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CAVE

MAP

SYMBOLS

NSS Standard Cave Map Symbols, 1976

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THE 1976 NSS STANDARD MAP SYMBOLS

Standing Committee on Cave Map Symbols
NSS Section on Cave Geology and Geography*

INTRODUCTION

CAVE MAPS are the basic documents of speleology. An adequate map shows not only the widths and trends of the passages. It contains, also, the location of the cave, directions for reaching it, a geological summary, an outline of hydrology and meteorology, data on biota and their ecology, notes on history, an indication of the scenic value of the cave, and advice on the skills and equipment required to explore it. In short, the map must be a concise, encyclopaedic summary of the cave.

This information, permanently recorded in the form of printed maps, must be communicated through time as well as across space. Effective communication depends upon symbols the definitions of which are uniform throughout the world and unchanging through time. Neologisms should be introduced only when needed to express new concepts or to record new percepts; in no case, should new symbols conflict with those previously adopted. Individuality is preferred in layout, draughting, and lettering; it must be foresworn absolutely in regard to the symbols used in the map, in order to protect the primary information-transfer function of the map.

Maps intended for permanent reference should be surveyed to CRG Grade SB, Level 2 standards (or higher) and published at a scale of not less than 1:240. Such a map, sometimes called an "Accurate Outline Survey," shows all of the passages in their proper (compensated) trends, widths, slopes, and interrelationships. It is a skeleton, only, but will serve as a reliable base to which specialists may later add their own data. Maps drawn from less precise surveys or published at smaller scales must be regarded as special-purpose maps and usually are wasted effort. They cannot meet the needs of specialists and will have to be done over in the future.

Cave cartographers, like other information specialists, are severely handicapped if limited to only a small vocabulary of symbols with which to formulate and to express their ideas. A complex

cave can no more be represented by a dozen symbols than Basic English can accurately convey the nuances of Shakespeare. Twenty-nine of the most-often used symbols are presented separately on pages 36 and 37 as a vocabulary of "basic cave map symbols," but they are meant as an aid to beginning cavers, just as a pocket dictionary is meant for beginning language students. Cave cartographers cannot conceptualize and execute highly informative maps until they acquire a large vocabulary of symbols.

The 19 panels of 1976 NSS Standard Map Symbols which follow are largely compatible with lists of symbols published by AMCS, CRF, MSS, and other active mapping organizations in the United States. The Committee has obtained lists of symbols published elsewhere in the Americas, in Europe, and in the Near East; the NSS symbols are in many cases compatible with these symbols, also. We have made a deliberate attempt to achieve uniformity with the symbols proposed by the Union Internationale de Spéléologie[†], but this has been neglected in a few cases (*viz.*, "breakdown") where other symbols are so deeply ingrained in North American usage that attempts to change them would be futile.

PRESENTATION

Once a map has been surveyed, draughted, and field-checked, it becomes the pleasure of the cartographer to render the data in a clear, concise, and attractive fashion. The cave cartographer should entertain a passion for his work, but altogether too many maps reveal a love that languished. They are poorly laid out, hastily executed, and unequal to their calling.

The style in which a map is drawn is a matter of personal choice. All symbols proposed in this report remain clear and unambiguous, regardless of the materials and techniques used. A computer print-out can be as satisfying as an ornately hand-crafted map, providing that it is sufficiently detailed, has an open and legible construction, and is pleasing to behold. There is no conflict

between utility and art; there *are* conflicts both between haste and utility and between haste and art.

The pencil layout and inking of each panel of map symbols in this report involved about 4 hours of work. No cave map should be attempted in less time, not even the smallest. We hope that the recently instituted annual NSS Cave Map Salon will encourage more careful work by cave cartographers.

Most cave cartographers, especially inexperienced ones, would be well advised to use guides and adhesive transfers rather than pen-and-ink. Good map design can partially compensate for the rigidities of draughting aids, and professional-appearing work can be produced after a few hours of practice. However, all serious cartographers should consider that pen-and-ink methods, once learned, are the cheapest, quickest, and most versatile of all. The most complex maps can be executed on an ordinary table with only a few dollars worth of pens, a style book, and a bottle of ink. Symbols and lettering can be easily adapted to the scale of the map and to the space available if done free-hand, but require a large investment in materials if done with guides and transfers.

The reader may consult Brod (1962), Hedges (1975-76), and Hosley (1971) for extended discussions of cartographic philosophy and techniques. The Geographical Institute of the University of Wrocław (Poland) offers an MA program in cave mapping.

THE STANDARD MAP SYMBOLS

The 1976 NSS Standard Map Symbols were adopted by the Board of Governors on 2 July 1976. They may be freely copied by anyone for non-profit use and should be distributed as widely as possible.

Maps newly draughted for publication in The NSS Bulletin should follow the 1976 NSS Standard Map Symbols; they may not include symbols conflicting with these. Older maps can be published as originally drawn.

* James Hedges, Bill Russell, Bob Thrun, William B. White

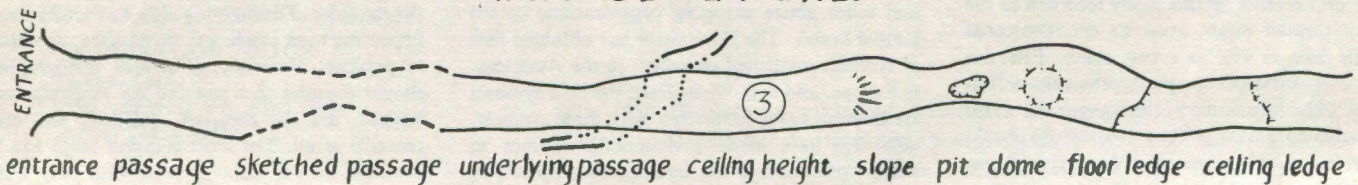
† The latest UIS report on map symbols, "Signes Spéléologiques Conventionnels" by Fabre and Audéat, is available for 25F (postpaid) from: CERGA, B.P. 5060, 34033 Montpellier Cédex, France. Bank foreign-exchange fees are roughly four times the cost of the publication, however. We recommend that it be obtained from Tony Oldham (Rhynchdywr, Crymch, Dyfed SA41 3RB, U.K.) or another bookseller who will accept payment in dollars.

