

CHAPTER X

JAMES PERSHALL AND HIS DESCENDANTS

JAMES, the second son of Richard Peshall (or Persall) of Horsely and Checkley, was born about 1565. His place of residence is not known. He had a son, Jonas, and a daughter, Margaret, married to Edward Wyndsor.¹ The Inquisition Post Mortem of 1610 on the death of James's elder brother Thomas, abstracted on page 85, refers to an Indenture dated 1596 by which Thomas, in default of his son John having issue leaves property to 'Jonas Peishall, son of James Peishall, brother of Thomas,' and so Jonas must have been born before 1596. The only other record of Jonas is in the *Visitations of Kent* of 1619-21, which gives the Pedigree of the Pershall family with particular reference to James's brother Edmund, who was then living at Bromley, Kent. This pedigree, given on page 83 of Chapter V., adopts all through the later spelling of the name, viz., Pershall. The name Jonas is Latinized to Jona, and we are told that at that date he was 'sup'stes in partibus transmarinis' (now surviving in parts across the ocean). It is safe to assume that Jonas was born between 1690 and 1695.

Jonas Pershall probably went first to Virginia, the prosperous Colony with which his Uncle Edmund was

¹ Collins's *Peerage*, vol. iii. p. 673. Edward Windsor, son of Walter, son of Sir Thomas, son of William Lord Windsor, Earl of Plymouth. See also appendix ix.

associated. Quite possibly he was sent out by Edmund himself, or by the Virginia Company of which Edmund was a member. There are, unfortunately, no records of Jonas in America, nor is the name of his wife known. He had a son, James, who was born in either Virginia, or the other colony of New York, about 1630 to 1640. The first record of this James is a deed dated December 12th, 1679, which shows that he was then a resident of the Isle of Wight or Gardiner's Island, which was then included within the limits of the township of Easthampton.

The deed¹ referred to reads as follows :—

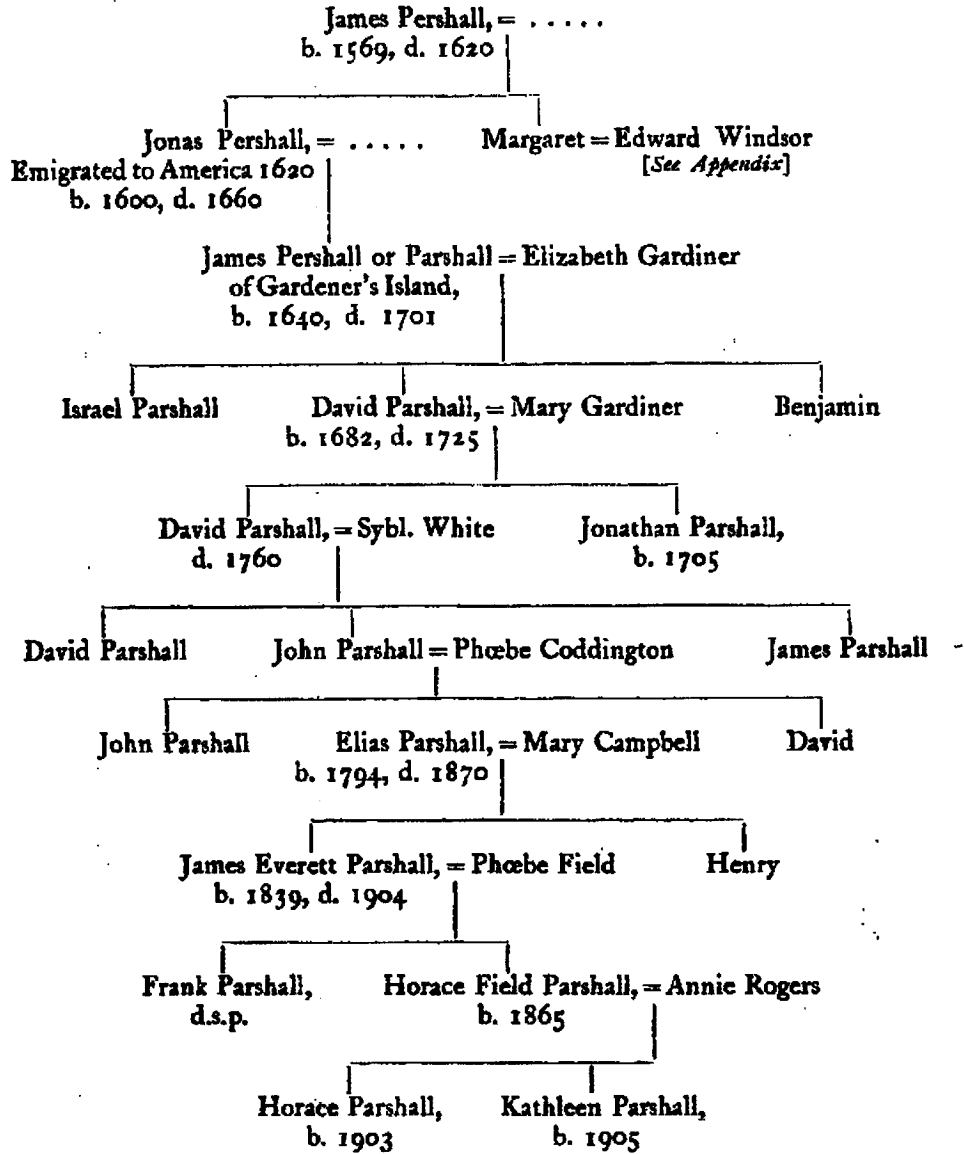
' This indenture made ye twelfth of December in the two and thirtyeth yeare of ye reign of our Sovereigne Lord Charles ye Second by the grace of God King of England etc. and in ye yeare of our Lord Christ one thousand six hundred seventy-nine. Between John Yongs Senr of the ye Towne of Southold on the one part and James Parshall of ye Ile of Whight in New England on the other part Witnesseth that the said John Yongs for and in consideration of a full satisfaction to me payd have granted and sould and by these presents doe grant and sell unto the said James Parshall, the first division of Acquabauk being five lotts of upland which the sd Yongs purchased of Joseph Horton and John Tucker, butting and bounding as followith—To the North Sea or Sound North—and to the East the land of Mary Wells, and to the sd John Yongs his late division West : Also five lotts of meadow lying and being on the South side the River and on the East side of the deepe Kreek butting and bounding as followeth—on the North west to a tree marked in manner of a crows foot to a pine tree marked with ye sd Yongs his mark South Est. To have and to hold etc.

