

BORNEO-EXPEDITION

GEOLOGICAL EXPLORATIONS

IN
CENTRAL-BORNEO

(1893-1894)

BY
DR. C. A. F. MOLENGRAAFF

Formerly Professor of the University of Amsterdam and Government Geologist of the South-African Republic

ATLAS

in 22 Sheets

Published by the Society for the Promotion of the Scientific Exploration
of the Dutch Colonies

E. J. BRILL
SOEBOE

H. GERLINGS
AMSTERDAM

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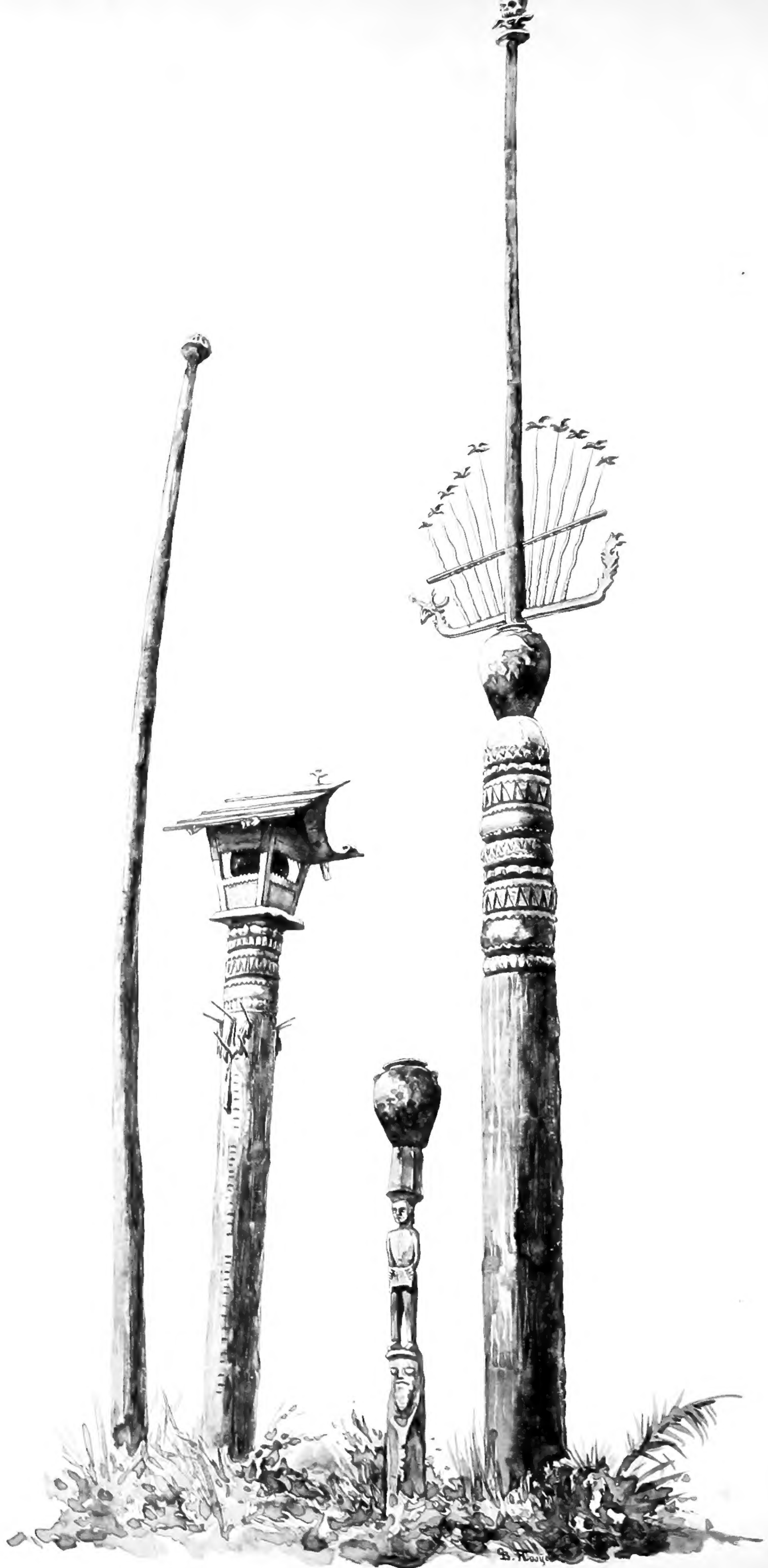
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TORAS AND SEPANISOKS AT MÉKAKAU.

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1902

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ERRATA.

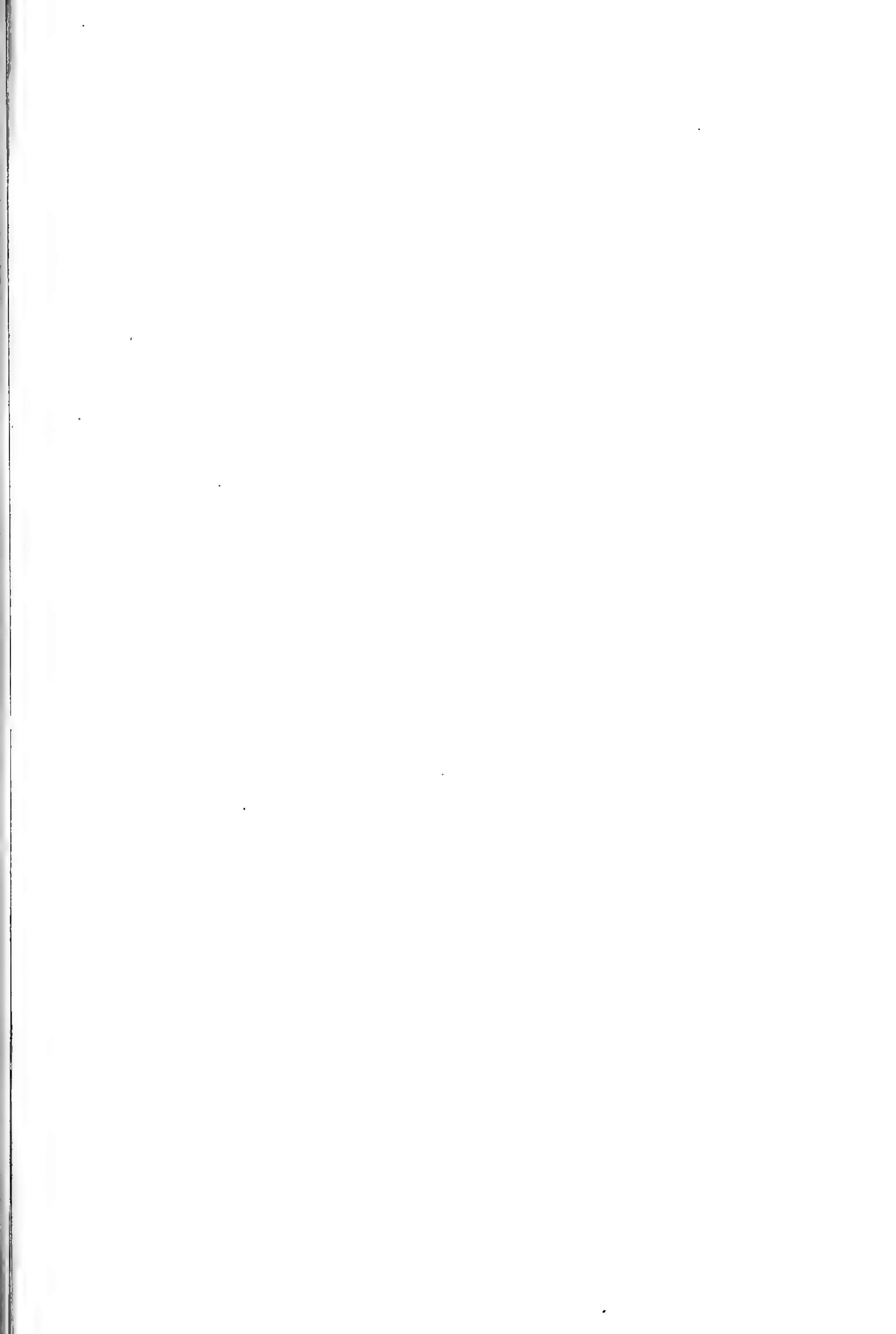
MAP I.

for: S. Embaloeh (Lebajan) *read:* S. Embaloeh Lebojan.




























MAPS II and III.

The colours 15 and 37 are by mistake too nearly alike each other. On the Lekawai and Tondok rivers the colour is meant for 15, *Old-tertiary*; whilst in the vicinity of Mt. Ampan and along the Embahoe 37, *Andesite* is indicated. This should also be considered with regard to the other maps and sections.

There is only a shade of difference between the colours 17, *recent fluvialite and lacustrine deposits*, and 33, *rhyolite*, which might lead to misapprehension on map VII^c. This can, however, be avoided by noticing fact the that where the colour 33 is meant the name of the rock is given in addition, which is not the case with colour 17.



Index to all the maps and sections.

	Maps. Kaarten.	Sections. Doorsneden.	
Crystalline schists, chiefly amphibolite.		1 	Kristallijne schists, hoofdzakelijk amphiboliet.
Old slate-formation.		2. 	Oude lei-formatie.
Danau formation, precretaceous (generally).		3 	Danau-formatie praecretaceesch (algemeene notatie).
Sandstone, clay-slate and shale.		4 	Zandsteen, klei en kleisteen.
Chert and hornstone.		5 	Kiezeller en hoornsteen.
Diabase.		6. 	Diabaas.
Diabase-tuff.		7 	Diabaas-tuf.
Silicified diabase-tuff, Poelau-Melaiou-type.		8 	Verkiezelde diabaas-tuf. Poelau-Melaiou-type.
Diabase-porphyrite.		9 	Diabaas-porphyriet.
Augite-porphyrite.		10 	Augiet-porphyriet.
Limestone		11 	Kalksteen.
Cretaceous beds (generally).		12 a 	Krijtformatie, algemeene notatie.
Lower or shale-stage		12 	Onderste of kleisteen-étage.
Middle or marl stage.		13 	Middenste of meigel-étage.
Upper or sandstone-stage.		14 	Bovenste of zandsteen-étage.
Beds of upper-cretaceous and lower tertiary age.		15 	Lagen van boven-cretaceischen en oud-tertiären ouderdom.
Sandstone-formation.		16 	Zandsteen-formatie.
Older and recent fluvial and lacustrine deposits, Quaternary and Recent.		17 	Oude en jonge stroom en meerafzettingen; Quartair en Nover.
Rocks of unknown age, altered by contact-metamorphism.		18 	Contact-gesteenten van onbekenden ouderdom.
Granite and tonalite.		19 	Graniet en tonaliet.
Granite and tonalite, schistose by pressure.		20 	Graniet en tonaliet, schieferig door druk.
Gneissic granite from the Samba-river.		20 a 	Gneisachtige graniet van de Samba-rivier.

van the Danau formation.

van de Danau formation.

Cretaceous beds.




















Krijtformatie.

Kleurschaal voor alle kaarten en doorsneden.

	Maps. Kaarten.	Sections. Doorsneden.	
Tourmaline granite.		21.	Tourmalijn graniet
Augite tonalite.		22.	Augiet-tonaliet.
Diorite.		23.	Dioriet.
Diabase, not contemporaneous with the beds of the Danau-formation.		24.	Diabaas, met van gelijken ouderdom met de Danau-formatie.
Gabbro and olivine-gabbro.		25.	Gabbro en olivien-gabbro.
Olivine-hypersthene-norite.		26.	Olivien-hyperstheen-noriet
Pikrite, Harzburgite, Lherzolite and Serpentine.		27.	Pikriet, Harzburgiet, Lherzokiet en Serpentijn
Quartz-porphyrite (Palaeo-rhyolite).		28.	Kwartsporphyriet.
Diabase, Diorite, and Amphibole-porphyrite of unknown age.		29.	Diabaas-, Dioriet en Amphibool-porphyriet van onbekenden ouderdom.
Raja-porphyrite.		30.	Raja porphyriet.
Amphibole-porphyrite of andesitic type.		31.	Andesitische amphibool-porphyriet.
Volcanic rocks (generally).		32.	Vulkanische gesteenten, algemeene notatie
Rhyolite.		33.	Rhyolith.
Perlite and Obsidian.		34.	Perliet en Obsidaan.
Dacite.		35.	Daciet.
Mica-dacite.		36.	Biotiet-daciet.
Andesite.		37.	Andesiet
Mica-andesite.		38.	Biotiet-andesiet.
Andesite-tuff.		39.	Andesiet tuf
Basalt and dolerite.		40.	Bazalt en doleriet.
Stratified volcanic beds: tuff, tuff-breccia and lava-flows.		41.	Gelaagde vulkanische afzettingen, tuf, tuffbreccie en lavastroomen.
Country, geologically unknown.		42.	Geologisch onbekende streken.

SYMBOLS.

The direction of the line a gives the direction of the strike, the arrow b indicates the direction of the dip. Where no values are given, the strike and dip are only approximately known.

- Strata horizontal. 
- Strata vertical. 
- Strata much contorted, dip sometimes in one, sometimes in the opposite direction. 
- Landslip. 
- Locality where Radiolaria chert is found in situ. 
- Locality where Radiolaria chert is found as boulders. 
- Locality where Radiolaria are found in tuff. 
- Locality where fossils were found by the author. 
- Locality where fossils occur according to VAN SCHELLE. 
- Heights in Meters. 
- Direction of the sections. 
- Faults. 
- Boundary-lines of formations or rocks. 
- Coal mines. 
- Ladangs: strips of land where rice is or has been cultivated. 
- Forest. 
- Rocks. 
- Karangans; boulder and sandbanks. 
- Residences of Dutch officials (Map II). 

TEEKENS

De lijn a geeft de richting der strekking, de pijl b de richting der helling aan. Het cijfer bij de pijl geeft de hellingshoek aan. Zoo geen cijfers gegeven zijn, is de strekking en helling slechts bij benadering bekend.

- Stand der lagen horizontaal.
- Stand der lagen vertikaal.
- Lagen zeer sterk geplooid, helling nu eens in de ene, dan weder in de tegengestelde richting.
- Bergstorting, grondvers huiving.
- Vindplaats van kiezel of hoornsteen met Radiolaria als vast gesteente.
- Vindplaats van rolstenen van kiezel met Radiolaria.
- Vindplaats van tuf met Radiolaria.
- Plaats, waar fossielen door den schrijver zijn gevonden.
- Plaats, waar fossielen volgens VAN SCHELLE voorkomen.
- Hoogte-cijfer in Meters.
- Richting der doorsneden
- Verschuivingen
- Grenzen van formaties of gesteenten.
- Kool-mijnen.
- Ladangs: plaatsen, waar rijstvelden zijn of waren.
- Woud
- Rotsen.
- Karangans: rolsteen- en zandbanken.
- Standplaatsen van Nederlandsche ambtenaren (kaart II).

ABBREVIATIONS.

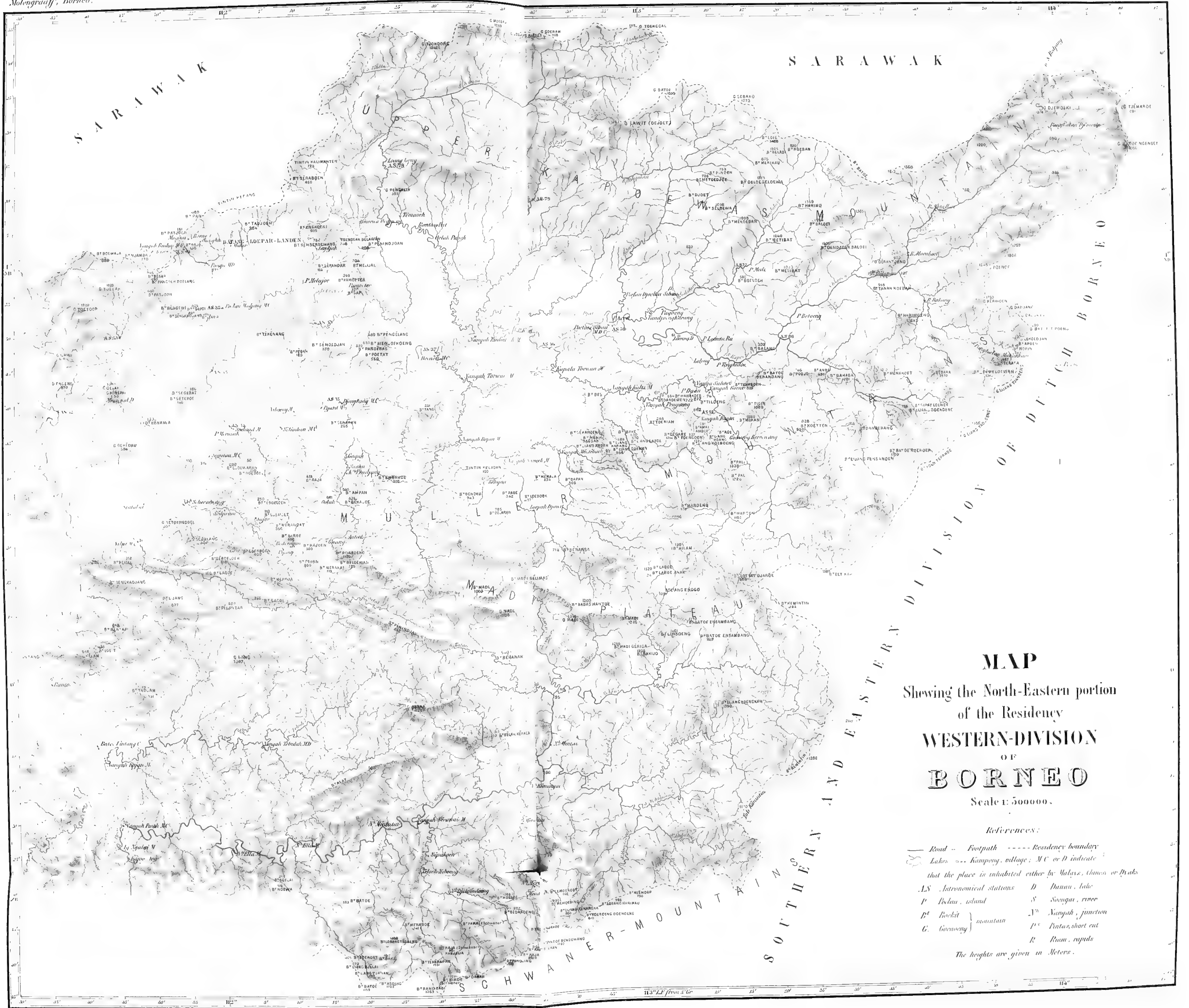
- River. S
- Lake D.
- Mountam G.
- Mountam, peak B^h.
- Island P.
- Rock, cliff B.
- Rapids R.
- Mouth N^o.N^h.
- House R^h.
- Bay St.
- Cape T.
- Island N.
- Mountam, peak P^h.
- Mouth T^h.T.
- Rapids K.
- Behind the name of a kampong or a house means: inhabited by Dyaks, Malays or Chinamen { D. }
 { M. }
 { C. }
- Resident R.
- Assistent-Resident A.R.
- Controleur C.
- Astronomical beacon of the topographical survey A.S.

AFKORTINGEN.