Twenty-nine of the most frequently used

BASIC CAVE MAP SYMBOLS

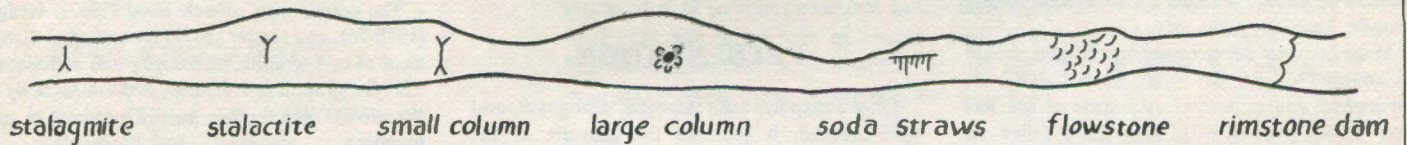
from the
NSS Standard Map Symbols, 1976

PASSAGE FEATURES



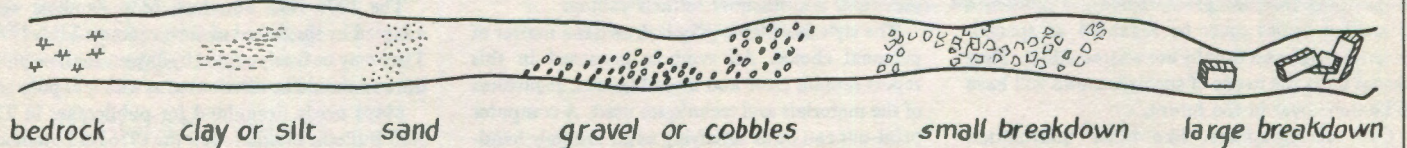
entrance passage sketched passage underlying passage ceiling height slope pit dome floor ledge ceiling ledge

SPELEOTHEMS



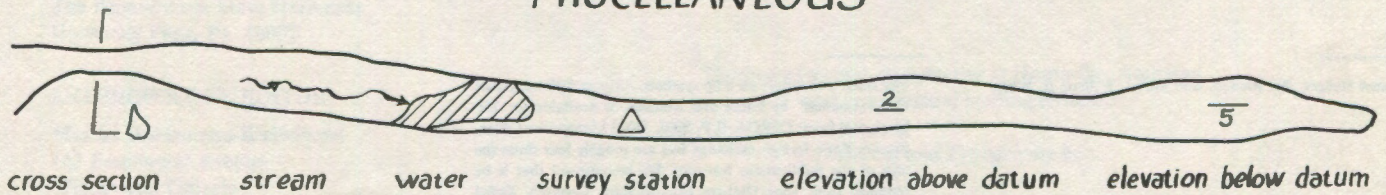
stalagmite stalactite small column large column soda straws flowstone rimstone dam

FLOOR MATERIALS



bedrock clay or silt sand gravel or cobbles small breakdown large breakdown

MISCELLANEOUS



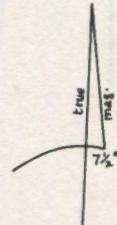
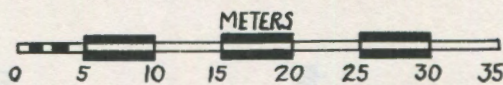
cross section stream water survey station elevation above datum elevation below datum

Chimerical Caverns

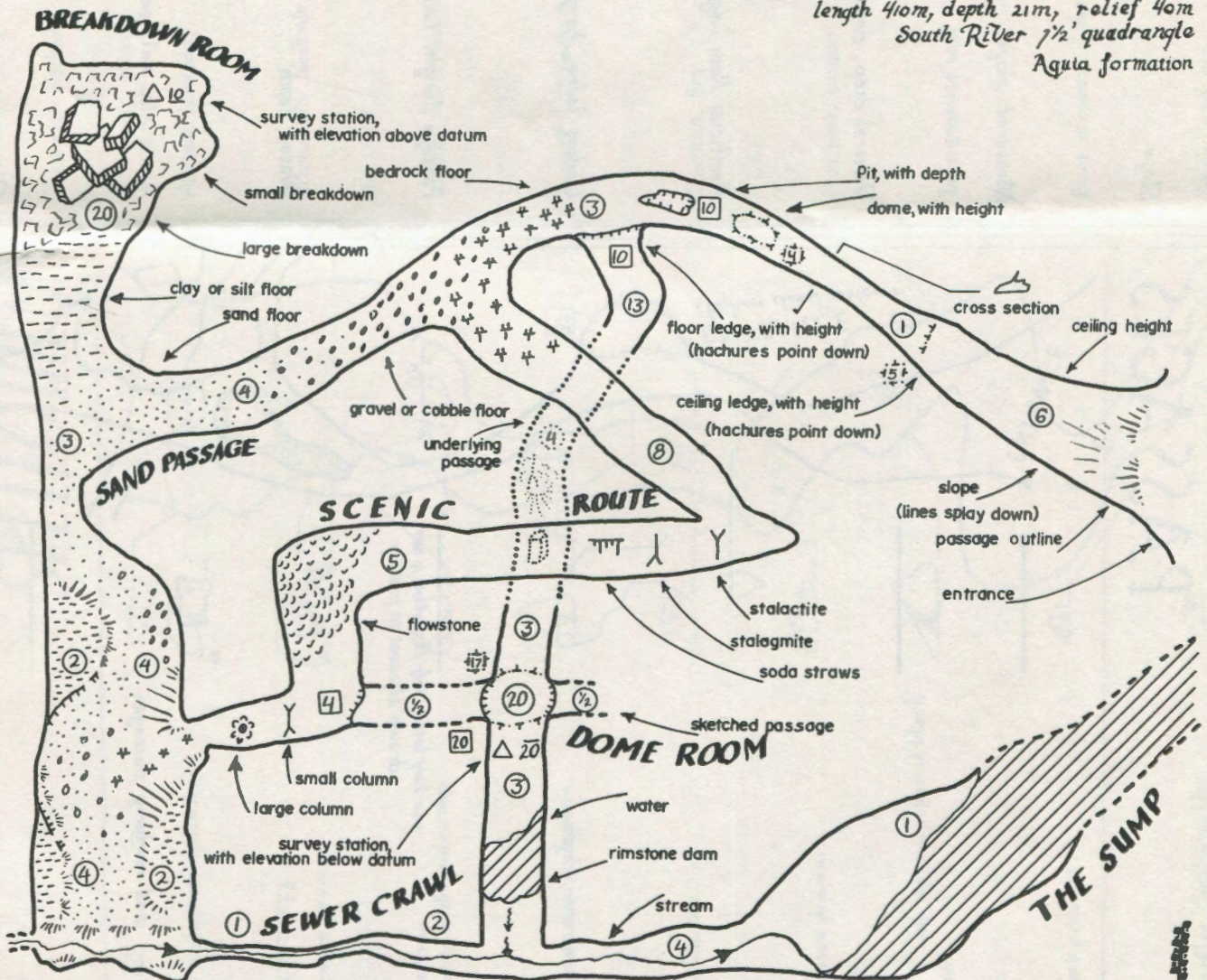
38° 58' 30" N Lat.
76° 30' 10" W Long.
15 meters ad

