A LIFE OF THE

HONBLE. ROBERT BOYLE, F.R.S.

SCIENTIST AND . . PHILANTHROPIST.

THOS. FARRINGTON, M.A., F.C.S., F.I.C.

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(*From a Drawing.*)

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BY

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With Portrait

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FOREWORD.

To those who have not read Birch's six large volumes on the Life and Works of Robert Boyle, or Miss Flora Masson's charming account of his life and times in ~~six~~ three hundred pages, a concise sketch of the career of this remarkable man may be welcome.

If anyone is induced by reading this essay to pursue the subject deeper, he will not find his occupation either fruitless or uninteresting.

THE AUTHOR.

A LIFE OF THE

HONBLE. ROBERT BOYLE, F.R.S.

SCIENTIST AND PHILANTHROPIST.

"Philaretus [1] was born in a condition that neither was high enough to prove a temptation to laziness, nor low enough to discourage him from aspiring."

THUS does Robert Boyle make reference to his own condition in life, and to its possible effects upon his career.

But we must regard his favourable circumstances as only permissive, for his talents were displayed and his energies exerted in such conditions as would have proved a serious hindrance had not his egregious personalty triumphed over all obstacles, and carried him on to achievements which have gained the deserved admiration of all who have become acquainted with them.

The wild hurly-burly amid which he lived included the Irish Rebellion of 1641, and the Cromwellian suppression thereof; the contests of King and Parliament, and the triangular duel of English, Scotch, and Irish, complicated with the strife of Roman Catholic, Anglican and Presbyterian contending for "the faith once delivered to the saints," each according to his own light.

Life in those days was not secure for king or peasant. Many in humble life fell victims to famine, pestilence, war or outrage, and the axe was laid to the roots of numerous high trees that had proudly held up their heads in the land.

The Puritanical austerity of the Commonwealth was succeeded by the licentiousness of the Restoration; the Great Plague and the Great Fire of London were anything but conducive to scientific research or philosophic meditation.

It may be worth while to examine briefly the antecedents of a man who in such a time could publish forty books on a variety of topics, carrying out at the same time the original researches and experiments that led to them, and who meanwhile earned a great and deserved reputation as an exemplary pietist and philanthropist.

The family was an old Herefordshire one, and the name is spelled "Biuvile" in the Doomsday Book.

[1] Lover of virtue.

Richard Boyle, better known as the "Great Earl of Cork," was the son of Roger Boyle of Herefordshire and Joan Naylor of Kent. In his early days he was a scholar in Cambridge, and a student of law in the Middle Temple, London. Not having sufficient means to continue the study of law on the higher plane, and realising that he could never attain either fame or wealth as a law clerk, he made up his mind to go abroad to seek his fortune.

In those days Ireland was a part of "abroad," and it was a much longer way to Tipperary than in these days of steamboats and railways.

In his "True Remembrances" he tells his own romantic story: "It pleased the Almighty by his divine providence to take me, I may say justly, by the hand, and lead me into Ireland, where I happily arrived at Dublin on the Midsummer Eve, the 23rd day of June, 1588. . . . When first I arrived at Dublin in Ireland . . . all my wealth was then twenty-seven pounds three shillings in money, and two tokens, which my mother had given me, viz., a diamond ring, which I have ever since and still do wear, and a bracelet of gold worth about ten pounds; a tafetty doublet cut with and upon tafetty, a pair of black velvet breeches laced, a new Milan fustian suit laced and cut upon tafetty, two cloaks, competent linen and necessaries, with my rapier and dagger."

He was married at Limerick in 1595 to Miss Joan Apsley, who died after four years, leaving her husband landed property worth £500 a year.

From this beginning his material prosperity increased until it excited the envy and jealousy of some of his contemporaries, and Sir Henry Wallop and others made accusations against him to Queen Elizabeth. The charges were: That he came over a poor man, that he could not be so well off except by the help of some foreign prince's money; that he had acquired certain seaside castles and abbeys to entertain Spaniards in; that he kept in his abbeys fraternities of friars who said mass continually; and such like other suggestions of a damaging nature.

After some adventures he was ultimately successful in having his case heard in the presence of the Queen, who exclaimed at the conclusion, "By God's death, these are but inventions against this young man. . . But we find him to be a man fit to be employed by ourselves, and we will employ him in our service, and Wallop and his adherents shall know that it shall not be in the power of any of them to wrong him, neither shall Wallop be our treasurer any longer."

Not many days elapsed before he was appointed Clerk of the Council of Munster, and recommended to Sir George Carew, the President. He was with the latter during the siege of Kinsale, and was the envoy sent to the Queen with the news of the capture of the town.

On Sir George Carew's advice he became the purchaser of Sir Walter Raleigh's estates, which were at that time waste, desolate, and untenanted, and more a source of expense than profit to the "bold sea rover."

These lands Boyle brought into cultivation again by planting with new tenants from England; and thus made the transaction profitable for himself and them, and probably for many of the former inhabitants of the country, impoverished and scattered by the state of war lately existing.

Sir George Carew did more for him; and this incident, as well as the former, reveals to us a quality possessed by the Great Earl of Cork for

the want of which many a capable and headstrong man misses the tide of fortune at its turning point.

"The Lord President," says Richard Boyle, "dealt very nobly and fatherlike by me, in persuading me it was high time for me to take a wife, in hopes of posterity to inherit my lands; advising me to make choice of Sir Geoffrey Fenton's daughter; and that if I could affect her, he would treat with her parents to have the match between us; wherein he prevailed so far, as the 9th of March, 1602, I was, in his Lordship's presence, contracted to her in her father's house at Dublin."

They were married next year, and the principal Secretary of State in Ireland gave with her one thousand pounds in gold, though the happy bridegroom did not ask for anything—it "not being in my consideration," he says, "but that gift of his daughter unto me I must ever thankfully acknowledge as the crown of all my blessings."

Mrs. Boyle from her side epitomises her regard and affection for her husband in the expressive phrase with which she commences her letters to him, "My owne goode selfe."

Richard Boyle was knighted by Sir George Carew on his wedding day, and made a privy councillor for Munster to King James I. in 1606. His promotion to the same office for the whole of Ireland followed six years later, and he was created Lord Boyle, Baron of Youghal, in 1616.

The Viscounty of Dungarvan and the Earldom of Cork were duly conferred in 1620, in which year his eldest brother, Dr. John Boyle, Bishop of Cork and Ross, died.

In the year 1629, in conjunction with Lord Loftus, he was sworn in one of the two Lord Justices for the joint government of the Kingdom of Ireland, and finally was made Lord High Treasurer in 1631.

The Earl's prosperity lasted for another ten years, that is, until the breaking out of the rebellion of 1641, of which more later.

Lady Boyle died in the year 1630, and was buried in St. Patrick's Church in Dublin, in her father's vault, over which the Earl "caused a very fair tomb to be erected."

Of such parents was Robert Boyle (the subject of this sketch), born in the town of Lismore and in the year 1627, being their 14th child and 7th son.[2]

He himself rejoiced that he "was born in a condition that neither was high enough to prove a temptation to laziness, nor low enough to discourage him from aspiring."

