Tercentenary of the Royal Society

Celebrations of the Royal Society of London for Improving Natural Knowledge were held 18–26 July.

Henry Allen Moe

The letters "F.R.S." or "For. Mem. R.S." following a scholar's name undoubtedly indicate the highest scientific repute in the world, with the exception of the smaller group of scientific Nobel laureates, most of whom, be it said, were or are Fellows of the Royal Society or among its Foreign Members. This Royal Society—*Regalis Societas* in the Latin of its charters granted by King Charles II—celebrated its tercentenary during nine days, 18 to 26 July 1960; and, as Professor A. W. K. Tiselius of Uppsala—For. Mem. R.S. and Nobel laureate—said to me, these were days to remember in detail for telling to our grandsons.

The celebration was managed with the greatest efficiency, was conceived in the highest style, and expressed the most perfect taste. Its purpose, as the president, Sir Cyril Hinshelwood, O.M., Nobel laureate, said at the formal opening ceremony, was to lay an account of the Society's three centuries of stewardship before the world. To this end, books, pamphlets, and articles were prepared by Fellows of the Royal Society and members of its staff; British industry advertised the Society's accomplishments for the general good of mankind and for the development of industry; informed editorial comment praised, the Prime Minister extolled, and Queen Elizabeth II, opening the celebration in the Royal Albert Hall, declared that the accomplishments of the Society's Fellows "shine like beacons for all men to see."

All this, and more, was justified, both in the history of the Society and in the magnificence of the celebration.

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So much was published on the history of the Society, to give a basis for understanding by the delegates and the public, that it would be impossible to offer anything original. Perhaps the Queen herself summarized it better, in fewer words, than anybody else when she said:

"The Society has had an unbroken record of activity through three centuries and the contribution of the Fellows to natural knowledge is as great today as ever.

"The Royal Society has more than fulfilled the hopes of its Founder, King Charles II. He gave you the Charter and your name and he bade you apply yourselves 'to further promoting by experimental studies the sciences of natural things and of useful arts, to the Glory of God the Creator, and the advantage of the human race.' The names of Sir Isaac Newton and Charles Darwin in pure science and of James Watt, Lord Kelvin and Sir Charles Parsons in engineering science are evidence of the Society's success and recall great episodes of progress. Their contributions shine like beacons for all men to see, but let us not forget the many hundreds of Fellows whose devoted work has been indispensable to the general advance of knowledge."

But the Queen's list, if one may say so, is too short; and in the words of John Milton in *Paradise Lost,* distinguished Fellows of the Royal Society have been as "Thick as Autumnal Leaves that strow the Brooks in *Vallombrosa.*" They have been so indeed, and this is the true glory of the Royal Society.

It seems worth mentioning that Milton was not a member of the Royal Society but that his contemporary fellow poets, John Dryden and Abraham Cowley, were elected. So were John Evelyn, the celebrated diarist, and Samuel Pepys. The reason it seems worth mentioning that John Milton was not a member is this: in 1660—the year of the Restoration—the former secretary to Oliver Cromwell could hardly be an acceptable member of a society established under the Royal patronage. Besides, as Kester Svendsen has shown, Milton's science was "fundamentally classical and medieval"; and Sprat's *History of the Royal Society* (1667) was in part an attack on the kind of scientific lore woven in the fabric of *Paradise Lost* [K. Svendsen, *Milton and Science* (Harvard Univ. Press, Cambridge, 1956), p. 42].

The founders of the Royal Society of London were twelve, most of whom had met together weekly in Oxford as early as 1649, during the Rebellion, in "an experimental philosophical Clubbe." Who they were has been well-stated by Lord Adrian, O.M., F.R.S., Nobel laureate, in his review, published in the *New Scientist* (14 July 1960), of *The Royal Society—Its Origin and Founders:*

"They are a remarkable company and all the biographies have something fresh to say of them. Twelve were at the meeting at Gresham College on 28 November, 1660, after Mr. Wren's lecture when the design of the Society took shape. Two would still have international fame whether the Royal Society had been founded or not, for Sir Christopher Wren has other monuments to keep his name alive and Robert Boyle was the father of chemistry. Sir William Petty can be counted as the first to make political economy a science, and the other nine were all learned and ingenious people with scientific interests and a wide range of achievement.