- Soengai Rivier.
- Danau Meer.
- Goenoeng Berg, gebergte.
- Boekit Berg, bergtop.
- Poelau Eiland.
- Batoe Rots, klip.
- Riam Stroomversnelling.
- Nangah Mond.
- Roemah Huis.
- Selat Baai.
- Tandjoeng Kaap.
- Noesa Eiland.
- Poeroek Berg, bergtop.
- Toembang Mond.
- Kiham Stroomversnelling.
- Gevoegd achter den naam van een kampong of van een huis beduift: bewoond door Dajaks, Maleiers of Chineezen.
- Resident.
- Assistent-Resident
- Controleur.
- Astronomisch Station der topographische opname.

The topographical basis of all the maps, those of the Samba-river excepted, as also the spelling of all the localities is taken from the Dutcl. topographical map of the Residentie Westerafdeeling van Borneo, surveyed 1886-1895 and published on the scale 1:200,000.

De topographische grondslag van alle kaarten, uitgezonderd die van de Samba rivier, even als de schrijfwijze der plaatsnamen, is ontleend aan de topographische kaart der Westerafdeeling van Borneo, schaal 1:200,000, opgenomen 1886-1895.



SARAWAK

SARAWAK

MAP
Showing the North-Eastern portion
of the Residency
WESTERN-DIVISION
OF
BORNEO

Scale 1:500000.

References:

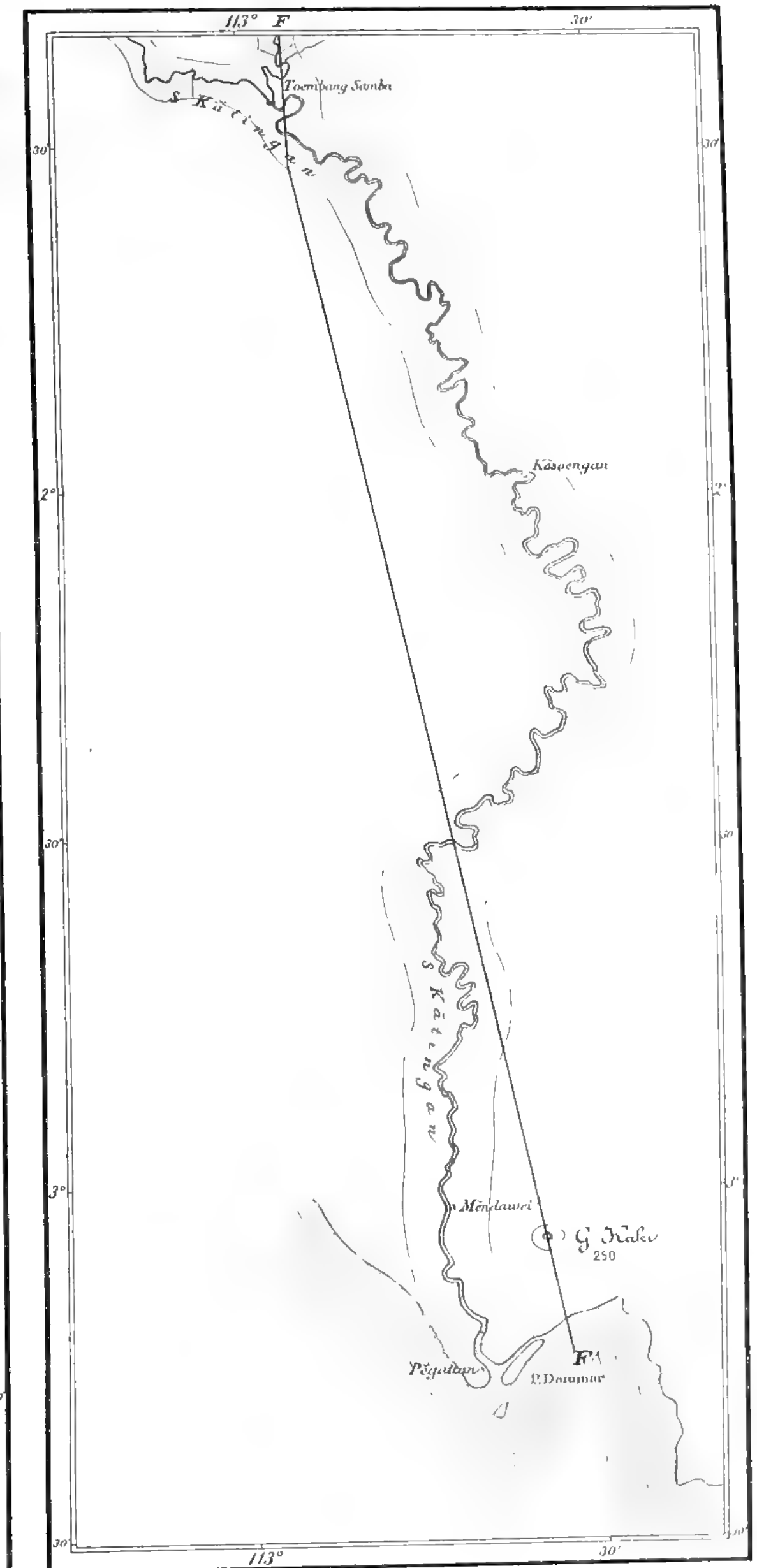
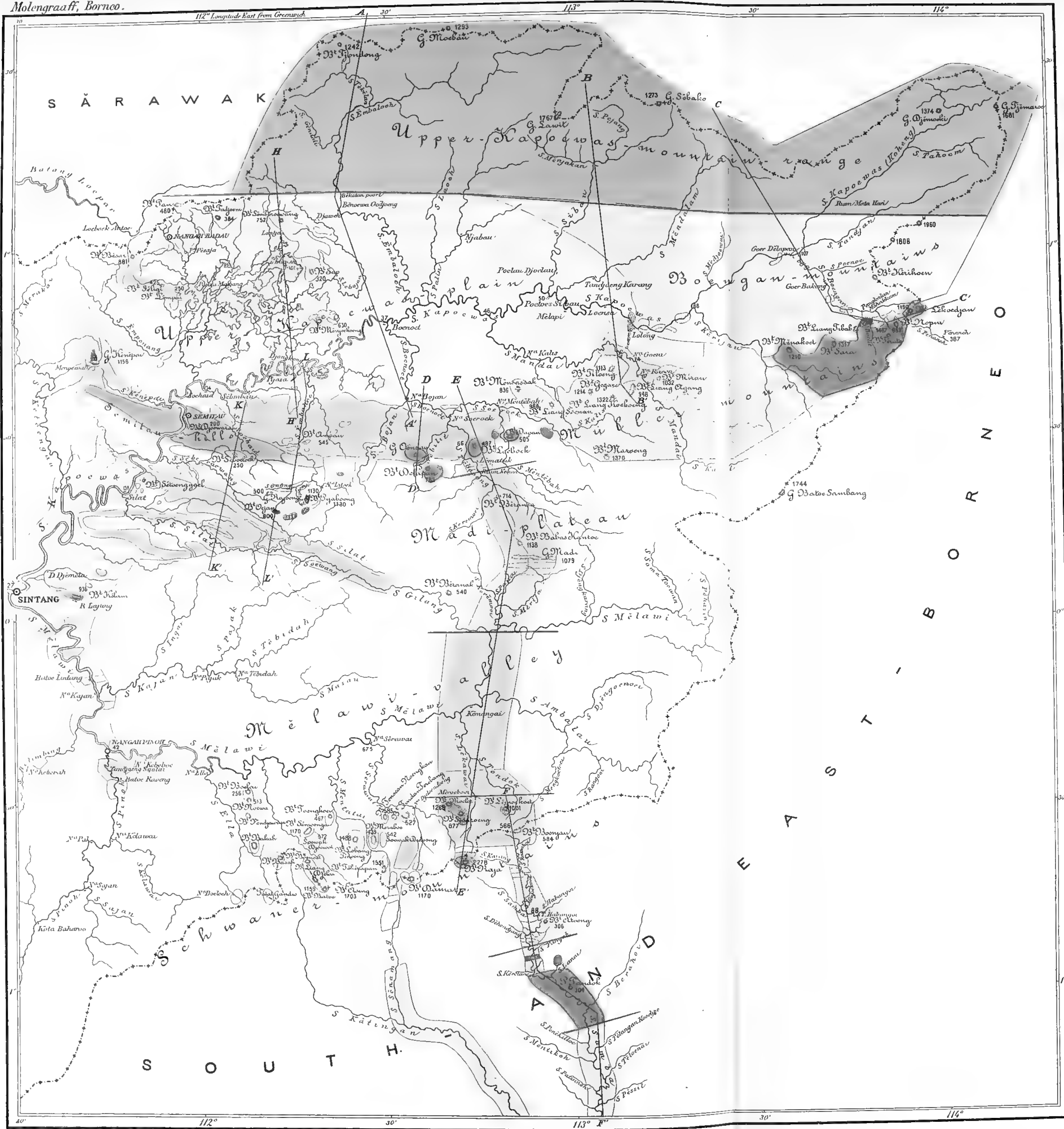
- Road — Footpath - - - - Residency boundary
- Lakes - - - - - Kampong, village; M C or D indicate that the place is inhabited either by Malays, Chinese or Malays
- AS Astronomical stations D Danau, lake
- P Pulau, island S Sungai, river
- B' Bukit } mountain Jⁿ Nangah, junction
- G. Gunung } mountain P^s Pintas, short cut
- R Riam, rapids

The heights are given in Meters.

SOUTHERN AND EASTERN DIVISION OF BORNEO

SCHWANER MOUNTAIN RANGE

112° 113° 114° 115° E from S. Gr.



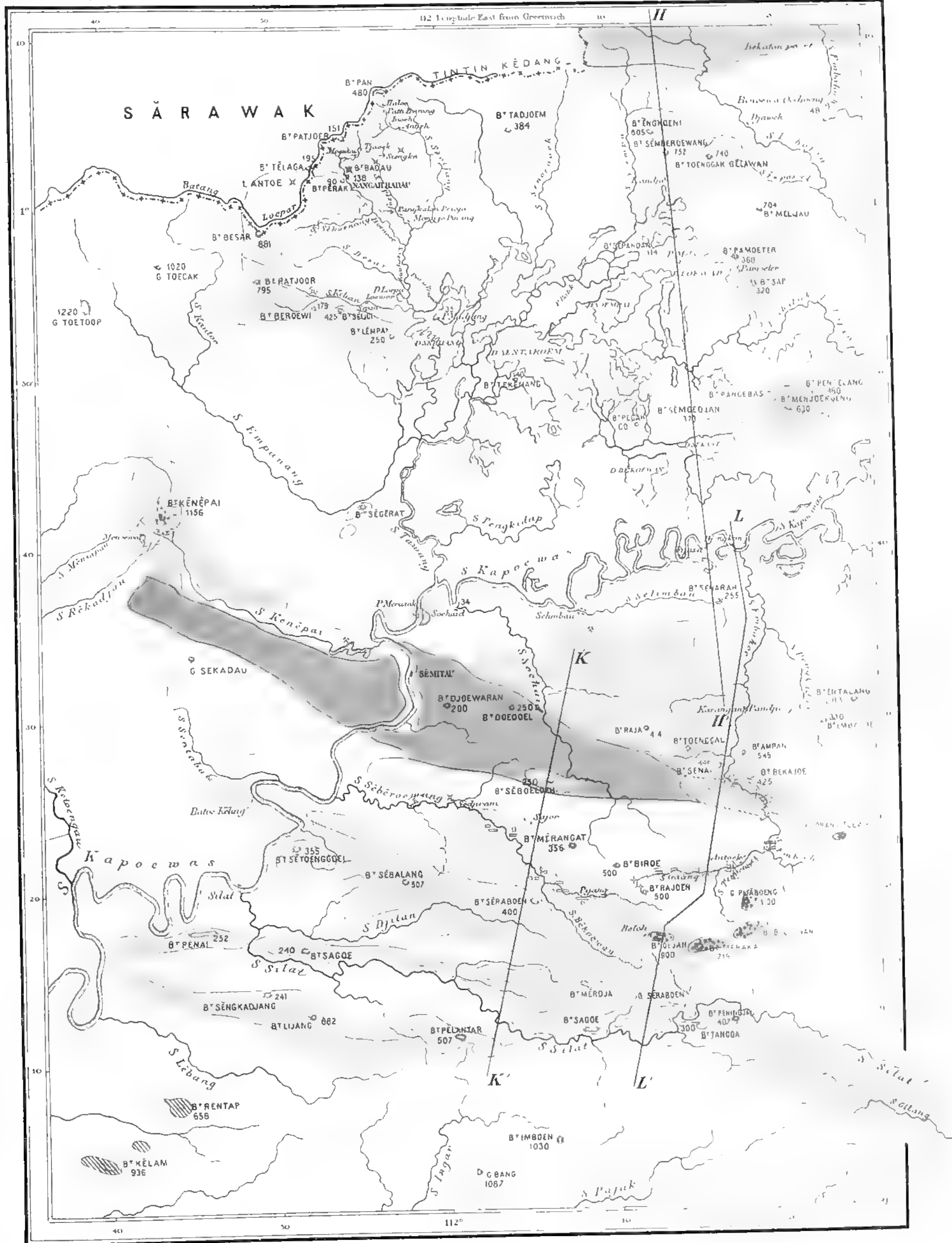
GEOLOGICAL SKETCH-MAP
 OF THE WESTERN PART OF CENTRAL-BORNEO
 AND A PART OF SOUTH-BORNEO.
 SCALE 1:750,000.

GEOLOGICAL SKETCH-MAP
 OF A PART OF THE KAPOEWAS - RIVER BASIN
 AND THE GREAT LAKES.

SCALE 1 400 000

Molengraaff, Borneo.

111



HYPSOMETRICAL MAP OF A PART OF THE KAPOEWAS-RIVER-BASIN ABOVE SINTANG.

THE KAPOEWAS CUTS THROUGH THE SEMITAU-HILLS.

Molengrauff, Borneo.

SCALE 1 : 225000

B^oMENJOEKONG IV

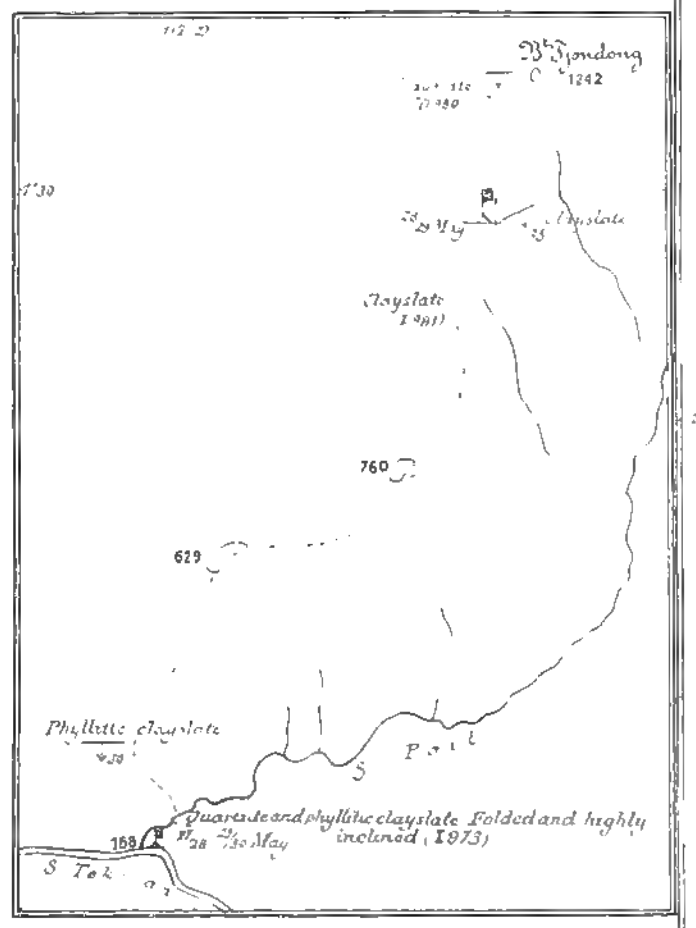
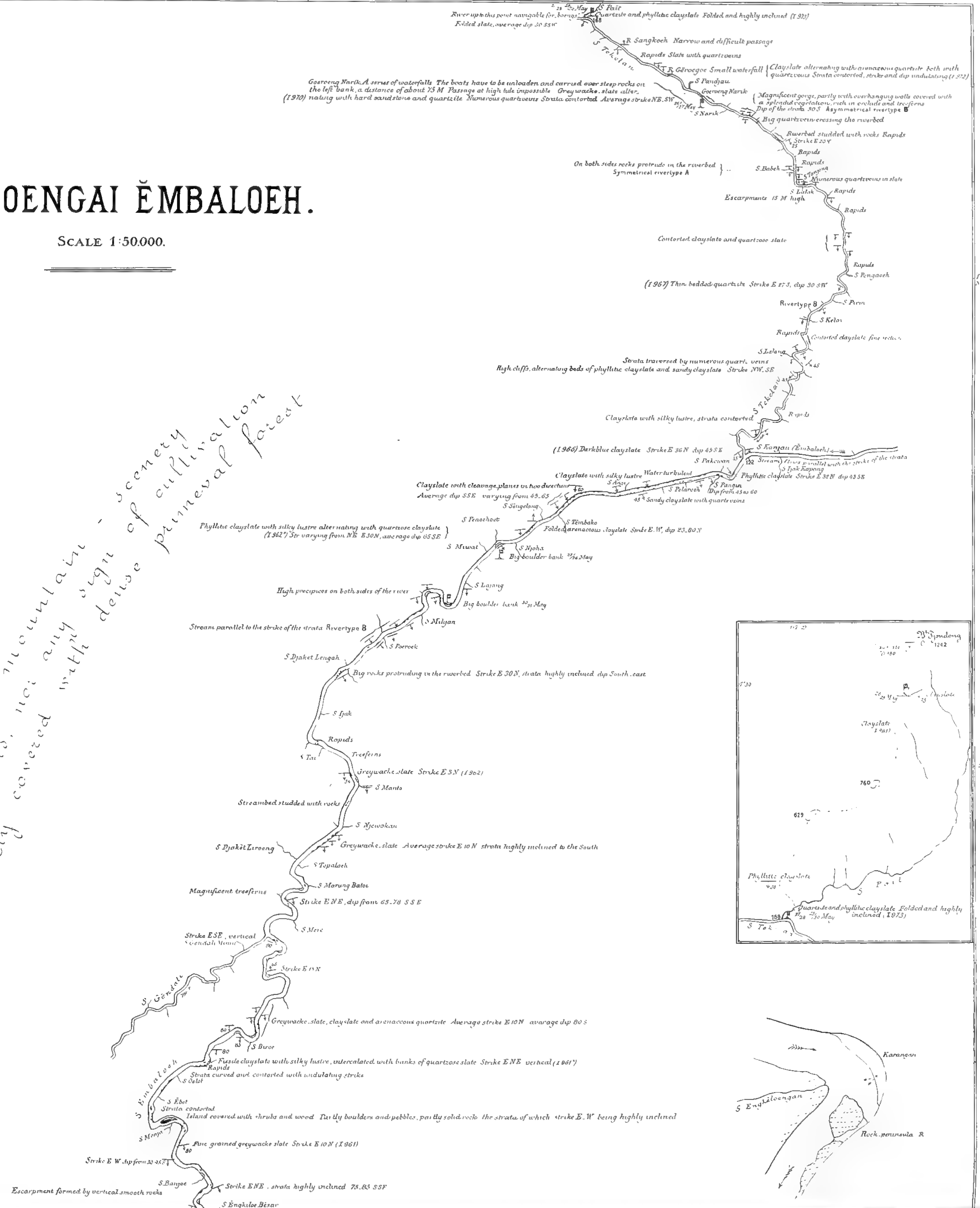


