

Sir William Petty (1623-1687) / by T. Percy C. Kirkpatrick.

Contributors

Kirkpatrick, T. Percy C. 1869-

Publication/Creation

[Ireland] : [The Irish Journal of Medical Science], [June, 1932]

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SIR WILLIAM PETTY
(1623-1687).

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*Reprint from "The Irish Journal
of Medical Science," June, 1932.*

BY

T. PERCY C. KIRKPATRICK, M.D., Litt.D., M.R.I.A.
Fellow and Registrar of the Royal College of Physicians of Ireland.

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SIR WILLIAM PETTY (1623-1687)*.

By T. PERCY C. KIRKPATRICK.

General Secretary, Royal Academy of Medicine in Ireland.

IN searching for a topic on which to address you I turned instinctively to a consideration of those persons who were foremost in instituting and organising learned societies in our city. Such a consideration takes us back almost three hundred years—to the middle of the seventeenth century, at a time when the outlook for Ireland seemed indeed to be black enough. The King had been beheaded, and the Commissioners of the Parliament of the Commonwealth were engaged in stamping out, with no undue tenderness, the dying embers of the Irish Rebellion. The capitulation of Limerick on October 27, 1651, and of Galway in the following April, were almost the last episodes in that devastating strife, and the Act of Settlement, which became law on August 12, 1652, was to make a beginning of a new Ireland. Many of those who had survived the war and the pestilence were to leave Ireland for foreign service, carrying with them into exile the best manhood of the country. Of those who were left many were to be turned out of their homes, and at best might be thankful for permission to earn a mere existence by working for others on lands which for generations had belonged to their ancestors. Sickness and pestilence following, as they so often do, in the wake of the sword and famine, were to take a heavy toll of both victors and vanquished, for at the time plague was rampant in the land. In July, 1651, Trinity College was closed “the house being at present visited with the pestilence”; while in the following month between fifty and sixty persons were dying each week of the plague in Dublin. To stay this pestilence Thursdays, December 11, and December 18, 1651, were set apart as days of humiliation, and four years later it was ordered that Thursday, May, 3, 1655, should be observed “as a fast on account of the sore visitation of the pestilence.” At the same time those who were in power were being urged on to further severities on the grounds, which were seriously believed, that the pestilence was a visitation of God angered at the delay which was taking place in the punishment of the Irish for their crimes in the Rebellion and for their persistence in the faith of their forefathers.

Such a stimulus to activity seems to us to have been scarcely necessary, when we remember that some thirty-two thousand officers, soldiers and adventurers were eagerly clamouring for Irish land which had been promised to them as a reward for services rendered to the English Government. The task of settling

*An Address delivered in the Hall of the Royal College of Physicians of Ireland on Friday, May 28, 1932, before the Royal Academy of Medicine in Ireland, at a meeting held to celebrate the fiftieth anniversary of the foundation of the Royal Academy of Medicine in Ireland, 1882-1932.

these claims appeared to be hopeless, not, it is true, from any serious opposition from the natives, for in 1652 the total population of the country was estimated at only eight hundred thousand persons, but because of the rapacity of those who were looking for satisfaction, a rapacity which made them almost as dangerous and as difficult to their friends as they had been cruel to their foes.

Into this country, so sorely stricken with sickness, bled to exhaustion by war, and over-run by a disbanded army clamouring for pay and reward, there landed at Waterford on September 10, 1652, as one of the Physicians to the Army of the Parliament, a man who was to leave a deep impression on the subsequent history of Ireland. That man was William Petty, whose life I wish to sketch for you this afternoon.

William, the third son of Antony and Francesca Petty, was born at his father's house in Rumsey on Trinity Sunday, May 26, 1623. Petty's father, who was in the woollen industry, was not in a position to endow his sons with much money, but he gave them, what was more important, a fair education at the local grammar school. At twelve years of age young Petty had a "competent smattering of Latin, and was entered into the Greek before he was fifteen." As a child he was interested in all sorts of craftsmanship, and while still a schoolboy he had gained some skill in the crafts of a smith, a carpenter and a watch-maker, as well as a considerable power of caricature in drawing. When thirteen years old, being anxious to see the world, he went to sea with sixpence in his pocket, which, as he tells us, had been given to him "by Mother Dowling, who having been a sinner in her youth, was much relieved by my reading to her in the 'Crums of Comfort,' Mr. Andrews 'Silver Watchbell' and 'ye Plain Man's Pathway to Heaven'."

On board the vessel, which was a small one trading with France, Petty held the position of a cabin-boy, or general servant, rather than that of a sailor, and his skill in the art of navigation, as well probably as the shrewdness of his caricature and his power of mimicking, did not make for his popularity with the crew. It is said that he first learned of his defective sight, a misfortune which was to influence greatly his subsequent career, when he was sent to the masthead to watch for some landmark. This the Captain saw from the deck before Petty could see it from the masthead, and as the vessel was then in shallow water the Captain "drubbed him with a cord."