"They were Jonathan Goddard who, with John Wallis, attended the weekly meetings for Philosophical Inquiries which started in London in 1645, and John Wilkins, Warden of Wadham, who joined the group after the move to Oxford in the Civil War. Viscount Brouncker was the first President of the Society in 1660. Sir Robert Moray was the soldier friend of Charles II who secured the Royal patronage, and there was Moray's compatriot Alexander Bruce, second Earl of Kincardine, whose estate soon called him back to Scotland. Laurence Rooke was an astronomer, Professor of Geometry at Gresham College, Sir Paul Neile was one of the Royalist group, famous for

his optic glasses, William Ball, another astronomer, was the first Treasurer of the Society, and Abraham Hill was a city man and a public servant. Their portraits show them all as men of ability, well versed in affairs, sensitive and keen witted or solid and capable.

"The twelve drew up a list of those 'judged willing and fit to joyne them in their design'. There were forty-one names on it, mostly of Royalists or supporters of Restoration, and a week later the Society was formally constituted. The King approved the design and 'was pleased to ofer of him selfe to bee enter'd as one of the Society'. . . .

"There are six more who deserve their place beside those who were at the first meeting: John Wallis, the mathematician, Kenelm Digby, 'skilled in six tongues and learnd in all the Arts', a link with the Court of Charles I in a more romantic age, whose life is excellently described by the late Dr. John Fulton; Elias Ashmole, who founded his museum at Oxford as a home for science, John Evelyn, the great recorder of the daily life of his time, Thomas Willis, who described the arteries of the brain, and William Croone the physician. Finally there are the two salaried officers, Henry Oldenburg, the indefatigable secretary, who edited the *Philosophical Transactions* and liked the trade of diplomacy, and Robert Hooke, the young curator who had to produce experiments for the weekly meeting, suspicious and ill-favoured and described by Professor Andrade as 'the greatest inventive genius who ever lived'. . . ."

Who were their successors, as numerous as the leaves that strow the brooks in Vallombrosa? It is possible, in the space of this article, to name only a few:

Sir Isaac Newton, of whom Leibnitz's description is certainly the shortest and perhaps the best: "a celestial genius," the greatest figure in the history of the exact sciences.

John Tyndall, whose elucidation of the blue sky was a meteorological milestone.

James Watt, perfecter of the steam engine, for whom a unit of electricity is named.

Edmund Halley, discoverer of Halley's comet.

Michael Faraday, discoverer of electromagnetic induction.

Charles Darwin and Thomas Henry Huxley.

Sir Humphrey Davy, inventor of the miners' safety lamp and discoverer of the anesthetic properties of nitrous oxide.

Left to right: Sir Gerard Thornton, foreign secretary of the Royal Society; Sir Cyril Hinshelwood, president of the Royal Society; and Detlev W. Bronk, president of the National Academy of Sciences and of the Rockefeller Institute. [Associated Press, London]

Lord Kelvin, a founder of the science of thermodynamics, improver of the mariner's compass, student of submarine telegraphy, who made the transatlantic cable practicable.

Lord Rayleigh, he of the *Theory of Sound*.

Sir Frederick Gowland Hopkins, a founder of the science of biochemistry.

Sir Charles Sherrington, a pioneer in experimental neurology.

Sir William Crookes, discoverer of the element thallium, who foretold the existence of isotopes.

Lord Rutherford, who established the existence and nature of radioactive transformations and demonstrated the nuclear structure of the atom.

James Clerk Maxwell, author of the electromagnetic theory of light.

Sir Joseph Banks, president of the Society for 42 years, a rich man with a passion for botany, who devoted much of his time and fortune to the welfare of the Society. He accompanied Captain James Cook on his first voyage of discovery in the *Endeavour* to observe the transit of Venus in the Pacific in 1769. It was Banks's clock, used on that voyage, which later was lent to Mason and Dixon for their history-fraught surveys in America.

These are some of the great dead of the Royal Society, a few of those so numerous, with pioneering accomplishment so great that they justify the words of President Hinshelwood: "According to any sane assessment the faith of 1660 has been fulfilled, and in the Tercentenary celebrations we pay tribute not only to the founding members but to all those through the three centuries who in peace or in strife, in brilliance or in obscurity, have brought the sciences to where they stand today, who have applied them to the useful arts and who have created the foundations of industry."