anne arundel county
maryland

Illustrating the (1976) NSS Basic Cave Map Symbols

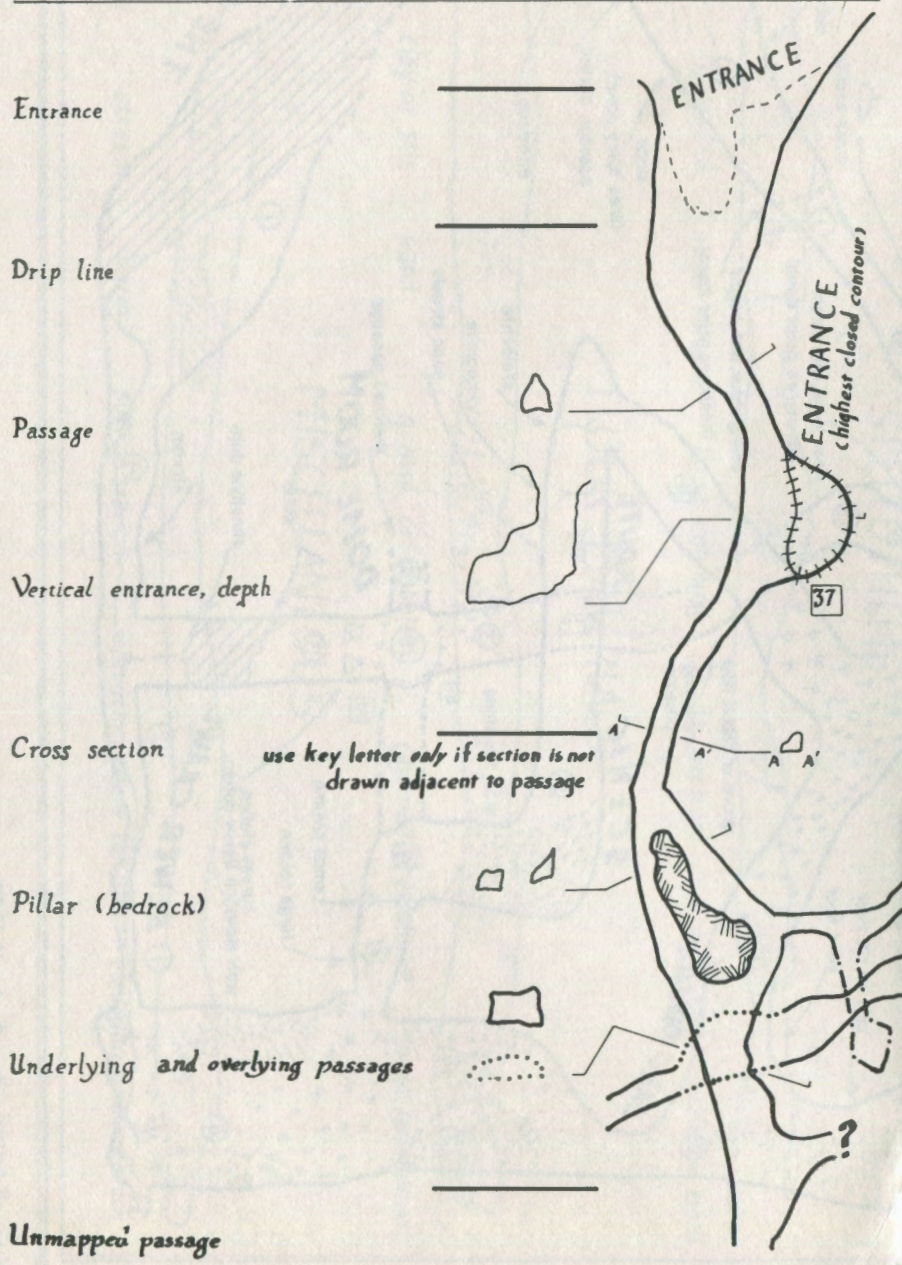


Surveyed by James Hedges, 6 February 1979
length 410m, depth 21m, relief 40m
South River 7 1/2' quadrangle
Aquia formation





PASSAGES



Entrance

Drip line

Passage

Vertical entrance, depth

Cross section

Pillar (bedrock)

Underlying and overlying passages

Unmapped passage

Slope

Measured slope

Vertical drop, depth

Artificial floor ledge, height

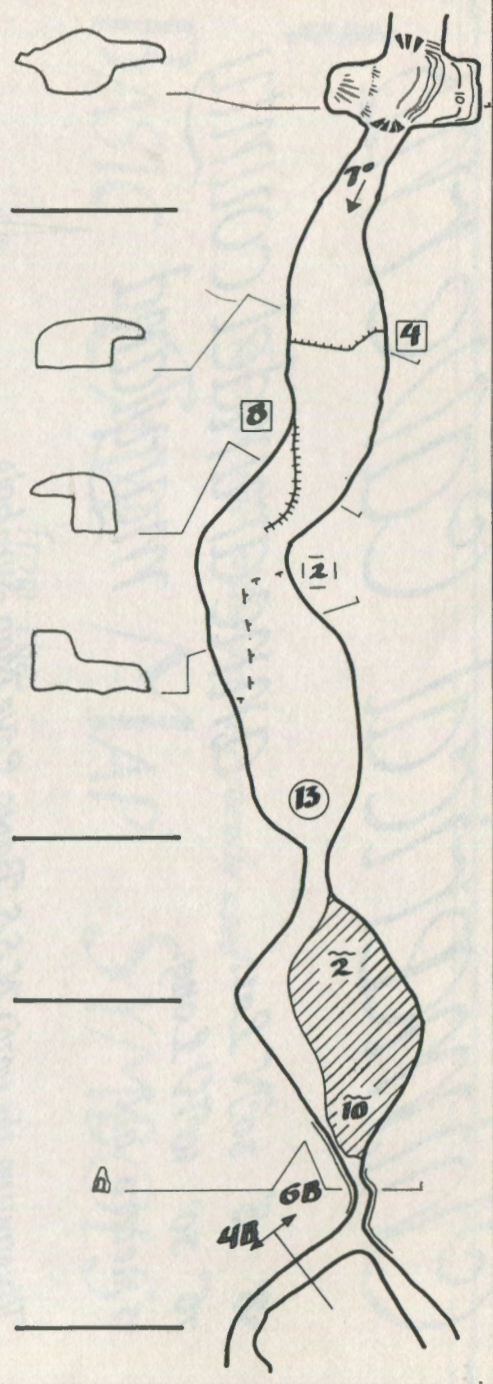
Ceiling ledge, height

Passage height (air-filled)

Water depth

Artificially enlarged passage

Change in grade of survey



SPELEOTHEMS

Large stalagmite (peak λ)