After ten months at sea Petty broke his leg and was put ashore in France, where it was set and he was cared for by a farrier's wife. During his convalescence he earned a few shillings by tricks at cards, by hawking sham jewellery and "hayre hatts," and thus he was able to keep himself and to make some return to the farrier's wife for her treatment of his broken leg. In some way, not now quite clear, he gained admittance in 1638 to the Jesuit College at Caen where he made rapid progress in his education. According to his own account at the end of two years he had

acquired "the Latin, Greek, and French tongues; the whole body of common arithmetic, the practical geometry and astronomy conducing to navigation dialling etc.; with the knowledge of several mathematical trades."

About the year 1640 he joined the King's Navy, and at the age of twenty he says "I had gotten about three score pounds, with as much mathematics as any of my age was known to have had." At the outbreak of the Civil War in England he left the Navy and went to the Continent for further study. He studied medicine at Utrecht in 1643, entered at Leyden on May 26, 1644, then went to Amsterdam, and from there to Paris where for a while he worked with Hobbes, for whose book on optics Petty is said to have made the drawings. While thus working in the Universities of Europe Petty became intimate with many learned men, and various of his letters written to them, dealing with problems in mathematics, have been preserved.

In 1646 Petty returned to England to find his father just dead, but having "left him little or no estate." For a while he tried to carry on his father's woollen business at Rumsey, and he was much occupied with inventions intended to make that undertaking more profitable. In 1647 he got a patent for a kind of manifold letter writer, which he devised as "an instrument of small bulk and price, easily made and very durable, whereby any man, even at the first handling, may write two resembling copies of the same thing at once, as serviceably and as fast as by the ordinary way." The great characteristic which marked all Petty's work was utility; applied rather than pure science was to be his hobby and it is typical of him that this practical apparatus was announced to the world in a pamphlet in which he advocated reforms in education. He pointed out the need of having as teachers of children the best educated, not "the worst and unworthiest of men," and that these teachers should teach the children things rather than words, "since few children have need of reading before they know or can be acquainted with the things they read of; or of writing, before their thoughts are worth recording, or they are able to put them into any form." If boys were made to spend their time in the study of things rather than in a rabble of words, there would not, he thinks, be "so many unworthy fustian preachers in divinity; in law so many pettyfoggers; in physicks so many quacksalvers, and in country schools so many grammaticasters." He advocated also the establishment of what he calls "*Ergastula Literaria*," or literary workhouses, to which all children of seven years of age might be sent for education, whether their parents could pay for them or not. Later there should be provided for them a *Gymnasium Mechanicum*, or college of tradesmen, for the study and improvement of various trades; a *Nosocomium Academicum*, or model hospital where practitioners could advance the study of medicine, and at the same time be able to afford the best treatment to the patients. We have not yet got much further than advocating these proposals of Petty, although

possibly the Hospitals Trust Committee may by the sweepstakes provide the means for carrying out the last proposal.

Hartlib, when sending a copy of this book to Robert Boyle, describes the author as of "twenty-four years of age, a perfect Frenchman, and a good linguist in other vulgar languages besides Latin and Greek; a most rare and exact anatomist and excelling in all mathematical and mechanical learning; of a sweet natural disposition and moral comportment, altogether masculine."

Just about this time there occurred the death of Petty's younger brother, Anthony, for whose education Petty had helped to pay, and with whom he had hoped to develop the woollen business at Rumsey. Some new arrangement had to be made, and in a letter written to his cousin John, Petty set out his needs, and made a proposal for a partnership. He intended, he said, to take a degree of Doctor in Physic "which being done, it will bee a discredit to mee and consequently a great hinderance to mee to goe and buy small matters, and to doe other triviall businesses, which I have many times to doe, and being not able to keepe a servant, and withall not having one fifth part of employment enough for a servant, and lastly much of that little business I have being such as I would not acquaint everyone with." His brother Anthony before his death had assisted him in chemistry and anatomy, and now he invited John to come to London and to take Anthony's place. He proposed to fit him up with a tape weaving loom, and to have him taught the trade, to lend him forty pounds as capital, to leave him working at his loom if trade was good, but to give him work either in chemistry or anatomy at twelve pence a day if that were more profitable. He further would give him a share in the benefit of any of his inventions, and he was willing to do all this, he tells him, because "all the end I have in you for myselfe, is to have a friend whom I may trust, and who is handy, neere about mee." He goes on to tell him:—"If I prosper in my wayes, you shall feel it. I only desire that you would bee cordiall and true to mee, without labouring to circumvent mee, and I shall bee as willing to doe for you as you are for yourselfe. You are best to bring a bed and such other things else with you as may bee of use to you here." John Petty proved himself a faithful friend and fellow worker till his death twenty years later.

On June, 24, 1646, Oxford surrendered to the army of the Parliament, and to that city Petty set out shortly after the death of his brother. Almost at once he was elected a Fellow of Brasenose College, of which he became Vice-Principal, and on March 7, 1649-50, he was admitted to the degree of Doctor in Medicine. On June, 25 1650 he was admitted a Candidate of the College of Physicians in London when, he said, "I had left about sixty pounds."

