified with Jemmy Twitcher of Gay's *Beggar's Opera*, was a Minister of State, and had great influence at the Admiralty.

Banks told the story of that adventure in his "Journal": read alongside the log of the *Endeavour* it gives an insight into the character of the man. He is filled with youthful enthusiasm; nothing escapes his notice. Whenever there is opportunity of shore excursions Banks and Solander, the professional botanist, are hard at work collecting specimens or observing natural phenomena. All is recorded faithfully and with commendable modesty, particularly when it is recognized that Cook looked upon him as a tower of strength in adversity. He handled the natives easily and with understanding. When an instrument is stolen it is Banks whom Cook dispatches to effect its return. Great was the disappointment among the natives when on later voyages Cook had to confess that Banks was no longer his companion. One is tempted to think that the great navigator would not have met his tragic end had Banks, in whom the natives placed such complete confidence, been at hand.

Here is not the place fully to examine the reasons why Banks did not accompany Cook on the latter's second voyage. One thing is certain: it was not because of any personal animosity between the two men. Whatever Banks's enemies said (and they said a great deal), the vessel, the *Resolution*, provided by the Admiralty did not permit of the elaborate structural alterations necessary for the accommodation of his suite. Cook, a competent sailor, bluntly said that he would not risk taking her to sea with a superstructure such as was contemplated; his superiors knew that he was right. So Banks and his party consoled themselves with a botanical expedition to Iceland, an account of which is to be found in Troil's "Letters on Iceland" (1781). This was the beginning of a life-long interest in Icelandic affairs. Not only did he serve the Icelanders by persuading the Admiralty to release their ships, held in British ports when the Danes joined Napoleon, but also he was even sounded by the Government with the view of initiating a move in Iceland to break with Denmark and place the island under the protection of Great Britain.

Banks's reputation was now firmly established, and on November 30, 1778, he was elected president of the Royal Society. The election was not universally popular among the fellows. He was young, and, so the mathematicians averred, wholly unfitted to direct the affairs "of that society in which philosophy once reigned, and Newton presided as her minister". The storm burst about him in 1783-84. He had charged Dr. Charles Hutton, the secretary for foreign correspondence, with neglect of duty. When the latter resigned, his mathematical friends, led by Dr. Samuel Horsley, a former secretary of the Society, rallied round him; and strove in open debate and in scurrilous pamphlets to oust Banks from the presidency. The details of this unfortunate dispute are too complicated fairly to be stated in a short article: suffice it to say that in the end Banks triumphed. Whether or not he was overbearing in his treatment of his colleagues, and ruthless in the conduct of his defence when assailed by those who would not yield to his will, cannot easily be decided. Certainly Banks was a masterful man; he was notoriously impatient of slipshod methods; he wanted action; he had his following, those fellows who were admitted to his brilliant receptions in Soho Square. But whatever may have been his faults, he was intensely loyal to the Royal Society, and was resolved that its fortunes should flourish under his direction. If he introduced into the fellowship (as his detractors said he did) men who had no claim to be regarded as men of science, he did so because he sincerely believed that the patronage of such men was essential for the improvement of natural knowledge; and he did not scruple to use their influence to obtain from Government the means to finance scientific research.

Organized science in Britain had no reason to repent of its choice of leader. Herschel's discovery of Uranus and his plans for the making of a large reflecting telescope, the planning of a geodetic survey of the British Isles, the Cavendish-Watt controversy over the composition of water, Young's undulatory theory of light, the need for proving the standards of weights and measures, the possibility of navigation through the North-West Passage—these were only some of the interests which agitated the scientific world during Banks's long presidency of the Royal Society. To assess his part in them is an unenviable task. As president of the Royal Society he was bound to bask in the reflected glory of the achievements of its fellows. Of chemistry, physics and astronomy he knew little (and he would have been the first to admit it); but he considered it his duty to assist all who were grappling with scientific problems; and there was no length to which he would not go in order to obtain official recognition of scientific work. Having the ear of the king, George III, he was able to lighten the privy purse of funds for the geodetic survey and the cost of making Herschel's telescope; with powerful friends at the Admiralty he could easily interest the sailors in the Society's schemes for the exploration of the North-West Passage. That the Government again came to appreciate the value of science is clearly demonstrated by the decision to provide the Royal Society with free quarters in Somerset House (1778): the improvement of that accommodation was incidentally one of Banks's first presidential acts.