¹ Southold Town Records, No. 379.

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In witness whereof I the sd John Yongs have hereunto sett my hand and seale the day and yeare first above written.

Witnesses

JOHN YONGS.

BENJAMIN YONGS

THOMAS OSMAN

Entered ye 22nd of the I. moth. 1679

pr. BENJAMIN Yo. : Rde.'

Some time previous to the date of the above deed, probably in 1678, James had married Elizabeth Gardiner, only daughter of David and Mary (Lerringman) Gardiner, of Easthampton.¹ This David Gardiner was the second proprietor of Gardiner's Island, and son of Capt. Lion Gardiner.

Lion Gardiner had purchased the Island, then known as Monchonack, from the native 'Indians' in 1638, and had renamed it 'Isle of Wight.' In 1665, the Island was officially granted to his son, David Gardiner, by the Governor of New York, for a Quit rent of £5 yearly or the same amount in kind. The record of this grant is preserved in the Record Office, London, with the other early Colonial documents.²

Some years after the purchase of Aquebogue, recorded by the above deed, James moved to Southold. The rate lists of 1683 do not contain his name, but from the census of Southold taken in 1686, it appears that he was then a resident of that place. His family is then recorded to have comprised 'six white males, two white females, three male slaves, and two female slaves.'³ In the Census of 1698, however, the names of all the members of the family are set

¹ Moore's Index of Southold; II. Southold Town Rec., 266; Id., 438; Early L.I. Wills, 226.

² Colonial Entry Books, C.O. 5, 1134.

³ xxxiii. N.Y. Col. MSS., 94.

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out as follows¹: James Pershall, Margaret Pershall, Mary Pershall, Israel Pershall, David Pershall, Benjamin Pershall, Margaret Pershall, Junis. The first Margaret was probably an error for Elizabeth, as there is no record of a second marriage of James, and further, Elizabeth was living June 26th, 1690, as the following receipt² to the executors of her father's estate clearly shows:—

‘Receipt and release of James Parshall of Southold to John, David and Lyon Gardiner dated 26th June 1690, for ninety pounds current mony as a legacy and for any other sum due Elizabeth Parshall his wife, and daughter of David Gardiner late deceased.

Witnesses

JAMES PARSHALL

JOSEPH GRIFFIN

STEPHEN BAILY

Entd pr BENJ: Yo. Rdr.

I do also hereby engage, in case of a nonpayment of the sd above obligation never to exact or desire any more than ninety pounds, as my wife's and my full proportion of the estate of my father in law Mr. David Gardiner deceased.

Witness my hand and seal 26th June 1690.

Memorandum: If the sd Estate shall be wasted or destroyed by robbery or fire before the obligation of ninety pounds be performed then I am to bear my proportion of what shall be wasted or destroyed—June 26th, 1690—

JAMES PARSHALL.

