Report on the Geological Survey of Nepal

by Toni Hagen

Index of the Attached Plates

Geological Panoramic Views

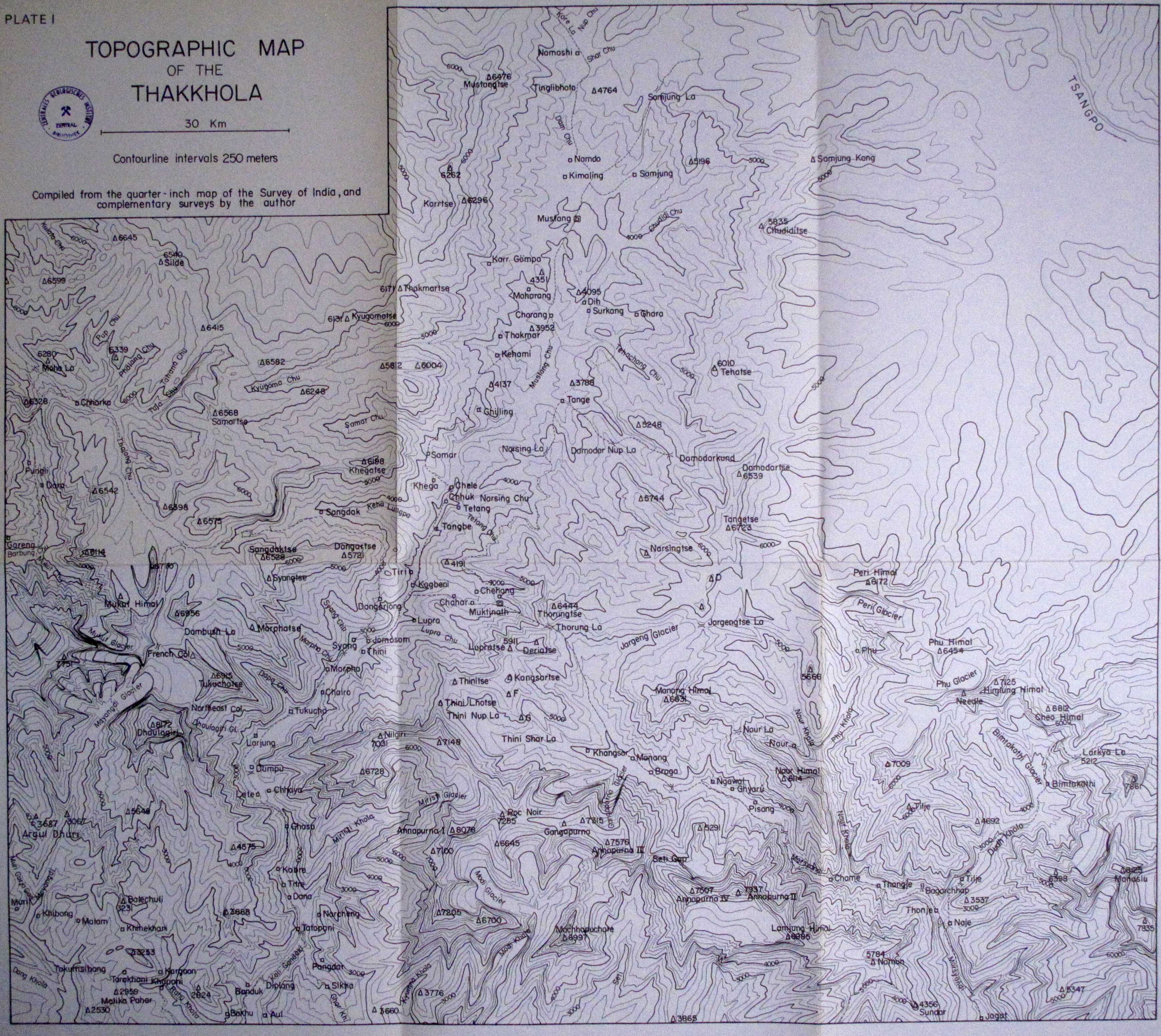


PLATE I
TOPOGRAPHIC MAP
OF THE
THAKKHOLA
30 Km
Contourline intervals 250 meters
Compiled from the quarter-inch map of the Survey of India, and
complementary surveys by the author
TSANGPO
Namashi
Mustangtse
Tinglibhoto
Samjung La
Namdo
Kimaling
Samjung
Samjung Kang
Karrtse
Mustang
Chudiditse
Karr Gömpa
Thakmartse
Kyugometse
Moharang
Dih
Surkang
Ghara
Charang
Thakmar
Kehami
Tehatse
Mustang Chu
Kyugomo Chu
Samartse
Chharka
Moha La
Ghiling
Tange
Samar
Norsing La
Damodar Nup La
Damodarkund
Damodartse
Khegatse
Khega
Chele
Chhuk
Norsing Chu
Tetang
Tangbe
Sangdak
Pungli
Dara
Tangetse
Norsingtse
Sangdaktse
Dangastse
Syangtse
Tirib
Kagbeni
Chehang
Chahar
Dangarjong
Muktinath
Thorungtse
Thorung La
Mukut Himal
Dhambush La
Morphatse
Lupra
Jomosom
Thini
Syang
Morpha
Lupratse
Deriatse
French Col
Tukuchatse
Jorgengtse La
Jargeng Glacier
Peri Himal
Peri Glacier
Phu
Phu Himal
Phu Glacier
Himlung Himal
Needle
Cheo Himal
Thinitse
Kangsartse
Thini Lhotse
Thini Nup La
Thini Shar La
Chairo
Tukucha
Northeast Col
Dhaulagiri
Dhaulagiri Gl.
Mayangdi Glacier
Manang Himal
Nour La
Nour
Larkya La
Bimtakothi Glacier
Bimtakothi
Larjung
Dumpu
Nilgiri
Khangsar
Manang
Braga
Ngawal
Ghyaru
Nour Himal
Chhaiya
Lete
Argui Dhuri
Ghasa
Roc Noir
Annapurna I
Gangapurna
Annapurna III
Pisang
Tilje
Seti Gap
Annapurna IV
Annapurna II
Chame
Thangle
Bagarchhap
Thonje
Naje
Manaslu
Kabre
Titre
Dana
Narcheng
Tatopani
Bolechuli
Muri
Khibang
Matam
Khimekhani
Modi Glacier
Machhapuchare
Lamjung Himal
Namun
Tokumsibang
Tarakhani
Khaparni
Korgaon
Pangdor
Sikha
Banduk
Diplang
Bakhu
Aul
Sundar
Jagat
Marsyandi
Kali Gandaki
Dang Khola
Mehika Paher