Lady Boyle saw little of her youngest son, for he was soon sent away to be reared by a foster-mother, and had hardly returned home before he suffered one of his juvenile "disasters," the loss of a mother, whose "free and noble spirit, added to her kindness and sweet carriage to her own, made her so hugely regretted by her children and lamented by her husband."

The second juvenile misfortune he deplores was the acquisition of a stutter, contracted by imitating some playmates so afflicted. This he himself considered as "possibly a just judgment upon his derision."

[2] Another daughter, born 15 months later, completed the list of those whom the Great Earl designates as "all my hopeful children," some of whose effigies decorate his tomb in the Collegiate Church in Youghal.

One of his fortunate escapes from death occurred about this time. Travelling to Dublin with his father the cavalcade had occasion to pass over "four-mile-water" near Clonmel, the stream being much swollen by heavy rain. The little boy was left in a coach with no other companion but a foot-boy, when "a gentleman of his father's, very well horsed, accidently espying him, in spite of some others and his own unwilingness and resistance, carried him in arms over the rapid water, which proved so much beyond expectation both swift and deep that horses with their riders were violently hurried down the stream, which easily overturned the unloaded coach, the horses (after by long struggling they had broke their harness) with much ado saving themselves by swimming."

It was undoubtedly owing to this accident that the Great Earl caused a bridge to be built at Four-mile-water. The bridge, however, fell down in the Earl's lifetime, and he consequently left the sum of £120 in his famous will for the rebuilding of it. The bridge had been built by John Lodder, mason, of Bandon Bridge, and yet the testator wills thus:—"And howsoever this said Jn. Lodder hath failed in his work and the trust I yet reposed in him through too much negligence or covetousness or both, yet I am of opinion that he is the fittest man to rebuild it to redeem his own error and disgrace."

The truthfulness of Robert Boyle's character is well illustrated by an anecdote often related by his favourite sister, Lady Ranelagh, and worthy of the caption "George Washington outdone." A fruit tree in the garden was specially reserved for an elder brother's wife, Lady Dungarvan, then in a delicate state of health; but young "Robyn," as his father was wont to call him, happened to pass by, and so some of the precious plums were not to be found. His sister coming on him charged him with the aggravated offence of having eaten half-a-dozen. "Nay, truly, sister," he ingenuously replied, "I have eaten half-a-score."

In his ninth year, his father fearing for his mental and moral health what he previously feared for his physical health, sent him away to school. Or as Robert himself puts it, "(His father) considering that great men's children breeding up at home tempts them to nicety, to pride, and idleness, and contributes much more to give them a good opinion of themselves than to make them deserve it, resolves to send over Philaretus in the company of Mr. F. B.,[3] his elder brother, to be bred up at Eton College near Windsor, whose Provost at that time was Sir Henry Wotton, a person that was not only a fine gentleman himself, but very well skilled in the art of making others so."

The party, including a gentleman of the Earl's entourage and a tutor attendant, reached Youghal from Lismore without trouble; but, notwithstanding the delay of a week for a favourable wind, their vessel was driven back again by a storm. Another wait of eight days secured the favouring breeze; and escaping both storms and Turkish galleys (which at that time infested the shores of Ireland), they at length arrived safely at Bristol. To-day we are more independent of the wind, and the Turks do not travel so far.

The journey from Bristol to Eton presented no special difficulties, and

[3] Frank Boyle.

the boys were duly handed over to the care of the College authorities by their guardian.

Sir Henry Wotton, the provost, had been a distinguished diplomatist, and had on one occasion carried a message to James VI. of Scotland (James I. of England) from the Duke of Tuscany, warning the future King of Great Britain of the danger of his being poisoned. The royal gratitude advanced Sir Henry for a time, but did not survive an unfortunate epigram written in an album and conveyed by some busybodies to the Court in London. "An Ambassador," wrote Wotton, "is an honest man sent to *lie* abroad for the good of his country." The saying did more honour to his veracity than to his diplomacy, with the result that when he was fortunately selected out of many competitors for the Provostship of Eton he was obliged to borrow money to enable him to take up the position. He was a cousin of Francis Bacon, and numbered among his friends Beza, Casaubon, Arminius, and Kepler, while he deemed his "idle hours not idly spent," as he angled in the neighbourhood with Izaak Walton himself.

Robert Boyle, with his brother Frank, lived in the house with John Harrison, who, with Hales, was one of the distinguished teachers of that time. The house master gave special attention to the studious and reflective youth, and, according to the boy's own account, "Would sometimes give him, unasked, playdays, and oft bestow upon him such balls and tops and other implements of idleness as he had taken away from others, that had unduly used them."

Among the books he studied during this happy educational period was the "History of Alexander," by Quintus Curtius Rufus, which helped to wean him from "pedantic books," and he often stated that he had gained more from the account of Alexander's victories than the latter had done from the victories themselves.

Four serious accidents befel him at Eton. Two were falls from horseback, another the administration of a wrong dose of physic, and the last a cataclysm that occurred in his bedroom at night.

"Robyn" was already in bed, and Frank was sitting by the fire with some companions when the side wall and ceiling came tumbling in, accompanied by the contents of the room overhead. Frank was pulled out of the debris by a bigger boy, and Robert was saved from the grosser matters by the four-poster bed ; but the most interesting fact in connection with the future student of the air, was his own spontaneous device to avoid suffocation by the dust, for, as he states, he "remembered to wrap his head in the sheet, which served him as a strainer, through which none but the purer air could find a passage."

When he had been about two years at Eton he went one Easter to his eldest brother's (Lord Dungarvan) house in London for the vacation, but while there was "visited with a tertian ague," which was followed by a period of depression. To cheer his spirits he was induced to read, as he says, "the state adventures of Amadis de Gaule and other fabulous and wandering stories . . . which meeting in him with a restless fancy . . . accustomed his thoughts to such a habitude of roving, that he had scarce ever been their quiet master since. . . It is true," he continues, "that long time after Philaretus did in a considerable measure fix his volatile fancy and reclaim his thoughts by the use of all those expedients

he thought likeliest to fetter, or at least to curb, the roving wildness of his wandering thoughts. Amongst all which the most effectual way he found to be the extraction of the square and cube roots, and especially the more laborious operations of algebra."

When he had been about 3½ years at school he was recalled by his father to Stalbridge, in Dorsetshire—a place which the Earl had recently purchased—and which he ultimately left to Robyn. He ingenuously confesses to being his father's favourite son, and suggests three possible reasons—his being the youngest; his resemblance to him in body and mind; and his not having lived long enough with him to be tempted to run into debt, or to take such other courses as he "disrelished" in the case of his other sons.

His teaching was first committed to the Parson of Stalbridge, at whose house the boy lodged, "to avoid the temptations to idleness that home might afford;" but on the return of his brothers, Lord Kinalmeaky and Lord Broghill, from their three years of travel, the tutor who had accompanied them became tutor to their youngest brother.

