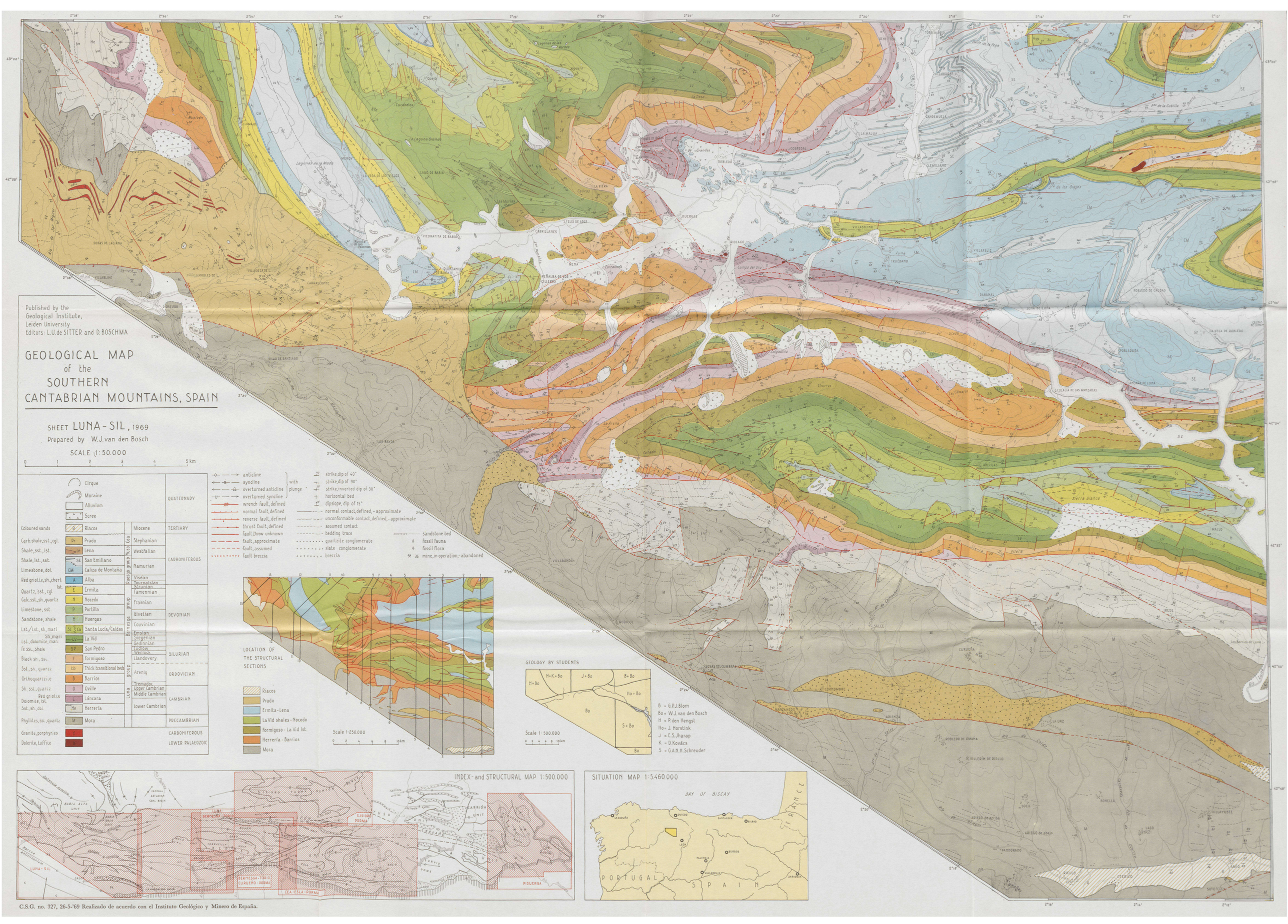
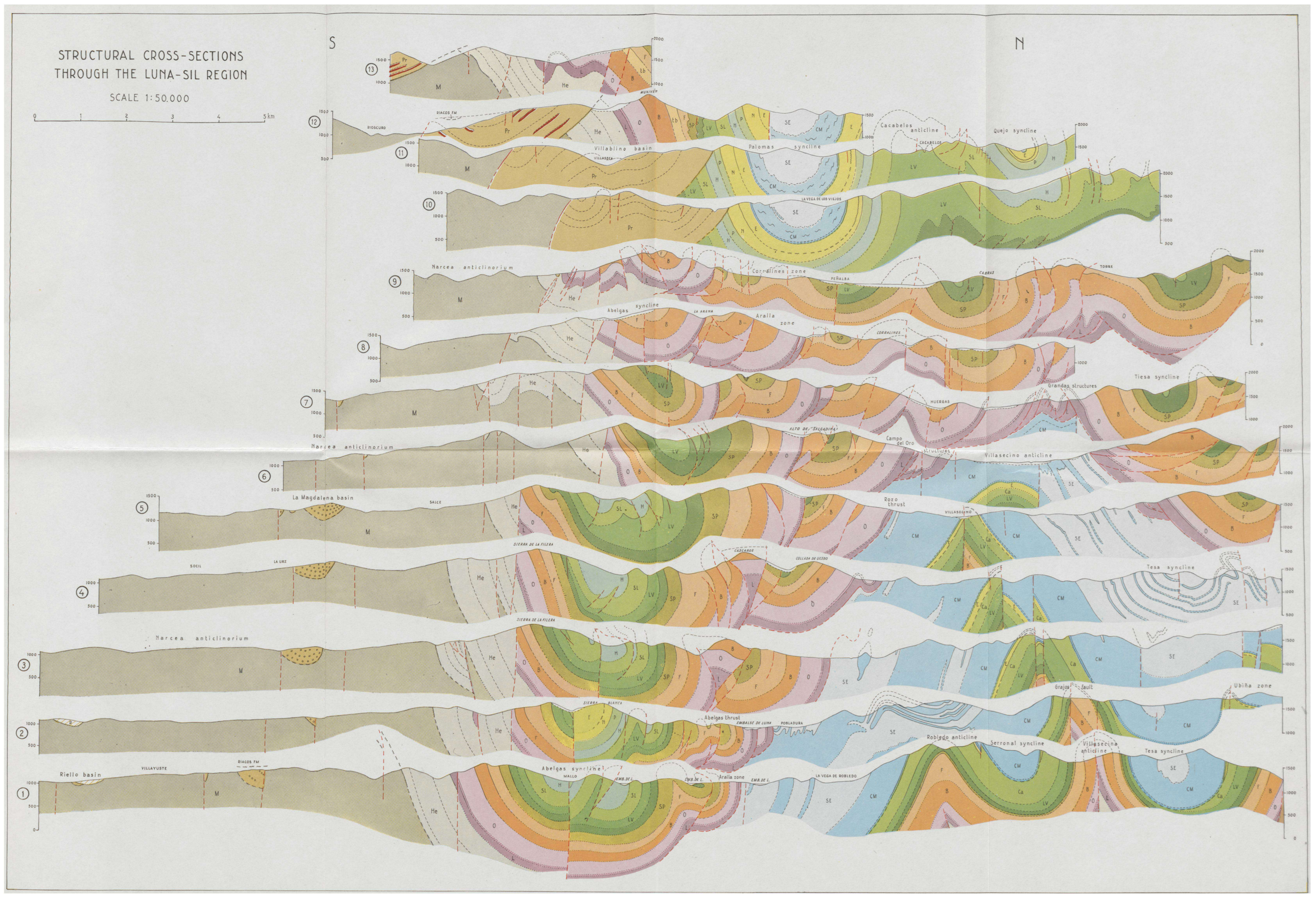

Published by the
Geological Institute,
Leiden University
Editors: L.U. de SITTER and D. BOSCHMA
GEOLOGICAL MAP
of the
SOUTHERN
CANTABRIAN MOUNTAINS, SPAIN
SHEET LUNA-SIL, 1969
Prepared by W.J. van den Bosch
SCALE 1:50.000
0 1 2 3 4 5 km
Cirque
Moraine
Alluvium
Scree
QUATERNARY
Coloured sands
Riacos
Miocene
TERTIARY
Carb. shale, sst., cgl.
Prado
Stephanian
Shale, sst., lst.
Lena
Westfalian
Shale, lst., sst.
San Emiliano
Limestone, dol.
Caliza de Montaña
Namurian
Red griotte, sh., chert
Alba
Viséan
Quartz, sst., cgl.
Ermita
Tournaisian
Calc. sst., sh., quartz
Mocedo
Strunian
Limestone, sst.
Portilla
Famennian
Sandstone, shale
Huergas
Frasnian
Lst./Lst., sh., marl
Santa Lucía/Caldas
Givetian
Sh., marl
Lst., dolomite, marl
La Vid
Couvinian
Fe sst., shale
San Pedro
Emsian
Black sh., sst.
formigoso
Siegenian
Sst., sh., quartz
Thick transitional beds
Gedinnian
Orthoquartzite
Barrios
Ludlow
Sh., sst., quartz
Oville
Wenlock
Red griotte
Dolomite, lst.
Láncara
Llandovery
Sst., sh., dol.
Herrería
Arenig
Phyllites, sst., quartz
Mora
Tremadoc
Upper Cambrian
Middle Cambrian
Lower Cambrian
CARBONIFEROUS
DEVONIAN
SILURIAN
ORDOVICIAN
CAMBRIAN
PRECAMBRIAN
Granite, porphyries
Dolerite, tuffite
CARBONIFEROUS
LOWER PALAEOZOIC
Cea
Yuso group
Huergas group
Bernesga group
Luna group
anticline
syncline
overturned anticline
overturned syncline
with plunge
wrench fault, defined
normal fault, defined
reverse fault, defined
thrust fault, defined
fault, throw unknown
fault, approximate
fault, assumed
fault breccia
strike, dip of 40°
strike, dip of 90°
strike, inverted dip of 30°
horizontal bed
dipslope, dip of 15°
normal contact, defined, - approximate
unconformable contact, defined, - approximate
assumed contact
bedding trace
quartzite conglomerate
slate conglomerate
breccia
sandstone bed
fossil fauna
fossil flora
mine, in operation, - abandoned
LOCATION OF THE STRUCTURAL SECTIONS
Riacos
Prado
Ermita-Lena
La Vid shales-Mocedo
formigoso-La Vid lst.
Herrería-Barrios
Mora
Scale 1:250.000
0 2 4 6 8 10 km
GEOLOGY BY STUDENTS
H+Bo
H+K+Bo
J+Bo
B+Bo
Ho+Bo
Bo
S+Bo
Scale 1:500.000
0 2 4 6 8 10 km
B = G.P.J. Blom
Bo = W.J. van den Bosch
H = P. den Hengst
Ho = J. Horstink
J = E.S. Jharap
K = D. Kovács
S = G.A.M.H. Schreuder
INDEX- and STRUCTURAL MAP 1:500.000
SITUATION MAP 1:5.460.000
BAY OF BISCAY
FRANCE
PORTUGAL
SPAIN
LA CORUÑA
OVIEDO
SANTANDER
BILBAO
LEÓN
PALENCIA
BURGOS
VALLADOLID
ZARAGOZA
LUNA-SIL
BERNESGA-TORIO
CURUEÑO-PORMA
CEA-ESLA-PORMA
PISUERGA
S. ISIDRO
PORMA
ARRIÓN UNIT
BAHIA ALTA UNIT
CENTRAL ASTURIAN
CÓRD. BASIN
LA MAGDALENA BASIN
MAPECA
MESOSTRATUM
LUNA-SIL
SALDA
TURBIO
DOME
RADIOLARITE
LIAS
TRIAS
PALEOZOIC
Sallinches
Anticline
Fault
Thrust
Fault
Fault
Fault

