



SZPELEOLOGIAI TÁRGYU REFERÁTUMOK A CHEMICAL
ABSTRACTBAN

/vol.107-111/

Összeállította:

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A Chemical Abstracts /továbbiakban röviden C.A./ az Amerikai Kémiai Társaság kiadványa, általában előbb utóbb minden vegyész kapcsolatba kerül vele munkája során. Jelenleg az egyetlen olyan referáló folyóirat amely minden kémiai tárgyú közleményt referál. Az anyagát 150 országban megjelenő mintegy 14000 tudományos és műszaki folyóirat cikkei alapján állítják össze, továbbá feldolgozza az új könyveket, huszonhat ország szabványait, kongresszusi kiadványokat, diszertációkat, kutatási jelentéseket, szabadalmakat, stb. 1907 óta jelenik meg és ez idő alatt több mint 8 millió referátumot közölt 80 témakör szerinti szekciókban. Ennek a munkának az elvégzésével több ezer szakember foglalkozik a C.A. Washingtonban lévő szerkesztőségében, továbbá több ezer külső referálót is alkalmaznak akik saját hazájukban anyanyelvükön megjelenő cikkek angol nyelvű kivonatát készítik és küldik meg a lapnak.

A 80 témakör némelyikében /elsősorban háromban, a Mineralogical and Geological Chemistry, a Nuclear Technology, és a History, Education and Documentation címűekben/ jó egynéhány barlangos tárgyú közlemény referátuma is fellelhető, ezek közül található itt 42 összegyűjtve, melyek 101 szerző tollából származnak a legkülönbözőbb országokból. /Sajnos ezek között mindössze egyetlen magyar található/.

A C.A. referátumai mindig közlik az eredeti cikk teljes címét, a szerzők nevét és munkahelyét, a cikk megjelenési helyét és idejét, az eredeti cikk nyelvét és terjedelmét. Ezek után tömören megadják a cikk tartalmát, melyet én itt változatlanul adok tovább angol nyelven.

A C.A. füzeteként jelennek meg Ezeket 1962 előtt évente egy kötetbe foglalták, 1962 óta egyre gyakrabban fél-

évente kezdenek egy új kötetet, a referátumok előtt az első szám mindig a kötetszámot jelzik. Ezen munkában a 107-111 kötetekben található megfelelő témájú referátumok találhatóak, ezt mindig az egyes cikkek előtt első szám jelzi, a következő az azonosító szám amely alapján mind a C.A. szerinti szonosítószámmal megtalálhatjuk hátul, valamint a szintén hátul található szerzői indexben is erre hivatkozok.

Az egyes füzetekben négyféle index található a C.A.-ban, valamint időszakonként kiadnak egyéb összefoglaló jellegű indexeket is. Ezek közül én a Keyword Indexet, és a General Subject indexet használtam, és a keresést is csak mindössze 3 kulcsszóra végeztem: speleothem, Cave, Stalagmite/Stalactite/. Ezeken felül tapasztalatom szerint még lehettek egyéb többé-kevésbé speleologia szempontjából érdekes írások pl. a limestone, calcite, aragonite, flowstone, stb. címszavak alatt is azonban munkám célja nem a teljesség, hanem mindössze a figyelemfelkeltés. A cikkek egy része sajnos gyakran igen " egzotikus" Magyarországon nem mindig elérhető folyóiratokban, és nem is mindig angol, vagy német nyelven jelennek meg, de kellő utánajárással tapasztalatom szerint majdnem minden cikket meg lehet szerezni.

111.1 Thermoluminescence dating of calcite deposits in a Brazilian cave - Tatumi, S.H.; Batista, L.R.; Watanabe S.; Matsouka, M.; - Inst. Phys. Univ. Sao Paulo 01498 Sao Paulo Brazil - Nucl. Instrum. Methods Phys. Res. Sect. A 1988 A 280 /2-3/ 510-13 /Eng/

The thermoluminescence of secondary calcites found in a Brazilian cave was investigated. The first glow peak obsd. at 240 C° was fitted with second order kinetics and used for the evaluation of the accumulated dose.