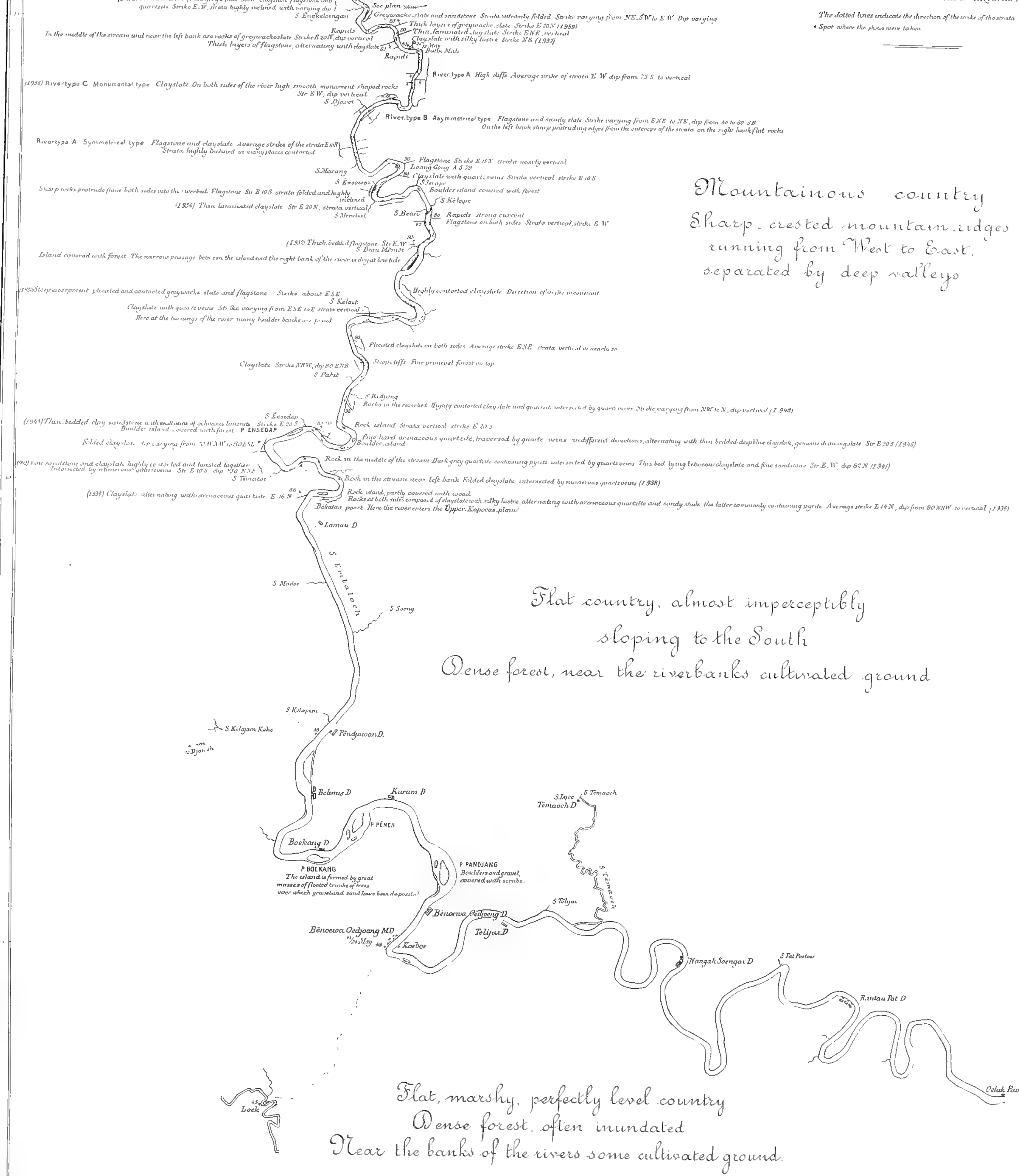
Country above 300 Meters
 Country between 100 & 300 Meters.
 Country below 100 Meters.
 Country inundated at high tide of the Kapoewas river
 Lakes and rivers

THE SOENGAI ĒMBALOEH.

SCALE 1:50,000.

Picturesque
 No human habitations, nor any sign of cultivation
 Ground entirely covered with dense primeval forest

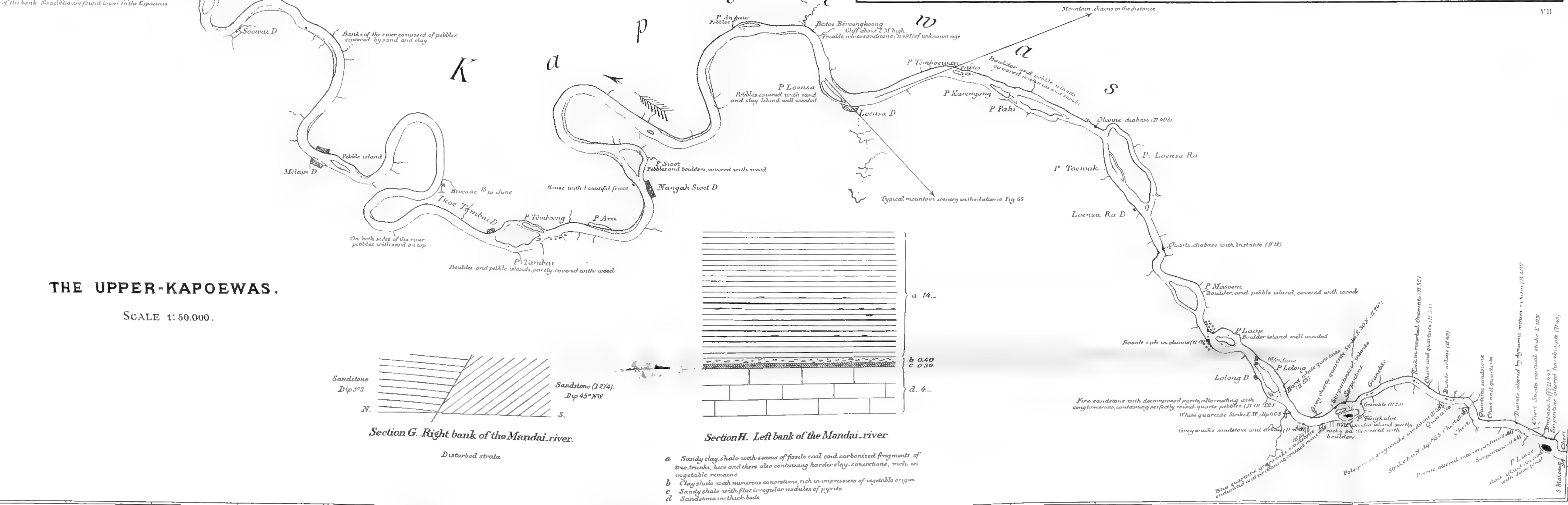
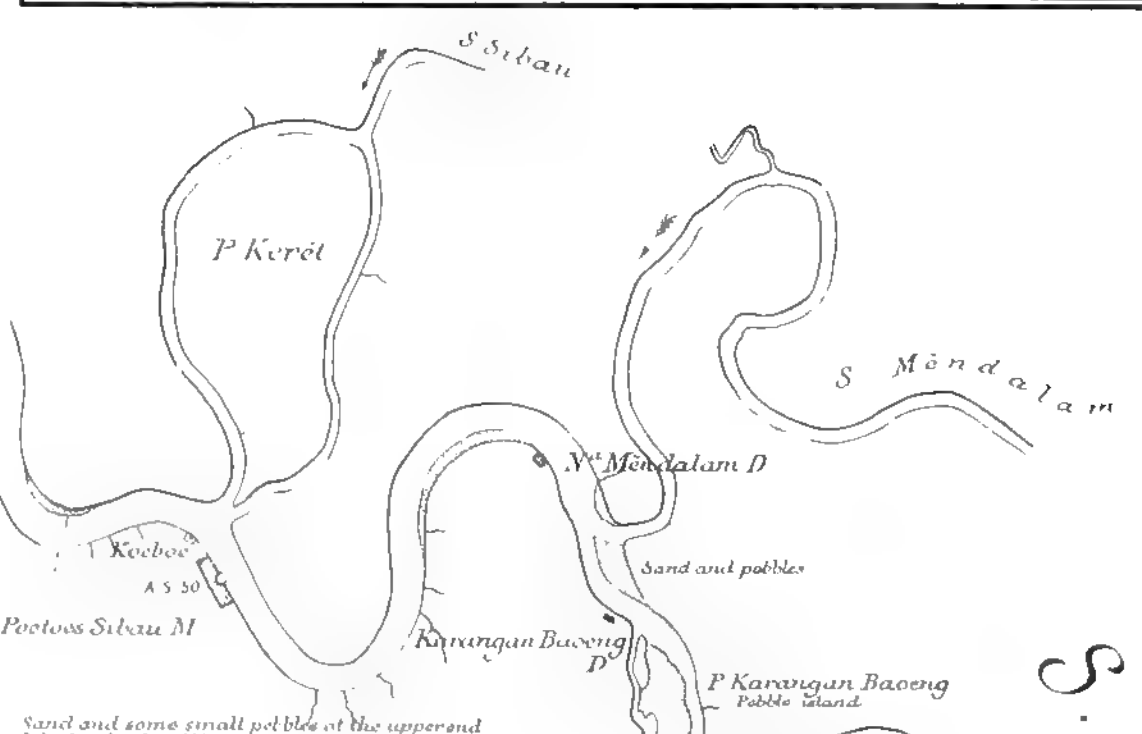
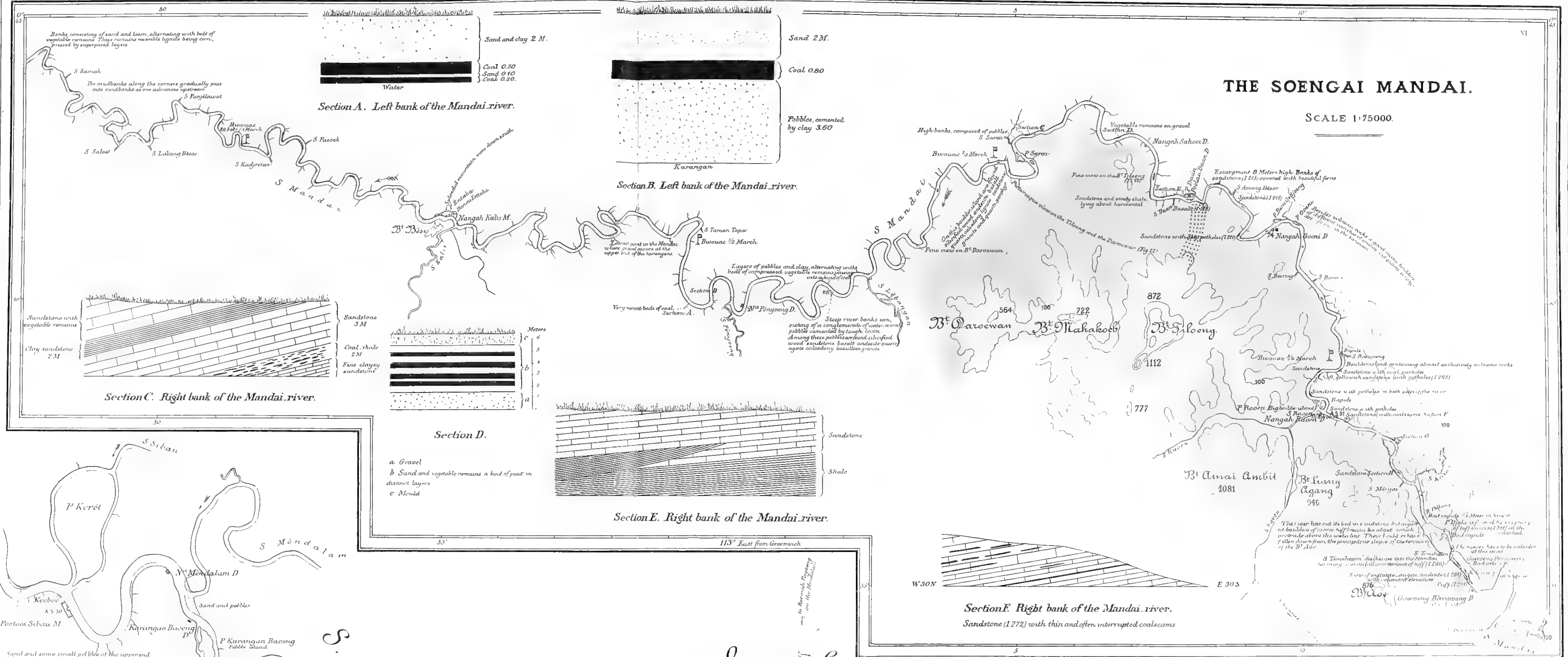




113° East from Greenwich

THE SOENGAI MANDAI.

SCALE 1:75000.



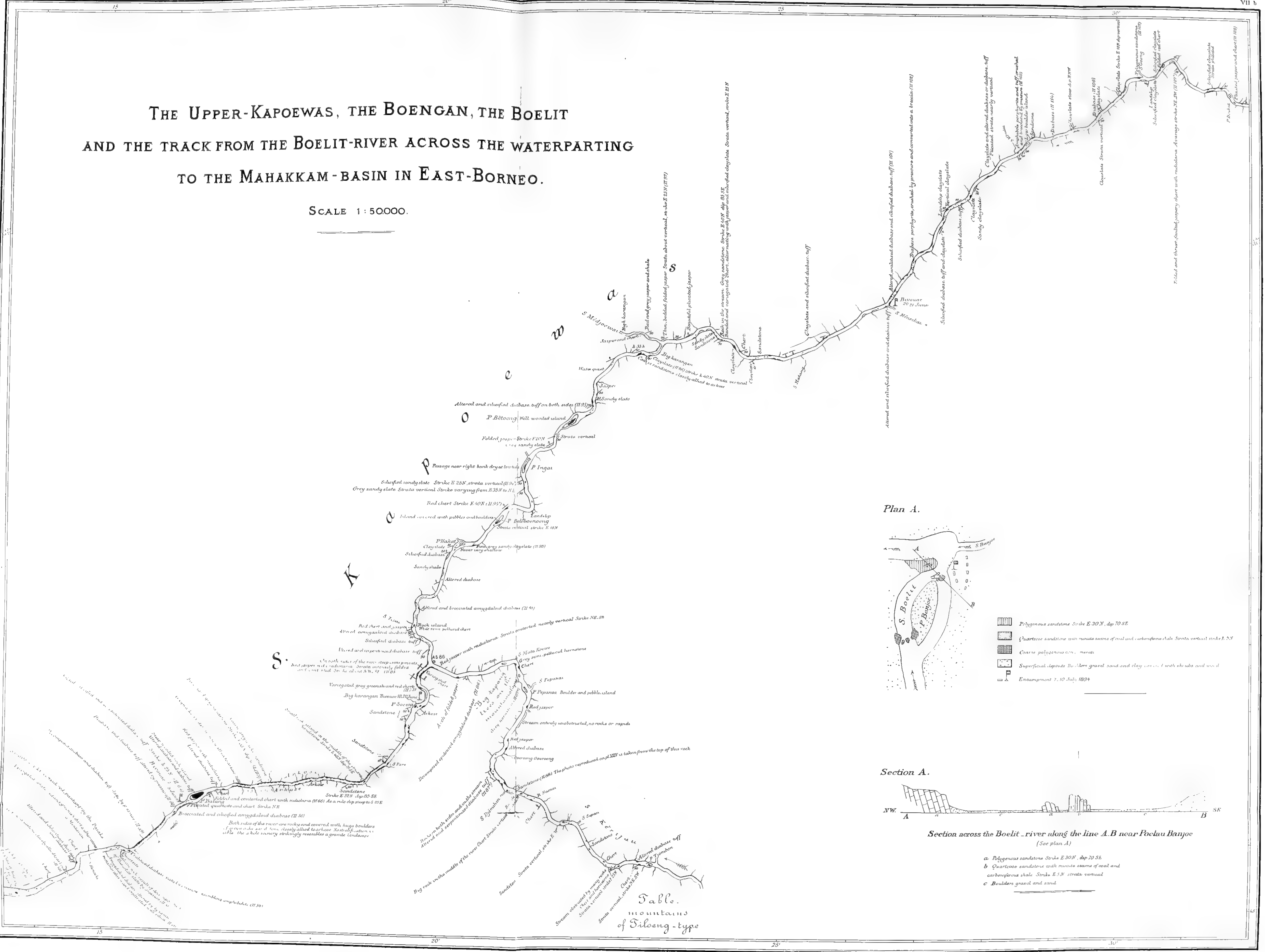
113°

5'

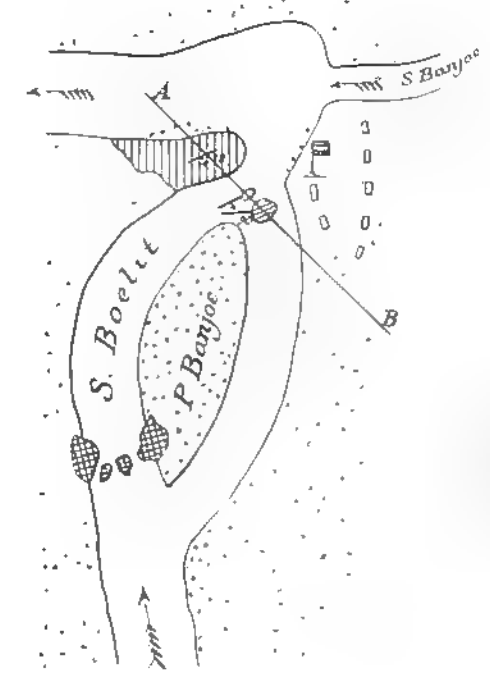
10'

THE UPPER-KAPOEWAS, THE BOENGAN, THE BOELIT AND THE TRACK FROM THE BOELIT-RIVER ACROSS THE WATERPARTING TO THE MAHAKKAM-BASIN IN EAST-BORNEO.

SCALE 1:50,000.

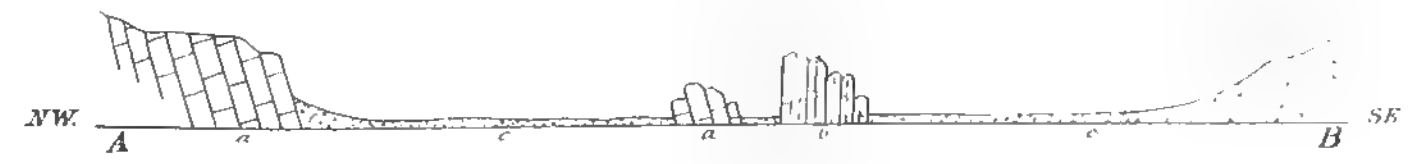


Plan A.