PLATE II

GEOLOGICAL MAP of the THAKKHOLA
(NEPAL — HIMALAYA)

by Toni Hagen

Fieldwork carried out under appointment of the United Nations Technical Assistance Programme
1952—1958

scale 1:200 000

Topographic map based on the Quarter inch map of the Survey of India
with alterations, corrections, and complementations by the author

TIBET

TECTONIC UNITS BELOW THE KATHMANDU NAPPES
(MURI ZONE, JAJARKOT NAPPES, NAWAKOT NAPPES)

TIBETAN ZONE
TIBETAN MARGINAL SYNCLINORIUM

QUATERNARY - TERTIARY

TERTIARY - CRETACEOUS

MESOZOIC

PALAEOZOIC

METAMORPHICS AND IGNEOUS ROCKS

KATHMANDU NAPPES
HIMALAYAN SCHUPPEN ZONE

83° 30 | 83° 45' | 84° | 84° 15' | 84° 30'

29°

28° 45'

28° 30'

PLATE III SHEET 1

13 GEOLOGICAL PROFILES

of the THAKKHOLA AREA (NEPAL-HIMALAYA)

by TONI HAGEN

scale 1:200 000

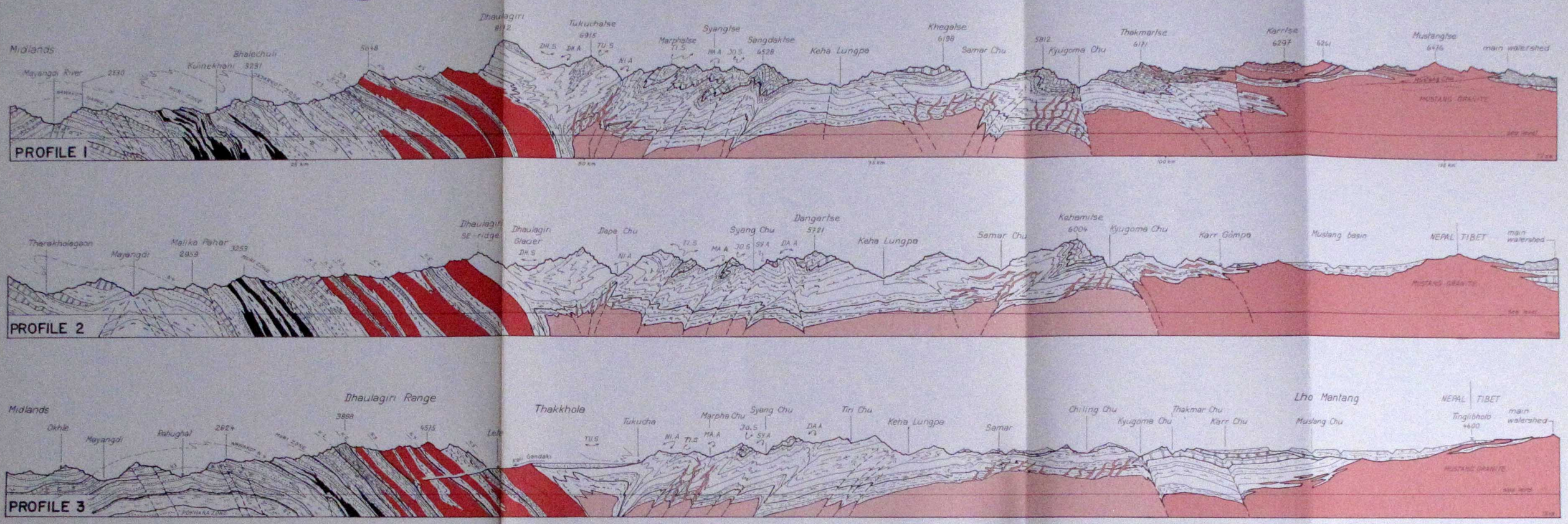
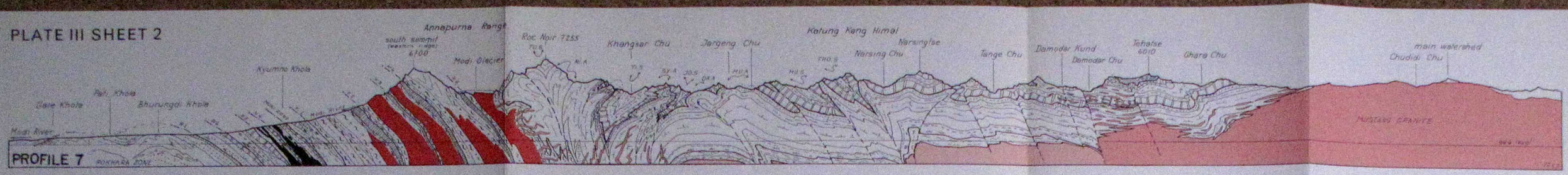
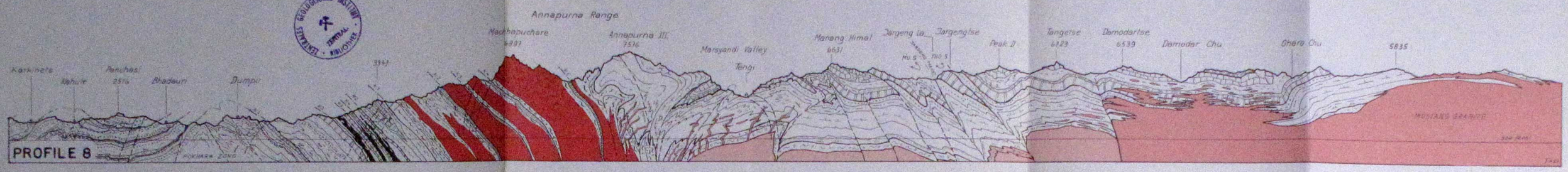
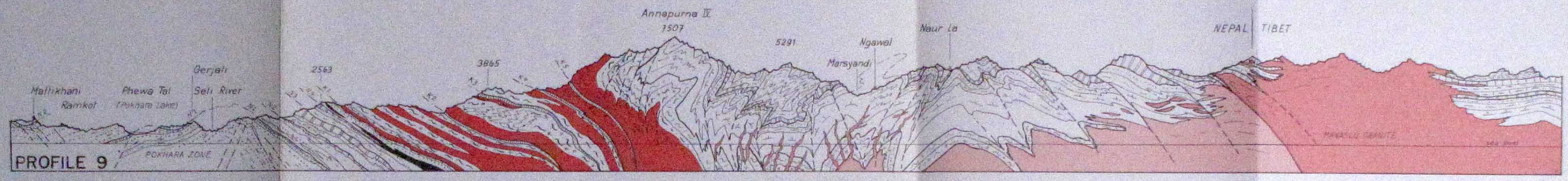