Monsieur Marcombes, for such was his name, was a French gentleman, who, according to his pupil, "was a man whose whole garb, his mien, and outside, had very much of his nation, having been divers years a traveller and a soldier. . . . Scholarship he wanted not, having in his greener years been a professed student in divinity; but he was much less read in books than men, and hated pedantry as much as any of the seven deadly sins." His worst quality was his quick temper, which Philaretus observing, learned the rather to avoid in himself than to imitate or emulate.

But there were "covenants" in those days, and "volunteers," and the Great Earl's eldest son, Lord Dungarvan, was raising a troop of horse to fight what his father called the "Covenanting rebelleous Skots." Kinalmeaky and Broghill were among the hundred "volunteers" who rallied to Dungarvan's standard; and thus the Earl had a son in the troop for each of the three thousand pounds he had contributed to the expedition.

Lord Barrymore, his son-in-law, had meanwhile travelled to Ireland to "raise and press a thousand Irish foot soldiers into the King's service against the Scotch." The illness of Frank, aged 16, prevented him and his younger brother, now only 12 years of age, from going also.

Peace having been patched up with the Scots, opportunity was revived for the amenities of ordinary life, and amongst the visitors at Stalbridge was Lady Stafford, who arranged with the Earl a marriage between her daughter, Mistress Betty Killigrew, a Maid of Honour at the Court, and the gentle Frank, the boy of sixteen, who was too delicate to go to the war.

The family moved in great force to London, and lived in princely state until the marriage was duly celebrated. "The King gave the lady away with his own hand, and a royal feast was made in Court for the young couple."

With Frank Boyle, however, marriage was not "settling down," for in four days he was packed off with Robyn to the Continent, that they might improve their education by foreign travel under the care of Mr. Marcombes.

The fickle wind was favourable this time, for starting one day from

Rye in Sussex, "a prosperous puff of wind did safely by the next morning blow them into France." Landing at Dieppe they travelled through Normandy to Rouen. On the way they heard of a robbery lately committed in a wood through which they were to pass by night; but judging that the evildoers would not venture soon again in the same spot, they courageously passed on and came through unhurt.

It is unnecessary to dwell on the journey through France, beyond saying that Robert Boyle describes Paris as "that vast chaos of a city," and Lyons as "a town of great resort, and no less trading, but fitter for the residence of merchants than of gentlemen."

Arrived at length at Geneva, where their tutor's family resided, the boys settled down to various studies and occupations suitable to their age. Robert studied rhetoric, logic, and mathematics, while he imbibed, or rather cultivated, a love for natural philosophy by frequent converse with a French book, "Le Monde," which treated of the past and present condition of the earth. He practised fencing and dancing also, and amused himself with mall and tennis. Through his reading and talking in the French language he became so proficient that when he desired he could easily pass for a native of the country.

It was from one memorable night during his stay in Geneva that Philaretus dated his conversion. He has thus outlined the situation himself:—"Though his inclinations were ever virtuous, and his life free from scandal and inoffensive, yet had the piety he was master of already so diverted him from aspiring unto more, that Christ, who long had lain asleep in his conscience (as he did once in the ship), must now as then be awaked by a storm."

And so one night, as the rain descended and the winds blew, and the lightning flashed and the thunder crashed—as they can do to some purpose among the Swiss mountains—the fourteen-year old boy thought the end of the world had come, and made the resolve and vow, "that if his fears were that night disappointed, all his further additions to his life should be more religiously and watchfully employed." It was a source of distress to his sensitive spirit that it should have required a storm to rouse him to a sense of his duty to his higher nature, but he consoled himself with the thought that he had renewed in the calm of the daylight the vow he had made in the storm and darkness.

Coming to Geneva the boys did not arrive wholly among strangers, for in addition to M. Marcombes' family were several friends whom Barrymore and Kinalmeaky had already made, including Mr. Diodato Diodati, the banker, and Dr. John Diodati, the famous Italian Protestant preacher.

"The Church Government," wrote Evelyn, concerning this period, "is strictly Presbyterian, after the discipline of Calvin and Beza, who set it up, but nothing so rigid as either our Scots or English sectaries of that denomination."

Though Marcombes wrote continually to the Earl, no letters came for some time from home, though, on the other hand, the financial arrangements had been working satisfactorily. When, after a lapse of three and a half months, communication was opened, two bulky packages came together, and a remarkable budget of news was contained in them.

Lady Dungarvan had a son and heir, who was christened "Charles,"

the King himself standing sponsor. Kinalmeaky was married to Lady Elizabeth Fielding, one of the ladies of the Queen's suite; the wedding was in the Royal Chapel, the King gave away the bride, and put on her neck a pearl necklace given by the Queen. The Great Earl, displaying at the same time two of his qualities, generosity and thrift, supplied £100 for the bridegroom's attire, and lent him Frank's wedding shoes. Lord Broghill was not left out of the Earl's count, and he thus writes to his son's late tutor: "Your friend Broghill is in a fair way of being married to Mrs. Harrison, one of the Queen's maids of honour, about whom a difference happened yesterday between Mr. Thos. Howard, the Earl of Berkshire's son, and him, which brought them into the field; but, thanks be to God, Broghill came home without any hurt, and the other gentleman was not much harmed; and now they have clashed swords together they are grown good friends. I think in my next I shall advise you that my daughter Mary is nobly married, and that in the spring I shall send her husband to keep company with my sons at Geneva."

But "the best laid plans of mice and men gang aft agley," and neither of the young people made the matches their father designed for them. The defeated duellist married the lady he fought Lord Broghill for, and Lord Broghill married Lady Margaret Howard, his antagonist's cousin. Little "unrewly" Mary, not for the first or last time, asserted her right to choose her own mate, and refused to be governed by her father's predilections; but ultimately, with the connivance of her brother Frank's wife, late Miss Betty Killigrew, carried out a runaway match with Mr. Charles Rich, second son of the Earl of Warwick.

Soon after the two boys with their tutor left France for a trip to Italy. Among other places in the northern part of the country they visited Florence, where Boyle spent many of his spare hours in reading modern history in Italian, "and the new paradoxes of the great star-gazer Galileo," who indeed closed his famous career not a league from that town, during the time that Robert was there. In due course they proceeded to Rome, where the young traveller states that "amongst other curiosities and antiquities he had the fortune to see the Pope at chapel with the cardinals." Further on he remarks that he was not "negligent to procure the Latin and Tuscan poems of this Pope, whose name Urbanus, his actions did not belie, he having more of the gentleman in him than his pontifical habit would seem to let him wear."

Returning to Florence they made their way to the sea, and coasting most of the way, at length arrived at Marseilles, where "Philaretus had the pleasure to see the French King's fleet of galleys put to sea, and about two thousand poor slaves tug at the oar to row them."

[Boyle's own memoir suddenly breaks off at this point, and other sources must be tapped for further supplies of information with regard to his history.]

At Marseilles, where they waited for the money necessary to carry them on, they at length received a letter from their father, telling of the rebellion in Ireland, and stating that it was with great difficulty that he was able to procure £250 to bring them home.

