We all drove to the works for the ceremony. There were some excellent speeches. One of the best, I remember, was made by Dr. Garnett. Looking up the references in the press I find an interesting résumé of his speech. He reminded us that it was sixty-three years since Faraday produced the first spark from a steel magnet. "That," he said, "was the beginning of the real work of electricity, and that spark has grown until we have the electric light of to-day. Electricity might be, and probably is, a baby still. We cannot tell what its future is going to be, but I think you will agree that we have before us a pretty robust baby whose muscles and nerves are imbued with the power of more than four hundred horses. It will, I think, be an improper thing if they do not inscribe the three engines before us with the three F's. They represent the *fortissimo* of electricity, and I think they ought to place upon them the names of Franklin, Faraday, and Ferranti."

After the Mayoress had been presented with a silver statue, as a gift from the contractors, and Zoë, dressed very prettily in pale pink, had presented her with a bouquet, she was conducted by Alderman Ellis to the Ferranti dynamos. A half turn of the steam-gauge wheel set the machinery going. To the relief of everybody concerned both dynamos were started with the greatest ease and a moment later the incandescent lamps round the walls were glowing with a brilliant white light. The Mayoress then having visited the Parsons turbo, which she also successfully started, declared the power station open.

In the evening the Mayor gave a banquet in the Town Hall. Again there were a great many speeches (which I did not hear as ladies were not invited). In the middle of the dinner Basti was called away to the

works. It seemed there was considerable risk of the Mayor and his guests being plunged into darkness. Nothing had gone wrong, but the Channel was not behaving with its accustomed regularity. They were using the sea for their condensing water and it happened that there was a phenomenally low tide that night. If they had had to import candles whilst the speeches were in progress it would have been terribly embarrassing for Basti. However, the lowest tide in the affairs of men and of the Channel turns at last and Basti was able to get back to the nuts and wine—which, by the way, were not a great attraction as he hardly ever drank wine.

Immediately after the opening of the station he had to leave for Caen in Normandy to attend a similar ceremony at some works where his dynamos had been installed. His reputation had grown as rapidly on the Continent as in England and America. He was continually having to cross the Channel to supervise his plant in France, Germany, and Switzerland. The Municipal Station in Paris had three alternators with capacity of 9,000 lamps; Plaza de Toros, Paris, had one alternator with capacity of 3,000 lamps; Nancy had three alternators with capacity of 9,000 lamps; Havre had two alternators with capacity of 12,000 lamps. Milan had two alternators with capacity of 6,000 lamps; Troyes had two alternators with capacity of 6,000 lamps; Nîmes had two alternators with capacity of 6,000 lamps; Dijon had one alternator with capacity of 3,000 lamps; St. Cere had one alternator with capacity of 600 lamps; Barcelona station, in Spain, had two alternators with capacity of 6,000 lamps. Alternators had also been sent to the La Plata and Rosario stations in the Argentine.

I mention these details of the Doctor's work because

it is not generally realized what an enormous impetus his inventions gave to the electric lighting industry all over the world. As Signor Marconi stands to wireless so does he stand to electric light. But owing to his retiring nature and the quietness of his life very few realize that Ferranti's genius and accomplishment were equal with that of Faraday, Benjamin Franklin, Leonardo da Vinci (for whom he had a great admiration), and the supreme inventive geniuses of the world.

We were all sorry to return to London after having been by the seaside for so long. Although it was June, Chelsea was stuffy. In August we took the children into the country. We found quarters in a farmhouse at Rotherfield, Sussex, not far from my people at Crowborough. In the autumn, instead of returning to Chelsea (our lease was up), we took over my brother-in-law's house (for the remainder of his term) at Ravenscourt Park. This was a help to him, as he wished to move into rooms. Madame de Ferranti and my niece and nephew, Wanda and Frank Stephen, lived with us. We were expecting to move our works some time during the following year, and so this arrangement suited us all very well.

In 1894 Edinburgh was erecting a power station under the supervision of Professor Kennedy. Basti's activities in many directions—alternator construction, concentric mains, street lighting, meters, automatic transformers, and other appliances had attracted Professor Kennedy's attention, and he was invited by the Royal Scottish Society of Arts to deliver a lecture before them on the Electrical Developments of the future. In November I accompanied him to Newcastle and from there went on to Edinburgh. We had a delightful time in Scotland; the people were so kind and hospitable. The evening before the lecture we

were invited to Dr. Taylor's house, where he and his wife gave a dinner party in our honour. Professor Walmsley was there and Dr. Milne Murray and Mr. Bruce Peebles and a number of interesting people.

Mr. Bruce Peebles replied to Dr. Taylor's invitation in some amusing verses:

> DEAR DR. TAYLOR,
> Your kind invitation I freely accept;
> It is always a pleasure to meet you;
> When Saturday comes I'll be with you that's sure
> And at seven and a half I shall greet you.
>
> Had you asked me to meet with a very dear friend,
> Say a cousin or uncle or auntie;
> The pleasure I'd have would not equal by half
> What 'twill be, when I meet with Ferranti.
>
> We shall drink to his health, and rejoice that the land
> Which can give us such poets as Dante,
> Can also alternately change her bit plan
> And yield such a man as Ferranti.
>
> T. BRUCE PEEBLES.

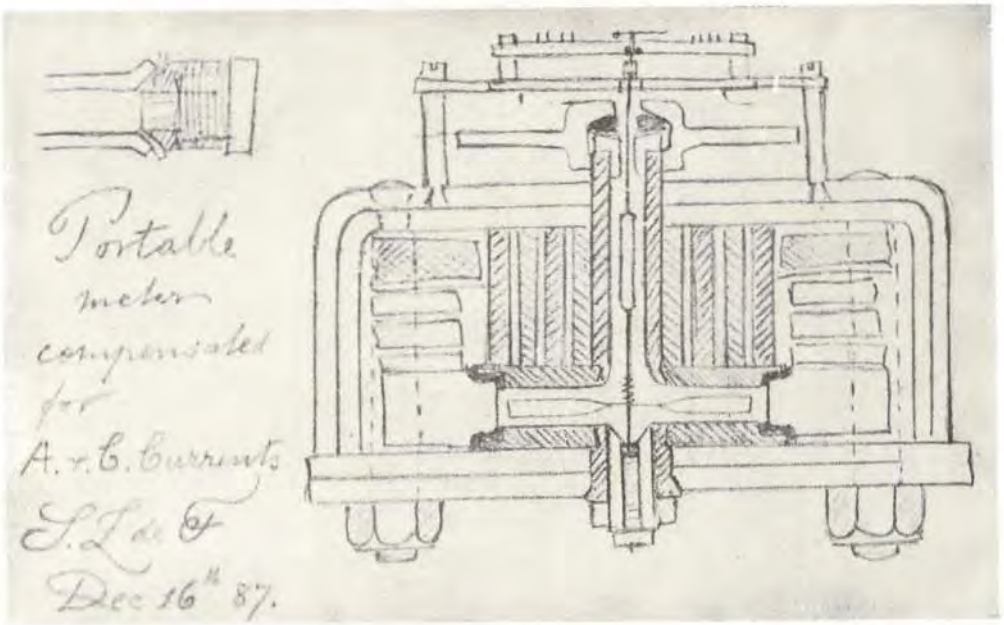
And upon being asked for a copy of the verses he added a charming postscript:

> You asked me for a copy of the above—
>
> I comply with your wish, and now that I've met
> Both Mr. & Mrs. Ferranti,
> He pleasant and frank, a man we all liked,
> She beautiful, charming and canty.
>
> We all wish them well, may they flourish and thrive,
> And their goods and their gear ne'er be scanty;
> So I thank you good friend, for great pleasure I had
> Meeting Mr. and Mrs. Ferranti.
>
> T. B. P.

A great deal has been said and written about the development of electricity since my husband delivered his lecture before the Royal Scottish Society of Arts in November 1894. But the indication he gave of the lines along which electrical developments would run has proved so correct that I think the lecture is well worth attention. Much of what he foretold has since come into being but a great deal more might have been done had there been men at the helm with his courage and his insight into the problems involved.

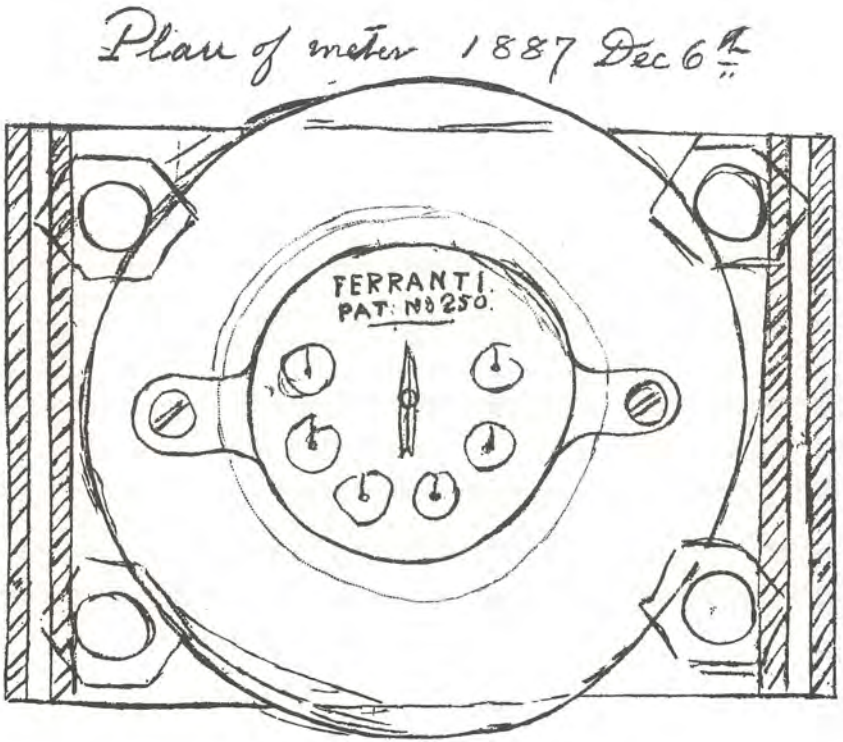
He dealt first with the rapid development of electricity in its application to the telegraph and the telephone, also to the railway systems in the use of signalling by means of electrical appliances. Next, he touched upon minor electrical developments such as electroplating and the use of electricity in artistic processes. Coming to the problems of electric lighting, he laid stress upon the fundamental need for cheapness of production—the same need being even more apparent with regard to the domestic purposes of cooking and heating.

Hygienic benefit was an aspect of electrical development that greatly appealed to the Doctor. "The black country" he regarded as a result of industrial development greatly to be deplored. Even London was not as it should be: "One may go out early on a summer morning in London and be surprised at the beauty and clearness of the atmosphere. It really makes one feel as if one were in the country. A little later one may see a cloud rising up over the whole city. It is quite evident that it's not fog but simply the smoke from the countless chimneys where morning fires are being lighted. This is a very serious matter; and you must all agree with me that it makes our towns much less suitable to reside in from the health point of view."



EARLY METER

(Facsimile from Sketch-Book)



EARLY METER, 1887
(*Facsimile from Sketch-Book*)

Another problem, he thought, which electricity might usefully tackle was the congested state of the population in our large cities. He looked forward to the time when electric railways would be installed: "There is at present a very serious congestion of the population in many of our large cities, and it is becoming recognized as one of the duties of our municipalities to secure better transit between the city and the country, so as to enable the large number of people who have to go to business every day to travel quickly and cheaply to and from their work. If this transit were improved —as it will be when electricity is more readily available, and when the knowledge on the subject is more general —living in towns, which undoubtedly in many cases are far inferior to the country from a health point of view, would not be so largely resorted to, and one of the greatest disadvantages of the congregation of people together for business purposes would be eliminated."