Enterd pr BENJ: Yo. Rdr.’

James Parshall's Will,³ made in 1692, reads as follows:

‘IN YE NAME OF GOD AMEN—Southold this 14th of Oct. 1692, I James Parshall of the town of S'hold in ye

¹ I. Doc. Hist. of N.Y., 453.

² Southold Town Records, II., 266.

³ Early L.I. Wills of Suffolk Co., 226.

County of Suffolk upon Long Island in ye Province of N. York being weak in body but of sound memory do ordain and establish these presents to be my last will and testamt in manner and form following—First—I bequeath my soul to Jesus Christ my merciful Redeemer & my body to ye earth by decent burial in ye last assured hopes of its resurrection again at ye last day & as to my outward estate all my just debts being first paid & funeral charges allowed for by my executors I do will & dispose as followeth—Imp-
 mis I do give and bequeath unto my two sons Israel & David all my accommodations of both upland & meadow to them & their heirs forever equally to be divided between them two only my eldest son Israel is to have the eastermost side of this my accommodation of upland in Occabaue with all the improvements thereon that is to say my dwelling house barn outhouses fences orchards & improved lands—also my will is that all my implements of husbandry & arms be equally divided between my sd two sons. 2ly I do give & bequeath to my beloved wife one bed with all the furniture thereunto belonging—4ly I do give & bequeath her choice of my Indian Girls also my will is that my wife enjoy one room of my dwelling house & half my orchard during her widowhood and no longer—5ly I do give and bequeath to my eldest daughter Mary one bed with all ye furniture thereunto belonging. Also I give unto my sd daughter my other Indian Girl—6ly my will is yt all ye rest of my estate shall be equally divided between my wife & all my surviving children—7ly My will is yt & if my two grown Indian slaves do serve faithfully five years (that then and not else they shall be free) Lastly—My mind and will is yt my beloved brothers in law John Gardiner & David Gardiner together with my friend Mr. Thomas Mapes be executors to this my last Will & testamt. And I do advise them to put out my two sons to such trades as they shall incline to learn for the confirmation hereof I have hereunto set my hand & fixed my seal

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in Southold this 14 day of Oct. in ye year of our Lord
God, 1692.

JAMES PARSHALL (Seal)

Signed sealed published & declared before us

EVAN DAVISE
SAMUEL SWAZY
THO. MAPES.'

The following minute of the proceedings on the probate of the foregoing instrument is also of record :—

'By the tenor of these presents know ye yt on ye 28 day of Oct. 1701 at ye manor of St. Georges in ye County of Suffolk before ye Honoble Coll William Smith Judge of the Prerogative Court in ye sd County was proved and approved ye last will & testamt of James Parshall late of S'hold in ye sd County deceased on ye 15 day of Sept. 1701 who by his sd will did nominate and appoint his brothers in law John & David Gardiner & Thomas Mapes his executors—and ye administration of the goods & chattels of ye sd deceased was granted to ye sd David Gardiner & Thomas Mapes.'

A careful perusal of this will, makes it appear probable that all the children of James, mentioned in the Census of 1698 were born prior to the date of the will. Benjamin probably died in childhood, as no records of him are extant.

The following quaint deed preserved in the Southold Town Records (II. No. 179) is of interest :—

'Know all men by these presents that I James Paresall belonging to Southold in ye County of Suffolk on ye Island of Nassaw yeoman have sold and delivered unto John Parker of Southampton fuller an Indian Garle aged about eight years daughter of one Dorcas an Indian woman, which said Sarah was my slave for her life time ; and I doe by these presents sell her ye sd Sarah unto him the said John Parker dureing her naturall life, to be unto him ye said Parker his heiress and assigns as his or their proper estate ; and I doe

bind myself my heirs, executs and administrats to make good ye sale of ye above Indian gairle to him ye said Parker his heirs and assigns ; and I doe acknowledge to have received of him ye said Parker for and in consideration of said Indian garle as full satisfaction, the full and just sum of sixteen pounds current money of the province.

In witness whereof I have hereunto sett my hand and seale this 27th day of March 1698.

Witnesses

JAMES PEARSALL

JOSEPH MOORE

SAMUEL CLARK

Entd May ye 10th 1712.'

The variation of spelling in these records is worthy of notice, the name being given as Parshall, Pershall, Paresall, and Pearsall.

James died at Southold¹ on Sept. 15th, 1701, but the place of his burial is unknown.