PLATE III SHEET 2

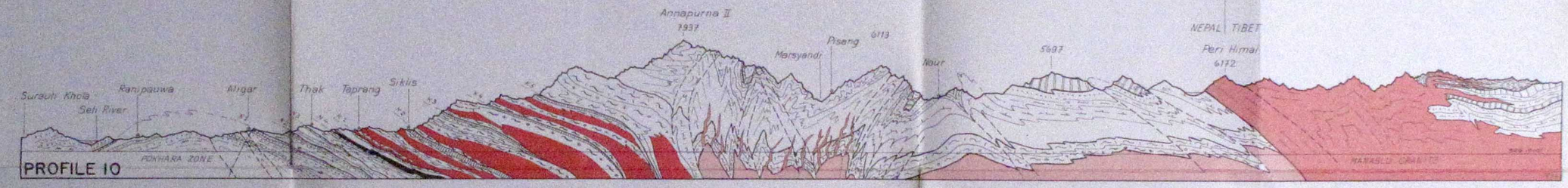






KATHMANDU NAPPES
HIMALAYAN SCHUPPEN ZONE

- limestone (Ordovician ?) quadzite
- slates, sericite-slates (Cambrian?)
- calcsilicate-gneiss, calcsilicate-schists
- micaschists
- mainly paragneisses (fine-grain biotite-gneiss)
- mixed gneisses, migmatites, augengneisses with pegmatites
- mainly orthogneisses, granite-gneiss
- pegmatite layers and dykes



JAJARKOT NAPPES
MURI ZONE

PALAEOZOIC

- siliceous limestones and dolomites
- quartzites
- slates and sericite-slates, phyllites
- conglomerates, conglomerate-gneiss, augengneiss (Barbati-Ullari-gneiss)
- micaschists
- granitic igneous rocks
- amphibolites

TIBETAN ZONE
TIBETAN MARGINAL SYNCLINORIUM

- (Alluvial filling of the Tukucha basin)
- Thakmar series (Tertiary – Pleistocene)

UPPER CRET.-TERT.

- Kaghberi series (greensand series, upper Paleocene – Eocene)
- Saligram series (lower – middle Paleocene)
- Narsing series (lower Paleocene – upper Cretaceous)
- Thakkhola series (predominant flysch facies, upper Cretaceous – lower Tertiary (-)

MESOZOIC

- Upper Jurassic
- Lower Jurassic
- Rhetic
- Triassic

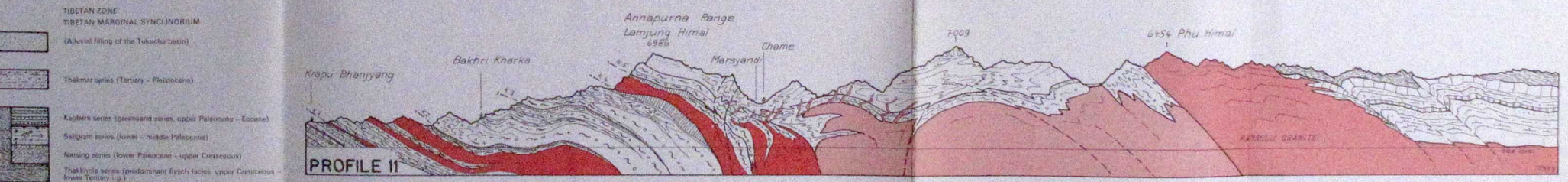
PALAEOZOIC

- Permian
- Carboniferous
- Devonian
- Silurian – Ordovician – Cambrian (?)
- slates, sericite-slates, phyllites Cambrian (?)

PRE-PALAEOZOIC

- calcsilicate rocks, calcsilicate marble
- mainly paragneisses
- mixed gneisses with pegmatites
- orthogneisses, granite-gneisses crystalline basement I-II

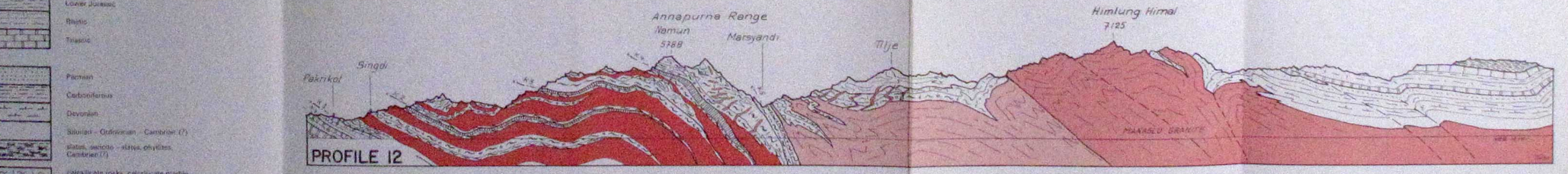
- pegmatites
- Mustang granite, Manaslu granite, with pegmatites



NAWAKOT NAPPES

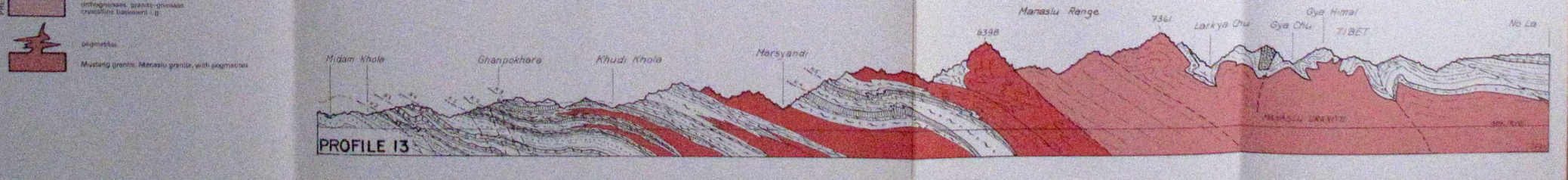
PERM-TRIASSIC

- dolomite and limestone
- quartzite
- conglomeratic schists
- slates
- phyllites
- micaschists
- conglomerate-gneiss (Ullari-gneiss)
- amphibolites
- granitic igneous rocks



POKHARA ZONE

- dolomite, limestone
- slates, phyllites, sericite-schists
- conglomerate-schists



B1-N5 Kathmandu nappes 1-5
B1-N4 Nawakot nappes 1-4

PLATE IV

8 LONGITUDINAL GEOLOGICAL PROFILES

of the THAKKHOLA AREA (NEPAL-HIMALAYA)

scale 1:200 000 by
TONI HAGEN

TIBETAN ZONE
TIBETAN MARGINAL SYNCLINORIUM

(Alluvial fillings of the Tukucha Basin)

Thakkhola series (Tertiary – Pleistocene)

UPPER CRETACEOUS – TERTIARY

Kagbeni series (pretriassic series, upper Paleocene – Eocene)

Saligram series (clayey – middle Paleocene)

Nesting series (lower Paleocene – upper Cretaceous)

Thakkhola series (predominant flysch facies, upper Cretaceous – lower Tertiary e.g.)