It may be remarked, *en passant*, that the need to-day (1934) is still for more trains and better accommodation. The overcrowded state of many of our morning and evening trains to and from London is a disgrace to civilization.

Proceeding in his address to deal with the question of the cheaper production of electricity, the Doctor said: "We have a certain amount of machinery in an electric light station but it is found that the public demand only takes one-tenth part of the total current that such a station can generate if run continually at its full load for the twenty-four hours. The reason of this is because everybody wants the current (being for lighting purposes) at about the same time, and therefore the station is doing a very great deal of work for an hour or two—in fact, working up to its full capacity

while during the rest of the time the load often falls to a mere nothing. This means that for a given capital expenditure you only supply as much saleable electricity as you would if you put up a station one-tenth of the size, at about one-tenth the capital cost and worked it continuously for the whole twenty-four hours. This, you will see, is one of the reasons which make electricity expensive." He therefore advocated an improvement of the load factor: "Instead of a station in the future supplying about one-tenth of what it should do if run at full load for the twenty hours, it would supply about two and a half times as much or one-fourth of what it could do if it ran continuously at full load." He also looked to the development of the gas engine. "I think the solution of CHEAP MOTIVE POWER, which is essentially what is necessary for the production of cheap electrical energy, is to be found IN THE INTERNAL-COMBUSTION OR GAS ENGINE. This subject is receiving considerable attention, and even at the present early stage shows excellent promise of realizing the greatest economy of the future. I do not think this result will ever be attained with very small engines or with such gas engines as we are all familiar with at present; but I do think that in some simplification of the internal-combustion engine will be found the solution of the difficult problem of producing power more economically."

Another interesting forecast the Doctor made was the cheapening of plant and its simplification: "We would require therefore the plant of the future to be four times as powerful as at present for the same money, and this I do not think is a thing about the realization of which there can be much doubt. There is already a great deal being done towards the cheapening of electric plant, not by cutting prices and getting bad

work, but by improved designs and by taking advantage of recent knowledge which we have at our disposal. . . . The machinery of the central station of the future will have to require less repairs, less cost for supervision and wages in running it, and therefore will have to be in a much simpler form than at present. This, of course, it is possible to conceive will come with practice. What we require is machinery of a nature which will work upon a varying load with just as good economy as though it were working at its full load. Current would also be transmitted at higher power, and distributed over wider areas. Electricity will be transmitted at higher pressures than we generally employ to-day; and I think that the progress which is being made in the manufacture of electric cables generally will have this part of the problem ready long before it is required."

With regard to the use of electricity for domestic purposes, and especially for cooking, the Doctor had no doubt of its ultimate universal adoption. But realizing how sluggishly conservative human nature is, he knows progress would be slow. "The question of the general use of electricity does not depend simply upon points which I have endeavoured to lay before you, but it depends also on the progress of the people —that is to say on their being educated up to the point of feeling and believing that electricity is necessary and useful to them. It will be a matter of natural growth, extending, I should think, over some considerable period."

I have shown two illustrations (facing pp. 134, 135), taken from my husband's sketch-book, of his early type of meter. Naturally, as the years went on, he made various improvements in these instruments, and the Ferranti meter has evolved into the very delicate and accurate

instrument that is known to-day, illustrations of which are shown facing pp. 140, 141, viz.:

(*a*) Internal and external views of a house meter.
(*b*) Two internal views of meters made for what is known as the "Grid" Electrical Scheme.

In this latter type of instrument it will be noticed that provision is made on the dial for as many as 10 million units.

The meters in the early days were much more costly in comparison than they are now, and I show, facing p. 129, a facsimile entry in his notebook of September 10, 1885, which shows the prices charged for meters to Sir Coutts Lindsay, Ltd. at that time.

"When," he concluded, "people have been educated in this way, after some years have perhaps gone by, and science has made further progress, I am myself convinced that we shall come to the time when electricity will be produced as cheaply as I have mentioned, and further, that it will be almost universally adopted, with the greatest possible advantage to the community."

While in Edinburgh Basti also delivered a lecture before the Royal Scottish Society of Arts on the Ferranti meter. A pleasant sequel to our visit came in the form of a letter from the Royal Scottish Society of Arts in which the Secretary wrote: "I have the pleasure to inform you that the Prize Committee of this Society have awarded you a Keith Prize of the value of £30 for your paper on the Ferranti Electricity Meter. . . ."

From Scotland we went to Rainhill to stay with Mr. Jim Atherton, with whom my husband was still doing business at the British Insulated Cables. Basti practically started that Company with his patents and held shares in it all his life.

The summer of 1895 was an anxious time for us: my husband was so frequently ill. Nevertheless he continued his visits to the North and the Midlands. I was always in dread lest I should get a wire from somewhere to say that he was laid up. In July we went for the summer holiday to Holm, in Yorkshire. We shut up the house in Ashchurch Grove, and Mrs. Kolle kindly invited Basti to stay at her house any time he was in town.

On August 29th I received a wire from Mr. Kolle saying that Basti was ill and asking me to go to him at once. I left immediately and arrived late that evening to find that he had had a severe attack and Mr. Kolle had been up all night with him. The doctor diagnosed it as appendicitis and said that before long he would have to undergo an operation. At that time appendicitis was such a new medical discovery that I don't think we had heard of it. After six days I was able to take him back to Holm to recuperate, but I knew that an operation would be necessary before long. We returned to London on September 12th. On the 18th I went with him to Dr. Goodheart, who examined him but did not advise an immediate operation.

In January 1896 he was again ill and had to stay in bed for a day or two. I think it was then that he received a letter from my father urging him to consult Sir Frederick Treves, who was at that time the leading authority on the appendix. The attacks were becoming more and more frequent, so Basti took my father's advice and on January 24th went with him to see Sir Frederick Treves. It was decided that an operation should take place on the following Monday, January 27th. Arrangements were made for him to go to a private nursing home in Duchess Street, Portland Place.

We were all very troubled and worried. Basti and I

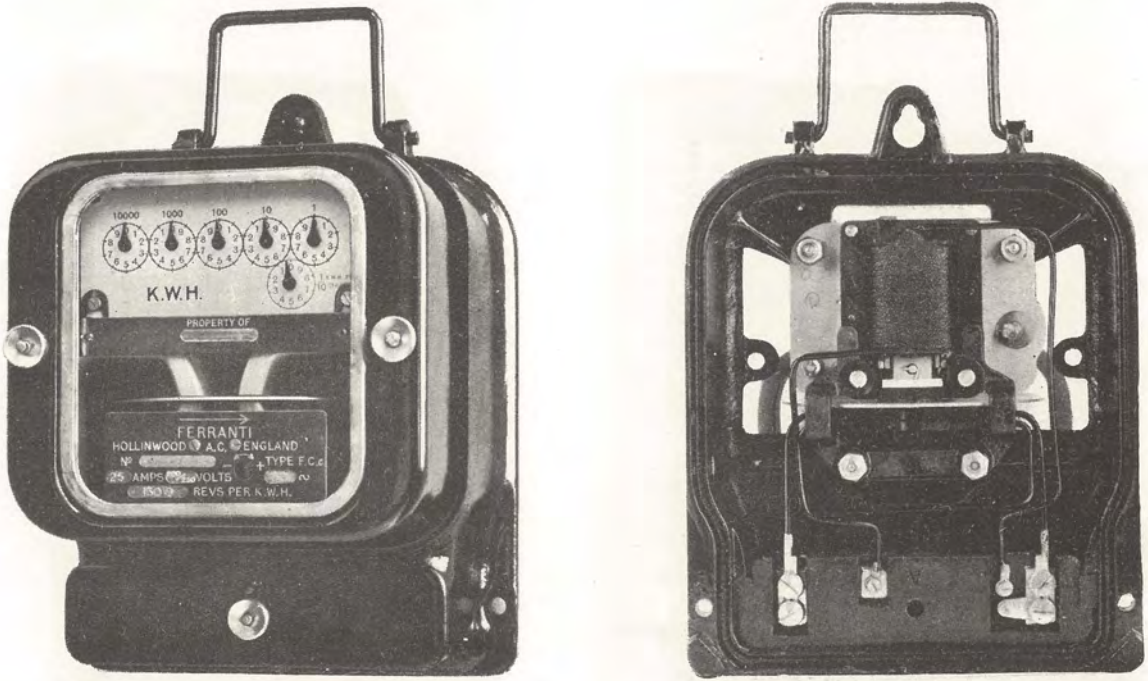
felt that the right thing to do was to go to Holy Communion before his operation and offer Mass for the intention that he might be brought safely through the danger. This we did on Sunday morning the 26th.

Mr. Charles Sparks called in the afternoon and very kindly went with me to take Basti to the nursing home, and after leaving him there I went to my parents for the night so that I might go down to the home with my father the next morning while the operation was being performed. Waiting under such circumstances must always be a terrible ordeal. Time moves like a snail, but at last we were told that he had come through satisfactorily. We were not allowed to see him that day. Next morning I went with his mother to the home and the nurse gave us a favourable account.

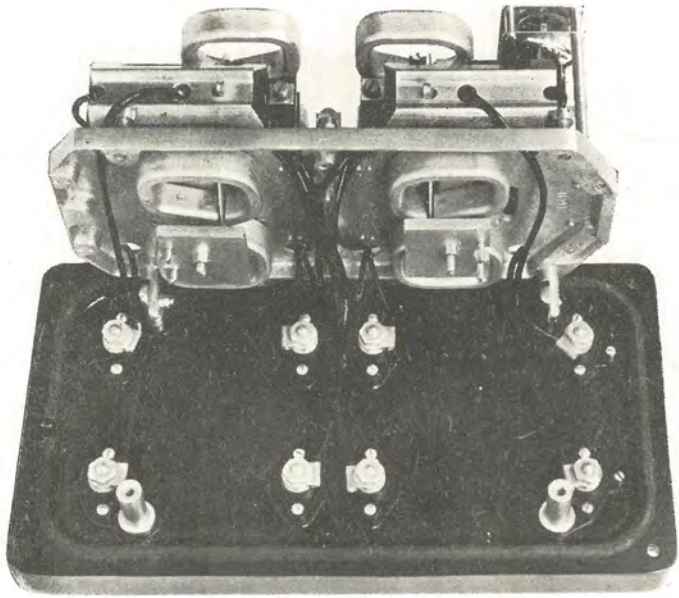
On Wednesday the 29th I called in the afternoon and was allowed to be with him for a short time. The anaesthetic had upset him very much and he looked terribly ill. After this I went down every afternoon to sit with him, and a few days later he was allowed to have any of the staff at the home to see him and deal with such business as needed his attention, and in a few days I was able to take the children to see him.