James's eldest son, Israel, born in March, 1680, was one of the most prominent men of his day in Southold, and also one of the largest landowners of the township. This history, however, is more concerned with his second son, David, the ancestor of the present Parshalls. David was born on Gardiner's Island in 1682. He married in 1704, his cousin, Mary Gardiner,² and had six children. David, like his brother Israel, was a large landowner in Southold, and was probably one of the wealthiest men of the community. He appears as a private in the Southold Militia Co. in 1715. He died at Aquebogue on Jan. 25th, 1726, and was buried in Mattituck Cemetery.

David's will, dated Jan. 24th, 1726, reads as follows³ :—

'IN THE NAME OF GOD, AMEN. The 24th day of January, in the year of our Lord, 1726, I, David Parshall, of Southold,

¹ Rec. Probate Court ; Early L.I. Wills, 227.

² Moore's Indexes ; Gardiner Gen. ; Wm. Wells, *Fam. of Southold*, 265.

³ N.Y. Wills, Lib. x. p. 157.

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in the County of Suffolk, and Colony of New York, husbandman ; being very sick and weak in body but of perfect mind and memory . . . this my Last Will and Testament.

Imprimis : I give and bequeath to my eldest son, David Parshall, the one-half of my land that I now live upon. The outermost side and also the land one half of my undivided Land with my Eastermost piece of Meadow Ground at Sawmill Brook Lying between Israel Parshall on the East side and Joseph Brown the West side & my half of all the rest of my Meadow ground.

Secondly, I will & bequeath to my youngest son Jonathan Parshall, the one-half of my land that I now live upon. The west half also the one-half of my undivided Land & my Meadow Ground not given before.

Thirdly, I give & bequeath to my youngest son Jonathan Parshall, Sixty pounds in Current money of New York, my will is that the said £60 shall be put to use at the discretion of my Executors while my said son shall come to the age of 21 years.

Fourthly : I give & bequeath all the rest of my estate after my lawful debts are paid unto all my children equally to be divided between them at the discretion of my Executors.

Further my will is that if any of my Daughters shall die before marriage then their part shall be divided equally between the rest of my daughters who are the survivors.

Lastly : I constitute & ordain my brother Israel Parshall Samuel Swezey & John Wells my only & sole executors of this my last Will & testament.

(Signed) DAVID PARSHALL

In presence of

SAMUEL WELLS

CHRISTOPHER YOUNGS Sen.

PETER SIMMONDS JUNR.'

David's eldest son, David, born at Aquebogue, married, in 1736, Sibyl, daughter of Capt. Ephraim White,¹ and had eight children. He died in January, 1760. His will, dated March 11th, 1759, reads as follows² :—

'I, David Parshall, of the town of Southold, . . . Yoeman . . . to my oldest son David Parshall all land Northward of the New Road & Meadow at Sawmill Brook—To my second son Elias Parshall all my lands which lyeth between the North Rode & the South Rode where I now live, with all the buildings upon the same and also all that West Meadow—upon the North side of Peconek River (allows his wife the improvements of it until he shall come of age) To 3rd son James Parshall land Southward of the South Rode and the Meadow adjoining to the said land & all the buildings which stand upon it. Land bounded upon the East by the lands of Nathan Perry; South by Samuel Wells, West by Isaiah Tuthill & North by Kings Rode allowing his mother my now wife the improvement until he come of age. To youngest son John Parshall £100, when he shall come of age. To my daughter Desire Downes £5. To my daughter Sebil Parshall £30, to my dau. Mehitabel £30 when eighteen or day of marriage. To my wife Sebil Parshall . . .

Exrs. Wife Sebil & Son David

Dated 11 Mch. 1759 Proved 28 Feby. 1760.'

David's eighth and last child was a son John,³ born May 5th, 1759. This John married Phœbe Coddington of Newburg, N.Y., and had eleven children, the seventh of whom was Elias, my grandfather.

John Parshall, like many of his relations, was a soldier of the American War of Independence,⁴ and between the years

¹ Salmon Record; Howell's *Hist. of Southampton*, p. 400.

² N.Y. Wills, Lib. 22, p. 150.

³ Bible Record in possession of Mrs. Rosamund Barry.

⁴ Recs. U.S. Pension Office; Muncell's *Hist. of Suffolk Co., N.Y.*, xv. Col.; *Hist. of N.Y.*, p. 216; *N.Y. in the Rev.*, p. 166.

