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Jeoloji Panorama

Jeoloji Mühendisliği Dergisi'nin 50. sayısının "Jeoloji Panorama" Dünya PeriyodÜderindea CD Tarama sayfalarında "Karbonatların jeokimyası" konusu araşbrmacüann hizmetine sunulmaktadır. Öz/Abstract bölümünde sayfa sınırlaması nedeniyle ancak 4 öz/abstract'a yer verldi.. Sempozyomlardan haberlere 1.997 yılında Çukurova ve Selçuk: Üniversiteleri Jeoloji Mühendisliği Böllimleıince .gerçekleştirilmiş Jeoloji Sempozyumlan ko.no yapılmışta. Çeşitli yayınevlerinden derlenen yeni, yaym ve kitaplarla okurïanmizm Iteratör dağarcığı daha da zen.ginleşmiş olacakta.. Yapılan değerlendirme sonucunda oldukça ilgi göreceğine .inandığımız ""Jeoloji .Panorama*"' sayfalarına içerdikleri konu başlıkları, kapsamında sizlerden gelecek, olan yazılan beklemekteyiz. Bo düşünce ile sizlerinde katkılarıyla jeolojinin çeşitli, disiplinlerine daha. geniş bir perspektifle bakabilmek olanağı bulunulacaktır. Ayrıca okurlarımızın bize gönderecekleri öğrenmek istedikleri konulan ve yanıtlamamızı istedikleri somları, yanıtlan ile birlikte bulacakları "'Okurlarımızdan** başlığı ile yeni. bir bölümü gelecek, sayımızdan başlayarak "Jeoloji Panorama" içinde yer vereceğiz,.

Dünya Periyodiklerinden CD-Tarama GEO-REF (1983-1993)

Hazırlayanlar Engin öncü. Sümer ve Mine Sümer.

Konu: Karbonatlı kayaçlarm jeokimyasal, özelikleri

Kısaltmalar

Tl = Başlık

AU = Yazar (fer)

ÖS = Yayınlandığı yer,, cilt, sayfa

AB' = Yayının özeti

YE = Yayınlandığı, yıl

LA = Yayının yazıldığı dil

DE = Yayının, .anahtar' sözcükleri

GEOCHEMISTRY OF CARBONATE (References) (ODTÜ **Kütüphanesi GEOREF** 1983-1993 **CD-taraması)**

Tl: Sedimentary cycling **and -environmental** change Ira **the** late **Proterozoic;** evidence from stable sand radiogenic isotopes.
AU: Derry-Louis-A; Kauf man-Alan-J; Jacobsen-Stein-B
SO: Geochiinica-et-Cosraochimica-Acta.. 56,. (3). p. Ï 317-1329. YR: 1992
DE: carbon-; C-İ3/C-12; carbonate-rocks; strontium-; Sr-87/Sr~86; oxygen-; 0-18/0-1.6; isotopes-; .sedimentary-rocks; upper-Proterozoic; Proterozoic-; upper-Precambrian; Precambrian-; stable-isotopes; radioactive-isotopes; alkaline-earth-metals; metals-; ratios-:; marine-environment; environment-

Tl: **Geochemistry öf Precambrian carbonates; IV, Early Paleoproterozaic (2.25 + or - #«25 Ga) seawater.**
AU: Veizer-Jan; Oayton-Robert-N; Hinton-R-W
SO: Geochimica-et-Cosmochimica-Acta. 56. (3). p.. 875-885. YR: 1992
DE: South-Africa; geochemistry-; carbonate-rocks; Australia-; Canada-; oxygen-; Q-18/O-16; carbon-; C-13/C-12; isotopes-; sedimentary-rocks; strontium-; Sr-87/Sr-86; Precambrian-; lower-Proterozoic; Proterozoic-; upper-Precambrian; Malmani-Dolomite; Transvaal-Supergroup; Southern-Africa; Africa-; Duck-Creek-Dolomite; Wyloo-Group"; Australasia-; Bruce-Member; Espanola-Formation; Huronian-; trace-elements; stable-isotopes; ratios-; marine-environment; environment-; alkaline-earth-metals; metals-

Tl; Carbonate **minerals,** major **and minor elements** and **oxygen.** and carbon isotopes and **their** variation with water depth in cool, temperate carbonates, western. **Tasmania, Australia.**
AU; Prasada-Rao-C; Adabi-Mohammad-H
SO: Marine-Geology. 103. (1-3). p. 249-272.. YR: 1.992
DE: Tasmania-; oceanography-; sediments-; Tasman-Sea; oxygen-; O-i 8/0-16 ; carbonate-sediments; carbon-; C-l 3/C-12.; isotopes- ; diagenesis-; cementation-;, geochemistry-;, processes-; chemical-fractionation; Australia-.; **Australasia-;** West-Pacific; Pacific-Ocean; carbonates-; major-elements; minor-elements; stable-isotopes; sedi mentation-rates; marine-sediments; temperate-environment; environment-; depth-.; temperature-; SEM-dala; X-ray-diffraction" data; bryomol-; bioclastic-sedimentation

TI: Glacial to interglacial contrasts in the calcium carbonate content and influence öf Indus discharge in two eastern AraMan Sea cores.
AU" Divakar-Naidu-P
SO" Palaeogeography.-Paîaeoclimatology -Palaeoecology. 86. (3-4). p.. 255-263. YR: 1991
DE: Arabian-Sea; stratigraphy-; Quaternary-; sediments-; composition-; calcium-carbonate; Indian-Ocean; Indus-River; cores-:; discharge-; distribution-; geochemistry-; Holocene-; Pleistocene-; glacial-environment; environment-; interglacial-environmenir fluctuations-; climate-; changes-; indicators-

TI: Geoctaemical mapping of carbonate **terrains.**
AU: Pire-Simon; McNeal-J-M; Lenarcic-T; Prohic-Esad; Svrkota-R
SO: Applied-Earth-Sciences.. **100.** p. **B74-B87.** YR; 1991
DE: Yugoslavia-; geochemistry-; surveys-; geomorphology-; solution-features.; karst-; cartography-; topography-; terrains-; carbonates-; Southern-Europe; Europe-; statistical-analysis; soils-

TI: Strontiom isotope profile of Carboniferous-Permian **Akiyoshi** Limestone in Southwest Japan.
AU: Nishioka-Sumino; Arakawa-Yoji; Kobayashi-Yoji
SO: Geochemical-Journal. 25. (3). p. 137-146. YR: 1991
DE: Japan-; geochemistry-; isotopes-; Sr-87/Sr-86; limestone-; strontium-; sedimentary-rocks; Akiyoshi-Limestone; Honshu-; **Far-**

East; Asia-; alkaline-earth-metals; metals-; sedimentary-petrology; carbonate-rocks; stable-isotopes; Carboniferous-; Permian-; interpretation-

TT: Pétrographie **and geocheniical** analysis of caliche profiles in a Bahamian Pleistocene dune.,
AU: **Beier-J-A** SO: **Sedimentology.** 34. (6).. p.. 991-998. YR: İ9S7
DE: Bahamas-; geochemistry'-; sedimentary-rocks; carbonate-rocks; caliche-; carbon-; C-13/C-12; oxygen-; 0-18/0-1'?; isotopes-; ratios-; upper-Pleistocene; Pleistocene-; Quaternary-; West-Indies; clastic-rocks; **eolianite-;** "stable-isotopes; trace-elements; petrography-; San-Salvador

TI: Petrological and isotopic implications of some contrasting late **Precambrian carbonates, ME Spitsbergen.**
AU; Fairchild-I-J; Spiro-B SO^: Sedimentology. 34. (6). p. 973-989.. YR: 1987
DE; Spitsbergen-; sedimentary-petrology; sedimentary-rocks; carbonate-rocks; geochemistry-; carbon-; C-13/C-12; oxygen-; O-18/Ö-16; isotopes-; ratios-;, Svalbard-; Vendian-; upper-Ptoterozoic; Proterozoic-; stable-isotopes.; iron-; metals-; manganese-; strontium-; alkaline-earth-metals; diagenesis-; paieoenvironment-; upper-Precambrian; Precambrian-; Arctic-region; Polar-regions.

TI: Coordinated **textural, isotopic,** and elemental analyses of constituents in some Middle Devonian limestones.
AU; Popp-Brian-Nicholas OS.; University of Illinois, Urbana, United-States; Master's SO; 136 p, YR; 1981
DE: sedimentary-rocks; limestone-; isotopes-; Devonian-; sedimentary-petrology; geochemistry-; carbonate-rocks; textures.-; Middle-Devonian

TI: Stable isotope geochemistry of early Proterozoic carbonate concretions in the Ânimikie Group of the Lake Superior region; evidence for anaerobic **bacterial** processes.
AU; Winter-Bcyce-L; Knauth-L-Paul SO: Precambrian-Research. 54. (2-4). p. 131-151. YR:1992
DE: Minnesota-; geochemistry-; isotopes-; Ontario-; carbon-; C-13/C-12; concretions-; oxygen-; O-18/0-16; sulfur-; 5-34/S-32; sedimentary-structures; secondai-structures; Aitimikie-Group; Rove-Formation.; Thomson-Formation; Gunflint-Iron-Formaäon; Midwest-; Uni ted-States; stable-isotopes; lower-Proterozoic; Proterozoic-; dolomite-; carbonates-; precipitation-; diagenesis-; reduction-; Eastern-Canada; Canada-;. Pass-Lake-Quarry; Oliver-Creek; electron-probe-data; authigenic-minerals; Lake-Superior-region

TI; Origin of carbonate deposits in the vicinity of Yucca Mountain, Nevada; pTellmlnary **results** of **hydrochemical** modeling.,
AU: Kroitoru-Levy; Livnat-Alex; Fenster-David-F; Van-Camp-Scott-G
SO: American-Geophysical-Union. 72. (17).. p. 116 YR: 1991
DE: Nevada-; hydrogeologys ground-water; Nye-County-Nevada; Western-U.S.; United-States; sou.thern-Neva.da; Nevada-Test-Site; Yucca-Mountain; waste-disposal; radioactive-waste; high-level-waste; calcite-; carbonates-; fractures-; hydrochemistry-

TI: **Geochemical** constraints on the origin of dolomite in **the Ordovician Trenton** and Black River limestones» AIMon-Scipio area. Michigan.,
AU: Granath-Victoria-C
SO: AAPG-Bolietin., 75,. (3). p. 584-585 YR: 1991
DE: Michigan-; sedimentary-petrology; sedimentary-rocks; Trenton-Group; Black'-River-Group; Midwest-; United-States; geochemistry-; dolostone-; carbonate-rocks; ordovician-; •limestone-; Albion-Scipio-Ftetd; Stoney-Point-Field; south-central-Michigan; strontium-; alkaline-earth-metals; metals-; Sr-87/Sr-86; isotopes-; stable-isotopes; matrix-; cement-; dolomitization-; sea-water; brines-; fluid-inclusions;' inclusions-; geologic-thermometry; oxygen-; O-18/O-16; hydrogen-; D/H-; deuterium-; Michigan-Basin; North-America; siliciclastics-

TT: Carbon **isotopic** stratigraphy of the **San** Andres Formation; a possible correlation tool.?.
AU: Colgan-R-Eugene; Scholle-Peter-A
SO: AAPG-Billetin.. 75.. (3).. p. 5.55 YR; 1991
DE: Texas-; stratigraphy-; Permian-; San-Andres-Formation; Southwestern-U.S.; United-States; carbon-; isotopes-; correlation-; Algerita-Escarpment; Permian-Basin; transgression-; shelf-environment; environment-;. nearsho:re-environ.m.ent; progradation.-; cycles-; dolostone-; carbonate-rocks;. C-1.3/0.12; stable-isotopes; dissolved.-materi.als; dol.omi.tizati.on-; chemostrattgraphy-

TI: **Calhodolnminescence** and trace-element geochemistry of carbonate cements formed with burial in seawater.
AU: Budd-D-A
SO: AAPG-Bulletin,, 75. (3). p. 547 YR; 1991
DE: Atlantic-Ocean; sedimentary-petrology; diagenesis-; cathodoluminescence-; trace-elements; cement-; carbonates,-; sea-water; cementation,-; Lower-Cretaceous; Cretaceous-; turbidite-; debris-flows; mass-movements; .DSDP-Site-534;; Leg-76; EPOB-;. Deep-Sea-DrilHng-Project; DSDP-Site-416; Leg-50; aliochems-; petrography-; overgrowths-; siliciclastics-; Eh-; pH-; brines-; 1 i mes tone- ; carfo onate-rocks