111.2. Tephra and cave deposits: Mutual stratigraphic inter-est - Jurigne Etienne; Gewalt Michel - Lab Geomorphol. Geol. Univ. Liege B-4000 Liege Belg. - Ann. Soc Geol. Belg. 1988 111/1/ 135-40 /Fr/.

Traces of 3 tephra-falls are found in cave deposits of High Belgium. One of them /Remouchamps tephra/ mapped most recently in speleothems was dated at $106 \pm 6 / \times 1000$ yr. using the $^{230}\text{Th}/^{234}\text{U}$ method. The other 2 /Laacher See tephra and Rocourt tephra/ were previously found and dated in out-of-cave deposits; their occurrence in caves provided original stratigraphic evidence for the relevant deposits and showed that high galleries were active during the Late Pleistocene even though they are much older. Min. age of the Rocourt tephra is modified from 51000 to 61500 yr. using U-series dating of a stalagmite from Remouchamps cave.

111.3. Carbonate speleothems of caves. A review. - Gewalt Michel; Ek Camille; - Lab. Geomorphol. Geol. Univ. Liege B-4000 Liege Belg. - Ann. Soc. Geol. Belg. 1988 111/1/ 9-19 /Fr/.

A review is presented with 127 refs., summarizing the results of the 20 yr. scientific work on cave deposits of dripstones and flowstones with particular ref to recent studies of speleothems their compn. growth rate, age and paleoclimatic environments.

111.4. An intercomparison of ESR and uranium series ages for Quaternary speleothem calcites - Smart, P.L.; Smith, B.W.;

Chandra, H.; Andrews, J. N.; Symons, M. C. R.; - Dep. Geogr. Univ. Bristol, Bristol UK BS8 1SS - Quat. Sci. Rev. 1988 7/3-4/ 411-16 /Eng/.

The ESR and U-series $^{230}\text{Th}/^{234}\text{U}$ ages detd. on speleothem calcites from 11 different localities /Clearwater Cave, Sarawak and in western Europe/ show good agreement with no indication of systematic error. Because of dosimetry limitations the precision of ESR ages is generally no better than $\pm 15\%$. Two procedures which are important in the ESR age detn. are /1/ the etching of the calcite in 10% HOAc for 2 min remove the outer surface of grains and /2/ post-irradn. annealing for several hours at 120° to eliminate interference from a short-lived radiation induced signal at $y = 2,0020 \pm 0,0003$ ESR offers the potential for dating speleothems > 1 Myr old. Care must be taken to establish that removal or deposition of sediment adjacent to the speleothem has not significantly changed the external dose detd. by dosimetry.

111.5. Comparison of TL, ESR and carbon-14 dates on speleothems - Bluszcz, A.; Goslar, T.; Hercman, H.; Pardur, M. F.; Walanus, A.; - Inst. Phys. Silesian Tech. Univ. PL-44-100 Gliwice Pol. - Quat. Sci. Rev. 1988 7/3-4/ 417-21 /Eng/.

Results of thermoluminescence /TL/, ESR and ^{14}C age detns. of speleothem calcite from the Magurska, Mietuska and Kasprowa Niznia caves /Tatra Mountains Poland/ are compared. Relatively good agreement was found between the TL and ESR ages. In the TL method the relative error of the equiv dose /ED/ was 5-30%, whereas for the ESR method, the ED relative error was $> 30\%$, but $\sim 20\%$ for a few samples. Because of uncertainty of annual dose in some cases the TL and ESR age could only be roughly estd. The ^{14}C dating was of limited value in testing the TL and ESR methods under the conditions in the Tatra Mountains. However the combined application of the 3 dating methods in conjunction with other evidence provided a basis for reconstructing the palaeoclimatic conditions in the Tatra Mountains during the past 100000 yr.