STRUCTURAL CROSS-SECTIONS THROUGH THE LUNA-SIL REGION

SCALE 1:50.000

0 1 2 3 4 5 km



GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

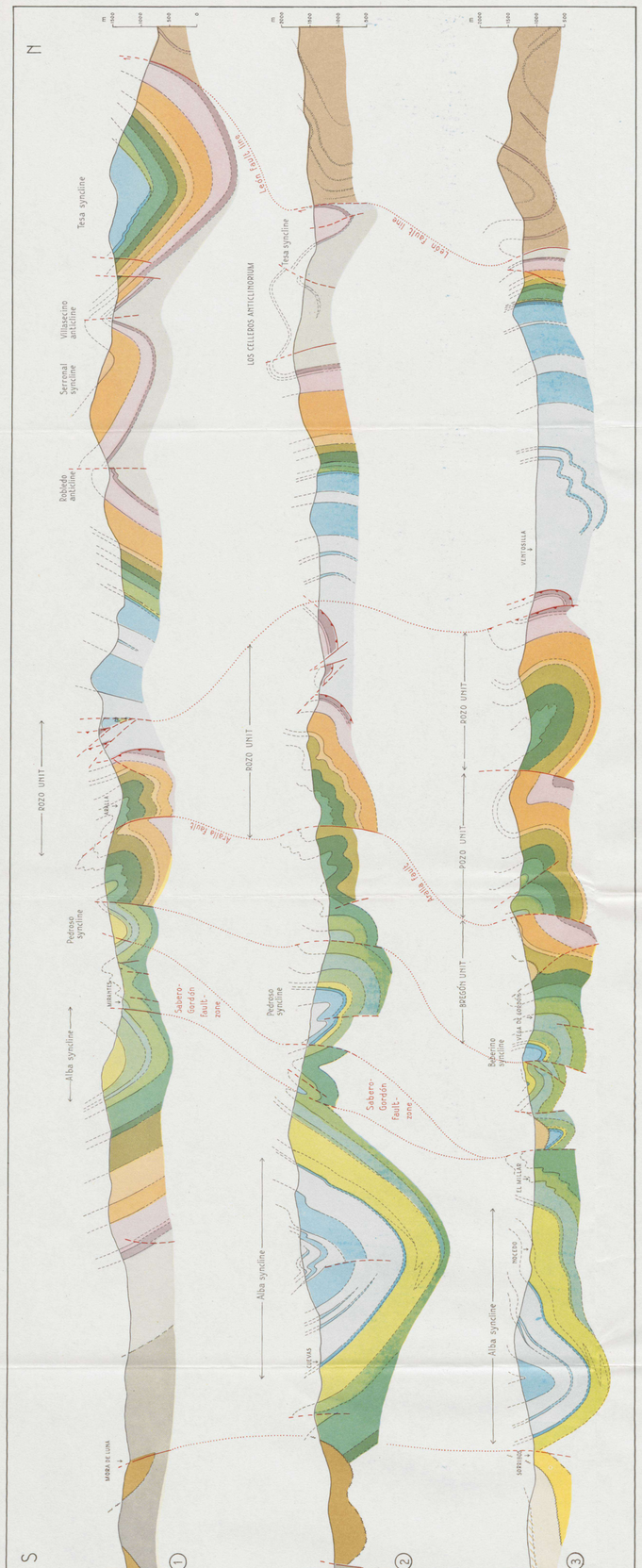
SHEET: LUNA - BERNESGA - TORÍO 1967

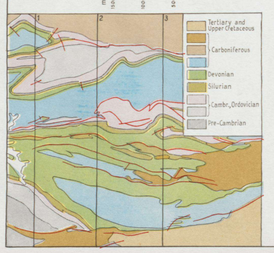
Prepared by C.J. van STAALDUINEN

Scale 1:50.000

0 1 2 3 4 5 km

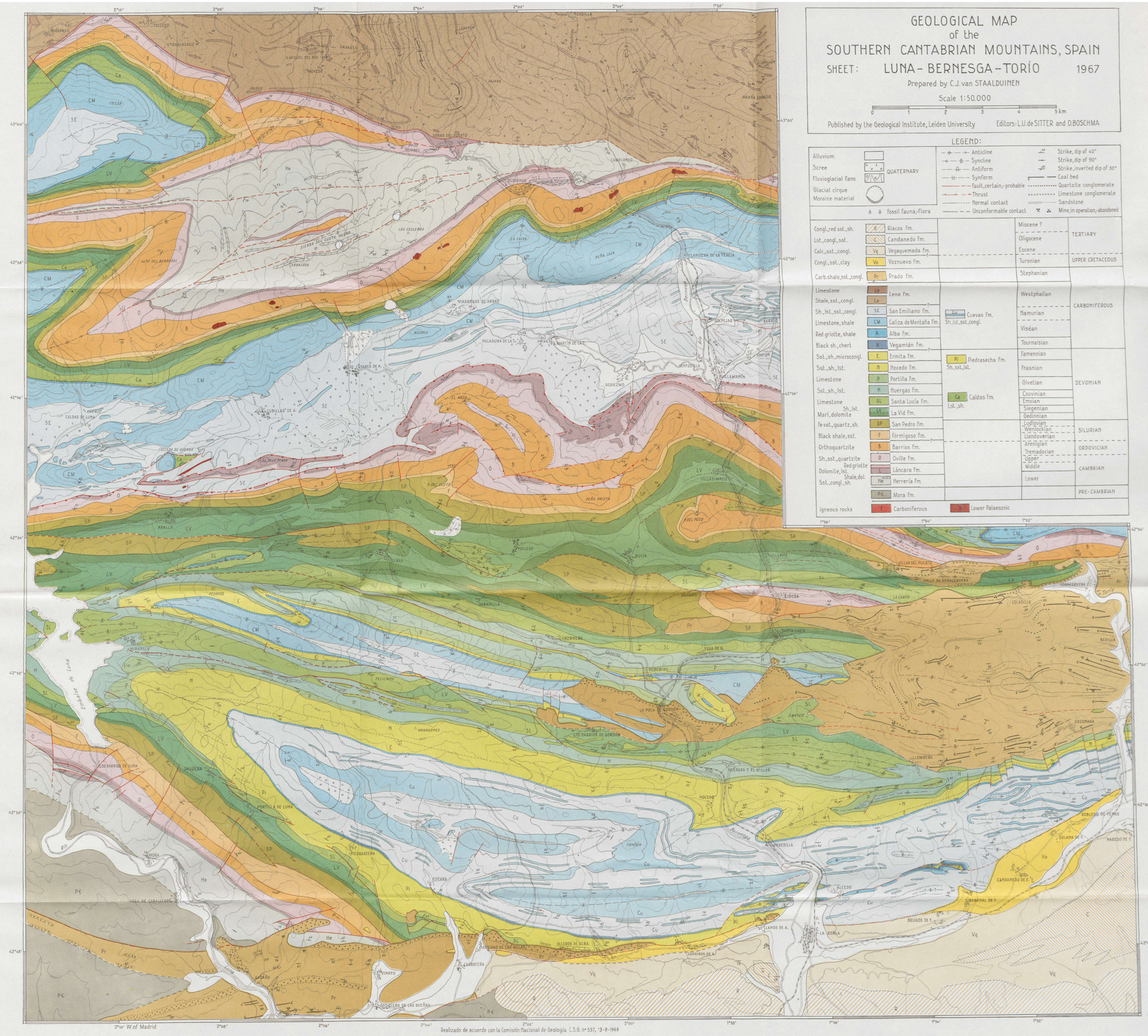
Published by the Geological Institute, Leiden University Editors: L.U. de SITTER and D. BOSCHMA

