constraints. In the Harness case space is made available in multiples of 2,500 sq ft squares, of which 10 are required for a 25,000 sq ft laboratory to serve a notional catchment area of 250,000 population. (In some areas of the building smaller increments than 2,500 sq ft are possible.)

The initial reaction to a proposition to standardize laboratory design may well be that it cannot provide for the variations of practice which we know currently obtains in the NHS. In favour of standardization is that since all laboratories rapidly become obsolete, whoever designs them, there is little in principle to choose between alternative designs. It may even be that where funds are limited one good standard design could well be less quickly obsolete than many of the laboratory designs produced by 'one-only' laboratory planners who have limited opportunity to learn from their mistakes.

More important than the detail of laboratory layout is overall availability of usable space, provision for expansion, and an adaptable arrangement of benching systems. The Harness solution, for which four leading clinical pathologists—one from each major discipline—have been coopted, aims to meet all these requirements.

Designing by Function

R. O. MOSS (*Department of Architecture, North London Polytechnic*)

Hospital activities carried out in free space would be far more convenient but perhaps less comfortable.

Providing for people to do what they need to do, now and in the immediate future, with the freedom of free space but in a controlled, fully serviced environment and at a reasonable cost generates the conflicts out of which arise conferences such as this one.

The resolution of such conflicts involves two different kinds of people; those with a knowledge of the activities to be enclosed and those with a knowledge of the enclosing techniques, but unfortunately these different people also have different languages and objectives.

Traditional methods of briefing have done little or nothing to draw the two sides together mainly because such methods accept without question both hierarchies and spaces. As a result design discussion has centred on the 'how' rather than the 'what'.

Questioning traditional hierarchies, demarcation lines, and operational methods

very often throws up new ideas on 'how to do it'. But perhaps even more important it provides an educative process which encourages both sides of the team to understand their own problems and those of others more clearly.

In recent practice it has been found that because of a clearer understanding of the 'what' such things as overlapping activities can be identified and grouped together in a smaller but more appropriate space and hence at less cost.

For the future, the traditional briefing methods are not good enough. The shift must be from a 'spaced based' approach (where functions are fitted into spaces) to a 'function based' approach (determining the functions around which spaces are delineated). This is especially important if the growing acceptance of standardization is not going to make life intolerable.

Special Requirements for Automation and Mechanization

L. G. WHITBY (*Department of Clinical Chemistry, Royal Infirmary, Edinburgh*)

'Automation', for design purposes, was taken to include mechanization and these two concepts were not separately considered, but the requirements for those departments intending to install a computer were discussed. It was assumed that these equipment features implied laboratories with large workloads, serving a group of hospitals or even several groups of hospitals.

The input of work to the laboratory and arrangements for the output of reports have to be taken into account when considering the external relationships and the optimum siting for the laboratory. The reception area, specimen handling, and storage areas must be capable of dealing with large workloads, especially at peak periods. As far as the laboratory itself is concerned, this is preferably subdivisible into (1) an automated area, (2) an area for manual and special techniques, (3) a computer (EDP) area, and (4) an office and administration area. The separate automated area is desirable so as to achieve in it a smooth factory-type operation, and the British Standards Institution (1970) has recommended that the EDP area should be kept separate.

When designing the automated area, account must be taken of the likely space requirements of the equipment, but if possible allowance should be made for the inevitable changes in instrumental design

so that, in due course, bench-top or free-standing equipment may be used, some of it requiring all-round access. Services need to be considered in relation to the equipment itself (ventilation, electricity supply, drainage of effluent, etcetera) and to the support of the automated equipment in daily operation, access to the laboratory for bulk supplies, space for bulk storage, an area for the preparation of reagents in bulk, and arrangements for bulk disposal. The particular dependence of automated equipment on an adequate and reliable electricity supply must be stressed, with the consequent need to consider headroom and output. Noise is a feature of the operation of much automated equipment that has too often been overlooked.

Most of the special design considerations for automated equipment are relevant also to the computer (EDP) area. The British Standards Institution publication advocated that the EDP area should be separate, which raises the important problem of communication within the laboratory, the correct siting of internal windows, hatches, doorways, provision for closed circuit television, etcetera. Computer manufacturers specify the environmental requirements for their equipment and the other special needs include a reliable electricity supply, false flooring for cabling, protection of equipment and records from stray magnetic fields, a separate fireproof records store, and again the recognition that noise may be a major problem (which may be largely overcome by subdividing the EDP area).

Reference

British Standards Institution (1970). British Standard Code of Practice CP95: 1970. Fire Protection for Electronic Data Processing Installations.

Lung Tumours

L. KREYBERG (*Institute of General and Experimental Pathology, Oslo*)

The Centre for Lung Tumours was the first of the WHO international reference centres to be established, and the WHO monograph 'The histological typing of lung tumours' was consequently the prototype for the succeeding volumes. In the years that have passed since its publication, a number of controversial points have emerged, although the scheme of classification, as a whole, has been favourably received and can be applied