TI: **Diagenetic** framework for chemical **remanence acquisition in lower** Paleozoic **carbonate** rocks from W.. **Newfoundland.**
AU: Beaubouef-R-T; **Rush-P-F**
SO: ÄAPG-Bulletin. 75. (3>. p.. .539 YR: 1991
DE: Newfoundland-; sedimentary-petrology; diagenesis-; stratigraphy-; Paleozoic-; Eastern-Canada; Canada-; lower-Paleozoic; carbonate-rocks ; western-Newfoundland; Saint-George-Group ; Tfemadocian-; Lower-Ordovician; Ordovician-; Port-au-Port-Peninsula; Cambrian-; autochthons-; uplifts-; petrography-; evolution-; fabric-; limestone-;, dolostone-; paleomagnefism-; magnetization-; hematite-; oxides-; karst-; solution-features; dedolomitization-; remagnetization-; magnetite-; geochemistry-; cementation-; precipitation-; authigenic-minerals; dolomitization-

TI:: **Kuwaiti dolocrete;** petrology» **geochemistry and** groura.dwa.ter origin..
AU: El-Sayed-M-1; Fairchild-1-J; Spiro-B SO: Sedimentary-Geology. 73. (1-2). p. 59-75. YR: 1991
DE: Kuwait-" sedimentary-petrology; sediments-; sedimentary-rocks; chemically-precipitated-rocks; duricrust-; ground-water; geochemistry-; isotopes-; oxygen-; Q-18/O-16; carbon-:; C-13/C-12; Arabian-Peninsula; Asia-; Quaternary-; calcrete-; carbonate-rocks; dolocrete-; stable-isotopes; dolomite-; carbonates-; dolostone-

TI: À reconnaissance **carbon-oxygen** isotopic study of nodcritic components in Silurian marine carbonates from eastern Iowa.
AU: Ludvigson-Greg-A; Witzke-Brian-J; Gonzalez-L-A SO: -Geological-Society-of-America. 23. (3). p. 26 YR: 1991
DE: Iowa-; stratigraphy-; Silurian-; Scotch-Grove-Formation; Gower-Fbrmation; Le-Porte-City-Liroestone; Midwest-; United-States; carbon-; C-13/C-12; isotopes-; stable-isotopes; oxygen-; **0-18/0-16;** carbonate-rocks; micritization-; diagenesis-; sedimentar}ᶜ-petrology; processes-; eastern-Iowa; dolomitization-

TI: **Petroleum** potentialities of central Tunisia as deduced from identification and characterization of oil source rocks.
AU: Saidi-M; Acheche-M-H; tooubii-H; Belayouni-H
SO: AAPG-Bulletin. 75. (8). p. 1420 YR: 1991
DE: Tunisia-; economic-geology; petroleum-; North-Africa; Africa-; central-Tunisia; source-rocks; possibilities-; Silurian-; Devonian-; shale-; clastic-rocks; Cretaceous-; black-shale; Eocene-; Paleogene-;

Tertiary-; carbonate-rocks; genesis-; natural-gas; geochemistry-; organic-materials; exploration-

T!: Geochemistry of **metastable** carbonate minerals from **the** Brush Creek **marine** interval **{Missourian),** Indiana County,. Pennsylvania.
AU: Cercone-Karen-Rose; Kime-Amy; Metehler-Scott; **Rittler-Keith**
SO: AAPG-Bulletin., 75. (8).. p. **1381** YR: **1991**
DE: Pennsylvania-; geochemistry-; carbonates-; Indiana-County-Pennsylvania; Brush-Creek-Formation; Eastern-U.S.; United-States; minerals.-; marine-environment; environment-:; Mi&sourian-; Upper-. Pennsylvanian; Pennsylvania«-; Carboniferous-; western-Pennsylvania; aragonite-; calcite-; shells-:; X-ray-diffraction-data; **magnesian-calcite;** isotopes-; carbon-; C-Î3/C-12; .stable-isotopes; oxygen- ; O-18/Ö-16; bivalves- ; moMusks-:; precipitation-; .Pharkidonotns-; recrystallizatlon-; textures-; SEM-data; crinoids-; echinoderms-; pore-water; **early-diagenesis;** diagenesis-

TI: Aspects of **fhe** chemistry **of modern and** fossil biological apatites.
AU: **Lee-Thorp-Julia-A;** van-der-Merwe-Nikolaas-J
OS: Univ.. Cape Town., Bep. Archaeol., Randesbosch, South-Africa; Univ.. Ha.,, United-States; Harvard **Univ.,** United-States.
SO: Journal-of-Arehaeological-ScIence. **18.** (3). p. 343-354. YR: 199!
DE: carbon-; isotopes-:; C-I3/C-12; Mammalia-; Primates-; Pleistocene-; South-Africa.:; paleontology-; stable-isotopes; bones-:; teeth-; Swaitkrans-;- geochemistry-; collagen-; proteins-:; organic-materials; apatite-; phosphates-; carbonate-apatite; infrared-spectra:; mammals-; Eutheria-; Theria-; biochemistry-; Quaternary-; diet-; Southern-Africa:; Africa-

TÏ: Carbon and oxygen isotope composition of lower Palaeozoic limestones .and concretions, an example of high temperature diagenesis.
AU: Buchardt-Bjorm
SO: Terra-Cognita. 4. (2). p. 219-220. YR: 1984
DE: Denmark-; geochemistry-; isotopes-; limestone-; carbonate-rocks; Scan.dlnavi.a-; Western-Europe; Europe-; Bocnholm-; geologic-thermometry; lower-Paleozoic; Paleozoic-; **O-18/O-16;** stable» isotopes; oxygen-; C-13/C-12; carbon-; IGCP-; high-temperature; diagenesis-

H: Sr isotopic variation in shallow **wafer carbonate** sequences; stratigraphie, chronostratigraphic, and eustatic implications of **the** record **at Enewetak AtolL**
AU: Quinn-Terrence-M; Lohrnann-K-C; Halliday-A-iSI
SO: Paleoceanography. 6. (3). p. 371-385. YR: 1991
DE: strontium-; isotopes-; Sr-87/Sr-86; carbon-; C-13/C-12; oxygen-; 0ˢ-18/O-16; Marshall-Islands; geochemistry- ; stratigraphy-; Pleistocene-; sedimentary-rocks; carbonate-rocks; alkali ne-earth-metals; metals-; stable-isotopes; • Enewetak-Atoll; Micronesia-:; Quaternary-; changes-of-level; variations-; shallow-water-environment; environment-; chronostratigraphy-; eustacy-

TI: Geochemistry of **Caihbro-Ordovician Arbuckle Limestone, Oklahoma; implications** for **diagenetic** delta. **(18)O** alteration and. secular delta. **(13)C and (87)Sr/(S6)Sr** variation..
AU: Gao-Guoqiu; Land-Lynton-S SOˡ: Geochimica-et-Cosmochimica-Acta. 5.5. (10).. p.. 2911-2920. YR: **1991**
DE: Oklahoma-; geochemistry-; isotopes-; oxygen-; O-13/Ö-16; carbon-; C-13/C-12; strontium-;. 5:r-87/5r-86; sedimentary-rocks; limestone-; Arbuckle-Group; Souihwestern-U.S.; United-States; Cambrian-; Ordovician-; carbonate-rocks; ratios-; stable-isotopes ; alkaline-earth-metals; metals-; diagenesis-; secular-variations; Slick-Hills; southwestern-Oklahoma

TI: **Fluorine** mobility **during** early diagenesis of carbonate **sediment; an indicator** of **mineral transformations.**
AU: Rude-Peter-D; Aller-Robert-C
SO: Geochimica-et-Cosmochimica-Acta. 55., (9.).. p. 2491-2509.. YR: 1.991
DE: fluorine-; geochemistry-; carbonate-sediments; Gulf-of-Mexico; diagenesis-:; indicators-; halogens-; migration-of-elements; sediments-; early-diagenesis; marine-sediments; Florida-Bay; North-American-Atlantic; North-Atlantic; Atlantic-Ocean; pore-water; fluoride-ion; mobility-

TI: Paleolimnologica] signatures from, carbon and oxygen Isotopic ratios in carbonates from organic carbon-rich lacustrine sediments..
AU: **Talbot-M-R; Kelts-K**
SO: **AAPG-Memoir.50.p.99-112.** YR: 1990
DE: Ghana-; geochemistry-; isotopes-; sediments.-; carbonate-sediments; sedimentary-petrology; carbon-; oxygen-; ratios-; lacustrine-environment; environment-; organic-carbon; organic-materials; carbonates-; **paleolimnology-;** West-Africa; Africa-; Lake-Bosumtwi; diagenesis-; water-; mineral-composition; **paleohydrology-**; processes-:; s alini ty-

TÏ: Carbon dioxide in the Paleozoic atmosphere; **evidence** from carbon -isotope compositions of p e do genie carbonate.
AU: Mora-Claudia-I; Driese-Steven-G; Seager-Paula-G
SO: Geology-(Boulder). 19. (10). p.. 1017-1020. YR: .1991
DE: Pennsylvania-; stratigraphy-; Paleozoic-:; carbon-; isotopes-; C-1.3/C-12; sedimentary-rocks; clastic-rocks; Pai.eosol.s-; paleoclimatology-; Bloomsburg-Fo.rm.ati.on; C'atskill-Formation; Mauch-Chunk-Formation; paleoatmosphere-; carbon^lioxide; stable-isotopes; red-beds; Eastern-U.S.«; United-States; central-Pennsylvania; soils-; cla.yston.e--; atmospheric-pressure:; fluvial-environment; en.viron.ment- ; deltaic-environment:

TI: **Influence** of deep-sea **bentbic** processes **on** atmospheric CO2.
AU: Sundquist-E-T
SO: Mathematical-and-Physical-Sciences. 331. (1616). p. 155-16.5. YR: 1990
BE: geochemis-try-; geochemical-cycle; carbon-; atmosphere-; sediments.-:; marine-sediments; diagen.esi.s-; carbon-dioxide; deep-sea-environment:; environment-; processes-; sea-water; solution-; **carbonate-sediments;** buffers.-:; **models-**

T1; Calcium carbonate: preservation In. the ocean.
AU: Emerson-S-R; Archer-D
SO: Mathematical-and-Physical-Sciences. 331. (1616). p.. 29-40.. YR: 1990
DE: Indian-Ocean; oceanography-; sediments-; marine-sediments; geochemistry-:; Atlantic-Ocean; carbon-; sea-water; calcium-carbonate.; sediment-water-interface; preservation-; degradation-; solution-; saturation-; organic-materials; deep-sea-environment; environment-; organic-carbon; sedimentary-petrology; processes-; models-

TI: **Geochemical** differences **between subtropical (Ordoviciait), cool-temperate (Recent** and Pleistocene) and subpolar **carbonate,** Tasmania, Australia,.
AU: Prasada-Rao-C
SO: Carbonates-and-Evaporites. 6. (1). p.. 82-106.. YR: 1991
DE: Tasmania-;*" sedimentary-petrology; sedimentary-rocks; carbonate-rocks; environment-; geochemistry-; oxygen-; isotopes-; O-18; carbon-;, C-13; Australia-;, Australasia-; Permian-;. Pleistocene-; Quaternary-; **Holocene-;** temperate-environment; subpolar-environment.; subtropical-environment; Ordovician-; classification-; stable-isotopes ; trace-elements

TI: Chemical **and isotopic evolution of fluids** in the active Long Valley hydrothermal system.,
AU: Peterson-Maria-L; White-Art-F
SO: 1989 annual meeting., Abstracts-with-Programs-Geolpgical-Society-of-America.. 21. (6). p. A85 YR: 1989

DE: California-; geochemistry-; isotopes-; Pacific-Coast; Western-Ö.S.; United-States; evolution-; Long-Valley-Caldera; topography-; hydrology-; hydrogen-; D/H-; stable-isotopes; deuterium-; oxygen-; O-18/O-J6; rainfall-; seasonal-variations; tuff-- pyroclastics-; volcanic-rocks; carbon-; C-13/C-12; carbonate-rocks; geologic-thernnometry; temperature-; pH-; kinetics-; sulfates-; sulfides-

TI; della (1,8)0 and delta (I3)C stable Isotope geochemistry of dolomitized defrital calcites of the Los JVionegros Group, southeastern Ebro Basin.» Spain.
AU: Peteıson-Jonathan-D
SO: AAPG-Butietïe. 74., (5).. p. 739-740 Y..R: 1990
DE: Spain-; sedimentary-petrology; diagenesis-; geochemistry-; isotopes-; Iberian-Peninsula; Southern-Europe; Europe-; oxygen-; O-18/0-16; stable-Isotopes; carbon-; C-13/C-12; dolomitlzatlon-; calcite-; carbonates-; Los-.Monegros-G.roup; Ebro-Basin; lacustrine-environment; environment-; limestone-; carbonate-rocks; lithocalcarenite-.; paleogeography-; pore-water