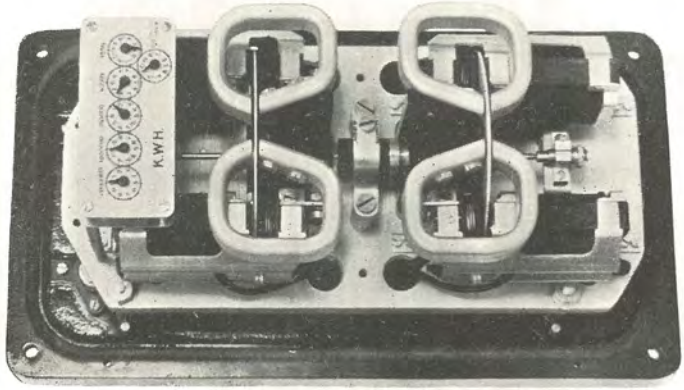
Sister Gertrude, the matron, told me that Basti was one of the best patients they had ever had. He never complained and was always so grateful to anyone who did anything for him.

My husband was to have got up on Saturday, February 15th, but when I went to see him he did not look so well and they decided he was not to get up till the following Tuesday. On that day he lay for a short time on a sofa. He was very weak and very glad to get back to bed again. He had lost weight, and as he was never a decidedly robust man we felt rather anxious about him.



MODERN FERRANTI METERS





MODERN FERRANTI METERS

It was a great day when, on February 23rd, I was able to take him home in a brougham. He had been in the nursing home four weeks. On the Monday we went for a drive to Hampstead and called in to see my mother there.

A great many friends and business acquaintances came to see him; among them Mr. Frank Bailey, the well-known engineer (he later became Engineer to the City of London Electric Lighting Company), and I remember how delighted Basti was to see him—they had so much in common.

By the 3rd of March the doctor considered his patient was strong enough to go away for a change, and we decided on Shanklin, in the Isle of Wight. Our oldest boy, aged five, had not been well so we took him with us to the Spa Hotel.

While we were at Shanklin I learnt to ride a bicycle on the beach. In these days such accomplishments are taken for granted, but in the year 1896 the tea parties were seriously discussing the problem: OUGHT WOMEN TO RIDE BICYCLES? Basti was very anxious I should ride so that I could go on expeditions with him. It was hard work in the days of long skirts, but after a good many tumbles on the sands I mastered it.

Soon after our return to Ashchurch Grove, on March 31st, there arrived two beautiful bicycles, "Columbias," fitted with wooden frames so that they should be as light as possible to ride. Basti had said nothing about their purchase and this was, therefore, a delightful surprise. Next evening we went for a short ride between six and seven. I felt very nervous on the roads and decidedly daring, but we kept to the quieter streets and I soon got accustomed to riding.

Very often at week-ends we went on our bicycles to visit friends: to Taplow, Richmond, and other places.

I vividly remember one Saturday afternoon when we cycled over to see Mr. Frank Bailey, who was then living at Richmond. All went well until we started to return home. It was dark and I had never ridden at night before. I found it very difficult to get into the saddle and when I succeeded the lamp wobbled and threw gigantic shadows about so that I fell off again. I'm afraid I got very angry with Basti and told him he ought not to take me out like that and make me return in the dark. . . . However we got home safely. I never liked riding at night, as, being short-sighted, I was at a disadvantage. Basti suggested we should have a tandem. "No, thank you," I replied. "*You* would go so fast I should fall off and you'd never notice and I should be left in the ditch." Speed fascinated him so far as wheels were concerned—from push-bikes to motor-bikes, and in later years, motor-cars. He was a first-rate driver, but fast. I used to say to him, "You are one of the slowest men to make up your mind that ever I knew but the quickest on wheels."

It is difficult to-day to realize how much pleasure those first bicycles gave their owners. All sorts and conditions caught the mania and most of the popular songs of that time were about bicycles or cycling. We had occasional mishaps. Having started on his bicycle very early one morning to breakfast with Mr. Frank Bailey, Basti had a fall and hurt his knee; this and a broken screw on the bicycle prevented us from going an intended ride the next afternoon. However, to make up, he took us (Zoë and me) to Olympia in the evening. I remember how delighted we were because in those days he so seldom had time to take us out anywhere.

Sometimes on Sundays we took the children for a drive in a brougham or victoria. This was a great treat for them though to-day it sounds decidedly slow. We

went at a jog-trot through the never-ending streets and did not seem able to get anywhere. To-day my grandchildren go dashing around in the fastest cars all over England. I wonder if they are better and happier for it? One naturally hopes so but——?

In May 1896 I accompanied my husband on a visit to the North to decide on a place for our new works. We first of all went to Coventry and had a look round. But the only buildings to be had there did not fulfil the necessary requirements. Later these works became the Daimler headquarters of Sir Ernest Manville. From Coventry we went to King's Lynn and had a look at some building ground we could either rent or buy. After considering this we decided that the Hollinwood works were best suited for our purpose. At Hollinwood there was plenty of room to extend and the rent was low. The district was the reverse of attractive from the residential point of view. Nobody lived there except mill people, who went about with woollen shawls over their heads and wooden clogs on their feet. (But what a difference to-day! The Ferranti works have certainly brought more money into the place, with the result that there are now attractive shops, and shawls are no longer considered fashionable wear.)

On that first visit to Oldham, having decided on the works, we hired a cab and went to look at Broomhurst —the beautiful house which eventually we took. It was situated in a large garden, well wooded, and with smooth grass lawns enclosing the building on three sides. There was also a lodge, a nice carriage drive, and excellent stables. But again the irony of circumstances compelled us to have gas for lighting purposes! We certainly saw our new house at its worst on that first visit. Everything conspired to be as depressing as possible. The rain poured down all day; the lanes

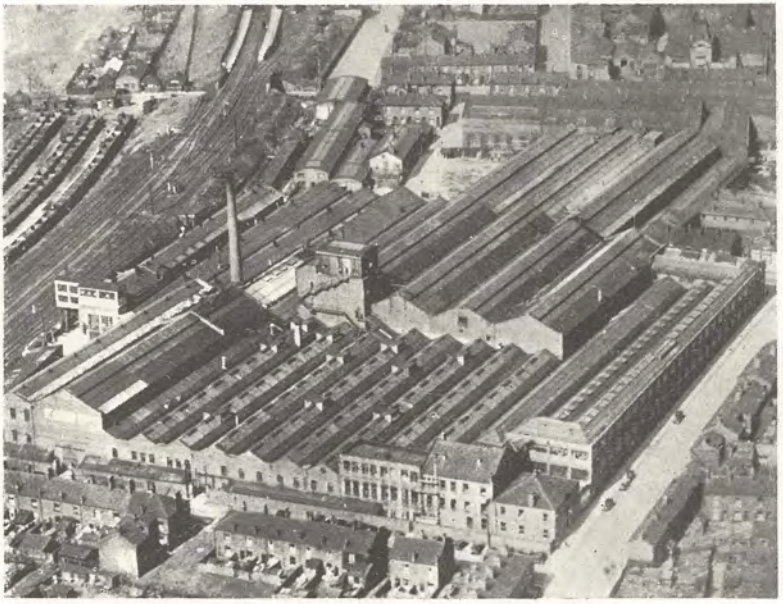
were heavy with thick, black mud, and when we reached the main road that we had to cross we were stopped by a procession of slow-moving carriages. It was the funeral of Mr. Lee (the late husband of Dame Lee, of Werneth Park, Oldham). I had never in my life before seem such a long procession of carriages.

Perhaps that wet day was sent as a warning of what to expect. For my memories of Oldham are chiefly of "the rain that raineth every day." However, in spite of the rain and the funeral procession that seemed as though it would never pass, we were young and enthusiastic. To be able to secure such large works at a moderate rent was better than we had hoped and here we could extend to our heart's content. The Ferranti works are now about six times larger than they were then and employ between five thousand and six thousand people. There is not much doubt that we chose the right spot, as the principal thing Basti was concerned about was labour, and he always felt that in that district he could get the labour—and good labour—that he wanted. Certainly nobody could have better workpeople, and less trouble with them, than we have had.

Is there anywhere a more fatiguing business than moving into a new house? At such times friends who will set to work and help are welcome as angels. I remember how grateful we were to Mr. Atkinson, who was on our staff (brother of the well-known Mr. Llewellyn Atkinson) for all the assistance he gave us at that time.

We soon found it imperative to get out of Oldham occasionally and away from the shawls, the wooden clogs, the dark, heavy atmosphere, the rain and the black mud. Sometimes, at week-ends, we would hire the only conveyance to be had: a heavy old coach, like

VIEW OF HOLLINWOOD WORKS IN 1896



AERIAL VIEW IN 1934 OF HOLLINWOOD WORKS

a hearse, with two black horses. It was curiously like driving to one's own funeral, and by the time the two ancient and respectable horses were beginning to come within sight of the country it was nearing their supper-hour and so we had to return.

Fortunately we had our bicycles, but the hills round Oldham were very trying. We used to toil up to "Bills o' Jack's," and I well remember one day when Basti and I and Mr. Atkinson were pedalling up the hill, some workmen sitting by the roadside shouted after us, "Call that pleasure?" Basti was a keen hill-climber and so up we toiled to the top. But the run down on the other side, with one's feet comfortably on the "rests," was certainly "pleasure." I think it was well worth the long ascent.

In August Mr. Kolle and my brother John came to stay with us. On the August Bank Holiday we took a train to the moors, had a long tramp and returned by rail. We carried our tea with us, intending to have a picnic. Unfortunately the kettle was rusty. Mr. Kolle volunteered to clean it, but did the job so thoroughly that he made a hole in the bottom. It was hot and we had to go on our way thirsty. We teased him a good deal about that kettle, because being an expert on cleaning boilers, we thought he ought to have known how to clean a humble kettle. When we reached the railway station we found the train had come in packed. We managed to squeeze ourselves into one of the vans Having got over the excitement of catching the train we began to breathe again. Only then did we discover we had got into a fish van. It had no windows and the smell was beyond description. I don't know how we should have endured it had not one or other of the men kept opening the door a few inches to dilute the fumes. We reached home at ten-thirty, very tired and

very thankful for a good meal—without fish. I am sure we all enjoyed that week-end in the Black Country, and by some strange freak I don't think it rained.

Being so far away from London, friends and relatives whenever they could pay us a visit were very welcome. My sister Pat came to us for a few weeks that summer. She had been a student at the Slade School of Art and was delighted with the wide view of chimneys from our house. With a stormy sunset behind them one got magnificent effects of colour. Certainly Oldham is not a favourite centre for artists, but my sister became eloquent of its possibilities.

The priest of the church we attended in Oldham, Dean O'Callaghan, was a delightful Irishman and an excellent preacher. He became a great friend of ours and often came to see us. He had an Irish jaunting-car and a pony which were to be raffled at a bazaar he was getting up. It was the following year, I think, that he took my sister and me an excursion into the country in the car. We were caught in a real Oldham thunderstorm (they have good ones there!) and had to dash to an inn for shelter. We certainly enjoyed that "jaunt"—it was such a complete contrast to the creaking old hearse with its slow, black horses.

Dean O'Callaghan was most anxious that Basti should open his bazaar. It was the first and last time he ever opened a bazaar. It was a great effort to him to speak at public functions, especially on anything outside his own subject. He was an excellent speaker and it was difficult for his audience to realize how nervous he was. When dealing with electrical matters he was so interested in his subject that he felt the strain far less.