- Polygenous sandstone Strike E 30 N, dip 70 SE
- Quartzose sandstone with minute seams of coal and carboniferous shale Strike vertical strike E. 5 N
- Coarse polygenous con. matrix
- Superficial deposits Bo. lites gravel sand and clay covered with shales and wood
- Encampment 7. 10 July 1894

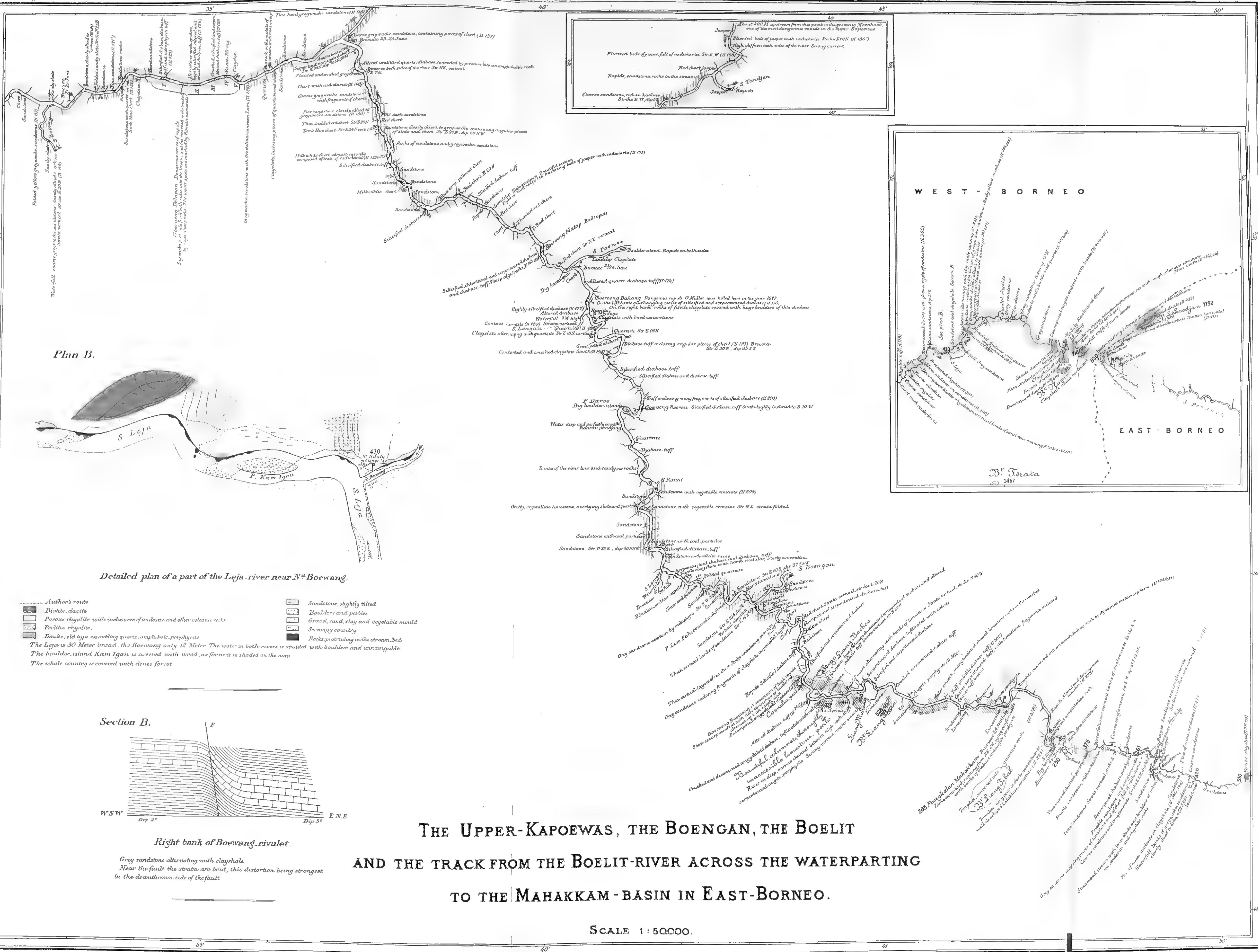
Section A.



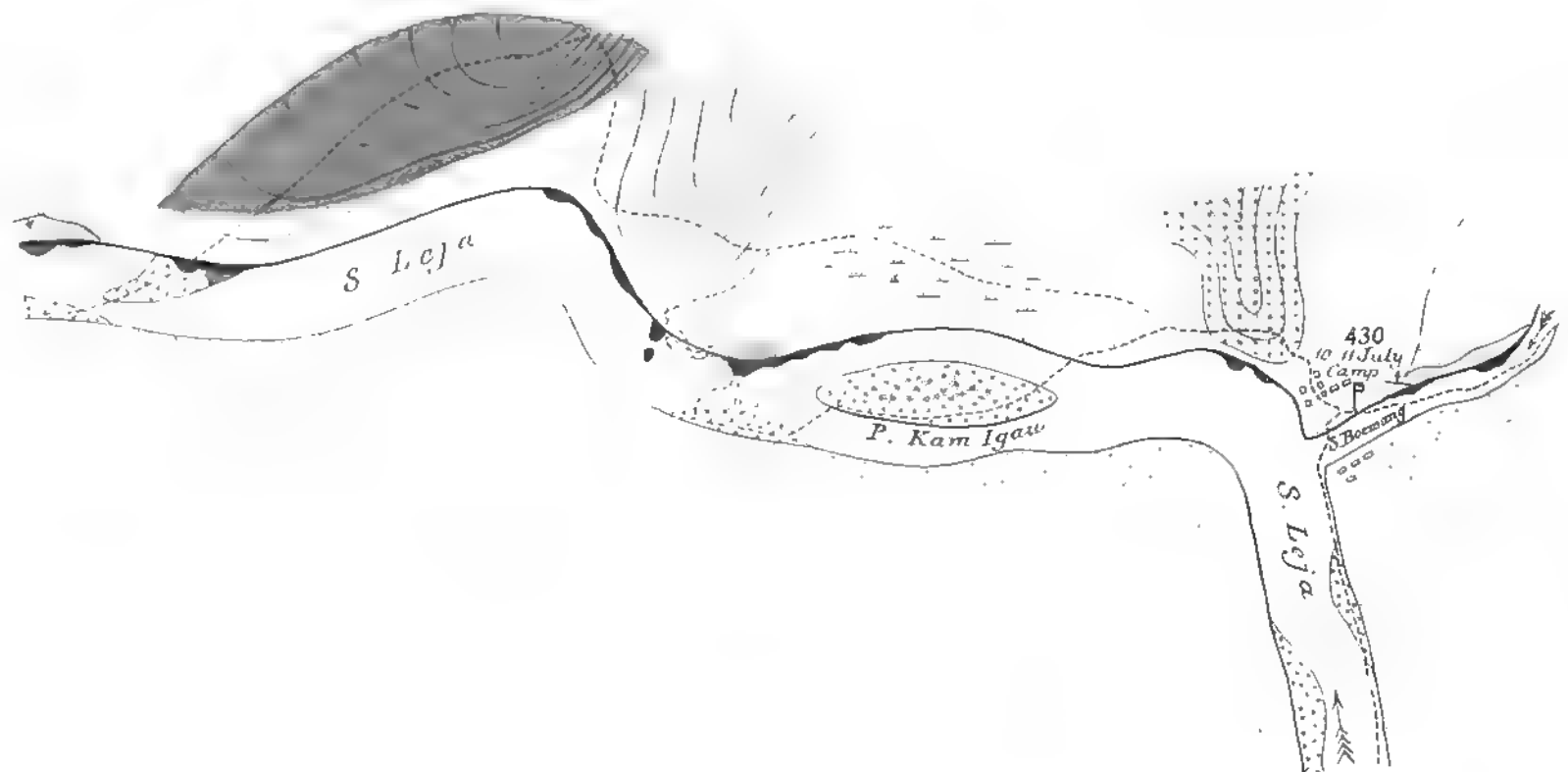
Section across the Boelit-river along the line A.B near Poelau Banjo (See plan A)

- a. Polygenous sandstone Strike E 30 N, dip 70 SE
- b. Quartzose sandstone with minute seams of coal and carboniferous shale Strike E. 5 N strata vertical
- c. Boulders gravel and sand

Table. mountains of Sibong-type



Plan B.



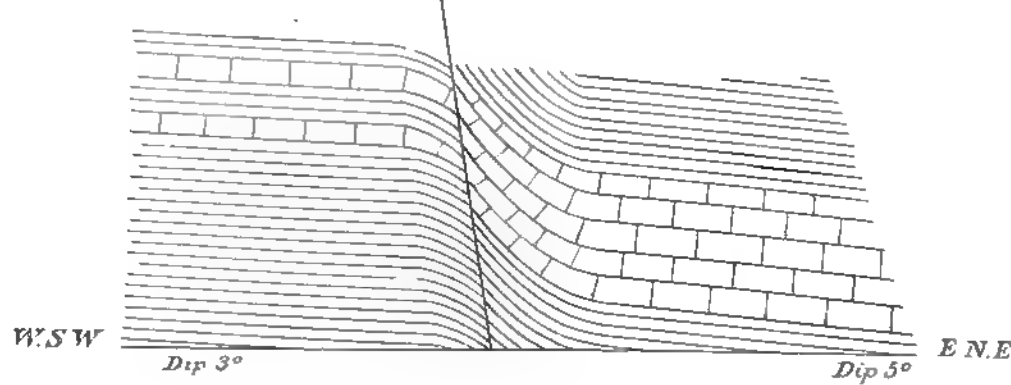
Detailed plan of a part of the Leja river near N³ Boewang.

--- Author's route

- Biotic dacite
- Porous rhyolite with inclusions of andesites and other volcanic rocks
- Poritic rhyolite
- Dacite, old type resembling quartz, amphibole, porphyrids
- Sandstone, slightly tilted
- Boulders and pebbles
- Gravel, sand, clay and vegetable mould
- Scampy country
- Rocks protruding in the stream bed

The Leja is 30 Meter broad, the Boewang only 12 Meter. The water in both rivers is studded with boulders and unswimmable. The boulder island Kam Igau is covered with wood, as far as it is shaded on the map. The whole country is covered with dense forest.

Section B.

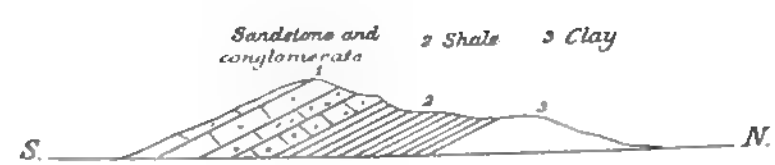


Right bank of Boewang rivulet.

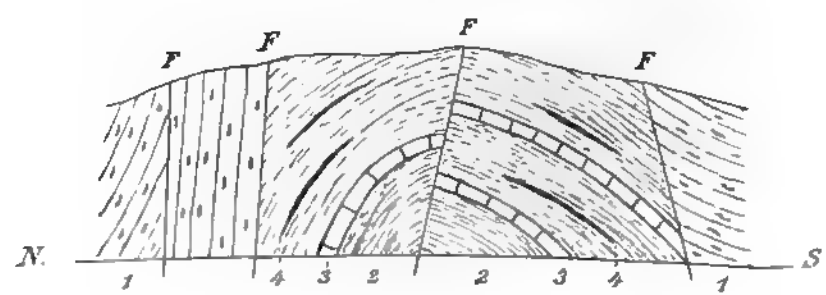
Grey sandstone alternating with clay shale
Near the fault the strata are bent, this distortion being strongest in the downthrown side of the fault

THE UPPER-KAPOEWAS, THE BOENGAN, THE BOELIT AND THE TRACK FROM THE BOELIT-RIVER ACROSS THE WATERPARTING TO THE MAHAKKAM-BASIN IN EAST-BORNEO.

SCALE 1:50,000.

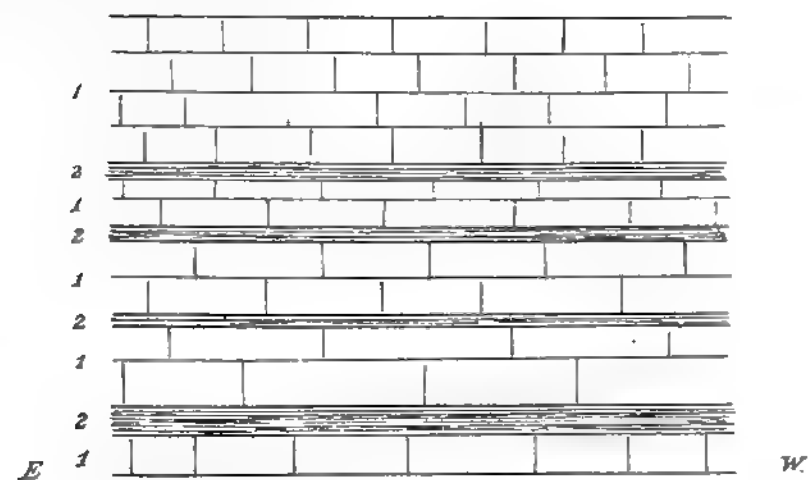


Section A.



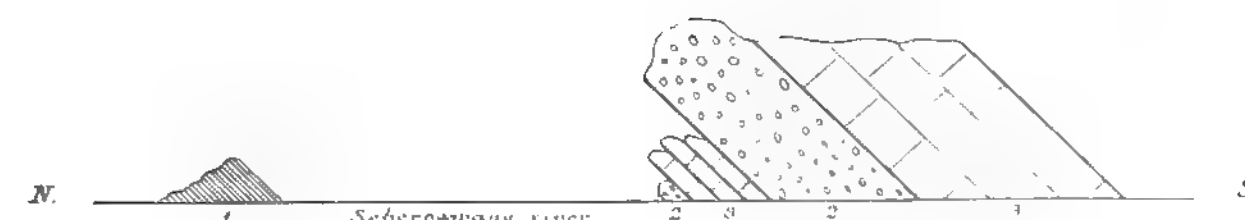
Section B. Faulted strata left bank of Sëbëroewang river, 500 Meter upstream from the house Antoe.

- 1 Soft shale with hard marly concretions
- 2 Shale with some beds of clay sandstone 3 intercalated
- 4 Thin segregated quartz veins in shale
- F Fault



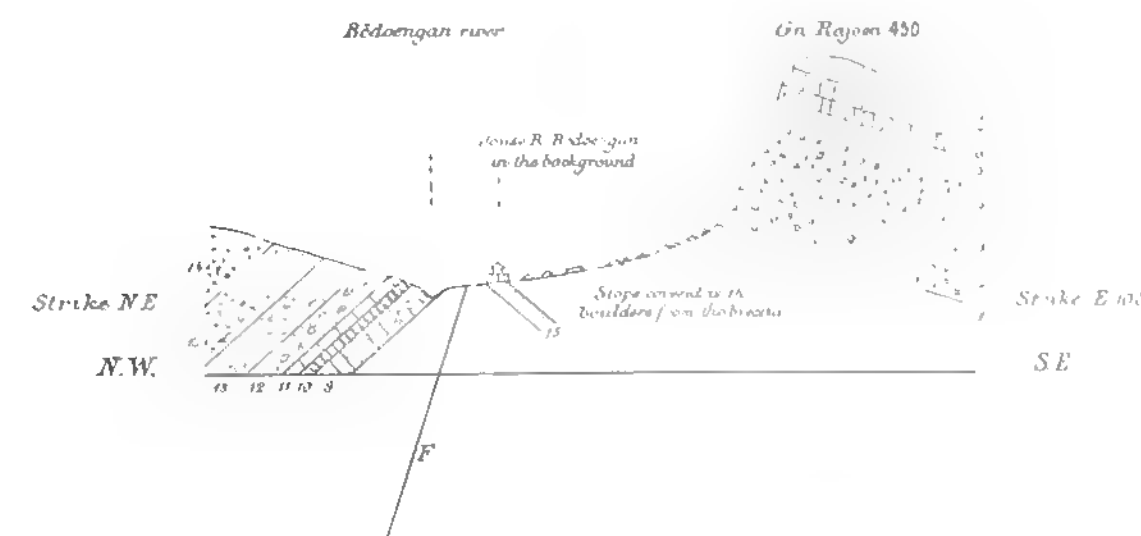
Section C. Left bank of Sëbëroewang river near Batoe Binawah Scale 1:150

- 1 Grey sandstone
 - 2 Thin bedded clay sandstone with minute coal seams
- The strata dip 35° to South



Section D across Sëbëroewang river, 200 M upstream from the mouth of the rivulet Gaman Scale 1:100

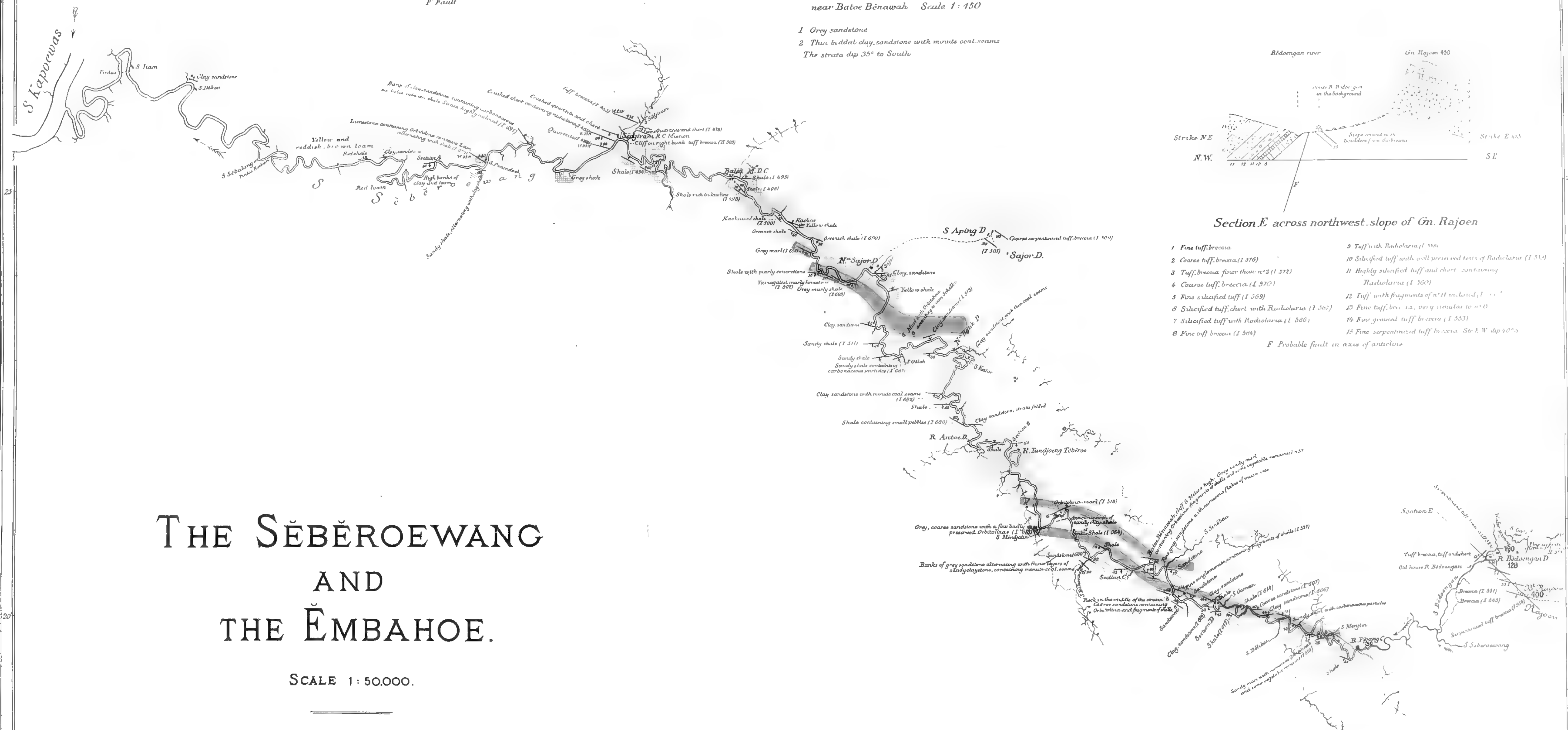
- 1 Shale rock in river near right bank
- 2 Conglomerate
- 3 Sandstone