MESOZOIC

Upper Jurassic

Lower Jurassic

Rhetic

Triassic

PALAEOZOIC

Permian

Carboniferous

Devonian

Silurian – Ordovician – Cambrian (?)

PRE PALAEOZ.

calcsilicate rocks, calcsilicate marble

various gneisses, paragneisses and mixed gneisses with pegmatites, marginal zone of the Manaslu granite

granitic basement (e.g.

Mustang and Manaslu granite, with pegmatites
(Muglu granite in western Nepal)

KATHMANDU NAPPES
HIMALAYAN SCHUPPEN ZONE

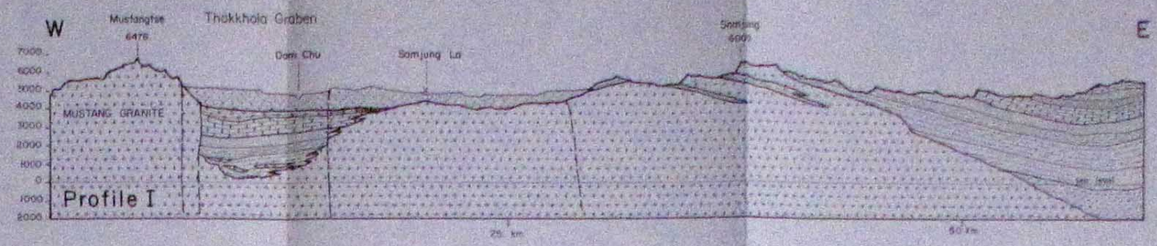
calcsilicate rocks, calcsilicate gneiss

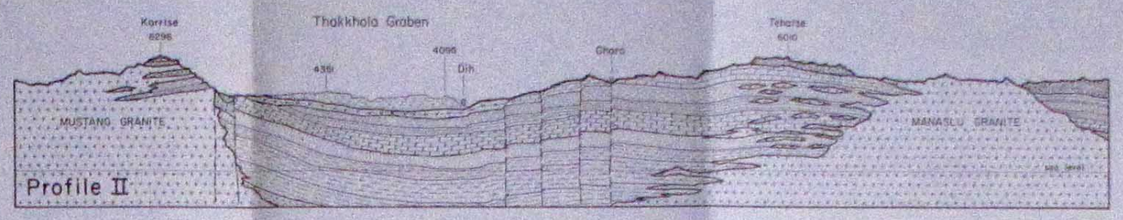
mainly paragneisses (fine-grained biotite – gneiss) micaschists

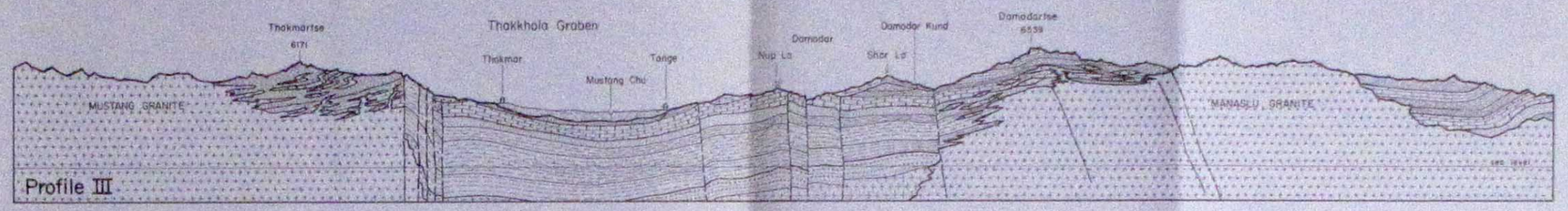
mixed gneisses, augen-gneisses, with pegmatites

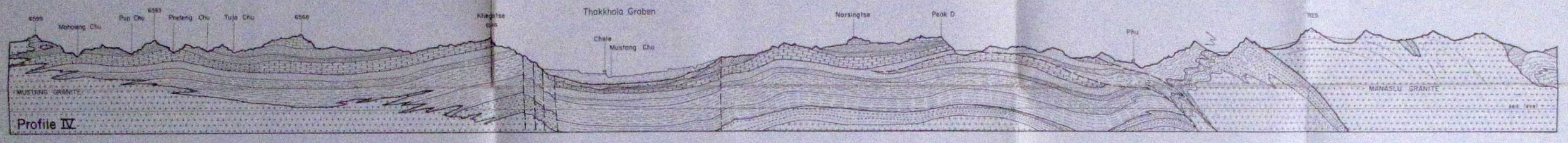
mainly orthogneisses, granite-gneisses

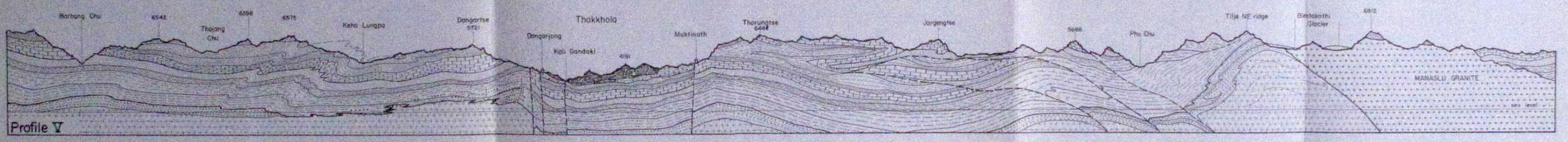
K 5 : Kathmandu nappe 5
K 4 : Kathmandu nappe 4
K 3 : Kathmandu nappe 3