The faith of 1660, to which President Hinshelwood referred, was that expressed in the words of the Royal Society's motto *Nullius in Verba*, "Take no theory on trust." The motto is taken from Horace's *Ac ne forte roges, quo me duce, quo lare tuter,/Nullius addictus iurare in verba magistri.* (And do not ask, by chance, what leader I follow or what godhead guards me. I am not bound to revere the word of any particular master.)

Taken for granted now, this was not so in 1649 nor in 1660. The motto meant that the members of the Society cut themselves loose from the authority of the ancients, from the so-called Aristotelian methods of disputation which

were concerned with little beyond discussing what was already accepted as "truth." The purpose of the Society was the revolutionary one of enlarging knowledge by observation of nature and by experiment. As Professor E. N. da C. Andrade, F.R.S., has written: "The Revival of Learning in Europe may be said to have been a return to that respect for the great sages of Greek and Latin antiquity which had prevailed before the time of the so-called Dark Ages. There was in the 15th and 16th century a widespread belief among the learned that the great classic philosophers, and in particular Aristotle, had fathomed the secrets of nature, and that for those who wished to learn these secrets the right method was to study what these masters had written. . . ."

The break that the members of the newly founded Royal Society made with the authoritarian tradition was neither sudden nor complete. They had had their predecessors, on the continent and in England—in Copernicus and Galileo, in William Gilbert and Kepler and William Harvey—but the discoveries of these predecessors had not yet been incorporated in university teaching.

"From the time of the foundation of the Royal Society onwards," as President Hinshelwood said, "there was a steady increase in the number of dedicated men who by the concentration of their minds, the skill of their hands, and the sweat of their brow, worked to uncover the secrets of nature. Their labours were largely unknown to their contemporaries, they are but perfunctorily recorded by historians, and yet they have ended by transforming the face of the globe and the life of humanity."

Such was the magnitude of the accomplishment celebrated in the London of 1960.

The celebrations began on the evening of Monday, 18 July, with a reception by Her Majesty's Government in Lancaster House, a great and lavish mansion, famous in the reign of Queen Victoria as the home of the Duke and Duchess of Sutherland. Like all the evening components of the celebration it was a "white tie" affair, "with orders and decorations"; and the plumage of the males fairly outdid the gorgeousness of their ladies' gowns.

But it was on the next afternoon, 19 July, in the Royal Albert Hall, that the celebration became airborne. The Queen herself, as the Patron of the Society, accompanied by the Duke of Edinburgh, F.R.S., opened the celebration with a speech of substance and sense. She was also accompanied by the King and Queen of Sweden. The King, F.R.S., who then and there was formally admitted to the fellowship of the Society and who also made a speech of substance and sense, expressed the convictions that men of science the world over have a keen desire for helpfulness and have high hopes that their new discoveries will be used in the best ways for the benefit of humanity.

Tributes to the Royal Society were presented on behalf of the University of Bologna by Professor D. Graffli, on behalf of the French Academy of Sciences by Professor J. Lecomte, and on behalf of the recently organized Australian Academy of Sciences by Sir John Carew Eccles, F.R.S. To all, President Hinshelwood responded in their own languages as he—past president of the Classical Association and of the Modern Language Association—could have done, also, in Latin, Chinese, or Russian! The author of *Kinetics of Chemical Change* is truly in the line of descent from the 12 founders of the Royal Society whose members, as noted above, included Sir Christopher Wren, great in all his roles of mathematician, astronomer, and architect.

There never had been assembled, it is safe to say, a company of men of learning and of affairs of greater distinction and greater size than those gathered in the Royal Albert Hall on 19 July 1960: and it is safe to say that there will not be another like it unless and until the Royal Society decides to celebrate its fourth century. For no other organization, no other society anywhere, has the prestige to draw to any occasion a comparable representation of the best scholars of the world.

Ranged behind the Queen and the president of the Royal Society in the Royal Albert Hall (Prince Philip and the King and Queen of Sweden being on the dais with her) were the Fellows of the Royal Society. In front of the Queen were the foreign members of the Society and the delegates, "a great international gathering of representatives from so many countries of the world, assembled here to do honour to this occasion," as the Queen said. The rest of the hall was filled to capacity with invited guests of the Society.