TI: Petroleum potential of the Upper Ordorician Maqnoketa Group in Illinois;; a coordinated geological and geochemical study,
AU: Croekett-Joan-E; Knige-Michael-A; Oltz-Donald-F
SO: AAPG-Bulletin. 74. (5). p.. 636 YR: 1990
DE: Illinois-; economic-geology; petroleum-; Maquoketa-Formatlon; New-Albany-Shale; Midwest-; United-States; possibilities-.; Upper-Ordovician; Ordovician-; geochemistry-; shale-; clastic-rocks; carbonate-rocks; source-rocks; lithoslratigraphy-; Rock-Eval; pyrolysis-; _maturity-; pristane-; alkanes-; aJphatie-hydrocarbons; hydrocarbons-; organic-materials:; phytane-; steroids;-,; jsomers-; lithofacies-; sandstone-; migration-; stratigraphic-traps.; traps-; Cottage-Grove-Fault

TI:: Pakoclimatic controls on stable oxygen and carbon isotopes in caliche of the: Abo Formation (Penman), south-central New Mexico, Ü.S.A,
AU: Mack-Creg-H; Cole-David-R; Giordano-Thomas-H ; Schaal-William-C; Barcelos-Jose-H
SO: Joumal-of-Sedimentary-Petrology. 61. (4). p. 458-472. YR: 1991
DE: New-Mexico; stratigraphy-; Permian-; paleoclimatology-; Isotopes-; sedimentary-rocks; caliche-; carbonate-rocks; oxygen-; O-18/0-16; carbon-;, C-13/C-12; sedimentation-; deposition-; environment-; Abo-Formation; Southwestem-U.S.; United-States; stable-isotopes; south-central-New-Mexico

TI: Isotopes in. dimatological studies.,
AU: Rozanski-Kaziraierz; Gonfianti-Roberto
SO: .International-Atonilc-Energy-Agency-Bulletin 32 (4) B 9- IS YR: 1990
DE: isotopes-; analysis-; climate-- paleoclimatology-; indicators-; atmosphere-; research-; meteorology-; techniques-; ocean-circulation; marine-environment; environment-; ice-caps; terrestrial-environment-polar-environment; changes- ; marine-sediments ; lake-sediments ; ground-water; calcium-carbonate; circulation-; data-bases; models-; precipitation-; geochemistry-

TI: Carbonate minerals in glacial sediments; geochemical ciu.es to palaeoenvironmeiat.
AU: Fairchiid-lan-J; Spiro-Bamch
SO: Geological-Soclety-Special-Publlcations,. .53. p 201-?16, YR-, 1990
DE: sediments-; carbonate-sediments; glaciomarine-environment; minerals-;, carbonates-; occurrence-; sedimentation-; transport-; glacial-transport;, environment-; paleoenvironment-;, Quaternary-; chemostratigraphy-; geochemistry-; .ÏGCP-; Proterozoic-; upper-Precambrian; Precambrian-; recrystallization-

TI: Events leading to global phospbogeoesis around the Proterozoic/Cambrian boundary.
AU: Donnelly-T'-H; Shergold-J-B; Southgate-P-N; Barnes-C-J
SO: Geological-Society-Special-Pubiications. 52. p. 273-287 YR-1990
DE: diagenesis-; processes-; phosphatization-; sedimentation-; environment-; anaerobic-environment; isotopes-; ratios-; stable-isotopes; strontium-; Sr-87/Sr-86; carbon-; C-13/C-12; global-; upper-Proterozoic; Proterozoic-; Lower-Cambrian; Cambrian-; boundary-; alkaline-earth-metaJs; metals-; marine-environment; IGCP-; organic-materials; carbonate-rocks; geochemistry-; phosphorus-

TI: Ptecambrian/C^infoiian boundary problem; carbon isotope correlations for Vendian and Tommotian time between Siberia and Morocco.
AU; Magaritz-Mordeckai; Kiischvink-Joseph-L; Latham-Andrew-J; Zhuravlev-A-Yu; Rozanov-A-Yu
SO: Geology-(Bonlder). *19.* (8). p. 847-850. YR: 1991
DE: USSR-; stratigraphy-; Pfoterazoic-; Morocco-; Cambrian-;' isotopes-; carbon-; C-13/C-12; sectimentary-rocks; carbonate-rocks; geochemistry--, Siberia-; North-Africa; Africa-; upper-Precambrian ; Precambrian-; Vendian-; upper-Proterozoic; Tommotian-; Lower-Cambrian ; boundary-; correlation-; chemostratigraphy-; stable-isotopes; fluctuations-; cycles-; Anti-Atlas; Siberian-Platform-sections-; IGCP-

TI: Oxygen-isotope composition of diagenetic calcite in organic-rich rocks; evidence for (18)0 depletion in marine anaerobic pore water.
AU: Sass-Eytan; Bein-Amos;; Almogi-Labin-Ahuva
SO: Geology-(Boulder). 19. (8).. p. 839-842.
YR: 1991
DE: Israel-; geochemistry-; isotopes-; oxygen-; 0-38/0-16; diagenesis-; sedimentary-rocks; carbonate-rocks; Middle-East; Asia-:; stable-isotopes; calcite-; carbonates-; organic-materials; marine-environment; environment-; pore-water; anaerobic-environment; Upper-Cretaceous; Cretaceous- ; SEM-data; fbraminifers- ; microfossils-; paleo-oceanography; bicarbonate-Ion

TI: Geocbemical studies of subsurface carbonate rocks.
AU: Erickson-R-L; Eri.ckson-M-8; Mosier-E-L; Chazin-Barbara
OS: U. S. Geol. Snrv., United-States; U. S. Geol. Surv., United-States
SO: Geological-Survey-BuUetin. p. 51-52. YR: 1991
DE: Missouri-.; geochemistry-; carbonate-rocks; sedimentary-rocks; surveys-; Polk-County-Missouri; Greene-County-Missouri; Dallas-County-Missottri; Laclede-County-Missouri; Webster-County-Missouri; Wright-Counry-Missouri; ÜSGS-; Midwest-; United-States; southwestern-Missouri; Springfield-Quadrangle; cores-

TÏ: DeternHnation of carbonate carbon in geologic materials: by coulometric titrafion.
AU: Brand;t-Elai.ne-.L; Aroscavage-Philip-J; Papp-Clara-S-E
SO: Geological-Survey, p.. 68-72, YR: 1990
DE: chemical-analysis; techniques-; sample-preparation; carbon-:; analysis-; USGS-; titration-; coulometry-; carbonates-

Tl: Carbon and oxygen isotope trends of Precambrian-Cambıian carbonates from Lesser Himalaya» India.
AU: Tewari-Vinod-C
OS: Wadia Inst. Himalayan Geol.,„ Dehra Dun, IndiaYR: 1990
CN: Himalayan geology seminar, Dehra Dun, April 4-7, 1990
DE: India-; geochemistry-:; isotopes-; sedimentary-rocks; carbonate-rocks; ^ Lesser-Himalayas; Indian-Peninsula; Asia-; Precambrian-; Cambrian-:; Deoban-Formatioi; Riphean-; upper-Proterozoic; Proterozoic-;. Vendian.-; Krol-Formation; C-13/C-12; stable-isotopes' carbon-; ratios-; oxygen-; O-18/Ö-16; Tommotian-:; Lower-Cambrian'

variations-; sedimentation-; evolution-; cyclic-processes; atmosphere-; oceanography-

TI: Characterization of tar from a carbonate reservoir in Saudi Arabia; Part I„ Chemical aspect.
AU: Harouaka-A-S; Asar-H-K; Al-Arfaj-A-A; Al-Husaini-A-H; Nofid-W-AYR: 1991
DE: Saudi-Arabia; geochemistry-; organic-materials; engineering-geology; petroleum-engineering; reservoir-rocks; chemical-analysis;; methods-; chiomatography-; Arabian-Peninsula; Asia-; carbonate-rocks; characterization-; tar-; sampling-; thermal-analysis; X-ray-analysis

TI: Tàe influence of limestone stability on the interpretation of geochemical processes occurring in the saltwater-freshwater mixing zone.
AU: Wicks-Caiol-M; Heiman-Janet-S; Randazzo-Anthony-F; Jee-Jonathan-L
SO: Abstract5-with-Pmgrams-Geologîcal-Society-of--America. 22. (7). p. 63 YR: 1990
DE: Florida-:; hydrogeology-:; ground-water; Horidan-Aquifer; Southeastern-U.S.; Eastern- U.S.; United-Stales; Central-Florida; west-central-Fiorida; limestone-; carbonate-cocks; aquifers-:; geochemistry-; hydcochemistry-; salt-water; fresh-water; solubility-

TI: Radium isotopes» alkaline earth diagenesis, and age determination of travertine from Mammoth Hot Springs,, Wyoming» Ü.S.A.
AU: Sturchio-Neil-C
SO- Applied-Geochemistry. 5.. (5-6). p.. 631-640. YR: 1990
DE: Wyoming-; geochemistry-; isotopes-; sedimentary-rocks; carbonate-rocks; travertine-; radium-; Ra-228/Ra-226; Park-County-Wyoming; Mammoth-Hot-Sp'.ings; Western-U.S.; United-States; Yellowstone-National-Park; alkaline-earth-metals; metals-; cadioactive-isotopes; diagenesis-; sedimentary-petrology; absolute-age; Quatemary-

TI: Manganese contents of some rocks of Silurian, and Devonian ages in Northwest Virginia«
AU: Cox-Leslîe-J
OS: U. S. Geol Sun'., United-States; U. S. Geol. $Erv,, United-States
SO: Geological-Survey-Bullettn. p. B1-B16. YR: 1991
DE: Virginia-; geochemistry-; trace-elements; economic-geology; manganese-ores; .mineral-deposits; gen.esi.s-; supergene-pcocesses; sedimentary-rocks; manganese-; carbonate-rocks; Shenandoah-County-Virginia; Frederick-County-Virginia; Rockingham-County-Virginia; Hdderberg-Group; USGS-; Southeastern-U.S.; Eastern-US...; United-States; northwestern-Virginia; Silurian-; Devonian;-; lower-Paleozoic; Paleozoic-:; metal-ores; metals-; sedimentation-; marine-environment; environment-; shallow-waler-environment; mi neral - d eposits, -genesis

TI:: Manganese contents of some lower Paleozoic carbonate rocks of Virginia.
AU: Force-Eric-R
SO: Geological-Survey-Bulletin. p.. A1-A.9. YR: 1991
DE: Virginia-; economic-geology; manganese-ores; sedimentary-rocks; geochemistry-; manganese-; carbonate-rocks; mineral-deposits; genesis-; supergene-processes; Clarke-County-Virginia; Shenandoah-County-Virginia; Giles-County-Virginia; Buchanan-County-Virginia; Montgomery-County-Virginia; Grayson-County- Virginia; Carroll-County-Virginia; Botetourt-County- Virginia; Washington-County-Maryland; Shady-Dolomite; Knox-Group; USGS-; Southeastern-U.S.; Eastem-U.S..; United-States; western-Virginia; Maryland-; northwestern-Maryland; metals-; lower-Paleozoic; Paleozoic-; mineral-deposits, -genesis; metal-ores; marine-environment; environment- ; shallow-water-environment; geochemical-controls; sedimentation-:; hydrogeological-controls

TI: Manganese contents of some sedimentary rocks of Paleozoic age in Virginia.
AU: Force-Eric-R; Cox-Leslie-J
SO: Geological-Survey-Bulletin. 25 p. YR: 1991
DE: Virginia-; geochemistry-; manganese-; carbonate-rocks; sedimentary-rocks; Shady-Dolomite; Knox-Group; Oriskany-Sandstone; Helderberg-Group; US.GS-; Southeastern-U.S.; Eastem-U.S.; United-States; metals-; Paleozoic-; manganese-oxides; oxides-; manganese-ores; metal-ores; Appalachians-; North-America

TI: Devonian dolomites from the Holy Cross Mts.» Poland; a new concept of the origin of massive dolomites based on pétrographie and isoiopic evidence.
AU: Migaszewski-Zdzislaw-M
SO: Journal-of-Geology. 99.. (2). p. 171-187. YR: 1991
DE: Poland-; sedimentary-petrology; sedimentary-rocks; carbonate-rocks; dolostone-; isotopes-; carbon-; C-Ï3/C-12; oxygen-; Ö-18/Ö-16; diagenesis-; dolo.mitizatio.n-; evolution-; Central-Europe; Europe-; Swiety-Krzyz-Mountains; genesis-; petrography-; Upper-Devonian; Devonian-; clay-mineralogy; pyrite-; sulfides-:; stable-isotopes

