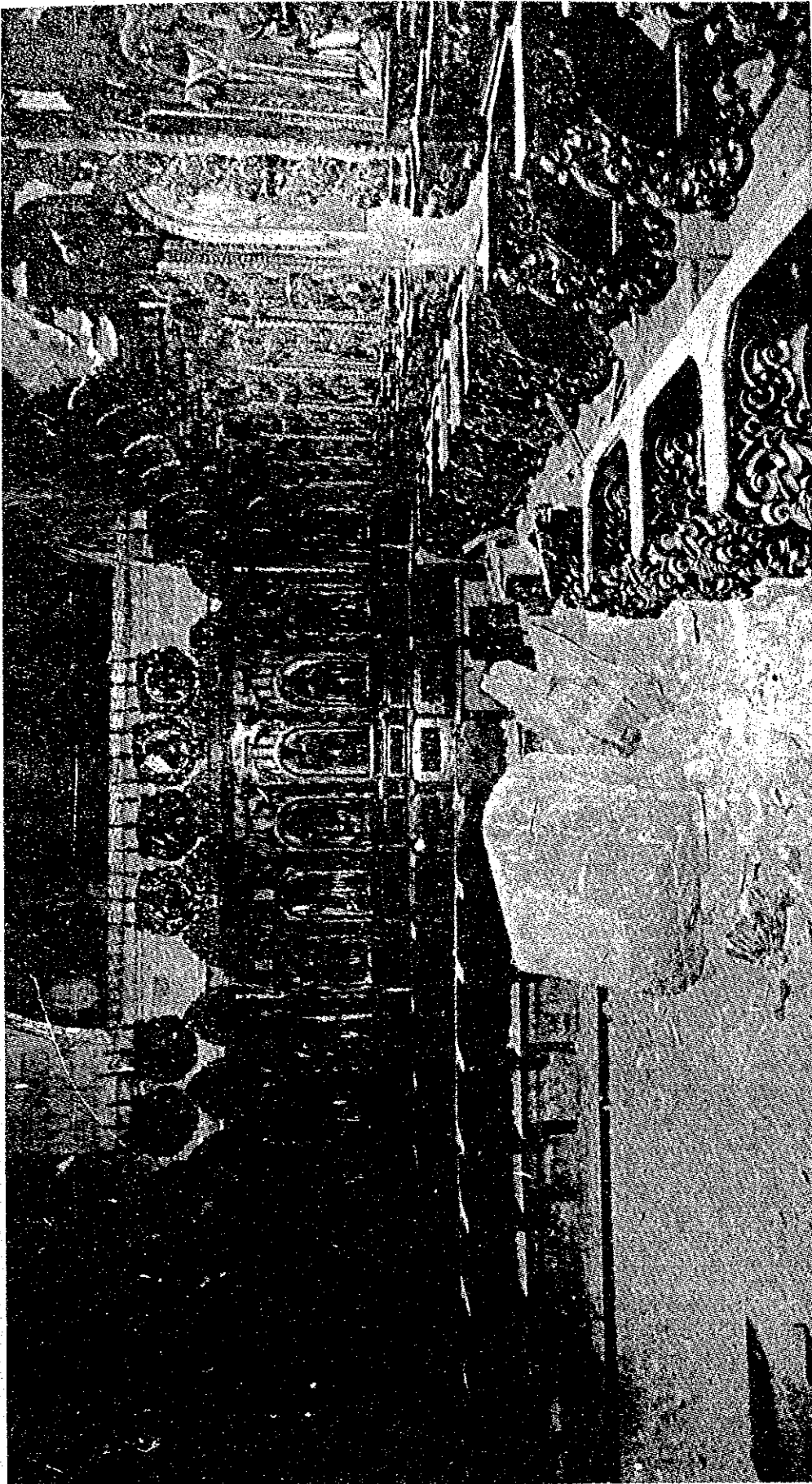




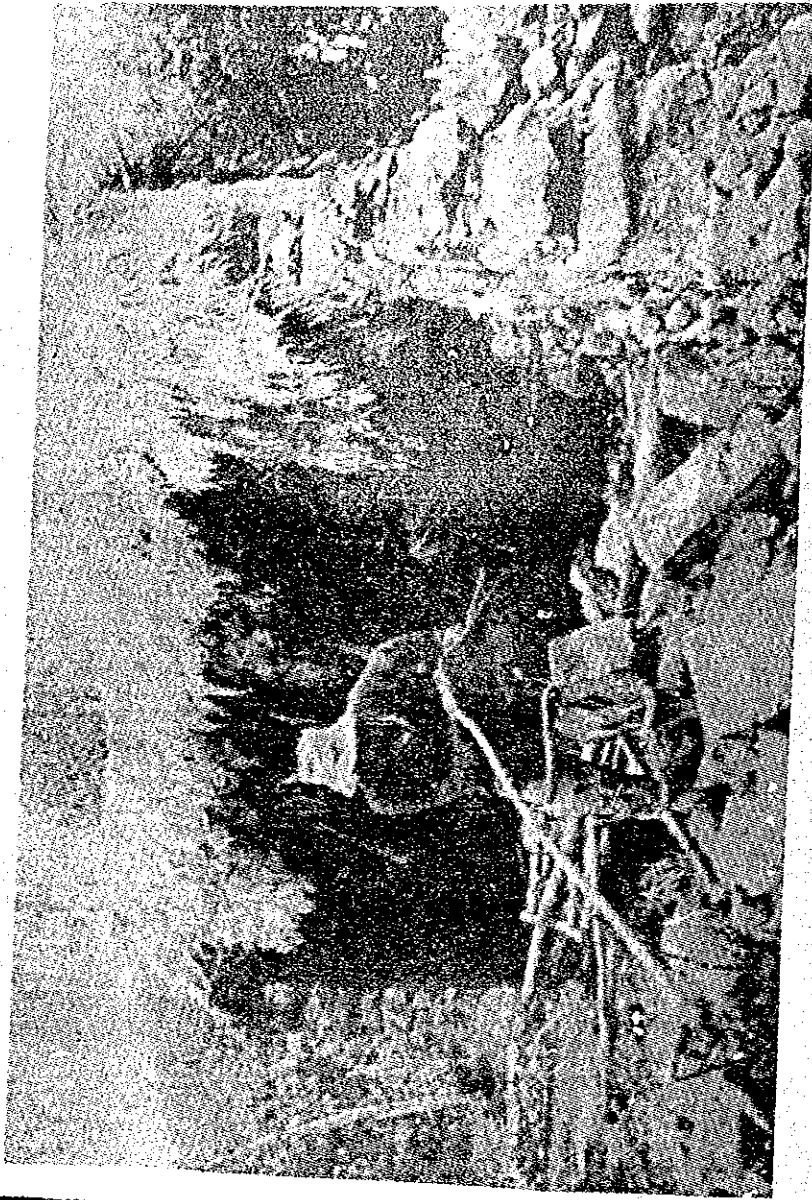
LA REPUBLICA NEWSPAPER. Cuzco, B: The number of death people due to the earthquake is not determined yet. Here, the soldiers rescue a person who was killed during the earthquake. He was hit by a collapsed wall. The president visited the city of Cuzco to take the immediate action for the reconstruction.