It is worth mentioning, especially for the ladies, that amid the brilliant gowns of the Fellows and delegates, predominantly bright red, the Queen wore just the right dress of a yellow-green color, like young fern fronds in a dell. It was a color just right not to clash with the predominant reds—the reds of the academic gowns and hoods and the reds of the uniforms of the trumpeters and band of the Royal Military School of Music. Indeed, the color of the Queen's dress was "scientifically" right, the complementary color of the yellow-vermilion-reds that surrounded her. And her hat, a milliner's modest triumph of clustered pink and red roses, also was just right.

Ranged to the right and left of her, and overhead, were banks and domes of ferns and flowers, and the band played "A Salute to the Royal Society," composed for the occasion by the Master of the Queen's Musick, Sir Arthur Bliss.

In his presidential address, Sir Cyril viewed the history of the Royal Society in the widest context and stated many thoughts worth pondering, among which I select this:

"The task of the men of science is therefore clear. It is to go ahead undeterred by any of the uncertainties. Faith in science is not incompatible with or exclusive of any other kind of faith. Indeed there would seem to be no inconsistency in believing that scientific knowledge is itself one of the great instruments of higher ends. However that may be, duty, expediency, and the zest of living unite their voices in calling for unremitting effort, not in the certainty but in the hope and faith that knowledge may advance, mastery over environment increase, drudgery be abolished, sickness healed, the people fed, and life made happier."

Wednesday, 20 July, was given over to visits to Canterbury, Greenwich, St. Albans—as chosen by the delegates—and to lectures by Fellows of the Society on their own fields of research.

Prince Philip, Duke of Edinburgh, F.R.S., as president of the International Grasslands Congress held at Reading the week before, had at that time reminded his audience that unless we take to eating our vegetable protein directly processed, the value of grass and other herbage crops lies in their utilization by animals. The capacity of beasts to deal profitably with bulk is notoriously variable; and as the *Times'* correspondent noted, the bulk of the material put before the Grasslands Congress "has been so large that, for most of us, only a little selective grazing has been possible."

So it was also in respect to the lec-

tures of the tercentenary; only a little selective grazing was possible, and I selected the lecture on "The problems of transplantation," by Professor P. B. Medawar, F.R.S., presided over by our own Dr. Peyton Rous, For. Mem. R.S. Professor Medawar's lecture was truly a marvel of lucidity and elegance, and Dr. Rous's presiding was a model of self-effacing knowledge which made just the right setting for the lecture. I can only hope that other delegates found as good grazing as I!

That evening there was a reception at the Senate House of the University of London—"full evening dress with orders and decorations"—at which Her Royal Highness Princess Alice, Countess of Athlone, received the delegates.

On Thursday, 21 July, the delegates were invited to the University of Oxford, and four hundred of us went up in a dozen buses. There were lunches in the college halls—banquets, indeed—and afterwards the university conferred honorary degrees of doctor of science upon five delegates. My own college being Brasenose—of which I have the honor of being an Honorary Fellow—my wife and I were invited there for lunch, and, again, I can only hope that the other delegates found as good grazing (this time in the more literal sense of food and wines) as I.

Among the delegates who received honorary degrees from the vice-chancellor of the University of Oxford, Dr. T. S. R. Boase, president of Magdalen College, was Dr. Felix Bloch, professor of physics in Stanford University, recently director-general of the European Committee of Nuclear Research at Geneva and Nobel laureate in physics. Concerning Dr. Bloch, the University's Public Orator, Mr. A. N. Bryan-Brown, said (in Latin, with English translations provided) that he had "devoted special research to metals and had been the first to show how the regularly spaced positively charged atoms so influence the negatively charged free electrons as to produce a wave-like pattern of motion." The Public Orator said much more besides about Dr. Bloch's scientific accomplishments and their practical value, and he did not omit mention of the honorand's interests in music, in mountaineering, and in the Hebrew text of the Old Testament.

Privately, the Public Orator said to me afterwards that whereas, because the ancient Romans had law, it had been comparatively easy to present me for the D.C.L., as he had done the week before, the job of characterizing a modern scientist in Latin took a good bit of doing! The Public Orator's modesty was equal to his performance and vice versa.