111.6. TL and ESR dating of speleothems and radioactive

disequilibrium in the uranium series - Goslar, T.; Heremann, H.; - Inst. Phys. Silesian Tech. Univ. PL-44-100 Gliwice, Pol. - Quat. Sci. Rev. 1988 7/3-4/ 423-7 /Eng/.

A method is described which takes into account in the thermoluminescence and ESR dating of speleothem, the U-series disequilibrium, in the case where the annual dose /D/ is detd.

β -spectrometry. The approach is based on the concept of the lab age T_1 from the sample age is detd. The sample age is defined as $T = ED/D$, where ED is the equiv. dose and D the annual dose which is the sum of 3 components: D_u , D_{Th+K} and D_{ext} corresponding to the annual dose from U-series, Th-series plus ^{40}K and external β -radiation resp.. The method makes use of the explicit math. function $f/T/pqk$ where q and p are the initial $^{234}U/^{238}U$ and $^{236}Ra/^{238}U$ activity ratios resp., and k is the β -efficiency. For the simplified case in which $D = D_u$ i.e. D_{Th+K} and D_{ext} are 0. $f/T/pqk = T_0 D_u / t/dt / D_u / T$ where D_u is the U-series annual dose calcd. under the assumption of secular equilibrium from the actually measured ^{214}Bi concn. in the sample. For the general case in which $D = D_u + D_{Th+K} + D_{ext}$ $f/T/pqk = T_1 - T/D_{Th+K} + D_{ext} / D_u$. The method enables direct reading of the age of a sample from diagrams in which the dependence of T_e on p and q is plotted as a function of time; these diagrams are called GH plots.

11.7. In-situ solidification technique for waste disposal in underground caverns - Kraemer, R.H.; Kroebel, R.H.; - Kernforschungszentr. Karlsruhe D-5700 Karlsruhe FRG - Proc. Symp. Waste Manage 1989 89-93. /Eng/.

A comprehensive review with 5 refs. about a recently terminated project on an alternative waste management concept which is in development in the FRG since 1976. The concept was primarily developed for the disposal of radioactive low- and intermediate-level wastes but it is generally applicable for liq. and special forms of solid wastes /grains, powders, slurry/. The main features of the in situ concept are: /1/ containerless disposal technique of fluid waste-binder mixt., /2/ direct disposal from above ground into underground caverns at 1000 m depth, and /3/ in-situ solidification at the final disposal position. Soln. mining tech-

nique is favored for, the allocation of the underground caverns. All important items of the concept are now demonstrated up to an industrial relevant scale, above all: processing of primary waste solns. using granulation technique and the vertical transport of concrete enriched with granules through pipelines of 1000 m length.

111.8. High-precision mass-spectrometric uranium-series dating of cave deposits and implications for paleoclimate studies - Li, W. E.; Lundberg, J.; Dickin, A. P.; Ford, D. C.; Schwarz, H. P.; McNutt, R.; Williams, D.; - Dep. Geol. McMaster Univ. Hamilton ON Can L8S 4M1 - Nature/London/ 1989 339/6225/ 534-6 /Eng/.

U-series dates obtained on a speleothem located 15 m below modern sea level in a Bahamian cave record changes in sea level over the past 280 kyr. The dated in deposition indicate high sea level stands that are in general agreement with data from deep-sea O-isotope stratigraphy and other ests. for the timing of high stands and glacial mins.

111.9. New minerals of a grotto: Fibroferrite from the Ferrata a grotto - Forti, P.; Salvatori, F.; - Inst. Ital. Speleol. 40127 Bologna Italy - Riv. Mineral. Ital. 1988/4/ 219-26 /It/ The Ferrata Cave on the eastern slope of Monte Cucco /Central Italy/ extends along a discontinuity in limestone, within layer with in metallic nodules mainly marcasite with minor pyrite. Peculiar speleothems were obsd. which consist of globular purple-yellow effluorescences on clay filled fractures in limestone. Brittle pinkish-white concretions and reddish-brown-black or yellow, crusts coat the rock along these fractures occasionally bearing transparent colorless crystals. All these were sampled analyzed and identified as fibroferrite. The Ferrata Cave is the most important occurrence of fibroferrite in Italy and, for the first time, this mineral is considered to be of cave origin. A karst origin is hypothesized.

