are licensed by the AEC or by their states to use radioisotopes in their work. The annual market for nuclear medicine equipment in hospitals, clinics, and physicians' offices will exceed $40 million this year. To this we can add $25 million in annual sales figures for nuclear medicine for a total in excess of $65 million. (These figures, by the way, do not include radiochemicals and sealed sources, for which total figures are not available, nor do they include the very large radiological use of machine X-ray sources, the cost of which today is considerably more than those Roentgen tubes and tandem bicycles I mentioned before.)

Now let us break down some of these items, not in terms of cost but as to what they are and what they are accomplishing for medicine. I should begin by pointing out that over the past 20 years, since the days when we produced those first medical isotopes with Lawrence's cyclotron, 100 different radioisotopes have been used in medical research. Today some 30 different radioisotopes, available in quantity, are used around the world in the diagnosis and treatment of many diseases and disorders and in continuing research on them. In the United States alone radioisotopes are employed annually in approximately eight million individual therapeutic treatments or in vivo or in vitro diagnostic procedures.

Let me take a minute here to explain for those of you not familiar with it the major principles upon which radioisotopes work in medical diagnosis and treatment. The radioisotope, being a radioactive counterpart of a regular isotope of an element, behaves chemically like its nonradioactive relative; that is, if ingested or injected into a living system, it goes to that part of the system or functions in the system in the same manner as the nonradioactive substance. The radioisotope can be used to "tag" a compound, which becomes a radiopharmaceutical that also behaves within the body as its nonradioactive counterpart might. As the radioisotope or the radiopharmaceutical moves within the system or locates at a certain point, it continually sends out "signals" as to where it is and how it is concentrated. When these "signals" are detected by the physician's scanners, cameras, or counters, they give a picture or an analysis of the functioning of the system or of a certain organ. This is used by the physician as a diagnostic tool to determine the system's or organ's health. In a similar way, injection or ingestion of a prescribed amount of a radioisotope may be given to travel to a selected part of the body to destroy cancerous material there. As I will point out later, radiation from radioisotopes or machines also can be applied from external sources to attack tumorous tissue.