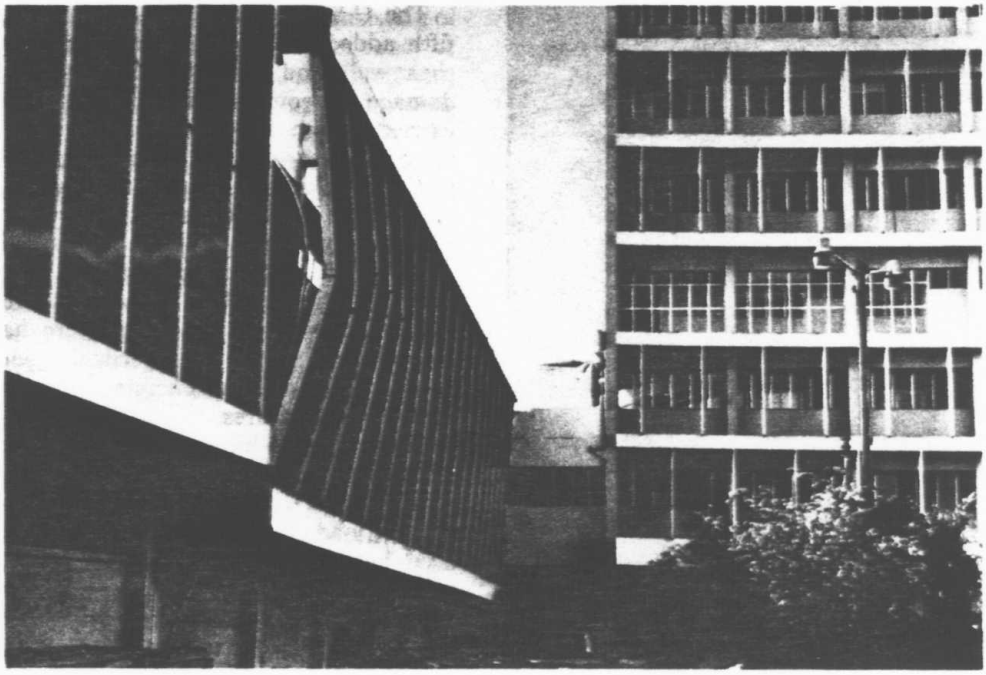

Fig. 7. Collapsed annex building at Benjamin Bloom Hospital.

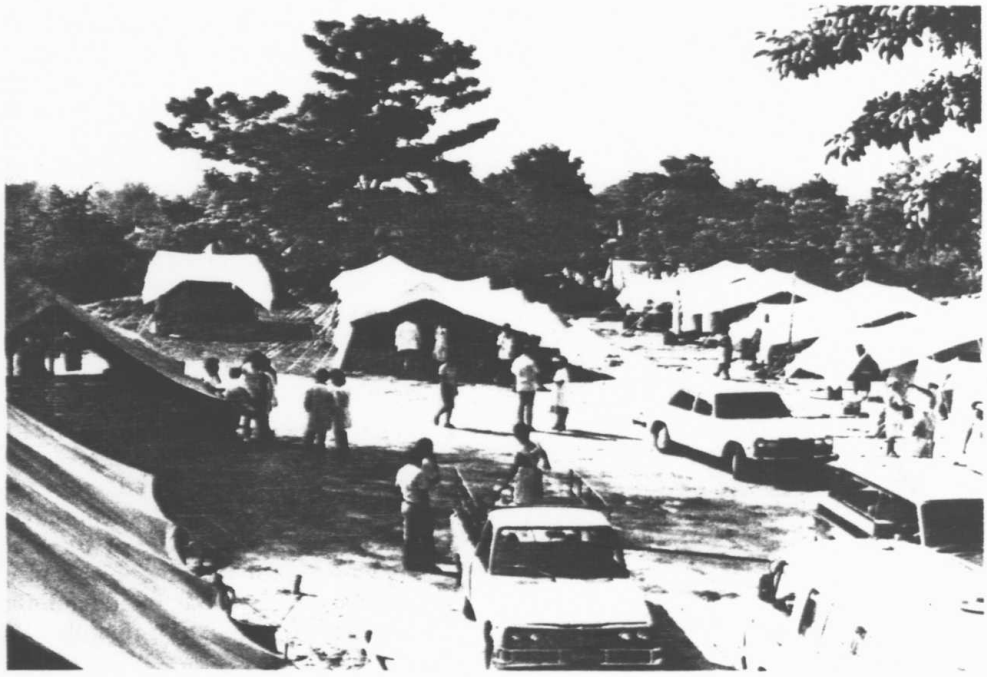

Fig. 8. Field hospital set up at Benjamin Bloom Hospital.