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1776 and 1780 figured in many battles and campaigns. The period of enlistment during the Revolution was short. He enlisted no less than six times. With Capt. Drake of Newburg he took part in various battles in a campaign against the Indians. In the campaign near Fort Plain, N.Y., it appears that he became acquainted with the country in which he and some other members of the family finally settled. At one time during the revolutionary war he served with one of the Connecticut regiments. The compensation of a soldier during the Revolution was uncertain, but after the war he received substantial recognition for his services, which, considering the then financial resources of the United States, sufficiently establishes his reputation as a soldier and patriot.¹ After the Revolution the family divided, one part settling in Central New York, another in Western New York, and the third in Western Pennsylvania. I have met different members of the family either in the University or in my travels, and all seem animated by the same general instincts and ideals.

Elias Parshall,² his son, was born on February 9th, 1794, at Newburg. He succeeded his father and inherited the homestead in Middlefield, Otsego County, N.Y., still in possession of the family. Many happy days were spent in my boyhood, and by my father before me, in fishing there in the waters of the Susquehanna or hunting in the forests on the hills. My grandfather died when I was a child, but I still have remembrances of him sitting in his arm-chair expounding the scriptures, on which he and my grandmother were the accepted local authorities. My grandmother Parshall was a Campbell³ and was descended

¹ From *The History of the Parshall Family*, by J. C. Parshall.

² Bible Record in possession of Mrs. Rosamund Barry.

³ Grave at Middlefield Center, N.Y.

The Campbell family came originally from Inveraray, Argyllshire, and were members of one of the famous Campbell clans of the Highlands of Scotland. They emigrated to Ireland near the close of the reign of Queen Elizabeth, *i.e.* about the year 1600. The northern portion of Ireland received at that period large accessions

from a family conspicuous during the revolutionary war. She still treasured silver that, with the women and children, had been hidden in the woods during the historical Cherry Valley massacre. While the three B's of the revolutionary days, that is, Bullets, Blackstone and the Bible, had been reduced to two, viz., the Bible and Blackstone, memories of the Revolution were vivid in the minds of all the older generation.

By his marriage with Mary Campbell of Cherry Valley, New York, my grandfather had four children, Mary, James Everett, Anna and Henry Elias.

James Everett Parshall, LL.D., my father, was born August 2nd, 1839. He was educated at Hartwick Seminary in part, as many of my mother's family had been. He was studying law in Cooperstown, New York, when the Civil War broke out. During the Civil War his activities were many and diverse, not the least of which was handling a large cotton mill property in the absence of the owner. The handling of such a property in all of its departments by a youth just of age indicates the strength of his character. A cotton mill in those days was a self-contained social unit, and the manager had to control the community in all its departments: that is, in housing the operatives, in running the commissary—that is, the factory

of Scotch Protestants, who proved valuable and useful citizens. Here the Campbells continued to live for several generations, until John Campbell, with a family of ten or twelve children, emigrated to America in 1726, and settled first in Donegal, Lancaster County, Pennsylvania. The records of this place show that Patrick Campbell, one of his sons, born in 1690, was serving as a constable in 1729. About 1730, John Campbell, with three of his sons, Patrick among them, removed from Pennsylvania to what was then a part of Orange, near Augusta County in the rich valley of Virginia. [See Foote's *Sketches of Virginia*, Second Series, pp. 114, 117; Rupp's *History of Lancaster County*, p. 185; Mombert's *Lancaster*, p. 120; and Campbell's *History of Virginia*, 1860, p. 700.] Among the children of Patrick Campbell was Charles, who married a Miss Buchanan, and became a prominent pioneer of the Augusta Valley. His son William was the Col. William Campbell, hero of the battle of King's Mountain. The town of Cherry Valley was founded by a member of the Campbell family, most probably by an ancestor of James Campbell of Cherry Valley, referred to in the text above.

store—in looking after the output, the shipping and the machinery. Such a training was useful to my father in after life in connection with his law practice. He often told me he had but two ideals in life, one a happy and well-ordered home, the other to hold an acknowledged position in the law.

After the Civil War my father was engaged for a considerable period in mercantile pursuits, but as soon as opportunity afforded, he returned to practise the law. He was an acknowledged authority on many special subjects, and his library, which was second to none in Central New York, was extensive and complete. His one boast was that he could go inside his office in the dark and pick out any book and turn to any case. I know this, I never could take down a book and put it back but that he knew automatically what I had been in search of. He married Phoebe Anne Field who died in 1899. The Fields were a well-to-do country family, descended from the Providence Fields and relatives of Cyrus and other distinguished members of the New England family. My grandfather Field married Ada Windsor who had descended from the Windsors of Buckinghamshire, England.¹ My father died in 1904. Whatever success I may attain in life, I ascribe to the never-ceasing attention given by both my father and mother to every detail of my early life.

