INSTRUMENTATION WORKSHOP: INTRODUCTION

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Although the invention of the vacuum triode amplifier and multiplier phototube were key ingredients to achieve the sensitivity necessary for technical feasibility, it was the application of the coincidence technique in 1950 by Reynolds which made liquid scintillation spectrometers (LSS) commercially practicable. Recognition of tritium as a valuable biological tracer and the automation of LSS's in 1957 created a preferential demand for LSC's over ion chamber and 2π gas flow proportional counters. Invention of the external standard by Fleishman and Glazunov in the U.S.S.R. in 1961 and its subsequent automation by ANSITRON in 1964 was a major advance in simplifying the determination of efficiencies, generally replacing the internal standardization method.

During the period from 1954 to 1968, major improvements in detection efficiency occurred principally due to the development of multiplier phototubes (MPT) with higher quantum efficiency and lower background. Graded shielding and anti-coincidence guard detectors have also been used to reduce background rates to several counts per minute.

Developments during the last decade have been directed toward improving the accuracy, speed, reliability, cost, effectiveness and operator convenience of the instruments. Tray changing mechanisms have been developed to provide for easier sample loading and more compact instruments. Multi-user batch operation is available from most manufacturers. Both pre-programmed and user programmable data reduction capabilities are also available. Automatic-calibration, color restoration, and improved quench correction methods have been developed to reduce potential quench-correction errors. Future developments will most likely be in the area of improved data processing and sample handling.