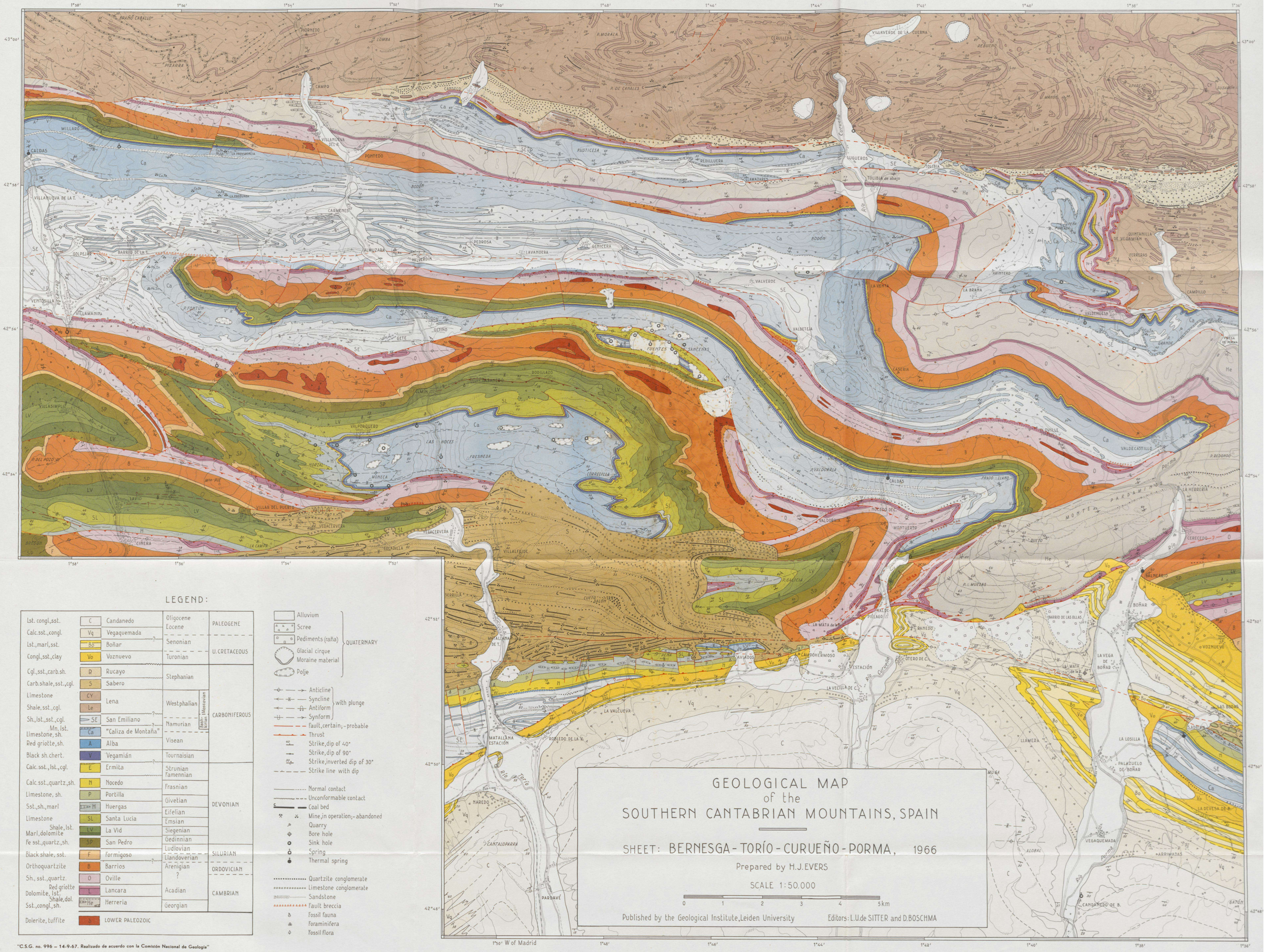




S-N Structural Sections corresponding to map sheet LUNA-BERNESGA-TORÍO

scale 1:50.000


2°10' W of Madrid
43°00'
42°58'
42°56'
42°54'
42°52'
42°50'
42°48'
Embalse de Luna
Embalse de Vegamián
Embalse de Camporredondo
Embalse de Ruiseñada
Embalse de Cueto Negro
Embalse de Barrios de Luna
Embalse de Ciñera
Embalse de Vegacervera
Embalse de Matallana
Embalse de Boñar
Embalse de Vega de Terna
Embalse de Ceyes
Embalse de Cofiñal
Embalse de Ricobayo
Embalse de Esla
Embalse de Cuerda del Pozo
Embalse de Linares
Embalse de Tabilla
Embalse de Ribadelago
Embalse de Nuevo
Embalse de Sanabria
Embalse de Vega de Tera
Embalse de Ricobayo
Embalse de Esla
Embalse de Cuerda del Pozo
Embalse de Linares
Embalse de Tabilla
Embalse de Ribadelago
Embalse de Nuevo
Embalse de Sanabria
Embalse de Vega de Tera
Embalse de Ceyes
Embalse de Cofiñal


GEOLOGICAL MAP
of the
SOUTHERN CANTABRIAN MOUNTAINS, SPAIN
SHEET: BERNESGA-TORÍO-CURUEÑO-PORMA, 1966
Prepared by H.J.EVERS
SCALE 1:50.000
0 1 2 3 4 5km
Published by the Geological Institute, Leiden University
Editors: L.U.de SITTER and D.BOSCHMA
LEGEND:
Lst. congl.,sst. C Candanedo
Calc.sst.,congl. Vq Vegaquemada
Lst.,marl,sst. Bo Boñar
Congl.,sst.,clay Vo Voznuevo
Cgl.,sst.,carb.sh. R Rucayo
Carb.shale,sst.,cgl. S Sabero
Limestone CY Lena
Shale,sst.,cgl. Le
Sh.,lst.,sst.,cgl. SE San Emiliano
Mn.lst. Limestone,sh. Ca "Caliza de Montaña"
Red griotte,sh. A Alba
Black sh.chert. V Vegamián
Calc.sst.,lst.,cgl. E Ermita
Calc.sst.,quartz.,sh. N Nocedo
Limestone,sh. P Portilla
Sst.,sh.,marl H Huergas
Limestone SL Santa Lucia
Shale,lst. Marl,dolomite LV La Vid
Fe sst.,quartz.,sh. SP San Pedro
Black shale,sst. F Formigoso
Orthoquartzite B Barrios
Sh.,sst.,quartz. O Oville
Red griotte Dolomite,lst. L Lancara
Shale,dol. Sst.,congl.,sh. He Herreria
Dolerite,tuffite δ LOWER PALEOZOIC
Oligocene Eocene PALEOGENE
Senonian Turonian U.CRETACEOUS
Stephanian Westphalian Namurian Visean Tournaisian CARBONIFEROUS
Strunian Famennian Frasnian Givetian Eifelian Emsian Siegenian Gedinnian DEVONIAN
Ludlovian Llandoverian SILURIAN
Arenigian ? ORDOVICIAN
Acadian Georgian CAMBRIAN
Alluvium
Scree
Pediments (raña)
Glacial cirque
Moraine material
Polje
QUATERNARY
Anticline
Syncline
Antiform
Synform
with plunge
Fault, certain; - probable
Thrust
Strike, dip of 40°
Strike, dip of 90°
Strike, inverted dip of 30°
Strike line with dip
Normal contact
Unconformable contact
Coal bed
Mine, in operation; - abandoned
Quarry
Bore hole
Sink hole
Spring
Thermal spring
Quartzite conglomerate
Limestone conglomerate
Sandstone
Fault breccia
Fossil fauna
Foraminifera
Fossil flora
1°50' W of Madrid
"C.S.G. no. 996 – 14-9-67. Realizado de acuerdo con la Comisión Nacional de Geología"
SITUATION MAP 1:5460.000
BAY OF BISCAY
FRANCE
PORTUGAL
SPAIN
INDEX- and STRUCTURAL MAP 1:500.000
BERNESGA-TORÍO CURUEÑO-PORMA
CEA-ESLA-PORMA
PISUERGA
GEOLOGY BY STUDENTS (1960-1964)
A = H.W.J.van Amerom
B = W.F.Beunderman
Bo = A.J.Bol
Bij = A.J.Bijwaard
E = H.J.Evers
L = E.G.Lekahena
M = C.A.Mulder
O = J.M.Oosterbaan
R = L.Rácz
V = P.J.Verwoerd
Vu = L.T.M.van Vugt
W = C.F.Winkler Prins
10km

GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

Published by the Geological Institute, Leiden University

Editors: L.U. de SITTER and D. BOSCHMA

SHEET SAN ISIDRO - PORMA 1966

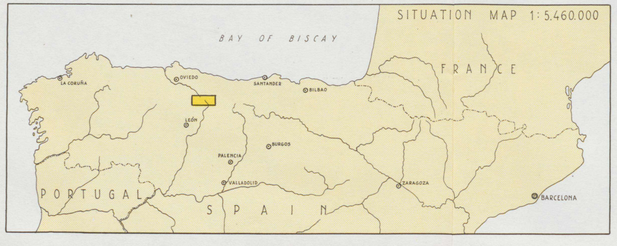
Prepared by N. SJERP

SCALE 1:50.000

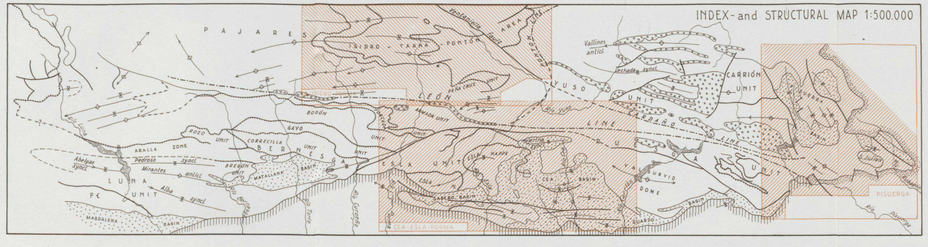
0 1 2 3 4 5 km

"C.S.G. Nº 999 - 14-11-66" "Realizado de acuerdo con la Comisión Nacional de Geología"