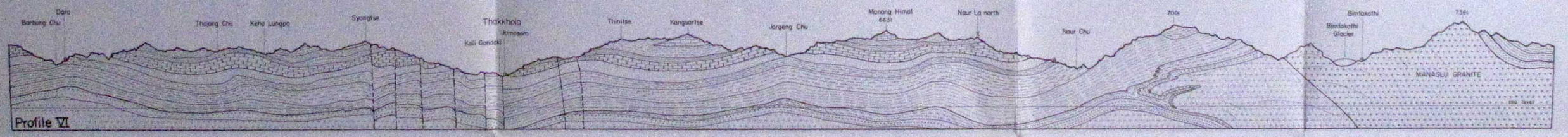


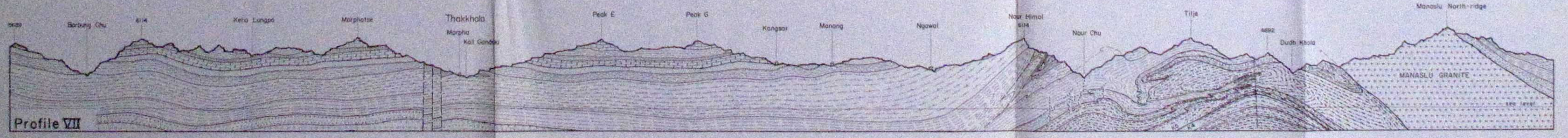


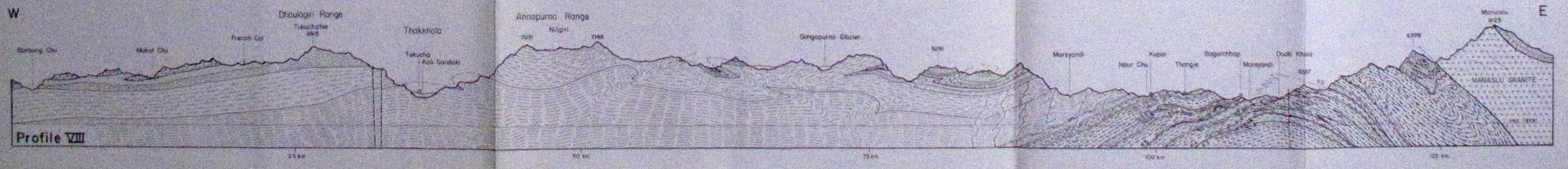












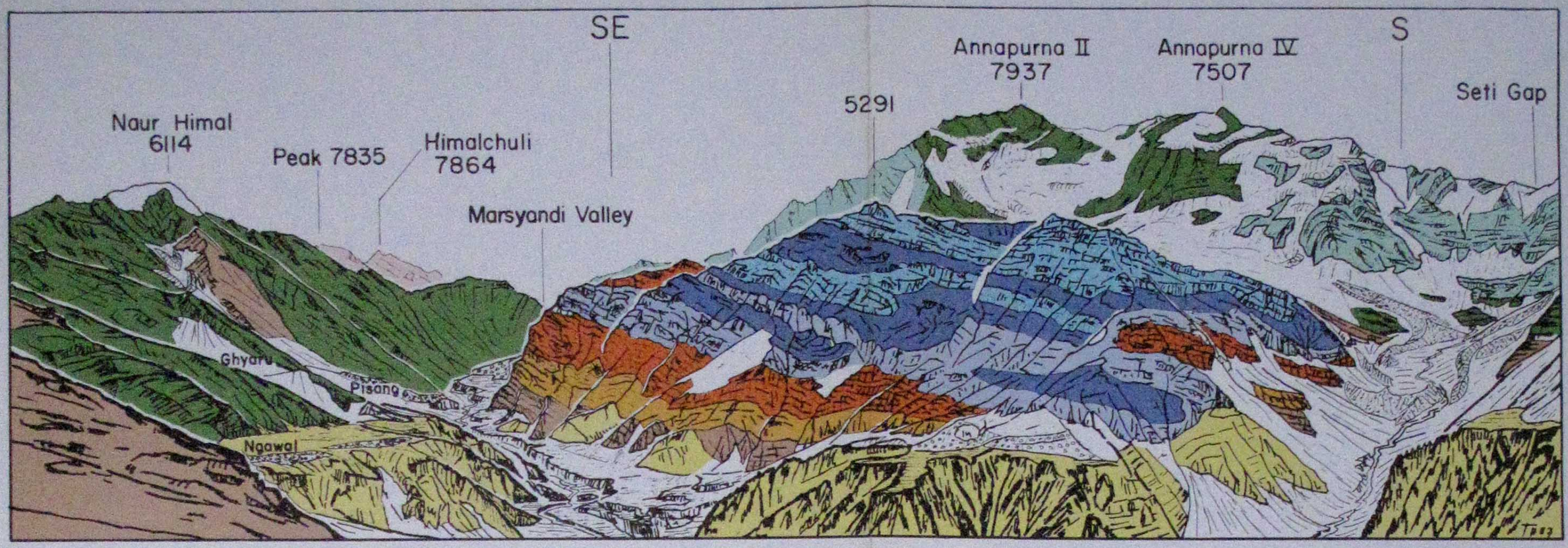


Plate V, Fig. 1 The lower part of the Manang Valley with Naur Himal and Annapurna II, seen from the west.