111.10. Deuterium and O-18 content of fluid inclusions trapped in carbonate cave deposits - Rozanski, K.; Dulinski, M.;

- Krakow ,Pol. - Freiberg Forschungsh. C. 1988 C24D 92-105 /Eng/.

The δD and $\delta^{18}O$ values were detd of fluid inclusions /FJ/ in calcites of speleothem from caves of central and southern Poland. Three groups of FJ are recognized: /1/ those with a D concn. close to that of present-day pptn., /2/ those with δD similar to that in glacial groundwaters and /3/ FJ enriched in D by 10 % in comparison to δD of modern infiltration waters. The av. D value of the Polish speleothem calcite FJ is -82,4‰. The $\delta^{18}O$ value has a wide range from -10,5 to +7,8‰. Large apparent change in ^{18}O content is attributed to post-depositional fluctuations of the cave temp. as well as to the type of extn. procedure adopted. The O isotope exchange rate between FJ and the host calcite was controled not only by temp. of deposition but by the environment to which the material sampled was exposed during its existence; the $\delta^{18}O$ value may reflect post-depositional changes in the cave temp.. The D content however remained unaltered since the time of deposition and thus the δD values reflect the D content in the original infiltration waters of the cave.

111.11. Study of natural radioactivity in caves and pits -
Saumande Pierre; Rannon Alain; Lorenz Claude; - Lab. Hyg.
Limoges Fr. - Bull. Soc. Pharm. Bordeaux 1988 127/1-2-3-4-/
49-55 /Fr./

The levels of natural radioactivity / β -emitters and Rn/ were measured in caves and pits and correlated with the levels of Rn in the air of these cavities. Relatively high levels of natural radioactivity /1500-7500 Bq/m³/ were obsd. in the cavities. Clay sediments in the natural hollows were considered to be the origin of the radioactivity. Rn levels in air did not correlate with clay levels. Environmental exposure to the radioactivity is briefly discussed.

111.12. Dating of speleothems by radiological methods -
Papastefanou, C.; Charalambous, C.; - Nucl. Phys. Dep. Aristotle
Univ. Thessaloniki, Thessaloniki Greece 54006 - Nucl. Instrum.
Methods Phys. Res. Sect. A. 1989 A 281/2/ 406-8 /Eng/.

Exposure dose rate measurements were performed in a limestone cave at Petralona Greece. γ -spectrometry by using 3in. x 3in. NaI/Tl/ scintillation detectors and thermoluminescence dosimetry using TLD-200 /CaF₂-Dy/ scintillation crystals were applied. The adsorbed dose rate inside the cave reached 95 mrad/yr. The radioactivity of various speleothems found in the cave, such as soil from different layers /classified according to stratigraphy/ stalactite and bone samples was detd. by γ -spectrometry with high-resoln. and high-efficiency Ge spectrometers for dating purposes. High values of the exposure dose rate derived from exptl. data lead to younger ages than those previously reported by various investigations.

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110.1. Variations of radon-222 air concentration in Postojna Cave - Kobal, I.; Ancik, M.; Skofljanc, M.; - J. Stefan Inst. E. Kradelj. Univ. Ljubljana 61111 Ljubljana Yug. - Radiat. Proz. Dosim. 1988 25/3/ 207-11 /Eng/.

Seasonal and diurnal variations of ^{222}Rn concs. in the air of Postojna Cave were investigated. As expected higher values were found in summer and during afternoon sampling ED equ - irs obtained by a tourist during high 0 min. visit to the Cave were estd to lie between 60 and 135 Sv. However in some remote badly ventilated places not open to tourist a speleologist could receive in 1 h dose of up to 15 mSv.