Stalagmites present



Stalagmite with stalactites



Stalactite over stalagmite



Large stalactite



Stalactites present



Column *only narrowest part is black*



Columns present



Stalactiflat / stalagmiflat



Travertine blockade

Alluvial blockade

Breakdown blockade

Vegetal debris blockade

Debris fill blockade

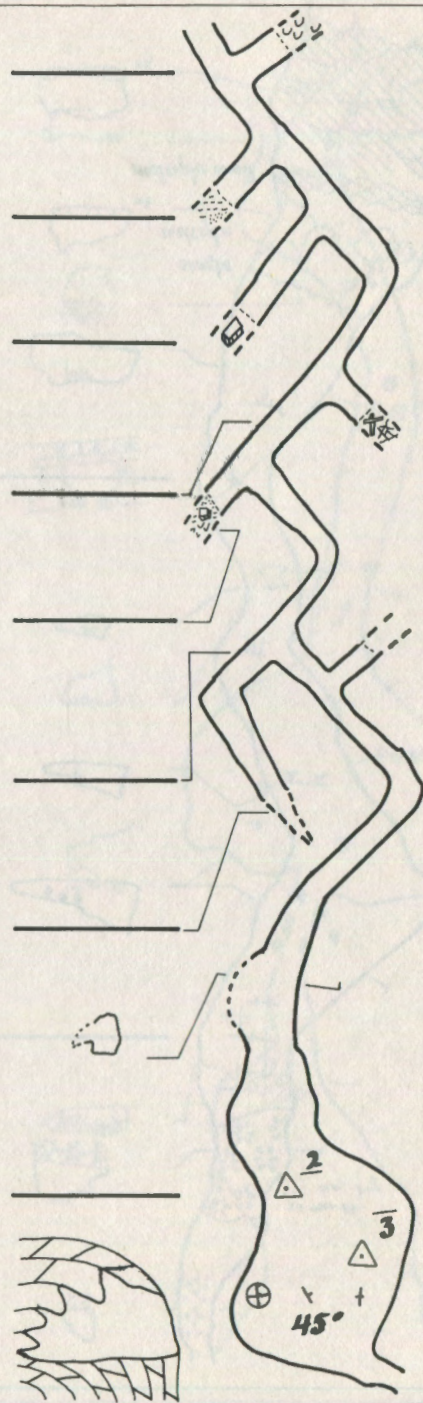
Continues, low

Continues, narrow

Indeterminate wall

Floor elevation \pm datum

Strike and dip



dashed line shows limit of exploration

Helictites



Flowstone floor



Flowstone cascade



Flowstone on ceiling



Draperies



Shield



Floral concretions



Pisolites



Cave coral



Phototropic speleothems



Cristalline fill



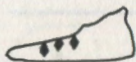
Ice or firn (perennial)



Boxwork



Spar



Anthodites



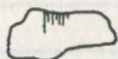
Oulopholites



Moon milk



Soda straws

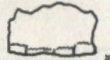


Rimstone dams

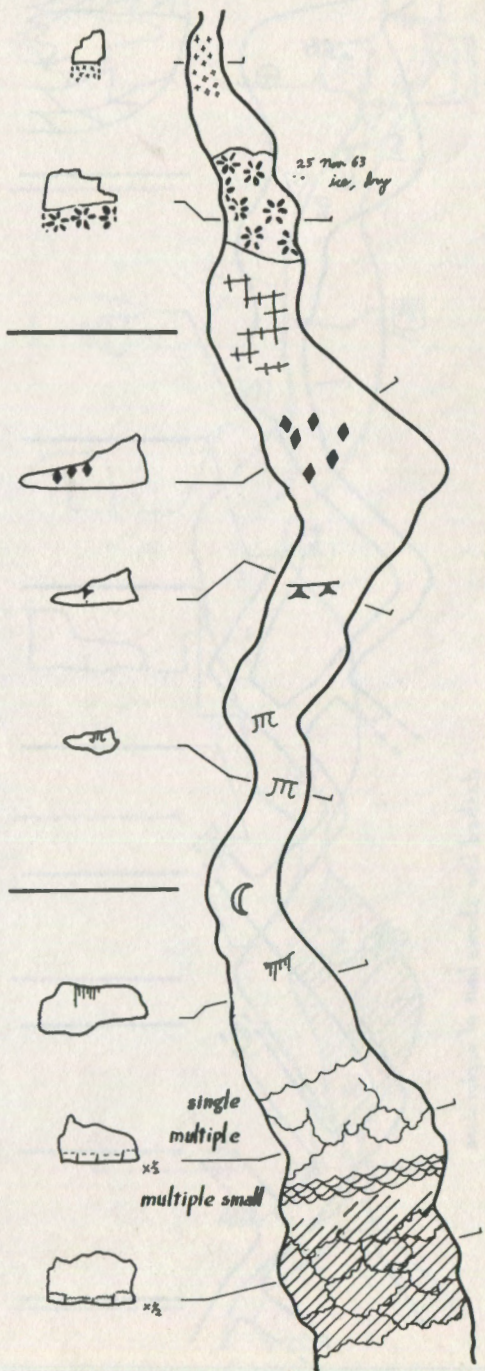
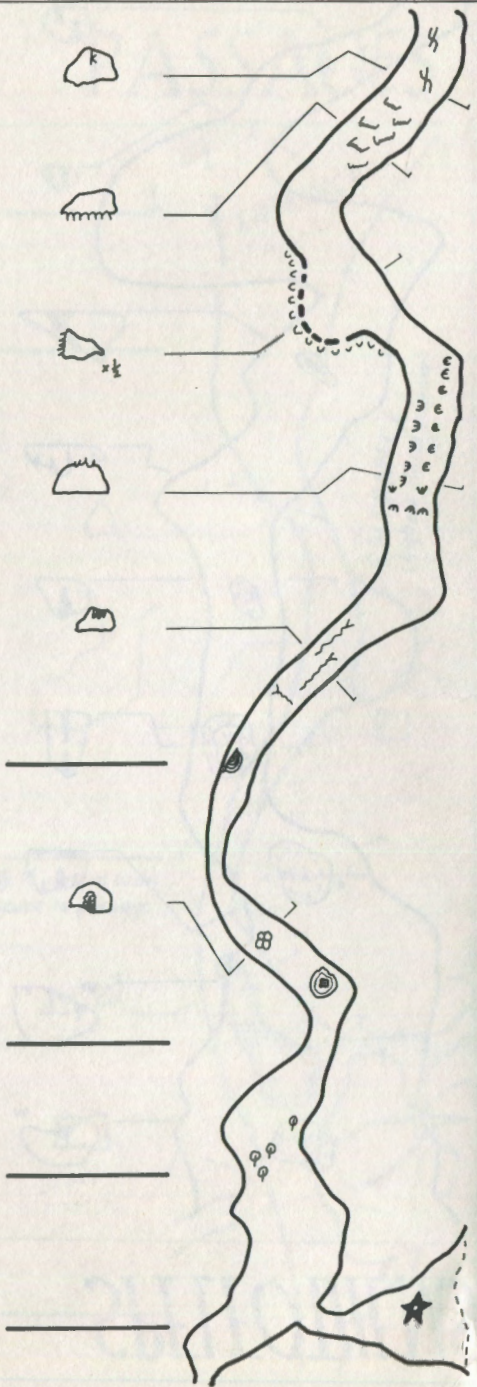