Other friends came to visit us during that first year. Mr. and Mrs. Charles Sparks arrived towards the end

of October and stayed with us before moving into their house, which was within easy reach. He was manager of Ferranti's at that time and they were both great friends of ours. It was while they were with us that the great burglary occurred which turned out in the end (as Dean O'Callaghan might have put it!) not to be a burglary at all. At two o'clock in the morning we were all awakened by a sudden and terrible noise. Basti and I started up. When digging in the garden we had found some coal and I had somehow got it into my head that the house was built over a disused mine. My fear was that there might be a violent explosion or that the house might collapse into the mine. My first thought therefore was that we were either about to go up or to go down. The noise swelled into a terrible battering and thundering. At Broomhurst we had a large hall and the staircase led up to a balcony on to which the bedrooms opened. With the exception of Mrs. Sparks, everybody rushed out on to the balcony. It seemed now like a determined attack from without. Thinking to scare the burglars I called out to my husband: "Call out the men!" Basti, still a little sleepy, stared at me in blank astonishment and asked, "What men?" He then went down and opened the door an inch. The thieves did not burst in. A policemen had come to tell us that a bicycle had been left outside the door. It was our first experience of the extreme care the police of Oldham took of our property.

In November my father and mother came to stay with us. They were very anxious to see the new works. My mother and I and the baby (Vincent) returned to London on the 9th, my mother's fifty-third birthday. My father joined us at Crewe.

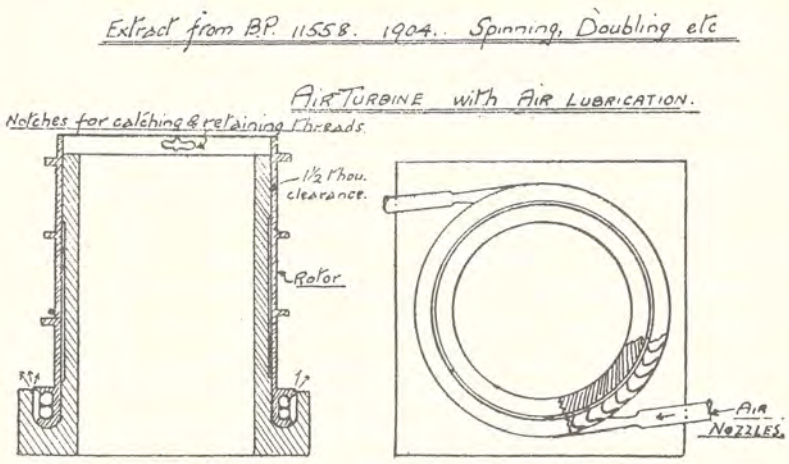
That year closed with a very happy Christmas house-party. We had with us my sister-in-law Juliet,

my nephew Ladislas, Mr. and Mrs. Charles Sparks, Miss Muriel Sparks, Mr. Atkinson, Mr. Martin, and his brother. At midnight on the last day of the old year Mr. Atkinson went outside the house and rang the dinner-bell to welcome our first New Year at Oldham.

I find a note in Madame de Ferranti's diary recording that Basti and I went to Liverpool on January 1, 1897, and that we paid a visit to Bysshë, at Egremont. Bysshë was the family name for Basti's nurse, who was devoted to him. It was Bysshë who took him when almost a baby to look at his beloved engines at Lime Street Station in Liverpool. I remember very well the visit to her. She had married a Mr. Seddon, who kept a poultry and fish-shop in Liverpool. They had four sons, who all became priests. But in her eyes there had never been so marvellous a baby as Sebastian.

My husband went to Glasgow towards the end of February to visit a great friend of his, Mr. Watson, owner of a large paper mill. Having invented a process for cotton twisting, Basti was very anxious to keep this as a private venture for himself, separate from Ferranti, Ltd. But at that time we were hard up. He therefore asked Mr. Watson to buy these patents from him for a nominal sum and hold them until he could afford to do something with them. To this Mr. Watson very kindly agreed. Eventually Mr. Ernest Coats interested himself in these inventions with Basti. Though this side of his work involves too many technical details to be dealt with fully, no account of his life would be complete without at least touching upon it. Practically nothing is known by the public (and very little by engineers) of the enormous amount of thought and care he put into these inventions for the improvement of spinning. From 1906 up to the time of his death,

excepting for the war period, he was continually at work on the problems involved. The processes of hand and spinning-wheel spinning, in use up to 1764, were simple enough and need not be described. The spinning jenny of Hargreaves, and the mule of Compton, mechanized the process about 1764 so far as related to discontinuous spinning. But there was



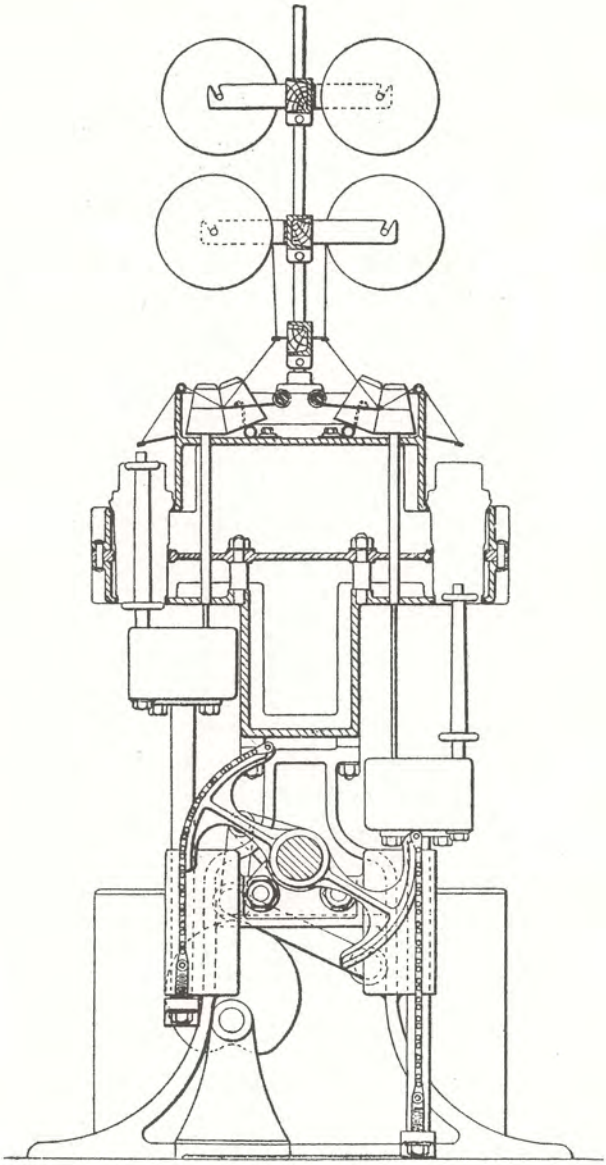
Tiny Air Turbine used in Cotton Spinning.

This little air turbine ran experimentally up to 60,000 revolutions per minute, so it was decided to adopt 21,000 to 24,000 revolutions per minute as a safe speed, and to compel all the gear to work at this speed.

another method of spinning whereby the process, instead of being a discontinuous one, was continued by the use of a "flyer" which twisted and wound up the thread. It was Arkwright's invention which mechanized this process about 1769. The various improvements in detail allowed this type of spinning to be carried up to 3,000–5,000 revolutions per minute; above this the vibration and the bending of the flyer

under centrifugal force made higher speeds uneconomic. The next step was the ring spinning frame, in which, in place of the curved arm with a hole at the end revolving, only the hole revolved, in the shape of a very light steel ring sliding on a fixed track surrounding the bobbin. This allowed a very great increase of speed, say, up to 10,000 revolutions per minute. But here other troubles developed, particularly in the matter of the driving bands, which slipped and worked irregularly, thus breaking the threads and producing inferior work; whilst further, the pull necessary to unwind the thread from the feeding bobbin, being conveyed by the spinning bobbin, every inequality in the motion of the latter tended to break the thread.

The Doctor, in his first patent of 1903, cut right across these two difficulties. He proposed to drive each spindle separately by a small polyphase motor or a turbine at the base, and he inverted the twisting operation. Instead of the spinning bobbin drawing off the threads from the fixed supply bobbin and winding it upon itself, he spun the supply bobbin, drawing off the thread by feed rolls geared to the supply bobbin, thereby maintaining a constant feed to spinning ratio, and wound the finished thread on to a fixed bobbin. This procedure is especially applicable to the doubling or twisting of several spun threads one upon another. In another patent he returned to the principle of the ring-spinning arrangement, but having given the spinning bobbin a perfectly regular motion by the air turbine, he substituted for the retarding ring, dragged round on its encircling channel, an independently driven encircling tube carrying the thread through a hole and having a perfectly definite retardation. In order to allow of the high speeds of rotation necessary, there were arrangements for bearings supported on



SECTION OF A FERRANTI SPINNING MACHINE

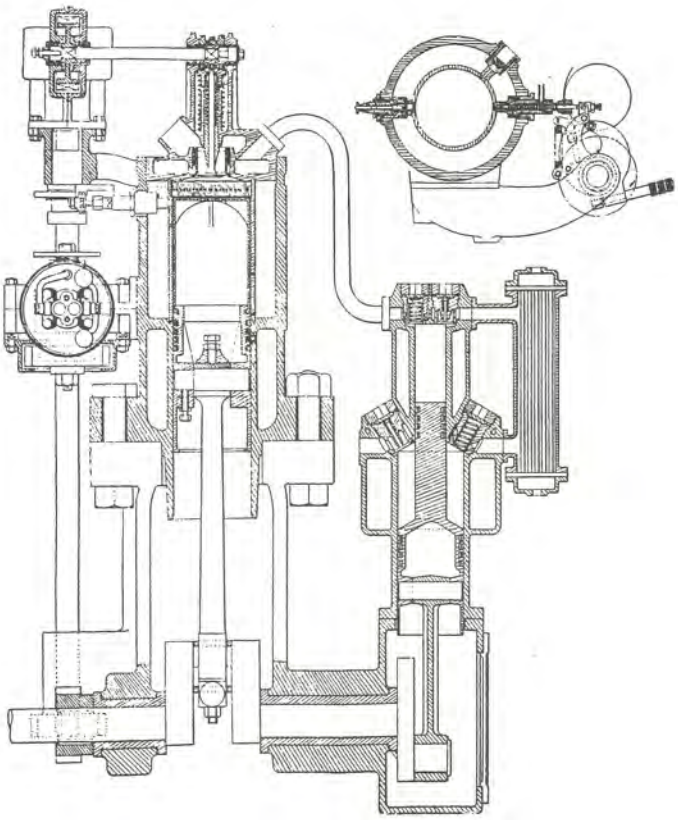


ILLUSTRATION FROM A PATENT SPECIFICATION FOR A SINGLE RECIPROCATING "RED-HOT" GAS ENGINE

compressed air, thus avoiding lubrication by oil, and arrangements for taking the weight of the revolving parts by air or magnetic lift. Further patents covered self-aligning and self-centering bearings to allow the spindle and bobbins to revolve about their dynamic centre of mass, and many other matters of detail. Nothing has been published as to this work, nor did it reach finality, and whether the greater requirements of machinery and accessories will justify itself economically time will show. In any case these various patents and improvements exhibit the mechanical side of my husband's work at its best.

I must return now from these highly technical matters to life in the rough, and life in the winter of 1897 at Oldham was decidedly rough. It was a winter of colds varied by an epidemic of mumps. The colds were caught on the spot, the mumps were imported.