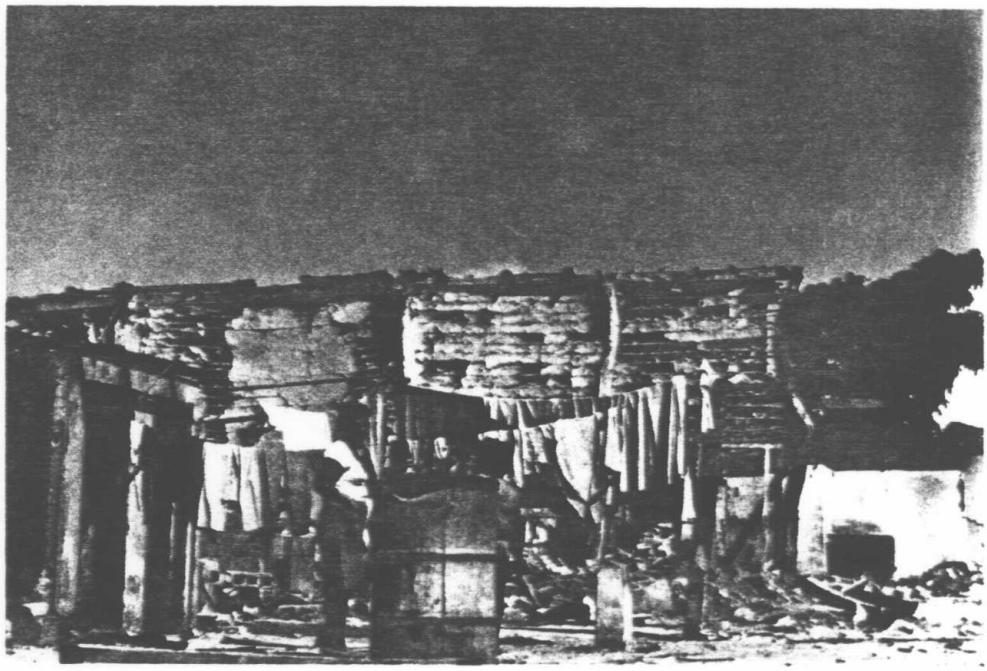

Fig. 9. Bahareque house.

Fig. 10. Bahareque house; rebuilt within three weeks of earthquake.

the government of El Salvador began work to introduce a Law of Demolition to grant the Ministry of Public Works full power to order demolition of buildings it assessed as being unsafe. The extent to which this law has been applied has not yet become clear although the authors observed a great deal of repair work being carried out with no obvious inspection or control by any officials. An example of this was at the Almacenes Siman, a modern department store where a number of columns had failed or been badly damaged; whilst the damage certainly did not warrant demolition the safety that would be provided by the repairs that were carried out was open to serious question.

There was no evidence anywhere in the city of damage to engineered structures resulting from foundation failures.

HOUSING

The 10th October earthquake caused a great deal of damage to housing in San Salvador, particularly in the poorer districts. Like many Latin American capitals, San Salvador has seen a very rapid growth in its population in recent years: in 1960 it stood at 200,000 and in 1969 400,000; at the time of the earthquake the capital's population had risen to as high as 1,500,000. Forms of construction for houses in the poorer areas include brick, masonry, timber and corrugated iron, but the traditional and most popular form of construction is "bahareque" (Fig. 9). This is formed from timber verticals and bamboo horizontals infilled with mud and plastered with a lime mortar. The roofs are usually made from tiles or corrugated iron on nailed wooden trusses or purlins. Bahareque is well suited to El Salvador's geography, being cheap, easy to construct (some houses had been completely rebuilt within three weeks of the earthquake, see Fig. 10) and it provides good insulation against the tropical heat. Furthermore, when well built with good materials bahareque also behaves well under seismic conditions; in many cases it was observed that the mud and plaster had simply been shaken out leaving the flexible frame intact. However, the action of insects and micro-organisms on the untreated timber leads to complete deterioration within ten to fifteen years, whence the houses are very weak. The Ministry of Planning reported that 23,000 houses were destroyed in the earthquake and a further 30,000 badly damaged, resulting in 10,000 injured and as many as 300,000 people being made homeless. The death toll was fairly low, between 1,000 and 1,500, but there can be little doubt that if the earthquake had occurred at night rather than at midday when most people were outside their homes the number of casualties would have been many times higher.

Apart from the poor quality of construction, another factor that contributed to the large number of houses damaged is the terrain on which many of the poor are obliged to live. In the southern parts of the city shanty towns sprawl across the faces of steep ridges where the houses are built on terraces cut out of the hillsides (Fig. 11). Apart from the fact that such ridges can have the effect of amplifying the ground motions, the instability of the vertical cuts can also result in damage to small structures founded on them In one of the southern districts, Santa Marta, a row o houses was destroyed by a landslide along the ravine or whose banks they were founded. This ravine had been cu deeper and steeper over the years by flood waters from the Cerro de San Jacinto. Also in Santa Marta were a few houses that sank into liquefied ground; this appeared to be the result of the ground being water-logged around a leaking water mains (Fig. 12). Nowhere else were there any signs o liquefaction.

Fig. 11. Poor housing in southern districts.

Many of those made homeless by the earthquake returned to other parts of the country from where they had migrated in recent years, often displaced by the war. Others immediately set about repairing or rebuilding their homes. Thousands of the homeless set up shelters in the streets wherever a space could be found, erecting wood, corrugated iron, canvas and plastic sheeting to provide these makeshift homes (Figs. 13 and 14). Very few of the homeless were housed in tents. Although the rainy season was coming to an