While abroad Petty had acquired a considerable knowledge of anatomy, and he is said to have read Vesalius along with Hobbes while they were together in Paris. He had also worked at the

subject in London before his brother Anthony died. Shortly after he arrived at Oxford he was appointed assistant, or deputy, to Thomas Clayton, then Professor of Anatomy. Thomas Hearn accounted for this preferment by saying that during the war Petty had taught anatomy and "cutt up dogges"; others said it was because of Clayton, the Professor, "being possess't with a timorous and effeminate humour, could never endure the sight of a mangled or bloody body," and so was glad to get someone to take his place in the dissecting room. Others again attributed the advancement to Petty's friendship with the leaders of the Parliamentary party. Petty had, however, never identified himself with any political party, but in 1644 the Protector had laid down a principle (afterwards adopted in Saorstát Eireann) when he said: "the State in choosing men to serve it, takes no notice of their opinions. If they be willing faithfully to serve it that satisfies." Whatever the reason for the appointment may have been, Petty was soon to justify to the full his acceptance by the ancient University.

Petty had not been long in his new post when an opportunity came to him which he grasped with both hands, and which won for him widespread fame. In all probability it was not easy, even during the period of the Commonwealth, for the Professor in a University town like Oxford to get material for the study of human anatomy. The bodies of executed criminals were the chief, if not the only, source available, and among such only the bodies of those whose crimes had not been deemed sufficiently important to involve a sentence of mutilation in addition to that of death. On December 14, 1650, one such, a young woman, Anne Green, "being about twenty-two years of age, of middle stature, strong, fleshie and of an indifferent good feature," was brought to execution for the supposed murder of her new-born child. She was duly hanged by the neck for about a quarter of an hour, during which time the bystanders, with all the brutality of the time, "gave her great strokes" to ensure her death. Her body having been cut down was placed in a coffin and then brought at once to the dissecting room, where it was found that she still gave evidence of life. Although the attendants thought it their duty with further violence to make sure of her death, when Dr. Petty and Dr. Willis arrived, she was still breathing feebly. Efforts were then made at restoration and, although not supplied with modern conveniences such as carbon dioxide, oxygen and radiant heat, they made shift by cordials, strong waters, rubbings, binding up of the limbs, using a candle end by the way of a suppository, and putting her to bed with a warm woman, to restore her gradually to consciousness, and by the 20th of the month she was well on the way to recovery. She was still, however, liable to the extreme penalty of the law, and Petty drafted for her a petition which he backed up with a long certificate signed by the medical men who had attended her, praying that she might be pardoned. It is pleasing to learn that

the prayer of this petition was granted, and her crime pardoned.

A small collection was made for her by Petty, and subsequently she married, became the mother of several children, and, as the story books used to say, "lived happily ever after."

The daily press had not in 1650 developed to the extent to which it has to-day, but the fame of Anne Green's recovery was noised far and wide. Oxford was flooded with verses, both in Latin and in English, on the subject, and a pamphlet, which reached a second edition early in the following year, was published, giving a detailed description of the treatment. It is instructive however to note that the advertisement is of the incident and not of the physicians. In the pamphlet, said to be written by one Watkins, the names of Petty and Willis are mentioned once only:—"Dr. Petty, of Brazen-nose College, our Anatomy Professor, and Mr. Thomas Willis, of Christ-Church," are said to have acted "as well from humanity as their profession sake; whilst they missed the opportunity of improving their knowledge in the dissection of a dead body, they advanced their fame in restoring to the world a living one." Shortly after, in January, 1651, Petty succeeded Clayton as Professor of Anatomy in Oxford, and in the following March he was elected Professor of Music in Gresham College, London. In connection with this professorship, it should be remembered that the term "Music" was used in the Greek sense of general culture, rather than in the modern acceptance of the term.

At Oxford Petty was actively engaged in the practice of medicine, and in what we may call research, especially in anatomy and chemistry. He was a member of a small coterie of students of science which used to meet at Dr. Wilkins' rooms in Wadham College, and which included men like Seth Ward, Matthew and Christopher Wren, Robert Boyle, Thomas Willis, William Goddard, and John Bathurst, afterwards Physician to the Protector. That Petty was much engaged in medical work is shown by several papers from his pen, some of which have been published by Lord Lansdowne in *The Petty Papers*. In one of these he sets out the heads of a medical essay which he proposed to write and he lays down very satisfactory rules for the formation of scientific hypotheses, and for the proper reasoning from them. He insists "that as few as possible of insensible things, such as cannot be examined by experiments, be supposed," "that nothing be supposed impossible or absurd. . . . That the supposition be simple and short and easily intelligible. That it solve all the phenomena." In another paper he describes what is needed in a student of medicine. He says "When a youth of good understanding and good sight, that can read his mother tongue, comes to ten years old, let him learn to write and draw, some arithmetic and grosse geometry, and the use of the globes; as also to understand the Latin and French tongues." He should learn to know the plants which grow naturally in the district in which he lives, and especially those most frequently used in

