

6. Digression: the growth of accelerators

Let me digress here to give some indication of how the enormous gap between the early low energy experiments of Rutherford, Compton, DuMond and Deutsch and the recent high energy experiments on electron scattering and electron-positron collisions has been bridged. I am here emphasizing the similarity in concept but the dissimilarity in scale between the early and recent experiments. The actual *pace* of this progression has been defined by the evolution of the technology of high energy accelerators and colliders. Figure 15 is an update of a chart, originally due to S. Livingston, which shows how the energy available through the use of accelerators has evolved over time. The pattern is indeed dramatic: the energy of accelerators has increased by a factor of 10 approximately every 7 years ever since the 1930s. This has been achieved not simply by building larger and larger accelerators of a single type, but rather by a succession of new technologies which were invented whenever an old technology became saturated in its ability to reach higher energy. Thus the growth in size and cost of accelerators has not

*change
2 arrows*

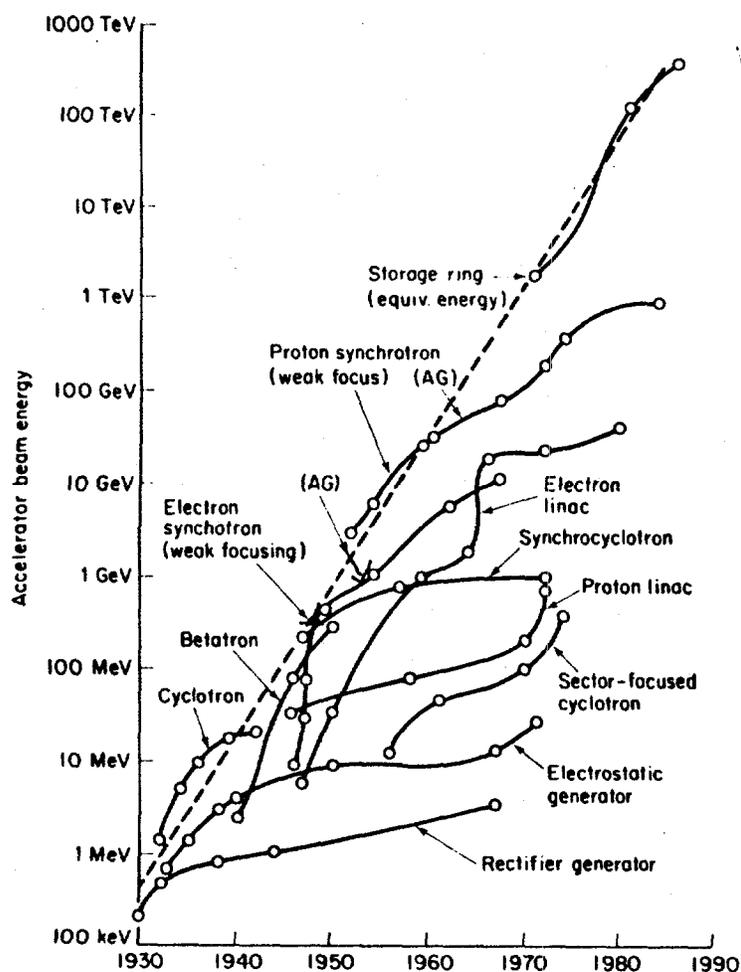


Fig. 15. Progress of the energy attainable through particle accelerators and storage rings. This growth is achieved through a succession of machines employing different technologies.