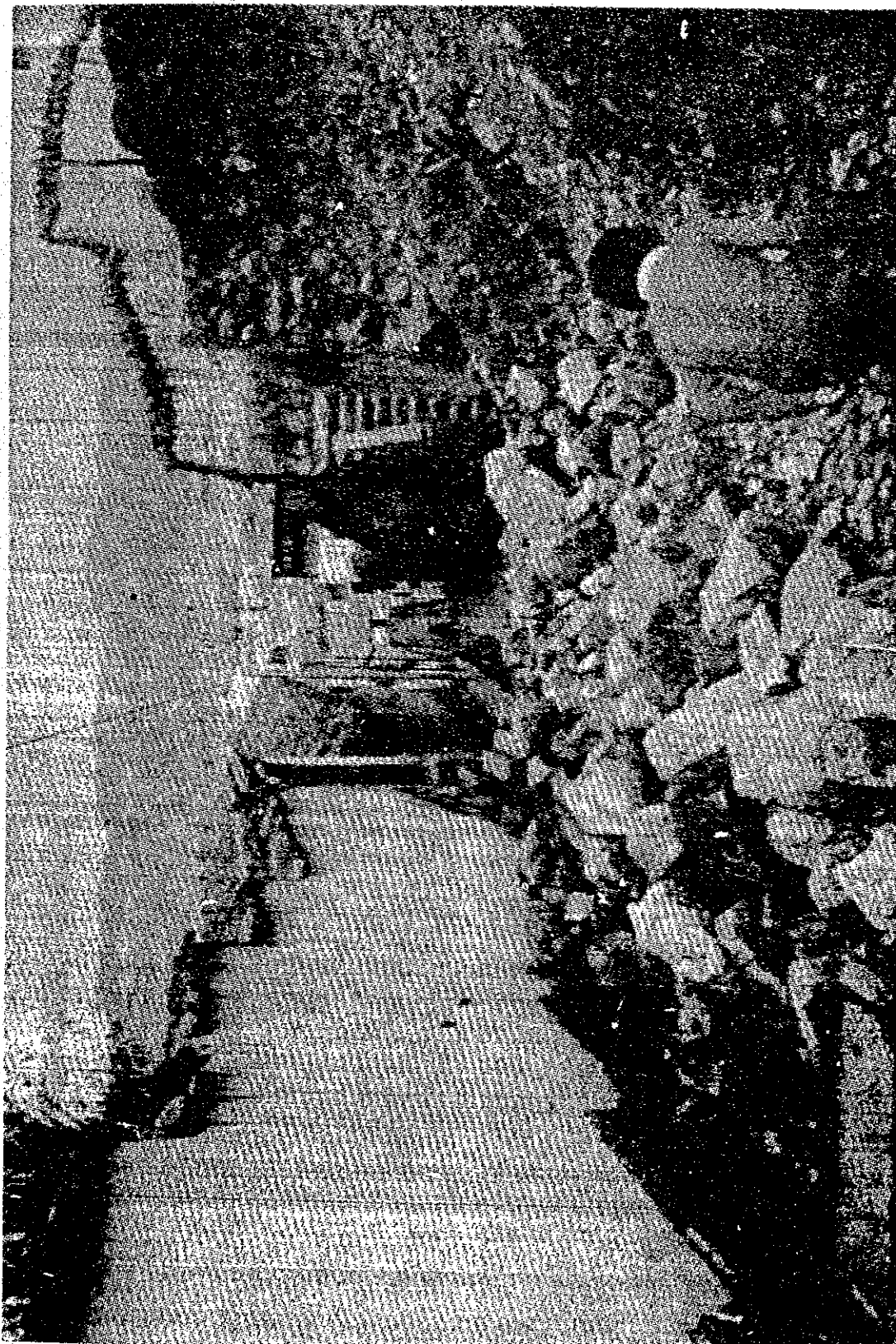
EL COMERCIO NEWSPAPER. CUZCO 8: A big stone fallen down inside of the Cathedral of Cuzco



View of Ccorao Village



THE REPUBLICA NEWSPAPER, CUZCO 9
People trying to reconstruct their homes in Ccorao



LA REPUBLICA NEWSPAPER. CUZCO 9: A boy is walking on the ruins of destroyed houses in the village of Ccorao, place of the Epicenter of the earthquake.

5. Explanation of Photographs

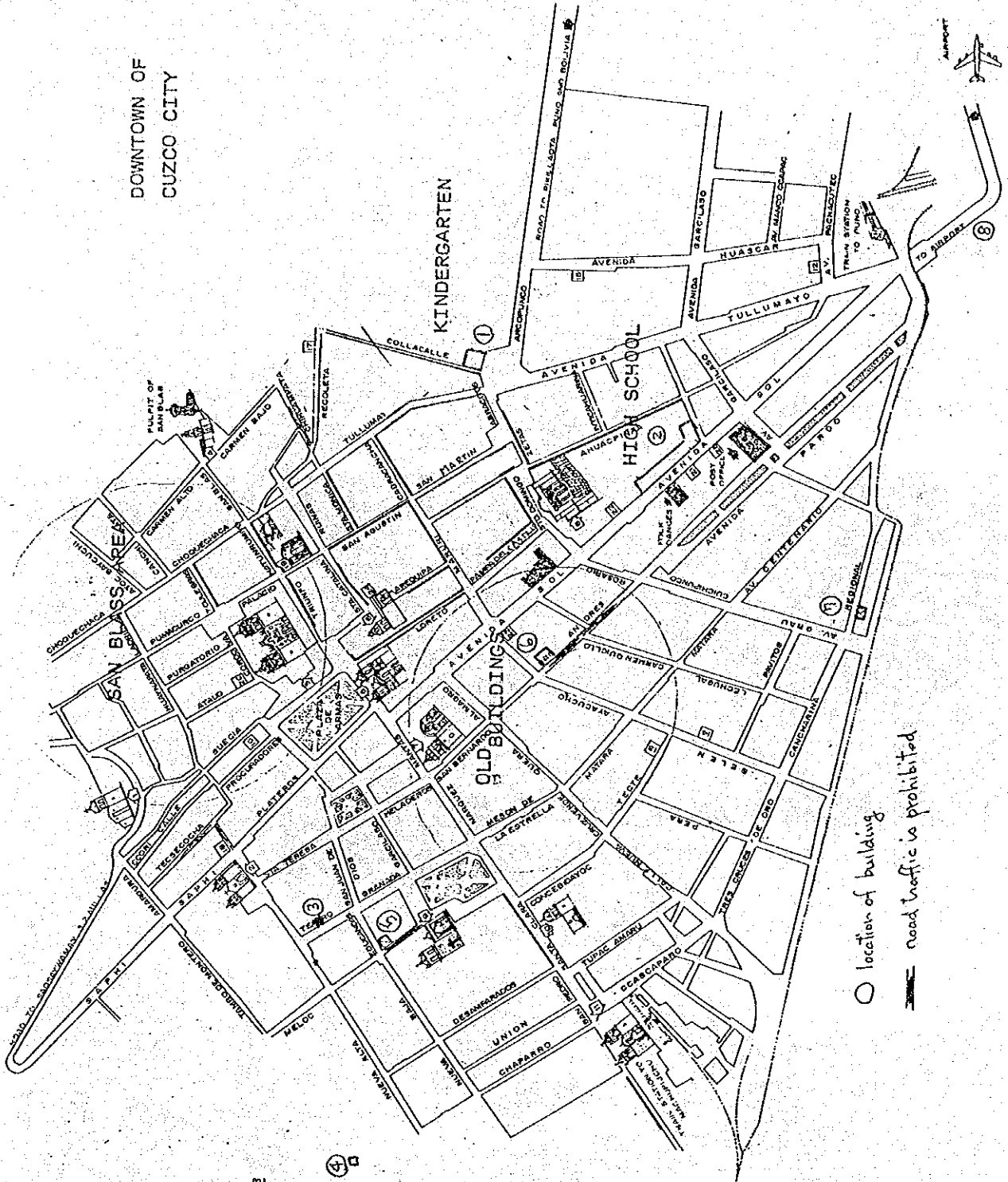
On the basis of the evaluation of earthquake damages made by Cuzco University, we surveyed seriously damaged buildings.

Checking sheet for evaluation of earthquake damages in adobe buildings is shown in Appendix 1.

Fig. 2 shows the areas in Cuzco that were severely damaged and locations of buildings that were surveyed.

The numbers in parentheses at the side of the photographs, show the location of the damage which can be found in Fig. 2.