medicine. After that "let him learn (but not by books but *per autopsium*) the anatomy of man, of a dog, of a cock and hen, a salmon, eele, lobster, and oyster." Except for his insistence on a knowledge of the "Latin tongue" this substantially agrees with the pre-medical education lately devised by the wisdom of the General Medical Council. The oyster has now, perhaps, become too expensive for a medical student's study. In his "Observations upon Physicians" he makes some shrewd remarks, and suggests as a profitable subject for investigation "whether of 1,000 patients to the best physicians, aged of any decad, there do not dye as many as out (of) the inhabitants of places where there dwell ne physicians." Among the unprinted papers which Lord Lansdowne has identified as belonging to this period are lectures on medicine, on botany, on pharmacology and on osteology.

Petty had not been long at Oxford when he was given two years leave of absence on his full pay of £30 a year. Why he should, even temporarily, have abandoned a position which seemed to hold out such good promise in such comfortable surroundings, we do not know. It may have been the restlessness of youth, seeking further adventure, or it may be that pressure was put on him by members of the Government, who sorely needed honest men of ability to work for them. Whatever the reason may have been he was appointed Physician to the Army in Ireland, and to the Commander-in-Chief, General Fleetwood, at a salary of twenty shillings a day and permission for private practice. In his will he tells us that he had at that time saved £400, and that £100 was advanced to him to go to Ireland, so that when he landed at Waterford on September 10, 1652, "he had full £500."

In Dublin, where he settled down as physician to General Fleetwood, he met his old Oxford friend Robert Boyle, and together they began again their study of chemistry and anatomy. Writing to Samuel Hartlib's son-in-law in London Boyle says:—"wanting glasses and furnesses to make chemical analysis of inanimate bodies, I am exercising myself in making anatomical dissections of living animals, wherein (being assisted by your father-in-law's ingenious friend, Dr. Petty our Physician General) I have satisfied myself of the circulation of the blood and the freshly discovered and hardly discoverable *receptaculi chyli*, made by the confluence of the *venæ lacteæ*."

Petty was not long in Ireland before he found that part at all events of his department was in a most disorderly condition. The State Apothecary, who with his three assistants, had the regulation and the distribution of drugs and hospital stores, appears to have been very inefficient. There was much waste of money with a very inadequate service. Petty took the matter in hand at once, and "to the content of all persons concerned" he saved the State £500 a year, while at the same time he "furnished the army, hospitals, garrison and headquarters with medicaments, without the least noise or trouble reducing that affair to a state of easiness and plainness which before was held a mystery, and the vexation

of such as laboured to administer it well." Petty must have had his time fully occupied, for he tells us that over and above his official salary he was making about £400 a year in private practice, a goodly sum considering the times.

Hardly had he set the Department of the State Apothecary in order before his attention was directed to a much bigger problem, the solution of which seemed to be quite beyond the power of the Government of either England or Ireland. To understand the nature of this problem, and how Petty became involved in its solution it will be necessary to refer, very briefly, to the land problem in Ireland at the time.

In 1642, when the English Government was looking for money to equip an army to suppress the Rebellion in Ireland, people were asked to lend money on the assurance that it would be repaid in Irish land after the war. Those who did so were called "adventurers." Some two million five hundred thousand acres of Irish land were thus pledged, although the troops raised on this pledge fought in the English Civil War and did not cross to Ireland at all. Subsequently further advances of money were made to assist the Commonwealth, and by what was known as the "doubling ordinance," an original adventurer was allowed to double his allotment of land if he advanced a sum of money equal to one fourth of his original contribution. After the war in Ireland was over the pay of the army was largely in arrear, and it was decided that this debt was to be liquidated by Irish land at adventurers' rates, as were also the many debts due to other creditors of the Government. The claims of all these people were regulated by an Act of Settlement, which was passed in September, 1653. They were in all some thirty-five thousand claimants for Irish land, but the actual land available for distribution could not be known till the forfeiture of individual properties had been determined, since those people only were to be dispossessed who could not show "constant, good affection." Furthermore, the land eventually to become available for distribution varied greatly in value, and although a proportionate value was arbitrarily put on the lands in Leinster, Munster and Ulster, yet in each province some of the land was profitable, some was unprofitable, and there were no maps capable of showing which was which. To overcome this difficulty the Surveyor-General, Dr. Benjamin Worsley, was ordered to make a survey of the country. The survey thus undertaken was known as the "grosse survey," and it was merely a list of the forfeited lands in each barony, together with some descriptive notes. Maps were to accompany this survey, but it was said that it would take at least thirteen years to complete the work, and further that much of it, which had already been done, was grossly inaccurate. The plan of the "grosse survey" being consequently wholly unsatisfactory another plan was adopted, the so-called "civil survey," which was to be carried out by civilians, or commissioners appointed for each county. This was

really the old "grosse survey" more expeditiously carried out and quite without maps. Maps were, however, essential and Petty came forward with a proposal to survey the three provinces, and to put this survey down on a map. This, in consequence known as the Down Survey, Petty offered to complete in thirteen months from an appointed day, "if the Lord give seasonable weather and due provision be made against Tories, and that my instruments be not forced to stand still for want of bounders." For this work he was to be paid at the rate of £6 per thousand acres or a gross sum of thirty thousand pounds out of which he was to pay the expenses. After much squabbling with the Surveyor-General, whom Petty accused of gross incompetency, an agreement was entered into on the lines of Petty's proposals, and finally adopted on behalf of the Government on December 25, 1654.