It was the Earl's wish when sending the £250 that the two boys should come to him in Ireland, landing at Dublin, Cork or Youghal. Owing to some failure on the part of Mr. Perkins of London, who was

to have sent it out, the money never reached them, and the Boyle's "extremity" became M. Marcombes' "opportunity." Right well did the good Frenchman make use of it. He took Robyn to Geneva and supported him there for two years, while he managed to put together enough money to carry Frank (afterwards Lord Shannon) back to Ireland.

The Earl had suggested as an alternative that the lads should go to Holland and join the forces of the Prince of Orange, but in a letter to his "Most honoured Lord and Father," Robert states that after his long journey of 800 miles he was "as yet too weake to undertake so long a voyage in a strange country, where when I arrive I know nobody, and have little hope by reason of my youth to be received among the troops." . . . However, he adds, "If your Lordship hath need of me in Ireland, I beseech your Lordship to acquaint me therewith, and to believe that I have never beene taught to abandon my parents in adversity, but that there and in all other places, I will always strive to show myself an obedient sonne. . . ."

Frank lost no time in getting to Ireland, and matters moved quickly to a crisis in the "distressful country."

I take the liberty of quoting from the graphic description of the events preceding the Earl's death in Miss Flora Masson's life of our hero. "The battle of Liscarrol had been fought on September 3. The Earl's loyal son-in-law, Lord Barrymore, and all the Earl's sons except Robert fought in that battle. And at the battle of Liscarrol Kinalmeaky was killed—killed on his horse by a musket shot through the head. It was Frank—the 'sweet spirited Frank,' fresh from the fencing and dancing and vaulting lessons in Geneva and Italy—who 'carrying himself with undaunted resolution,' rescued his brother's body and horse, and kept troop and foot together. The old man did not know then which of these two sons to be the proudest of. It was a grim satisfaction to the Earl, after all that had passed, when 'Kynal' had been buried in Lismore Church, to sit down and make that entry in his diary: 'six of the rebell ensignes were carried to his widdoe.' . . . There is something Shakspearean in the mood in which this old fighter lived his last months and drew his last breath. Shut up in Youghal, 'preserving' that town for his King, his sons away fighting, his daughters and grandchildren scattered, Kynalmeaky and Barrymore dead, and poor Lettice dying, his lands despoiled, his fortune vanished, he was still the Great Earl of Cork, the head of a great family, the old man of action and experience, the Elizabethan soldier-statesman, to whom the younger men, statesmen and kinsmen alike, turned in this hour of extremity, and not in vain."

Robyn—the seventh son—his father's especial favourite, was not forgotten in this time of turmoil. The Earl found time to write to him; was on the lookout for a situation for him; set apart his own "choice dun mare" to be "kept and drest carefully" for him, and after his wont had a valuable ring purchased to be duly presented from him to the little Lady Ann Howard, whom he was pleased to call "my Robyn's younge Mrs."

Robyn's attitude to matrimony will be revealed in due course; but now his one idea was to get home from Holland to his own country and kindred.

"At length," he writes, "I was forced to remove from thence, and having upon his (M. Marcombes') credit, made shift to take up some

slight jewels at a reasonable rate, we made sale of them from place to place, and by their help, at last, by God's assistance, we got safe into England, towards the middle of the year 1644, where we found things in such confusion, that although the manor of Stalbridge were, by my father's decease, descended unto me, yet it was near four months before I could get thither."

Probably owing to the "dreadful confusion of affairs" then existing, Robyn's family were not aware of his arrival in England, and it was by some happy accident, which he mentions but does not describe, that he was brought into touch with his much-loved sister Catherine, Lady Ranelagh, who was then living in London in the same house as her sister-in-law, who was the wife of one of the leading members of the House of Commons. Boyle was thus brought into friendly contact with the party which was soon to be in power; and this fact gained for him early protection for his estates both in England and Ireland.

For higher reasons also he rejoiced in this circumstance, which he ever regarded as providential, for naturally he would have followed his brothers into the army, where the generality of the associates he would have been thrown amongst would hardly have been congenial.

Miss Masson draws the picture of the unnatural alliance admirably:—

"If Robert Boyle had joined the King's army! It is difficult to think of him in 'armor of prooff,' and quite impossible to picture him as a laughing Cavalier. He disliked 'customary swearing,' he drank water, he did not smoke, he dearly loved to point a moral, and he never adorned a tale. It is certain no officers' mess would have endured him for ten minutes, in the rôle either of sceptical chymist or of Christian virtuoso. And what would have become of the Invisible College and the Royal Society?"

As already stated it is not now known what was the happy accident which brought Boyle and his sister together; but speculation has not been absent on the point, and there is probability in the suggestion that it came about through John Milton or Samuel Hartlip, or both of these friends and brothers in literature. Certain it is that Milton was well acquainted with the various members of the Diodati family in London and Geneva—the "Epitaphium Damonis" was written in memory of Charles Diodati—and also equally certain that this great man was intimately acquainted with Lady Ranelagh. She not only assisted him by sending to him her own son, Dick Jones, as a pupil, but also her nephew, young Lord Barrymore; and her kindness was such that the blind poet in the time of his loneliness said she stood "in place of all kith and kin" to him. Under these circumstances it does not require much stretch of imagination to fix on Catherine Boyle, then Lady Ranelagh, as the good angel who piloted the future author of "Paradise Lost" away from the scaffold, and thus earned the undying gratitude of posterity.

The same gracious influence was a refuge in a time of storm to the eighteen year old boy, who took more kindly to the pen than the sword, although he is recorded to have put his bows and arrows near his pillow on one occasion when he feared a night attack on the house where he stayed.

As soon as he could command some of his fortune he paid a short visit to the Continent, evidently in order to repay to Mons. Marcombes the money

he had lent him, and soon after his return went to reside at his manor of Stalbridge.

An extract from a letter to his sister, recounting his adventures on the journey, will illustrate at the same time the disturbed condition of the country and the character of our hero's "occasional reflections" on all sorts of subjects:—"The morning," he writes, "I had the unhappiness to take my leave of you and my Lady Molkin, I bid farewell to the city, and began my journey upon a courser. Him I rid to dinner to Egham, and at the end of the town, there it was my good fortune (as we are pleased to miscall it) to overtake an express sent from the parliament to the general, making ceremonies with his horse, whither of them two should lead the way," and so on. . . "As we went along we met divers little parties with whom we exchanged fears, and found that the malignant rumours, that were then abroad, had frightened the country into a quaking ague, till we came to Farnham, which we found empty and unguarded, all the townsmen being gone out to oppose the King's party, and chusing rather to have their houses empty, than replenish with such guests, as otherwise they were necessarily to expect. There, invited by the coolness of the evening, and the freshness of the garden I was walking in, I almost lost myself in meditating how foolishly rash were our controlments of, and repinings at, the wise contrivances of that all-swaying providence, whose proceeding should be as far above our censures as they are above our reach. How apt we are upon the least thwarting of our designs to murmur against providence, and in a pettish humour throw the helve after the hatchet, 'la manche apres le coignée, and give ourselves for gone, when, had we had our will in the means, we should have been frustrate in our expectation of the end! Whereas that superlative wisdom that we grumble at for thwarting us in the means, by crossing us in the way, brings us the sooner to our journey's end."