Section E across northwest slope of Gn. Rajoen

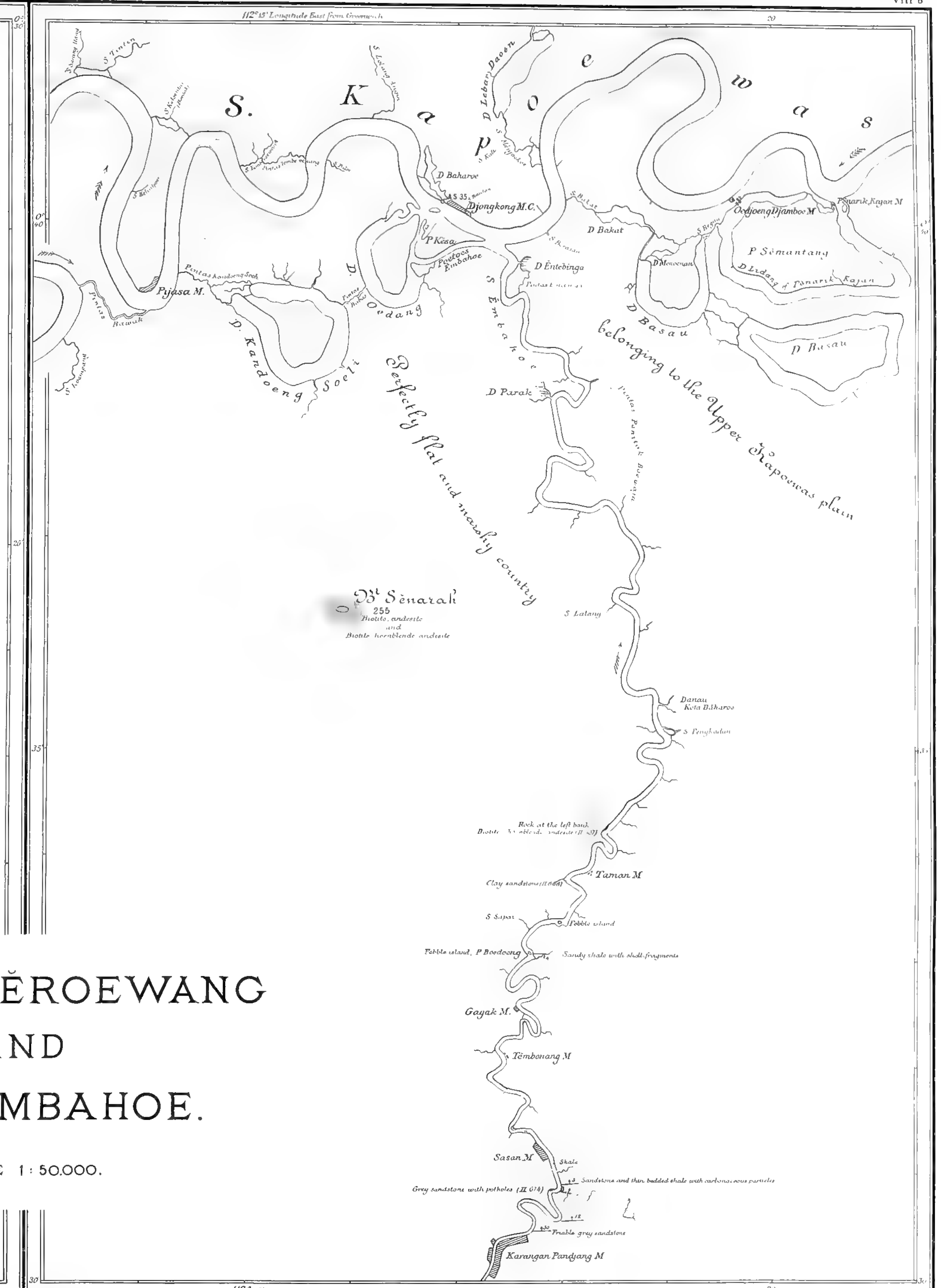
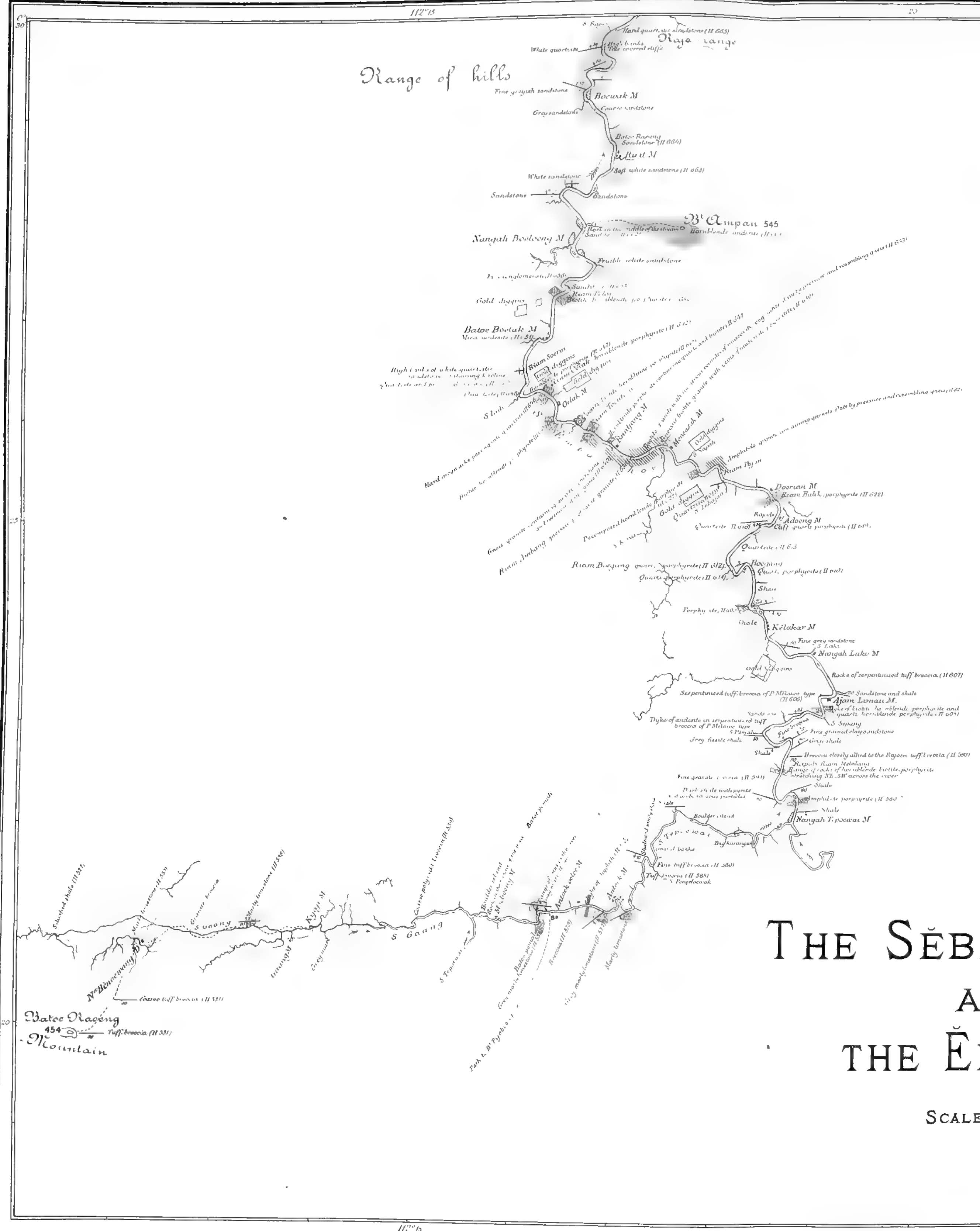
- 1 Fine tuff breccia
- 2 Coarse tuff breccia (1 576)
- 3 Tuff breccia finer than n°2 (1 572)
- 4 Coarse tuff breccia (1 570)
- 5 Fine silicified tuff (1 569)
- 6 Silicified tuff chert with Radiolaria (1 567)
- 7 Silicified tuff with Radiolaria (1 566)
- 8 Fine tuff breccia (1 564)
- 9 Tuff with Radiolaria (1 561)
- 10 Silicified tuff with well preserved tests of Radiolaria (1 559)
- 11 Highly silicified tuff and chert containing Radiolaria (1 560)
- 12 Tuff with fragments of n°11 included (1 562)
- 13 Fine tuff breccia, very similar to n°1
- 14 Fine gravel tuff breccia (1 553)
- 15 Fine serpentinitized tuff breccia. Str. W dip 60° S

F Probable fault in axis of anticline



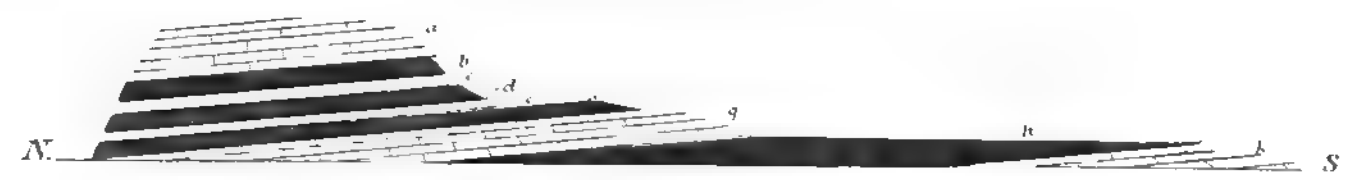
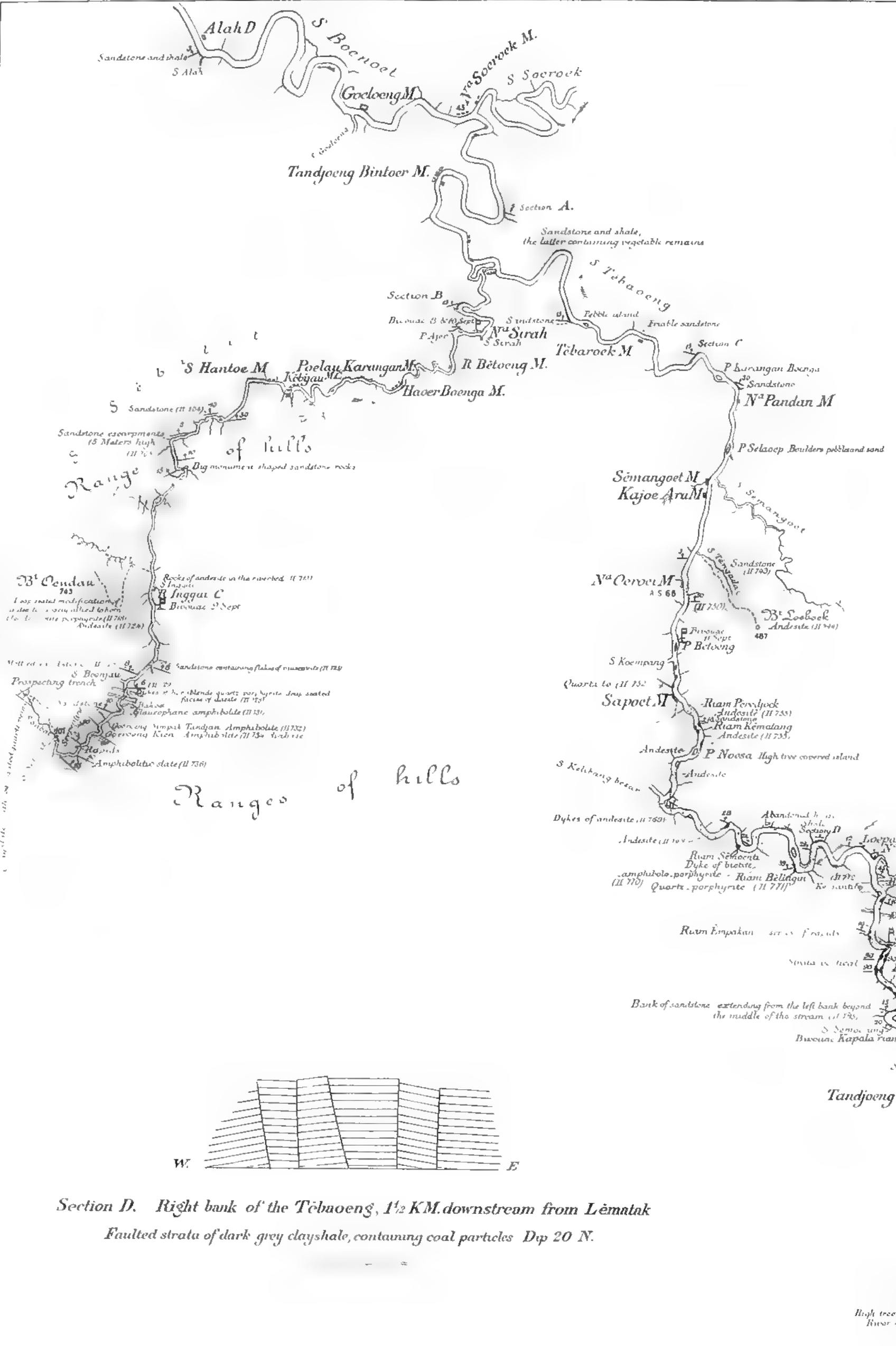
THE SËBËROEWANG AND THE ÈMBAHOE.

SCALE 1:50,000.



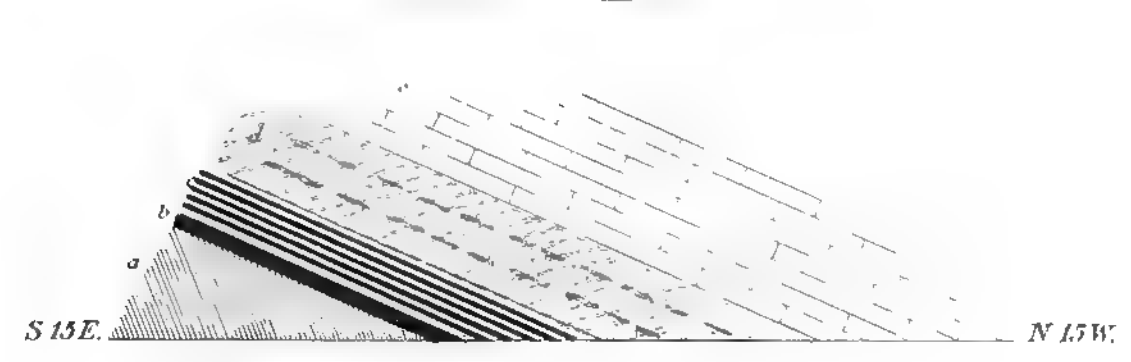
THE SĒBĒROEWANG AND THE ĔMBAHOE.

SCALE 1 : 50,000.



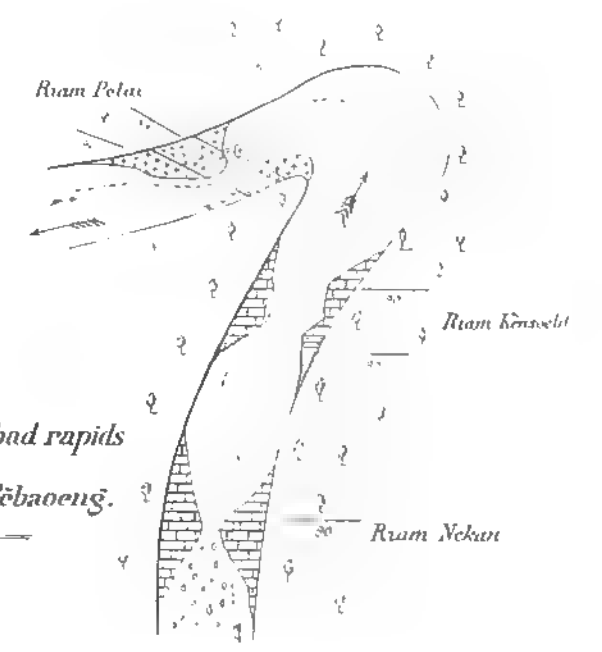
Section A. Right bank of the Tebaoeng, 1 1/2 KM. upstream from N^o Soeroek.
Dip 5° N. 10 E.

- a Sandstone 150 M
- b Fissile and compact coal (11623) and shale, 0 55
- c Clayey sandstone with concretions and coal particles (11694)
- d Fissile coal, 0 45
- e Sandstone with coal particles 0.20
- f Fissile coal, 0 30
- g Sandstone, 1. —
- h Fissile coal, 1 50
- k Sandstone



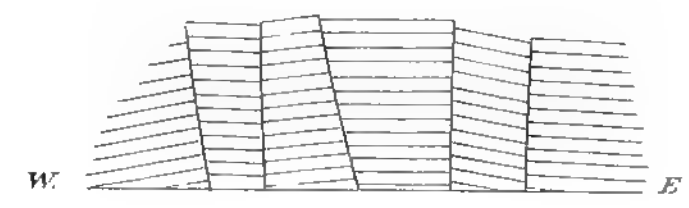
Section B. Left bank of the Sèbilit, 1 KM. downstream from Nangah Sirah.
Dip of the strata 23° N 15 W.

- a Grey shale (11699) 4 — M
- b Coal (lignite) more compact than c
- c Fissile coal (11700), 1 50
- d Sandy shale with concretions containing vegetable remains (11702), 2 30
- e Sandstone

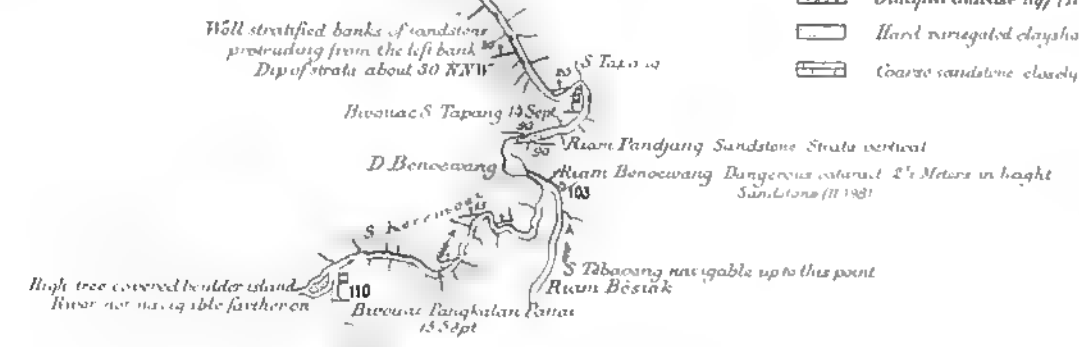


Plan of the bad rapids
in the S^o Tebaoeng.