In February of this year a niece of mine came to stay with us. She was at school at the Sacred Heart at Carlisle. We decided to send Zoë back with her to the Convent to see how she liked it. It was the first time she had left home and I remember seeing her off at Manchester station and coming away feeling very lonely and unhappy. On February 16th I received a letter from my niece saying that mumps had broken out in the school. I wired that Zoë should come home as we were anxious she should not take it. At Easter we decided to go to Blackpool for a few days' holiday. My sister Rachel (who was on a visit to us) and I started off with the three children. Basti was to follow a day or two later.

No sooner had we got there than Zoë developed symptoms of mumps. She was very ill with it and my sister helped to nurse her. Within a week my sister was down with mumps. Being in rooms, it was very

awkward and uncomfortable. The two boys took it, but not so seriously, and we were glad when we were able to get back to Oldham.

At the beginning of April Basti did not feel well and went to bed. Next morning I could hardly recognize him. His neck had swollen to such proportions that he looked more like the family butcher among his joints and sausages than Sebastian de Ferranti. He was up within a week, but feeling so ill that on getting out of bed he nearly fainted. I have always thought that this attack of mumps started the trouble which led to his last illness. Doctors in those days did not pay much attention to mumps, and I think he did not stay in bed long enough.

Without our summer holidays I don't know how we should have endured Oldham. Fortunately North Wales was within reach and in August we took Madame de Ferranti and the children to rooms at Colwyn Bay. We all loved North Wales. Basti had spent his happiest holidays there as a child. It was impossible for him to be long away from the works, but he came to us for week-ends.

Whilst at Colwyn Bay, Dean O'Callaghan came to us for a visit. I think he missed his jaunting-car (which had been raffled) for while with us his great joy was to go and watch the coaches start off. One day he persuaded Basti and me to take the baby (Vincent) a coach ride to Penmaenmawr. I shall never forget that ride, the roads were so narrow and precipitous. As we turned at the top of the Sychnant Pass a sudden gust of wind carried away the coachman's hat. He let go the reins, the horses took fright, and for an instant things looked unpleasant, for we were on the edge of a gaping gulf. The Dean, who was sitting at the back of the driver, took hold of the reins and kept the horses on the road

until they had recovered from their alarm. Of course he said afterwards there was no danger whatever, but then he was not a man to sing his own praises and I don't think, in this matter (though a Dean!) he told the truth.

We spent Christmas this year at home at Broomhurst, Oldham. As usual we all went to Mass together, driving in a cab up to St. Patrick's and walking home.

My sister Pat was staying with us at that time. I was expecting my fourth baby and she came to be with me and to take charge of the house. A week before the baby was expected I had a wire from the nurse to say she was unable to come as arranged. This was rather upsetting, especially as Basti had to be in London that week. The event occurred rather sooner than we anticipated. My sister sent for the doctor, who was fortunately able to get the services of the district nurse. I had a very bad day and night and early next morning my sister went down to the sitting-room to send a wire for Basti to come home. Just as she was sitting down to write she saw him enter the drive and walk up to the house. He had had a feeling that I was ill and had caught the night train. He arrived, to my great relief, at about seven in the morning, and the baby (also to my great relief) at eight-thirty. Vera (the baby in question) should be full of gratitude to Oldham, for she was born in Oldham, met her husband in Oldham, and was married from Oldham. If this doesn't entitle her to be regarded as an "Oldham lassie," I don't know what would.

As soon as the baby was a month old my sister took me and the four children to Blackpool. Money was a bit scarce at that time and we could only afford to go into rooms on the South Shore. Every day we went the whole length of the promenade in the electric

tram, and the fresh sea air soon picked me up. It seems funny nowadays to think of oneself being delighted to go to Blackpool, but to anyone who has lived long in Oldham it was marvellous to get away from the chimneys and smoke, the damp, the rain, and the darkness to blue sea and a clear sky.

The problem of finding suitable schools for the children was very difficult at Oldham. Zoë, being the first child, had been a bit spoilt. We decided the best way would be to send her to a boarding-school and our choice fell on the Sacred Heart Convent at Roehampton. But she never really settled down there and in the middle of the first (and last) term she had a very severe attack of measles. On her return for the Easter holidays we decided not to send her back, but to engage a daily governess and send the boys to a day-school in Oldham. We were very fortunate in securing the services of Miss Constance Gough, who came to us in May 1899. She lived with us for about nineteen years, and I owe a great deal to her for the way she helped me look after the children. At first she used to cycle every day from Trafford Park to Oldham. And her work was not always easy! I remember she came to me in great distress one morning. Zoë, she said, had locked herself in her bedroom and would not come to her lessons. "Don't worry," I told her, "when she has had enough solitary confinement she will come out," and she did. Miss Gough proved to be the one person who was able to manage her.

In the summer of that year we took a furnished house at Old Colwyn. While there we decided that we would not return to Oldham for the winter. The children had been so continually ill during the winter before that we thought we had better try and find a rather better climate within reach of the works. After visiting

a number of places we decided on Birkdale, which was convenient for Basti, and took a furnished house there in Bickerton Road. However, in the autumn of 1900 we decided that it would be better to return to London, and we rented a house in Lyndhurst Road, Hampstead.

On April 9th, my husband's birthday, our fifth child, Yolanda, was born. It was the evening of the Old Ferrantians' Annual Dinner which Basti was, of course, attending. I insisted on his going and at about nine o'clock the baby was born. This was the first occasion he was not at home at the time of the birth of one of our children. The nurse telephoned through to him and he came in for hearty congratulations from all the Old Ferrantians at the dinner. It is sad to think that we should have lost Yolanda at the age of seventeen from appendicitis. She was a very good baby and used to sleep well. Often in the evenings I was able to play cards with the nurse and Herbert Donner while my husband went on with his sketching or drawing. He was always very happy if I could enjoy myself in this way while he was free to sit and draw, read, or think out his inventions, just as he felt inclined. Herbert Donner (Basti's cousin), who had always done a great deal of work for him, was at this time acting as his private secretary and lived in rooms quite near us.

When Yolanda was a month old Basti took myself, the nurse, and the baby to Sheringham for a few weeks. We thought we might find a house there for the summer holidays. He had to return to Town on business after a few days and on rejoining us for the week-end, to my surprise, he brought Vera, aged four. He thought she was not looking well and the sea air would do her good. The nurse was very annoyed at this as she did not think Basti was capable of looking after a small child on so long a journey. It was certainly a trying

experience for him as Vera was train-sick all the way down.

On Saturday morning we hired a carriage and pair of horses and, with the nurse, the baby, Vera, and myself, drove round to look at some furnished houses to be let. As we were driving back the door of the carriage flew open and Vera fell out. The metal tyre of the wheel went over one of her legs just at the back of the knee and she was terribly cut. We drove at once to get a doctor, but they all appeared to be playing golf. At last we found one and the leg was strapped up. It was none too soon as the cut was near a main artery. Basti was so upset that he wired for Vera's nurse to join us. When she turned up (in tears) she said, very emphatically, "I told you so. I knew you were not capable of looking after the child, sir." It certainly did seem careless of us grown-ups to let her fall out. But the door could not have been fastened properly. It was some time before she was able to walk. On Basti's next visit to London he returned with a most beautiful farmyard, with every kind of animal, each clothed in its proper skin. Vera was so pleased with this present that she soon forgot all about her leg.

We found a house at Sheringham and went down there with all the children, Madame de Ferranti, and Miss Gough and the maids.

It is strange the queer things that remain in one's memory. All I can remember of that holiday—a very happy one—was earwigs. They crawled everywhere; got into the house and into the beds. We seemed to be all the time stamping on earwigs and it was hard work, for one stamp isn't enough to kill an earwig. They each require a sword-dance.

Hampstead proved an excellent place for schools. There was a very good preparatory school kept by

Mr. Stallard, to which we sent Basil and Vincent. The discipline of the school was splendid and the games very well managed. Basil distinguished himself at boxing and Vincent at gym. From Mr. Stallard's they were able to pass into Repton in 1905.

At the works in September 1903 things were not going well financially. Not knowing much of business matters at that time I was very puzzled when Basti told me that "Receivers" had been appointed on behalf of the Debenture holders. I remember meeting Mr. Tait (one of the Receivers) at the Institution of Electrical Engineers' Dance shortly afterwards. He was much amused (and so was my husband, who was with me at the time) when I told him that putting in a Receiver seemed to me more like putting in a Retriever, for it appeared to make no difference to our income. After this Mr. Tait was always known among us as "the Retriever."

In February 1904 a petition was entered in Court for the winding up of Ferranti, Ltd.

Later in this year a meeting of creditors was held at which a scheme for the reconstruction of the company was unanimously approved. Under the scheme it was arranged:

1. That the first mortgage Debenture Stockholders would receive in exchange for their present holding a similar holding in first mortgage Debenture Stock of the new Company, together with payment of arrears of interest.

2. That the second mortgage Debenture holders would receive in exchange a similar debenture in the new Company, together with payment of arrears of interest.

3. That the unsecured creditors would receive fully paid-up Preference shares for the nominal value of the debts.

4. That the Preference shareholders of the present Company would receive fifty per cent. of their holding in Ordinary shares of the new Company.

5. That the Ordinary shareholders of the present Company were to get nothing.

At this point it seems advisable to go further into detail with regard to the Ferranti company, which was registered on February 27, 1905, under the directorship of Mr. A. W. Tait (Chairman), Mr. S. Z. de Ferranti, Mr. J. M. Henderson, and Mr. A. Whittaker.

The issued capital of the company was:

	£
53,281—6% Cum. Pref. shares of £1 each ..	53,281
At June 30, 1905—	
60,000—7% Ordinary shares of £1 each ..	60,000
10,000 Deferred shares of £1 each	10,000
	£123,281

The issued capital of the company now is—

At June 30, 1933—

	£
500,000—7% Cum. Pref. shares of £1 each	500,000
600,000 Ordinary shares of 10s. each ..	300,000
	£800,000

The above figures show that the capital has increased six and a half times since the formation of the present company.

The following figures show how the annual turnover of the company has increased since its formation, i.e. nearly ten times:

	£
Year to June 30, 1906	130,000
Year to June 30, 1933	1,200,000

Of the men who worked with my husband in the company during these years. mention should be made of:

Mr. A. B. Anderson (appointed General Manager in 1905).
Mr. M. B. Field (Manager of Switch Department).
Dr. C. C. Garrard (Manager of Instrument and Transformer Department).
Mr. W. Hamilton (Manager of Meter Department).
Mr. R. H. Schofield (Sales Manager).
Mr. J. W. Davies, Mr. J. Turner, Mr. W. Holmes.

Looking still further ahead, in 1919 Mr. Vincent Z. de Ferranti joined the company (following service with H.M. Forces in Gallipoli, etc.) and took charge of the production of 6-inch H.E. shell forgings. Following the Armistice he was appointed Manager of the Power Transformer Department, and in February 1924 was appointed a Director of the company. On January 24, 1930, he was appointed Chairman and Consulting Engineer, and he has directed and controlled the fortunes of the company during the past four difficult years.

Mr. Denis Z. de Ferranti joined the sales organization of the company in November 1928.

He was appointed Assistant Manager of the Meter Department as from January 1, 1931. He was appointed a Director of the company on February 3, 1933.

The present Directors of the company are:

Mr. Vincent Z. de Ferranti (Chairman).
Mr. R. W. Cooper.
Mr. Denis Z. de Ferranti.
Mr. H. W. Kolle.
Mr. Arthur Whittaker.

One of the most successful patents as regards bringing in income when we had very little to depend

upon was the Ferranti-Hopkinson valve, for which we received royalties. No doubt Hopkinson realized that if they did not take up the invention, Basti would have made the valve himself, and would have become a keen competitor.