It would not be possible to give here even the merest outline of Petty's activities in connection with the survey, nor indeed is it necessary since the interesting story has been told over and over again. He engaged men in Ireland to make some of the necessary instruments, others he bought in London from where he got also "a magazine of royall paper, mouth-glew, colours, pencills, etc." There was some difficulty in providing the men who were to do the actual field-work, for he needed "persons such as were able to endure travail, ill lodginge and dyett, as alsoe heates and cold, alsoe men of activitie, that could leap hedge and ditch, and could alsoe ruffle with the severall rude persons in the country, from whom they might expect to be often crossed and opposed." Overseers were appointed to check the field-work, and he got good and willing service by paying the men regularly according to the work which they did. In all, he says, "the quantitie of line which was measured by the chaine and needle beinge reduced into English miles, was enough to have encompassed the world neere five times round."

The survey was practically finished by the end of March, 1656, but the final discharge of Petty from his obligations was delayed till December, 1657, owing largely to difficulties put in his way by Worsley, who had remained Surveyor-General.

No sooner was the Down Survey finished, indeed before Petty had got his final discharge therefrom, than he was engaged in another and more difficult undertaking. On July 10, 1656, a committee of three, Vincent Gookin, Miles Symner and Petty, was appointed to distribute the lands which had already been surveyed. The distribution was to be made by ballot or lot, a plan which appealed to the fanatical and religious sentiments of those who were to be satisfied. The army claimants had signed a paper in which they had declared "that they had rather take a lott upon a barren mountain as a portion from the Lord, than a portion in the most fruitful valley, upon their own choice." They, however, took every means in their power to ensure that the Lord would not send them "a lott upon a barren mountain," and

when he did they blamed Petty. "This party of men," says Petty, "although they seemed to be fanatically and democratically disposed, yet in truth were animals of all sorts, as in Noah's Ark." The settlement might have been much longer delayed than it was, had not the death of the Protector on September 4, 1658, made everyone anxious to be established in their property before further political changes developed.

Although Petty's work on the survey and distribution was done, and on the whole very well done, he found great difficulty in getting paid for it. Indeed the Government had no money with which to pay him, and eventually he agreed to take land in lieu of a large part of the debt. Further, he was content to take the most of that land in Kerry, a county which had been studiously avoided by the claimants. In addition to the land which was thus allotted to him he was able to add considerably to his Kerry property by purchase of allotments from adventurers and others who had no desire to become proprietors in that wild but beautiful county.

Among the adventurers many, to whom the Lord had not given what they considered a suitable lot, became bitter enemies of Petty, and the chief spokesman among these was one Sir Hierome Sankey, an Anabaptist, who had held military command in Ireland. Sir Hierome professed to be able to cure all sorts of ills by the laying on of hands, a profession on which Petty's medical training led him to pour continuous contempt.

In the quarrels between them there was little of what Aristotle calls *εὐτραπεία*. or cultivated impertinence; the language was down-right. Petty was called a "Socinian, a Jesuit and an Atheist," while he retorted by describing his foes as "hypocrites, proud Pharisees and Ananias, following Christ for loaves." They said he had used his position as a Commissioner to rob the army, to plunder the adventurers and to defraud the State. He retorted that his accusers had desired to do those things, and were angry because his honesty and watchfulness had prevented them doing so. While these disputes were going on, or as he said, "when the cry of his adversaries was loudest," the Government as a mark of confidence appointed him additional Clerk of the Council at a salary of £400 a year, and the Lord Deputy Henry Cromwell appointed him his private secretary.

Early in 1659 both Petty and Sir Hierome were elected members of the Parliament at Westminster, and on March 24, Sankey impeached Petty for bribery and corruption as a Commissioner for the distribution of the Irish lands. Parliament evidently favoured Petty, but was dissolved before it arrived at a final decision in the matter. Although Petty was called on to answer many charges of dishonesty, never was there one proved against him, and while with the changes in the political outlook his chief enemy Sankey disappeared into obscurity, Petty retained his fair name and gained further honours in the State, both in England and Ireland. There is another matter which is highly to his

credit. At the Restoration, when Henry Cromwell went into retirement, Petty continued to act as his friend, and was able to save for him not a little of his property. As he said "though I never promised *to live and die with him*, which is the common phrase, yet I did stay to see his then interest, which I had espoused, dead and buried, esteeming that then and when a convenient time for mourning was over, that if I should marry another interest, and be as fixed unto it as I had been to his, I should do no more than I always in his prosperity told him I would do, if I saw occasion." Subsequently both the King and the Lord Chancellor told him that they esteemed him the more highly for his loyalty to his old chief.