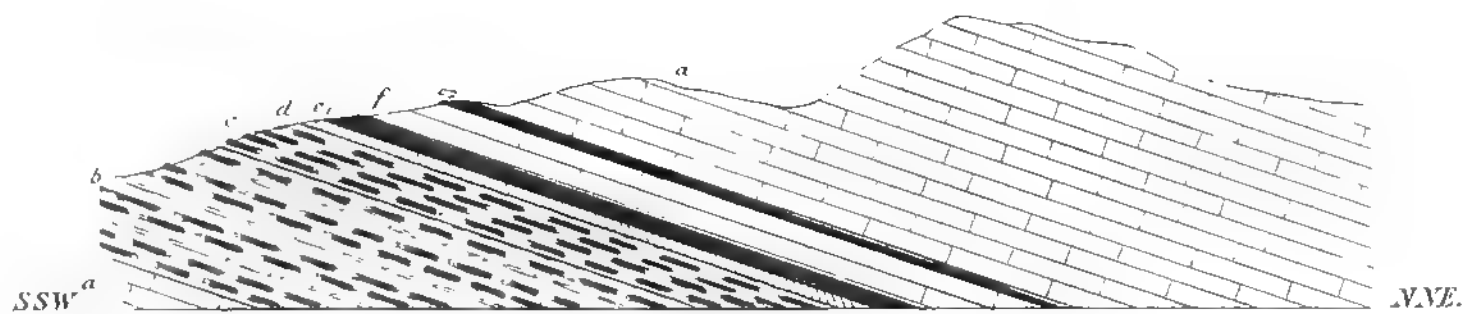
- Diabase and diabase porphyrite (11783, 187)
- Silicified diabase tuff (11781)
- Hard variegated clayshale (11781)
- Coarse sandstone closely allied to greywackes passing into conglomerate (11789, 79)
- Strike E. W. strata vertical
- Forest
- Route of a boat going upstream



Section D. Right bank of the Tebaoeng, 1 1/2 KM. downstream from Lèmatuk
Faulted strata of dark grey clayshale, containing coal particles Dip 20 N.

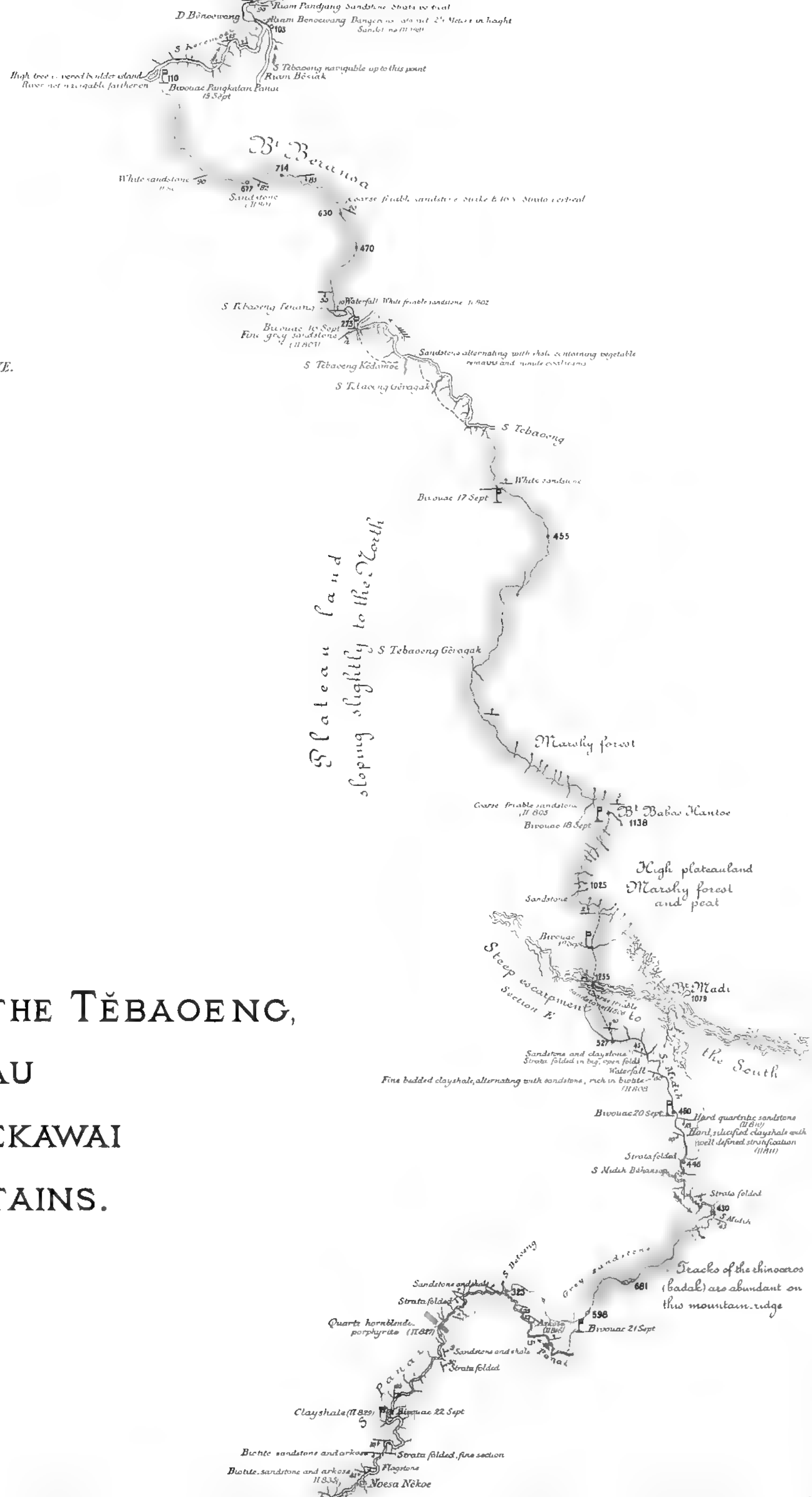


Molengraaff, Boorne.



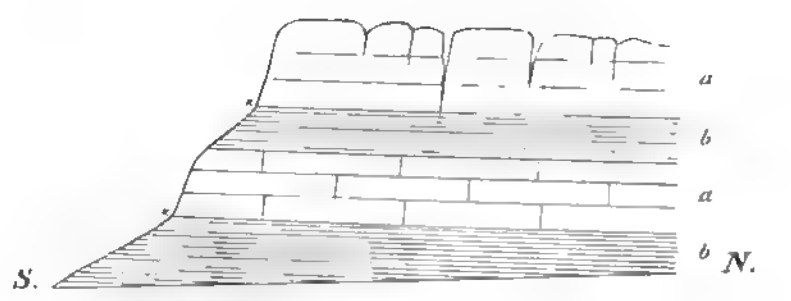
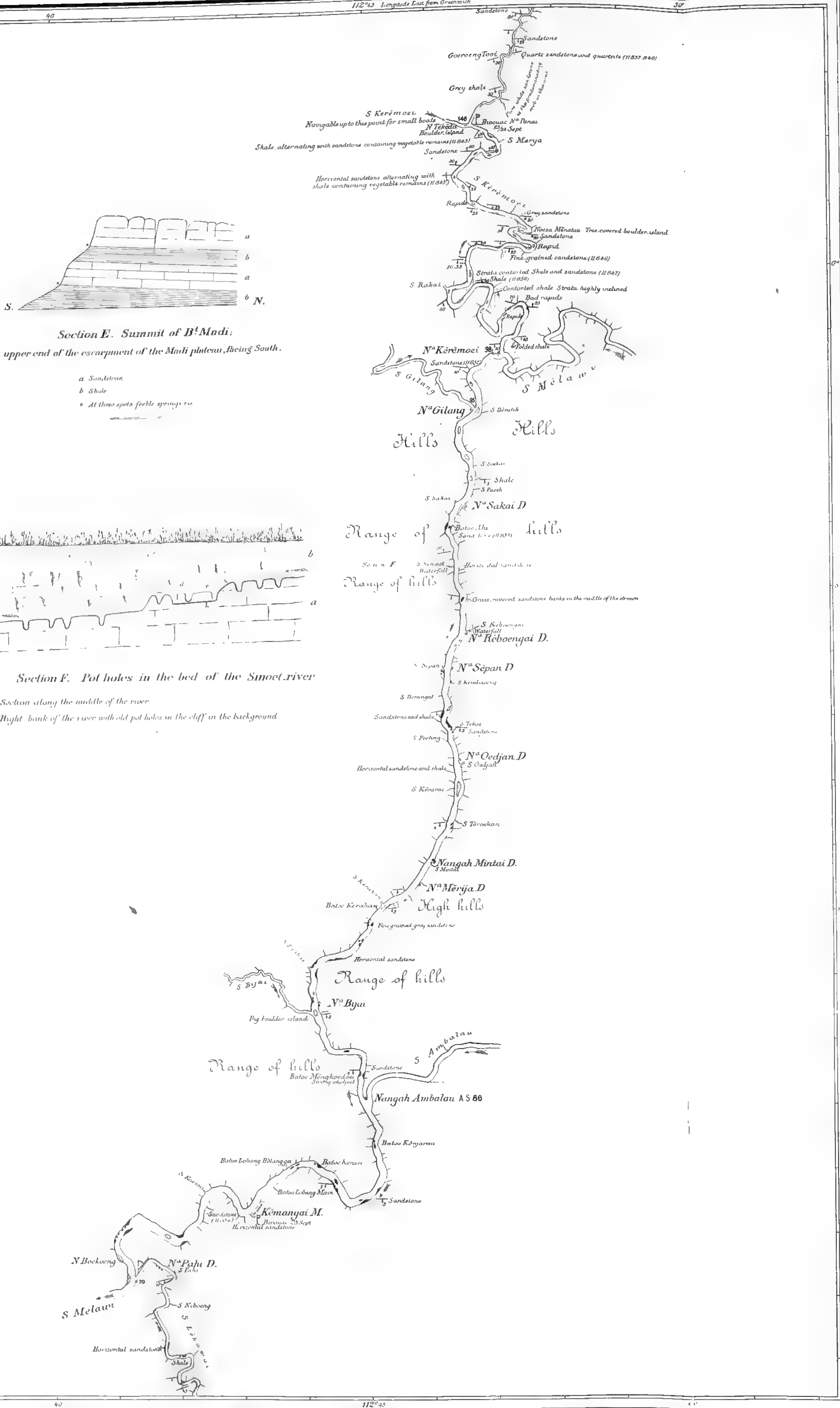
Section C. Right bank of the Těbaoeng, 7 KM. upstream from Nangah Sěbilit.
Dip 18° NNE

- a Sandstone
- b Fissile coal with intercalated banks of clayshale with concretions, containing vegetable remains, 4 — M
- c Fissile coal with intercalated banks of clayshale, 1 40
- d Clayshale, 0.25
- e₁ and e₂ (11751) Lignite #₂ being of better quality than e₁ Beds 0.35 and 0.25 thick
- f Clayey sandstone, 1. —

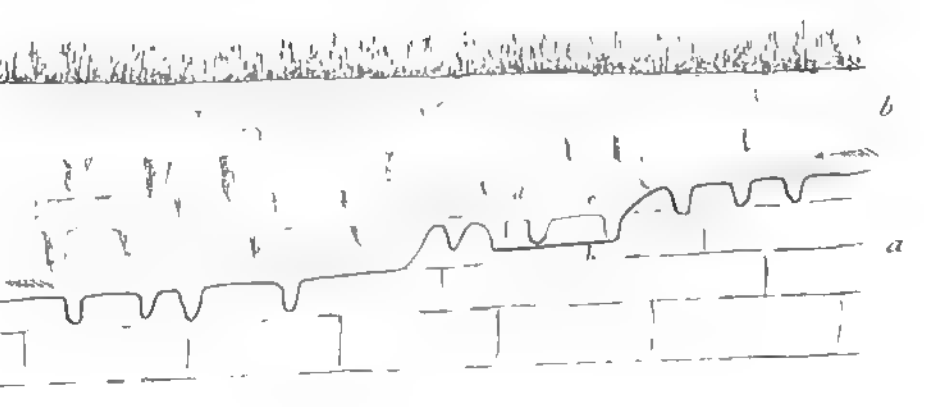


FROM THE BOENOET, THE SĚBILIT AND THE TĚBAOENG,
ACROSS THE MADI-PLATEAU
TO THE MĚLAWI-VALLEY, THE LĚKAWAI
AND THE SCHWANER-MOUNTAINS.

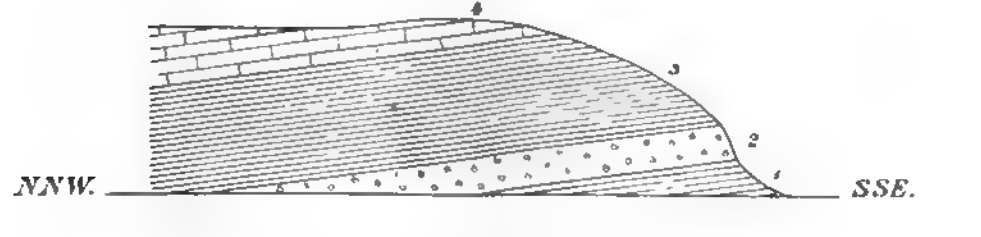
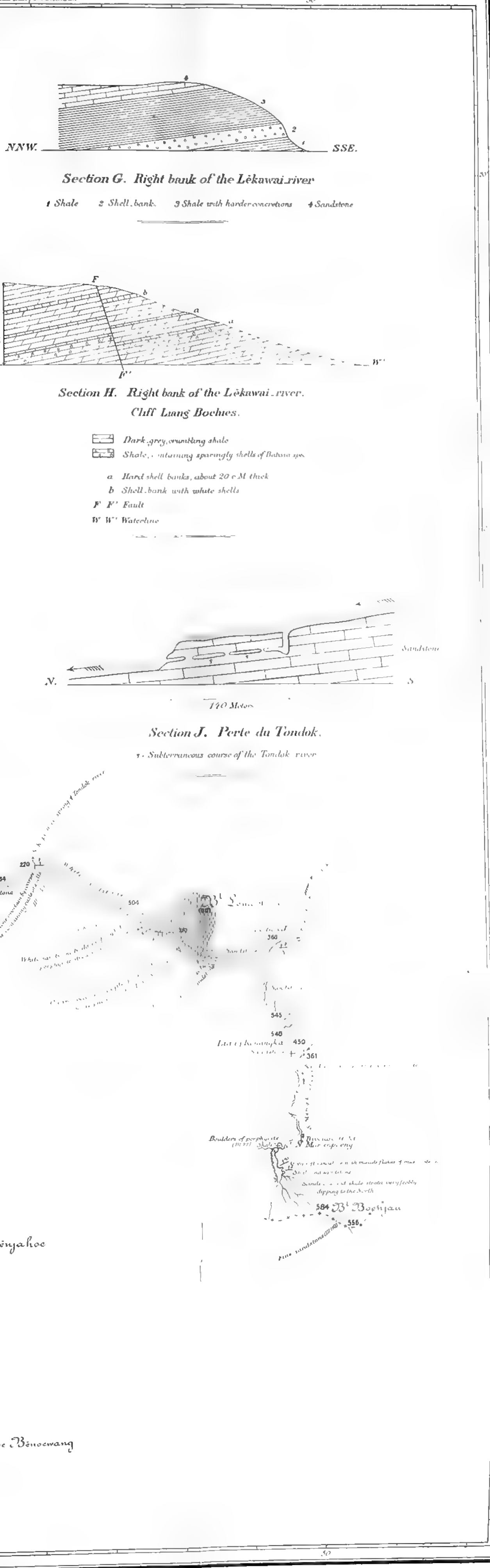
SCALE 1:75,000.



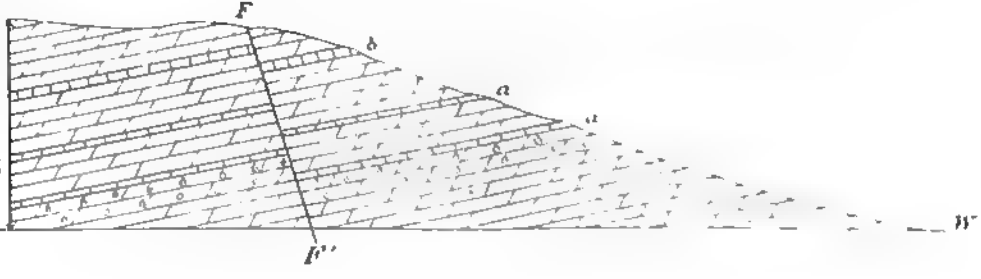
Section E. Summit of B' Madi; upper end of the escarpment of the Madi plateau facing South.



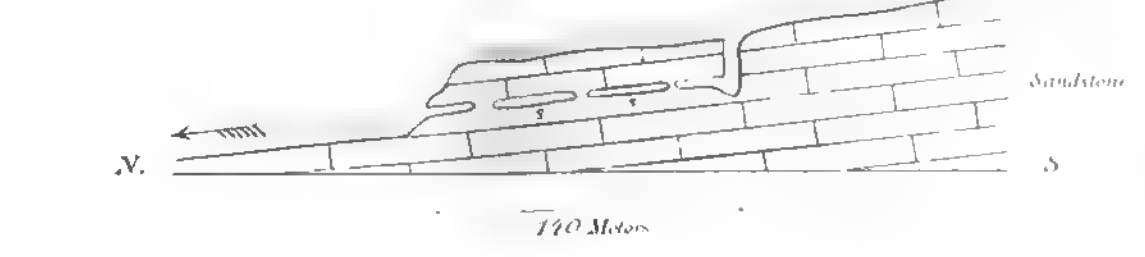
Section F. Pot holes in the bed of the Smoot river
a Section along the middle of the river
b Right bank of the river with old pot holes in the cliff in the background



Section G. Right bank of the Lékawai river
1 Shale 2 Shell bank 3 Shale with harder concretions 4 Sandstone



Section H. Right bank of the Lékawai river. Cliff Luang Boehies.