110.2. Application of thorium-227/thorium-230 method and reliability of uranium series age of stalagmitic carbonate - Shen, Guanjan - Guizhou Univ. Guiyang, Peop. Rep. China - Kexue Tongbao 1988 33/16/ 1356-58 /Eng./

A comparison is made of ages of stalagmite samples from European archeol. sites detd., by the ^{227}Th - ^{230}Th and ^{230}Th - ^{234}U methods. Both methods yielded, within $\pm 16\%$ a std. deviation/ consistent results; the anal procedure and the computer program developed for ^{227}Th - ^{230}Th dating do not impart any systematic error in age detn. of speleothem samples. The stalagmite samples which are relatively pure, compact and well-crystd. gave concordant results by the 2 methods and may provide std. materials for dating within the range 1P-350 kyr.

110.3. ESR dating of the Quaternary geological samples - Liang, Rengon; Jin, Sizhao; Peng Zicheng; Huang, Peihua; - Univ. Sci. Technol. China Hefei, Peop. Rep. China - Hejishu 1988 11/11/ 49-55 /Ch/.

ESR data /line intensity, irradiation dose etc./ is used to det. the av. age of stalagmites from the Choukoutien cave /China/ as 60 kyr.

110.4. Thermoluminescence dating of calcite and related data processing - Zheng, Gongwang - Beijing Univ., Beijing Peop. Rep. China - Hejishu 1988 11/11/ 28-30 /Ch/.

Procedural steps in the dating of calcite, based on its thermoluminescence characteristics are described; these include sample prepn. instrumentation and data processing. Using a computer for regression anal. and the least-squares procedure improve measurement precision. Calcite from a stalagmite from Shihuadory, China was dated and gave an age, when the data was processed by computer, of 43920 yr.

110.5. Moonmilk - Fischer Hans; -Ins. Kristallogr. Petrogr.; ETH CH-8092 Zurich Switz, - Aufschluss 1988 39/5/ 311-6 /Ger/

A review with 19 refs., on moonmilk which is a calcite micro or cryptocryst speleothem built mainly of 2 phases /liq. and solid/ with a min CaCO_3 content of 90%. Discussions are give on the mineralogy chem., genesis and terminaol of moonmilk.

110.6. Evidence from the Swartkrans cave for the earliest use of fire - Brain, C.K.; Sillen, A.; - Transvaal Mus. Pretoria 0001 S.Afr. - Nature/London/ 1988 336 /6198/ 464-6 /Eng/

The histol. and chem. of altered bone specimens found in hominid-bearing breccias in the Swartkrans cave indicate they were heated in a range of temps consistent with that occurring in campfires. The presende of these barnt bones, together with their distribution in the cave, is the earliest direct evidence for ase of fire by hominids in the fossil record.

109.1. Uranium-series dating of speleothems and bones from Victoria cave, Naracoorte, South Australia - Agliffe, L.K.; Veeh, H.H.; - Dep. Earth Sci. Flinders Univ. South Aust., Adelaide 5042 Australia - Chem. Geol. 1988 72/3/ 211-34 /Eng/.

Bone samples and assocd speleothems from crit. locations in limestone caves near Naracoorte, South Australia, were selected for U-series dating to test the reliability of U-series age of bone material and to make an informed age assessment of the bone deposit in terms of Quaternary climate. The age distribution of the speleothem samples reveals that speleothem growth ceased or was considerably diminished, between 200 and 120 kyr. ago, a time corresponding to the perultimate glaciation /O-isotope Stage 6/. This is consistent with observations from several other caves, and suggest that conditions generally were unfavorable for speleothem formation during glacial periods. The U-series ages of fossil bones are inconsistent with those of assocd. speleothems, indicating secondary U addn. to the bones. Discordancy between $^{230}\text{Th} / ^{234}\text{U}$ and $^{231}\text{Pa} / ^{235}\text{U}$ ages suggest that this secondary uptake of U was not a single event, but a more or less continuous process. However the $^{234}\text{U} / ^{238}\text{U}$ signatures of the bones are more consistent with a model of U assimilation caused by a succession of short events, than by a process of continuous diffusion. The abs. age control provided by the speleothems, combined with the min. age limits for individual bones suggest that the bone deposit was formed prior to the last interglacial period most probably during O isotope Stage 6.