SITUATION MAP 1:5.460.000

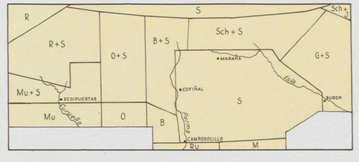


INDEX- and STRUCTURAL MAP 1:500.000



GEOLOGY BY:

B = A.J. Bijwaard	O = J.M. Oosterbaan
G = A.A. Gerrits	R = E.J.H.F. Rouffaer
J = M. Julivert	Ru = J. Rupke
M = J.J. de Meyer	Sch = F.M.A. van Schaeck Mathon
Mu = C.A. Mulder	S = N. Sjerp



LEGEND:

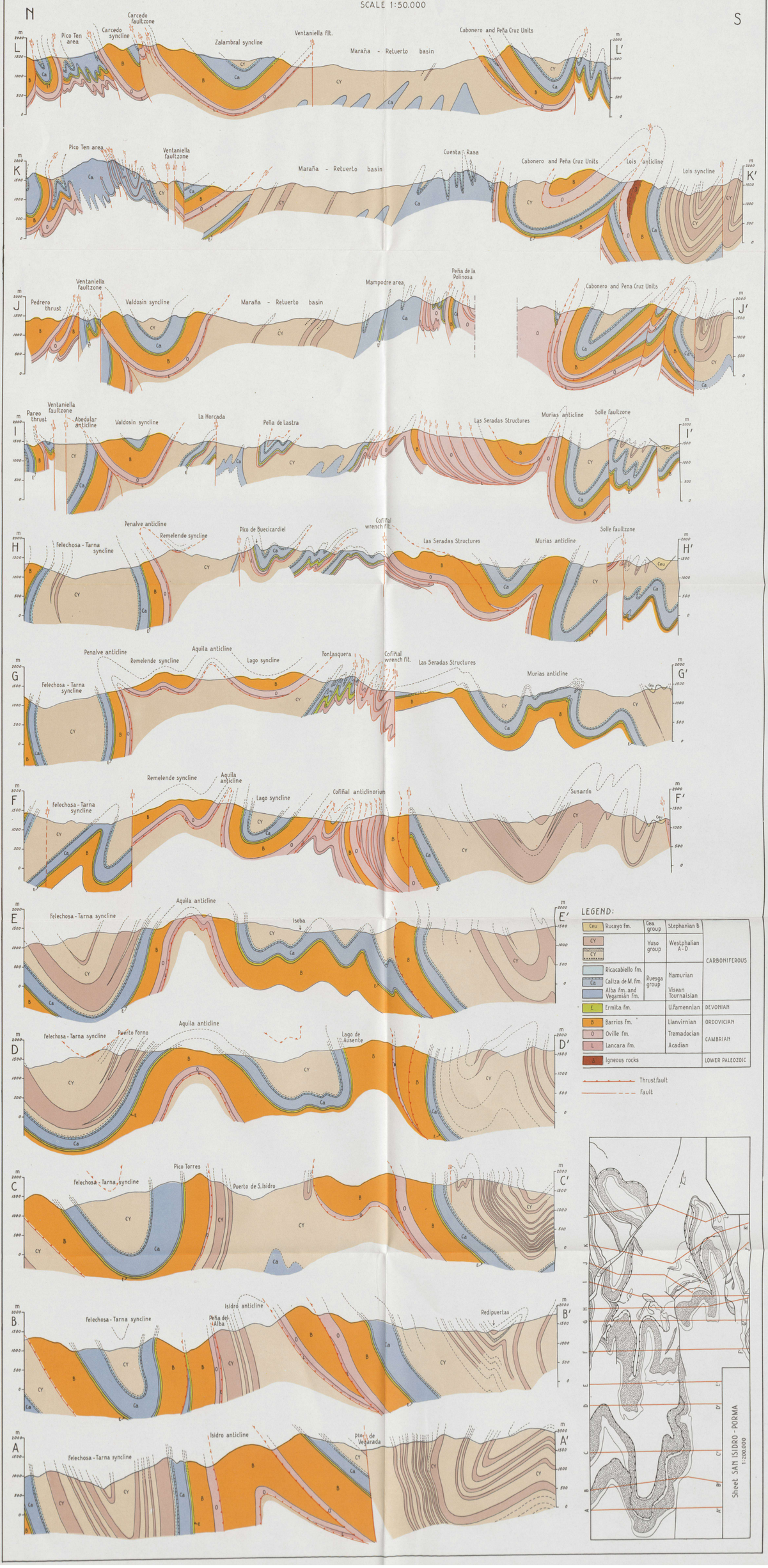
- fault, certain
- fault, probable
- Thrust
- Anticline
- Syncline
- Overturned anticline
- Overturned syncline
- Strike, dip of 40°
- Strike, dip of 90°
- Strike, inverted dip of 30°
- Mine
- fossil flora
- Trilobite fauna
- Moraine material
- Glacial cirque

Shale, sandstone, conglomerate	Ceu	Rucayo formation	Cea group	Stephanian B	CARBONIFEROUS
Limestone, Sandstone, Shale, Conglomerate	CY		Vasco group	Westphalian A-D	
Shale, Limestone, Griotte, radiolarites, Cherty black shale	Ca	Ricacabiello formation, Caliza de Montaña fm., Alba formation, Vegamián formation	Ruesga group	Namurian, Visean, Tournaisian	
Sandstone, limestone	E	Ermita formation		Upper Famennian	DEVONIAN
Orthoquartzite (Quartz.) sandstone	B	Barrios formation		Llanvirnian	ORDOVICIAN
Shale	O	Oville formation		Tremadocian	CAMBRIAN
Griotte, limestone, dolomite	L	Lancara formation		Acadian	
Igneous rocks	ɣ	Carboniferous			
	δ	Lower Paleozoic			

N-S STRUCTURAL SECTIONS, corresponding to map sheet SAN ISIDRO - PORMA

Prepared by N.SJERP 1966

SCALE 1:50.000



GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

SHEET CEA – ESLA – PORMA 1964

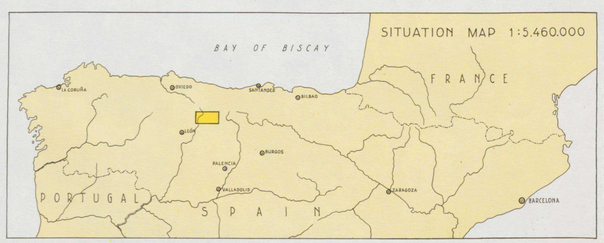
Prepared by J.RUPKE (Older Paleozoic) and H.M.HELMIG (Upper Carboniferous) et al.

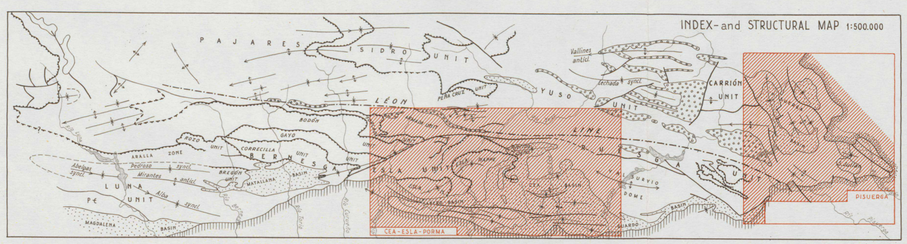
SCALE 1:50.000

0 1 2 3 4 5 km

Published by the Geological Institute, Leiden University ——— Editor: L.U.de SITTER

Publicado de acuerdo con el Instituto Geológico y Minero de España C.S.G. no. 1984, 10-12-'64





LEGEND:

- Antiform
- Synform
- Anticline
- Syncline
- Fault, certain
- Fault, probable
- Thrust
- Strike, dip of 40°
- Strike, dip of 90°
- Strike, inverted dip of 30°
- Strike line with dip direction
- Coal bed
- Mine
- Bore hole

- Quartzite conglomerate
- Limestone conglomerate
- Sandstone
- fault breccia
- fossil fauna (in Cea and Yuso)
- fusulinids
- fossil flora

Alluvium	QUATERNARY
Accumulation-terraces	
Piedmont flats	
Fluvioglacial fans	
Moraine material	
Glacial cirque	

Conglomerate, sst.	TU	Miocene ?			TERTIARY
Conglomerate	TL	Eo-Oligocene			
Limestone Shale, sandstone	K	Maestrichtian-Santonian			CRETACEOUS
Congl., sst.	KW	Wealden facies	Turonian		
Villacorta beds	Ceu	Prado member	Stephanian A-B	Kasimovian	Cea-form.	CARBONIFEROUS
	Ceu				
	Cel	Carrión member			
Limestone, shale	CY		Westfalian A-D	Moscovian	Yuso-group	
Sh., sst., congl.	CY				
Congl., sst., shale	C	Culm facies	Namurian-Visean	Bashkirian	Ruesga-group	
Sh., bitum. lst. Griotte, cherty black sh.	Ca	"Caliza de Montaña" Vegamian beds	Tournaisian			

Sst., quartz., shale	H	Ermitage	Famennian	Bernesga-group	DEVONIAN
Sst., limestone	H	Nocedo	Frasnian		
Lst., shale	P	Portilla	Givetian		
Shale, sandstone	H	Huergas	Eifelian		
Limestone	SL	Santa Lucia	Emsian		
Sh., marl, lst., dol.	V	La Vid	Siegenian, Gedinnian		
Sst., fe sandst.	SP	San Pedro	Wenlockian	Luna-group	SILURIAN
Sst., grapt. shale	F	Formigoso	Llandoverian		
Orthoquartzite	B	Barrios	Llanvirnian		ORDOVICIAN
Shale, sandstone	O	Oville	Tremadocian		CAMBRIAN
Griotte Lst., dolomite	Ma	Lancara	Acadian		
Sst., cgl., shale	Ma	Herreria	Georgian		
Igneous rocks	I	Carboniferous		Lower Paleozoic	

GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

SHEET YUSO 1977

Prepared by J.F. Savage
from the work of the Geological Institute, Leiden

Published by the Geological Institute, Leiden University
Editors: D. Boschma and J.F. Savage

Scale: 1:50.000

0 1 2 3 4 5 km

LEGEND

QUATERNARY			Alluvium	
			Scree	
			Moraine material	
CARBONIFEROUS	Stephanian	sh. sst. congl. limst	Lebena formation, Valdeon formation	Cea Group
			Cea or Yuso; no mapable boundary	
	Westphalian	sh.? sst. limst. congl.	Picos de Europa formation, Lechada formation, Curavacas formation	Yuso Group
			Yuso or Ruesga; no mapable boundary	
	Namurian	sst. sh. lst. congl.	Cervera formation	Ruesga Group
		lst.	Caliza de Montana formation	
	Viséan	nod. lst.	Alba formation	
	Tournisian	sh. chert.	Vegamian formation	
DEVONIAN	Famennian	nod. lst. sh.	Ermita formation, Vidieros formation	
	Frasnien	quartz sst.	Nocedo formation, Murcia formation	
	Givetian	lst. sh.	Portilla formation, Cardano formation	
	Eifelian	sst. sh. marl	Huergas formation, Gustalapiedra formation	
	Emsian	lst. sh.	Polentinos: Santa Lucia formation, Abadia formation	
	Siegnian	sh. marl lst. dolm.	La Vid formation	
	Gedinnian	quartz. sh. Fe. sst.	San Pedro formation	
SILURIAN	Wenlockian, Llandoverian	black sh. sst.	Formigoso formation	
ORDOVICIAN	Llanvirnian	orth. quartz.	Barrios formation	
CAMBRIAN	Tremadocian	sh. sst.	Oville formation	
	Acadian	griotte lst. dolm.	Lancara formation	

INGENEOUS ROCKS
CARBONIFEROUS: Lower Paleozoic; Intrusives; Extrusives

Geology by:

B	F. Bonvie 1972 int. rep.	M	K. Maas 1974 publ.
Bo	G. J. T. Bos 1964 int. rep.	Mr	O. Marcus 1972 int. rep.
D	H. Diederix 1962 int. rep.	P	C.D. Panhuys 1972 int. rep.
G	H. Gomez 1972 M. Sc. th.	R	J. Rupke 1965 publ.
K	P. Kamerling 1962 int. rep.	S	J.F. Savage 1961 M.Sc.th. 1967 publ.
Ku	J.A. Kutterink 1965 int. rep.	Sc	F.M.A. Schaeck Mathon 1964 int. rep
L	R. Lageman 1972 int. rep.	Sj	N. Sjerp 1966 publ.
La	E.J.T. Lambers 1973 int. rep.	V	J. v. Veen 1965 publ.

Dip vertical
Dip and Strike
Dip and Strike; strata overturned
Fault; certain, probable
Thrust fault; certain, probable
Normal sedimentary contact certain; approximate
Unconformity boundary observed; probable
Slump deformation
Mine
Fossil flora

„1a edicion autorizada por el Consejo Superior Geografico el 16-12-76 de acuerdo con la Comision Nacional de Geologica".

RELIABILITY DIAGRAM

SITUATION MAP

INDEX MAP
Sheets of the Geological Map of the Southern Cantabrian Mountains

GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

SHEET CARRION 1977

Prepared by: J.F. Savage
from the work of the Geological Institute, Leiden

Published by the Geological Institute, Leiden University
Editors: D. Boschma and J.F. Savage

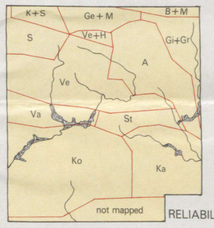
Scale 1:50.000

0 1 2 3 4 5 km

QUATERNARY		Alluvium	
		Moraine material	
		Scree	
		Terraces	
TERTIARY			
MESOZOIC	Santonian to Maastrichtian incl.	congl. (lst quartz) marl congl.	
	Cenomanian to Coniacian incl.	lst. mass foram. marl clayst.	
	Wealden	sst. congl. clay kaol.	
CARBONIFEROUS	Stephanian	sh. lst. congl. lst. — Guardo formation, Barruelo formation	Cea Group
	Westphalian	sh. lst. lst. congl. — Lechada formation; Curavacas formation	Yuso Group
		sst. sh. lst. congl. — Piedras Luengas Limst. Mbr, Trollo Limst. Congl. Mbr — Cervera formation	Ruesga Group
	Namurian	lst. — Caliza de Montana formation	
	Visean	nod.lst. — Alba formation	
	Tournisian	sh. chert — Vegamian formation	
DEVONIAN	Famennian	nod.lst. sh. — Vidrieros formation; Camporredondo formation (Cr)	
		quartz. sst. — Murcia formation	
	Frasnian	lst. sh. — Cardano fm. (Ca) Valcovero fm. (V) Riviera fm. (R)	
	Givetian	sh. lst. marl — Gustalapiedra fm. (G) Hornalego fm. (H) San Martin fm. (S)	
	Eifelian	sh. lst. Polentinos lst. Requejada — Abadia fm. (A) Otero fm. (O) Ventanilla fm. (Vi)	
	Emsian	sh. marl dolm. lst. — Lebanza formation (L) Compuerto formation (Co)	
	Siegnian	sh. qut. lst. lst. — Carazo formation	
	Gedinnian	qut. sst. sst. sh. — Las Arroyacas	
SILURIAN	Ludlovian, Wenlockian	sst. quartz. — Robledo formation	
	Llandoverian		
		Intrusives	

- Dip vertical
- Dip and Strike
- Dip and Strike, strata overturned
- Fault: certain; probable
- Thrust fault: certain; probable
- Normal sedimentary contact certain approximate
- Unconformity boundary observed, probable
- Slump deformation
- Mine; abandoned
- Fossil flora

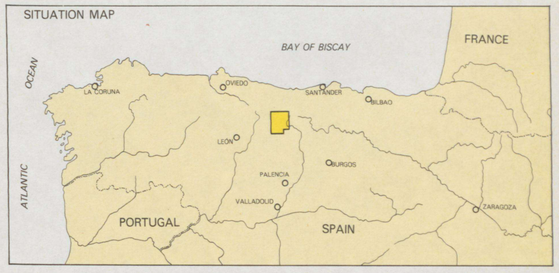
"1a edición autorizada por el Consejo Superior Geografico el 15-2-1977 de acuerdo con la Comisión Nacional de Geologia"



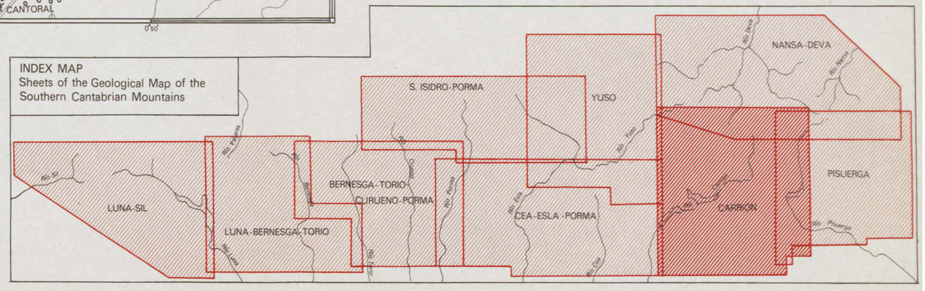
RELIABILITY DIAGRAM

"Geology by:
A — T. Ambrose 1972 unpub. Ph.D.thesis (University of Sheffield U.K.)
B — A. Breimer 1956 int. rep.
Ge — G.J.B. Germs 1966 int. rep.
Gi — A.C. v. Ginkel 1955 int. rep.
Gr — W.J.E. v.d. Graaff 1970 publ.
H — J.A. v. Hoeflaken 1955 int. rep.
K — P. Kamerling 1962 int. rep.
Ka — J. Kanis 1956 publ.
Ko — B.N. Koopmans 1962 publ.
M — K. Maas 1974 publ.
S — J.F. Savage 1961 unpub. 1967 publ.
St — 2 years students 1972
Va — T. Vaillant 1972 int. rep.
Ve — J. v. Veen 1965 publ.

SITUATION MAP



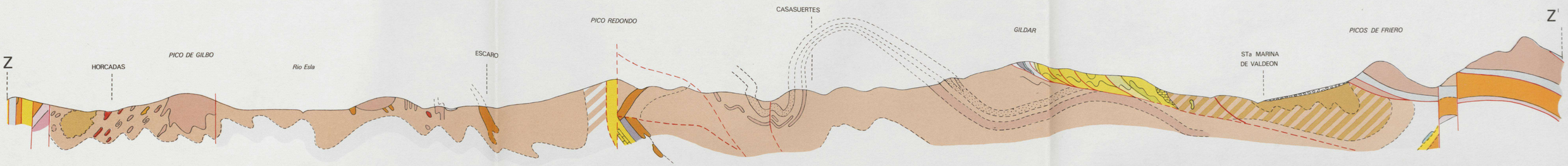
INDEX MAP
Sheets of the Geological Map of the Southern Cantabrian Mountains



