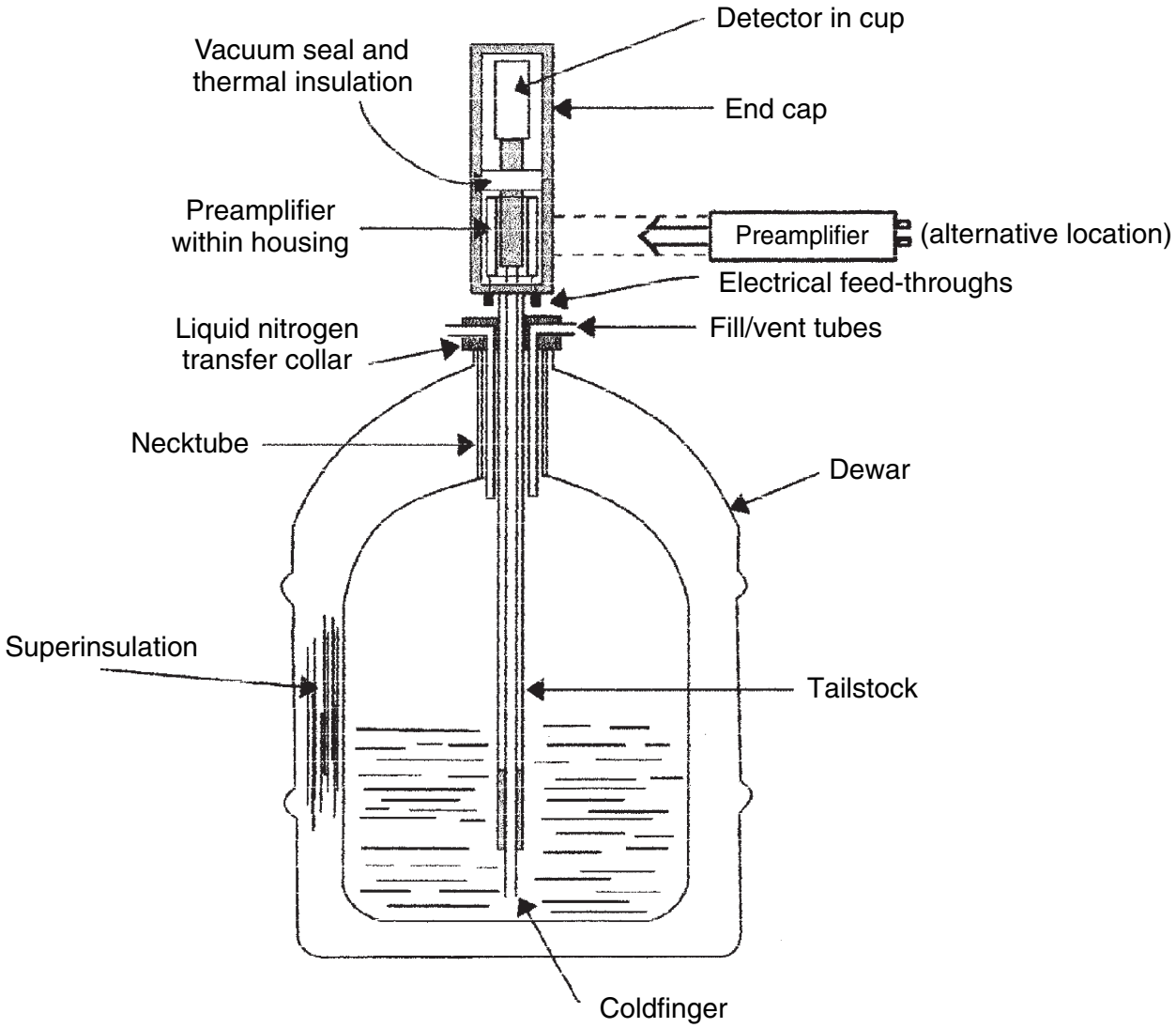

Figure 3.15 A typical germanium detector, cryostat and liquid nitrogen reservoir

the detector. (You should be aware of the extra absorption caused by this extra aluminium if the detector is to be used sideways on to the incoming radiation.) The core contact is made with either a conical pin or a spring-loaded pin extending within the hollow core. The whole of this arrangement is fixed to a pedestal that is, in turn, fixed to the copper cold finger, which extends through the whole cryostat to the liquid nitrogen reservoir. The complete assembly is then covered by the end cap to form a sealed chamber. The upper part of the detector housing is evacuated and thermally insulated from the rest of the housing. A pack of charcoal or molecular sieve absorbent will be mounted in the detector chamber to absorb traces of gases left after evacuation when the detector is cooled. Beneath the detector pedestal are secured the preamplifier field effect transistors (FETs) that need to be cooled.

At one time, preamplifiers projected from the side of the detector housing but nowadays, as electronic components and integrated circuits have reduced in size, the normal arrangement is to house the preamplifier around

is covered by its cylindrical shroud, the whole fo
compact cylindrical arrangement. (Even so, where
are particular reasons, perhaps lack of space or a de
distance the preamplifier from a low background de
a side-mounted preamplifier can still be specifie
systems designed for low background measurement
likely that a high-purity lead shield would be put be
the detector housing and the preamplifier to shie
detector from the small amount of radioactivity
materials of which the preamplifier is constructed
complete detector and preamplifier assembly moun
its cold finger can then be fixed onto a suitable l
nitrogen reservoir by an arrangement, such as that
in Figures 3.15 and 3.16.

In some cases, it may be necessary to pr
shielding or other detectors behind the detector itse
example, in an anti-Compton spectrometer system
Chapter 13). For this purpose, detector systems are
able with the preamplifier mounted close to the
leaving a clear length of cold finger between it a