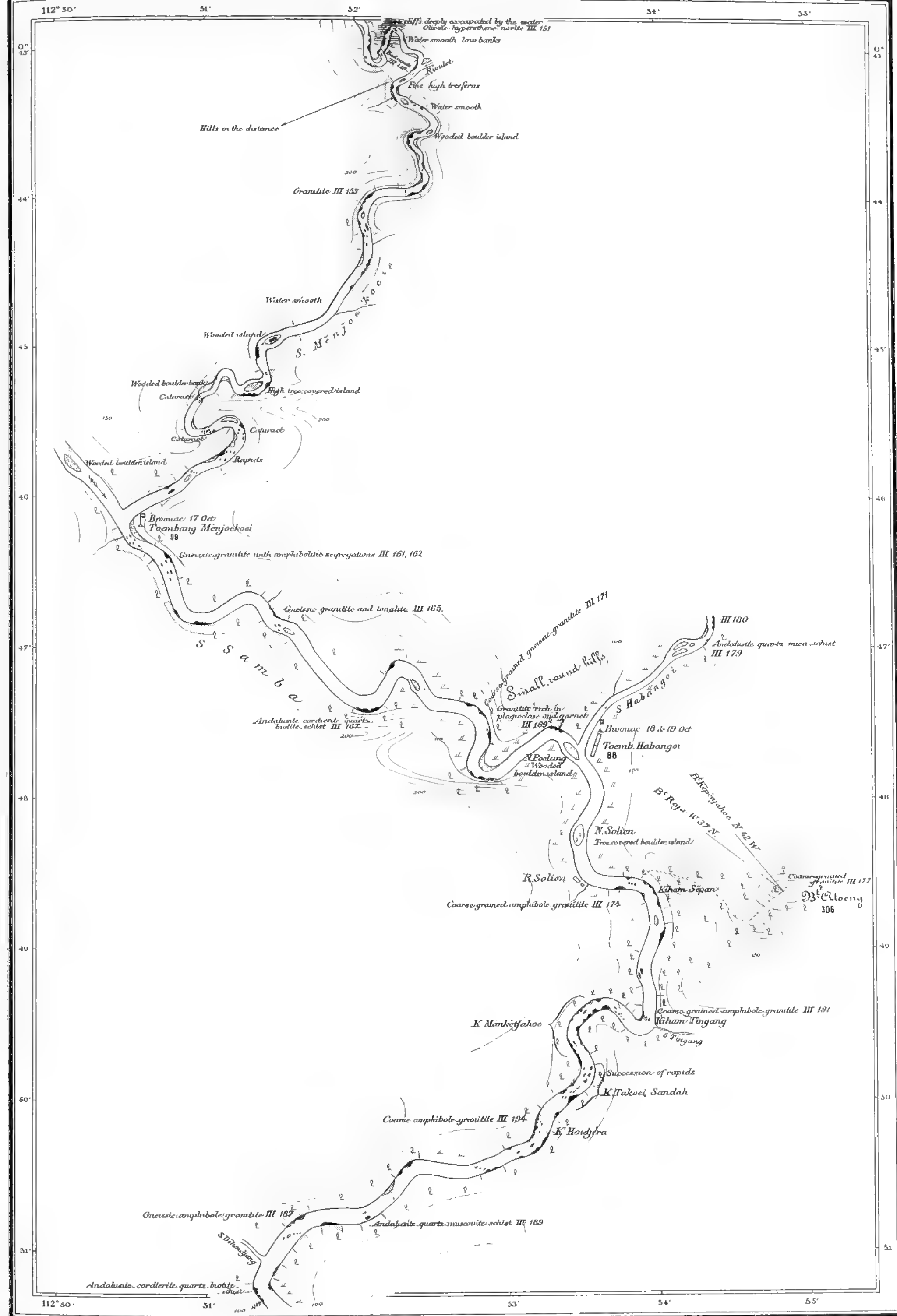
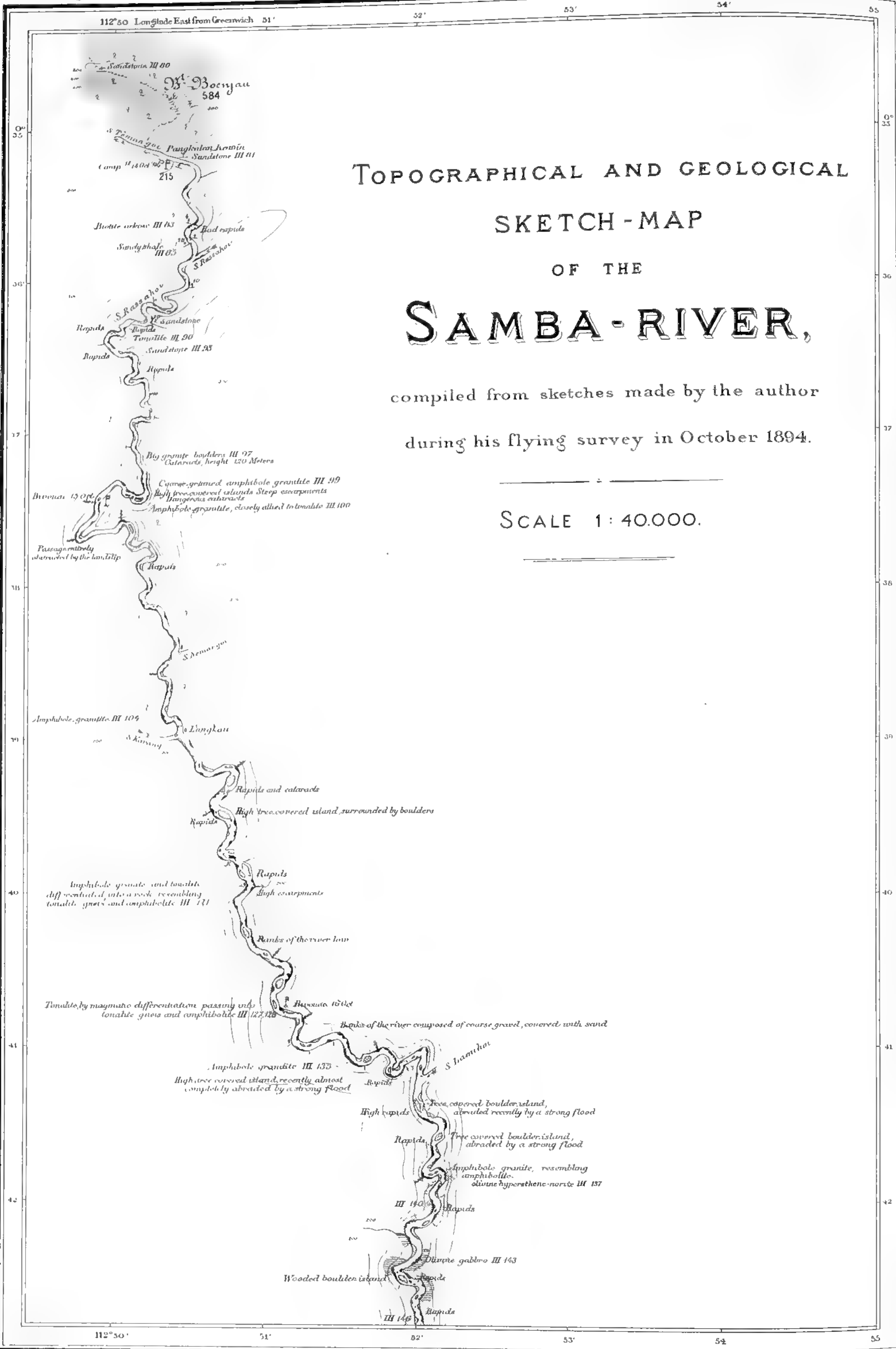


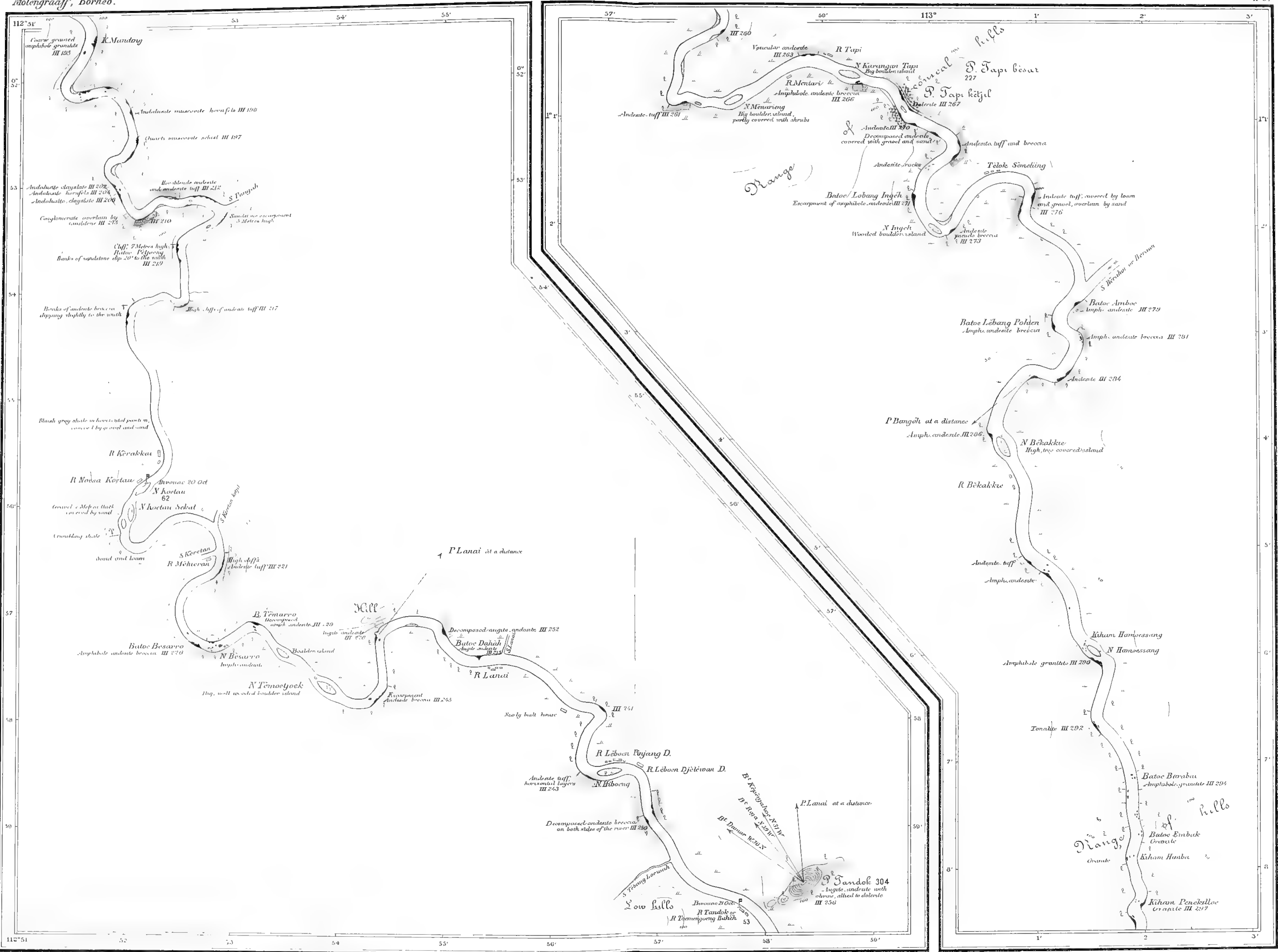
Section J. Perte du Tonok.
1. Subterraneous course of the Tonok river

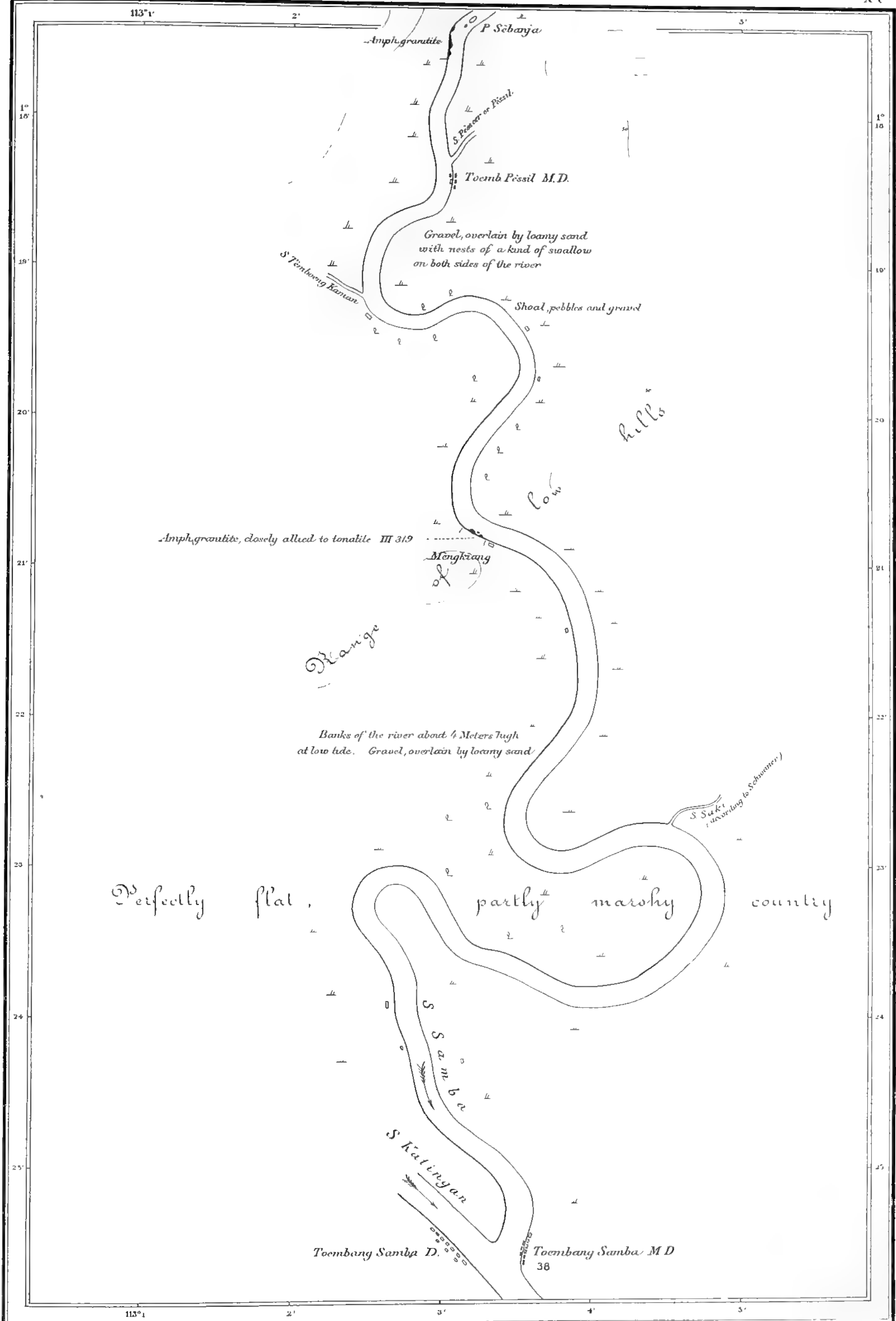
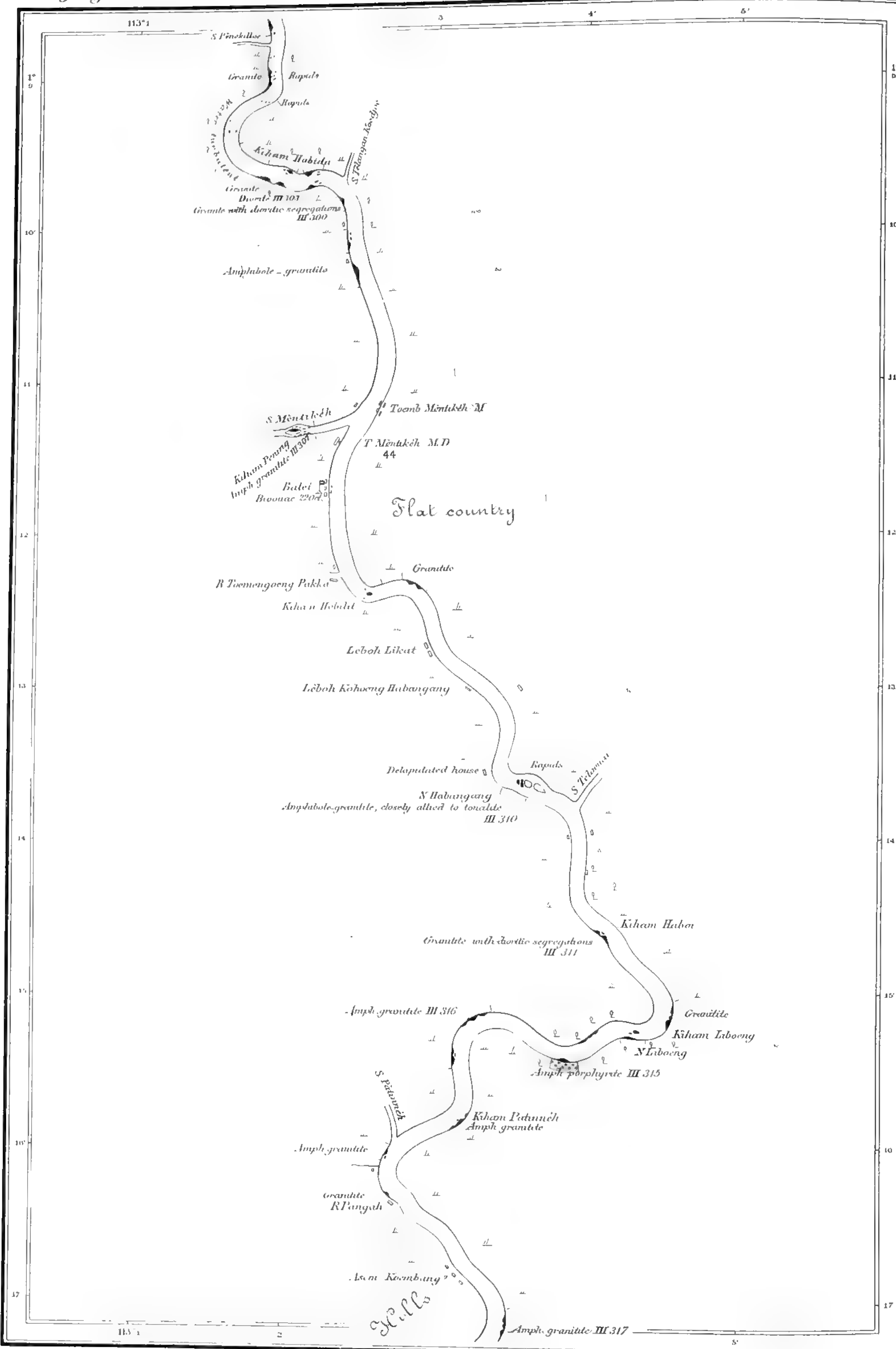
TOPOGRAPHICAL AND GEOLOGICAL
 SKETCH-MAP
 OF THE
SAMBA-RIVER,