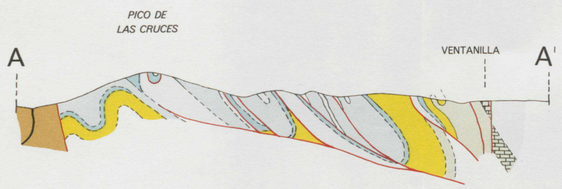
GEOLOGICAL CROSS - SECTIONS

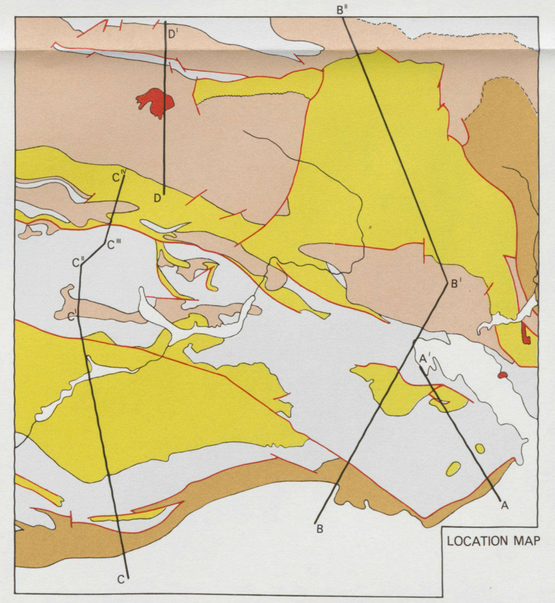
Horizontal and Vertical Scale 1 : 50.000

0 1 2 3 4 5 km



SHEET CARRION



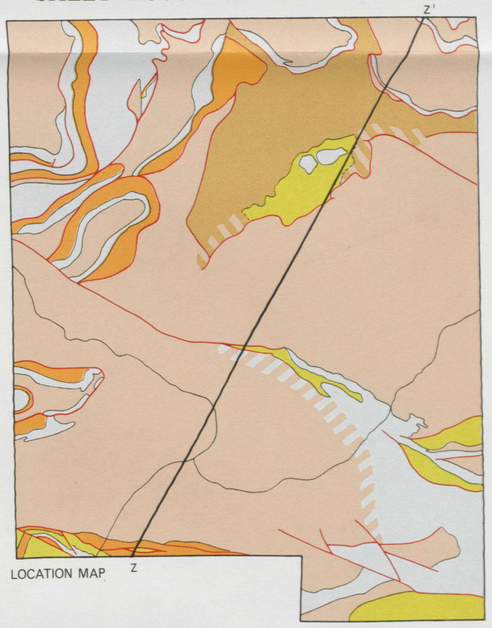


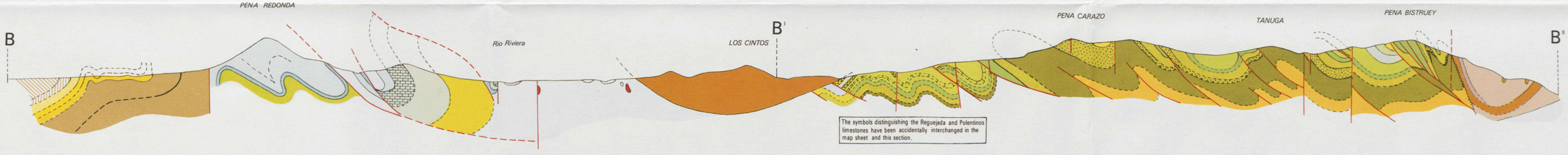
Simplified colour scheme
used in Location Maps

- Recent, Mesozoic and Tertiary
- Stephanian
- Westphalian
- Namurian
- Devonian / Silurian
- Cambro-Ordovician
- Intrusives

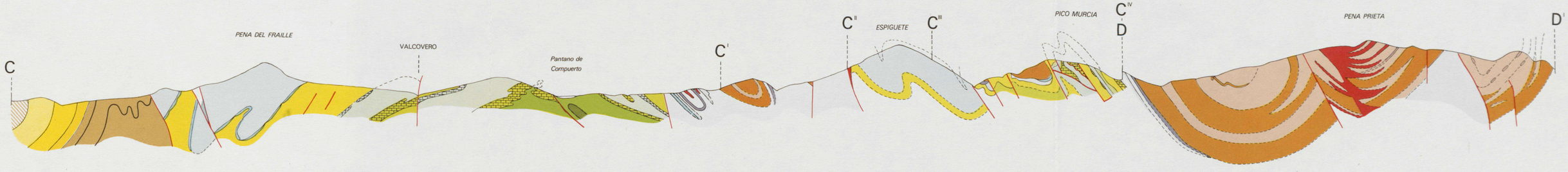
0 5 10 km

SHEET YUSO





The symbols distinguishing the Reguejada and Polentinos limestones have been accidentally interchanged in the map sheet and this section.



GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MTS., SPAIN

SHEET NANSA - DEVA 1972

Prepared by K. MAAS

Published by the Geological Institute, Leiden University
Editors: D. Boschma and J.F. Savage

Scale 1:50.000

0 1 2 3 4 5 km

scree
consolidated scree
fluvio-glacial deposits
alluvial fill
moraine ridges
moraine scree walls
rock glacier

PICOS DE EUROPA AREA

Kassimovian ?	sst., sh., sst. congl.	Leheña Fm.		Cea Group
Moscovian	mass. lst., sh., bedd. lst.	Picos de Europa Fm. / Aliva Fm.		Yuso Group
Bashkirian	lst.	Caliza de Montaña Fm.		Ruesga Group
Viséan	red. lst.	Alba Fm.		
Famennian ?	calc. sst.	Ermita Fm.		

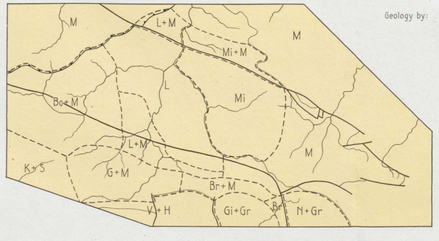
tectonic breccia
sandstone
normal position of strata
overturned position of strata
slump deformation
thrust fault, certain - probable
fault, certain - probable
unconform. boundary, observed - inferred
passing from unconformity in to sharp boundary where no unconformity was observed
strike and dip
strike and dip of overturned strata
a — a' type section

LIÉBANA, N. PISUERGA

Jurassic ?	lst.	Tudanca unit		
Triassic	ass., sh. congl.	Nansa unit		
Permian	ass., sh. tuff. volc. aggl.	Labra Fm.		
Stephanian C	ass., sh. congl.	Cordel unit		Cea Group
Stephanian A - Cantabrian - Westfalian D	lst., sh. coal. congl.	"Barruelo Fm."	Valdeon Fm. / S. Mames unit	Cea Group
Cea or Yuso; undefined				
Upper Moscovian	lst., ass., sh., lst.	Corisa Fm.	Pandabrave Fm.	Yuso Group
Lower - Upper Moscovian	congl., lst., ass., sh.	Lechada Fm.	Viñes Fm.	Yuso Group
Lower - Upper Moscovian	congl.	Curavacas Fm.		Yuso Group
Yuso or Ruesga; no mappable boundary				
Lower Moscovian - Bashkirian	lst., congl., lst., sh., congl.	Cervera Fm.		Ruesga Group
Bashkirian	lst., sh.	Cosgaya unit		Ruesga Group
Viséan	red. lst., lst.	Villabellaco Fm.		Ruesga Group
Viséan - Tournaisian	sh., chert	Vegamián Fm.		Ruesga Group
Older Palaeozoic	Undifferentiated			

Famennian	red. lst., sh.	Vidrieros Fm.
Famennian	quartzitic ass., sh.	Murcia Fm.
Frasnian	red. lst., sh.	Cardaño Fm.
Givetian	lst., sh.	Gustalapiedra Fm.
Eifelian	lst., sh.	Abadía Fm.

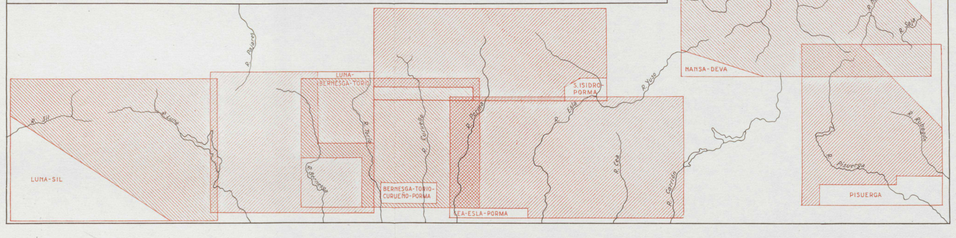
Granite
Intrusive igneous rock
Extrusive igneous rock



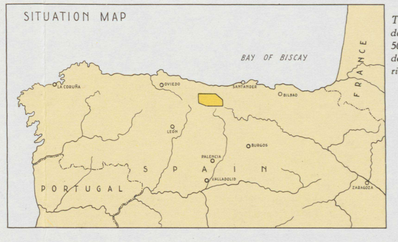
Geology by:
Bo = W.K. Boehmer 1965 int. rep.
Br = A. Breimer 1956 int. rep.
G = G.J.B. Germs 1966 int. rep.
Gi = A.C. van Ginkel 1955 int. rep.
Gr = W.J.E. van de Graaff 1970 publ.
H = J.A. van Hoeflaken 1958 int. rep.
K = P. Kamerling 1962 int. rep.
L = R.W. Lanting 1966 int. rep.
M = K. Maas 1968 int. rep. 1972 publ.
Mi = S.K. Miedema 1966 int. rep.
N = M.H. Nederlof 1959 publ.
S = J.F. Savage 1961 M.Sc.th. 1966 publ.
V = J. van Veen 1965 publ.

INDEX MAP

Sheets of the Geological Map of the Southern Cantabrian Mountains



SITUATION MAP



Topografía tomada de las Hojas 56-57 y 81-82 del mapa de España del Instituto Geográfico y Catastral (Escala 1 : 50.000). Realizado de acuerdo con la Comisión Nacional de Geología. 1ª edición autorizada por el Consejo Superior Geográfico en 8-8-72.

GEOLOGICAL MAP of the SOUTHERN CANTABRIAN MOUNTAINS, SPAIN

Published by the Geological Institute, Leiden University — Editor: L.U. de Sitter

Publicado de acuerdo con el Instituto Geológico y Minero de Espana C.S.G. no. 1984, 10-12-'64

LEGEND:

QUATERNARY
- Alluvium
- Scree
- Erratics of Permo-Triassic blocks
- Old scree
- Moraine material

TERTIARY
- Terraces

CRETACEOUS
- Limestone, marl lst., sandstone, glauc. sands, marls Cgl., sst., white-red shale lenses — KM Maestrichtian-Campanian-Santonian-Coniacian; KT Turonian-Cenomanian; KW Wealden (Albian)

JURASSIC
- Marls, limestone

TRIASSIC
- Congl., sst., shale — Tr.