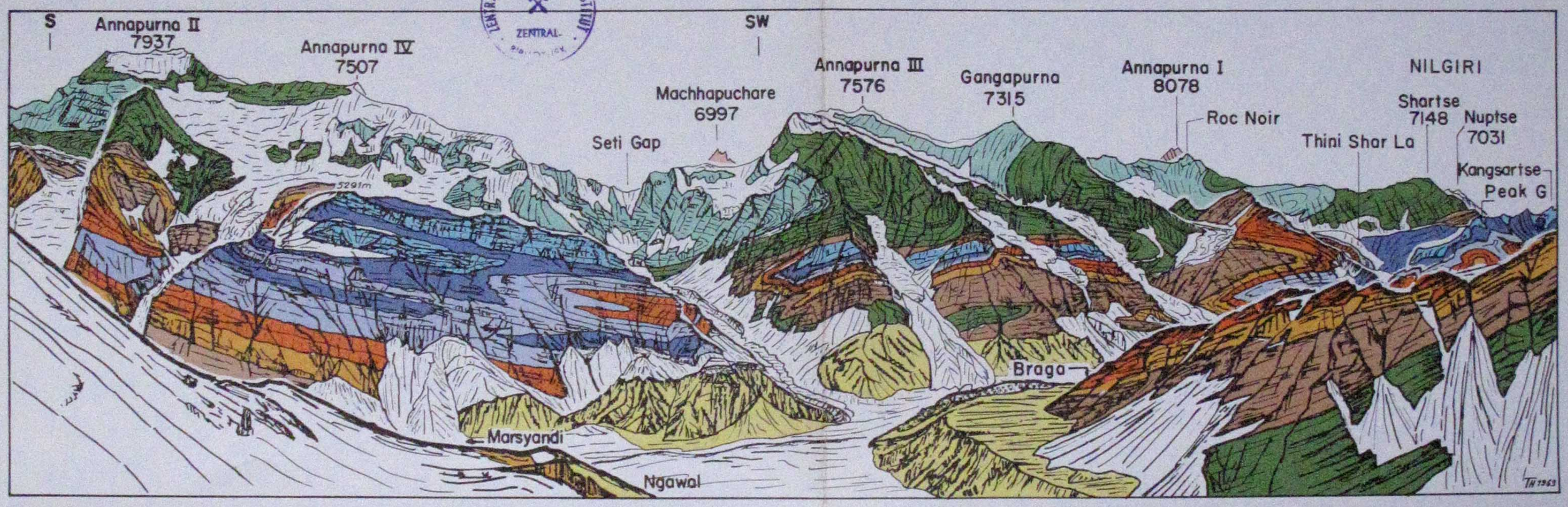


Plate V, Fig. 2 The northern flank of the Annapurna Range.

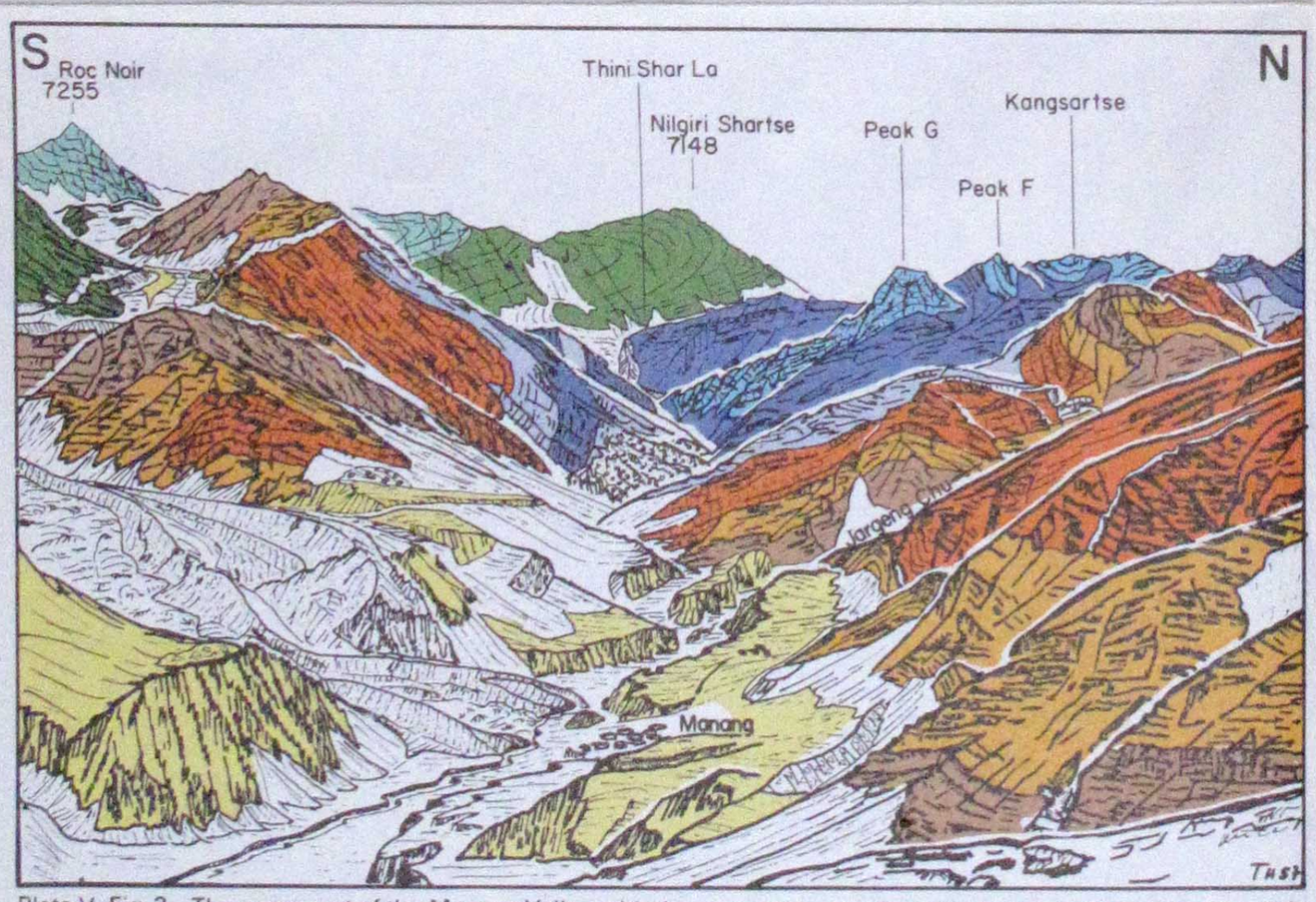


Plate V, Fig. 3 The upper part of the Manang Valley with the mountain range from the Annapurna towards the north, seen from the east.

River terraces
Recent morains
Ice age morains
Land slide of Braga

Upper Jurassic
Lower Jurassic
Rhetic
Triassic
Permian
Carboniferous
Devonian
Silurian

Granite and gneisses (Manaslu range, fig. 1)

Various gneisses of the Kathmandu nappes (Annapurna range, fig. 2)

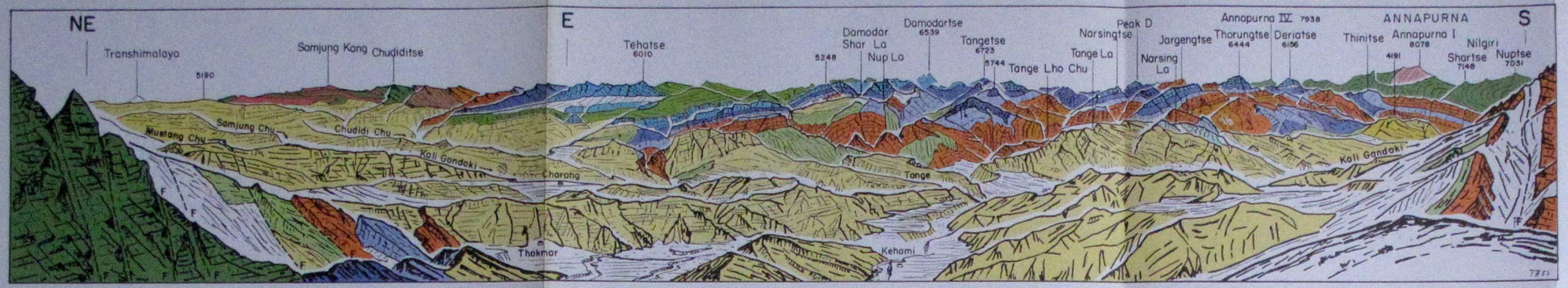


Plate VI, Fig. 1 The eastern flank of the Thakkhola, seen from Kehami.