The other American to get an Oxford D.Sc. that day was Dr. Alfred

Five scientists who received honorary degrees at Oxford during the tercentenary celebrations of the Royal Society, shown with the vice-chancellor of the university. Left to right: N. N. Semenov (U.S.S.R.); F. Bloch (United States); A. N. Richards (United States); T. S. R. Boase, the vice-chancellor; O. Winge (Denmark); and E. W. R. Steacie (Canada). [Associated Press, London]

Newton Richards, physiologist, professor emeritus of pharmacology of the University of Pennsylvania, For. Mem. R.S. The Public Orator said, in Latin, of Professor Richards, "The Latin gender rhyme reminds us that 'ren' is masculine: otherwise we pretty well forget the kidneys, provided that they are functioning properly. Our guest, though he has never qualified in medicine, has made many contributions to science, the best known of which is perhaps the elegant essay in physiological technique which threw so much light on the fundamental secretory processes of the kidney." The Public Orator then spoke of Professor Richards's expert and timely help to Britain during both world wars and hailed him as "a vigorous veteran in the field of science . . . a Foreign Member of the Royal Society."

The other honorands were: Academician Nikolai Nikolaevitch Semenov, Nobel laureate, For. Mem. R.S., director of the Moscow Institute of Chemical Physics; Dr. Öjwind Winge, For. Mem. R.S., professor at the Carlsberg Laboratories in Copenhagen; and Dr. Edgar William Richard Steacie, F.R.S., president of the Canadian National Research Council.

As the Oxford correspondent of the *Times* wrote: "It was indeed a great day in Oxford for Natural Science; but it was also perhaps some triumph for *Literae Humaniores*; for the Public Orator, in describing the fantastically complex developments in scientific discovery in which the distinguished honorands had been so prominent, continued to demonstrate that the Romans had words for them."

Afterwards, there was a party, in full sunshine, in the garden of Wadham College—most fittingly at Wadham, for there it was that the Oxford progenitors of the Royal Society had met, during the pre-Restoration years, in the lodgings of the Warden of Wadham, John Wilkins, later Bishop of Chester.

And so back to London by bus.

The delegates and their ladies who had not chosen to go to Oxford had been offered other fare: visits to the Royal Greenwich Observatory, the John Innes Horticultural Institution, the National Institute for Research in Nuclear Science, the British Museum of Natural History, all former homes of the Royal Society, the National Physical Laboratory, the Geological Survey and Museum, and the National Institute for Medical Research. Those who went to Oxford can only hope that the others' grazing also was first class.

On Friday, 22 July, there was, in the Royal Festival Hall, a ceremony for the conferment of honorary degrees by the University of London, presided over by the chancellor of the university, Her Majesty Queen Elizabeth the Queen Mother. The following were made doctors of science:

His Majesty King Gustav VI Adolph of Sweden, F.R.S.

Dr. Homi Jehangir Bhabha, F.R.S., director and professor of theoretical physics at the Tata Institute of Fundamental Research, Bombay, India.

Sir Macfarlane Burnet, O.M., F.R.S., professor of experimental medicine in the University of Melbourne, Australia, and director of the Walter and Eliza Hall Institute of Medical Research.

Dr. George Charles de Hevesy, professor of chemistry in the Research Institute for Organic Chemistry, Stockholm; Nobel laureate, For. Mem. R.S., winner of the second "Atoms for Peace" award.

Sir Thomas Ralph Merton, F.R.S., professor of spectroscopy in the University of Oxford.

Dr. Detlev Wulf Bronk, For. Mem. R.S., president of the Rockefeller Institute, president of the National Academy of Sciences, of whom the Public Orator said, in English (with no Latin translation provided!): "As an administrator and co-ordinator of research he has played a unique part in the modern history of the United States of America . . . but with it all has retained the essential humanity of a great man, known by his familiar name of 'Det' to a very wide circle of friends and fellow-workers, from President Eisenhower down to his junior colleagues, and to many old friends and well-wishers in this country."

That afternoon, at three of the clock, there was, at the Royal Festival Hall, the showing of the film *The Opening Ceremony Recalled* (glimpses of Tuesday's proceedings in the Royal Albert Hall caught by newsreel cameras) and of two scientific films, made by the Shell International Oil Company for the tercentenary.