single
multiple
x 1/2
multiple small

Rimstone pools



x 1/2



SPELEOCLASTS

Large breakdown



Small breakdown



Fallen speleothems



Clay and silt



Sand



Cobbles



Chert



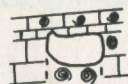
Heteropolycrapite



Vertebrate remains



Invertebrate remains



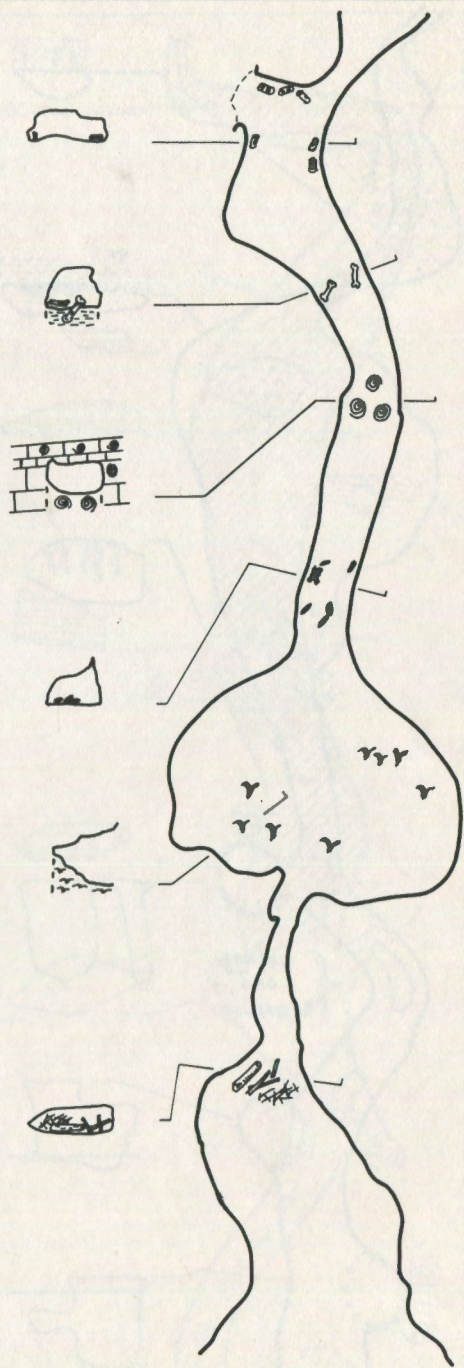
Large feces



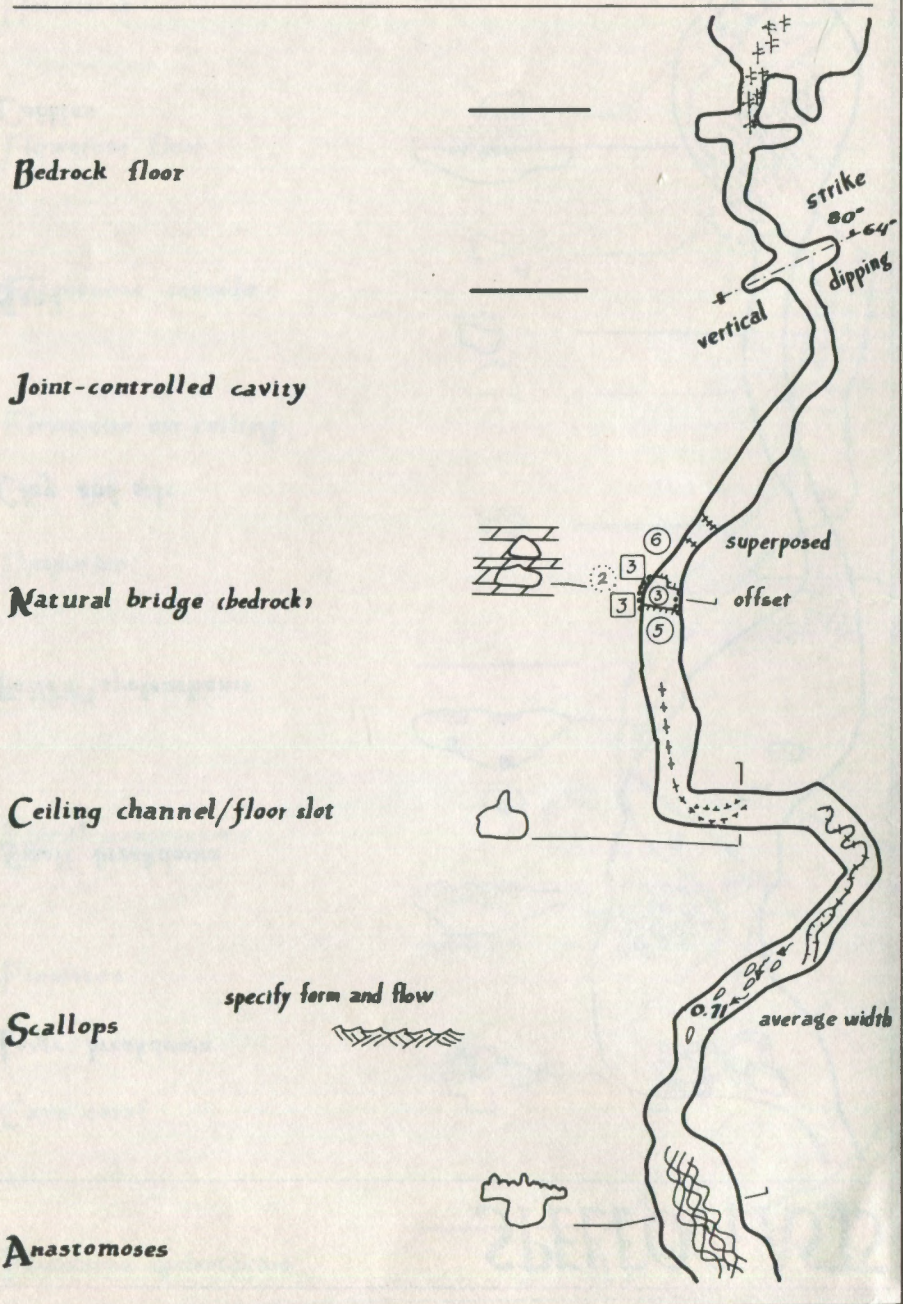
Guano



Vegetal debris



SPELEOGENS



Vertical shaft