In the summer of 1904 we took the children to rooms at Rhos-on-Sea, near Colwyn Bay. In those pre-car days it was slow work getting about in Wales. We had two girls, daughters of Mr. Massey, engineer to the King's household, staying with us. They were anxious to go up Snowdon and see the view, so Basti agreed to take the two girls and myself. We started early in the morning for Llanberis by train. It was lovely weather when we set out, but later in the day it grew cloudy and a wind sprang up. When we reached Llanberis in the afternoon a train was just starting for the summit. We got in and the rain began to come down in torrents. By the time we reached the summit a thick mist covered everything, and the wind howled most dismally. Nothing was to be seen, and the dampness of the air cut like a knife. The guide-book had informed us that refreshments could be had at the hotel. We looked anxiously round for this "hotel," but could only see a wooden shed. We went into this shanty, furnished with a few chairs and a stove. Here they cooked us eggs and bacon and told us that the gale was so bad that the train could not go down again that night. There was nothing to be done but to stay where we were. In those days some little wooden huts stood opposite the hut we fed in, the roofs of which appeared to be held down by large stones. These were used as bedrooms. We all became rather thoughtful. I think the girls (and I) were terrified. Everything seemed to be rocking in the gale. We wondered where the curious splitting sounds came from. Talking out-

side the hut was impossible. One's mouth opened, but one's voice was blown out like a candle. When it came to getting across to our bedrooms the problem of walking from hut to hut was alarming enough. The men in charge had practically to carry us across. I could not have stood on my feet. When we reached our rooms (fortunately one led into the other) we found the blankets and bedding soaking wet. The stones that kept on the roof didn't keep out the rain. We had no sleep that night. The girls sat on chairs holding on to each other, as they expected every moment to be blown, hut and all, over the edge. I think it was the roughest night I ever spent. Basti was, as usual, perfectly calm, although he did say that in such a gale the hut didn't appear quite as solid as the mountain. Morning came at last (no, we did not go out to see the sunrise) and we breakfasted on eggs and bacon (pigs and hens apparently do well on Snowdon!). We didn't wait for the second train down. We caught the first. I have never been to the top of Snowdon again. Frances Massey became the wife of Mr. Mackinnon, K.C., now Mr. Justice Mackinnon.

Early in 1905 Basti had to be frequently in Sheffield as he was arranging with Vickers to make certain experiments on a turbine he had invented; he was also very often in Paisley in connection with the cotton machinery on which he was working for Coats. Ferranti Ltd., being mainly in the hands of Mr. Anderson, Basti had more time to devote to his latest inventions.

The seven years' lease of our Hampstead house having nearly expired, we decided we would not renew it. Living in London necessitated Basti's going North so frequently that he decided to take us all up to Grindleford, in Derbyshire, a beautiful district. We were fortunate in finding a country hotel there, the

"Commercial," kept by an unusually capable woman —Mrs. Outram. Madame de Ferranti was now growing too old for travelling. We had a nurse to look after her day and night. We decided therefore to leave her in the Hampstead house for the summer with the nurse and the maids to attend to her, my husband going back to see her as often as he could. We took all the rooms that were to let at the Commercial Hotel and spent the summer there—a very happy one. Although the hotel was primitive, Mrs. Outram was a very good cook and we had wholesome country fare. To me it was a very welcome rest as I had a very busy time at Hampstead, with the house to look after and Madame de Ferranti and the servants and the children.

The following year (1906) was a sad one for my husband. His mother, who had had a slight stroke, and was growing very much weaker, died on Monday, the 9th of April. Unfortunately he had left early that morning for Sheffield, never dreaming that the end was so near. She had been up practically every day until the 8th. I don't think anyone ever had a better son. Basti was devoted to her. I was alone with her when she died. The passing came most peacefully—she just slept away. Two hours before she died I took the baby Yolanda in to see her. Although she was too weak to speak she was quite conscious. I remember so well the smile they gave each other and Yolanda was the last person she took notice of. Yolanda was the next one to go. And, looking back, it has always seemed to me that Madame de Ferranti in some way knew that she would be. The smile and little nod she gave seemed to say: "It will not be long before I see you again."

Basti's love for her was deep and abiding. How terribly he felt the loss and what she had been to him in childhood, and ever since, can be seen, in some

measure, from the following letter he wrote to his sister Wanda:

HAMPSTEAD,
April 12, 1906.

MY DEAREST WANDA,

Very many thanks for your letters of the 11th to Gertrude and myself.

I was not here when Mother died. I had been with her Saturday and Sunday and only left on Monday morning for Sheffield.

I cannot think how it was that I was so blind as not to see how she was, but I had such belief in her strength which had repeatedly carried her through that it never entered my head that the end was near.

I said good-bye to her on Monday morning and she wished me a thousand blessings for my birthday and I went away quite happy saying that I would be back next evening. She had had a very bad cold for the last few days, but seemed to me to be getting over it. Really I believe that she had influenza caught from Nurse Clements, who has been ill with it. This must have weakened her heart as you could not say that there was really anything wrong with her. On Saturday she was up as usual sitting in her chair. On Sunday she stayed in bed and slept a bit. I sat with her during part of the day but went out to tea at Mrs. Ince's in the afternoon, so that you can see how little I appreciated the position. She knew that we were going away for Easter to the Continent and got me to put down in her diary when we were leaving and when we should be back. It was arranged that Father Bracey of the Priory should come to give her Communion on Tuesday morning the 10th, but on Saturday and Sunday she asked us to write putting him off. This shows how she felt, but I am quite sure that she only did it as she thought she would be better a little later on. She was able to speak but very poorly lately and it was very difficult for her to get the words she wanted. If she had been able to talk it would have made things much easier. Gertrude has been

doing a great deal for her lately which is some consolation to me now, as they were really great friends.

She always spent a long time every day reading her prayers up to within the last week. In fact I cannot say that she did not do so on Saturday. Gertrude says that on Tuesday her lips were moving as though she was praying, and no doubt her mind was working perfectly to within a couple of hours of her death. She will be buried on Saturday in our vault at the Hampstead Cemetery where my Father was buried three years ago.

We cannot have a requiem Mass said as there is no Mass before Easter Sunday. There will however be Masses offered for her at Holly Hill, Hampstead and at the Priory Churches.

I have had a wire from Wladziu saying that he is coming to the funeral. Juliet will also be there. I want you to ask if you may receive anything belonging to Mother; if you may I should like to send you her Rosary or her Prayer Book which she used for so many years.

I cannot in any way express to you, dearest Wanda, what a blow this has been to me. I reproach myself very much for not having shown her more loving kindness. Although she always appeared business-like and unbending in her ways, she was really most loving and wanted and appreciated love. She often asked me if I still loved her as much, and I asked her how she could ask such a question. I often meant to tell her how dearly I loved her but never really did so fully, as it was so difficult to make her hear and she always would have her door kept *wide open*. I only hope she saw deeper than the surface, and knew how much she was cared for. Gertrude saw a great deal of her and I am sure they were most fond of each other. Gertrude feels her loss very much. I am going up now to look at her for the last time as the coffin will be closed this evening.

It is now eight o'clock and I am writing in the dining-room with the three large pictures of her when she was young hanging on the walls, the only other portrait being

that of Vincent in his dress as a Naval Artillery volunteer which you painted.

Gertrude and I have been into her bedroom to look at her for the last time; she seems to be hardly changed at all and might be asleep only her face has a look of more perfect peace than when she was asleep ordinarily.

I am sure that you need have no fear as to her perfect goodness and that she was in every way prepared to die. You must remember that her greatest idea in life was that there was only one road to follow and that was the right one and that she was always prepared to do right at no matter what cost. Her influence upon me was very great as she so wished that I should get on and do well and to the best advantage whatever I took in hand to do. She so wished that I should always do what was right that her influence has been the greatest good to me.

I can never repay what I owed her and must always regret that I didn't use the time whilst she was here to do more for her. I shall always think of her as my Darling Mother who loved me most dearly and try to do all she would have wished me to do.

Good-bye, dearest Wanda. With much love from us both.

Your loving brother,

BASTI.

We gave up the Hampstead house and determined to go North permanently so as to be nearer Basti's work. While looking about for a house we stayed again at the Commercial Hotel, Grindleford. We arranged with Mrs. Outram to have some of our own furniture there and a piano.

The boys passed into Repton from Mr. Stallard's school. Being Catholics, we were confronted with the religious difficulty. Mr. Ford, then head master, did not make any trouble about this and it was arranged that they were to be in Mr. Surtees' house, as he was not a clergyman. They were to be allowed to attend

Mass every Sunday at Burton, riding there on their bicycles. Repton suited us very well as the school was within easy reach of Grindleford.

In the summer of 1907 we had a delightful fortnight's holiday in Ireland. We were a large party: Basti and I, Zoë and Vincent, two French girls (cousins), my brother John, and Herbert Donner. We went over to Portrush, in Northern Ireland, and stayed at the hotel there. I think the French cousins enjoyed themselves. They had been brought up very strictly in the French fashion and used to come and ask me, solemn as little owls, if I thought it was quite *comme il faut* for them to go about with Herbert or my brother.

In October 1907 I was expecting my sixth child. It became imperative therefore that we should find a house. They were building in the high part of Grindleford—but houses that were rather too small for our requirements. However, we persuaded the landlord to alter one of these and slightly enlarge it. Just before Christmas, 1907, we moved into "Ingleside."

It was a cold, bleak district, and to warm the house we put in central heating with an outside coke boiler. And to light the house we were doomed to—carbide gas! It was an ironical position. After nineteen years of married life and in spite of all the work my husband had done to encourage the use of electricity, here we were back again to the old system with its smell and dirt and unwholesome atmosphere.

My youngest son, Denis, was born on May 28, 1908. It had been a cold winter, with heavy snow. But a week before Denis was born we went suddenly into warm spring weather.

At that time motor-bicycles were coming more and more into use. Basil had ridden one while staying with my father and mother at Crowborough. On his return

he begged me to get him one. This I did and when the baby was about three weeks old I looked out of the window and saw Basti trying to ride it. Just at that moment he came a terrible cropper, scratching and bruising himself severely. I began to wish I hadn't bought the machine after all. . . . Later on both boys had machines and became keen motor-cyclists. They were certainly not ambitious of attaining safety first. I remember Vincent taking a curve on the moors too fast, running head-on into a stone wall, knocking it down, turning a somersault, and landing on his feet. His gymnastic ability served him to good purpose and saved his life on several similar occasions.

About this time Basil matriculated at the Sheffield University. From Sheffield he went into Yarrow's works on a three years' apprenticeship and, having finished his time, entered Coats' to assist Mr. Herbert Donner in his work on Basti's inventions in connection with spinning.

Vincent matriculated a year later and followed Basil to Yarrow's. Whilst at Yarrow's he went sailing with two friends, Tudsbery (son of the Secretary of the Civil Engineers) and Browne, in a boat made by Tudsbery. The weather turned rough and the boat capsized. Vincent's letter describing the experience is so graphic and lively that I think all lovers of adventure will read it with interest. The excited female on board the steamer who foamed at the mention of brandy is a type we have all, alas, met!

SHERWOOD,
SCOTSTOUNHILL,
GLASGOW.
June 13, 1913.

MY DARLING MOTHER,

I did not write my adventures to you as I thought Pa would have told you them on the telephone.