Immediately after his impeachment in Parliament, when for a brief period political power passed into the hands of the extreme Anabaptists, Petty was in some danger of arrest, but he escaped unscathed, except for the loss of his Professorship of Anatomy and his Fellowship at Brasenose.

In 1658 the members of the Scientific Society, which used to meet at Oxford, were mostly living in London, and they continued their meetings there at Gresham College. On November 28, 1660, after listening to a lecture by Christopher Wren, they decided to form a regular Society, and on November 26, 1661, Petty read a paper to that Society in which he communicated his thoughts on the clothing trade. On April 11, 1662, Petty received the honour of Knighthood from the King, and when the Society at Gresham College was, on July 15, 1662, incorporated by Royal Charter, Petty was included as an original member. About the same time his cousin John, who had loyally assisted him all through his troubles with the Survey, was appointed Surveyor-General of Ireland, nominally as Deputy for Petty, and to him Petty, remembering his own troubles, gave this wise advice:—"meddle with no debentures, and stop your ears when the Sirens sing."

In the first Irish Parliament of Charles II, Petty sat as member for Innistioge in County Kilkenny, and early in 1662 the very serious charge was made against him of publicly suborning witnesses to swear against several persons whose cases were to be heard in Court. He at once applied to the Court for leave to clear himself of these charges, but as his case was delayed, he moved the House of Commons to appoint a Committee to enquire into the matter. On February 18, 1662, this Committee, after a full investigation, reported entirely in favour of Petty, and the House resolved that the charges "are very false and scandalous and that nothing appears to have been done by the said Sir William Petty unbecoming of an honest and prudent person." In the Act of Settlement, passed in the same year, Petty was confirmed of all the lands of which he was possessed on May 7, 1659, and in the amending Act of 1665, this was again confirmed, and persons were appointed to assess what arrears of pay were due to him.

Firmly established in his property, enjoying the friendship of the King, the Duke of York, the Lord Chancellor and the Duke of Ormond, and his company eagerly sought for by learned men both in England and Ireland, Petty ceased to take a prominent part in public affairs, and during the remainder of his life his great energies were devoted to the development of his property and the exposition of his views on the many subjects in which he was interested.

In 1654, Henry Cromwell, the Lord Deputy, established in Dublin the Fraternity of Physicians, with John Stearne as its President. Of this society Petty was an original and an active member. Later, in 1667, the King granted a Royal Charter, incorporating the College of Physicians of Ireland, and nominated Petty as one of the Fellows. In 1676, when, as he says, "after four and twenty years discontinuance, and when I am forced to see with borrowed eyes and to work by other men's hands, and when my mind is sophisticated with foreign thoughts," being the Senior Fellow of the College, it devolved on him to deliver an inaugural address to a course of lectures on anatomy. In this address, a draft of which survives, Petty shows an extensive knowledge of the recent discoveries in anatomy, he makes shrewd comments on their application to physiology, and he puts forward many wise ideas for the advancement of medicine. He advocates, as he had done many years before, the establishment of hospitals for the accommodation of the rich as well as the poor, and that these hospitals should be so "instituted and fitted as to encourage all persons to resort unto them." In such hospitals, he suggests, students may learn more in one year than without them they could learn in ten. So great are the advantages which may be expected to follow from these places that, he says, "it is not the interest of the state to leave Phisitians and Patients (as now) to their own shifts." In spite of these wise recommendations Dublin had to wait till the third decade of the next century for the establishment of its first modern hospital, and regular hospital attendance did not become compulsory on medical students till the nineteenth century.

Early in February 1662 there was published in London a notable book entitled "Natural and Political Observations mentioned in the following Index, and made upon the Bills of Mortality, by Captain John Graunt, citizen of London. With reference to the Government, Religion, Trade, Growth, Air, Diseases, and the several changes of the said City." This book made a considerable stir at the time of its publication, and it has been looked on as the first example of the use of the statistical method, or reasoning founded on recorded figures. Shortly after its publication it began to be whispered abroad that the real author of this book was Petty, and not Graunt. Although Petty never directly admitted that he was the author, yet Lord Lansdowne has brought forward much evidence to show that he was, and whatever view we may take of the matter, there can be

no doubt that the reasoning in the book is entirely in Petty's habit. If he were not the actual author, his was the mind which supplied the ideas which Graunt recorded in words. The "Observations" remain as an isolated contribution to the subject by Graunt, while the work fits at once into the varied mosaic of Petty's statistical writings, which at intervals occupied him during the rest of his life. His object, he tells us, was to investigate all the problems of nature by "Number, Weight and Measure," and subjects which were not amenable to these standards had little interest for him. Ratiocination, a word which he had adopted from Hobbes, who explained that the Romans had extended it from accounting to the faculty of reckoning in all other things, was, he tells us, his chief pleasure and relaxation in life, and to it he turned with increasing zest when troubles pressed upon him. When his cousin Robert Southwell advised him "not to write things beyond ordinary capacities," he replied "I write indeed many extraordinary things, but all in the intelligible and demonstrable termes of Number, Weight and Measure."