The episode of the bow and arrows already alluded to is worth repeating in the young philosopher's own words:—

"With divers contemplations upon this subject, I went to supper and thence to bed, not without some little fear of having our quarters beaten up by the cavaliers that night; when lo! to second my apprehensions, about the dead of my sleep, and that night, I heard a thundering at the door as if they meant to fright it out of the hinges and us out of our wits. I presently leaped out of my bed, in my stockings and clothes (my usual night posture when I travel); and while Roger was lighting a candle, got my bilboa and other instruments from under my pillow: whereupon Roger opening the door, saw it beset with musketeers, who no sooner saw us, but said aloud, that we were not the men they looked for; and being intreated to come into the chamber, they refused it, and he, that brought them thither, excused their troubling us, with as transcendent compliments as the brown bill could afford. I wondered at their courtesy until I knew that it was the town-constable, that making a search for some suspicious persons, and coming by my chamber that wanted a lock, either had a mind to make us take notice of so considerable an officer, or no mind that we should sleep whilst our betters watched; and for his not coming in, some accents of fear, that fell from him, made me suspect I was obliged for that to myself; and I remember that just at the opening of the door, he peeping in, espied me drawing a

pistol out of one of my holsters which, I believe, made him a disgraceful of his company. Well, away went my gentleman in prosecution of his search, and I even took my bows and arrows and went to sleep."

Near Salisbury they met a troop of horse who "came powdering so furiously upon" them that they scarce had time "to draw." The foot-soldiers who accompanied them gave Boyle an opportunity for animadverting upon the press-gang methods of the day and the horrors of war. "The foot we saw," he says, "were poor pressed countrymen, whom this party of horse were sent, not to convoy, but to guard. Amongst them I saw one poor rogue, lacqueyed by his wife, and carrying a child upon his shoulders. A pretty device, methinks, to make those, who have no goods, to fight for their wives and children! Good God! that reasonable creatures, that call themselves Christians too, should delight in such an unnatural thing as war, where cruelty at least becomes necessity, and unprocured poverty becomes a crime; and a man with his whole family must be subject to be unavoidably undone, because the violence perhaps of these very soldiers that press him had made him poor."—Birch's "Life," Vol. I., p. xxvii.-xxix.

At the end of this long epistle he tells his sister that his treatise on Ethics gets on slowly. This was one of the first of his books, and was commenced before the close of his 20th year. With the following playful conceits and complimentary flourishes, he concludes his letter:—"My stay here, God willing, shall not be long, this country being generally infected with three epidemical diseases (besides . . . the troop-flux), namely the plague . . . , fits of the committee, and consumption of the purse; to which so violent expulsives, if so potent an attractive as a letter from you were but added, it would both extremely sweeten the stay and accelerate the departure of, my dearest sister, your most affectionate brother, and humble servant, Robert Boyle.

During his retirement at Stalbridge he occupied himself with various studies, especially Natural Philosophy and Chemistry, all the time keeping up a voluminous correspondence with his numerous friends.

Many of these letters are extant, and give us an insight into his life and character. To his old tutor, M. Marcombes he wrote under date October 22, 1646, in a delicately complimentary style:—"Monsieur, since discontinuance of the practice of your language has robbed me of that little readiness your converse had taught me in it, I shall take the liberty to make use of mine, which I know you understand equally with your own."

He then gives an account of the state of affairs in England and Scotland, and turning to Ireland, says of his brother, Lord Broghill, who was then in command of the army there:—"But his own wants at home at last reduced him to that starving condition that when he prayed for his daily bread his request reached at least as far as his expectation. He is now there soliciting for supplies for distressed Munster, which, though very liberally voted, are so slow in their dispatch that many think they have just cause to apprehend that the physic will not get thither before the patient be dead."

He was gratified that the Presbyterian Government was at last settled, for the variety of religious opinions in London was very great at that time. "So," as he says, "that if the truth be anywhere to be found, it

is here sought so many several ways, that one or other must needs light upon it." He did not approve, however, of the action of the Parliament in passing a law for the punishment of errors of thought, pertinently remarking that as their own belief of the truth was confessedly a work of divine revelation, he could not understand "why a man should be hanged because it has not yet pleased God to give him his spirit."

Expressing the hearty goodwill of his family to his correspondent, he says, "An employment fit for you we cannot yet procure, because all our nobility stands at a gaze, to see whether the issue of the treaties now in debate will be either peace or war; in either of which cases it is probable that a good many of them will make visits to foreign climates."

Among his own difficulties he mentions that he had "to borrow money of servants to lend it to men of above £10,000 a year." That "the roguery of Tom Murray gave (him) a great deal of trouble to discover and prevent," but had taught him domestic economy. That he had to part with a good share of his land, partly to live . . . like a gentleman, and partly to perform all that (he) thought expedient in order to (his) Irish estate out of which (he) never yet received the worth of a farthing."

Writing to his sister from Stalbridge, March 6, 1646-7, he thus alludes to his chemical studies:—

"That great earthen furnace whose conveying thither hath taken up so much of my care [and concerning which I made bold very lately to trouble you, since I last did so], has been brought to my hands crumbled into as many pieces as we into sects; and all the fine experiments and castles in the air I had built upon its safe arrival have felt the fate of their foundation. Well, I see I am not designed to the finding out of the philosopher's stone, I have been so unlucky in my first attempts in chemistry. My limbecks, recipients, and other glasses have escaped indeed the misfortune of their incendiary, but are now, through the miscarriage of that grand implement of Vulcan as useless to me as good parts to salvation without the fire of zeal.

"Seriously, Madam, after all the pains I have taken, and the precautions I have used to prevent this furnace the disaster of its predecessors, to have it transported a thousand miles by land that I may after this receive it broken, is a defeat that nothing can recompense; but that rare lesson it teaches me, how britle that happiness is that we build upon earth."

A life-long friend of Robert Boyle was Mr. Samuel Hartlib, the son of a Polish gentleman who was driven from the country by the religious persecution which was the excuse for, if not the cause of, the partition which not long after overtook that unfortunate land. Of him Milton writes in his "Tractate of Education" as, "a person sent hither by some good providence from a far country, to be the occasion and the incitement of great good to this island."

Hartlib was a prominent member of a club formed in London in 1645, and called by its members "The Invisible College," or "The Philosophical College." Its object was, "precluding theology and state affairs," to cultivate the knowledge of the various sciences then studied by "worthy persons inquisitive into natural philosophy."

This association was honoured with Royal patronage after the Restoration, and thus developed into what is now known as the Royal Society of London. Robert Boyle was a member, contributed to its activities,

and maintained a correspondence with the other members while absent from the metropolis.

During the plague the Society quietly evaporated from London and condensed again in the safer seclusion of Oxford.