Much could be written of Banks's personal relations with the king. George III was "quite a piece of a farmer": he was keenly interested in horticulture and the raising of cattle. Suspicious of the pro-

fessional politicians, who not only thwarted him at every turn but also ridiculed him in their clubs, it was a relief to enjoy the friendship of a man like Banks, who stood aloof from the political arena. Together they would talk over the best methods of growing wool, even exchanging rams and ewes from their respective flocks; together they would plan the layout of the royal gardens at Kew, so dear to the king's heart since they had been the passion of his unhappy mother. During George III's reign nearly seven thousand exotic plants were introduced into England, and it is estimated that by far the greater number of these came to Kew through Banks's collectors.

It was impossible to enjoy the royal favour without incurring the ridicule of George III's enemies. Peter Pindar's venomous shafts were frequently aimed at Banks. He was accused of trying to amuse the Royal Society with frogs, flies and grasshoppers; he was said to have kept its fellows awake with loud raps of the presidential hammer; and, worse still, he sometimes swore in their august assemblies! Gillray's famous caricature is well known: *The Great South Sea Caterpillar Transformed into a Bath Butterfly*. "This insect," states the legend, "first crawled into notice from among the weeds and mud of the South Seas, and, being afterwards placed in a warm situation by the Royal Society, was changed by the heat of the sun into its present form. It is noticed and valued solely on account of the powerful red which enriches its body and the shining spot on its breast; a distinction which never fails to render caterpillars valuable." The king's enemies laughed heartily at Gillray's work—and, incidentally, so did Banks!

The caricaturist had, however, laid bare one of Banks's weaknesses. There is no doubt that he was inordinately proud of the K.C.B. which the king bestowed upon him in 1795; nor was he less proud of his admission to the Privy Council two years later. At all functions, whether official or semi-official, he appeared in court dress—a splendid figure of a man with the red sash across his body and the order conspicuously displayed on his breast. In that garb he presided over the Council and ordinary meetings of the Royal Society, sitting in the chair (his own gift) which is still used by the president.

Another of Banks's weaknesses was his dislike of all attempts to found new scientific societies. He believed that they must inevitably weaken the Royal Society; and that was not to be tolerated. If they were content to remain associations of scientific men, dependent upon the Royal Society, all well and good; otherwise they were to be opposed with all the powers at his command. Yet he helped to found the Linnean Society in 1788, and was its first president; he was also associated with the founding of the Royal Horticultural Society; it was in Banks's house in Soho Square that the famous meeting was held which resulted in the founding of the Royal Institution. On the other hand, he withdrew from the Geological Society when that body refused to become a dependency of the Royal Society; and, at the close of his life, he resisted most resolutely the move to found the Royal Astronomical Society, even persuading the Duke of Somerset, designated as first president, to refuse to accept office.

After his voyage with Cook, when both New Zealand and Australia were visited, Banks was looked upon by king and ministers as *the* authority on Australasian affairs; and there is positive evidence that he refused high political office in order to leave

himself free to watch over the destinies of the young colony, in whose future he had unbounded faith. When Europe was distracted by the Napoleonic wars he could write to Hunter, the governor of New South Wales: "I see the future prospect of empires and dominions which now cannot be disappointed. Who knows but that England may revive in New South Wales when it is sunk in Europe." To those who were entrusted with the government of the newly established colony his advice and encouragement were invaluable. Phillip, Hunter, King and Bligh, fighting manfully to give New South Wales an orderly government and thwarted by the professional soldiers who augmented their meagre pay by trafficking in rum, poured out their troubles to him; he reciprocated by doing everything in his power to smooth over their difficulties. In Bligh, that most maligned of men, he never lost confidence. Banks knew him for an expert sailorman, a wise and just governor; he could appreciate, perhaps better than Bligh's traducers, the courage which had been required of the latter when he navigated the loyal men of the *Bounty* through the Timor Sea. And all the time, intermingled with his words of counsel and encouragement, were requests for specimens of plants and any information which might be of value to men of science. It was not to be a one-way traffic in plants. "My business," said Banks to Hunter, is to be "the encourager of the transport of plants from one country to another." The young colony needed a supply of "useful plants"—hops, for example, were to be shipped to New South Wales in the hope that beer would diminish the consumption of rum; and it was Banks who tried to ensure that the colonists' needs were supplied. There were, of course, disappointments. Consignments of specimens were sometimes lost at sea, on homeward and outward voyages, and official support was not always forthcoming in London; but Banks never lost heart; and he could boast to Hunter that "we shall before it is long see her [Great Britain's] ministers made sensible of its [New South Wales's] real value". It is not to be wondered that our kinsmen in Australia look upon Banks as the 'godfather' of their country, and have zealously collected a great wealth of his papers.

