A detailed list is appended to this memorandum.

Cobalt Source for Sterilization

A large source of low specific activity Cobalt^{60} has recently been supplied to the University of Michigan. This is believed to be the largest source of radioactive material ever put to commercial use. A total activity of about 10,000 curies was shipped in a single container.

I might say that 10,000 curies is equal to 10,000 grams of radium in its radiating effect. A hospital that has two or three grams has quite a lot of radium. In this one source we have 10,000 curies which is the equivalent of 10,000 grams of radium in its radiating effect. This source will be used to further studies on sterilization of food stuffs, drugs and in other experimental work.

I might say that this is something we are extraordinarily interested in because we are constantly looking for a use for the radioactive isotopes or fission products which we have in such large numbers. To find some use for the bulk of fission products will be to our great advantage.

The next two pages contain a description of some of the short-lived isotopes. Do you think I should read it?

Hon. MEMBERS: Yes.

The WITNESS: This is an example of some of them to give you an idea of what they are used for.

Short Lived Isotopes

Sodium^{24} (half life 14·8 hours) has found application in the radiography of very thick sections because of its very penetrating gamma radiation (Aluminum Company of Canada, Kingston).

One example of the application is that of a large casting costing many thousands of dollars which needed to be inspected and could be inspected in no other way.

Sodium^{24} is short-lived and must be transported very quickly and used before its life has gone.

Palladium^{109} (half life 13 hours) has been shipped from A.E.C.L. to University of Michigan for studies in the effect of ionisation within cylinders of combustion engines.

That is a study of what takes place in the cylinder of an internal combustion engine.

Mr. GREEN: What does that term "half-life" mean?

The WITNESS: All radioisotopes decay. They decay because they are unstable, and as they decay they give off radiation and in order to get an idea of how long they are going to last, one must have some yardstick and the yardstick used is the length of time in which half of the existing life will decay. If you start with 100 units then the activity of this at the end of seven days will be 50.

Mr. PINARD: Why half?

The WITNESS: At the end of the next week there would be 25 and in the next seven days it would be 12½. It just gives you an idea of how rapidly it decays and the reason you cannot make it absolute is because you never know where the end is. You have to stop somewhere. That is the way we have of measuring the lifetime.

Some, for instance, radium is around 1,000 years. Plutonium is around 2,000 years, and Carbon^{14} is 5,000 years and you can have isotopes with only a few seconds. If you were to treat a person with radium—you would not want to treat them with an isotope that was going to be in their body for a long time, but with a short half-life it would die off, whereas if you treated them with Carbon^{14}, it would stay there. Does that answer the question?