"We" left the Canoe Club in the boat at 4.45 p.m. on Saturday. "We" consisted of Tudsbery (son of the Secretary of the Civils) Browne and myself. There was a S.W. wind which was fairly strong. We knew it would be stronger out in the Loch. The boat was a 12 ft. dinghy built by Tudsbery. It was a splendid boat and lasted in a sea which I am sure would have been far too much for any open boat of its size. We ran straight before the wind for Balmaha at a great pace. When we got to Inch Murrin the sea got very bad and Tudsbery had a very hard time keeping her from jibbing. We shipped one sea over the stern and several small ones in front, but easily kept her dry bailing.

We were now between Inch Murrin and Boturich Castle, four miles from Balloch, and two to go to get to Balmaha. The next mile would have been worse, but we should then have been sheltered by an island and made Balmaha easily.

Just before this the block holding the sheet had come away so I put the rope through the lifting ring and held the sheet, while Tudsbery steered and Browne bailed.

This was the position when the *Prince George* passed us at 15 knots on our starboard bow and about 300 yards away. When she had got about 400 or 500 yards past we got her wash coming at right angles to the following sea. We could not possibly steer between the two seas and lurched over to port. Browne went out backwards, I was crouching down holding the sheet and merely stood up, while Tudsbery sat on his seat for some time. The boat then turned upside down and Tudsbery climbed on top of her but she started rolling round and we had to climb just as if we were on a treadmill. At one time she made two complete revolutions without stopping, which was nearly too much for us. We got washed clear once but all got hold again. I pushed Tudsbery down once (so he says) thinking he was part of the boat. We were all under water at the time. Luckily he came up all right. I forgot

to say that at first the boat sank so that we were all standing on her with our chins just above the water. Then the dagger plate (centre "board," made of steel plate) fell out and she came up.

At last she steadied up and stopped rolling and we were comparatively comfortable but every now and again she rolled. We saw the steamer turning as soon as we had time to look in her direction. They came up to windward of us and got their lifeboat out with two men and rowed to us. I climbed into the lifeboat in great style much to the relief of the mate who thought we might be too exhausted, and was followed by Browne and Tudsbery who was very worried as to whether his boat would be saved! We had only been in the water a quarter of an hour and had not found it very cold as we had to keep moving! We never even felt the shock of going into it! It was a different matter in the lifeboat however. I was lying on the floor aft, but Browne and Tudsbery were sitting right up in the bow and got the full force of the wind which, blowing through their wet things fairly froze them. In fact when the mate told one of them to come aft neither of them could stand up. I was horribly cold where I was, so I can imagine what they felt.

It was a very difficult business getting on to the steamer. They tried to pick us up on their weather side but the wind drifted them away faster than we could row to them so they had to go round and pick us up on their lee, a very dangerous affair as they drifted down on top of us very fast. We hit against their paddle-box hard and our boat gave out a horrid noise. Browne gave an enormous leap on to the step of the paddle-box and Tudsbery very nearly as large a one and climbed up on to the top of the paddle-box where he was met by an infuriated female who cursed him for going out on such a day and when they were giving him brandy said: "No, don't give him brandy! Give him hot coffee!" She evidently thought we were drunk as in nearly every other boating accident on Loch Lomond the people have been drunk.

severance came through a difference of opinion between him and his colleagues. At that time the British Insulated Company were manufacturing motor tyres on a considerable scale, and my husband had some patents which clashed. A letter was written by him to the Board telling them he did not wish to seek re-election as a Director at the shareholders' meeting, giving as his reason that the company, having widened their operations so largely, this conflicted with his connections elsewhere.

My husband's life in the early days had been insured by the British Insulated Wire Company for £20,000, which I think shows how great his value to them was. Curiously enough, the policy expired at the end of 1896, soon after he had had his operation for appendicitis. The company did not renew the insurance.

On March 10, 1910, Basti received a wire from the Institution of Electrical Engineers:

> Council to-night unanimously nominated you for Presidency.

Of course I was delighted. My first remark was: "It is about time!"

It seemed to me so curious that so many eminent electrical men, but of no genius such as Basti possessed, should have been elected President of the Institution of Electrical Engineers before him. But genius is a quality which seldom pushes itself and of which many are afraid. It sometimes makes the rather important average people seem small in comparison. The subject he chose for his inaugural address was comprised under three heads: Coal Conservation, Home Grown Food, and The Better Utilization of our Labour. The whole address, which even to-day well

repays study, is to be found in the *Journal of the Institution of Electrical Engineers* (Vol. 46, Part 205). It is sufficient to say here that my husband's capacity for grasp of detail combined with his ability to take a wide and independent view of the subject under consideration, is excellently displayed in this address. He looked forward to conditions in the domestic use of electricity which are still a hope and not a realization. "Notwithstanding present high prices, a good deal of electric cooking and heating is already being done, and although it would appear to be too expensive for general application, still the very good results obtained and the large amount of labour saved is already sufficient to justify its use to-day. When electric heating and cooking are carried on with current at the very low figures at which it would be possible to sell for these purposes, it would only be a matter of time for all cooking and heating to be done by means of electricity."

How far we still lag behind the Doctor's dreams of what might be done is shown very clearly in the following paragraph:

> There is a further application of the electric current which, so soon as the price is low enough, will, no doubt, largely come into use. This is the intensive growing of fruit and vegetables under glass. It is known that considerably more forcing in the way of heat can be advantageously applied where light is also furnished artificially, and it is therefore probable that, with electricity everywhere available at a low price, an immense amount of intensive cultivation under glass with the heat supplied by an electric arc will be undertaken, as in supplying heat by this means light will also be supplied, which would have the effect of enabling the growth to benefit fully by the artificial heat.

However, I feel sure that by the end of that marvellous visit (which I did so enjoy and from which we both learnt so much) Mr. Merz found that I had not been too much trouble; and perhaps by the end of the trip the bachelors may even have enjoyed my company. Anyway, I had a lovely time.

We went to stay with the now famous Samuel Insull, who gave a dinner at Delmonico's in our honour, and visited many engineering works in Schenectady, Pennsylvania, and we visited Boston. We also went to Niagara Falls power station.

In October we came home in the s.s. *Mauretania*, which was a much nicer boat and in which we were given far better accommodation than on the voyage out. Basti was far less troubled on the return voyage and only missed one dinner. Mr. Merz insisted on champagne and whether it was the champagne (ordinarily he drank water) or Mr. Merz's company, I don't know, but he was in excellent spirits all the time. I think Mr. Merz enjoyed the trip too, and from that time we became real friends. He had all the delightful qualities of the Mad Hatter (my nickname for him), but perhaps that was not surprising for anyone might have mistaken his friends—Mr. Cooves for the Dormouse and Mr. Arthur Wright for the Rabbit.

Early in 1912 Basti was offered the degree of Doctor of Science of the University of Manchester. A few days before the ceremony was to take place he came home and told me all about it and asked me if I would like to attend. Of course I was most anxious to go and asked him if our friends, Mr. and Mrs. Sumpter, could come with me, as he was to dine first with the dignitaries of the University.

I knew, much as my husband appreciated the honour, he very much objected to having to go through a

ceremony of this sort. Getting the necessary robes, too, was a trying ordeal. He said: "I dislike so much appearing in a gown that I shall hire one for the occasion."

The 1st of March, 1912, was a great day for me. The Sumpters and ourselves went over to Manchester and stayed the night at an hotel. Having dined together we took a taxi to the University, where we were given our seats in the hall. All the University authorities entered in procession, but not all looked so aristocratic and handsome (at any rate in *my* eyes) as Basti in his beautiful robes.

Vice-Chancellor Sir Alfred Hopkinson presided at the ceremony, and there was present a distinguished gathering of members of the Senate and the Council and professors from other universities.

The Vice-Chancellor, in the course of his speech, said:

> It is a pleasure also, on this occasion, in a laboratory which is destined for work in electrical engineering, that we have the presence of the President of the Institution of Electrical Engineers, Mr. S. Z. de Ferranti, upon whom the University is about to confer the degree of Doctor of Science.

Professor Lamb, in presenting Basti to the Vice-Chancellor, said:

> More than a quarter of a century ago he attacked the problem of the transmission of electrical energy in its most concentrated form and undaunted by discouragements and prophecies of disaster he solved it in practice on a commercial scale with complete success. It is largely to his initiative and his labours that we owe the plentiful use of the light which supplements and often, alas, supersedes and surpasses the sunshine of Manchester.

Most people in England thought then that it would be over by Christmas.

It seemed quite difficult for the boys, at first, to get commissions. I remember going with Basil to Chesterfield and Manchester to different Army depôts without any luck. In fact, Basil had at last to go back to his work at Coats' until things could be settled. Vincent, after trying equally hard to get a commission, was advised by Basti to go up and see the President of the Institution of Civil Engineers, which he did in August 1914. By the President Vincent was nominated for a commission in the Royal Engineers and obtained this on September 1, 1914. He went to the School of Military Engineering at Chatham until the end of October in that year and was then posted to the 67th Field Company, R.E., who were stationed at Newark. This was one of the field companies of the 11th Division, and part of Lord Kitchener's first hundred thousand.

On Easter Sunday in 1915 Vincent's company was moved from Newark to Witley in Surrey, where in July of that year they left for Liverpool by night. They sailed for Gallipoli on the former *Empress of Britain*, to the hooting of sirens, which contrasted vividly with the secrecy that was observed when his company left Witley. To avoid submarines they zigzagged all the way to Gallipoli, stopping at Malta, Alexandria, and Mudros. At the last-named place they found a tremendous fleet of Atlantic liners carrying troops. They went on to Imbros for a week or so and landed at Suvla Bay on the night of August 6, 1915. Vincent stayed there with his company until the night of December 19, 1915, returning to Imbros for Christmas. He then went on to Sidi Bishr, the camp at Alexandria.

Vincent came home in March 1916, and returned to Salonika in September 1916, but this time with the 500th (Wessex) Field Company R.E. attached to the 27th Division, with whom he stayed in the Struma Valley and the Vardar Valley (Bulgaria having on October 18, 1918, given in) until the Armistice in November 1918, when he returned home once more.

Basil got a commission as 2nd Lieutenant in the 21st Siege Battery R.G.A. He was sent up to Tynemouth to train with his men. I remember well going to stay in "digs" with Denis, who was then a very small boy, to be near Basil for a time.

During that first year, when both the boys were training, our whole thoughts naturally were with them. Whenever it was possible to go to them we went, and if they got any leave they came home.

In 1915 Basil went to France. The following letter, one of many we received from him at the front, throws light on his generous, happy nature and his activities out there:

SUNDAY, *2nd Jan:* 1916.

MY DEAR FAMILY,

I can't raise the strength or nerve to write to each one of you separately! So you must forgive me for the one letter to you all. I have received a letter from the Gov. (he leaves you all *standing* when he writes a letter, no wonder Gertrude married him. I should have done it myself if I had been a girl!) a letter from Mum., one from Vera, one from Yoho, one from Dennis (some lad!) one from Bert, one from Chrissie, also the gloves, a scarf from Vera, the washleather pants. I don't think I have left anything out. I was awfully pleased with the letters and the presents. I got several food and drink things from the Merz's. By the way, theirs were the only things that arrived for me in time for Christmas. The post has been all over the show lately. The pants, gloves and scarf are beautifully warm. I told you in a hasty note that we

have been pretty busy. Things are more or less peaceful at present and the weather vile. I inclose a cutting which should interest you. Clever boys, Dick [Dick Garry] and I. We had a very exciting time. Dick nearly lost his fat head. A shell dropped on the parapet five feet away from it and a great lump of mud hit him in the back of the neck. I was out down the trenches. Our new Captain's name is Fenner. He *is* a gay little dog. He's always gallivanting round. At present he is doing Major at the northern section during the latter's absence on leave. Dick, Cooke (a new attached sub.) and I are here alone. Dick and I have moved into a wooden hut in the battery which we are gradually making cosy with mats, a fireplace and curtains. Have you a photo of the Gov. and yourself I could hang up therein?