DOWNTOWN OF
CUZCO CITY



CHURCHES

- 1 SAN CRISTOBAL
- 2 SANTA TERESA
- 3 LA CATEDRAL
- 4 SAN BLAS
- 5 LA COMIGNIA
- 6 SANTA CATALINA
- 7 LA MERCED
- 8 SANTO DOMINGO
- 9 SAN FRANCISCO
- 10 SANTA CLARA
- 11 SAN PEDRO

COMPANIAS DE OMNIBUS

- 12 CRUZ DEL SUR
- 13 HIDALGO
- 14 MONALES
- 15 SAN CRISTOBAL
- 16 OMNIBUS
- 17 VALLE SACRAO

MUSEOS

- 18 ARCHAEOLOGICAL MUSEUM
- 19 MUSEUM OF ART
- 20 RELIGIOUS MUSEUM

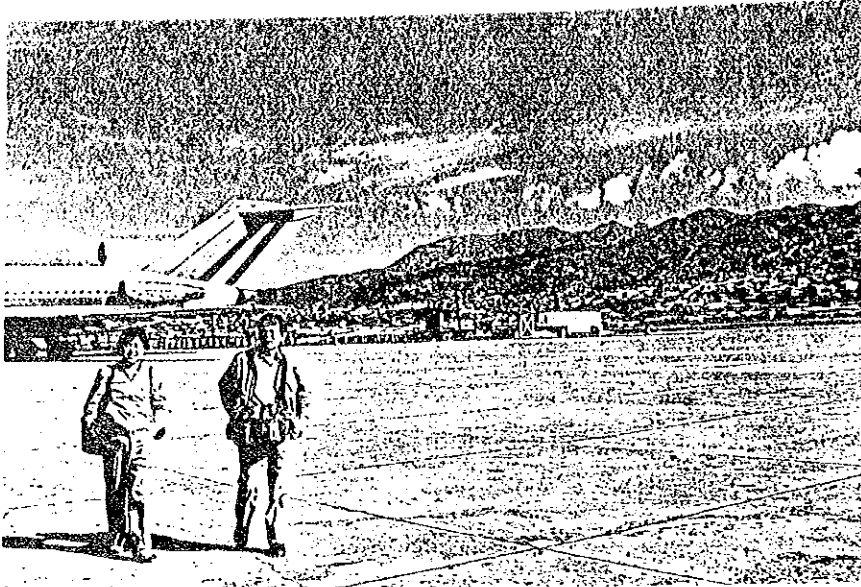
COMPANIAS AEREAS

- 21 AERO PERU
- 22 FAUCETT
- 23 LLOYD AERO BOLIVIANO
- 24 IBERIA
- 25 AIR FRANCE

OTROS

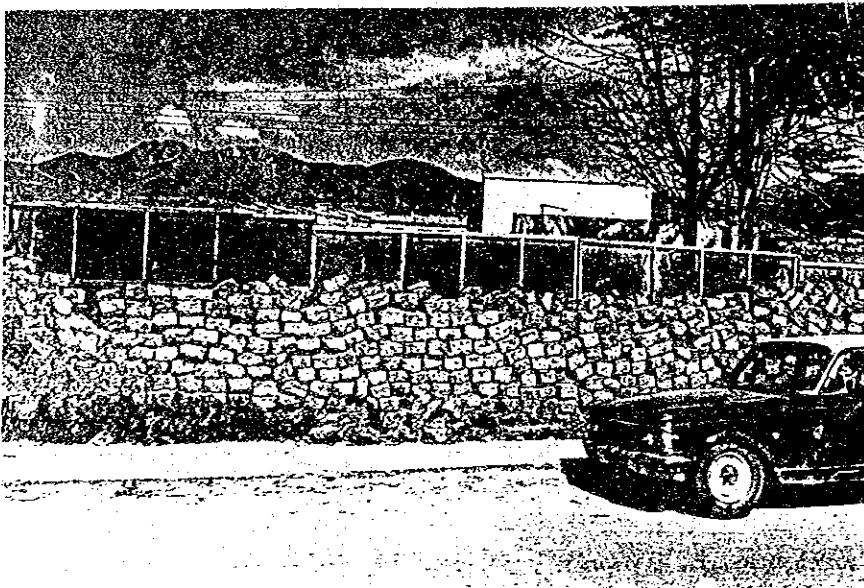
- 26 POST OFFICE
- 27 FOLK DANCES

O location of building
 - - - road traffic is prohibited



1

General view of Cuzco city. We arrived on 10th April at 9 in the morning.



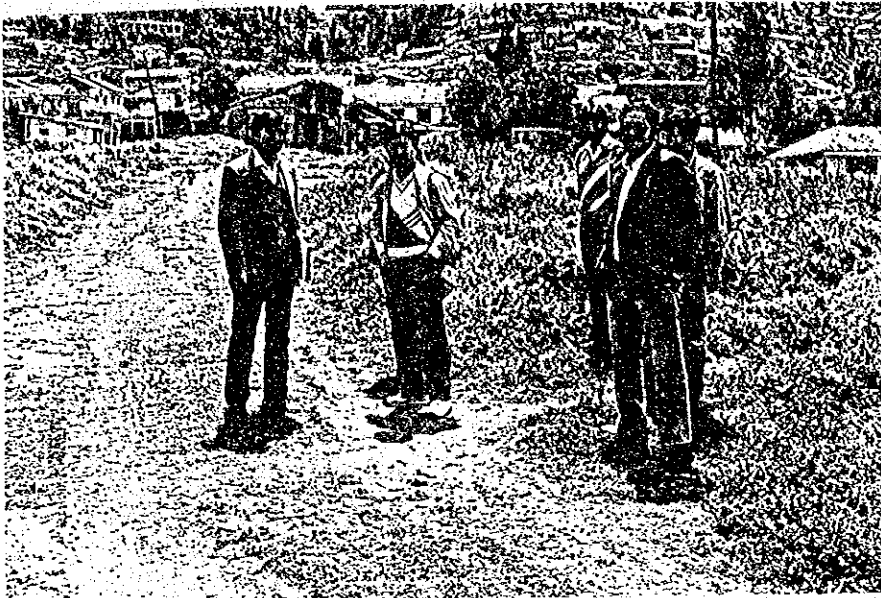
2

Adobe blocks.



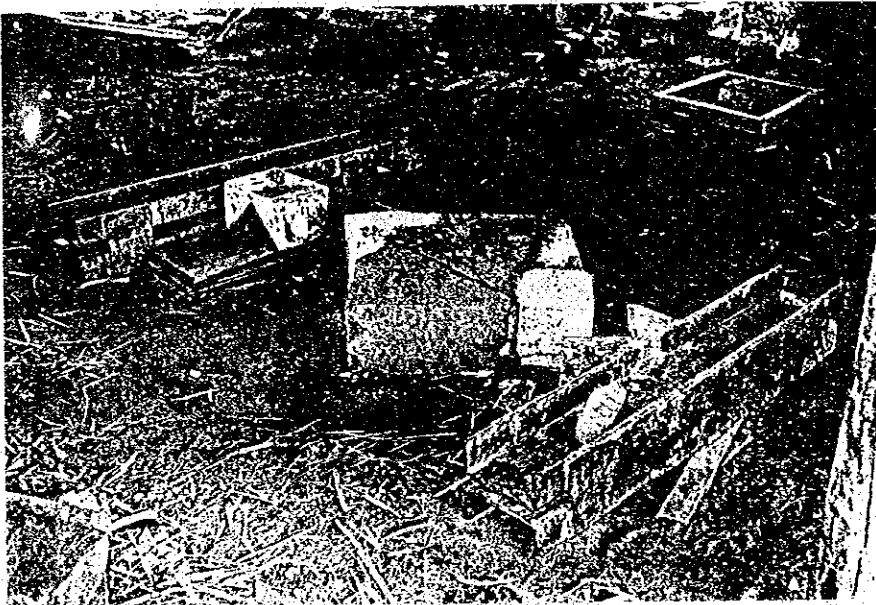
3

Cuzco University. Some buildings were slightly damaged. We can see the damages at the beam-wall joint.