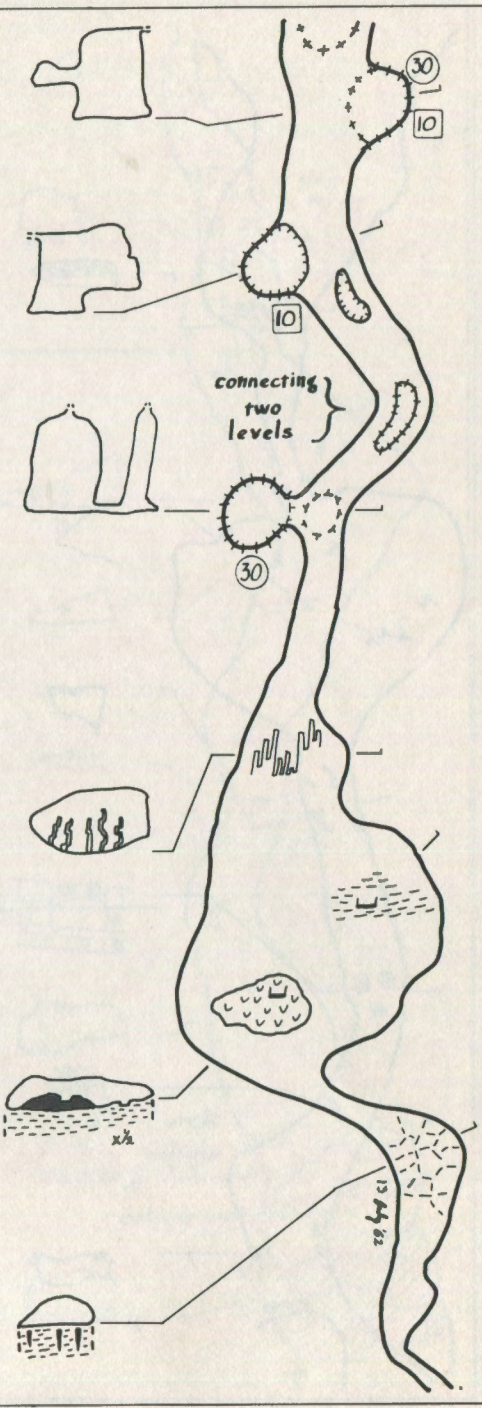
Pit

Dome

Echinoliths

Splash cups or drill holes

Mud cracks



HYDROLOGY

Intermittent stream

Small stream

Large stream

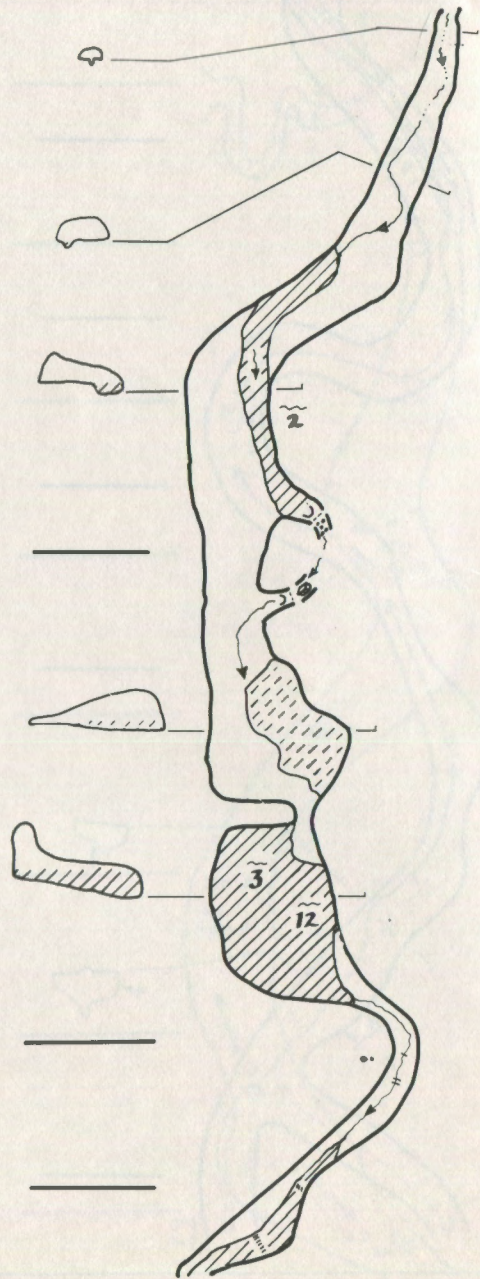
Conjectural stream

Intermittent lake

Lake, with depth

Small rapids

Large rapids



Waterfall

Submerged ceiling

Intermittent sump

Sump

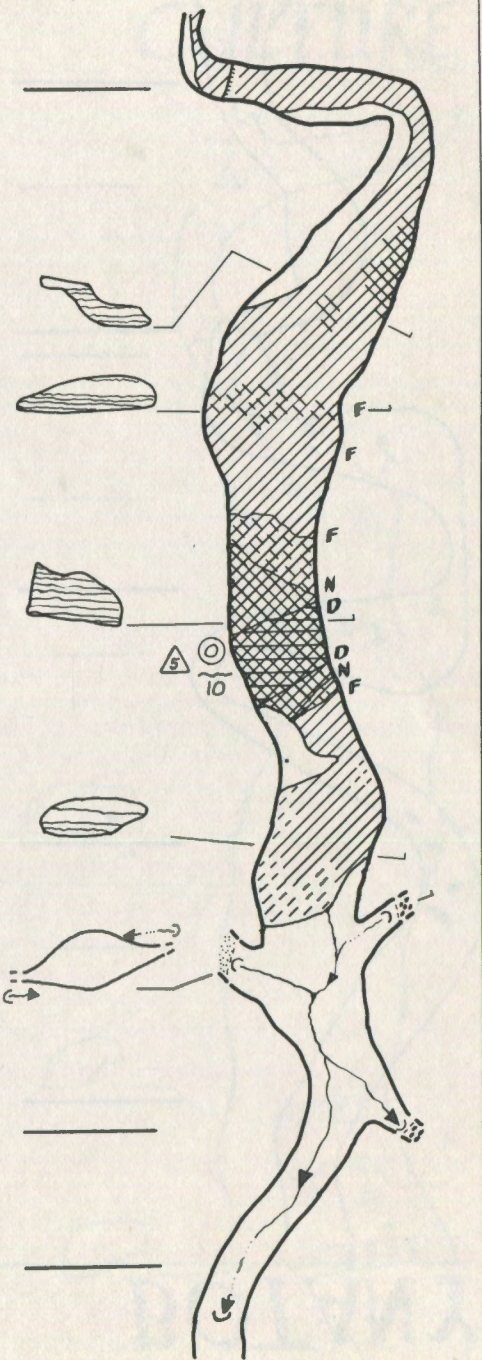
D.. DRY SEASON N.. NORMAL
F.. FLOOD STAGE

Fluctuating lake

Resurgence perennial/seasonal

Sink

Diffuse sink



Water, pure/unsafe

Wall seepage

Roof seepage

Current velocity

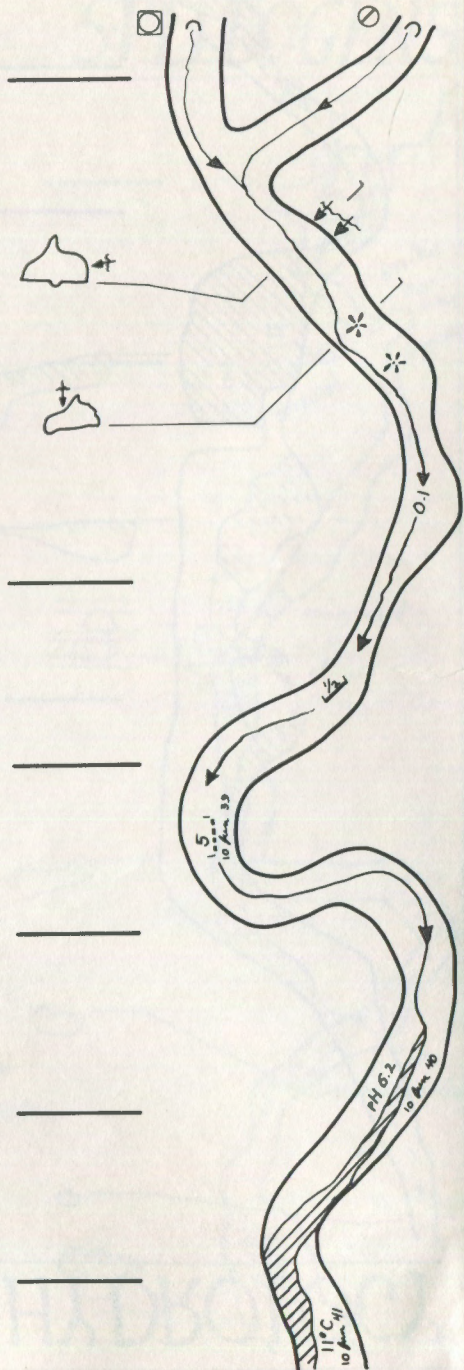
Lowest known discharge

name units of measurement

Highest known discharge

pH

Water temperature



BOTANY

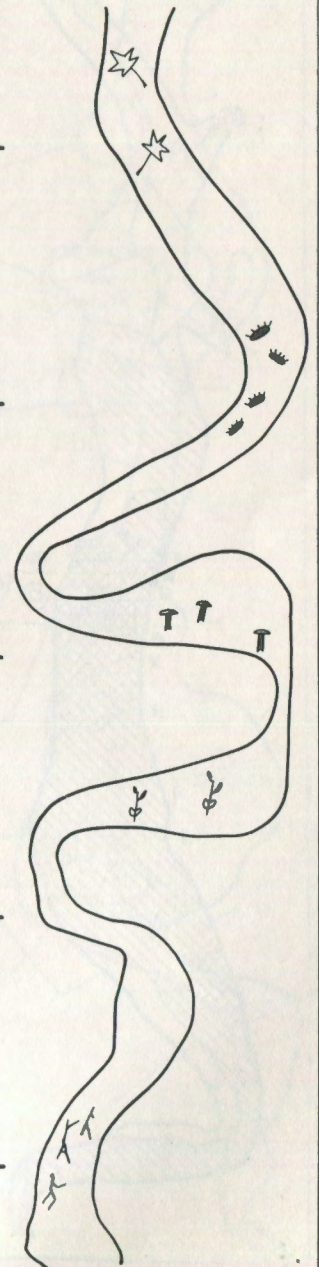
Green plants

Mold

Fungi

Seedlings

Roots



METEOROLOGY

Daylight limit

Thermocline

Relative humidity

Air temperature

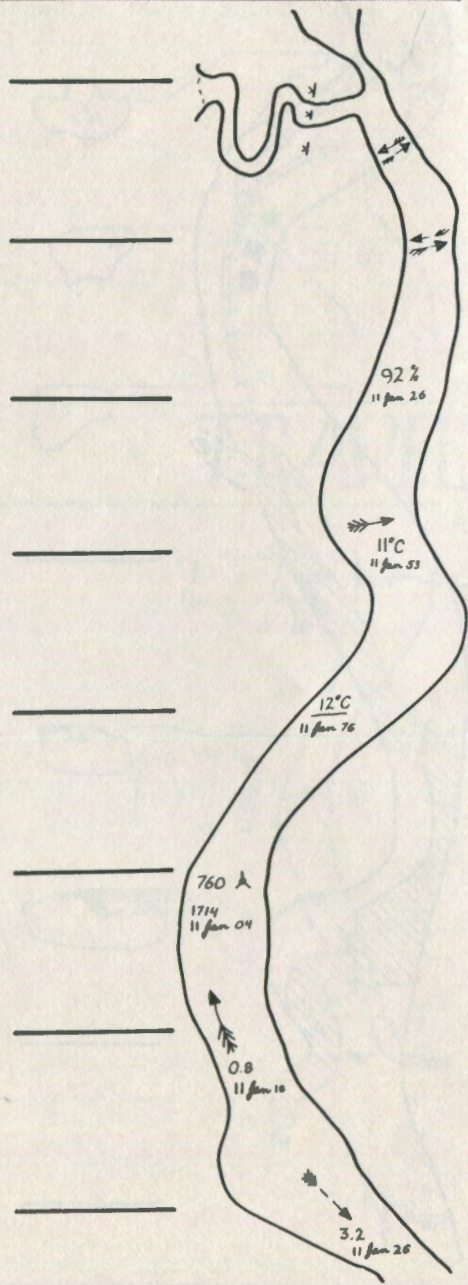
Ground temperature

Barometric pressure

Warm air current

name units of measurement

Cold air current



CULTURE

Datum

Light fixture

Marked survey station

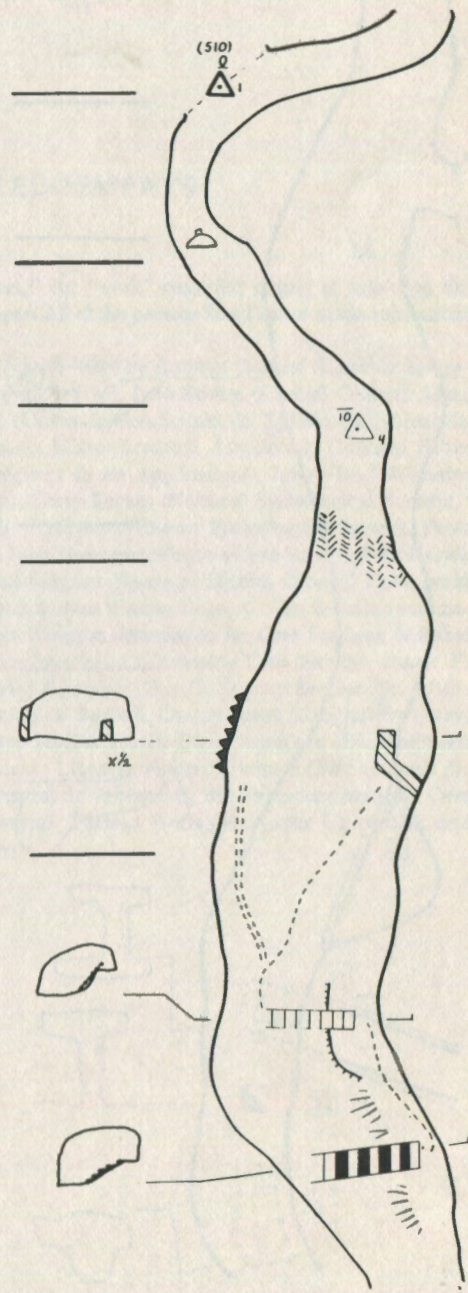
Pavement

Artificial wall

Trail, paved/unpaved

Ladder, lower end open

Stair, lower end open



Gate

Camp

Dam

Bridge

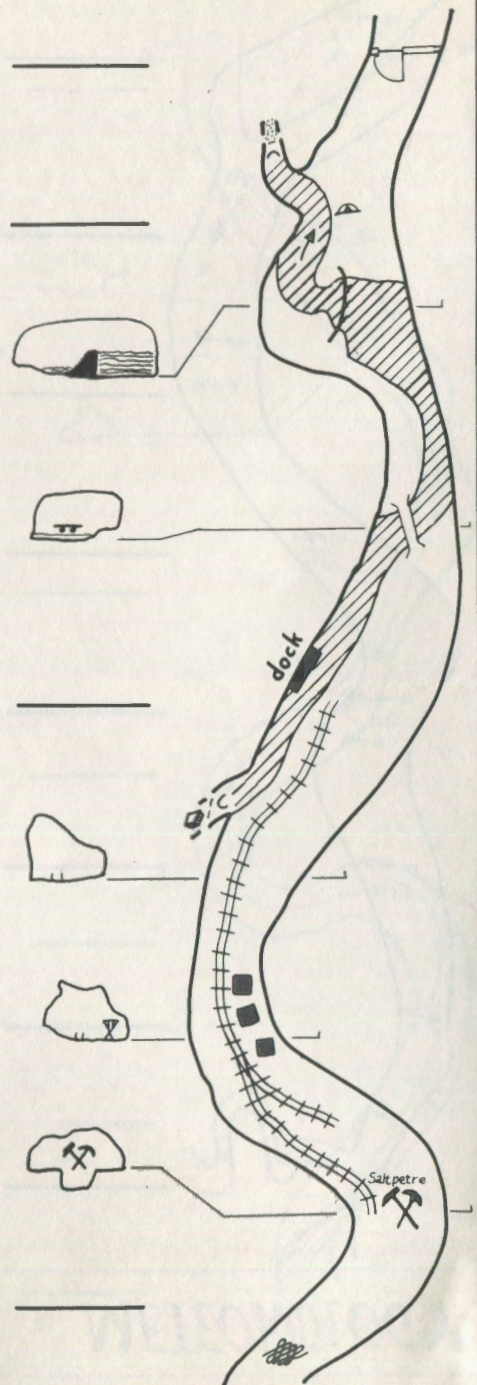
Dock

Railway

Saltpetre vat