In chronicling the principal events of my own life, I do not suggest that I am furnishing anything that will prove of interest except to my immediate descendants. I was born at Milford, New York, U.S.A., on September 9th, 1865. At an early age I was sent to Hartwick Seminary to prepare for the law or the ministry, but as time went on I developed a pronounced proficiency in physics, mathematics and the general sciences, in fact, my interest in these subjects was so great that other subjects, more particularly theology and law, did

¹ See genealogy in appendix.

not in any way attract me. After securing a scholarship, I was allowed to begin the then new course of electrical engineering at Cornell University. Here again the old tendency became strongly manifest, since it was a part of the curriculum to include subjects of no interest and, as my subsequent experience has shown, of no use to an engineer. After two years I went to Lehigh where I found a warm supporter and friend in Professor H. Wilson Harding, who believed that young men of energy should be allowed to follow the line of least resistance in their work. I was permitted to work at all times in the laboratory and to select the subjects I desired. These were Electricity, Magnetism, Light, Heat, and Machine Design. I graduated an easy first, whereas, had my standing been determined as to proficiency in the sort of curriculum so distasteful to me, I would undoubtedly have been an undisputed last. Since graduating, Lehigh has conferred on me the degree of Master of Science, the highest conferred on an alumnus.

Immediately on leaving Lehigh, I accepted a position in the Sprague Electric Railway & Motor Co. as a special student in the motor testing department. This was in the very early days of electrical engineering and before mathematical methods had been introduced in the process of machine designing. All was done by rule of thumb, and the waste was enormous. It frequently occurred that several machines were built before one gave the required results. In the University I had developed the theory that magnetic calculations could be based on the length and section of the circuit exactly as applied to electrical circuits. I made many experiments, derived constants both magnetic and thermal, which called for investigations as to the nature and extent of the energy losses in iron with varying magnetization and frequency, as also investigations on radiation of heat from stationary and rotating surfaces. As a result, when I was asked later on, to try my formulæ on a machine that had baffled the skill of the older engineers, I was at once successful



D^r H. F. PARSHALL, SON AND DAUGHTER

in producing one that complied with the set requirements. After this I became the accepted authority on machine design, and at the age of twenty-five was appointed Chief Designing Engineer of the Edison General Electric Company. Motors for traction purposes were then both costly and unreliable. I conceived the idea of using steel in the magnetic frame and of making the motor multipolar with a slotted armature. One was built which ran at one-third the speed of the old type, thus permitting of single reduction gears and making a quiet and efficient motor. This motor was so satisfactory in practice that practically all traction motors have since been constructed on the same general magnetic lines. During this time I had also been investigating the distribution of the magnetic flux in different machines with a view to proportioning the section to the flux, in order to secure the maximum economy in the use of material. I next directed my attention to the design of large slow-speed generators. About this time the two great American Electrical Companies were consolidated into the General Electric Company of America. I survived the consolidation and was appointed chief of the Technical Department, advising generally in connection with the development of traction and power machinery.

I was then given the opportunity I had so long hoped for, viz., of developing electrical machinery of great output according to the then standards and precedents. The design I had prepared was submitted to some of the great authorities, amongst others Dr. Henry Rowland of the Johns Hopkins University, who gave as his opinion that so great an output from such a small amount of material was impossible. He had forgotten to take into account the special features of the new form of construction, and had based his opinion on the older designs. My first large machine, viz., 2,500 H.P. 75 revs., was put to work at the Columbian Exposition, where it was assembled for the first time. It was so satisfactory that many more were built without any modi-

fication. So great was the impression produced by the performance of this machine that Elihu Thomson, the modern Franklin of America, pronounced its production as the most noteworthy event of the Exposition. This machine was only one of a series I had designed for the exhibition, most of which were awarded gold medals. During the time these machines were passing through the shops I gave my time to an investigation of the relation of chemical constitution to magnetic properties of iron and steel. This investigation formed the basis of a paper for which I received the prize of the Institution of Civil Engineers of England. At the same time I was giving a series of lectures at the Massachusetts Institution of Technology on Dynamo Design. At the suggestion of Lord Kelvin and Dr. John Hopkinson, the notes of these lectures were expanded into the treatise on *Armature Windings of Electric Machines* and the treatise on *Electric Generators*, subsequently enlarged into the treatise on *Electric Machine Design*. My degree of Doctor of Science was conferred by an institution using these works as standards of instruction.