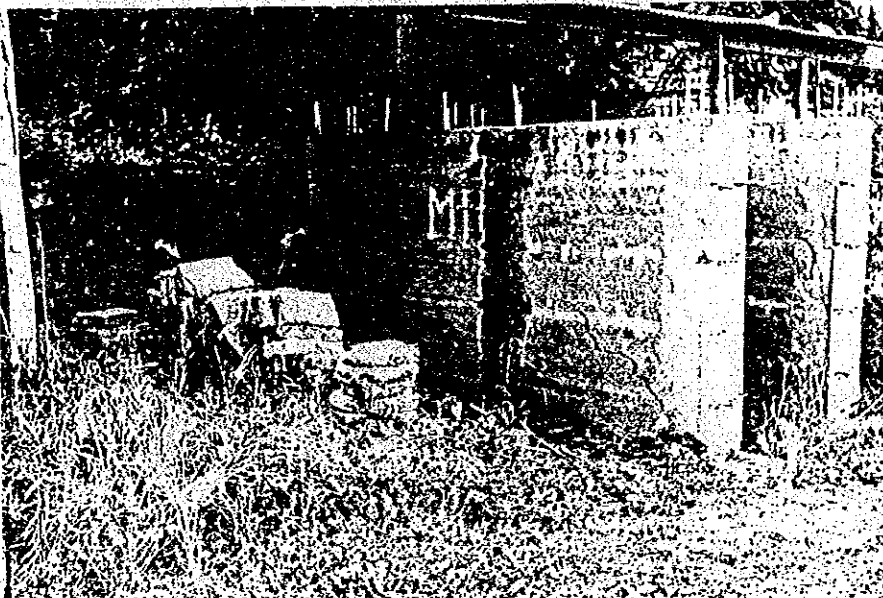
4

Counterpart of
Cuzco University
at left is Carlos
Malpartida Mendoza.



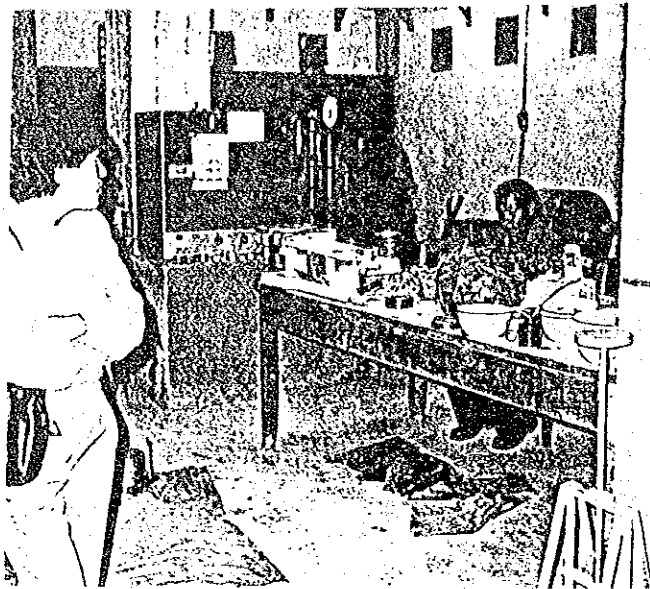
5

Interior of the
structural laborator
of Cuzco University.
They are testing
shear strength of
adobe block wall.
The laboratory is
in very poor
condition.



6

They intend to
improve adobe wall
using caña.



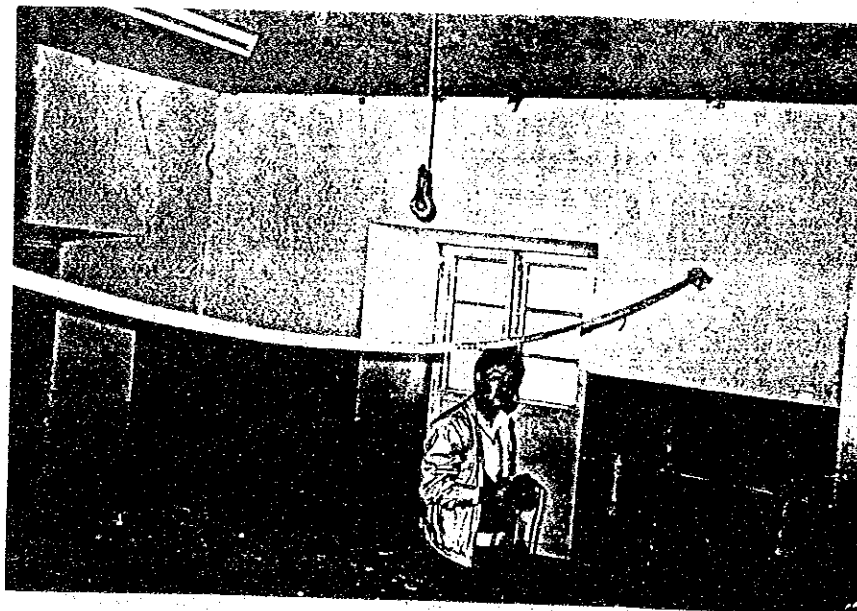
7

Cuzco University
material testing
laboratory.



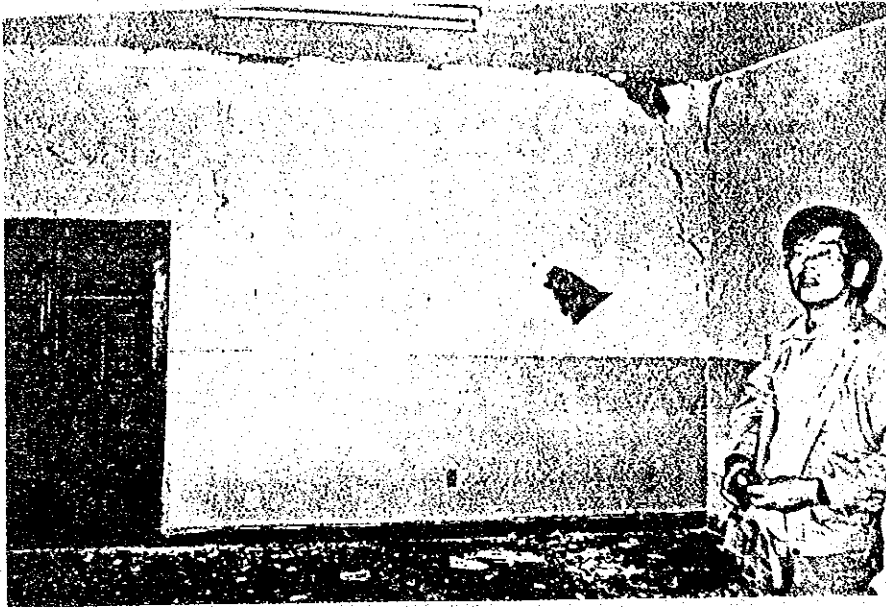
8

This is a two-storey
kindergarten
building made of
adobe blocks.



9

The building is very
old. The old type
adobe building has
about 80 cm 100 cm
thick adobe wall.
The reinforcing bar
shown was once used
to prevent walls
from falling outside
but after the
earthquake, the
wall inclined to
the inside.