TI: Oceanic ferromanganese geochemistry..
AU: Ancireev-Sergei-J (Andreyev, Sergey I.)
OS; VNIIQkeangeoL, Leningrad, USSR
SO: AAFG-Bulletin, 74. (6). p. 958 YR: 1990
DE: nodules-; ferromanganese-composition:; geochemistry-:; classification.-.; metals-:, carbonate-compensation-depth; diagenesis-; sedimentary-processes ; hy drothermal-processes

TI: A fluid inclusion and stable isotope study of synmetamorphic copper ore formation at Mount Isa, AustraJiareply.
AU: Heinrich-Chnstoph-A; Andrew-Anita-S; Wilkins-Ronald-W-T; Patterson-David-J
SO: Economic-Geology-and-the-Bulletin-of-the-Society-of-Economic-Geologists. 86. (1). p. 206-207. YR: 1991
DE: Queensland-; geochemistry-; isotopes-; fluid-inclusions; P-T-conditions; greenschist-facies; copper-ores; stable-isotopes; carbon-; C-13/C-12; oxygen-; O-18/0-16; hydrogen-; D/H-; mineral-deposits; genesis-, metamorphic-processes; deuterium-; ore-formiing-fliiids; Australia-; Aystralasia-; metal-ores; economic-geology Mount-Isa; inclusions-; mineral-deposits »-genesis; deformation-; breccia-; clastic-rocks; dolostone-; carbonate-rocks; zoning-; geologic-thermometry; greenstone-; schists-; paleosalinity-- alteration-; Urquhart-Shale; pH-; cooling-; mineral-assemblages; crystallization-; calcium-chloride; homogenization-

TI: Geochemical evidence supporting T. C. Chamber lin's theory of glaciation.
AU- Raymo-M-E
SO: Geology-(Boulder). 19. (4). p 344-347. YR: 1991
DE: biography-; general-; Chamberlin-; T.-C; glacial-geology; glaciation-; causes-; atmosphere-; geochemistry-; carbon-dioxide; weathering-; chemical-weathering; effects-; strontium-; isotopes-; Sr-87/5r-86; sedimentary-rocks; carbonate-rocks; Phanerozoic-; stratigraphy-; paleoclimatology-; global-; Chamberlin -T.-C, history-; ancient-ice-ages; degassing-; composition-" paleoatmosphere-; orogeny-; rates-; silicates-; alkaiine-earth-rnetals; metals-; stable-isotopes; paleo-oceanography; erosion-

TI: Manganese carbonate bands as *sin* indicator of hemipelagic sedimentary environments.
AU: Sugisaki-Ryuichi; Sugitani-Kenichiro; Adacii-Mamoru
SO: Journal-of-GeoIogy. 99. (1).. p. 23-40.. YR: 1991
DE: Japan-;, geochemistry-; manganese-; sedimentary-rocks; sedimentation-; environment-; hemipelagic-environment.:; minerals-; carbonates-; rhodochrosite-; isotopes-; oxygen-; 0-18/0-16; carbon-;; C-13/C-12; metals-; banded-materials; carbon-dioxide; chert-; chemically-precipitated-rocks; Paleozoic-:; Mesozoic-; Holocene-; Quaternary-; geochemical-indicators; Far-East; Asia-; Honshu-; Mino-Belt; stable-isotopes ; geochemical-profiles

Tl: Subdnctîon and accretion **of the Permanente Terrane** near San **Francisco, California.**
AU: Larue-D-K; Bames-I; **Sedlock-R-L**
SO: Tectonics.. 8.. (2). p. 221-235.. YR: 1989
DE: California-; tectonophysics-; plate-tectonics; San-Francisco-County-California; Franciscan-Formation; Calera-Limestone; Pacific-Coast; Western-U.,5..; United-States; San-Fıancisco-California; Pennanente-Terrane; structural-geology; tectonics-; limestone-; carbonate-rocks; subduction-; geochemistry-; "faults-; evolution-; faciès-; deformation-; greenstone-; schists-

TI: Carbon Isotope variations in **Cambrian-Proterozoic** rocks; a case for secular **global trend.**
AU: Banerjee-D-M
SO: Devdopments-in-Prccambrian-Geology.. 8. p., 453-470. YR: 1990
DE: Asia-; geochemistry-; isotopes-; carbon-; C-13/C-12; sedimentary-rocks; carbonate-rocks; Lower-Cambrian; Cambrian-; Proterozoic-; upper-Precambrian; Precambrian-; stable-isotopes; India-; **Indian-Peninsula; Pakistan-;** Mongolia-; Far-East; variations-;, ratios-

TI: Geochemistry of **Precambrian** carbonates; **3-shelf** seas **and** non-marine **environments** of the **Arcnean***
AU: Veizer-Jan; Clayton-Robert-N; Hin.ton~R-W; von-Brunn-Victor; Mason-T-R; Buck-S-G; Hoefs-Jochen
SO: Geochimica~et-Cosmoehimica-Acta. 54. (10). p. 2717-2729. YR: 1990
DE:; South-Africa; geochemistry-; isotopes-;. Western-Australia; sedimentary-rocks; stable-isotopes; sea-water; carbonate-rocks; sediments-; carbonate-sediments; strontium»; **Sr-87/Sr-86;** oxygen-; 0-1,8/0-16; carbon-; C-1.3/C-12; Precambrian-; Archean-; shelf-envl.ro-n.ment; environment-; Southern-Africa; Africa-; Australia-; Australasia-; Pongola-Supergroup; **Hameisley-Group;** alkaline-earth-metals; mêlais-; tectonics-; marine-sediments; playas-; dolostone-; chemical-composition; lacustrine-environment; Ventersdorp-Supergroup; • Fortescue-Group; trace-elements; iron-; manganese-

TÏ: Ec.log.itk **metamorphism in** carbonate **rocks; the** example **of** impure: marbles from, the **Sesia-Lanzo** Zone, **Italian** Western Alps,.
AU:Castelli~D
SO: Journal-of-Metamorphic-Geology. 9., (1). p. 61-77. YR: 1991
DE: Alps-;, petrology-; metamorphism-; Italy-; P-T-condlitions; high-pressune; metamorphic-rocks; faciès-:; eclogite-facïes; 'Europe-; Southern-Europe; carbonate-rocks; marbles-; Sesia-Lanzo-Zone; Western-Alps; geochemistry-; electron-probe-data.:; absorption-;. X-ray-speccra; chemical-composition; IGCP-

Tl: Glacial to **Hofocene** changes; in carbonate and clay sedimentation in the Equatorial Pacific Ocean estimated from thorium **230** profiles;.
AU: Yang-Yong-Liang; Eiderfield-Henry; Ivanovich-Miro
SO: Paleoceanography. 5. (5), p.. 789-809. YE: 1990'
DE: Pacific-Ocean; stratigraphy-; **Quaternary-;** thorium-; isotopes-; Th-230; sedimentation-; sedimentation-rates; **deep-sea-sedimentation;** geochemistry-; processes-; **solution-;** sediments-;, marine-sediments; Equatorial-Pacific; actinid.es-; metals-:; radioactive-isotopes; carbonate-sediments; glaeiomarine-environment; environment-; **postglacial-environment; marine-environment;** geochemical-indicators; upper-Pleistocene; Pleistocene-; **Holocene-;** geoehemical-profil.es;; paleo-oceanography; clay-; **clastic-sedimen'ts**

TÏ: Tracers of ocean paleoprodectivfty and **paleochemistry;** am introduction..
AU: Elderfield-Henry
SO: Paleoceanography. 5. (5). p. 711-718. YR: 1990
DE: sediments-; marine-sediments; geochemistry-; paleoecology-; indicators-; mari.n.e.-envi.ronment; productivity-:; environment-; geochemical-indicators; cadmium-; metals-; barium-; alkaline-earth-. metals; calcium-; ratios.-; paleo-oceanography; radioactive-isotopes; isotopes-; geochemical-profiles; carbonate-sediments; tracers-

Tl: Isotopic studies **of** caicite, pyrite, **and** wood from glacial deposits in the **Beardmore** Glacier area» **Transantarctic** Mountains.
AU: Hagen-Erik-H; Fauie-Gunter; Jones-Lois-M
SO: • Antan^c-Joornal-of-the-United-States. 24. (5). p. 67-68, YR: 1989
DE: glacial-geology; glacial-features; debris-; absolute-age; dates-; sediments-; Antarctica-; geochronology-; Paleozoic-:; isotopes-:; analysis-; sulfur-; S-34; Beardmore-Glacier; Polar-regions; Transantaictic-Mountains; **C-13;** stable-isotopes; carbon-; 0-18; oxygen-:; Sr-87/Sr-86; alkaline-earih-metals; metals-; strontium-; glacial-sedimentation; glacial-environment; environment-; limestone-; carbonate-rocks; pyrite-:; sulfides-; wood-; Shackleton-Limestone; Sirius-Fbrmation; East-Antarctica

TI: Primary and dlagemetic controls of **isotopic** compositions of iron-forniation carbonates.
AU: Kaufman-Alan-J; **Hayes-J-M;** Klein-C
SO: Geochiinica-et-Cosmochimica-Acta.- .54, (12).. p.. 3461-3473. YR: 1990
DE: Western-Australia; geochemistry-; sedimentary-rocks; diagenesis-; effects-; carbonate-rocks; isotopes-;, ratios-; carbon-; C-13./C-12; oxygen-; Q'-18/0-16; iron-formations; chemically-precipitated-rocks; lower-Proterozoic; Proterozoic-; upper-Precambrian; P'recambrian-;, **Dales-Gorge-Member;** Brockman-Iron-**Formation;** Australia-; Australasia-; Hamersley-Group; stable-isotopes

TI: **Geochemistry of sedimentary** carbonates.
AU: Morse-John-W; Mackenzie-rjired-T
SO: Developments-in-SedimentoIogy. 4-8.. 707' p. YR.: 1990
DE: sedimentary-rocks; carbonate-rocks; geochemistry-; mineral-composition; reactions-;, carbonates-; calcium-carbonate; diagenesis-; marine-environment; environment-; early-diagenesis

TI: (234>U - (238)ü - **(230)Th** - (232)Th **systematics in** salime **groundwaters** from central Missouri,
AU: Banner-Jay-L; Wasserburg-G-J; Chen-James-H; Moo:re-Clyde-H
SO: Earth-and-Planetary-Science-Letters. 101. (2-4). p.. 296-312. YR: .1990
DE: Missouri-; hydrogeology-; ground-water;, geochemistry-; radioactive-isotopes; isotopes-; uranium-; U-238/U-234; thorium-; Th-232/Th-230; Midwest-; United-States; central-Missouri; salt-water; **salinity-;** .artesian-waters; springs-; Mississippian-; Carboniferous-; Oidovician-; .sandstone-:; clastic-rocks; carbonate-rocks; aquifers-; hydrochemistry-; actinides-; metals-; radioactive-decay; brines-; po.lliu.tion-

TI: Relationshios between organic matter and metalliferous deposits in lower Palaeozoic carbonate formations in China.
AU: Jia-R; Liu.-D; Fu-J
SO: .S'pecial-Piifolication-of-the-IntematiO'nal-Association-of-Sedimentologists, (11). p. 193-201. YR: 1990
DE.: China-:; economi.c-geol.ogy; metal-ores; mineral-deposits; genesis-; controls-; geochemical-controls; *Far-East; Asia-; carbonate-rocks; upper-Paleozoic; Paleozoic-; organic-materials; Southern-China; mineral-depositsrgenesis; trace-elements; interprétation-; migration-of-elements; asphalt-;, bitumens-; IGCP-

TI: Stahle isotopic and trace elemental study *of* diagenetic styles: in adjacent **transgressİYe-regressive** (T-R) units,. Middle' **Devonian** Cedar Valley Group.
AU: Plocher-O-W; Ludvigson-G-A; Gonzalez-L-A
SO: **Abstracts-vnth-Programs-Geologjcal-Society-of-America.** 22. (.5), p. 42YR: 1990

DE: Iowa-; stratigraphy-; Devonian-; oxygen-; isotopes-; G-1.8/0-16; carbon-; C-13/C-12; sedimentary-rocks; carbonate-rocks; Invertebrates-; biochemistry-; diagenesis-; cementation-; geochemistry-'; trace-elements; Cedar-Valley-Formation; Coralville-Member; Littleton-Member; Midwest-; United-States; transgression-; regression-; Givetian-; Middle-Devonian; petrography-