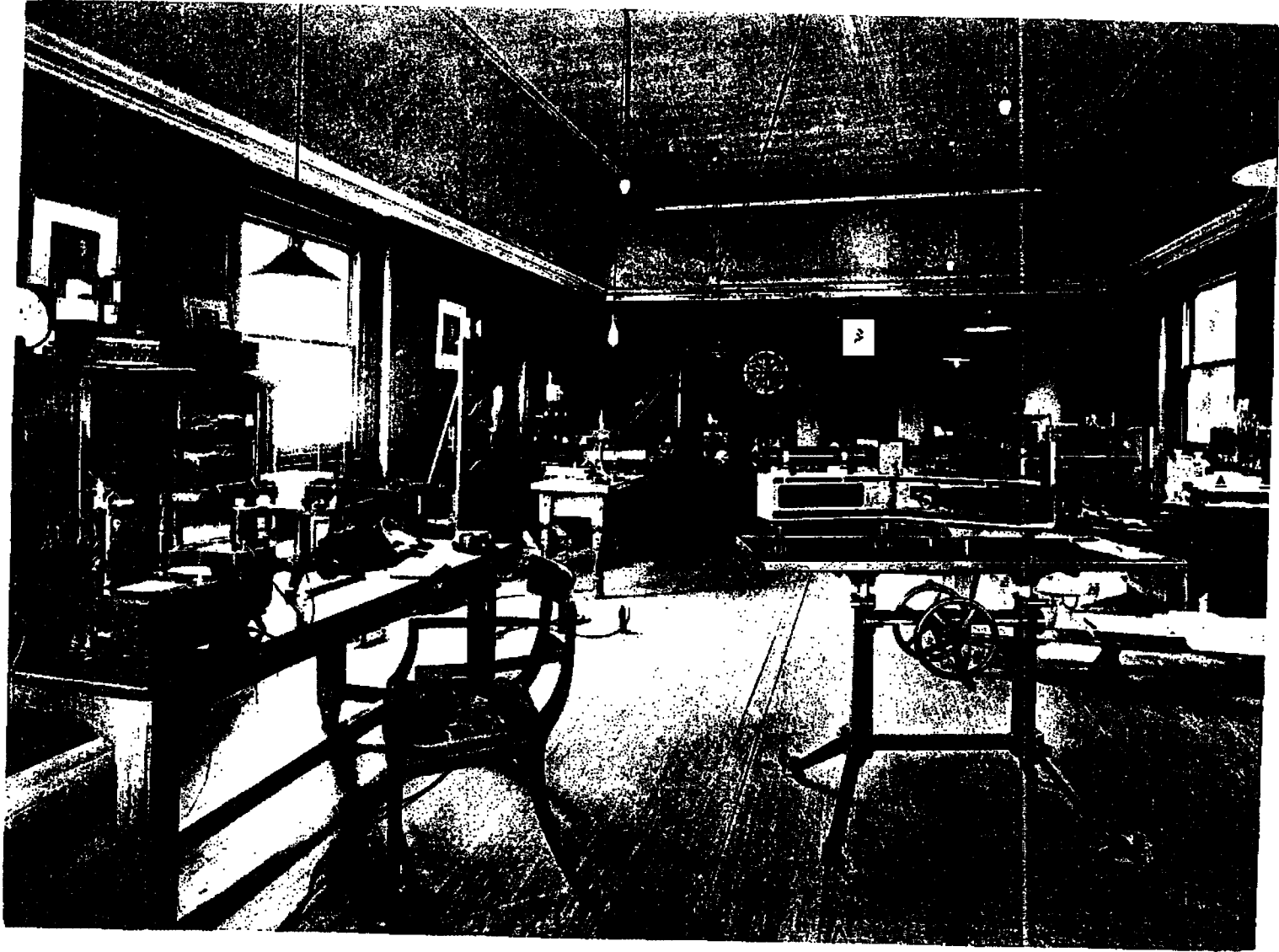
In 1894 there arose in London a dispute as to the efficiency of certain electrical machines, and I came abroad to attend to the interests of the American Company who had manufactured them. I associated Dr. John Hopkinson with the matter, and jointly we evolved the system described in the paper read before the Institution of Civil Engineers on *Alternating Current Tests*. In the final outcome, our results were admitted to be correct and all that I had contended for was justified. It took a much longer time to carry out this work than was anticipated. I had formed a considerable acquaintance in England and had been asked to do a good deal of technical work in connection with the early traction installations. It was at this time that I prepared the paper on *Electric Tramways* that received the prize of the Institution of Electrical Engineers. At first I did this work as a pastime, but subsequently was invited to act professionally,

and before I was fairly aware as to where matters were leading, I was an established consulting engineer. I commenced by re-equipping the tramways system of Bristol; and Dublin, Glasgow, London and other cities followed in rapid succession. The Central London Railway installation was one of the number, and is of special scientific interest in that it was the first traction system to use multiphase transmission and rotary transformer conversion. In America I had designed the first machine of this class, and so satisfied was I with the result that I then determined it was the solution of heavy railway distribution. Subsequently it came into general use in America and, now that its advantages are understood, is being almost universally used in England. The treatise on *Electric Railway Engineering* is an embodiment of my experience in connection with these installations, as also the paper on the *Economics of Electric Railway Distribution*. Subsequent to the opening of the Central London Railway, I was invited to act as Consulting Engineer, and ten years afterwards became Chairman of the Board of Directors.