10

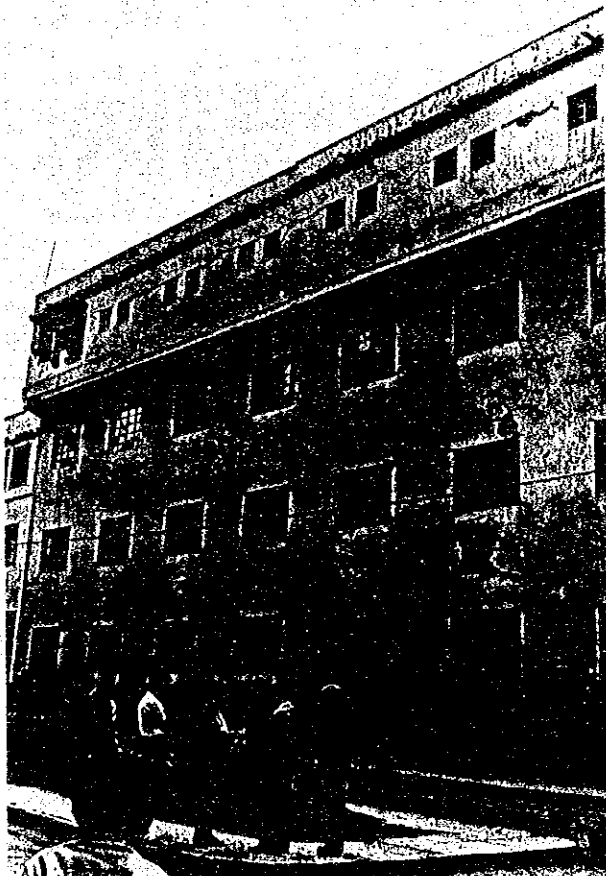
Second floor, inside
the kindergarten

11

ditto

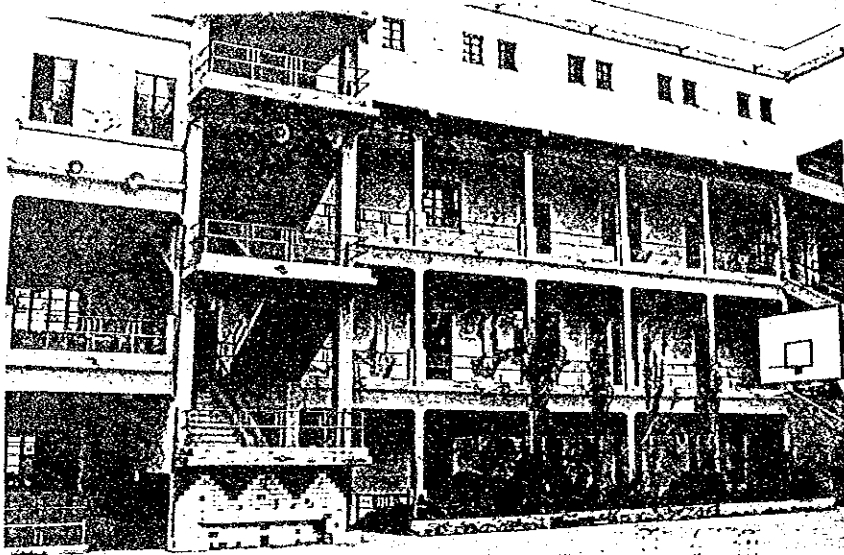


12



High school. This building is reinforced concrete frame structure; between the frame ordinary bricks are infilled. At the top floor (4th floor) bricks of corner wall were severely damaged. To prevent bricks from falling to the street, workers are destroying the brick wall.

13



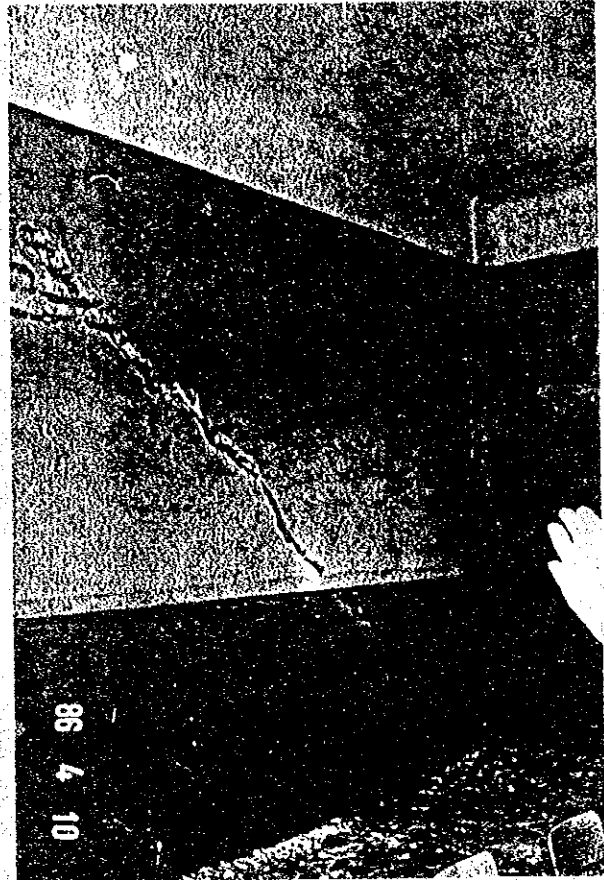
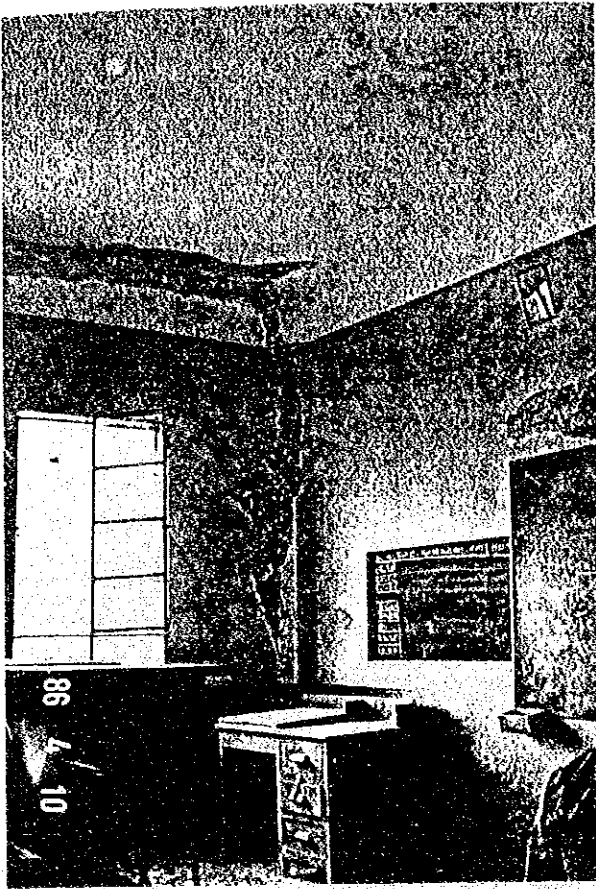
Carlos said the building was very damaged in the second storey. That is shown in this picture.

14
ditto



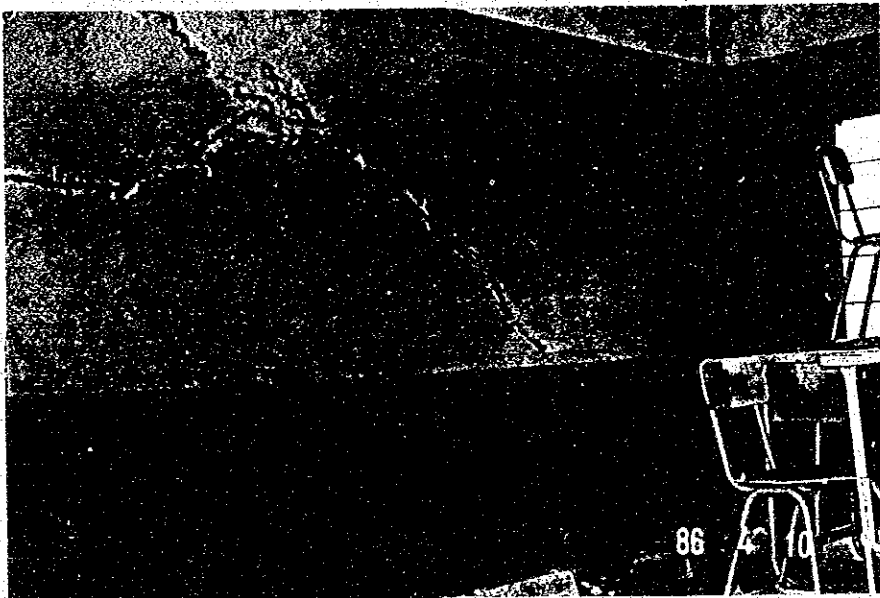
15
Inside the high school.

16



17

Two-storey separation wall of classrooms was damaged by shear force.



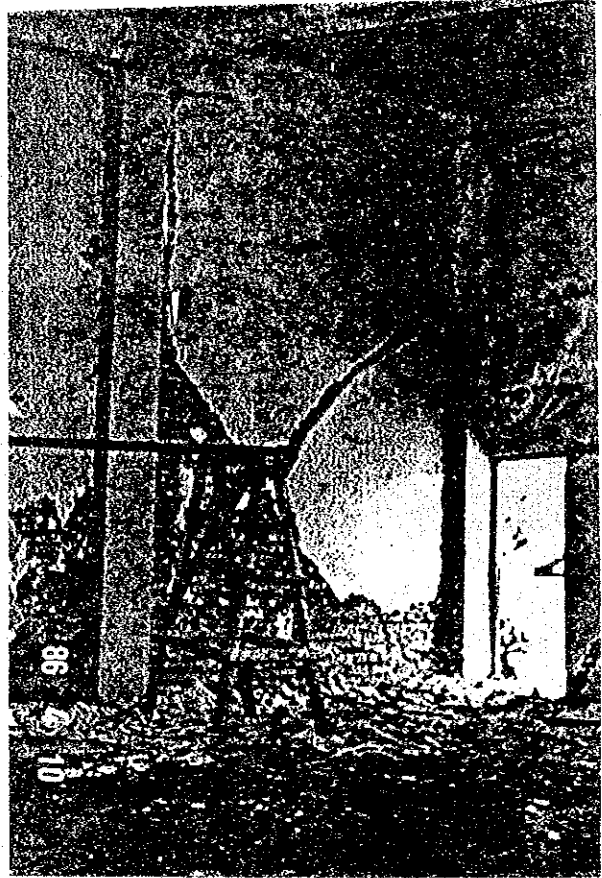
18

Two-storey separation wall of classrooms was damaged by shear force.

19



Reinforcement condition of columns. The covering was removed for investigation.

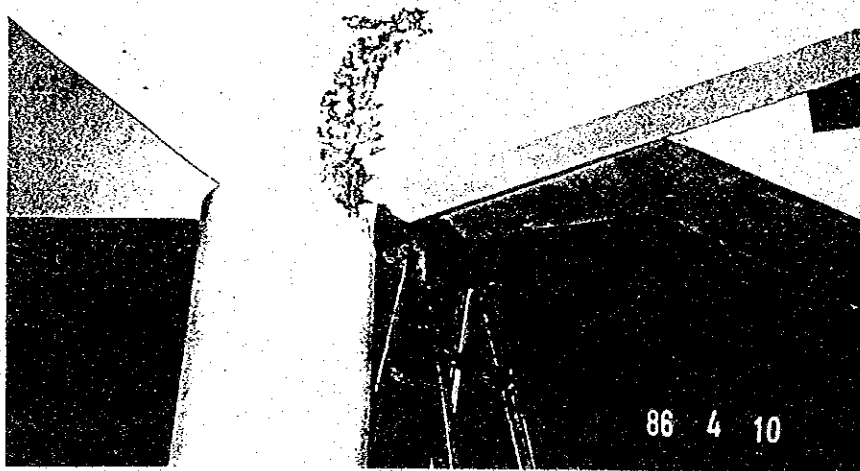


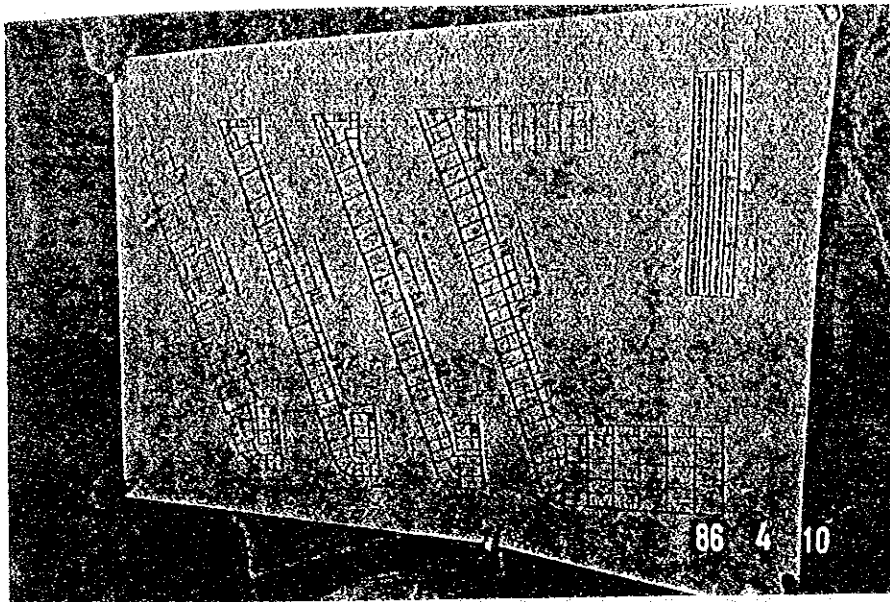
20

Inside the gymnasium damage of capital.

↑ 21

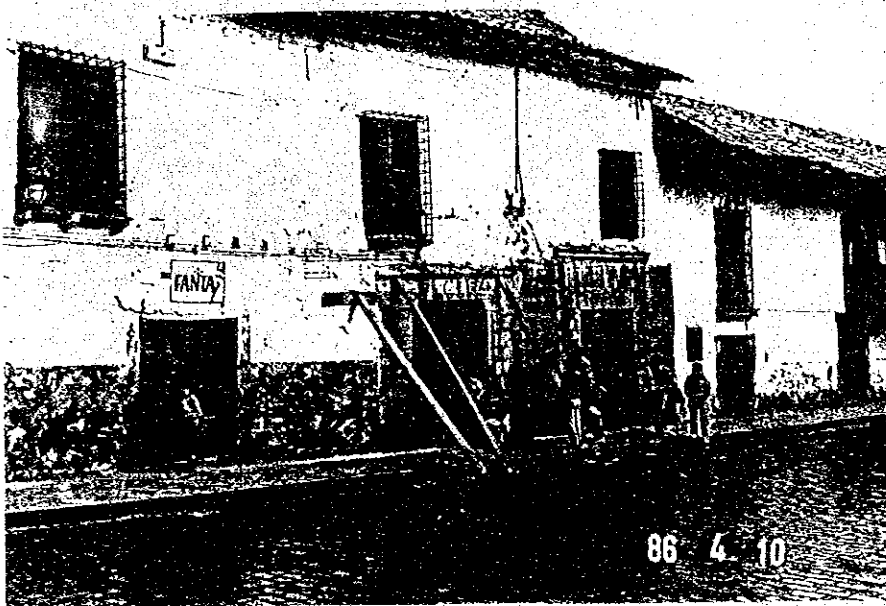
Finishing was falling down.





22

The drawing of the high school.



23

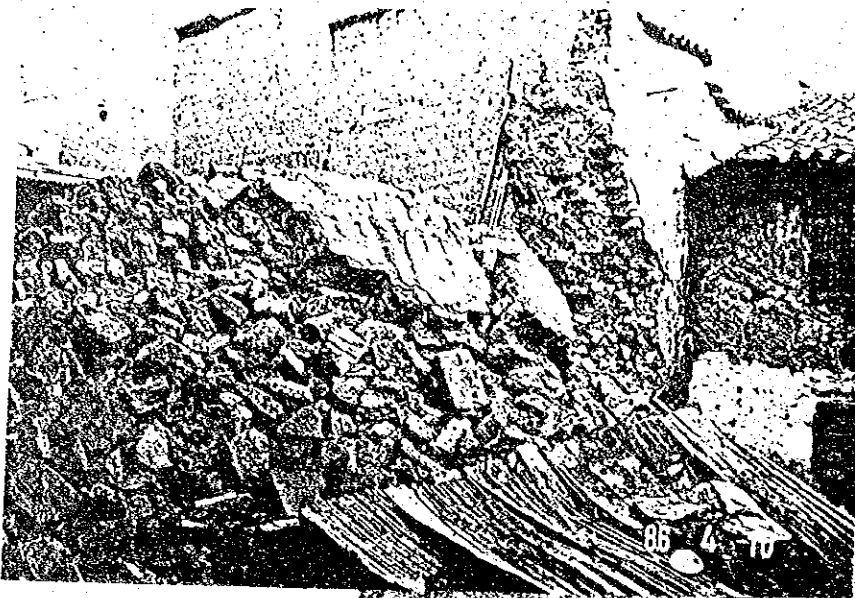
Earthquake made the wall incline outwards. (3)



24

Roof was also damaged.

25

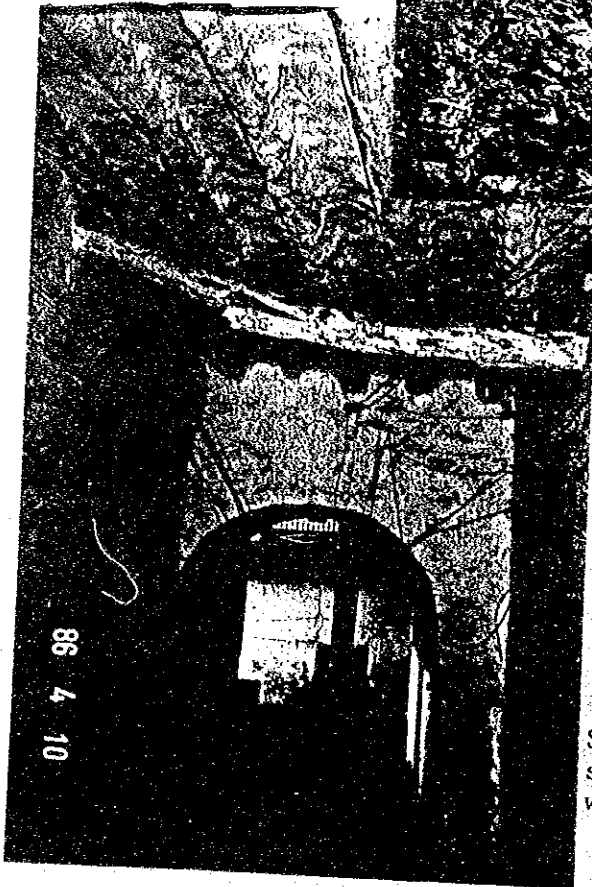


One of the adobe walls collapsed inside the building.



26

One of the adobe walls collapsed inside the building.



27

Structure of the second floor that was not damaged.

Inside a three-storey adobe building, walls were damaged severely at the second floor. (4)



86 4 10

ditto



86 4 10



86 4 10

Damaged adobe building. Nine families are living here. (4)

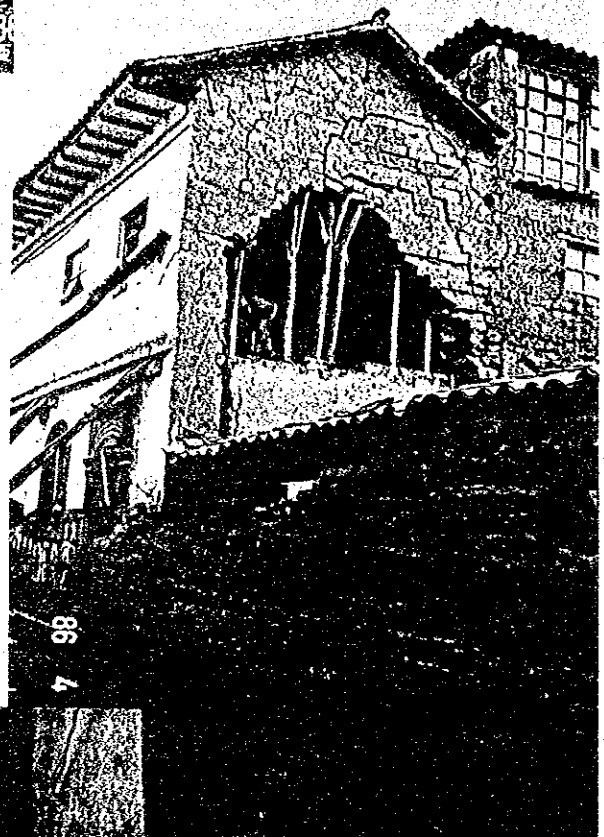


31

Wall inclined to the outside. (5)

32

Same building, some parts of the walls collapsed. (5)

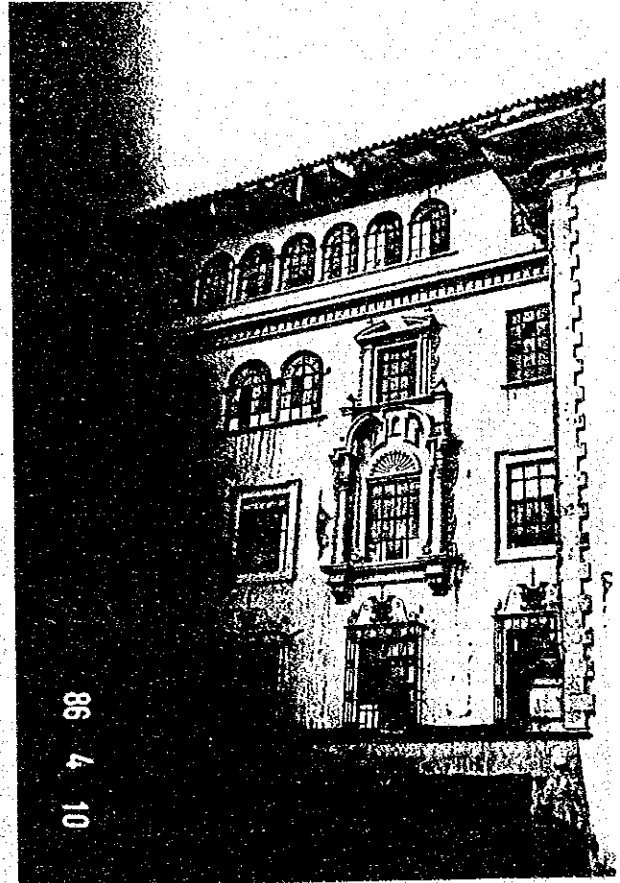


33

We can see the building supported. (Near (5)).

86 4 10

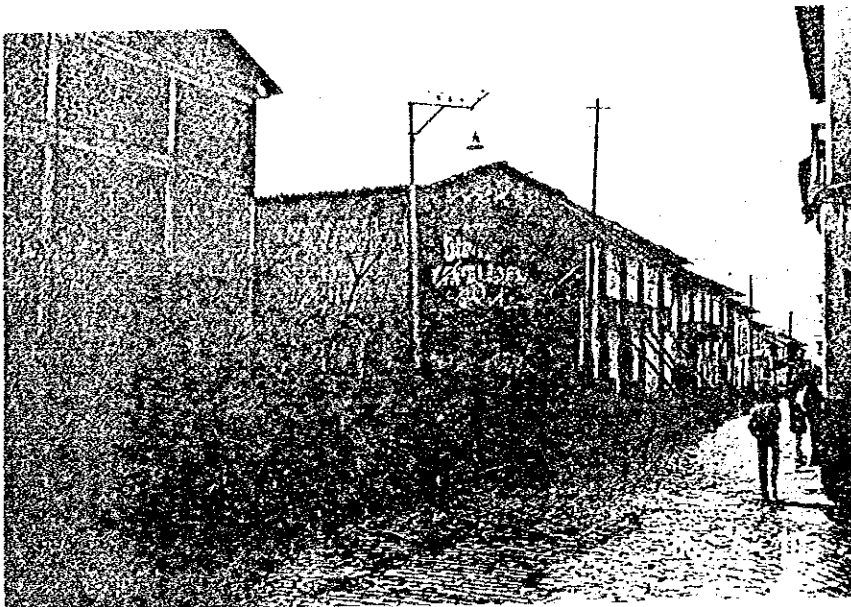
Walls inclined to the outside. (6)



Some buildings' outer walls were inclined to the outside, so road traffic was prohibited. (6)



The outer wall of Santo Domingo Church. We can see the shear cracks. The material of the wall is not known.



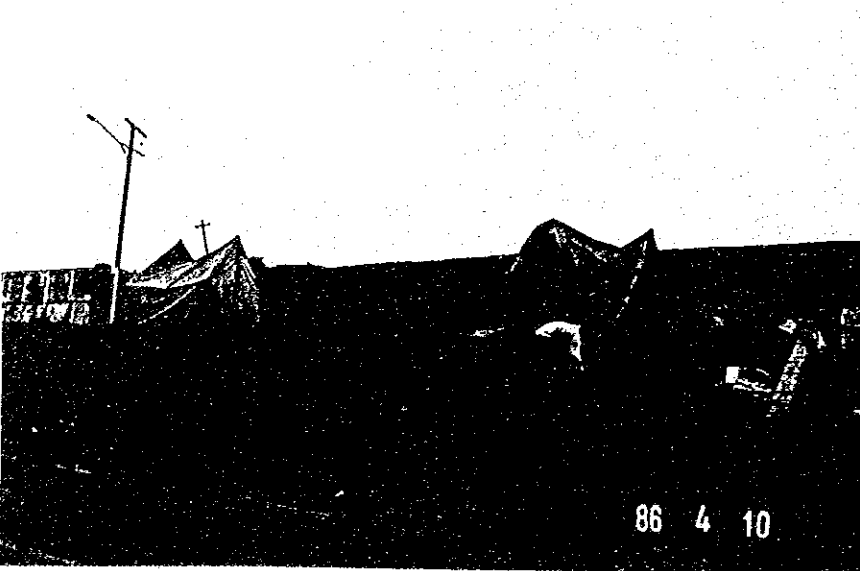
37

(Near (6))



38

This is a four-storey adobe building that stands just at the cliff slope. Adobe outer walls were severely damaged. (7)



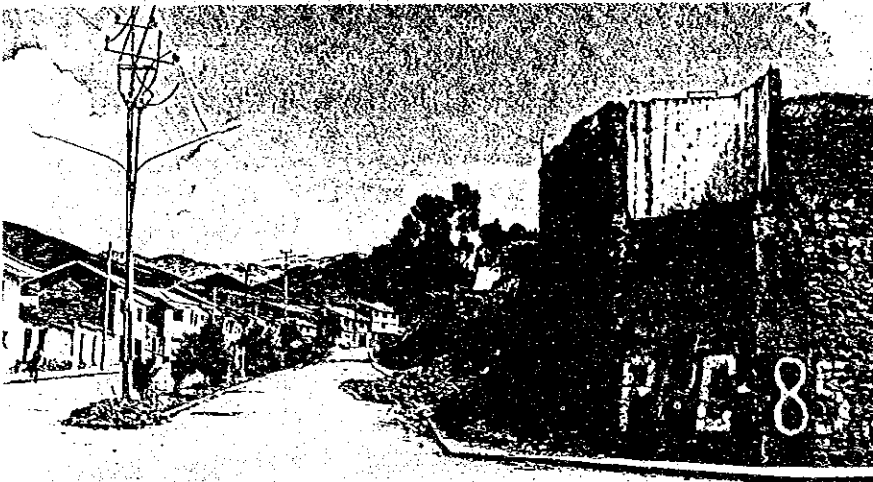
39

They are afraid of aftershocks so they are preparing their tents. This tent is located at a distance of 10 m from that building. (7)



40

Inside that building
(7)



41

Exterior walls of
adobe blocks falled
down to the street.
(8)

FACULTY OF CIVIL ENGINEERING AND GEOLOGICAL ENGINEERING
 EVALUATION OF DAMAGES IN ADOBE BUILDINGS IN CUSCO
 EARTHQUAKE OF 05-04-86

TABLE 1.- GENERAL EVALUATION

1. LOCATION OF THE HOUSE:

1.1 DISTRICT: () 1.2 SECTOR ()
 Urbanization:..... Mz..... L.....
 Street:..... N.....

2. HABITANTS OF THE HOUSE:

2.1 Number of Families..... ()
 2.2 Total number of Habitants..... ()
 2.3 Full name of the owner.....
 2.4 Place of work.....

3. GENERAL DATA OF THE HOUSE:

3.1 Number of stories: () 3.2 Age in years ()
 3.3 Foundation
 Do not have () Stone and mud () Concrete ()
 3.4 Thickness of the perimetral walls:
 0.25 m () 0.50 m () More ()
 3.5 Thickness of the interior walls:
 0.25 m () 0.50 m () More ()
 3.6 Roofs
 Tejas above () Tejas/pan () Eternit ()
 wooden trusses or nudillo or calamina

4. OBSERVED DAMAGES IN THE BUILDINGS:

	YES	NO
4.1 Walls wet at their base	()	()
4.2 Inclined or bend walls	()	()
4.3 More than 50% of perimetral walls are cracked on the top floor (cracks L>1.0m)	()	()
4.4 More than 50% of interior walls are cracked on the top floor (cracks L>1.0m)	()	()
4.5 More than 50% of the corners with vertical cracks	()	()
4.6 Collapsed walls due to the earthquake	()	()
4.7 Collapsed roofs due to the earthquake	()	()

5. DEGREE OF DAMAGES ACCORDING TO THE SURVEYOR

Slight () Moderate () Severe ()

6. OBSERVATIONS.....

.....

FACULTAD DE INGENIERIA CIVIL E INGENIERIA GEOLOGICA
CARRERA PROFESIONAL DE INGENIERIA CIVIL

EVALUACION DE DAÑOS EN EDIFICACIONES DE ADOBE EN EL CUSCO - SISMO : 5-04-86

FICHA 1.- EVALUACION GENERAL

1.0 UBICACION DE LA VIVIENDA:

1.1 DISTRITO : () 1.2 SECTOR : ()
Urbanizacion:..... Manzana..... Lote.....
Calle :..... Nº.....

2.0 HABITANTES DE LA VIVIENDA:

2.1 Nº de Familias : () 2.2 Nº Total de Habitantes : ()
2.2 Apellidos y Nombres del Propietario.....
2.3 Centro de Trabajo.....

3.0 DATOS GENERALES DE LA VIVIENDA:

3.1 Nº de Pisos : () 3.2 Antigüedad en Años : ()
3.3 Sobrecimientos:
No Tiene : () Piedra y Barro: () Cemento Ciclópeo : ()
3.4 Espesor de Muros Perimetrales:
0,25 mts. : () 0,50 mts. : () Más de 0.50 mts. ()
3.5 Espesor de Muros Interiores :
0.25 mts. : () 0.50 mts. : () Más de 0.50 mts. ()
3.6 Techos :
Tejas sobre Tije rales de madera () Tejas/pan o mudillo () Eternit o Calamina : ()

4.0 DAÑOS OBSERVADOS EN LA EDIFICACION:

	SI	NO
4.1 MUROS HUMEDECIDOS EN SU BASE	()	()
4.2 MUROS INCLINADOS O PANDEADOS	()	()
4.3 MAS DEL 50 % DE MUROS PERIMETRALES AGRIETADOS EN LA PLANTA SUPERIOR (GRIETAS L > 1.00 mts.)	()	()
4.4 MAS DEL 50 % DE MUROS INTERIORES AGRIETADOS EN LA PLANTA SUPERIOR (GRIETAS L > 1.00 mts.)	()	()
4.5 MAS DEL 50 % DE ENCUENTROS DE MUROS AGRIETADOS EN LA PLANTA SUPERIOR (GRIETAS VERTICALES)	()	()
4.6 MUROS CAIDAS A RAIZ DEL SISMO	()	()
4.7 TECHOS CAIDOS A RAIZ DEL SISMO	()	()

5.0 NATURALEZA DE LOS DAÑOS EN OPINION DEL ENCUESTADOR:

DAÑOS LEVES () DAÑOS MODERADOS () DAÑOS SEVEROS ()
6.0 OBSERVACIONES:.....