Mine

Graffiti



Scope

Shaft

draw to scale when possible

Winze

Guard rail

Pictograph/petroglyph

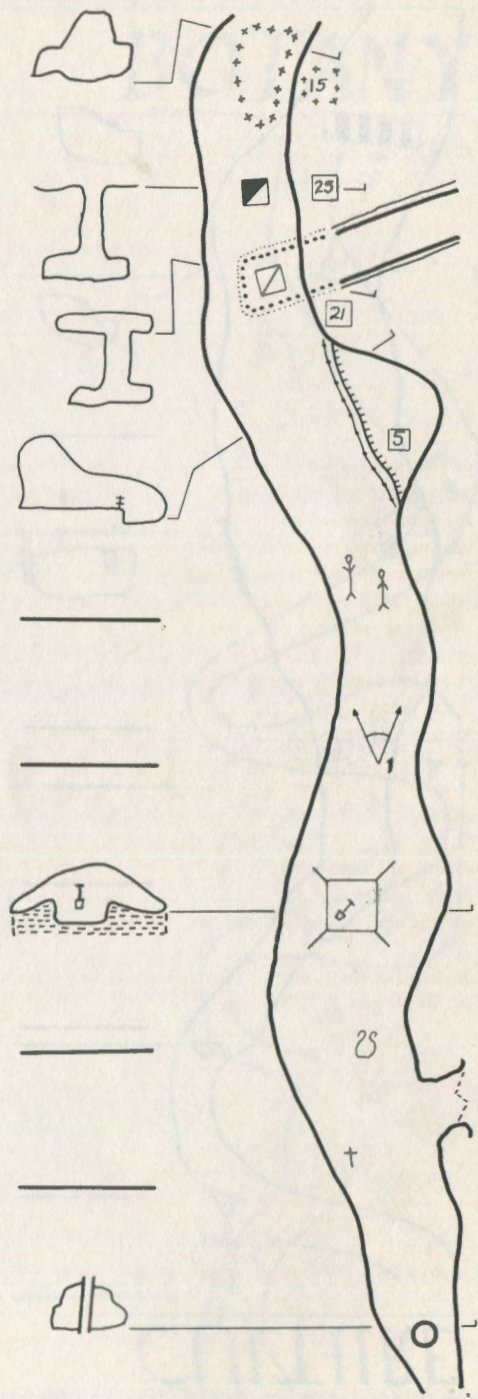
Camera station

Archeological excavation

Occupation debris

Burial

Well pipe



Chain or grille

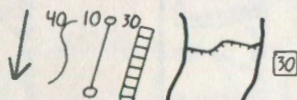
Boardwalk (design, not material)

Water or saltpeter trough

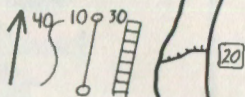


TRAVEL

Tackle for descent



Tackle for ascent



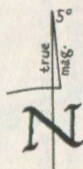
Hazard (specify)

HNO₃



Too small for average person

North arrow



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While this report lists four people as "authors," our "work" consisted largely of collecting the ideas of others and arranging them neatly on paper. All of the persons listed below made substantial contributions to this report.

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