Banks was unquestionably a great European. In London his name was a household word; even the humblest citizen knew of the "great Sir Joseph" who lived in Soho Square. Abroad, men of science looked upon him almost as the protector of all scientific effort, especially when the Napoleonic wars interrupted the free exchange of ideas between England and the Continent. Cuvier's tribute to his brave, and successful, endeavours to raise science high above the quarrels of nations is not an unfitting conclusion to this memoir. "During the long period of two and twenty years," said Cuvier, "in which war extended its ravages to every part of the two worlds, the name of Banks was in all places a palladium to such of our countrymen as devoted themselves to useful researches. If their collections were seized, they had only to address themselves to him to ensure their restoration; if their persons were detained, the time occupied in acquainting him with the fact was the only delay which was interposed between them and liberty. When the seas were closed in upon us on all sides, his voice opened a passage to our scientific expeditions. Geography and natural history are indebted to his solicitude for the preservation of their most valuable labours:—but for him our public

collections might now, and perhaps for ever, be deprived of the riches which adorn them."

Banks died at his house at Spring Grove, Isleworth, on June 19, 1820: he was buried, as he wished, with neither pomp nor ceremony, in the graveyard of Heston parish church.

## PRODUCTION GENETICS IN SWEDEN

By DR. C. D. DARLINGTON, F.R.S.

NATIONS often have to rely for their independence on the independence of their food supply. This principle is as well understood in Sweden as in Great Britain, and for similar reasons. Since the War of 1914–18, however, Sweden's position has been greatly improved. The annual yields of wheat and sugar-beet have been increased to the point at which the country is just self-supporting. The most important factor in this increase has been the improvement in the farmer's seed by plant breeding; indeed, one quarter of the wheat and nearly one half of the sugar harvest may be put down to the use of improved seed.

Sweden might seem to be a particularly grateful field for the plant breeder because, like Canada and the U.S.S.R., it lies on the northward margin of cultivation; any slight change in hardiness or growth-rate or light-response which pushes the limit of growth slightly farther north therefore throws open a vast new territory to cultivation. On the other hand, as we shall see, the severity of the Swedish climate does not allow the plant breeder to win his victories without a struggle. What these victories amount to I have recently had the privilege of seeing.

The foundation of Swedish success in plant breeding lies in the small village of Svalöv in Skåne, the richest and southernmost province of Sweden. At this centre we find three partners working together. The youngest of the three is the Institute of Genetics of the University of Lund, some twenty miles from Svalöv. This is a department for teaching and research. It was established for Prof. Nilsson Ehle in 1927 and is now directed by Prof. Müntzing. The second partner is the Svalöv Plant Breeding Institute, formerly directed by Nilsson Ehle and now by Prof. Akerman. This Institute is immediately responsible for the production of new varieties, but is, at the same time, concerned with long-term research and houses a part of the Institute of Genetics. The third partner is the Swedish Seed Company, which has the monopoly of maintaining the stocks and selling the seed of the Svalöv varieties and controls each step between selection and marketing. Without this monopoly it was realized that the maintenance of scientific standards could not be guaranteed. The triple organization, now occupying about three thousand acres, arose at first from a farmers' union, but it is now supported and partly controlled by the Government.

This system has developed during the last fifty years and has grown as the field of possible activity has extended and the numbers of crops that have seemed worth while improving have increased. It began with cereal breeding and with the union, on one hand, of the new genetic analysis of quantitative inheritance in terms of cumulative factors by Nilsson Ehle and, on the other hand, of the practical under-