TI: Anatomy of a Middle **Ordovician** carbon isotope excursion; preliminary carbon and oxygen **isotopic** data from limestone components in the **Decorah** Formation, Galena Group, eastern Iowa.
AU: Ludvigson-G-A; Witzke-Brian-J; Lohmann-K-C; Jacobson-S-J
SO: Afostracts-with-Programs-Geological-Society-of-Ameiica,. 2.2.. (5). p. 39 YR: 1990
DE: Iowa-; geochemistry-; isotopes-; carbon-:; C-13/C-12; oxygen-; O-18/O-16; sedimentary-rocks; limestone-; invertebrates-.; biochemistry-; **Decorah-Shale;** eastern-Iowa; Midwest-; United-States; **Galena-Dolomite;** carbonate-rocks

TI: Trace-element distribution across **calcite** veins; a tool for genetic interpretation.
AU: Erd-Yigal; Katz-Amkai
SO: Chemical-Geology. 85. (3-4). p. **361-367.** YR: 1990
DE: Israel-; geochemistry-; trace-elements; sedimentary-rocks; carbonate-rocks; chalk-; crystal-chemistry; carbonates.-; calcite-; Middle-East; Asia-; Jedean-Desert; Menuha-Formation; Santonian-; Senonian-; Upper-Cretaceous; Cretaceous-;, veins-; geochemical-profiles; dolomltization-; solution-; epigene-processes;.. extension-; crystal-growth

TI: Stratigraphie shifts in carbon isotopes from **Proterozoic** stromatolitic **carbonates** (Mauritania); **influences of primary** mineralogy and. diagenesis.
AU: Fairchild-I-J; Marshall-J-D ; Berrrand-Sarfati-J
SO: **American-Journal-of-Science.** 290-A... p. 46-79. YR: 1.990
DE: Mauritania-; stratigraphy-; Proterozoic-; carbon-; isotopes-; C-13/C-12; diagenesis-; materials-; stromatolites-; **sedimentary-**strucrtires; **biogenic-stroctutes;** sedimentary-rocks; carbonate-rocks; geochemistry-; IGCP-; West-Africa; Africa-; upper-Ptocambrian; Ptecambrian-; Atar-Group; stable-Isotopes; ultrastracture--; fractionatlon-; algae-; paleo-oceanography; **chemostratigraphy-**

TI: Carbon isotope shifts in **Fennsylvaman** seas:.
AU: **Magaritz-Mocdeckai;** Holser-William-T
SO: American-Joumal-of-Science. 290. (9). p. 977-994 YR: 1990
DE: New-Mexico; geochemistry-; isotopes-; Pennsylvania«-; .stratigraphy-; paleo-oceanography; carbon-; C-13/C-12; sedimentary-rocks; carbonate-rocks; Nevada-; Carboniferous-; Soufhwestern-U.S.; United-States; southwestern-New-Mexico; Big-Hatchet-Peak; .stable-isotopes; marine-environment; environment-; Western-U.S.; Arrow-Canyon; paleoatmosphere-; geochemical-profiles

TI: **Extreme** (13)C depletions in **seawafer-derived** brines and their implications for the past **geochenûcal** carbon cycle.
AU: Lazar-Boaz; Erez-Jonathan
SO: **Geology-CBoulder).** 18. (12).. p. .1191-1194. YR: 1990
DE: sea-water; geochemistry-; carbon-; isotopes-; C-13/C-12; geochemical-cycle; ecology-; observations-; hypetsaline-envjronment; Israel-; Red-Sea; stable-isotopes; brines-; salinity-; evaporites-; chemically-precipitated-rocks; carbonate-rocks; organic-materials; microbi.al-ma.ts; sediments.-; fractionation-; photosynthesis;-; environment-; Middle-East; Asia-; Indian-Ocean; Golf-of-Aqaba

TI: Paleomagnetism of the Cambrian Rover Dolomite and **Fenusylvanian Collings** Ranch Conglomerate. southern Oklahoma; an early Paleozoic magnetization and nonpervasive remagmetization by weathering,,
AU: Nick-Kevin-E; Ehnoıe-R-Douğlas
SO: Geological-Society-of-America-Bulletin. 10.2. (11). p. 1.517-1525. YR: 1990

DE: Oklahoma-; stratigraphy-; Pennsylvanian-; Cambrian-; paleoma.gneti.sm-; Paleozoic-; isotopes-; sedimentary-rocks; stable-isotopes; oxygen-; G-18/0-16; carbon-; C-13/C-12; Carter-County-Oklahoma; Miuxay-County-Oklahoma; Collings-Ranch-Conglomerate; Royer-Dolomite; **Southwestern-U.S.;** United-States; **south-cen'tral'-Oklahoma; Arbuckle-Mountains; Carboniferous-** ; dolostone-; carbonate-rocks; conglomerate-; clastic-racks; weathering-; .remagnetization-; dedolomitization-; karstlfiicatlon-; chérnical-rcmanent-magnetizatlon; **lemanent-magnetization;** magnetization-; SEM-data; natural-iemanent-magnettzation; depositional-remanent-magnetization; pole-positions

TI: The **influence of growth mechanism** and. surface structure on the partitioning of trace elements into minerals; examples from carbonate minerals.
AU: Reeder-Richard-J
SO: Chemical-Geology, 84. (1-4). p, 305 YR: 1990
DE: crystal-chemistry; carbonates-; calcite-; crystal-growth; partitioning-; diagenesis-; trace-elements; **crystal-structure**

TI: Dolomites; reconciling modern sample with the ancient **record.**
AU: **McKenzie-J-A**
OS: **ETH Geol.** Inst., Zurich,. Switzerland; Univ. Aix-Marseille Ii,, Lab. Geosci. Environ.» **Marseilles,** France
SO: Chemical-Geology., 84. (i-4), p. 190-191 YR: 1.990
DE: diagenesis-; dolomitiza.tlo.n-; sebkha-environment; environment-;, dolomite.-; carbonates-; dolostone-; carbonate-rocks

TÏ: Caribon and. oxygen isotopic **evidence** for iron-formation. **depofiitional** conditions; **Gnnflint** Formation, **Thunder** Bay region, Ontario, Canada.
AU: Cairigan-W-J; Cameran-E-M
• SO: Abstracts-with-Piograms-Geological-Soctety-of-America.. 21. (6). p., 24 YR: 1989
DE: Ontario-; stratigraphy-; Proterozoic-; Eastern-Canada; Canada-; upper-Precambrian; **Ptecambrian-;** isotopes-; **carbon-;** C-1.3/C-12; stable-Isotopes; oxygen-:; O-18/0-16; kon-focmations; chemically-precipitated-rocks; deposition-; GunfHnt-Formation; Thunder-Bay; limestone-; carbonate-rocks; **dolostone-;** siderite-; carbonates:-; black-shale; clastic-rocks; chert-; precipitation-; organic-materials; **iron-; metals-**

TI: Evolution of mi,ssissi.ppi valley-type ^(MVT) **brines** in Lower **'Qrdovician** carbonate rocks **of** the **Appalachian Orogen.**
AU: **Kesler-Stephen-E**
SO: Abstracts-with-Programs-Geological-Society-of-America.. 21. (6). p. 3 YR: 1989
DE: Appalachians-; economic-geology; base-metals; North-America;; evolution-; mississippi-valley-rype; metal-ores; Lower-Ordovician; Ordovician-; carbonate-rocks; Appalachian-Phase; sphalerite-;; sttlfides-; dolomite-; carbonates-; **fluorite-;** fluorides-; halides-; barite-; sulfates-; paragenesis-; Isotopes-; strontium-; **alkaline-earth-metals;** metals-; **Sr-87/Sr-86;** stable-isotopes; brines-; fluid-inclusions; inclusions-; East-l^enne&see-Field; solubility-; Tennessee-; Southern-U.S.; United-States; Pennsylvania-; Eastern-U.S.;. Newfoundland-; Eastern-Canada; Canada-; **ore-fonning-fluids;** mlneral-deposits,-genesis

TI: Bolomittzation of Lower Cambrian carbonate platform during **deep burial,** Virginia Appalachians, USA..
AU: Barnaby-R-J; **Read-J-F**
•SO: Inte.rn.ational-Geologlcal-Cong:rcss,-Abs:tracts-Congfes-Geologique-Intemation.ale,~Résumes. 28. (1). p. 89-90. YR: 1989

DE: Virginia-; sedimentary-petrology; diagenesis-, Appalachians-; Shady-Dolomite; Southeastem-U.S.; Eastern-U.S.; United-States, North-America; stratigraphy-; Cambrian-; Lower-Cambrian; dolomitization-; carbonate-platforms; cathodoluminescence-; brecciation-; C-13/C-I2; isotopes-, stable-isotopes; carbon-; O-18/Q-16; oxygen-, strontium-; aJkaline-earth-metals; metals-- Sr-87/Sr-86; iron-; manganese-; marine-environment; environment-; cement-, solution-; fluid-inclusions; Inclusions-

TI: The carbon- and oxygen-Isotope **record** of the **Precambrian-Cambrian** boundary interval in China and Iran and their correlation.,

AU: Brasier-Martin-D; Magaritz-Moideckai; Corfield-Richard; Lno-**Huilin;** Wu-Xiche; Ouyang-Lin; Jiang-Zhiwen; Hamdi-B; He-Tinggui; Fraser-A-G

SO: Geological-Magazine. 127. (4). p. 319-332. YR: 1990

DE: China-; stratigraphy-; Cambrian-; Iran-; Proterozoic-; carbon-: isotopes;-; C-13/C-12; oxygen-; O-18/O-L6; invertebrates-; biostratigraphy-; USSR-; ratios-; interpretation-; Far-East; Asia-Middle-East;; Yunnan-; Southwestern-China; Meishucun-; Szechwan-; Maidiping-.; Vailiabad-; stiatotypes-; upper-Precambrian Precantbrian-; Lower-Cambrian; upper-Proterosoic; correlation-: boundary-; diagenesis-; eariy-diagenesis; dolostone-; carbonate-rocks phosphate-rocks; chenucally-precipitated-rocks; trilobites-; stable-isotopes; Morocco-; North-Africa; Africa-; Tommotlan-; India-Indian-Peninsula; Siberia-; mollusks-; Russian-Republic

TI: .Experimental study bearing on. **the** absence of carbonate **in mantle-derived senofiihs.**

AU: Canil-Dante

SO: Goology-CBottlder)., 18. (10). p. 1.011401.3, YR; 1990

DE: magmas-; geochemistry-; dissociation-; processes-; mantle-; composition-; .minerai-composition; Inclusions-; xenoliths-; **kimberiite-;** phase-equilibria; experimental-studies.; CaO-MgO-SiO.2-CO2; P-T-conditions; high-pressure; peridotites-; ultramafies-; carbon-dioxide; synthesis-; decompression-; decarbonation-; carbon-

TI: **Dinantian** dolomites from East Fife; **hydrothermal** overpri.nti.ng of early **nmdng-zone** stable **isotopic** and. **Fe/Mn compositions.**

AU: Searl-A; Fallick-A-E

SO: Joumal-of-the-Geological-Sociery-of-London. 147. (4). p. 623-638. YR: 1990

DE: Scotland-; sedimentary-petrology; sedimentary-rocks; carbonate-rocks; geochemistry-; isotopes-; oxygen-; O-18/O-16; carbon-; C-13/C-12; diagenesis-.; dolomiti zati on-; Great-Britain; United-Kingdom; Western-Europe; Europe-; **Dinantian-;** Carboniferous-; limestone-;; dolomite-; carbonates-;; mixing-; stable-isotopes; iron-; metals;-.; manganese-; Saint-Monans-Syncline; Fife-; 5EM-da.ta; cement-,; .petrography-; thin-sections; Nfid-Kinniny-Limestone; Chaiiestown-Main-limestone; Saint-Monans-little-Limestone; Patfihead-Fau.lt; major-elements; calcite-; siderite-; Saint-Monans-Biecciated-Iimestone.; Saint-Monans-White-Iimestone

TI; **'Intracrystalline** carbon and oxygen isotope **variations** in calcite revealed by laser **microsampling.**

AU: Dickson-J-A-D; Smalley-P-C; Raheim-A; Stljftoom-D-E

SO: Geology-CBouIder).. S8. (9). p. 809-81 !.. YR: 1990

DE: minerals-; carbonates-; calcite-; crystal-growth; spectroscopy-; laser-methods; techniques-; chemical-analysis; methods-; carbon-; isotopes-;; C-13/C-12; oxygen-; O-18/0-16; Wales-; **Great-Britain;** United-Kingdom; Western-Europe; Europe-:; South-Wales; Abercriban-; Carboniferous-; limestone-.; carbonate-rocks; vugs-; sample-preparation; stable-Isotopes; zoning-; chemical-composition.; precipitation-

TI: Glaciation and saline-freshwater mixing as a possible cause of cave formation in the eastern **Midcontinent** region of the United States; a conceptual model.