After the films there was a tea at the Royal Festival Hall given by the Shell International Oil Company; but the delegates' ladies did not tarry for it because they were invited to tea by Her Majesty Queen Elizabeth the Queen Mother, to a reception at St. James's Palace. It was reported by those present that the Queen Mother charmed all with the graciousness of her hospitality and by the breadth of her conversational interests. At St. James's Palace the delegates' ladies were charmed, too, by meeting the Queen Mother's ladies-in-waiting, wearing the beautifully appropriate jewels of their office.

With just time for a hurried dinner, that very evening there were receptions, in full dress, by the Lord Mayor and Corporation of the City of London at Guildhall and by the Twelve Great City Companies at the Mercers' Hall. Again, alas, one had to choose between competing magnificences, in obedience to the physical law that no body can be in two places at the same time.

At the Guildhall, the Lord Mayor and Lady Mayoress received the Fellows of the Royal Society and the delegates and ladies in medieval grandeur, flanked by sheriffs, aldermen, pikemen, and sword-bearers. The gold plate of the Corporation of London was on view, there was music, there was champagne and hock, there was food and coffee. In the Library adjoining the Guildhall proper there was a display of books and manuscripts, and the manuscripts were the more thrilling because they had not been collected and brought there but were in their right place—such as William the Conqueror's grant of the freedom of the city to a citizen in 1066.

On Saturday morning, 23 July, there were scientific lectures by members of the Royal Society; but many delegates, and especially their wives, were beginning to think that unless they husbanded their strength they would be unable to go the full course. But if they took that excuse they missed a great presentation by Dr. Dorothy Hodgkin, F.R.S., on "Molecules in crystals." And they missed getting a clear understanding of what the Queen had said in the Royal Albert Hall: "there is another change that gives me special pleasure even though it has taken almost 300 years to make. It is the admission of women to your fellowship and I am delighted to see the increasing part they are taking in scientific work in this country."

What grazing those who sought pastures, other than Dr. Hodgkin's, found, I cannot say.

The afternoon was mercifully free: nothing to do until eight-thirty of the clock in the evening when there was a *conversazione* at Burlington House, the home of the Royal Academy of Arts,

of the Royal Society, and of several other scientific societies. On display were the greetings of organizations represented at the tercentenary—arranged alphabetically from Argentina to Yugoslavia. Prince Philip and some 2000 guests attended.

Whether or not Prince Philip singled out other greetings for his special attention I cannot say, for of course I was standing by the greetings of the American Philosophical Society. But he certainly did indicate his approval of the greetings conveyed by the successors of Benjamin Franklin, F.R.S.

There was champagne and there was hock, and sandwiches; and even more important, there were scientific exhibitions of 15 avenues of research in which British scientists had had important parts in the past dozen years, including radio astronomy, refined methods of chemical separation, the molecular structure of biochemical systems, the origin and transmission of nerve impulses, and so forth.

And so to bed, wondering what the ingenuity of man might come up with in the next 300 years. A futile speculation, which, having no possible answer, seemed conducive to sleep.

The next morning, Sunday, 24 July, to St. Paul's Cathedral, designed by Sir Christopher Wren, F.R.S., to hear a sermon by the dean of St. Paul's, the Very Reverend W. R. Matthews, on "The conflict of science and religion." His point was that while religious thought moved more slowly than scientific thought, it did move—partly under the stimulus of science.

"We have to learn," Dean Matthews said, "that we who believe in God cannot afford to neglect or forget the revelation of science. Though it is not the whole truth, insofar as it is true we must accept it gladly as from God and meant for our learning. Shall we not find when we consider our creation in the light of science that our conception of the Creator has been vastly too narrow? We have thought of Him too much as like ourselves, we have been too anthropomorphic in our theology and our devotions."

Surely, Thomas Henry Huxley, F.R.S., would have been somewhat pleased with this resolution of his debate with the Bishop of Oxford, Dr. Wilberforce, exactly a hundred years before.

