

**1959** David Kuhl at the University of Pennsylvania made the first transverse section scan of the body with a device that was the forerunner of today's single-photon emission computed tomography (SPECT) scanners.



**1960** While studying salt retention in different strains of rats, Lewis Dahl at Brookhaven discovered the link between salt consumption and high blood pressure.

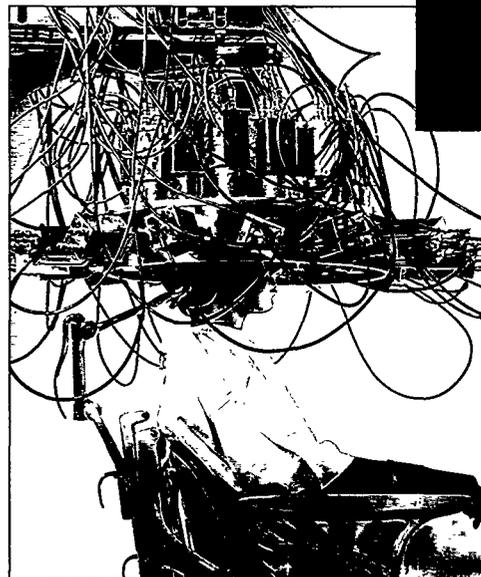
**1961** James Robertson and his colleagues at Brookhaven built a 32-crystal positron camera, the "head-shrinker," the first single-plane PET instrument.

workers at the University of Pennsylvania, and scientists at the NIH produced the positron-emitting compound that made this practical—a compound known by its shorthand name  $^{18}\text{F}$ FDG. In 1976, at Pennsylvania, the same team used PET and  $^{18}\text{F}$ FDG to obtain the first images of glucose metabolism in the human body. Among subsequent studies, work at UCLA provided the first "brain mapping" of normal function and illuminated how the brain develops from childhood to adolescence. And at Brookhaven studies have revealed metabolic changes in the brain associated with smoking and drug use. Over the past two decades, BER-supported research has also used  $^{18}\text{F}$ FDG and other tracers labeled with positron emitters to study epilepsy, Alzheimer's disease, Parkinson's disease, schizophrenia, depression, and a host of other ailments. Some of these same compounds are equally useful as PET tracers in the diagnosis of heart disease and in searching for the sites of primary and metastatic cancers.

**HIGH-TECH TREATMENTS:  
ISOTOPES AND PARTICLE  
BEAMS**

Beyond diagnosis lies treatment, and here, too, radioisotopes have

had enormous impact. One isotope, iodine-131, is still the most widely used radioactive substance for the treatment of diseases such as toxic goiter and thyroid cancer. As a result of its use, no other metastatic cancer is more effectively treated than thyroid cancer. Cancer treatment with radioactive iodine-130 was first tried at MIT and at Berkeley's Radiation Laboratory in 1941, and in 1946 iodine-131 was first used in an "atomic cocktail" for thyroid cancer therapy. After iodine-131 became available from the Oak Ridge reactor, it was widely



**THE BIRTH OF PET** The "head-shrinker" (at left), developed by James Robertson at Brookhaven in 1961, was a direct forerunner of today's positron emission tomographs. The first practical PET camera built for human studies is shown above, with one of its developers, Michael Phelps. Called PETT III (the extra T was for "transaxial"), it was developed at Washington University in 1974. Unlike the Brookhaven prototype, the Washington University instruments embodied advanced mathematical algorithms for computing three-dimensional images.