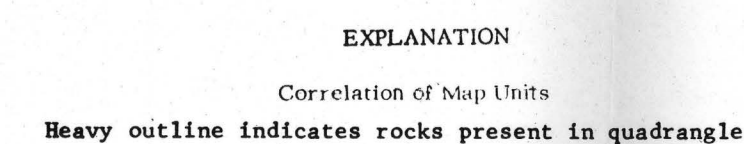


USGS OPEN-FILE REPORT 74-306
(IR) LI-63-B



NAME: _____

Field data are shown by conventional symbols; other data sources are indicated by letter symbols adjacent to structure symbols, or at limit of line segment to which the symbol applies: M, aeromagnetic data; P, photo interpretation; R, radiometric data.

Ql Qf			Holocene	}	Quaternary
Qb Qs			Pleistocene(?)		
Tl	Tb	Tc	}		Tertiary
Te					
Kf Xfc			Cretaceous		
Kjk	Kja	Kj	Cretaceous or Jurassic		
Jd	Jb	Jurassic			
Dp	Devonian(?)				
Ps	Paleozoic(?)				
d					

	N	N-F	F	Normal
	N	N-F	F	Thrust
	N	N-F	F	Fault zone or shear zone
	N	N-F	F	Fault intersected by dike
	N	N-F	F	Uniform-sloping trace of crestal plane and direction of plunge
	N	N-F	F	Overturned antiform
	N	N-F	F	Synform-sloping trace of trough plane and direction of plunge
	N	N-F	F	Overturned synform
	N	N-F	F	Strike and dip of axial plane of fold
	N	N-F	F	Inclined
	N	N-F	F	Vertical
	N	N-F	F	Strike and dip of beds
	N	N-F	F	Inclined
	N	N-F	F	Horizontal
	N	N-F	F	Vertical
	N	N-F	F	Strike and dip of foliation
	N	N-F	F	Open symbol indicates fold truncating earlier foliation or bedding
	N	N-F	F	Solid symbol indicates relation to bedding
	N	N-F	F	Unknown
	N	N-F	F	Inclined
	N	N-F	F	Horizontal
	N	N-F	F	Vertical
	N	N-F	F	Strike and dip of parallel foliation and bedding
	N	N-F	F	Inclined
	N	N-F	F	Horizontal
	N	N-F	F	Vertical
	N	N-F	F	Strike of foliation, no dip determined
	N	N-F	F	Strike and dip of joints
	N	N-F	F	Inclined
	N	N-F	F	Horizontal
	N	N-F	F	Vertical
	N	N-F	F	Strike and dip of plane
	N	N-F	F	Feature determined from photo interpretation
	N	N-F	F	One, two, or three times indicate gentleness, angle, or steep dip

Stratigraphic succession not implied for the following units

grg gr dl dlq dr gbn

sy f ch en pg

md u sm sq so s

q am t mn z

tr te is mmo mnx

gngg gngd gng₁ gndq

gnl gnl₁ gnl₂ gnl₃ gnm gnl₄ gnl₅ gnl₆ gnl₇ gnl₈ gnl₉ gnl₁₀ gnl₁₁ gnl₁₂ gnl₁₃ gnl₁₄ gnl₁₅ gnl₁₆ gnl₁₇ gnl₁₈ gnl₁₉ gnl₂₀ gnl₂₁ gnl₂₂ gnl₂₃ gnl₂₄ gnl₂₅ gnl₂₆ gnl₂₇ gnl₂₈ gnl₂₉ gnl₃₀ gnl₃₁ gnl₃₂ gnl₃₃ gnl₃₄ gnl₃₅ gnl₃₆ gnl₃₇ gnl₃₈ gnl₃₉ gnl₄₀ gnl₄₁ gnl₄₂ gnl₄₃ gnl₄₄ gnl₄₅ gnl₄₆ gnl₄₇ gnl₄₈ gnl₄₉ gnl₅₀ gnl₅₁ gnl₅₂ gnl₅₃ gnl₅₄ gnl₅₅ gnl₅₆ gnl₅₇ gnl₅₈ gnl₅₉ gnl₆₀ gnl₆₁ gnl₆₂ gnl₆₃ gnl₆₄ gnl₆₅ gnl₆₆ gnl₆₇ gnl₆₈ gnl₆₉ gnl₇₀ gnl₇₁ gnl₇₂ gnl₇₃ gnl₇₄ gnl₇₅ gnl₇₆ gnl₇₇ gnl₇₈ gnl₇₉ gnl₈₀ gnl₈₁ gnl₈₂ gnl₈₃ gnl₈₄ gnl₈₅ gnl₈₆ gnl₈₇ gnl₈₈ gnl₈₉ gnl₉₀ gnl₉₁ gnl₉₂ gnl₉₃ gnl₉₄ gnl₉₅ gnl₉₆ gnl₉₇ gnl₉₈ gnl₉₉ gnl₁₀₀