Sir Cyril, in his presidential address, had said of the early years of the Royal Society: "The Warden of Wadham might be a leader of the new movement: Dr. Fell, the formidable Dean of Christ Church, would have none of it. The Public Orator of the University of Oxford declaimed against the Royal Society in the theatre built by [Sir Christopher] Wren, and Antony Wood declared it to be an obnoxious body. Bishop Wilkins, Bishop Ward and Bishop Sprat might defend the new philosophy with every strength of argument and eloquence, Robert Boyle might write the *Christian Virtuoso*, every protestation and example of piety and orthodoxy might be offered by the Fellows, none of this prevented attacks from the pulpit, and the strongest accusations from other quarters. . . .

"Much of this was still reverberating yesterday and even lasts today, and in this respect the three centuries assume perhaps their shortest perspective. . . . Every complaint and reproach levelled in the 17th century, every fear expressed, every resentment, interested or disinterested, openly or secretly working, can be paralleled in the recent past. Every anxiety, misgiving, criticism or reserve voiced today has been countered by the 17th century apologists. Nor can the threat of destruction by the release of nuclear energy really have exaggerated the issue, for the perils of atomic warfare are at least no more terrible than the prospects of eternal damnation to which many in the earlier age believed the new doctrines were leading men."

On Sunday afternoon, to the Victoria Station (wearing dinner jackets or full dress at two o'clock in the afternoon!) to go to the opera performance at Glyndebourne in Sussex. And the limited few who had gotten tickets were rewarded with a performance of Mozart's *Don Giovanni* of such quality that those who had heard it before, elsewhere, knew that now they had heard Mozart at his best.

Monday morning, 25 July, early by bus to Cambridge, and there the hundred Cambridge Fellows of the Royal Society were joined by three hundred Fellows and delegates from elsewhere. First, there were luncheons in the Cambridge colleges, quite the equal of the Oxford luncheons, as those of us who were entertained at Trinity—where presided the master, Lord Adrian, and his Lady—can and do testify.

Later, the vice chancellor, Professor Herbert Butterfield, master of Peterhouse, conferred the honorary degree of doctor of science upon four eminent scholars: Sir John Eccles, F.R.S., president of the Australian Academy of Science, professor of physiology in the John Curtin School of Medical Research, Australian National University; Professor Sven Otto Hörstadius, professor of physiology in the University of Uppsala, For. Mem. R.S.; Professor Bernardo Alberto Houssay, director of the Intitute of Biology and Experimental Medicine, Buenos Aires, physiologist, Nobel laureate, For. Mem. R.S.; and Professor Jan Hendrick Oort, professor of astronomy at the State University of Leiden, For. Mem. R.S. As at Oxford, the Orator, Mr. L. P. Wilkinson of King's College, presented the honorands in Latin (an English translation was provided). After the ceremony, Trinity and St. John's Colleges gave a garden party on the justly famed "backs" along the River Cam.

For the delegates who did not go to Cambridge, there were scientific lectures and visits to Greenwich, to the Wellcome Research Laboratories, and to other places of scientific and esthetic interest.

Tuesday, 26 July, the final day of the celebration—morning and afternoon, were devoted to visits, at the delegates' choice, to the East Malling Research Station, the Bradwell Nuclear Power Station of the Electricity Generating Board, Whipsnade Zoological Park, National Institute for Research in Dairying, Rothamsted Experimental Station, Royal Aircraft Establishment, Chester Beatty Research Institute, Lister Institute of Preventive Medicine, Hampton Court Palace, Houses of Parliament, Goldsmiths' Hall, and other places of interest.

In the evening, at Grosvenor House, there was the tercentenary banquet, with some 1300 persons in attendance, presided over by President Hinshelwood, who proposed toasts to the Queen, to Queen Elizabeth the Queen Mother, to Prince Philip, Duke of Edinburgh, to other members of the Royal Family, and to "the pious memory of the Founder." A toast to the guests was proposed by Lord Adrian, and responses were made by Dr. F. C. James, principal and vice-chancellor of McGill University, and by Dr. A. H. T. Theorell, Nobel laureate, For. Mem. R.S.

The Prime Minister, the Rt. Hon. Harold Macmillan, M.P., proposed the toast of the Royal Society.