One is tempted to linger over his political and statistical philosophy, and to quote many of his wise sayings, but one or two must suffice. To politicians he says:—"We must consider in general that as wise physicians tamper not exceedingly with their patients, rather observing and complying with the motions of nature than contradicting it with vehement administrations of their own; so in politicks and economics the same must be used." It is to be feared that too often both physicians and politicians resort to the "vehement administrations of their own." With regard to lotteries he says that they are a tax upon "self-conceited fools," and "that as the world abounds with this kind of fools it is not fit that every man that will, may cheat every man that would be cheated"; consequently, he added, "State lotteries should be a royal monopoly." He has rules for everyone and says:—"the true use of the clergy is rather to be patterns of holiness, than to teach man varieties of opinion *de rebus divinis*." The excessive wealth of the clergy he thinks is injurious to religion, unless it is denied "that there were golden priests when the chalaces were of wood, and but wooden priests when the chalaces were of gold." In another place, he says:—"Doing as we would be done unto, is a very short Rule, but requires much practise."

In his "Treatise on Taxes and Contributions," his "Political Arithmetic," his "Observations on the Dublin Bills," and in many other published and unpublished papers he studied the problems which confronted him by the aid of recorded figures, and he strenuously urged that further advance must be preceded by the collection of further figures.

It was with the view of encouraging such studies that, in 1684, Petty with others established the Dublin Philosophical Society. This society, of which Petty was the first President, or Rector, as he was called, and William Molyneux the first Secretary, was

constituted on lines similar to those of the Royal Society of London, and the draft of its first rules and the "Advertisements" of its aims, in Petty's handwriting, are still preserved. The chief duty of the Rector was "to preside at all the meetings, to regulate the discussions thereat, so that there bee noe interruption, cavills, heat or confusion, but that everyone have fair liberty of proposing and speaking his mind, and that as briefly and pertinently as may bee." The Minutes of this Society are preserved in the British Museum (B.M. Add. MS. 4811) and they show the active interest Petty took in its work.

Next to his statistical and social enquiries the subject which seems to have been nearest to Petty's heart was navigation, or indeed everything connected with what he calls "the greatest and noblest of all machines: a Shipp." Both the King and the Duke of York were deeply interested in ships, and Petty had great hopes that they would pay for, or adopt for the Navy, his design of the sluice-boat, or as it is more commonly known the "double-bottom." Of this boat, which absorbed much of Petty's time and energies, there were four examples. The first, known as the *Simon and Jude*, but later as the *Invention*, was built in 1662. It consisted of two cylindrical hulls or bottoms joined together by a platform, and although it was very rough in its construction, it won a race in Dublin bay from three competitors, carrying off the prize "a flagge of Silke charged with a guilded harpe and in a wreath of Laurell above, and in a scrole beneath this inscription *Præmium Regalis Societatis Velociori*." In the next year a larger boat, with hulls clinker-built instead of cylindrical, was launched in July, and within a few weeks it had won for Petty a wager of £50 in a race to Holyhead and back. This vessel "*Invention II*," was on the suggestion of the King brought to England in October. It was at Dover in January, 1664, but its subsequent history is not recorded. A new boat, "the great double-bottom," built in England was launched in December, 1664, and was christened by the King "*Experiment*." This boat sailed with cargo to Oporto in the following year, but on the return journey, her necessary crew of fifty men having been reduced to seventeen by the press gang of the "*Dragon frigate*," she was lost with all hands in a storm in which some fifteen other vessels "miscarried." The fourth vessel the "*S. Michael*," was not tried till December 1684, and she proved to be a complete failure. William Molyneux writing of her said: "She performed soe abominably, as if built on purpose to disappoint in the highest degree every particular that was expected from her." Her crew refused absolutely to go to sea in her, so, as Molyneux said "the whole design is blowne up." Petty remained convinced of the correctness of his ideas about the double-bottom, but he said: "if I can find just cause for it, I will write and publish a Book against my Selfe, soe much doe I prefer truth before Vanitie and Imposture." He died before he found this "just cause," and modern designers have not yet made an unqualified success of

the experiment, although the Calais-Douvres plied for several years between England and France, in the service of the London, Chatham and Dover Railway Company.

After the Restoration Petty had been confirmed in the possession of large estates in Kerry which had been given to him in payment for his work on the Survey. To these lands he had added considerably by the purchase of "debentures" from soldiers and others who were unwilling or unable to keep their grants. As Petty said, it had been possible to buy as much land in Kerry for ten shillings as would produce ten shillings a year over and above quit rents. It was one thing, however, to get a grant of land in Ireland, and another thing to get undisturbed possession of it. At that time the Royal Revenues were farmed out to the highest bidder, and these farmers, as they were called, having considerable power, did not hesitate to use every means they could to increase their profits. Many people, as Petty said, were prepared "to pay anything required rather than to pass through the fire of that purgatory," which opposition to the farmers involved. This, however, was never his plan; and during the last twenty-five years of his life he was constantly engaged in lawsuits with all and sundry by whom he was attacked. He records that he had as many as thirty such suits on hands at one time.