I had quite good fun at Christmas, and saw Jacques and Angèle on Christmas Day evening. Jacques was in great form. We gave him an electric torch for Christmas and he kissed us most affectionately. He was all dressed up in an officer's tunic and hat—the tunic trailing on the ground. He *did* look so sweet. I spent the last day of the old year (a sporting one from my point of view) in bed. I've had a medium attack of gastritis which is still rather putting me off my job but no doubt I shall recover soon. Think I will spend another day in bed as there is nothing on. I have spent to-day in a new Observation Post which we now occupy (with a Canadian sub. who is a great sport). It has a fire and is jolly comfy. Did you order any stuff from Harrods? It never turned up which is perhaps as well as I'm not hungry at present! (Yes, my dear Mama, I took a big dose as soon as the trouble started; it wasn't Christmas that did it but wet feet, I fancy). I haven't sent those songs (sent me by mistake for records) back yet. I will very soon. Can you send some records instead? We should love some more (including "He'll never believe me" from *To-night's the Night*). We are also hard up for books. Did you remember to inquire of Mrs. Sumpter if there are any new ones by Jeffery Farnol out yet?

Well, I must stop now.

Ever and ever so much love to you all and many thanks for the presents. Let me know if you manage to get hold of Vincent. Don't be pessimistic, and do a theatre or Music Hall once a fortnight—relaxation is good for the Gov. and it must be of a light variety.

Your
BASIL.

Basil arrived home on leave for the last time on March 16, 1917. We spent a very happy week-end together at Baslow, and on the Monday all returned to Werneth. On the 21st Mr. and Mrs. Sumpter, our greatest friends, came over from Grindleford and Basti and I, Vera, and Yolanda all dined together at the Midland Hotel, Manchester. We tried to be as cheerful as we could. Basil was to leave on the midnight train. That evening is deeply impressed on my mind. Basil was different. He had, I am sure, a feeling that he would never return. We all went to the station to see him off, and he and I walked up and down the platform till the train came in, but try as we might to be cheerful, we all felt so miserable. I can never forget our last good-bye. We all seemed to have such a presentiment we should never see him again. He spent the next day in London with his sister Zoë, and on Friday the 23rd he left again for France. On his return to his Siege Battery (the 21st) he was made a Major. He had already won the M.C.

In July 1917, when we were busy getting in the hay, we received a short, but very kind, pencilled letter from the Roman Catholic padre at the base hospital in Belgium telling us that Basil had been very seriously wounded, but that he had been with him and that he had just come out of the operating room, and he thought all would be well with him. We only received a tele-

gram from the War Office a day or two later. We understood that there was a chance he might be brought over to a hospital in England, which we hoped and prayed for. However, this was not to be. He was taken to a hospital in Wimereux, and we think moved rather too soon from the base hospital, with the result that from his toe, which had been badly injured, septic poisoning started and went up the leg. We had a second telegram saying he was seriously ill, which appears to have been a mistake; it should have been "dangerously" ill. We went up to London and tried to get permission for one of us to go across and see him, as we had had a three-lined pencilled letter from him saying he wished we could go over. The authorities said that that telegram could not be used as any permission to go across. If the telegram had said "dangerously ill" they would have allowed one of us to go. Basti got Sir Vincent Raven, who was at the War Office, to telephone through to the hospital to see how things were. He was told that Basil was going on as well as could be expected and it was no use our going over. We only realized afterwards the reason for this. They had decided to operate and take off his leg, and I think knew quite well he could not live. We left London, never for one minute thinking that he would not get through. The next day we had a wire from the War Office to say he was dead.

Dr. Ord, who became my son-in-law (he had been with Basil in France), came direct to us when Basil was wounded, at his request, to tell us all about him. Naturally we were overwhelmed with pleasure to meet him and hear about Basil. Dr. Ord was on his way to Scotland for his leave. However, we persuaded him to stay with us. He came over to Baslow with Vera and Basti. The result of this meeting was the

engagement and marriage of my daughter Vera. Dr. Ord returned and saw Basil three days before he died. He wrote telling me that he thought he was very, very ill, but he still felt that he might pull through. He had to go back to his quarters, and it was a great shock to him when he returned two days later to find him dead and buried. This was the greatest blow that Basti and I had ever had. Basil was so like his father in character and disposition, and loved by everybody.

It was the first terribly sad thing that had happened to us in our married life. Our eldest boy killed. It is difficult not to ask in bitterness: "What good has it done to the world?" He was one of the finest and best. . . . On Thursday, July 19th, a memorial service was held for him at the Church of the Holy Name, Manchester. The works closed and practically all our workpeople attended the service. Many of them had known Basil since he was a little boy who used to go on Sundays with his father to the works.

In August, much to Basti's amusement, I bought a pony and trap. I had begun farming and it was the only way to get to Bakewell. I was thus enabled to go there on market days to buy a cow or a pig. My youngest daughter, Yvonne, and I used to drive over the Snake from Baslow to Werneth.

Vera, my second daughter, was married to Dr. Ord on October 20th, at the Holy Name, Manchester.

Christmas, during the war, was a miserable time for most people. We had such happy memories of Christmas in Switzerland in the preceding years. As far back as 1908 we had spent Christmas at Villars-sur-Ollon, with Mr. Kolle and other friends. From this time onwards until the war we went most winters to Villars, Pontresina, Adelboden, or somewhere in Switzerland. For the Christmas of 1911 we took two

of the girls with us, Vera and Yolanda. Mr. Merz and his sister Teresa were also members of our party. The children took at once to Teresa. She was one of the nicest women I ever met and we all got very fond of her. In fact, we named our youngest child Yvonne Teresa after Miss Merz.

Yolanda became a very good skier and could go long expeditions with her father and Basil. It was in Switzerland that we came across the Wilsons again (Mr. Wilson had been on our staff in the very early days) and made the acquaintance of their daughter Dorothy (who later married my son Vincent), then a girl of fourteen.

These, as one looks back upon them, were the most enjoyable and happiest of holidays possible. Everybody busy and out all day, and in the evening dancing, fancy-dress balls, etc. I feel that these visits to Switzerland did Basti more good than any holiday he could take during those years.

But now, in 1917, Christmas seemed all a mockery. What was one to do? We could not bear to spend it at Baslow without dear Basil or Vincent, so we decided to go, with the three girls and the youngest boy, Denis, to Llandudno. Basti and I and Yvonne drove in our little trap from Werneth. It was beautiful sunny weather but cold. We spent two nights *en route*, the first at Chester and the second at St. Asaph.

In February 1918 Basti was busy working on the internal-combustion engine and more particularly the gas engine. During this year he had purchased a small gas engine and was experimenting with it in the direction of obtaining very high temperatures, for which special materials were used. At first he was very hopeful about this engine, which he called (owing to the high temperatures involved) "The Red-Hot

Engine." Unfortunately, when he used his regenerator in this engine, which necessitated passing the air and fuel through very narrow straight passages into the cylinder, this prevented the rapid turbulence of the air and fuel going into the cylinder head. The combustion was in consequence so slow that the engine could only run slowly to be efficient. Basti, therefore, gave up the idea of this Red-Hot Engine and turned his attention to the reversing regenerator boiler. At a later date, however, he made a number of experiments on internal-combustion engines for the Air Ministry in attempting to obtain a high-speed engine, using heavy oils instead of petrol. These experiments, though full of promise, were only partially successful. I think that the principles involved must have been adapted by other people since that time as it has enabled heavy oil engines to be applied to buses, and there are a great many of these on the roads to-day.

In February 1918 we began farming at Werneth. We started with the incubation of chickens, which I attended to myself with an oil-lamp incubator. We also ploughed a small field and in April sowed oats. Basti had it in his mind to apply his inventive genius to the development of farming. He was delighted that I took an interest in this and managed the stock myself. In order to help me with the butter-making he made one of the cellars into a dairy with hot and cold water. But at this time we were unable to get more arable land from the Duke of Rutland's estate.

In a small diary which Basti kept at this time I find an entry under March 15th announcing the first brood of chickens from the incubator. Great was our delight at the hatching-out of these lively little balls of fluff. We had bought a "foster-mother," also heated by oil, and we put this in an empty room at Werneth

and made a little run for them. We had White Leghorns and did quite well with eggs. Later on, when the war was over, we took the poultry to Baslow.

Under April 24th is an entry: "Sowed oats." We did this on the quarter acre of the land that we owned and Basti had it sown on a Sunday by a Belgian as he wanted to see exactly how it was done.

At this time he was experimenting with sparking-plugs for aero engines. In May he commenced consideration of A.C. meter design; up to this time he had made D.C. meters only. To-day our principle A.C. meter production is the result of that consideration.

On May 22nd he notes the receipt of a letter from Will Pycroft, our eldest son-in-law, from Salonica. He was at that time not far from Vincent, who was also in Salonica. It was a great joy to us when we received letters from these two.

On June 5th he notes in his diary, "First shells forged from Rotary Press."

While I was looking after the farm, Basti was busy experimenting on his Red-Hot Engine. On September 24th he writes: "Second run on R.H. Engine. Self-firing after four minutes. Exhaust 180° C. Load 5 amps. 100 volts. Shut down for knock in cylinder."

There are two interesting items in his diary for October–November. He notes that on October 12th, Vera's eldest child was born at Baslow Hall. Her husband, Dr. Ord, was at this time one of the doctors in charge of the Canadian Hospital at Buxton. And on November 3rd he notes, "Calf born at Baslow from Lettey."

Both babies did well.

About two weeks before the Armistice my dearest

was taken ill. We called in a local doctor who said an operation would have to be performed. We wrote at once to Vincent asking him to get leave to return. As a matter of fact, he was at that time on his way home on leave. He arrived on November 23rd. On the 26th Basti went to London to consult a specialist. Unluckily he took a great dislike to this man owing to his rough treatment in making an internal examination, with the result that he decided against the operation and refused to see any more doctors. But at times he suffered great discomfort.

We spent Christmas at Baslow and all the family met together for the first time since before the war. It was a sad Christmas in a way as we missed our dear eldest son Basil. On December 27th Dorothy Wilson came for the first time on a visit to us at Baslow and soon after this she and Vincent became engaged.

Returning to Basti's diary, he wrote on May 26, 1918, "Work in hand:

1. Cotton Spinning.
2. Red-Hot Engines.
3. Sparking Plugs.
4. Rotary Press.
5. Light forgings for 100 pdr. shells.
6. Aero cylinder forging machines.
7. A.C. Meters.
8. D.C. Meters.
9. Transformers.

While dealing with the war period, reference should be made to Ferranti's conversion to a munitions factory. There was some difficulty at the start in connection with the shell contract, but my husband was able to overcome this as the following passage from a letter he wrote me on February 28, 1915, on the train from Euston to Manchester, shows: