DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Field Trip Guide to selected features along the San Andreas fault near Parkfield, central California

by

John D. Sims
U.S. Geological Survey [1]

Open-File Report 88-360

[1] Menlo Park, CA

1988

This guide was originally used for a field trip to the Parkfield area by USGS personnel. Please be aware that all land off paved roads is private. Geoscientists work in the Parkfield area at the pleasure of the landowners. We depend on their good will. Please respect the landowners' privacy and property rights.

Stop 1 Watertank site. (Private Property--NOT ACCESSIBLE)
Features:
1. Location of trenches (now closed) in an alluvial fan that is offset 48.6 $\pm$ 0.7 m. (fig. 1)
2. Offset fence. The fence was built in 1908 and repaired several times.
   Total offset 69 $\pm$ 3 cm (fig. 2). Creep since 1966 earthquake is 3 mm/yr $^{-1}$.
   Average slip is 15 cm/earthquake based on the 1966 earthquake.
3. Offset? gully (optional)
4. Scarps (optional)

Stop 2 Gold Hill (Private Property--NOT ACCESSIBLE)
Gold Hill is an exotic block of quartz-bearing hornblende gabbro that is correlated with the same rock types at Eagle Rest peak in the San Emigdio Range and with the Logan Quarry main near Watsonville (fig. 3). The block is bounded on the SW by the San Andreas fault and on the NE by the Jack Ranch fault. Numerous geophysical wells are drilled into the gabbro mass.

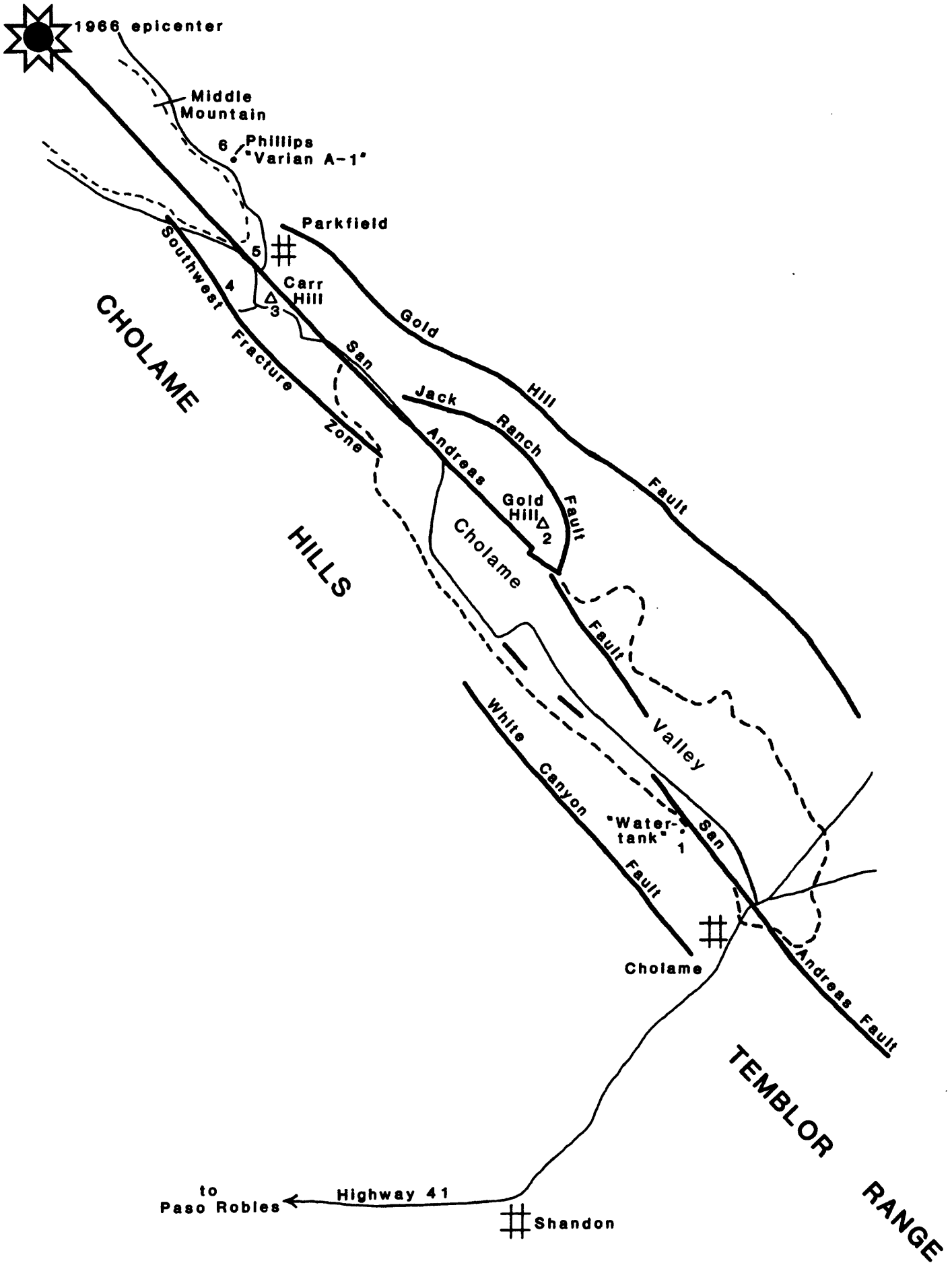
Stop 3 Carr Hill. Two-color laser installation. (USGS Geophysical Observatory - NOT ACCESSIBLE)
The two-color laser is permanently installed in a hut just west of the San Andreas. A creep meter is located nearby across the 1966 rupture of the fault.

Stop 4 Offset fence on Ranchita Canyon Road.
Here a fence is offset 12 cm by the southwest fracture zone. This offset was only recently discovered. The age of the fence is unknown, although it was in place in 1966. Accurate measurement of the offset is pending.

Stop 5 Parkfield Bridge.
The bridge was built in 1932 on seven pairs of vertical steel I-beam pilings sunk into the bed of Little Cholame Creek. Three of the pairs of pilings are west of the San Andreas and have been moved NW by co-seismic slip and interseismic creep 81 cm since 1932. A layer of concrete was laid over the steel frame in 1960 in an attempt to stiffen the bridge. Note that the concrete surface and steel guard rails bend broadly but show no point of offset (Figure 4).

Stop 6 Phillips "Varian A-1" well. (Private Property--NOT ACCESSIBLE)
Phillips Petroleum drilled this wildcat well beginning August 8, 1981 and completed the well October 8, 1981 to a total depth of 5030' (1523 m). Dips on strata in the well range from about 50°-70°. The well was spudded into the Miocene Etchegoin Formation and ended in the Temblor(?) Formation. These formations are present:

	Interval	True thickness (60° avg. dip)
Etchegoin (friable sandstone)	0-1775	887' (269m)
Monterey (mudstone)	1775'-4855'	1540' (466m)
Temblor(?) (sandstone and clay?)	4855'-8030'	87' (26m)


1966 epicenter
Middle Mountain
6
Phillips "Varian A-1"
Parkfield
5
Carr Hill
4
3
Southwest Fracture Zone
San Andreas
Gold Hill
2
Jack Ranch Fault
Gold Hill Fault
Fault
CHOLAME HILLS
Cholame
Fault
White Canyon Fault
Valley
"Water-tank"
1
San Andreas Fault
Cholame
TEMBLOR RANGE
to Paso Robles
Highway 41
Shandon
0
5Km

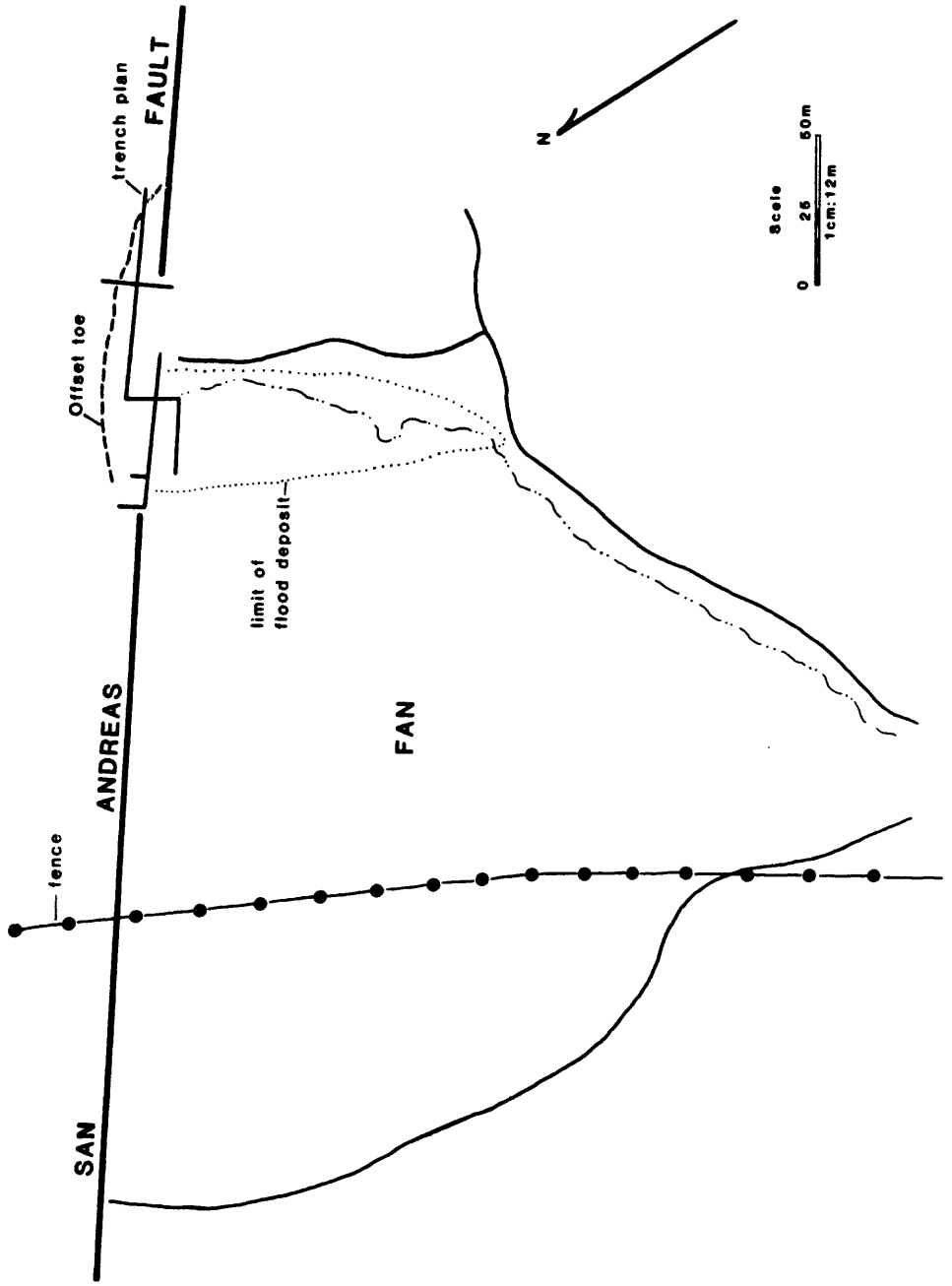

FAULT
trench plan
Offset loe
limit of
flood deposit
FAN
ANDREAS
SAN
fence
N
Scale
0
25
50m
1cm:12m

Figure 1

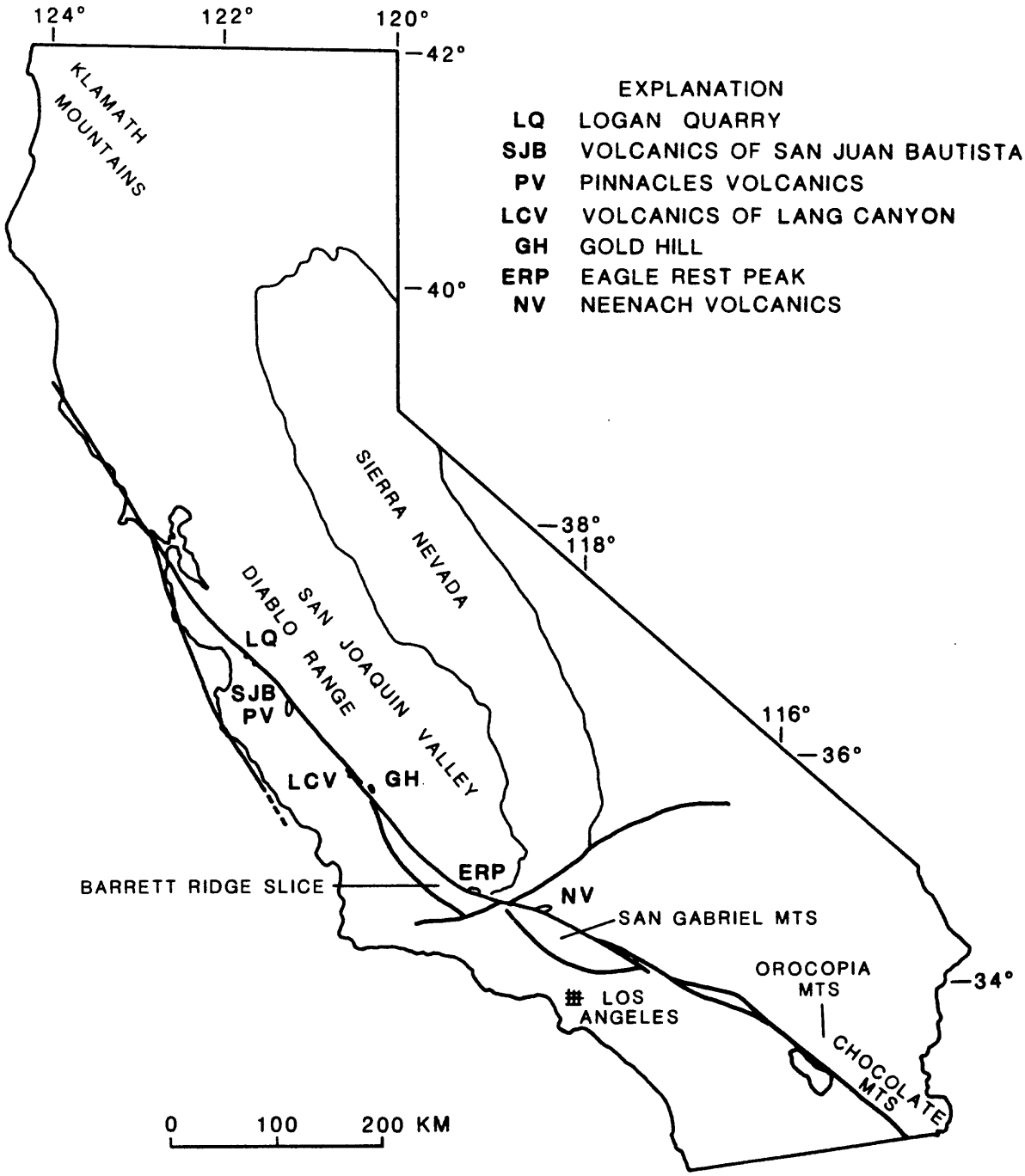
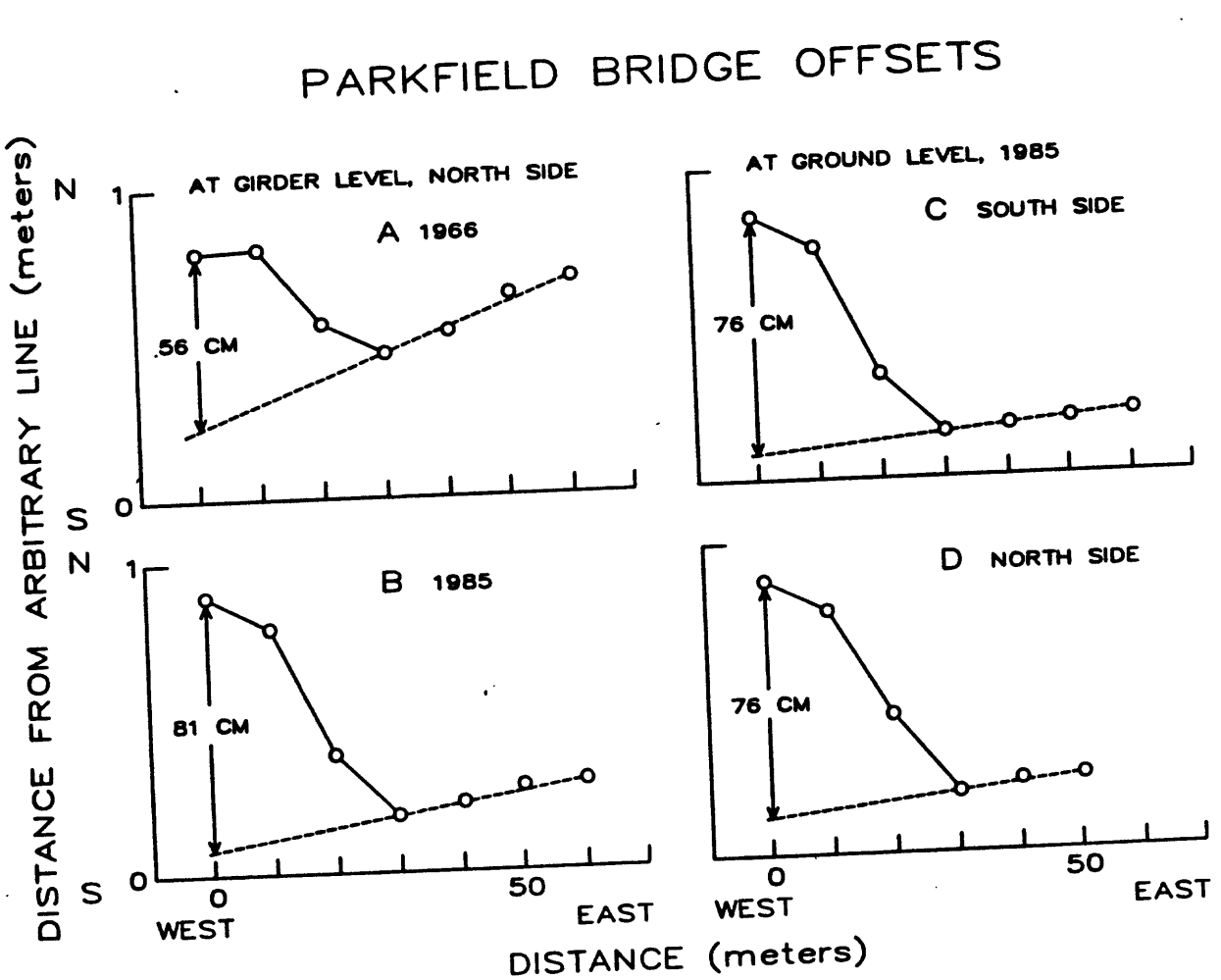

124°
122°
120°
42°
40°
38°
118°
116°
36°
34°
KLAMATH MOUNTAINS
SIERRA NEVADA
SAN JOAQUIN VALLEY
DIABLO RANGE
LQ
SJB
PV
LCV
GH
ERP
NV
BARRETT RIDGE SLICE
SAN GABRIEL MTS
OROCOPIA MTS
LOS ANGELES
CHOCOLATE MTS
0
100
200 KM
EXPLANATION
LQ LOGAN QUARRY
SJB VOLCANICS OF SAN JUAN BAUTISTA
PV PINNACLES VOLCANICS
LCV VOLCANICS OF LANG CANYON
GH GOLD HILL
ERP EAGLE REST PEAK
NV NEENACH VOLCANICS

Figure 3.


PARKFIELD BRIDGE OFFSETS
AT GIRDER LEVEL, NORTH SIDE
A 1966
.56 CM
AT GROUND LEVEL, 1985
C SOUTH SIDE
76 CM
B 1985
81 CM
D NORTH SIDE
76 CM
DISTANCE FROM ARBITRARY LINE (meters)
N
S
1
0
WEST
EAST
50
DISTANCE (meters)

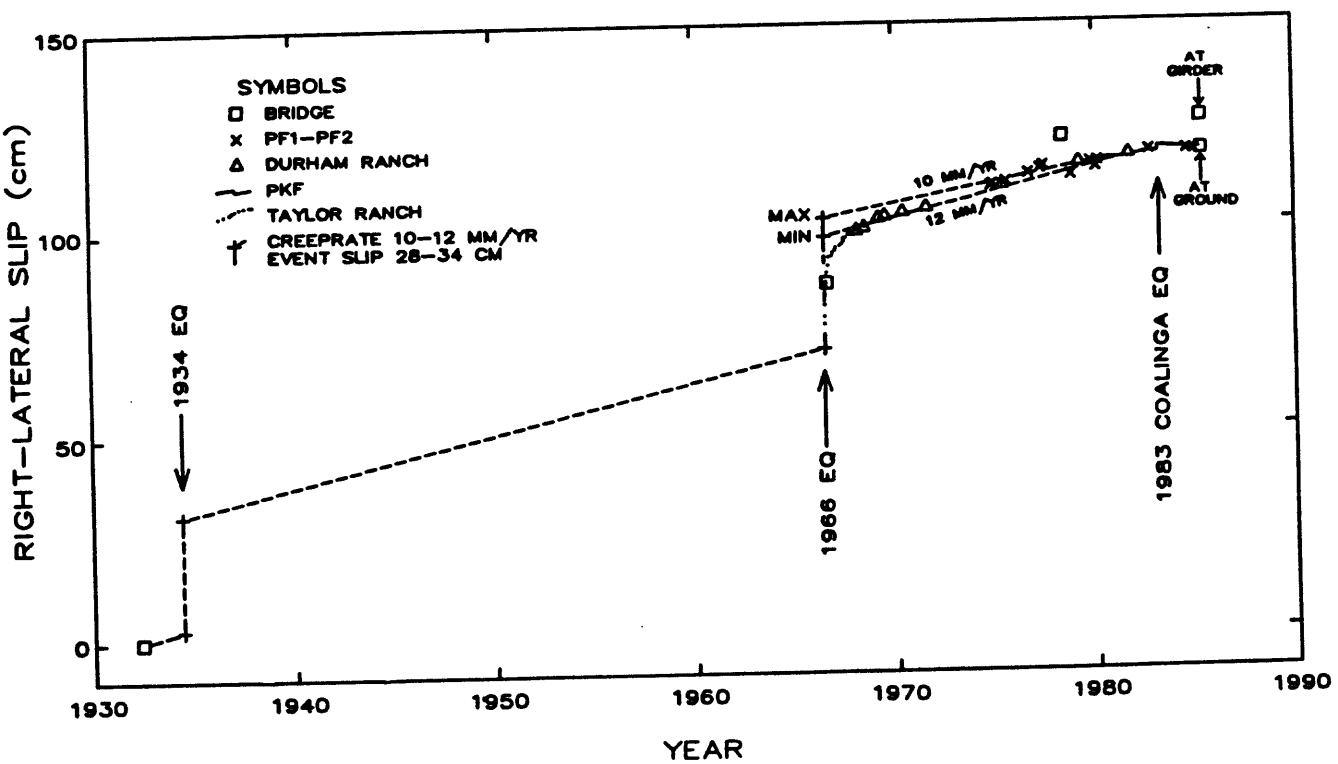

SYMBOLS
BRIDGE
PF1–PF2
DURHAM RANCH
PKF
TAYLOR RANCH
CREEPRATE 10–12 MM/YR
EVENT SLIP 28–34 CM
1934 EQ
1966 EQ
1983 COALINGA EQ
MAX
MIN
10 MM/YR
12 MM/YR
AT GIRDER
AT GROUND
RIGHT-LATERAL SLIP (cm)
YEAR
150
100
50
0
1930
1940
1950
1960
1970
1980
1990

Figure 4