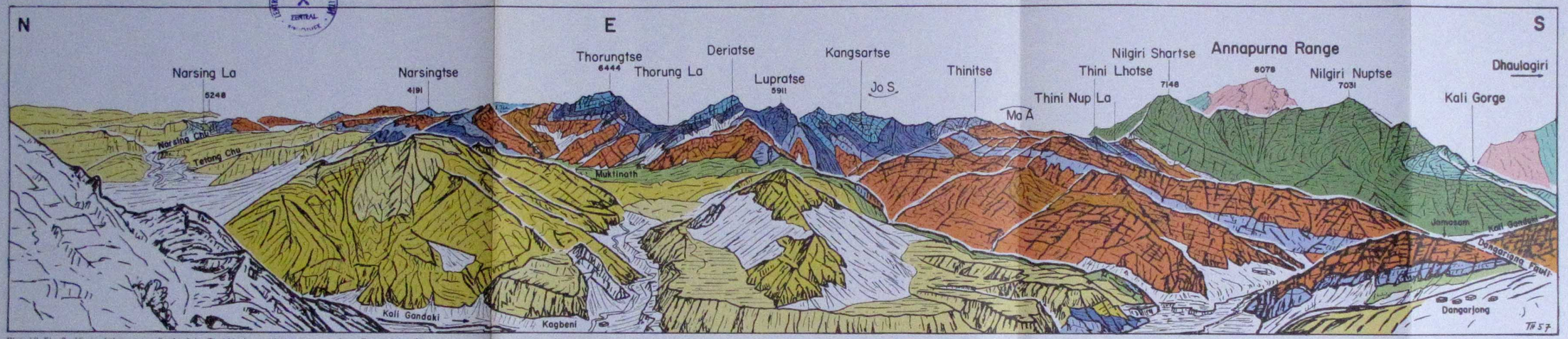


Plate VI, Fig. 2 View of the eastern flank of the Thakkhola, southern part, seen from Dangarjong Chang La.

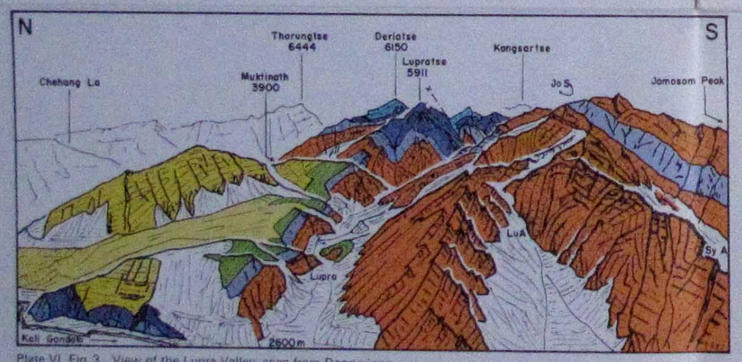


Plate VI, Fig. 3 View of the Lupra Valley, seen from Dangarjong.

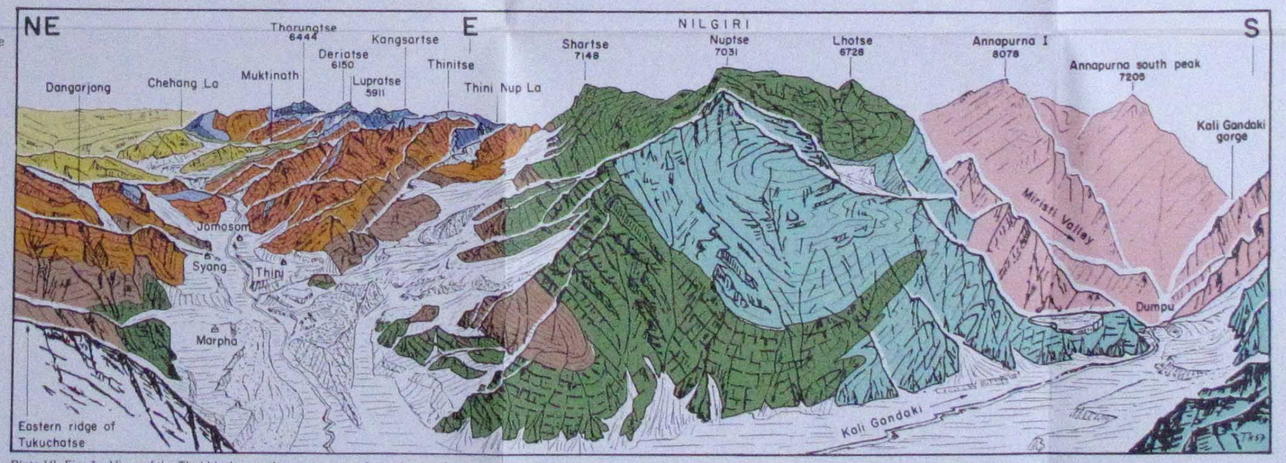


Plate VI, Fig. 4 View of the Thakkhola, southern part, seen from the south.

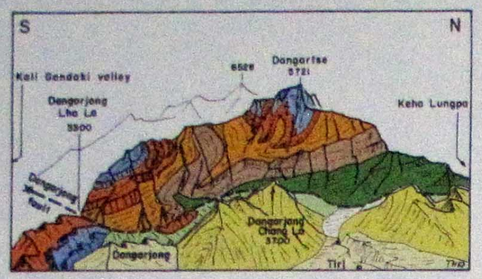


Plate VII, Fig. 1 View on Dangarjong and Dangartse, with the Dangarjong-fault.

