My dear Sir Ken

I wish, in turn, to express my thanks and appreciation of your kind and appreciative letter. It has set me thinking, or at least one of your expressions has — You mention a possibility of writing a book or essay on your reminiscences. I hope you will.

For my own part, during my 83 years of life — probably the most interesting 43 years in the history of the world, I have had a very good innings, and accumulated a few recollections which may prove interesting to you.

I think the first really startling event was one which Bragg and I shared in common. You may remember I told you how I used to drop in at his private room at the University for a year. Well, on one of these occasions I found him in a state of great excitement, holding a recent copy of Nature in his hands. He suggested I wish unusual warmth and said “Oh, Crooke just look here — they have succeeded in passing one atom through another”. I forget who they were, but he considered that the fact was undoubted and his belief infected me. But it was impossible! Each pair held firmly to the Newtonian atom, which was definitely impervious. I say nothing about myself, but that was the moment of Bragg's awakening. I can also remember so well how he bewailed the fact that his fingers had not been educated at school. He did so want to start reasoning on his own. And I can remember how he determined
to remedy the defect I immediately arranged to take a complete course with Rogers, the very capable instrument maker at the University. In later years I could trace that early beginning in his world famous work on crystals, and on X-ray photography.

And talking about X-rays. In the early part of 1896 I went to western Australia, and one of my first jobs was to visit England and Europe in connection with the new instruments for the new Observatory. On the actual day of leaving I came across the news of the discovery of X-rays that would puncture metals, and the human body, with a description of some photographs that had been actually made—mainly of hands. After the little work that Bragg had commenced to do in Adelaide, which I was privileged to see, I did not completely neglect the news about the new X-rays, but, doubting greatly, I partly digested them on board, I talked about them with other passengers, and for fancy dress at the usual ball that was then customary, I actually painted a set of nails on some linen. I got my wife to fashion the linen into a vest, and went as “X-ray”. Arrived in London, one of my first visits was to a famous instrument maker in the Strand (Messrs. Elliot’s) and was one of the very first to see the results from their latest and largest apparatus, which they had just completed for Lord Salisbury, the British R.I.M.

I was so fascinated with this new development that I immediately purchased a tube, had it packed, and sent to Mr. Hancock, of the Public Work’s dept. in Perth, who had charge of all the electrical works for the new Observatory.
got him to intern it inside the hollow frame of a foundation stone. It is probably the oldest such piece of apparatus not in Australia, I will certainly be in a few centuries. At the same time I sent Hancock a couple of tubers for himself, he immediately started honours work at the South Public Hospital. Unfortunately he knew nothing about the dreadful dangers of the powder to his eyes; later he broke out into a most dreadful dermatitis and in a few years died a lingering and most fearful death. He was one of my closest friends and one of the finest fellows I have ever known, and I have never yet, never will, get over my great regret at the way we both wasted in where angels fear to tread.

I was also privileged to see some of the early work of another young man who afterwards became a famous scientist—Sir Frederick Soddy. When I first went to W. Australia, in 1896, the Adelaide University authorities, with whom I was then persona grata, asked me to try to get together a small committee of leading educationalists in South Australia and inaugurate a system of Public Examinations, to be identical with, I conducted by the Adelaide E.E. Board. In this I was very successful. Sir John (afterwards Lord) Forrest, entered heartily into the scheme, became our patron, it allocated a sum of money in the Public Service Estimates, for expenses. Sir Henry Hackett was our chairman, the Inspector General of Schools, Cyril Jackson, one of our members. One of our scheme was to hire a young promising lecturer from one of the English Universities to pay us a visit and give a series of
popular lectures. These met with instant success. It gave the lecturer a break in his work, an unusual holiday, a nice little fee. Amongst these young chaps was Soddy, not much more than a boy, and a shy one at that. My wife and I took a great fancy to him; he almost lived at the Hotel. His subject at that time was high tension electricity and he brought an enormous coil. He gave us some real thunder and lightning. He caught me in a nice trap once. I was his chairman, the audience included the Governor, his lady, all the elite of Perth. After some startling experiments, he informed us that whereas 5000 volts were fatal, a million volts could be passed through the human body without injury. "I will demonstrate that," he said. "There is now over a million volts waiting to rush round through any circuit that is established between these two poles. The Chairman and I will join hands, and each make a grab at one of these terminals, and we shall not be even the least bit distressed." Well I was nicely caught, although I knew he must be right, I can tell you it was not the happiest moment of my life. Matters were not improved when he whispered "It is quite alright, but when I say 'Grip', grip firmly I don't jumble." Well I am still alive.

I have mentioned Soddy, because he was then just at the threshold of his career, it gave me my first introduction to radium and radioactivity. I am not quite sure how he developed later, but I don't think it was along those early lines altogether. I frequently come across his name in recent literature, he has been knighted for his work, so I know he has developed, anyhow.
One of his experiments was very simple and very beautiful. I frequently hear references to it from those who were privileged to see it. We gave him a send-off at the Darth Observatory, which took the form of a euchre party. Bridge had not then come along. Daddy had never played euchre, so my little daughter practically played his hand for him, and he was delighted to get first prize. All this is by the way. When the cards were finished we were practically all grouped round him, just conversing desultorily, when he told us that he had a smile of radium with him, and suggested a few experiments. The one that took our special attention was when he invited any of the ladies who were wearing pearls which they believed to be genuine to expose them to a test. Lady Wittenoom, who was wearing a magnificent necklace, responded. The test was quite simple, but I really forget which way it went. I think that radium irradiates genuine pearls and has no effect on any substitutes. Anyhow I have that the lights were turned off and the pearls placed on one of the card tables, and Daddy held his radium under the table. I shall never forget the brilliance of those gems in the dark room. It was a beautiful little experiment.