AU: Panno-Samuel-V; Bourcier-William-L

SO: Geology-(Boulder). 18. (8). p. 769-772. YR: 1990

DE: Illinois-; geomorphology-; solution-features; Michigan-;; Appalachians-; caves-; glacial-geology; glaciation-; diagenesis-; effects-- karstification-- Midwest-- United-States- Illinois-Basin; Michigan-Basin; North-America; Appalachian-Basin.; Midcontinent-; genesis-; theoretical-models;; models-; karst-; salt-water; discharge-; fresh-water; ice-movement; aquifers-; limestone-:; carbonate-rocks; ground-water; consolidation-; recharge-:; mixing-; hydiochemistry-

11: 'Channelized fluid **flow through shear** zones during **fluid-enhanced** dynamic: «crystallization, Northern. **Apennines, Italy.**

AU: Carter-Karen-E; Dworkin-Stephen-I

SO: Geology-CBoulder). 18. (8). p. 720-723.. YR: 1.990

DE: Italy-; structural-geology; defo.rmali.on-; Apennines-; crystal-growth; carbonates-; ' calcite-; structural-analysis; preferred-orientation; faults-; effects-; shear-zones; field-studies;" recrystallization-; isotopes-; sedimentary-rocks; limestone-; strontium-; Sr-87/Sr-86; oxygen-; O-18/O-16; geochemistry-; trace-elements; Southern-Europe; Europe-; Northern-Apennines; liguria-; Triassic-; Portoro-Li mes tone; nappes-;; fluid-phase; stable-isotopes; aikaline-earth-metals; mêlais-; low-grade-metamorphism; metamorphism-; carbonate-rocks

TI: **Geochemical** and isotopic **constraints on** the **diagenetic** history of a massive' **stratal,** Late Cambrian **(Royer) dolomite,** Lower **ArfoudUe** Group» Slick Hills, **SW Oklahoma,'** USA.

AU; Gao-Guoqiu

SO: Geochimica-et-Cosmochimica-Acta. 54. (7). p 1979-1989 YR-1990

DE; Oklahoma-; geochemistry-; trace-elements; diagenesis-; isotopes-; sedimentar}^-rocks- ratios-; carbonate-rocks; dolostone-.; oxygen-; O-18/0-16; strontium-; S.r-87/Sr-86; carbon-.; C-13/C-12; Slick-Hills; Southwestern-U.S.; United-States; southwestern-Oklahoma.:; Arbuckle-Group; Royer-Dolomite; Upper-Cambrian; Cambrian-; stable-isotopes; alkaline-earth-metals; metals-

TI: Geochemical **sampling and** .analysis:.

AU: Jones-D-G; **Webb-P-C**

TI: **Diagenesis** of carbonate cements in **Permo-Tr** lassie sandstones from the Iberian Range, Spain; evidence from **chemical and** stable: isotopes.

AU: Motad-S; Al-Aasm-lhsan-Shakir; .Ramseyer-Karl; Marfil-R; Aldahan-A-A

SO: Sedimentary-GeoJogy. 67. (3-4). p., 281-295. YR: 1990

DE,;: Spain-;; stratigraphy-;; Permian-; Tri.assi.c-; isotopes-.; diagenesis-; cementation-; oxygen-; O-18/CM6; carbon-;; C-B/C-12; sedimentary-rocks; clastic-rocks; sandstone-; Iberian-Peninsula; Southern-Europe; Europe-; Iberian-Mountains; cement-:; carbonates-; stable-Isotopes; dolomite-; calcite-; Guadalajara-Province; petrography-;; geochemistry-

TI; Precipitation of dissolved carbonate species from **natural water for** delta (13)C analysis; a critical appraisal.

AU: Bishop-Philip-K.

SO: Chemical-Geologyî-Isotope-Geoscience-Section. 80. (3). p 251-259. YR: 1990

DE: chemical-analysis; techniques-; sample-preparation; carbon.-.; isotopes-; C-13/C-12; geochemistry-; processes-.; precipitation-; stable-isotopes; natural-materials; water-; fractionation-; analysis-;, experimental-studies; carbonates-

TI: Sedimentology and geochemistry of a **regional** dolostone; correlation of trace **elements** with **dolomite** fabric and texture.

AU: Shukla-Vijai

SO: Abstracts - Society - of — Economic — Paleontologists - and. - Mineralogists,-Annual-Midyear-Meeting. 1986 (Vol. 3). p. 102 YR: 1986
DE: North-Dakota; geochemistry-; trace-elements; Intedake-Formatlon; Williston-Basin; Midwest-;; United-States; diagenesis-; Silurian-; dolomitization-; dolostone-; carbonate-rocks; textures-

TI: A multkomponent carbonate-silicate model of the sedimentation process in the Precambrian oceans.
AU: Mef-nichuk-V-I
SO: Oceanology. 29. (2).. p. 203-207. YR: 1989
DE: Pîrecambrian-; stratigraphy-; paleo-oceanography; sedimentation-; processes-; marine-sedimentation; th.eoretical-stadi.es; mathematical-models; models-; silicates-; carbonates-;, carbon-dioxide

TÏ: Successive pore fluid générations in a Lower Permian brine: aquifer, Palo Du.ro Basin, Texas. Panhandle, U.S.À.
AU: Hsher-R-Stephen; Posey-Harry-H; Kyle-J-Richard
SO: Applied-Geochemistry;. 4. (5). p., 455-464. YR: 1989
DE: carbon-; Isotopes-; C-13/C-12; oxygen-; O-18/0-16; strontium-; Sr-87/Sr-86; water-:; ratios-; Texas-; geochemistry-; sedimentary-rocks; carbonate-rocks; pore-water; Lo'wer-Permian; Permian-; brines-; Palo-Duro-Basin; Southwestern-U.S.; United-States; Panhandle-; alkaline-earth-metals:; metals-; stable-isotopes

TI; Microlfthon alteration, associated with development of solution, cleavage in argillaceous limestone; textural, trace-elemental and. stable-isotopie observations.
AU: Bhagat-Snehal-S; Marshak-Stephen
SO: Journal-of-Structural-Geology. 12. (2). p. 165-175.. YR: 1.990
DE: structural-analysis; interpretation-; cleavage-; oxygen-; isotopes-;; O-.18/0-16; New-York; structural-geology, carbon-;, C-İ3/C-12; .sedimentary-rocks; limestone-; stron.tiu.m-; geochemistry-; manganese-; Greene-Cöunty-New-York; Albany-County-New-York; Ulster-County-New-York; Kalkberg-Limestone; Coeymans-Förmation; Manlius-Fonnation; Eastem-U.S.; United-States; eastern-New-York; carbonate-rocks; Hudson-River-valley; CMskill-New-York; Albany-New-York; Kingston-New-York; »crystallization-; petrofabri.es-;, calcite-; carbonates-; slip-cleavage:; foliation-;, micrplithons-; • trace-elements; statistical-analysis; metals-;, Lower-Devonian; Devonian-; alkalîne-earth-metals; stable-isotopes

TI: Stable Isotopic systematks of the Bushveld Complex II, Constraints on hydrothermal processes in layered intrusions.
AU: Schiffries-Cralg-M; Rye-Danny-M
SO: American-Journal-of-Science. 290. (3). p.. 209-245. YR: 1990
DE: South-Africa; geochemistry-; isotopes-; intrusions-; layeied-intrusions; contact-metamorphism; metasomatism-; processes-; hydrothermal-alteration; hydrogen-; D/H-; carbon-;, C-13/C-I2; oxygen-; O'-1.8/Ö-16; mineral-deposits; genesis-; metal-o.res; hydfothecmal-processes; analysis-; stable-Isotopes; Southern-Africa; Africa-; Transvaal-; Bushveld-Complex; aureoles-; metamorphism-; hydrotheimal-conditions; deuteri'um-; mineral-deposits-,-genesis; veins-; carbonate-rocks; igneous-rocks; ore-forming-flulds

TI: Geochemistry and sedimentology of a facies transition from limestone to iron-formation deposition in the early Proterozoic Transvaal Supergroup, Sooth Africa,
AU: KMn-Cornelis; Beukes-Nicolas-J
SO' : Economic - Geology - an.d - the - Bulletin - of - the - Society - of-Economic-Geologists.. 84. (7). p.. 1733-1774., YR: 1989
DE: Sooth-Africa; economic-geology; iron-ores; mineral-deposits; genesis-;, hydrothennal-processes; sedimentary-petrology; sedimentary-rocks; chemically-preeipltated-f ocks; iron-formations; Southern-Africa; Africa-;, Transvaal-Supergroup; reconstruction-; deposition-; limestone-; carbonate-rocks; dolostone-; shale-; clastic-rocks; precipitation-; regression-; models-;; Kaapvaal-Craton; organic-carbon.;, organic-materials; transgression-; rare-earths; metals-; East-Paclfic-Rise; Atlantic-Ocean; mi.xl.ng-; ore-fbrming-fluids; mineral-deposits.-genesis; metal-ores; Kuruman-lron-Formation; outcrops-; weathering-; alteration-; Danielskuil-; Kuruman-; Pomfret-Mine; as bes tos -deposi ts ; b oreh oles -

TI: Pétrographie and geochemical evidence for origin of paieospeieothems, New Mexico; Implications for the application of fluid inclusions to studies of diagenesis.
AU: Goldstein-Robert-H
SO: Joumal-of-Sedimentary-Petrology. 60. (2). p. 282-292. YR: 1990
DE: New-Mexico; stratigraphy-; Mississippian-; isotopes-; sedimentary-rocks; ratios-; carbon-; C-13/C-12; oxygen-; 0-18/0-16; fluid-Inclusions; geologic-thermometry; interpretation-; geochemistry-; trace-elements; diagenesis-; processes-' carbonate-rocks; limestone-; Lake-Valley-Formation; Southwestern-U.S.; United-States; Carboniferous-; solution-features; paleokarst-; speleothems-; calcite-; carbonates-; stable-isotopes; inclusions-, paleosalinity-

T1: (13}C and (18)O coBiposJtions of carbonates from a cyclic carfoonate-evapoiite rock sequence; evidences for meteoric water input.
AU.: Sheu-Der-Duen
SO: Chemical-Geology. 81.(1-2). p. 157-162. YR: 1990
DE: Texas-; geochemistry-; isotopes-; sedimentary-rocks; carbonate-rocks; sedimentation-:; environment-:; nearshore-environment; carbon-; C-13/C-12; oxygen-;, Q-18/0-16; McKnight-Formation; Cretaceous-; Albian-; Lower-Cretaceous; southern-Texas; eva.porit.es- ; chemlcally-precipitated-rocks ; cyclic-processes ; stable-isotopes ; paleogeogra.pb.y-; .geochemical-indicators; marine-environment; fresh-water-environment; meteoric-water; subtidal-environment; intertidal-environment; rhythmic-bedding; planar-bedding-structures; sedimentary-stractares; Southwestern-U.S.. ; United-States

TI: Comparative study of the kinetics and mechanisms of dissolution of carbonate minerals.
AU: Chou-Lei; Garrels-Robert-M; Wollast-Roland
SO: Chemical-Geology. 78. (3-4). p. 269-282. YR: 1989
DE: geochemistry-; processes-;, solution-; calcite.-; carbonates-; aragonite-;, magnesite-; dolomite-; experimental-studies; kinetics-; pH~; theonodynamic-properties; stoichiometry-

TI: Petrography, trace elements and oxygen and. carbon, isotopes of Gordon Group ca.rboea.tes; (Ordovician),,, Florentine: Valley, Tasmania, Australia.
AU: Rao-C-Prasada
SO: Sedimentary-Geology. 66. (1-2). p.. 83-97, YR: 1990
DE: Tasmania-; geochemistry-; trace-elements; sedimentary-rocks; carbonate-rocks; stratigraphy-:; Ordovician-; diagenesis-; isotopes-; oxygen-;, O-18/Q-16:; carbon-; C-13/01.2; Australia-.; Australasia-:; Florentine-Valley; Gordon-Limestone; petrography-; stable-isotopes; Arenigian-;, Lower-Ordovician; Ashgillian-; Upper-Ordovician; strontium-; alkaline-earth-metals; metals-; sodium-; alkali-metals; manganese-; iron-; magnesium-; dolostone-:; glacial-environment; environment-; Benjamin-Limestone; materials-; intertidal-environment; sxipiatidal-environment; sufotidal-environmenl; 'Casm'ons-Creek-Iimest'One