When in the University I found time to investigate the possibilities of Spectrum Analysis. I reached the conclusion that through the spectroscope lay the possibility of determining the nature of the structure of the chemical atom. I have followed the subject practically ever since, having given much time to this research, and have satisfied myself as to the correctness of my view, viz., that the structure of the atom is but a miniature model of the universe as a whole. The one idea that has prevailed in my mind from boyhood has been uniformity of structure and physical law from the infinitesimal particles that constitute the chemical atom to the infinitude of space comprehending planetary action. In my laboratory I have developed apparatus accurate to one-thousandth of a ten millionth of a millimetre for the observation of spectral arrangements. I find the arrangements follow a simple periodic law, that the performance of an atom

is as definite in its constitution and action as that of a planetary system, the cyclic events being only of less dimension as to space and time even though the atom which is a model of the planetary system as a whole is so minute that two million million are in the compass of a cubic centimetre. Monochromatic light has been resolved into its components and the spreading of a single line into many by magnetic action of measured intensity proved that the particles of the atom do but behave as the planets in their courses. In viewing the spectrum of a gas we see the picture an astronomer might see if similarly situated towards our planetary system. Astronomy leads towards the infinite, spectroscopy towards the infinitesimal. A star year which is a small distance to the astronomer comprehends a sphere of the order of 10^{19} metres, the spectroscope 10^{13} metres, the ratio of these 10^{32} which is the range of dimension in which physical phenomena can be proved to be uniform in action with the means at present in use by the scientist.

Some little time before going abroad, I had been occupied in designing generators several times larger than the one that had attracted so much attention at the Chicago Exposition. These were for the power development at Niagara Falls. As a result of this work and that already done on rotary converters, I satisfied myself that the system of supplying cities from several small power stations was an economic mistake. I worked out a general scheme of electrical supply for some of the larger cities, making use of the new form of generation, transmission and conversion, and the calculations showed such enormous savings that I was tempted to ask some of my colleagues to approach some of the larger American Companies with a view to the use of the improved system, but failed, owing to political reasons. There was little encouragement at first, but since that time the suggested system has been generally adopted in America and many European cities. In 1907 I was asked



LABORATORY AT PENBURY GROVE. BUCKS

to assist the London County Council who desired to bring the London Electricity Supply into line with modern practice. In 1908 another attempt was made, but the vested interests were so strong that Parliament decided the obsolete methods must continue. The waste in the London Electricity Supply amounts to more than a million pounds sterling per annum, and it is to be hoped that in the fulness of time the old may give way to the new and an efficient system come into effect.

In 1909 I visited Spain, and, as a result, the power of the River Ebro is being utilized to furnish power for the greater part of Catalonia. I have also designed large power installations for both Lancashire and Yorkshire. Latterly I have been Chairman of as well as Consulting Engineer to the Lancashire Electric Power Company, which promises to be one of the most important electrical developments in the Kingdom. The saving in fuel, labour and capital in these central installations is so considerable when the larger class of machines is employed, that the cost of energy is now but a fraction of what it is when the older methods are employed. In some parts of the world large districts are almost independent of coal owing to hydro-electric power development. In these districts civilization will continue after the supply of coal has failed to supply the wants of man.

Twenty-five years ago electricity was to some extent a luxury, to-day it is an industrial necessity. The activity of man can only be maintained by the utilization of the forces of nature, and electricity is the only agent of universal application. To-day my energies are entirely devoted to the application of electricity to the industrial and economic needs of mankind, and I confidently look forward to the time when electricity will be the universal medium for the utilization of the forces of nature.

For the last twenty years, I have resided principally in England, although continuing my American practice and retaining my American connection. My two children,

Horace and Kathleen, were born here. We are the sole representatives of the ancient family in England. Whether my children elect to remain in the land of their earlier ancestors and perpetuate the name or migrate to my own country as did their forefathers, time alone will determine. The difference between the two countries is not now so great as to make the decision one of pressing importance, since I have found life congenial in England just as I did in my earlier days in America. Whatever may be their course in life, I trust it will be worthy of the best traditions of those who have preceded them in either country, and that, as time goes on, some other member of the family may find worthy matter to chronicle in respect to those that succeed me and my generation.