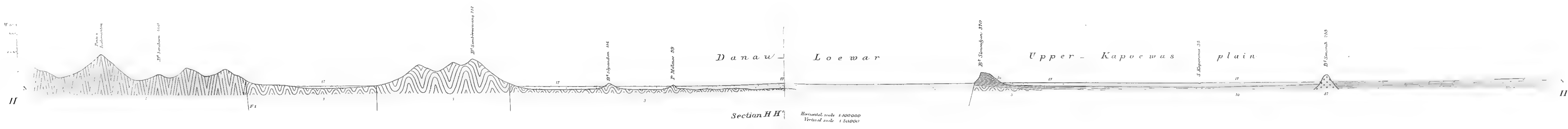
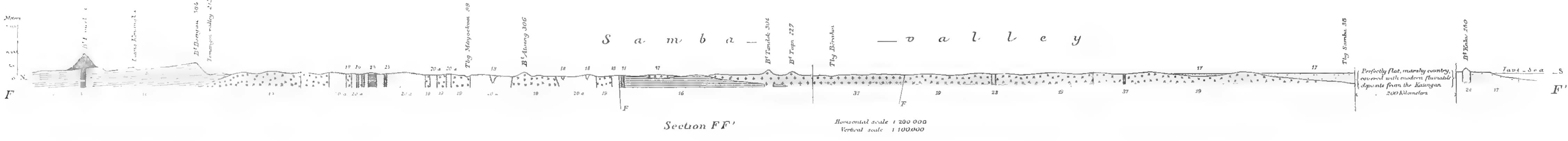
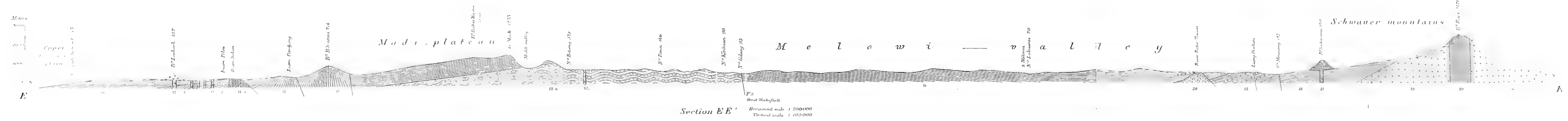
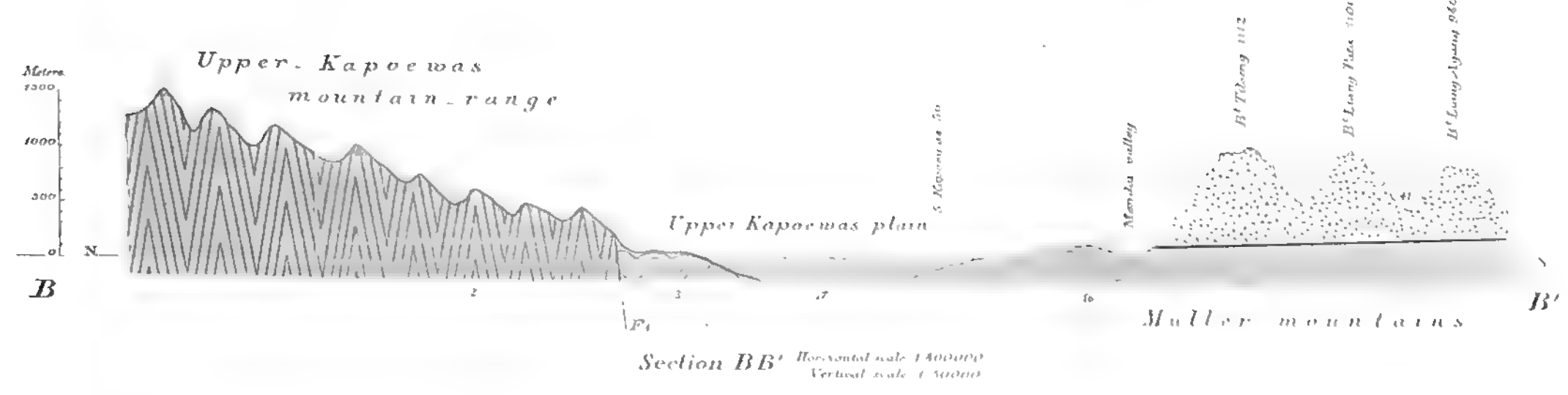
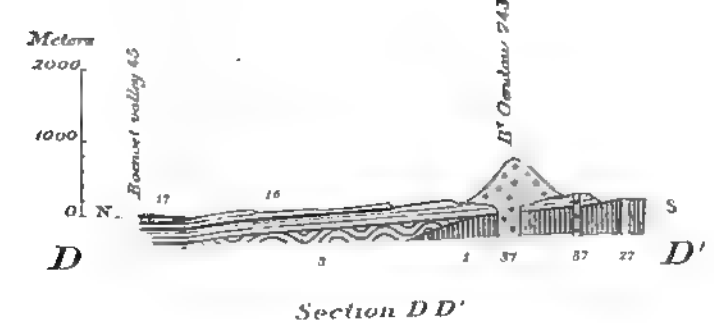
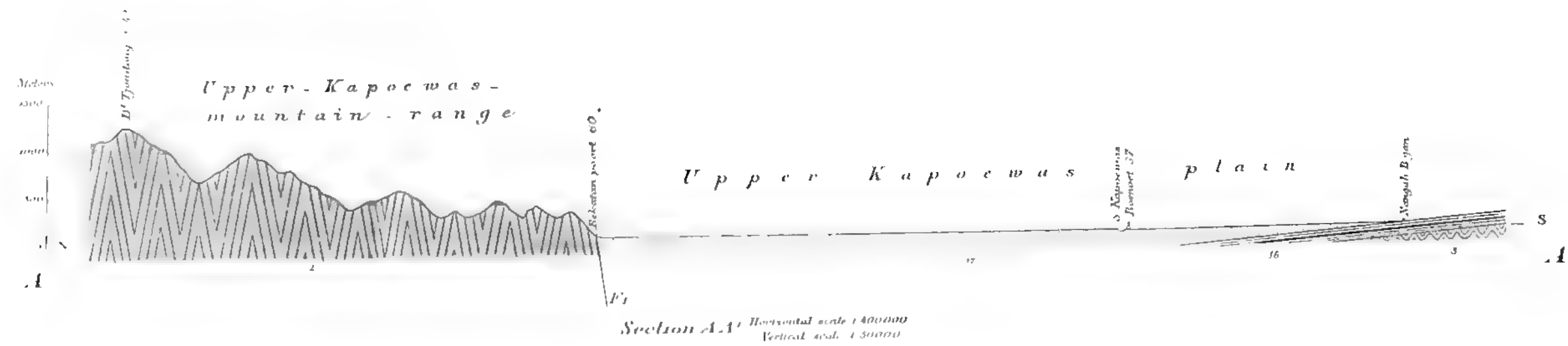
compiled from sketches made by the author
 during his flying survey in October 1894.

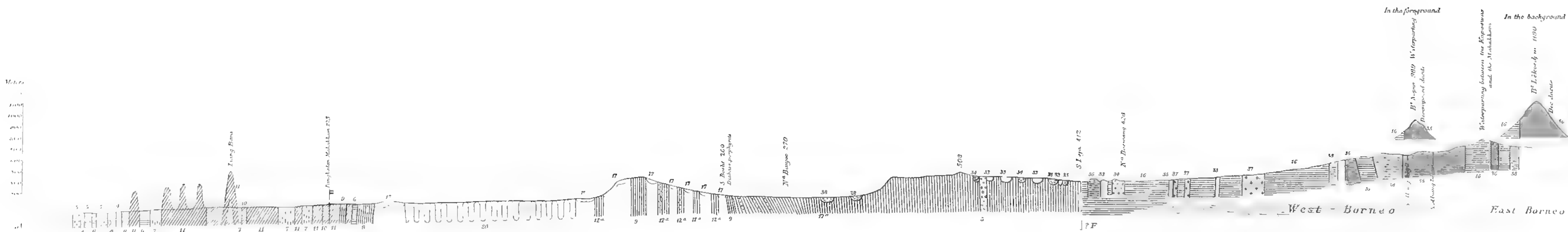
SCALE 1:40,000.





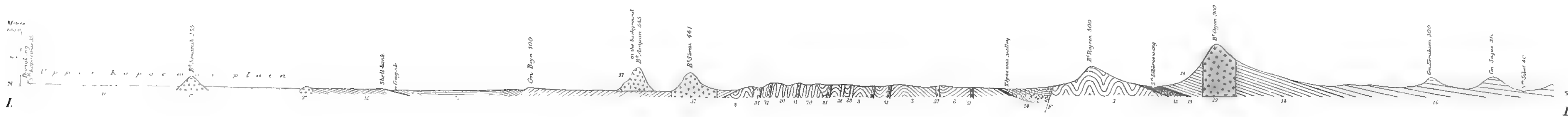




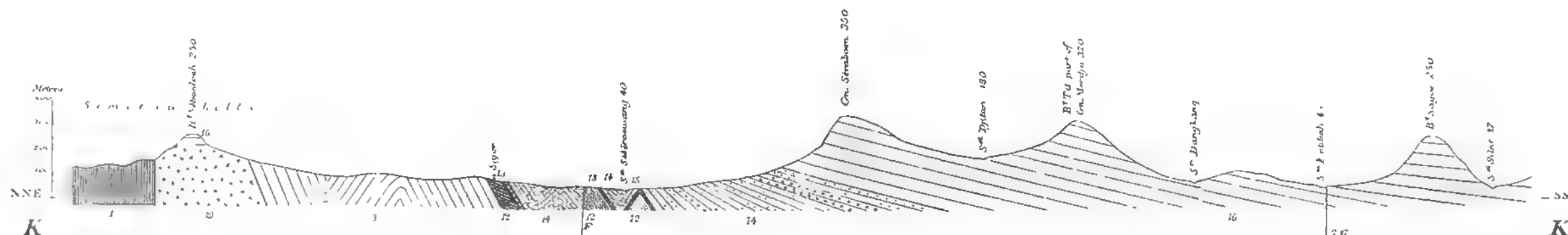


Section from Nangah Boelit to the Penaneh river in East Borneo.
 From Nangah Boelit to Pangkalan Mahakam the section runs along the Boelit river,
 from there to Penaneh along the path, drawn on Map VII^c

Horizontal scale 1:40,000
 Vertical scale 1:25,000



Section L-L' Horizontal scale 1:100,000
 Vertical scale 1:50,000



Section K-K' Horizontal scale 1:100,000
 Vertical scale 1:20,000

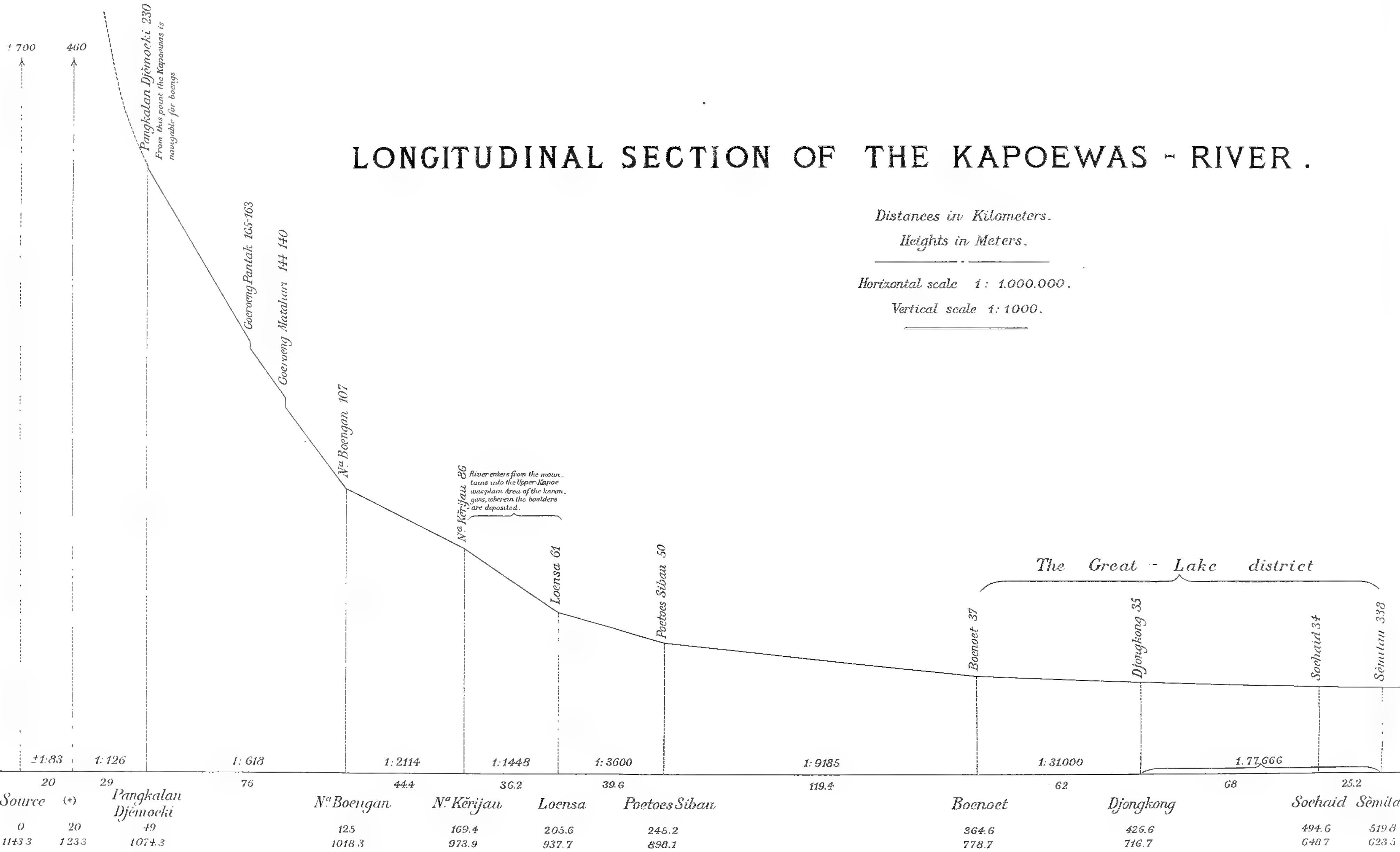
LONGITUDINAL SECTION OF THE KAPOEWAS - RIVER.

Distances in Kilometers.

Heights in Meters.

Horizontal scale 1: 1,000,000.

Vertical scale 1: 1,000.

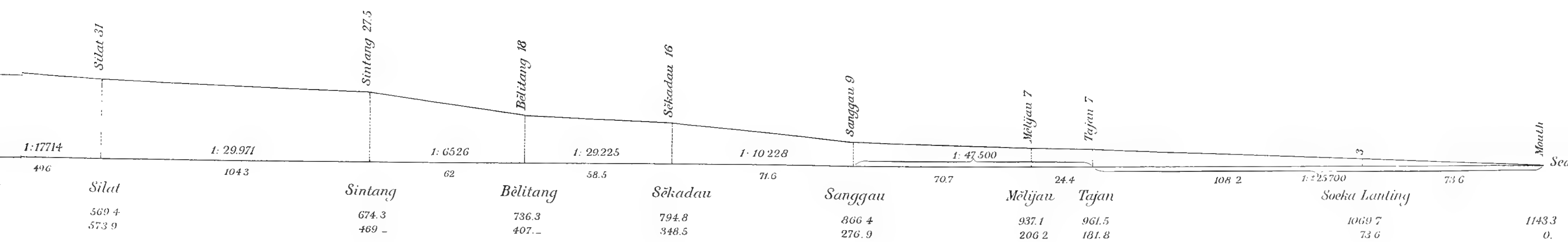
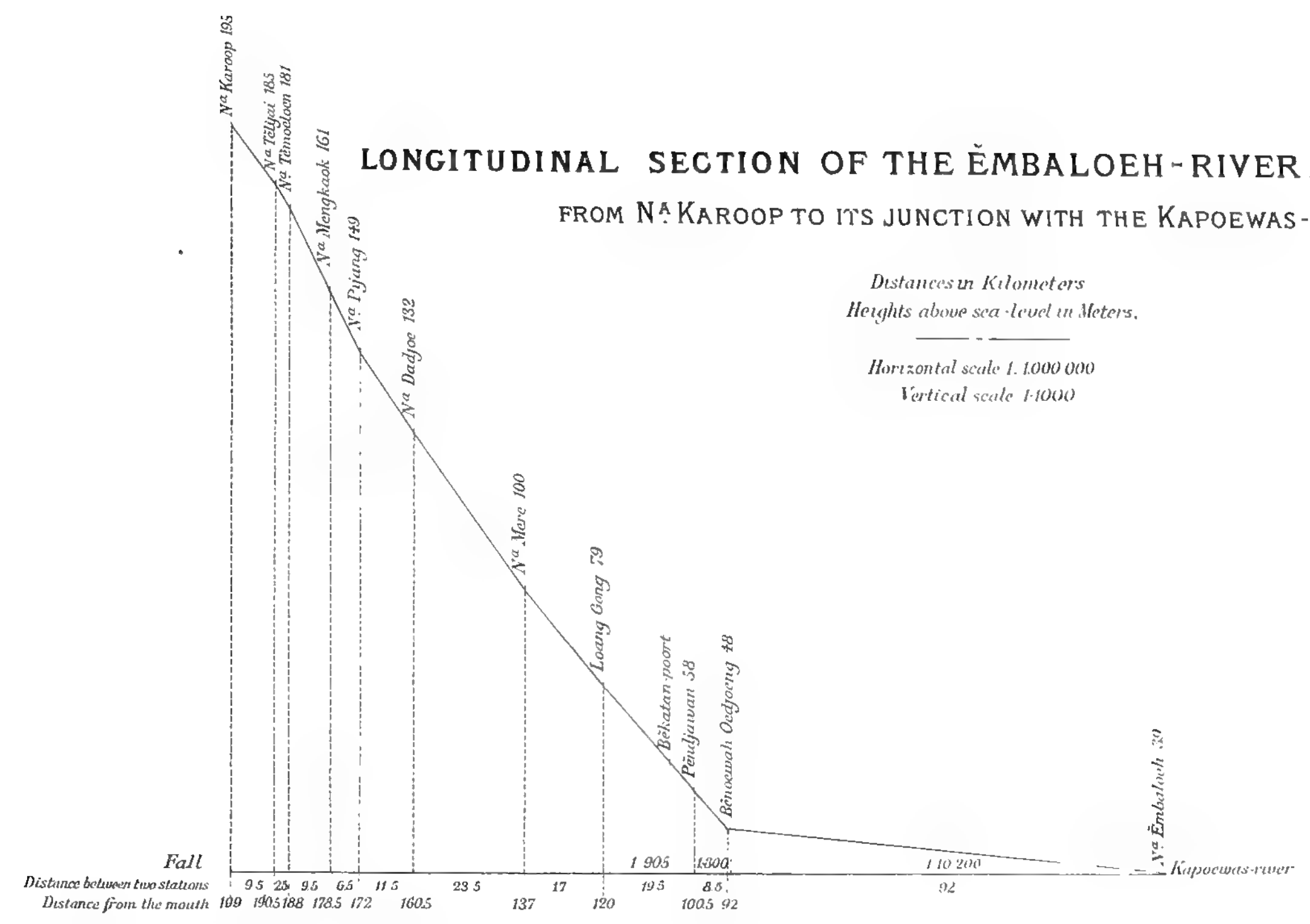


Stations	Source (+)	Pangkalan Djemoeki	N° Boengan	N° Keri'au	Loensa	Poetoes Sibau	Boenoet	Djongkong	Soehaid	Semitau
Distance between two stations	20	29	76	44.4	36.2	39.6	119.4	62	68	25.2
Distance of each station	0	20	49	125	169.4	205.6	245.2	364.6	426.6	494.6
a) from the source:-	1143.3	123.3	1074.3	1018.3	973.9	937.7	898.1	778.7	716.7	648.7
b) from the mouth:-										623.5

(+) Spot, where the path from pangkalan Djemoeki, to the Batang Redjang crosses the Upper Kapoewas

LONGITUDINAL SECTION OF THE ĒMBALOEH-RIVER,
 FROM N^a KAROOP TO ITS JUNCTION WITH THE KAPOEWAS-RIVER.

Distances in Kilometers
 Heights above sea-level in Meters.
 Horizontal scale 1:1000 000
 Vertical scale 1:1000



Kenepai
1156

Tempai
250

Séngkadjang
400

Séligi
425

Bésar-mountains.
Genting Patjour
660

Pangour Doeleng
890



DANAU SÉRYANG AND THE MOUNTAINS BORDING ITS WEST-SIDE, SEEN FROM POELAU MADJANG.

Sintang.

European part.

Mouth of the Melawi-river.

Chinese quarter.

Malay kampong.



VIEW OVER THE KAPOEWAS DOWNSTREAM FROM THE EUROPEAN PART OF SINTANG.