TI: Did major changes in the stable-iso tope composition of Proterozoic seawater occur?.
AU: Burdett-J-W; Grotzinger-John-P; Arthur-M-A
SO: Geology-(Boulder).. 1&, (3). p. 227-230. YR: 1990
DE: Northwest-Territories; geochemistry-; isotopes-;, Canadian-Shield; Proterozoic-:; stratigraphy-; paleo-oceanography; oxygen-:; O-18/0-16; carbon-; C-13/C-12; sedimentary-rocks; carbonate-rocks; diagenesis-; Canada-; North-America; Rockwest-Fbrmation; upper-Precambrlan; Precambrian-; lower-Proterozoic; stable-isotopes; eariy-diagenesis; dolomitization-; cementation-; oolite-:; marine-environment; en vironment-

TI: Origin of late **Precambrian** intrusive carbonates, Eastern Desert of Egypt and **Sudan; C,** O and. Sr **isotopic** evidence.
AU: Stern-Robert-J; Gwinn-Cynthia-J
SO: Precambrian-Researek 46.. (3).. p. 2.59-272., YR; 1990
DE: Egypt-; geochemistry-:; sedimentary-rocks; carbonate-rocks; isotopes-; carbon-; C-I3/C-12; oxygen-; 0-18/0-16; strontium-; Sr-87/Sr-86; North-Africa; Africa-; Sudan-; East-Africa; genesis-; upper-Precambrian; Precambrian-; intrusions-; Eastern-Desert; stable-isotopes; alkaline-eairth-metals; metals-; basement-; whole-rock.; Pan-African-Orogeny; mixing-; evolution-; continental-margin; melange-; X-ray-data

TI: **Geochemistry** of drift over the **Precamhrian Grenville** Province» **southeastern** Ontario **and** southwestern Quebec.
AU: Kettles-I-M; Shilts-W-W
SO: Paper-Geological-Survey-of-Canada. p.. 97-112..
YR: 1989
DE: Ontario-; geochemistry-; drift-; Quebec-; glacial-geology; glaciation-; glacial-transport; Eastern-Canada; Canada-; clastic-sediments; Precambrian-; Grenville-Province; southeastern-Ontario; sou.thwestem-Qu.ebec; till-; Frontenac-Arch; overburden-; acid-rain; mineral-exploration; •trace-elements; minor-elements; wea.theri.ng-; lithofacies-; copper-; metals-; chromium-; Ottawa-Valley; Gati.nea.e-Valley; clay-; bedrock-; marbles-; outcrops-; glaciomarine-environment; environment-; boulder-trains; glacial-features; distribution-; zinc-; arsenic-; calcium-carbonate; histograms-; statistical-analysis

TI; **Changes** in marine **isotopic** composition and the Late **Ordovidan** glaciation,
AU: Marshall-James-D; Middleton-Paul-D
SO: Journal-of-the-Geological-Society-of-London. 147.. (1). p. 1-4. YR: 1990
DE: Sweden-; stratigraphy-; Ordovician-; isotopes-; sedimentary-rocks; ratios-; carbonate-rocks; coquina-; carbon-; C-I3/C-12; oxygen-; Ö-18/Ö-16; geochemistry-; trace-elements; brachiopods-; biostratigraphy-; glaci.al-geol.ogy; ancient-ice-ages; paleoclimatology-; Scandi.na.via-; Western-Europe; Europe-; stable-isotopes; limestone-; Upper-Ordovician; Siljan-; central-Sweden; paleo-oceanography; KuIIsberg-Iimestone; Boda-Limestone; Dalama-; Hindella-; cathodoluminescence-

TI: Carbon iso topic ratios of Silurian marine carbonates in the Michigan. **Basin;** a record of organic: **productivity?.**
AU: Cercone-K-R; Lohmann-K-C
SO: Abstra.cts-S'Oci.ety-of-EcoMomic-Paleontologl.sts-and-Mineralogists,-Annnal-Midyear-Meeting. 3.. p., 20' YR: 1986
DE: Michigan-; geochemistry-; carbon-; Michlgan-Basin; North-America; isotopes-; Silurian-; carbonate-rocks; marine-environment; environment-; ratios-; brachiopods-; cementation-; dia.gene.sis-; C-13/C-12; stable-isotopes; anaerobic-environment; bacteria-; fermentation-; organic-materials; Midwest-; United-States; omdation-; shelf-environment:

TI: Gradients in. carbonate: **.mineralogy, Biscayne** Bay» **SE** Florida; a reassessment of **XRD** analysis.
AU: Burton-Elizabeth-A
SO: Abstracts-Society-of-Economic-Paleontologists-and-Mineralogists$_t$-Annual-Midyear-Meeting. 3. p. 16-17 YR: 1986
DE: Honda-; sedimentary-petrology; sediments:-; Dade-Counry-Florida; Southeastern-U.S»; Eastem-U.S.; United-States; Biscayne-Bay; carbonate-sediments; fresh-water-eriivi.ronm.enit; environment-magnesium-; alkaline-earth-metals; metals-; calcite-; carbonates-aragonite-; X-ray-data; ratios-; solution-; Atlantic-Coastal-Plain North-America

TI: Sedimentary cycling and the **Phanerozoic** carbonate mass distribution.
AU: Mackenzie-Fred-T
SO: Abstracts - of- Papers - American -Chemical-Sociery^National-Meeting. 198. p. GEOC 15 YR: 1989
DE: sedimentary-rocks; carbonate-rocks; geochemistry-; geochemical-cycle; carbon-; Triassic-; Phanerozoic-; uniformitarianism-; Devonian-; rates-:; calcite»; carbonates-; dolomite-; ratios-; Cambrian-; Permian-; Quaternary-; Ordovician-; Carboniferous-; Silurian-; Jurassic-; Cretaceous-; Cenozoic-; oxygen-; concepts-

TI: Global **Pbanerozoic geocbemical cycle** of carbon..
AU: Ronov-Alex-B
OS: Verna.ds.ky lust., Moscow, USSR
SO: Abstracts-of-Papeas-American-Chemical-Society,-Natio.nal-Meering. 198.. p. GEOC 13 YR: 1989
DE: geochemistry-; geochemical-cycle; carbon-:; organic-carbon; organic-materials; carbonate-ion; oxygen-; sedimentary-rocks; carbon-dioxide; Phanerozoic-; paleoatmosphere-; evolution-; atmosphere-; volcanism-

Tl: Cartoon isotope fractionation between dissolved **carbonate (CO3(2-))** and **CO2(g)** at 25 degrees and **40 degrees-C**
AU: Lesniak-P-M; Sakai-H
SO: Earth-and-Planetary-Science-Letters. 95. (3-4). p. 297-301. YR: 1989
DE: carbon-; isotopes-; C-13/C-Î2; stable-isotopes; fractionation-; carbon-dioxide; carbonate-ion; d:issolved-materi.als; experimental-studies; open-systems; pH-

TÏ: Geochemistry of some **Ordovidan and Devooiao** tri! obi te cuticles from North America.
AU: McAllister-John-E; Brand-Uwe
SO[1]: Chemical-Geology. 78, (1>. p. 51-63.. YR: 1989
DE: Ontario-; paleontology-; Trilobita-; New-York; trilobites-; biochemistry-; Ordovician-; isotopes-; cuticles-; diagenesis-L geochemistry-; trace-elements; carbon-, C-13/C-12; oxygen-; O-18/O-16; sedimentary-rocks; Erie-County-New-York; Livingston-County-New-York; Ludlowville-Formation; Moscow-Formation;; Eastern-Canada; Canada-; Great-Lakes-region; North-America; Eastem-U.S.; United-States; west-central-New-York; Onondaga-limestone; Whitby-Fornnation; Cobourg-Formation; Verulam-Formation; southern-Ontario; Devonian-; minor-elements; Phacops-rana; Isoletus-gigas; calcite-; carbonates-; stable-isotopes; limestone-; carbonate-rocks; shale-; clastic-rocks

TI: Late Proterozoic glacial carbonates in Northeast Spitsbergen; new insights into the carbonate-tillite association.
AU: FaircMSd-I-J; Hambrcy-MichaeS-J; Spiro-B; Jefferson-T-H
SO: Geological-Magazine. 126. (5). p. 469-490. YR: 1989
DE: Spitsbergen-; stratigraphy-; Proterozoic-; sedimentary-rocks; lithofacies-; isotopes-; carbonate-rocks; oxygen-; O-18/O-16; carbon-; C-13/C-12; sedimentation-; environment-; interprétation-; Svalbard-; Arctic-region; apper-Precambrian; Precambrian-; upper-Proterozoic; Pettovbreen-lVIember; Eldobreen-Fbmiation; stable-isotopes; glacial-environment; cathodolominescence-; Wilsonbreen-Formation; glaciolacestrine-environment; paleoenvironment-; environmental-analysis; tillite-; clastic-rocks; petrography-

11: Application of geochemistry to **the stratigraphie** correlation of Appin and Argyll Group carbonate **rocks** from the **Dalradian** of northeast Scotland.
AU: Thomas-C-W
SO: Joumal-of-the-GeoIogical-Society-of-London., 146.. (4). p. 631-647. YR: 1989
DE: Scotland-; geochemistry-; trace-elements; stratigraphy-; Cambrian-; Precambrian-; metamorphic-rocks; metasedimentary-rocks; Great-Britain; United-Kingdom; Western-Europe; Europe-; Dalradian-; Appin-Group; Argyll-Group; carbonate-rocks; northeastern-Scotland

TI: Trace **element** and isotope: **geochemistry** of **zoned caicite** cements, Lake Valley **Formation (Mississippian,** New Mexico)[1]; **insights** from water-rock **interaction modelling.**
AU: Meyers» Wiiiiam-J
SO: Sedimentary-Geology., 65. (3-4). p.. 355-370. YR: 1989
DE: New-Mexico; geochemistry-; trace-elements; diagenesis-; cementation-; caicite-; oxygen-:; Isotopes-; Ö-18/Ö-16; carbon-; C-13/C-12; minerals-; ratios-; Lake-Valley-Formation; Southwestern-U.S.; United-States; carbonates-; cement-; **stable-isotopes;** crystal-zoning; Mississippian-; Carboniferous-; rock-water-Interface; rnodels-; cathodoluminescence-

TI: Détermination of both chemical and stable isotope composition in milligramme-size carû onate samples.
AU: Coleman-Max-L; Walsh-J-Nick; Benraore-Richard-A
SO: Sedimentary-Geology. 65.. (3-4).. p. 233-238. YR: 1989
DE: minerals-; carbonates-; chemical-composition; oxygen-.; isotopes-; Ö-18/Q-16; carbon-; **C-13/C-12;** ratios»; stable-Isotopes; experimental-studies; inductivdy-coupled-plasma-methods

TI: **High-resolution** scanning proton **microprobe** studies of micron-scale trace element zoning in a secondary dolomite; implications for studies of re d ox behaviour in dolomites.
AU: Fraser-Donald-G; Feltham-David; Whiteman-Mark
SO: Sedimentary-Geology. 65. (3-4). p. 223-232. YR: 1989
DE: Italy-; geochemistry-; trace-elements; crystal-growth; carbonates-; dolomite-; minerais-; diagenesis-; cementation-; Southern-Europe; Europe-; Eh-; crystal-zoning; cement-; electron-probe-data; cathodoluminescence-; X-ray-data; Gargano-Feninsula

TI: The laser microprobe and its; application to the study of C **and** O isotopes in caicite and aragonite.
AU: Smalley-P-C; Snjfhoorn-D-E; Raheim-A; Johansen-H; Dickson-**J-A-D**
SO: **Sedimentary-Geology.** 65. (3-4). p.. 211-221, YR: 1989
DE: oxygen-;, isotopes-; 0-18/0-16; carbon-; C-13/C-12; diagenesis-; cementation-; caicite-; minerals-; ratios-; carbonates-; crystal-growth; analysis-; laser-methods; stable-isotopes; aragonite-; cement-;; crystal-zoning