With one of these antagonists, Sir Alan Broderick, matters went so far that Sir Alan sent Petty a challenge to a duel. Petty, as the person challenged, had the choice of weapons and the place of meeting, so, being at the time nearly blind, he at once accepted the challenge, and in order that neither should have an unfair advantage he chose a dark cellar as the place, with hatchets as the weapons. The meeting did not take place. On another occasion, having been grossly insulted by a Colonel Vernon, Petty beat him in the street and then sent him a challenge, but the gallant Colonel would not appear, and instead he applied for the protection of the courts.

In 1667, at the age of forty-four years, Petty married Elizabeth, widow of Sir Maurice Fenton, and daughter of Sir Hardress Waller, a distinguished officer of Cromwell's army. Aubrey describes Lady Petty as "a very beautiful and ingenious lady, brown, with glorious eyes." Petty was devoted to her and they were a very happy couple. Shortly after his marriage he was offered a peerage, but he declined the honour, saying: "I would rather be a copper farthing of intrinsic value, than a brass half crown, however gaudily so ever it be stamped and gilded." Just before this offer had been made, however, he had suffered considerable losses in money, and his house in London had been destroyed by the Fire.

Petty's two eldest children, a boy and a girl, died while they were quite young from small-pox, but three children, a daughter, Ann, and two sons, Charles and Henry, survived him. In the education of these children Petty took great interest, although

he says: "I lett nature work with them", and again, "I do not make my house a Bridewell unto them nor myself a Bedel." Ann, much to her father's delight, showed early aptitude for arithmetic, for he says "I hope that one day Arithmetick and Accountantship will adorne a young woman better than a suit of Rubands, and keep her warmer than a Damnable dear Manto." To his daughter while still a child he wrote:—

"My pretty little Pusling and my daughter An
That shall bee a Countesse, if her pappas can.
If her pappas cannot, then I make no doubt
But my pretty Pusling will be content without.
If my pretty Pusling prove an ugly carron,
Then it will bee enough if she gett but a barron."

When Isaac Newton's *Principia* appeared in 1686 Petty wrote to Southwell, "Poor Isaac Newton—I have not met with one man that puts an extraordinary value on his book." Again he says: "As for Mr. Newton's book, I would give £500 to have been the author of it, and £200 that Charles understood it."

After the death of King Charles, Petty ceased to live in Ireland, but at first he felt himself and his property secure in that he enjoyed the friendship and good will of King James. Things, however, changed rapidly in Ireland. The little colony of workers on Petty's estates in Kerry were attacked and driven from their homes, which were plundered and burnt. After great hardships some of the survivors escaped to England. All Petty's life-work seemed to have gone at one blow, but he himself was too ill to do anything to stay the catastrophe. On December 16, 1687, he died at his house in Piccadilly of gangrene of the foot.

After his death King James created Lady Petty a peeress for life, as Baroness Shelbourne in the Irish peerage, and Charles, her eldest son, Baron Shelbourne. The estates, which were sequestered by the Irish Parliament in 1689, were restored in 1690. Charles, Baron Shelbourne, died without issue in 1696, but three years later the Barony was revived in his brother Henry, who died, also without issue, in 1751, when the title became extinct. The estates passed to John Fitzmaurice, second surviving son of Thomas Fitzmaurice, Lord of Kerry and Lixnaw, who afterwards was created Earl of Kerry. His grandson, Lord Lansdowne, afterwards wrote how this Thomas, Lord Kerry, had "married luckily for me and mine, a very ugly woman who brought into his family whatever sense may have appeared in it or whatever wealth is likely to remain in it." This "ugly but sagacious woman" was Ann Petty, Sir William's "Pretty little Pusling."

Petty was buried at Rumsey Abbey, but the stone in the aisle which marked his grave with the simple words "Here layes Sir William Petty" has long since disappeared. A full length

recumbent figure in marble, on the South side of the West door of the Abbey, erected by the third Marquess of Lansdowne, now records his name.

He had fulfilled the Apostle Paul's desideratum :—

“ A workman that needeth not to be ashamed.”

NOTE.—In addition to Petty's own writings I have to acknowledge my indebtedness to *The Petty Papers*, *The Petty Southwell Correspondence*, and to *The Double Bottom or Twin-Hulled Ship of Sir William Petty*, each of which has been edited by the Marquess of Lansdowne. Without the help of these books much of the paper could not have been written. I am also much indebted to *The Life of Sir William Petty*, by Lord Edmond Fitzmaurice, to *The Economic Writings of Sir William Petty*, edited by Charles Henry Hull, and to the three volumes on Petty's Political Geography recently published by Mons. Y. M. Goblet. It has not been considered necessary to give references to the various passages quoted from these works, to the authors of which I tend my grateful thanks.