Plutonic
Igneous
rocks

Metamorphic
rocks

Precambrian

Description of Map Unit

Jd	Diabase. Dark-gray dike rock chiefly diabasic but locally gabbroic in texture; consists primarily of calcic plagioclase and clinopyroxene, with minor amounts of magnetite and ilmenite
Pe	Pegmatite. Simple pegmatites usually with graphitic granite, muscovite, and tourmaline
ch	Charnockite. Massive gray coarse-grained hypersthene granite with perthitic potash feldspar phenocrysts
z	Composite unit. Predominantly mafic schists, including actinolite rock, actinolite-chlorite schist, grunerite-garnet rock, and hornblende-garnet-quartz amphibolite. All are commonly associated with quartzite (either pure or as garnet, mica, or magnetite quartzite), quartz-mica schist, and iron formation (mostly itabirite)
it	Iron-formation, oxide facies (itabirite). Finely laminated magnetite-quartz rock
am	Amphibolite. Hornblende-plagioclase gneiss, locally with minor garnet and quartz, usually well foliated or lined
q	Quartzite. Hematite-garnet quartzite with subordinate iron-formation and amphibolite
s	Schist. Quartz-mica schist, locally garnetiferous, with associated iron-formation and amphibolite
mi	Migmatite. Gneisses with segregation or injection bands over 10-cm thick of felsic rock in biotite-rich rock
gn ₁	Composite gneiss. Granitic gneiss with subordinate amphibolite and itabirite
gn ₂	Composite gneiss. Assemblage of hornblende-plagioclase amphibolite and leucocratic gneiss
gn ₃	Composite gneiss. Leucocratic gneiss with subordinate magnetite itabirite, quartzite, hornblende-plagioclase amphibolite, and quartz-mica schist
gum	Melanocratic gneiss. Amphibolite and dark pyroxene-plagioclase gneiss
gnl	Leucocratic gneiss. Typically well foliated medium-grained biotite gneiss, includes numerous small bodies of amphibolite
gnl ₁	Leucocratic gneiss. Differs from gnl in that composition is mostly quartz dioritic to granodioritic
gnl ₂	Leucocratic gneiss. Kyanite- and muscovite-gneiss
gnl ₃	Leucocratic gneiss. Differs from undivided leucocratic gneiss in magnetic signature
gnh ₁	Leucocratic gneiss. Hornblende-bearing gneiss associated with amphibolite
gnh ₂	Granitic gneiss. Mostly coarse grained or porphyroblastic, relatively massive, biotite gneiss with potash feldspar

→ 10 Mining and plunge of lineation: arrow indicates
critical axis or interesting foliation: solid arrow indicates mineral lineation
Structural trend based on photo interpretation

• M - - Structural trend based on magnetite
• Observed outcrop

- - - Marker bed distinguished by rock symbol or index mineral

by Index minerals:

ad	andalusite	en	enstatite	k	kyanite
an	anthophyllite	ep	epidote	m	moscovite
au	australite	eu	eulite	py	pyrite
b	biotite	gs	garnet	ps	pyroxene
cl	chlorite	gt	glaucophane	st	staurolite
cp	cingulite	h	hornblende	s	sillimanite
gr	glaucophane-grunerite	by	hypersthene	at	actinolite
d	diopside	il	ilmenite	ta	tremolite-actinolite

Local locality

Invertebrate

Plant

• 2000 Radiometric age in m. y.

—liberalism—
—Bureau—

Boundary between radiometrically determined age provinces--
Pan-African, 500-700 m. y.; E-thrust, 1000-2000 m. y.;
Liberian, 2700-3000 m. y.

× 0
G, sand, gravel, clay, or placer pit--B, bauxite; D, diamond;
V, gold

× 8
Mine or quarry--B, building stone or road metal; C, clay;
I, iron

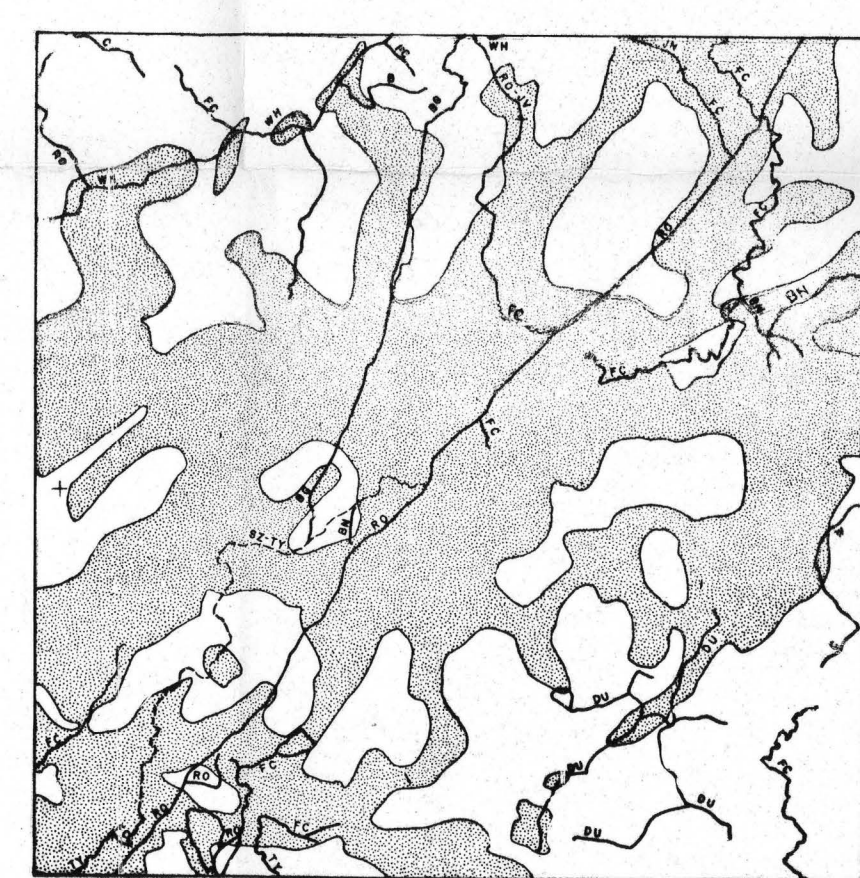
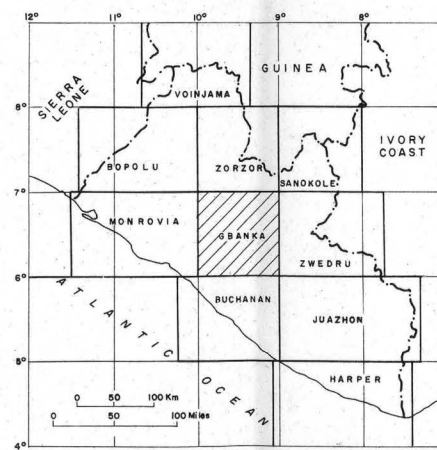
× 6
Prospect--pit--B, bauxite; K, kaolinite

Compiled by photo-planimetric methods from aerial photographs taken 1968-69
The international boundary must not be considered authoritative
Form lines have no consistent interval and show only the general shape of terrain
Geographic graticule and rectangular grid based on Hotine's Rectified Skew Orthomorphic projection

PREPARED BY THE U.S. GEOLOGICAL SURVEY AND THE LIBERIAN
GEOLOGICAL SURVEY UNDER THE JOINT SPONSORSHIP OF THE
GOVERNMENT OF LIBERIA AND THE AGENCY FOR INTERNATIONAL
DEVELOPMENT U.S. DEPARTMENT OF STATE

by
E. R. Force and J. D. N. Dunbar

U. S. Geological Survey
OPEN FILE REPORT 74-304
This report is preliminary and has
not been edited or reviewed for
conformity with Geological Survey
standards or nomenclature.



0 10 Km
 0 10 Miles

— SURFACE TRAVERSE
 --- HELICOPTER TRAVERSE

AREA COVERED BY OFFENSES & TRAVEL
 (1961)

Sources of Field Data

B	M. W. G. Baker (IG3)	JN	C. Johnson (IG3)
BG	H. Bergmann (IG4)	Ro	S. Rosenblum (IG5)
BH	M. B. Cooper (IG3)	St	F. Stella (IG3)
C	C. D. Delaney (IG3)	TY	
DU	J. D. D. Durnham (IG8)	W	C. S. Worcester (IG8)
HC	F. H. Horne (IG3)	WH	R. W. White (IG3)