Elisha Graves Otis, so we are told, built and demonstrated the world’s first safe lift or elevator in 1853. In so doing, he made it possible for architects to arrange large numbers of small accommodation elements vertically instead of horizontally. Children in many Asian countries now live much of their lives in flats ten or twenty storeys above ground level. They are used to coming and going by lift and are as familiar with the need for caution near an open window, thirty metres above the ground, as they are when crossing a busy street.

The need for high-rise dwellings, offices, public and other buildings in many Asian cities has been generated by substantial population movements during and after the Second World War. Some cities have had population increases of millions, almost overnight, and this, coupled with normal population expansion due to births and to the slow movement from rural to urban areas, has led to a chronic shortage of land. The only short-term solution to this problem has been to build tall buildings. This, however, has given rise to a host of other problems, most of which stem from a failure to realize that a vertical city cannot be planned and operated in the same way as a city of two- or three-storey buildings.

Building sites

The first difficulty arises from our concepts of building sites. In conventional, spread-out towns the site is always an area of land, earmarked for a particular purpose. Thus there will be separate sites or areas for schools, hospitals, houses and so on. The result of this is a need for horizontal communication in the form of roads and footpaths. Unfortunately, in most cases when a decision is taken to construct high-rise buildings, the concept of separate sites for schools, hospitals and houses is maintained. The result is that instead of a 1,000-place school occupying a site of one or two hectares, accessible from several widely separated boundary roads, the building may occupy a site of a few hundred square metres and have one entrance. This, as may be imagined, creates a serious traffic problem, which is multiplied for every other high-rise building in the city.

The difficulty can be overcome to some extent by rethinking our ideas on sites. In older, horizontal towns the sites are at ground level. In the newer, vertical towns, sites can be thought of as being arranged in layers vertically, as well as horizontally. Thus, in creating a new residential area of tall buildings, the shops might occupy the ground-level accommodation so that they can be easily supplied with goods to sell, schools might occupy the uppermost storeys with play-space on the roof, and in the storeys between
High-rise schools

would be located the flats for dwelling, post and other local government offices. The city and some of its movement patterns would then become vertical and the old concepts of separate, ground-level sites for schools, hospitals and so on, be no longer valid.

At present, an Asian city in which some of these ideas can be studied in action is Hong Kong, where high-rise buildings incorporate shops, community halls, department stores, clinics, maternity homes, post offices, public libraries, youth centres and kindergartens. Hong Kong may be regarded as a dramatic and early forerunner of the sort of situation that is likely to develop in many other Asian cities.

School building sites

The developments in Hong Kong have been possible because of the existence of a central housing authority which has been able to co-ordinate public building in the manner described above. In most cities, in the Asian region, however, co-ordination of this type does not exist and thus, when land is scarce and new facilities are needed, a site is acquired and a tall building constructed on it. Notable examples include a fourteen-storey private school in Hong Kong and a ten-storey primary school in Singapore.

Selegie Integrated Primary School, Singapore

Selegie Primary School was built in 1960. Ten storeys high, it was the first Singapore school to be built higher than five storeys and, because it seemed to anticipate what will obviously become a trend in school building in Asia's most overcrowded cities, it was made the subject of a recent intensive design and administration study (see Fig. 1).

The school houses 1,534 children in a morning session and 1,445 in the afternoon at a net building cost per place of U.S.$135.6 on a site of 3,863 square metres, of which 1,891 square metres is a play area at ground level. Canteens are provided at ground and sixth floors, a dental clinic on the seventh floor and toilets at ground, third, sixth and eighth floors. The building is

Fig. 1. Selegie Integrated Primary School, Singapore: vertical section, ground to roof, through classrooms, looking west.