CARBONIFEROUS
- Congl., sst., coal — Ce Stephanian B; Peña Cilda formation; Cea
- Occ. cgl., sst., sh., coal (prod) — Ce Stephanian A; Cea
- Limestone — Ce Stephanian A; Cea
- Sst., sh., coal (prod) cgl. — CY Westfalian s.l.; Vaso
- Limestone — CY Westfalian; Vaso
- Cgl., sst., shale, (lst.) — CY Westfalian A-B?; Curavacas congl. formation; Vaso
- Sst., shale, cgl. — C Namurian-Visean; Culm facies; Ruesga
- Bit. limestone (briette, lst., chert, red-green shale — Ca Namurian-Visean; Caliza de Montaña facies; Ruesga; Visean-Tournaisian
- Nodular limestone, sst., quartzite Shale — FF Upper Devonian
- sst., lst. — A Eifelian?; Abadia formation
- Lst., shale — L Emsian-Siegenian; Lebanza formation
- Quartzites, sst., sh. — Car Gedinnian+Upp. Silurian; Carazo formation; SILURIAN

Igneous rocks
- Quartz porphyry
- Porphyritic diorite and granite
- } Late Carboniferous

- Lydite breccia
- Quartzite conglomerate
- Limestone conglomerate
- Arenaceous Culm beds
- Sandstone and quartzite

- Anticline
- Syncline
- fault, certain
- fault, probable
- Strike, dip of 40°
- Strike, dip of 90°
- Strike, inverted dip of 30°
- Strike line
- Intraform. unconformity
- Coal bed
- Mine
- Ancient stone work shop

SHEET PISUERGA 1964

Map prepared by the Geological Department, Leiden

SCALE 1:50.000

0 1 2 3 4 5 km

SITUATION MAP 1:5.460.000

BAY OF BISCAY — FRANCE — PORTUGAL — SPAIN

INDEX- and STRUCTURAL MAP 1:500.000

PAJARES — ISIDRO UNIT — LEÓN — YUSO UNIT — CARRIÓN UNIT — LUNA — PISUERGA — CEA-ESLA-PORMA

Cross-Sections Sheet PISUERGA, Cantabr. Mts.

SCALE 1:50.000

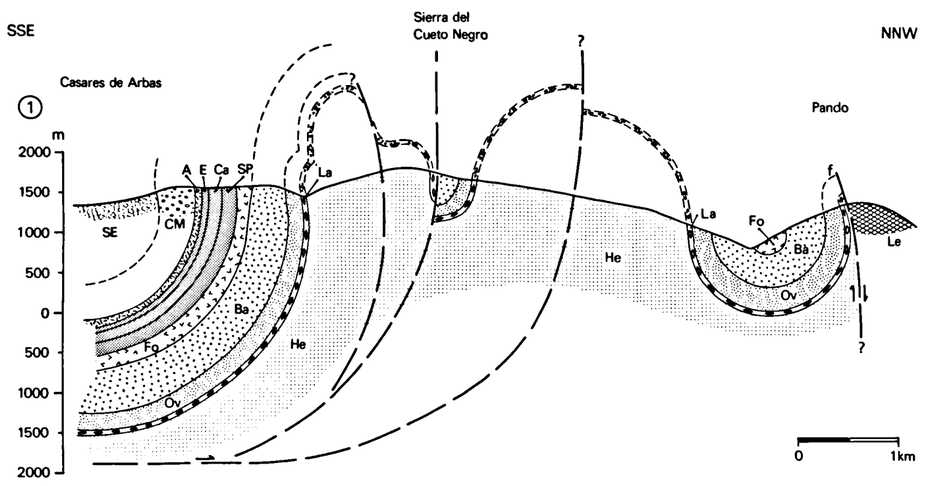
Geol. Dept., Leiden University, 1964

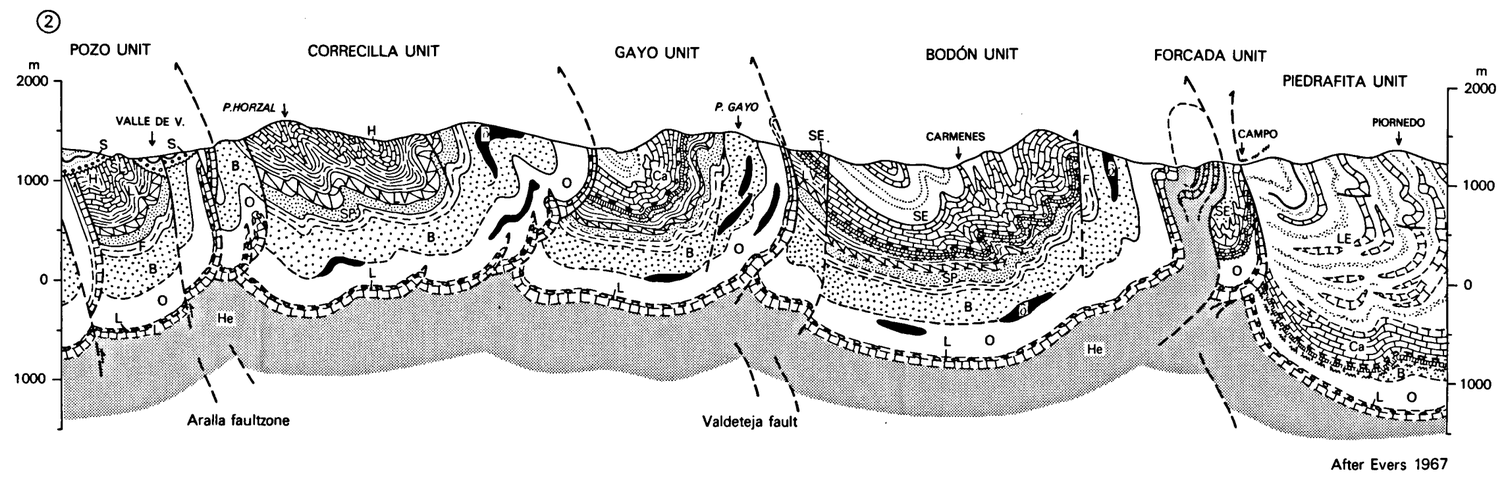
Legend: Tert. Terraces; Limestone, marl lst., sst., glauc. sands, marls, Cgl., sst., white-red sh. lenses — KM Maestr.-Camp.-Santon.-Coniac.; KT Turon.-Cenom.; KW Wealden; Marls, lst. — J Jurassic; Cgl., sst., shale — Tr Triassic; Cgl., sst., coal; Occ. cgl., sst., sh., coal (prod.); Limestone — Ce Stephanian B; Ce Stephanian A; Sst., shale, cgl. — CY Westfalian s.l.; Limestone — CY Westfalian; Cgl., sst., shale — CY Westfalian A-B?; Sst., sh., cgl. — C Namur.-Visean; Bitum. lst. (briette, lst., chert, red-green sh.) — Ca Nam.-Visean; Vis.-Tournaisian; Nodular lst., sst., quartzite; Shale; Sst., lst.; Lst., shale — FF Upper Devonian; A Eifelian; L Emsian-Siegenian; Quartzite, sst., sh. — Car Gedinn.+Upp. Sil.; Intrusives; Quartzite conglomerate; Sandstone; Coal bed; Fault

Sections: A, B, C, D, E, F, G, H

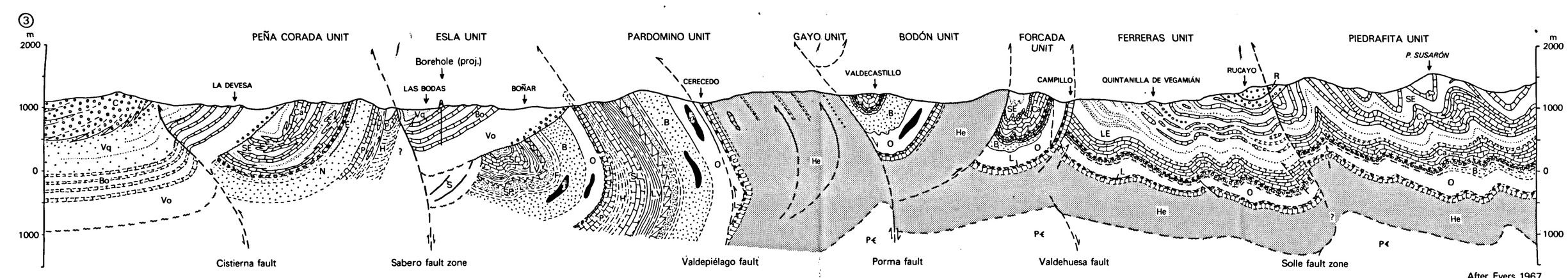
Ruesga faults; Santibáñez ridge; Curavacas syncline; Polentinos anticline; LEONIDE ZONE; Barruelo fault; San Julian; Casavegas syncline; Los Lázaros anticline; Redondo syncline; Sierra Corisa syncline; Verdeña anticline; Celada anticline; Rabanal ridge; Ligüérzana fault zone; Cadaramo anticline

CROSS-SECTIONS FOR MAP SHEETS III AND V. STRUCTURAL SKETCHMAP





After Evers 1967



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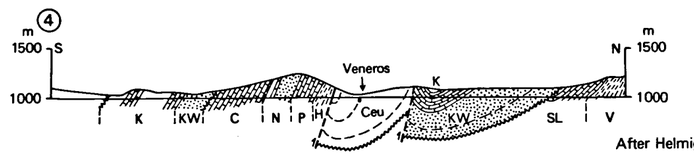