Mr. Boyle's moderate views with regard to differences in religious opinions are clearly expressed in the following extract from a letter to Mr. John Dury, famous for his attempts to reconcile the Lutherans and Calvinists. "It is strange," he writes, "that men should rather be quarrelling for a few trifling opinions wherein they dissent than to embrace one another for those many fundamental truths wherein they agree. For my own part, in some two or three and forty months that I spent in the very town of Geneva, as I never found that people discontented with their own Church-government (the gallingness of whose yoke is the grand scarecrow that frights us here), so could I never observe in it any such transcendant excellency as could oblige me either to bolt heaven against, or open Newgate for, all those that believe they may be saved under another."

During the years 1647-1651 he was occupied with studies and experiments and literary compositions, and (with the exception of a short visit to Holland) resided in various parts of England. A painful disease to which he was subject interfered with both his writing and his experiments, but on one occasion he writes to his sister Ranelagh, "Nor has my disease been more guilty of my oblivion than my employment . . . for Vulcan has so transported and bewitched me that . . . the delights I taste in it make me fancy my laboratory a kind of Elysium . . . I there forget my standish and my books, and almost all things but the unchangeable resolution I have made of continuing till death, yours, &c., R.B."

Early in 1652 his "Essay on the Scripture," still extant in manuscript, was begun. Though his aptitude and tastes lay more with things than words, his desire to accomplish this task in a worthy manner was so great that he gave himself to the study of Hebrew and Greek and other needful languages; in fact, he says, "A Chaldee grammar I likewise took the pains of learning, to be able to understand that part of Daniel, and those few other portions of scripture, that were written in that tongue; and I have added a Syriac grammar purely to be able one day to read the divine discourses of our Saviour in his own language."

He says, further, that not inconsiderable progress was made by so slow a proficient as himself "in less than a year, of which not the least part was usurped, by frequent sicknesses and journies, by furnaces, and by (which is none of the modestest thieves of time) the conversation of young ladies."

In 1652 he journeyed to Ireland, where he remained for over a year settling his affairs. After a brief visit to Stalbridge he returned to Ireland, and remained until the middle of 1654. He met with such difficulties in the pursuit of his favourite studies, that he styles his native land "a barbarous country, where chemical spirits were so misunderstood and chemical instruments so unprocurable, that it was hard to have any hermetic thoughts in it."

Failing to carry on his chemical work he had recourse to anatomy. By his dissections he satisfied himself of the circulation of the blood,

discovered by Harvey not many years before, but not immediately accepted as true by his contemporaries.

He made inquiries also into the minerals that were found in Ireland, and his statement that no country in Europe was so rich in mines as Ireland may have helped to produce the somewhat exaggerated idea which many hold as to the mineral wealth of this island.

On his return to England he went to reside at Oxford, where he had converse with many kindred spirits at the University, and where he was able to prosecute his experimental enquiries into the secrets of nature. Here it was that he improved the airpump, discovered a short time previously by Otto von Guericke of Magdeburg. In this he was materially helped by his assistant, Robert Hooke, whose law of stress is as well known to students of mechanics as Boyle's Law is to physicists. With this "engine," as he calls it, he made many experiments supporting his theory of the constitution of the atmosphere, which he described in his famous paper entitled, "New Experiments Physico-Mechanical Touching the Spring of the Air, and its Effects."

I will not attempt to give an account of the distinguished litterateurs and scientists who were friends and correspondents of Boyle at this period. Two references, however, may throw additional light on his personal character.

Mr. John Evelyn, writing about a Philosophical College which he desired him to join, says he was in himself "a society of all that were desirable to a consummate felicity," and in a later letter in reference to Boyle's essay on "Seraphic Love" he writes, "You have at once by this incomparable piece taken off the reproach that lay upon piety and the enquiries into nature, that the one was too early for young persons, and the other the ready way to atheism."

In the year 1759, having heard that the learned Rev. Dr. Sanderson, afterwards Bishop of Lincoln, had lost all his preferments on account of his attachment to the royal party, he gave him an annual grant of £50 a year—thus enabling him to complete his famous book on "Cases of Conscience."

At the Restoration Robert Boyle was well treated by the King and his ministers, and the Lord Chancellor Clerendon tried to persuade him to take holy orders, believing that his blue blood, his learning, and his goodness, would all be acquisitions to the State Church. However, after due consideration, Mr. Boyle took a different view. His good qualities were so well known to his contemporaries for sterling gold, that he did not need the guinea stamp, and he believed that his religious teaching would come at his time with more force from a layman, as people said in those days that clergymen preached because it was their trade, and that they were paid for it.

In 1661 Mr. Boyle published a work which created a furore at the time and attained a European reputation. It was entitled "The Sceptical Chemist; or Chemico-physical Doubts and Paradoxes touching the Experiments, whereby vulgar Spagyrists are wont to endeavour to evince their Salt, Sulphur and Mercury, to be the true Principles of Things." In this book he combated the idea of the alchemists that everything was compounded of three elements, viz., salt, sulphur and mercury; and thus materially advanced the true science of Chemistry.

About this time a grant of some of the forfeited impropriations in

Ireland was obtained from the King in Boyle's name, but without his knowledge. Desiring that these revenues should be utilized as before for religious purposes, he arranged to devote two-thirds of them for such services in Ireland, and the remaining third "for the propagation of the Gospel among the heathen natives of New England and other parts of America."

In connection with the latter many letters were written to him by Mr. John Elliott of New England, of which I shall only quote the mode of address to exemplify the respect and regard of the writer. The first commences "Right Honourable," the second advances to "Right Honourable Nursing Father," the third improves matters with "Right Honourable, Charitable Indefatigable Nursing Father," the sixth supplies us with "Right Honourable, Right Charitable, and Indefatigable Nursing Father," while the climax is reached in the tenth with "Right Honourable, Deep Learned, Abundantly Charitable, and Constant Nursing Father."

For these benefactions a letter of thanks was sent by the Governor, Deputy-Governor and General Court of New England; and also one defending themselves against charges of intolerance, etc., in which they say that while Anabaptism, Quakerism, etc., had been looked upon as great errors, and laws made to secure themselves from danger, "yet some peaceable Anabaptists and some of other sects who have deported themselves quietly, have and do live here under the protection of this government undisturbedly."

The connection of Robert Boyle with the Royal Society is thus described in Birch's Life of this distinguished man:—

"In 1663, the Royal Society being incorporated by King Charles II. by letters patent dated 22nd of April, Mr. Boyle was appointed by the charter one of the Council of the learned body, and as he had been one of the principal persons to whom that Society owed its first rise and progress, he continued during the rest of his life one of its most useful members."

In a letter appended to his book on "Colours," published about this time, he makes an interesting allusion to the possibility of such a substance as radium.

Extract from a letter by Robert Boyle relating to a diamond that shines in the dark. (Birch I., p. 791.)

"But, Sir, though I be very backward to admit strange things for truths, yet I am not very forward to reject them as impossibilities, and therefore I would not discourage any from making further enquiry, whether or no there be really in *rerum natura* any such thing as a true carbuncle or stone, that without rubbing will shine in the dark. For if such a thing can be found, it may afford no small assistance to the curious in the investigation of light, besides the nobleness and rarity of the thing itself."