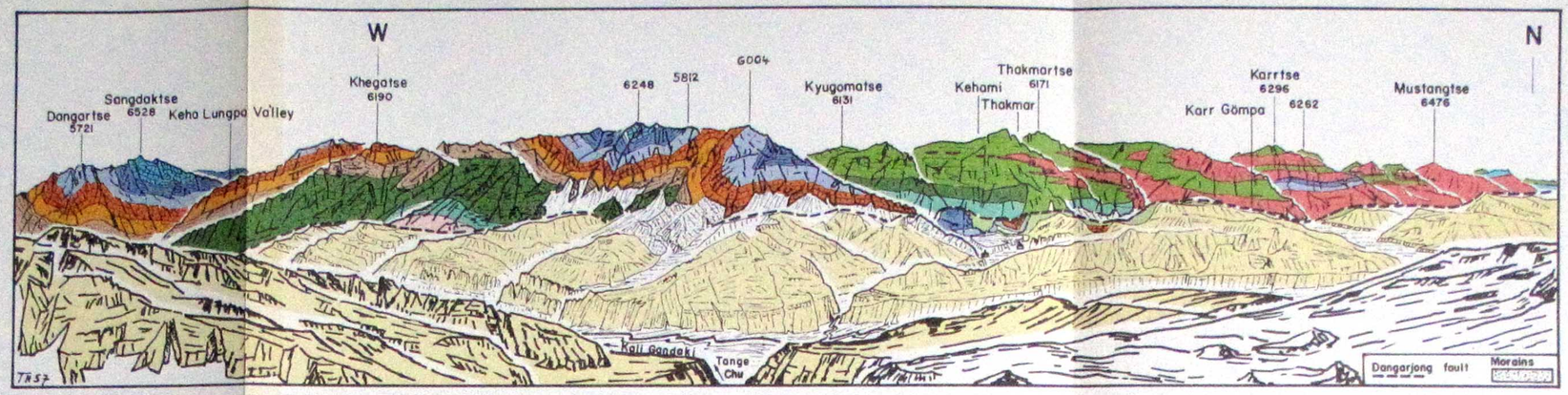


Plate VII, Fig. 2 The western flank of the Thakkhola, northern part, seen from Damodar Nup La.

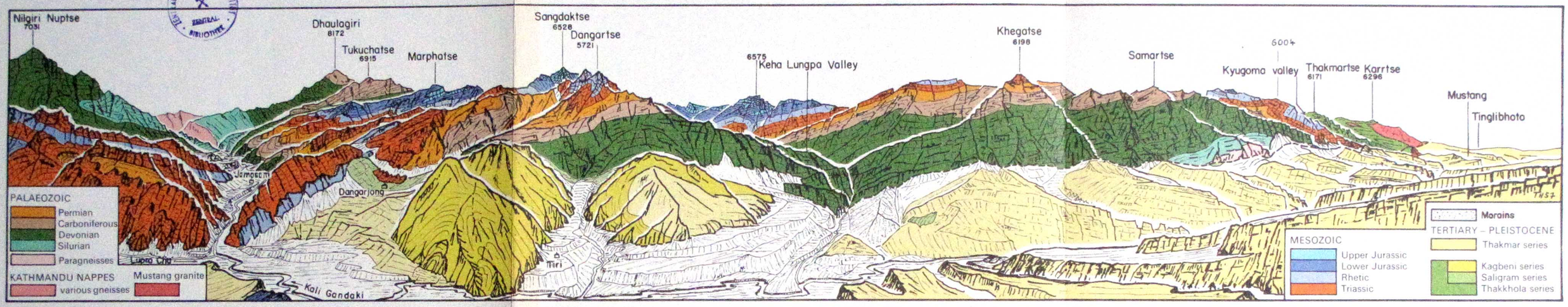


Plate VII, Fig. 3 The western flank of the Thakkhola, central part, seen from Thorung La.

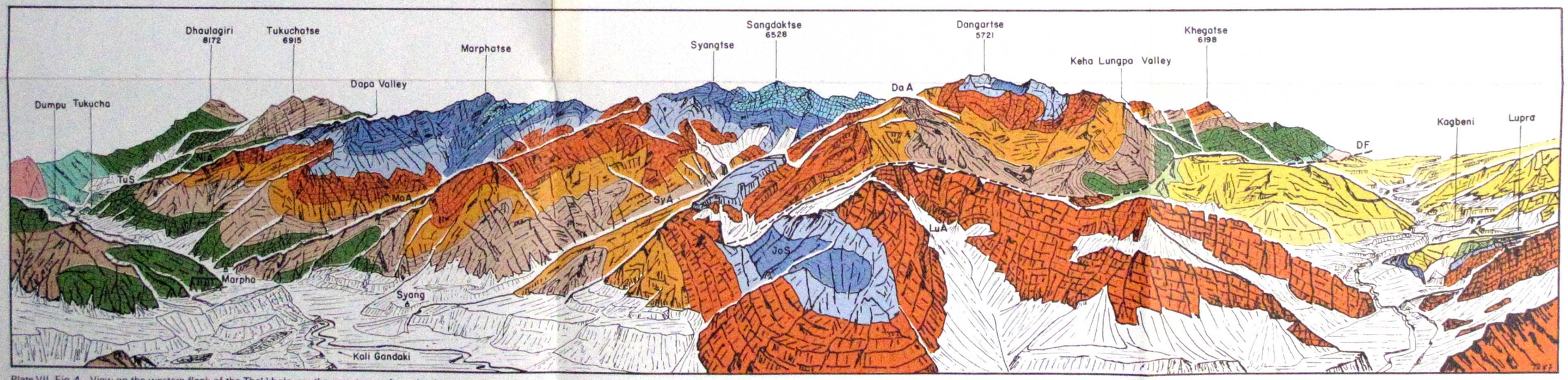


Plate VII, Fig. 4 View on the western flank of the Thakkhola, southern part, seen from the Jomosom Peak.

TERTIARY – PLEISTOCENE
- Thakmar series (middle Tertiary – Pleistocene)
- Kagbeni series (upper Paleocene – Eocene)
- Saligram series (lower-middle Paleocene)

MESOZOIC
- Upper Jurassic
- Lower Jurassic
- Rhetic
- Triassic

PALAEOZOIC
- Permian
- Carboniferous
- Devonian
- Silurian

KATHMANDU NAPPES
- gneisses and granites

BASEMENT OF THE SYNCLINORIUM
- biotite – paragneiss

Morains

Tu S Tukucha syncline
Ni A Nilgiri anticline
Ma A Marpha anticline
Sy A Syang anticline

DF – – – – – Dangarjong fault
Jo S Jomosom syncline
Lu A Lupra anticline
Da A Dangarjong anticline