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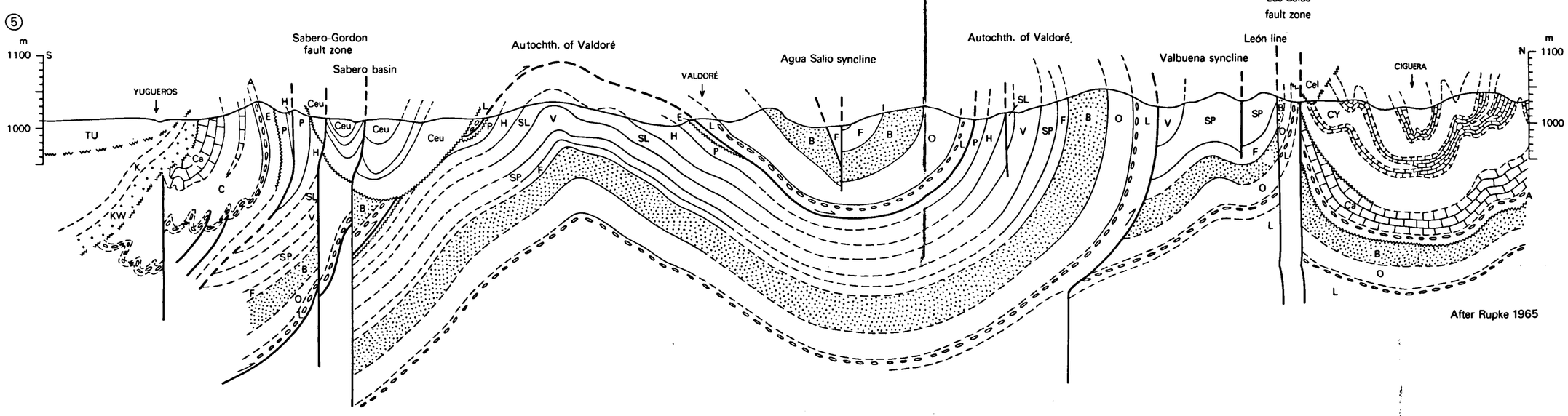

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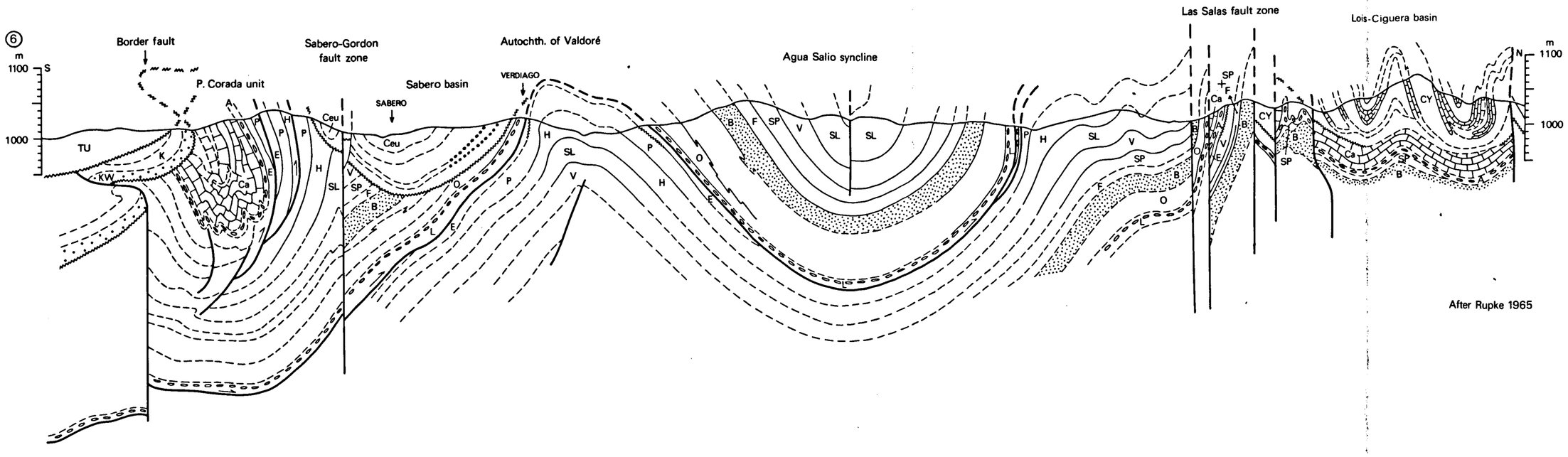

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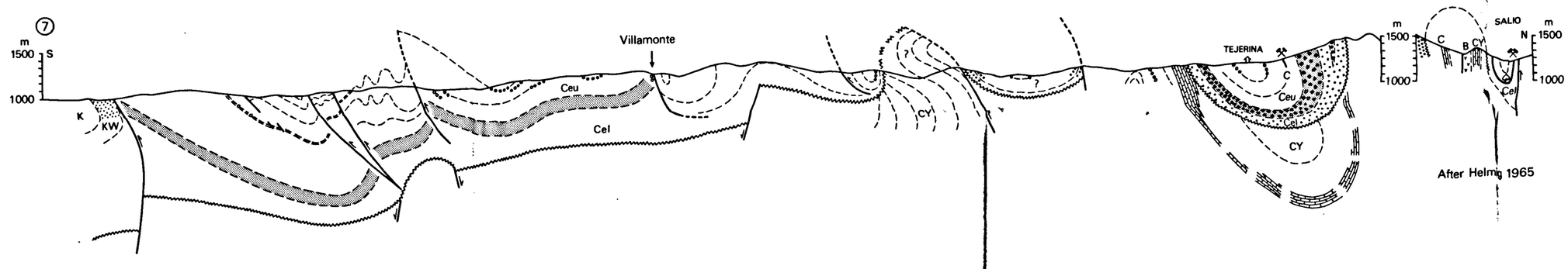

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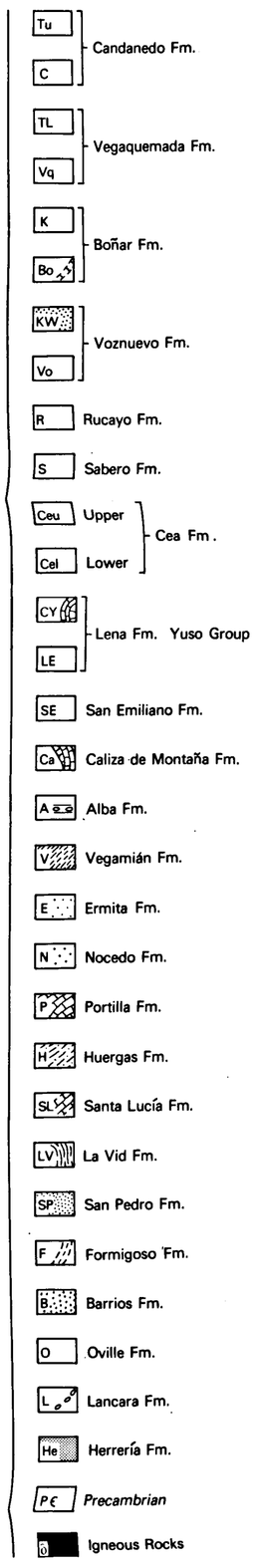
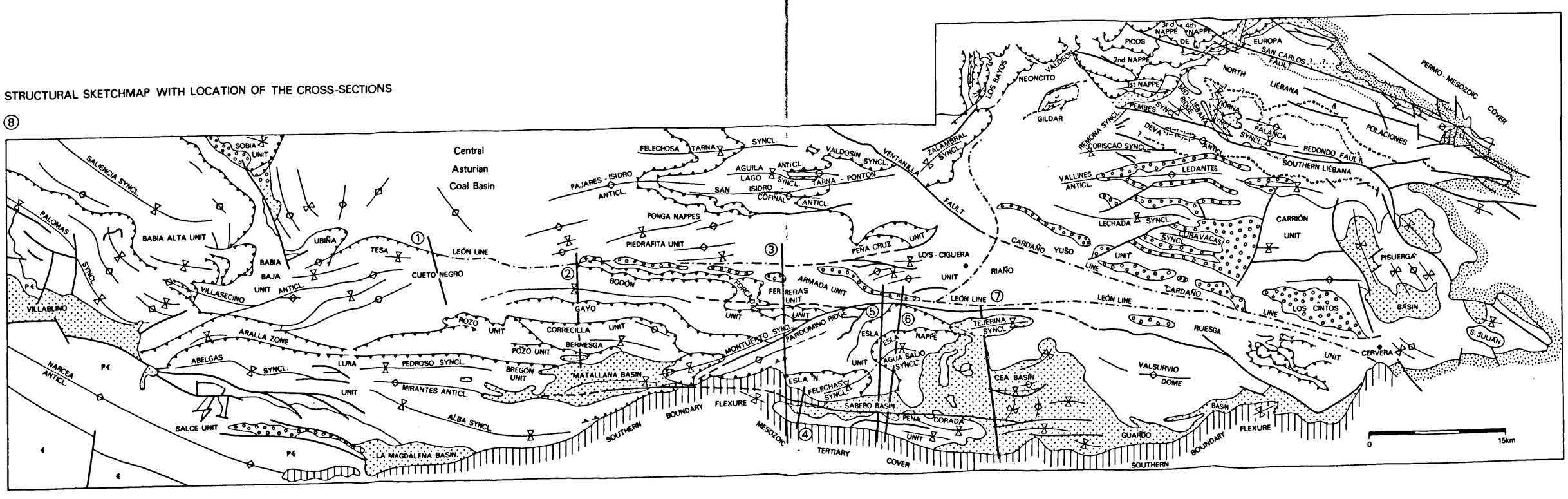
STRUCTURAL SKETCHMAP WITH LOCATION OF THE CROSS-SECTIONS