In 1664 he was elected into the Company of the Royal Mines, and in the next year he published his "Occasional Reflections upon several Subjects," addressed to his sister the Countess of Ranelagh, under the name of "Sophronia." These were learned, witty and well written thoughts on a variety of topics, though some of them were suggested by trival occasions. This latter circumstance gave an opening for a better known but less worthy litterateur to cavil at them, in the shape of Dean Swift's "Pious Meditations on a Broom-Staff in the Style of the Hon. Mr. Boyle," which Birch describes as "the most licientious buffoonery," and of which Lord Orrery has said: "To what height

must the spirit of sarcasm arise in an author, who could prevail on himself to ridicule so good a man as Mr. Boyle? The sword of wit, like the scythe of time, cuts down friend and foe, and attacks every object that lies in its way. But sharp and irresistible as the edge of it may be, Mr. Boyle will always remain invulnerable."

Perhaps, however, it was a case of imitation being the sincerest flattery, for it is probable that the witty Dean owed the idea of his "Gulliver's Travels" to one of Boyle's "Occasional Reflections," in which he says, "he had thoughts of making a short romantick story, where the scene should be laid in some island of the Southern ocean, governed by some such rational laws and customs as those of Utopia or the New Atlantis, and in the country he would introduce an observing native that upon his return home from his travels made in Europe, should give an account of our countries and manners under feigned names, and frequently intimate in his relations (or in his answers to questions that should be made to him) the reasons of his wondering to find our customs so extravagant and differing from those of his country."

A more good-natured allusion to "Occasional Reflections" was made by another of his contemporaries, the famous Puritan statesman and martyr, Sir Henry Vane.

For once at least Robert Boyle attended a conventicle, and heard Sir Harry preach "in a large thronged room a long sermon." His own views did not coincide with those of the preacher, and at the close he ventured to express his dissent. Vane, however, recognising his critic, and having the last word, smoothed out the matter by remarking that what he had said on the text was only intended by way of "Occasional Reflections" on the Book of Daniel.

In the same year he published among other works the treatise entitled "New Experiments and Observations touching Cold; or an Experimental History of Cold begun," in which he deals in a most interesting manner with thermometers and improvements in the same, the phenomena connected with freezing, and the various effects of cold on sundry matters, and ends up by anticipating our modern views of cold by observing, "that though he will not undertake to prove the nature of cold to be privative, yet he thinks it easy to show that the arguments produced for its being positive are not conclusive." (Birch, p. lxxiii.)

In this year, too, he was nominated to the Provostship of Eton, but declined to accept the honour and emoluments attached thereto, lest he should be distracted from the labours and studies to which he had devoted himself.

In the following year he made the acquaintance of another renowned native of Ireland, Mr. Valentine Greatraks, known as "the Stroker." This remarkable man was born at Affane, and educated at Lismore, both in the County of Waterford. He was designed for Dublin University, but owing to the Rebellion had to fly to England. On his return he had to retire to the castle at Cappoquin for safety, but subsequently entered the army as a lieutenant under the Earl of Orrery, Robert Boyle's brother. When the great part of the army was disbanded he returned to his estate in Affane, and was soon after appointed Clerk of the Peace for the County of Cork.

About the year 1662 he had an impulse that he could cure the King's

evil, and on trying his skill upon a bad case found his efforts to result in success. He confined his attention to this one disease for some time, but later on, finding that ague and other disorders yielded to his treatment, he extended his practice more widely. Among others he cured Colonel Phaire of Cahirmoney, Co. Cork, of an ague by his process of stroking. At the request of the Earl of Orrery he journeyed to England, where he effected numerous cures in Warwickshire and Worcestershire, and subsequently in London, where he was presented to the King.

Boyle's attention was called to these wonders by Mr. Stubbe of Warwickshire, and the facts were attested by E. Foxcroft, M.A., a fellow of Cambridge. The great scientist was at first cautious and sceptical, but having seen for himself, he believed, and signed his name to a document testifying to the bona fides and skill of Mr. Greatraks, which among many other signatures of distinguished men, includes one which will have a familiar ring—Sir Nathaniel Hobart.

Boyle, as we have seen, was not in London for the plague, but he seems to have been for the great fire, inasmuch as Henry Olderburg, writing soon after, does not tell of the event but only of the consequences. "I cannot omit acquainting you," he says, "that never a calamity—and such a one—was borne so well as this is. It is incredible how little the sufferers, though great ones, do complain of their losses. I was yesterday in many meetings of the principal citizens whose houses are laid in ashes, who, instead of complaining, discourse almost of nothing but of a survey of London, and a design for rebuilding."

Evelyn wrote to Sir Samuel Tuke, "Everybody brings in his idea, amongst the rest I presented his Majestie my own conceptions with a discourse annexed. It was the second that was seene within 2 dayes after the conflagration; but Dr. Wren had got the start of me."

Though Boyle had fled from the scene of desolation, he had left something behind; for Lady Ranelagh wrote to him at the same time, "I dispensed your charity amongst some poor families and persons that I found yet in the fields unhoused."

We have our pessimists to-day, but a peep into the history of that time should make them green with envy. The Navy was in a parlous condition; the exchequer was empty; the Dutch and the French were masters of the seas; dissentions and mutinies were the order of the day at home, in fact, things had come to such a pass that "The very men who had stood in the Strand and blessed God at the Restoration, now wished Cromwell back again" (F. Masson, p. 271).

To merely enumerate the titles of the books, pamphlets and papers published or communicated by Robert Boyle would be too tedious, I shall therefore content myself with mentioning a few of special interest, or such as may illustrate the subjects upon which he wrote.

In 1675 he published in London, "Some Considerations about the Reconcileableness of Reason and Religion," and in the same year he submitted to the Royal Society a paper entitled "An Experimental Discourse of Quicksilver Growing Hot with Gold." This latter has added interest, as it drew a letter from Sir Isaac Newton which was addressed to the Secretary, Henry Olderburg, and speaks about "Mr. Boyle's uncommon experiment about the Incalescence of Gold and Mercury."

Near the close of his remarks he says, "therefore I question not but that the great wisdom of the noble author will sway him to high silence, till he shall be resolved of what consequence the thing may be, either by his own experience or the judgment of some other that thoroughly understands what he speaks about."

Newton was afraid of the loss that might accrue to experimental science if Robert Boyle were tempted to spend his time toying with transmutation, and fortunately for the progress of chemistry his advice was taken by "the noble author." Miss Masson says, "If these two men could be present at a meeting of the Royal Society in Burlington House to-day! Their two portraits are on its walls. Their two faces look down on modern experimental science. Their self-restraint has had its reward."

In the year 1679 Newton wrote from Cambridge a long letter to Boyle, who was then in London, giving his views on such subjects as, the ether, solution, the atmosphere, and, last but not least, the cause of gravity. This letter he concludes by saying, "For my own part, I have so little fancy to things of this nature, that had not your encouragement moved me to it, I should never, I think, have thus far set pen to paper about them. What is amiss therefore, I hope, you will the more easily pardon in your most humble servant and honourer.—Isaac Newton."