"If you are going to succeed in the modern world," said Mr. Macmillan,

"you have, generally speaking, to be some sort of specialist, to know a great deal about some particular branch of knowledge. This applies to everyone nowadays—except, of course, politicians" (and he ad-libbed that "the only amateurs left are the politicians!"). "But these men, your founders, were no narrow specialists. Sir Christopher Wren, who was your President in 1680, was an astronomer, indeed a professor of astronomy in two universities, before he was an architect. He really had two quite distinct careers; one as an experimental philosopher (as it was called) in which he studied eclipses, and the paths of the comets, and conducted blood transfusion experiments with Robert Boyle; and another career as an architect. If his reputation now rests on his supreme works of art, that mainly illustrates the truth that Art is more lasting than Science. 'A thing of beauty is a joy forever.'

"Nevertheless, Wren combined in himself the classical tradition and the new scientific method. He never divorced art from science, nor would he, I think, have understood the distinction we make today between the arts and the sciences. He brought a wonderful talent for scientific invention to the solution of the problems of architectural design."

And Prime Minister Macmillan concluded:

"Finally, in the presence of so many distinguished visitors from overseas, I need hardly remind you that the search for new knowledge is an activity that surmounts all barriers of nationality, language, creed or race.

"Since 1723 the Society has had its own Foreign Secretary and has maintained its ties above all with the Commonwealth. In the 18th century an illustrious member of the Society was the American Benjamin Franklin. After his long stay in London and his return to America, Franklin became a leading figure on the revolutionary side in the War of Independence but this did not affect the cordial relationship between himself and the Royal Society. In fact Franklin used his personal influence to prevent American cruisers from interfering with James Cook who was then voyaging in American waters. On the other hand, the war had no influence on the Society's support for Franklin's views on the controversial subject of lightning.

"There have been many other examples of the way the Society has striven to avoid rupture of relations between men of science in opposing countries during wars. This was always done without in any way wavering in their loyalty to the Sovereign. For instance Sir Humphrey Davy travelled freely on the continent during the Napoleonic wars, by special permission of Napoleon, and was even given a dinner by the leading French scientists at which, as tonight, the Toast of the Royal Society was proposed. This spirit of Humanism still pervades the Royal Society. Never was it more needed than today."

President Hinshelwood, responding to the Prime Minister's toast, said: "a list of the earliest members of the Royal Society would not contradict the assertion that the natural sciences are among the greatest of the humane studies. Yet some curious perversity of men and of fashion gradually created a situation in which the sciences were driven to an island where they seemed to be engaged in arts as strange as those of Prospero. But the tempests of modern times had cast up many from the other camp on to the isle of science and as a result understanding has grown and reconciliation is in sight."

And Sir Cyril concluded: "There would be no more worthy, nor more historically significant interpretation of these Tercentenary celebrations than to be able to regard them as the definitive healing of the rift and the return of science to its rightful place."

In the opinion of the president of the American Philosophical Society (founded by Benjamin Franklin, F.R.S.), and the secretary general of the John Simon Guggenheim Memorial Foundation—both of which have heeded Sir Francis Bacon's injunction to take all knowledge and all art for their province—there could have been no more fitting conclusion and climax to the tercentenary of the Royal Society of London for Improving Natural Knowledge.

Bibliography

E. N. da C. Andrade, *A Brief History of the Royal Society* (Royal Society, London, 1960).

———, "The Royal Society. 1. Foundation and early history," reprinted from *Impulse*, 2nd quart. (1960).

——— and D. C. Martin, "Some distinguished presidents of the Royal Society," reprinted from *Endeavour* (Apr. 1960).

———, "The Royal Society and its foreign relations," reprinted from *Endeavour* (Apr. 1960).

Cambridge and The Royal Society (Cambridge Univ. Press, Cambridge, 1960).

H. Hartley, Ed., *The Royal Society: Its Origin and Founders* (Royal Society, London, 1960).

——— and C. Hinshelwood, *Gresham College and the Royal Society* (Royal Society, London, 1960).

C. Hinshelwood, *The Royal Society Tercentenary Celebrations Programme* (Royal Society, London, 1960).

The Listener (21 July 1960).

D. C. Martin, "The Royal Society today," reprinted from *Discovery* (July 1960).

———, "Structure and function in 1960," reprinted from *Impulse*, 2nd quart. (1960).

The New Scientist (14 July 1960) (The Royal Society Tercentenary special issue).

M. Purver and E. J. Bowen, *The Beginnings of The Royal Society* (Oxford Univ. Press, Oxford, 1960).

The *Times* (19 July 1960) (special number on the Royal Society).