Coming back to Bragg, I should like to refer to his first practical experiment with "long-distance" radiography. I had been in N.S.W. for a year or two, so it must have been very close to the beginning of the present century. I came over to Adelaide for a holiday, and naturally made my way up to my former haunt at the Observatory. The exact
moment chosen for my visit happened to form one of those remarkable coincidences that make one wonder if there is something at the back of them, pulling the strings. This particular incident had far-reaching repercussions.

When I reached the Observatory I found Lei Charles Todd and Bragg messing about with a Morse recorder on a little deal table on the lawn in front of the office. There was a battery under the table, a wire stretching up to the top of the annular lens tower. Both Todd and Bragg were most excited as they both gave me a most hearty welcome. "What's up?"

I naturally asked. "Oh we are trying to raise Henley Beach," that did not sound much nearer, but I soon ascertained that this was their first experiment outside the confines of a room to converse telegraphically over several miles without any obvious means of communication. However, Bragg showed me a little glass tube filled with metallic filings and told me it was a coherer, it was the real Democritean machine. He began to explain, when Lei Charles yelled out "There he is."

It seems that Mr. Unbehauen, Chief instrument maker at the GPO, was down at Henley with a similar apparatus, and Lei Charles was calling him H B H B H B O B O. All of a sudden a reply came C 0 0 0 H B. "Get him," said Lei Charles, and then came the first "Long distance" message ever sent on S.A., and probably in Australia.

I can easily imagine what a kick off that was to Bragg, but I think it was the last occasion on which I saw him. However, it had a "long distance" effect on me. When I returned to Perth I naturally told the family about my remarkable experience, and this had a marked effect
upon my record. Ron Basil was about 15 years old. From that moment the kitchen department began to lose cups, saucers, plates etc., and the workshop began to miss coil, wire & other things, and in a few days Basil informed us that he had established wireless communication between the anemometer tower and the Done building.

He, this fellow, Ron Glyde, became obsessed. A short time afterwards the Americans fleet put in an appearance at Fremantle & Basil immediately paid a visit to their "Shack." I found them using a crystal set. Getting the hang of that he chummed up with the Director of the Museum, who had a marvellous collection of Australian crystals. Inflected the Director with his enthusiasm, he obtained permission to test every kind of crystal for its wireless potentialities; I soon had a choice collection of his own. Then these two boys took a wider range; first from Perth Observatory to Fremantle, & afterward, to Albany.

They succeeded quite well at Albany, one of Basil's last achievements in Perth was to pick up a quarrel between two ships in the Pacific, which was summarily checked by orders from a man-of-war in the neighborhood.

Then I was transferred to Sydney, and Basil, still mad on his wireless, found a magnificent site for his further investigations. It was the old magnetic hut, from which all instruments had been transferred to Pennant Hills. It was quite isolated & empty, & free from all ferrous metals. Besides, there was the anemometer tower in the close neighborhood.
Basil soon chummed up with the lads on the Pacific boat, and got a little further ahead with the magnetic trans-
matter. Eventually one of these lads came along with the present-
value, which had just been put on the market in America.
After a few trials he found he had got the whole world at his
fingertips. The other "fans" began reverting round to Basil;
two valves became the greatest wonder of the age to them.
Then he made his first Commercial Venture by ordering
a dozen valves through his friend. Before they arrived, however,
the First World War had broken out and Cresswell, the
head of radio in the navy, forbade all experimental work, as
you will remember; and collared Basil's dozen valves at
cost-price.

By this time Basil & Ernest Stalker (afterward, knighted)
had become leaders among the amateurs, and Basil
obtained permission to carry on, under a constant military
guard, which was established at the Observatory. He cooperated
with the official experts, essentially in directional work, so
they proceeded in discovering 3 spy sets, of very superior
German workmanship.

Basil still carried on, with his new-valve hook-up
I used to listen in to the Germans talking in English to
America during the early stages of the war. A bit later
I came into the game. Basil told me he had on several
occasions picked up definite clock records on a very long
wave—25,000 miles or thereabouts, and we mutually
discovered that the Americans, who by that time had become
our allies, had erected the world's most powerful radio tower
at Lyons; and amongst other things had commenced a
series of regular "Vernis" clock ticks, I suppose for the benefit of the joints parties. However we found we could
make them up and for the first time long distance time signals
were established as part of the Observatory work.

Rather a curious development occurred in connection
with the influx of amateurs after the cessation of the war.
They became quite a nuisance and eventually their sphere of
operations had to be limited. But a remarkable incident
occurred. The experts had been developing along lines which
made it seem advisable to increase the wave length for great
distances. Lyons with its 25,000 miles was so far the maximum,
so the amateurs were restricted to short waves, and, as you
know, these are now used exclusively for long distance work.

I hope you find these memories of a few early beginnings
interesting. The prevailing impression on my mind and have
been writing about them is the tremendous rush which seems
to have set in since the end of last century. That is permeable
too in other directions, in the reluctance with which old fashioned
ideas were relinquished for modern inventions. I have had
actual experiences, more or less humorous, but sometimes quite
annoying, in that respect, I have no doubt that you have come
across similar troubles. But now I have given you an "earful"
as the Americans say, I subsist myself.

Yours sincerely,

[Signature]

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