In 1680 he was elected President of the Royal Society, but, though highly sensible of the honour thus paid him, he was unable to accept of it, owing, as he himself puts it, to his "great tenderness in point of oaths."

About this time he contributed very largely to the expense of publishing Dr. Burnet's "History of the Reformation," and brought out his own "Discourse of things above Reason."

His zeal for toleration in matters of religious opinion is shown by a letter to Mr. J. Eliot of New England, in which he says: "Of late I have, to my trouble, heard the government of the Massachusets sharply censured for their great severity to some dissenters, who, contrary to order, had convened at a meeting-house to worship God. This severe proceeding seems to be the more strange and the less defensible in those who, having left their native country and crossed the vast ocean to settle in a wilderness, that they may there enjoy the liberty of worshipping God according to their own conscience, seem to be more engaged than other men to allow their brethren a share in what they thought was so much all good men's due."

In 1784 Dr. Cudworth, in a letter recommending him to publish his complete works, says:—"The writers of hypothesis in natural philosophy will be confuting one another for a long time before the world will ever agree, if ever it do. But your pieces of natural history are unconfutable, and will afford the best grounds to build hypothesis upon. You have much outdone Sir Francis Bacon in your natural experiments, and you have not insinuated anything, as he is thought to have done, tending to irreligion, but the contrary."

Some two or three years before his death he began to feel the effects of increasing age and infirmity. He had in consequence to limit the visits of his numerous friends to him and to restrict his activities in other ways.

In the notice he circulated for the purpose he said he found himself "reduced to deny himself part of the satisfaction frequently brought to him

by the conversation of his friends and other ingenious persons, and to desire to be excused from receiving visits . . . two days in the week . . . . . that he may have some time both to recruit his spirits, to range his papers, and fill up the lacunae of them, and to take some care of his affairs in Ireland. . . ."

About this time also he wrote to a friend, Sir Edmund King, explaining (in answer to the inquiries of many as to why he had not given more attention to the subject of transmutation), that on the one hand he did not need more wealth for his own use, and on the other he believed the simple and direct experiments he made were more useful for discovering the causes of things and for laying the foundation of an experimental history of nature.

He, however, makes clear in his writings that he believed in the possibility of artificially producing gold, and avowed the same to Halley, the astronomer. It was probably in consequence of this belief that he interested himself in getting repealed an Act of Henry IV. "against the multiplying of gold and silver."

In 1690 he published his "Medicina Hydrostatica," being a description of methods of detecting the adulteration of drugs by their weight in water and his "Christian Virtuoso, showing that by being addicted to experimental philosophy a man is rather assisted than indisposed to be a good Christian."

It would not be right to close this sketch without a further reference to his sister, Lady Ranelagh, with whom Robert Boyle lived for nigh on forty-seven years, and whose death only preceded his by a week.

Birch says: "She had lived the longest on the most public scene, and made the greatest figure in all the revolutions of these kingdoms for above fifty years of any woman of that age. She employed her whole time, interest, and estate in doing good to others; and as her great understanding, and the vast esteem she was in, made all persons in their several turns of greatness desire and value her friendship, so she gave herself a clear title to use her interest with them for the service of others, by this, that she never made any advantage of it to any end or design of her own. . . . . Such a sister became such a brother; and it was but suitable to both their characters that they should have improved the relation under which they were born to the more exalted and endearing one of friend.

"And as they were pleasant in their lives, in their death they were not divided; for as he had lived with her for the greatest part of forty-seven years, so he did not survive her above a week, for he died in the sixty-fifth year of his age, on Wednesday, December 30, 1691, at three-quarters of an hour after twelve at night."

He was buried in the chancel of St. Martin's in the Fields, Westminster, and his funeral sermon was preached by Dr. Gilbert Burnet, Bishop of Salisbury.

As regards the personal characteristics of this great and good man, it might be said, as it was of the Apostle Paul, that though "his letters were weighty and powerful, his bodily presence was weak and his speech contemptible," for though tall, he was not robust, and only prolonged his useful life to 65 years by careful attention to his health, regulating the weight of his clothing by reference to the indications of his thermometer. And though he was gifted in mind and was the author of so many learned

and luciferous literary productions, he never completely overcame an impediment in his speech acquired in his youth, which must have militated against any serious attempt at oratory.

In addition to his researches and writings, he contributed much to the happiness and comfort of his contemporaries and the progress of the world by many philanthropic and useful services. Among them were:—The endowment of lectures in defence of the Christian religion; the procuring of a translation of the New Testament into the Malayan tongue, and the printing and distribution of the work in the East Indies.

He acted similarly with regard to Grotius' book, "Of the Truth of the Christian Religion," which he had translated into Arabic. He would have contributed the whole cost of the translation of the New Testament into the Turkish language, but the body which had it in charge would only accept a large donation.

He paid £700 towards an edition of the Holy Scriptures in Irish, and gave a large subscription to the Welsh issue. In addition he gave large sums for the propagation of the Gospel in America and in India. His other charities amounted to upwards of £1,000 a year.

He was never married, but there were suspicions of his having a love affair in early youth, which may account for the ring he left to his sister, Lady Ranelagh, with whom the secret died.

The first bequest in his will reads thus: "I give and bequeath unto my dear sister, the Lady Katherine, Viscountess Ranelagh, a small ring, usually worn by me on my left hand, having in it two small diamonds with an emerald in the middle, which ring being held by me ever since my youth in great esteem, and worn for many years for a particular reason, not unknown to my said sister, the Lady Ranelagh, I do earnestly beseech her, my said sister, to wear it in remembrance of a brother that truly honoured and most dearly loved her."

The ring never passed into the possession of the Lady Katherine, for she had died seven days before the testator, and the knowledge of its secret is now hid to the world.

Robert Boyle's attitude to marriage in his later years is, however, no secret, as will be seen from the following quotation, with which I shall close this sketch. It is from a letter addressed to his niece, Lady Barrymore, in which, at the close, he makes reference in his characteristic witty and complimentary style to a report that he had been already married.

"It is high time for me to hasten the payment of the thanks I owe your ladyship for the joy you are pleased to wish me, and of which that wish possibly gives me more than the occasion of it would. You have certainly reason, madam, to suspend your belief of a marriage, celebrated by no priest but Fame, and made unknown to the supposed bridegroom. I may possibly ere long give you a bit of the spleen upon this theme; but at present it were incongruous to blend such pure raillery, as I ever prate of matrimony and amours with, among things I am so serious in as those this scribble presents you. I shall therefore only tell you that the little gentleman and I are still at the old defiance. You have carried away too many of the perfections of your sex to leave enough in this country for reducing so stubborn a heart as mine, whose conquest were a task of so much difficulty, and so little

worth it, that the latter property is always likely to deter any that hath beauty and merit enough to overcome the former. But though this untamed heart be thus insensible to the thing itself called love, it is yet very accessible to things very near of kin to that passion; and esteem, friendship, respect, and even admiration are things that their proper objects fail not proportionably to exact of me, and consequently are qualities which in their highest degrees are really and constantly paid my Lady Barrymore by her most obliged humble servant and affectionate uncle, Robert Boyle."