TI; **Neomo-rphisoi** and **cementation** in ancient deep-water limestones;, Cow Head, Group* **(Cambro-Ordovkian), western** Newfoundland., Canada.
AU: Coniglio-M
SO: Sedimentary-Geology, 65. (1-2). p., 15-33. YR: 1989
DE: Newfoundland-; geochemistry-; trace-elements; diagenesis-; cementation-; limest.on.e-; sedimentary-rocks.; carbonate-rocks; carbon-; isotopes-; C-B/C-12; oxygen-; **O-18/O-16;** Eastern-Canada; Canada-; sedimentary-petrology; deep-sea-environment; environment-; Cow-Head-Group; Cambrian-; Ordovician-; western-Newfoundland; stable-isotopes; cathodoluminescence-; »crystallization-; caicite-; carbonates-; crystal-zoning; Humber-Anmi-Allochthon; petrography-; SEM-data

TI: Active dissolution in modern shallow marine carbonate sediments; global implications?.
AU: Walter-Lynn-M; Burton-Elizabeth-A
SO: Abstracts-with-Programs-Geological-Society-of-America... 19. (7). p. 880 YR: 1987
DE: Fl.orid.a-; oceanography-; sediments-; solution-; shallow-water-environment; environment-; marine-environment; carbonate-sediments; global-; pore-water; geochemistry-; Florida-Keys; Southeastern-U.S.; Eastem-U.S.; United-States; aragonite-; carbonates-; caicite-; cores-; carbonate-platforms; organic-materials; geochemical-cycle

TI; **Th/U** dating; **of open** carbonate: **systems.**
AU: Hillaire-Marcel-C; Causse-C; Carro-O; Casanova-J; Ghaleb-B; Goetz-C
SO: Chemical-Geology. 70. (1-2)., p. 127 YR: 1988
DE: absolute-age; dates-; carbonate-rocks; sedimentary-rocks; age-; caliche-; travertine-; stromatolites-:; biogenic-stroctures; algae-; Th/U-; caicite-; carbonates-

TI: Tie use of **the Th-230** .and **Ba** as indicators **of palaeoproductivity** over a 3§Q kyr time: scale; evidence from, **the NW Arabian Sea.**
AU: Şhimmield-Graham-B; Price-N-B; Khan-A-A
SO: Chemical-Geology. 70.. (1-2). p. 112 YR: 1988
DE: Arabian-Sea; stratigraphy-; Quaternary-; thorium-;, isotopes-; Th-230; barium-; geochemistry-; sediments-; northwestem-Arabian-Sea; actinides-; metals-; radioactive-isotopes; **alkaline-earth-metals;** Owen-Ridge; calcium-carbonate; paleoproductivity-; Indian-Ocean; paleo-oceanography

TI: Chemical and mineralogical effects of acid deposition on **Shelburne** Marble and Salem Limestone test samples placed at four NAPAP **weather-monitoring** sites.
AU: Ross-Malcoïm- McGee-Elaine-S; Ross-Daphne-R
SO: American-Mineralogist. 74. (3-4). p. 367-383. YR: 1989
AB: Marble and limestone briquettes were placed at National Acid Precipitation Assessment Program (NAPAP) test sites in North Carolina, Washington, D.C., New Jersey, and New York to determine mineralogicaï changes, that might be attributed to acid deposition. Samples have been examined after exposures of 1 .and 2 yr, and the most significant change is the development of a gypsum-rich "spot"" on the sheltered side of the briquettes. X-ray and SEM analyses reveal that gypsum plus caicite is present within the "spot" area, but outside this area and on the upper surface of the briquettes, only caicite is detected. A model, based on the sequence of salts observed to **crystallize** from a -progressively more concentrated solution, is **presented** to' explain the. presence of the **"spor"** on the undersides of the briquettes.. In the models, the CaCO3 -saturated solutions filling the pore space in the- stone continuously precipitate- caicite during the drying period after the rain event; gypsum is precipitated only after evaporation is nearly complete. As evaporation proceeds, the solution, migrates by gravity to the lower surface of the briquette and the last residual liquid precipitates gypsum and produces, the gypsum-rich "spot". It is proposed that the most significant stone damage is due to salt: build, up on. and within the stone rather than due to stone removal through dissolution.—Modified journal abstract.
DE: construct!on-materials; geochemistry-; weathering-; chemical-weathering;;, building-stone; rock-mechanics; materials-; properties-; pollution-:; effects-; atmosphere--; acid-rain.; hydrology-; atmospheric-precipitation:; Salem-Limestone; Shelburne-Marble; NAPAP-; Natl.-Acid-Precipitati'On-Assess.-Program; marbles-; limestone-;, carbonate-rocks; limestone-deposits; marble-deposits; field-studies; **sulfuric-**acid; nitric-acid; SEM-data; salt-; evaporites-; chemically-precipitated-rocks; gypsum-; sulfates-; caicite-; carbonat.es-

11: Stable **isotopk (S,C,O) study** of the **Abbeytown Zn+Pb+Ag** mine, Co. Sligo, Ireland.
AU: Hitzman-Mu.na.y-V; Recio-C; Cauifield-J-B-D; Boyce-A-J; FalMck-Anthony-E
SO: Abs.'tracts-with-Programs-Geological-Society-of-Ameri.ca. 20. (7). p. 38 YR: 198®
DE: Ireland-; economic-geology; silver-ores; lead-zinc-deposits; Western-Europe; Europe-; metal-ores; pyrite-; sulfides-; precio<us-metals; geochemistry-; isotopes-; stable-isotopes; oxygen-; carbon-; sulfur-; Abbeytown-JVSine; Mississippian-; Carboniferous-; carbonate-rocks; dolomitlzation-; dedolomitizatlon-; fluid-inclusions; inclusions-; sphalerite-; galena-; breccia-; clastic-rocks; S-34/S-32; C-13/C-12;.O'-18/O-16;Sligo-

TI: Discovery of **a** second Ordovieiait meteorite using **chromite** as **a** tracer...
AU: Nystram-Jan-Olav; Lind.strom-Mau.rits; Wickman-Frans-E
SO: Nature-(London), 336. (6199). p.. 572-574. YR: 1988

DE: meteorites-; detection-.; stony-meteorites; Sweden-; geochemistry-; diagenesis-; materials-; conodonts-; biostratigraphy-; Ordovician-; fossil-meteorites; chromlte-; oxides-; geochemlcal-indieators; limestone-; carbonate-rocks; Scandinavia-; Western-Europe; Europe-; southern-Sweden,; Osterplana-; KinneJculle-; electron-probe-data; SEM-data; microfossUs-; metasomatism-

TI; **Mixing-zone** dolomites in **the** Golly **Oolite,** Lower **Carboniferous, South** Wales;. .->

AU: Searl-A

SO: Journal-of-the-Geological-Society-of-London. 145 (Part 6). p.. 891-S99.. YR: 1988

DE: Wales-; stratigraphy-; Cacboniferous-; sedimentary-petrology; sedimentary-rocks; geochemistry-; isotopes-;, carbonate-rocks-; limestone:-; oxygen-; 0-18/0-16; carbon-; C-13/C-12; Great-Britain; Uni ted-Kingdom; Western-Europe; Europe-; Dinantian-; South-Wales; doloraitic-limestone; petrography-; Gully-Oolite; stable-isotopes

TI: Stable isotopes In. the back, reef fades of the **Bonneterre and Davis formations** {Cambrian),,, MO; evidee.ee: for a complex **diagenetic history.**

AU: Gregg-Jay-M; Shelton-Kevin-L

SO: Abstmcts-with-Programs-GeoIogical-Sociery-of-America. 20.. (7). p. 120 YR: 1988

DE: Missouri-; sedimentary-petrology; diagenesis-" Bonneterre-Formation; Davis-Formation; Midwest-; United-States; geochemistry-; isotopes-; Cambrian-; carbon-; oxygen-; limestone-; carbonate-rocks; dolostone-; doJomin'zation-; mississippi-valley-type; mineralization-; mudstone-; clastic-rocks; **0-18/O-16;** stable-isotopes; C-J3/C-12

Tl: Kristalle als **Geothermometer und-barometer.**

AU: Paulîsch-Feter

SO: Zentralblatt für 'Geologie und Paléontologie. Teil I. **H.3.p.** 181-344. YR: 1990

LA: German

De: *Jadeite:* Para.gen.sis, crystal structure and. color, orientation in rocks and experimental deformation, experiments on jadeite forming, jade as: roughmaterial for the ait handwork, summary; *Amphibole:* Prefered orientation, of hornblendes, experimental hornblende - deformation, anisofropy of amphiboliles, crystal structure of the hornblende and faciès, aluminium., sodium, calcium, magnesium, iron, and titanium in hornblendes,, isotopes in hornblendes:, epitaxis, biopyriboles, hornblende rea.cti.ons in nature, experimental forming of amphiboles;, technical syntheses, summary; *Chloritoid:* Natural paragensis, with chloritoid, crystal structure: and polytyps, orientation von chloritoid in. rocks» experimental chloritoid-reactions, literature aut of lands, summary; *Staurolite* Paragensis, crystal structure .and epitaxis, orientation, experimental deform.ali.on, laboratory experiments: on the forming conditions, summary; *Titaniie:* Paragensis, age, form, crystal structure, experimental deformation and orientation,, titamite-syntheses, titanites in tectonic, summary; *Corundum:* Paragensis, form, and epitaxis, structure, color, orientation,, corundum-syntheses with, different mineral pairs, technic,, rubles, world wide,, summary; *Talc.* Paragensis:,, ore deposits, structure, laic:-synthesis:, technic,, summary; *Pkologopitei* Natural paragensis, crystal chemistry and poltyps, isotopes and trace elements, fluid inclusions» epitaxis, orientation and experiments of deformation, conditions of experimental forming, weathering, technic, summary.
(Özcan DORA)

Özler / Abstracts

Candan Gökçeoğkı, Hüsnü Aksoy, ***1996,*** *Landslide Susceptibility mapping of the slopes in ike residual soils of the Memgem region (Turkey) iff deterministic stability analyses* ***mud*** *image processing tecniqites:* .Engineering Geol.,44* 147-161,

Abstracts; The aim of present study is to prepare a landslide susceptibility map of a. region of about 120 km^2,,, between Gokcesu and Pazarköy (around Mengen, NW Turkey) at approximately 10 km .norm of tlie North Anatolian Fault Zone, where frequent landslides occur., For this purpose, mechanisms of the. lao.dsli.des were studied by two-dimensional stability analyses together with field, observations,,, and. the parameters controlling; the: development of such slides, were identified. Field observations .indicated that die failures, generally developed within, the uncoD.soli.da.ted and/or semiconsolidated soil units in forms of .rotational, successive shallow landslides within the weathered zone in. Mengen, Çukurca and. Sazlar formations* Although consisting of residual soils., Capak and Gokdag formations do not exhibit landslides as the natural slopes formed on theses, do not exceed, the: critical slope angles.. Statistical evaluations and distribution of the landslides on. the topographical map showed that such parameters as cohesion, angle of internal friction» slope:, relative height» orientation of slopes;, proximity to drainage pattern, vegetation cover and proximity to major faults were the common features on the landslides. Digital images, were obtained to represent, all these parameters on gray scale on 'the SPOT image and. on the: digital elevation model (DEM) of the ,area using image processing techniques. Soil mechanics tests, were carried ont on 36 representative samples collected from different units, and. parameters, were determined for' two-dimensional stability analyses basing on "sensitivity approach" and for' 'the preparation, of digital shear' strength map. In order' to determine the critical slope angles values for 'the residual soils,,, a series of sensitivity .analyses we« realized, by using two-dimensional deterministic slope stability analyses techniques for varying values of cohesion., angle of internal friction and slope height along with varying saturation conditions. According to the-results of the sensi.ti.vity analyses., the Mengen formation was found, to be most susceptible unit to landslides., covering about 33.5 % of 'the region studied, in terms of surface area... The distribution of the critical slopes were determined, by superimposing the -critical slope values from sensitivty analyses on slope map of the study area., On the other hand, Iso-cohesion and iso-friction maps were produced by locating 'the values of'Cohesion, and internal friction angles, in a geographic coordinate system such 'that they coincide with sample locations on the DEM and by further' .interpolation, of •the values concerned... The' pixel values were evaluated .in gray scale: from. 0 to 2,55,0 representing, the lowest pixel value and ,255 representing the highest. Sensitivity analyses on. 'Cohesion, and angle of internal friction, .investigate the effects of the parameters only on stability, revealed, that cohesion, was effective at. a rate of 70% by itself » while: angle of Internal friction alone controlled 'the stability by a rate of 30%. The Iso-cohesion. and iso-friction maps previously obtained were- digitally combined in these rates and a "shear strength map" was prepared. The geographic, setting of the: study area is such that northern slopes usually .receive dense precipitation, In relation to this fact, about 42% of the landslides, .are. due north.. Thus,, a slope orientation map was prepared using 'the DEM, and slo-