109.2 Recent ferromanganese formations of the Zoluska cave /USSR/ - Volkov, S.N.; Andreichuk, V.N.; Yanchuk, E.A.; Smirnov, B.I.; - Lvov Geol. Razved. Eksp. Lvov USSR - Mineral Sb. /Lvov/ 1987 41/1/ 79-83 /Russ/

Tiny black particles occurring in hemispherical structures stalactites or as linings, on floors, and corridors in the Zoluska-cave /Volyn-Podolia USSR/ contain Mn 40 and Fe 6%. The particles are mostly birnessite probably a calci-

um variety contg. 1% Ca and having c-unit cell parameter 0,71-0,72 nm. Fe occurs in an X-ray amorphous phase. Possible sources of Mn, Fe, and other metals in cave deposits are considered. The caves is a natural lab for study of the effect of anthropogenic activity on mineral formation in subsurface karst.

109.3. Oil and gas deposits in caverns - Schneider, G.; - 5000 Cologne FRG - Aufschluse 1988 39/4/ 193-208 /Ger/.

A review with 11 refs., of the important points of oil and gas storage in caverns /without water pollution/ covers subterranean storage possibilities, origin of salt deposits, planing of a cavern geol. and geophys. aspects related to caverns and construction operation and monitoring in petroleum and natural gas storage.

109.4. ESR dating of fossils and stalactites - Sato, Takakaru

- Fac. Eng. Sci., Niigata Univ. Igarashi, Japan 950-21 -

Chishitsuzaku Ronshu 1988 29'199-206 /Jan/.

A review with 37 refs.. Progress of ESR dating of fossils and secondary carbonate deposits is described. The fossils considered are foraminiferas corals shells, bones and teeth. The ESR signals from which ESR ages should be derived and methods of annual dose estns. are mentioned together with means to cope with various interferences. The latest development of ESR dating for each sample is briefly described.

108.1. Multiple dating of a long flowstone profile. Comments

- Gruen, Rainer; Schwarz, H.P.; - Dep. Geol. McMaster Univ.,
Hamilton ON Can. - Radiocarbon 1987 29/1/ 148-52 /Eng/.

A polemic with M. Gegh and G. Hennig /ibid. 1986 28/2A/ 503-9/
The numbering of flowstone samples taken from the Heggen
cave /FRG/ for age detns. does not coincide with the nu -
merical sequence of the series designated earlier during
sampling for paleomagnetic study; thus confusion exists
over which samples were dated by ^{14}C and U-series methods.
The Brunhes/Matuyama boundary was obsd. between samples
CL8 and CL9 at a depth of 18 m and not between samples
HA 17 and HA 18 at a depth of 70 cm. Accumulated dose /AD/ is
only one of many parameters used to calc ESR age and thus
the plot of AD presented for vertical profiles in the flow-
stone is not very meaningful. Results for U/Th isotopic
detns should have been given so that, the reliability of
the U/Th ages can be evaluated. A check could have been
made to see if the calcite within a growth layer was ptd.
at C isotopic equil. The assumption was made that the flow-
stone formed almost exclusively during interglacial peri-
ods but speleothems can grow during glacial periods /alt-
hough normally only in caves located in low latitudes/ and
may even grow under active glaciers. The rate of calcite
accumulation on a speleothem is probably not a simple fun-
ction of climate, it depends principally on the degree of
supersatn of the drip water with calcite, plus the rate of
 CO_2 release from the cave atm.

108.2. Multiple dating of a long flowstone profile. A reply

- Gegh, H.A.; Hennig, G.J.; - FRG - Radiocarbon 1987 29/1/
153-5 /Eng/.

A polemic in reply to R. Gruen and H. Schwarz /ibid 148-52/
In the flowstone profile of Heggen Cave /West Germany/
the Brunhes/Matuyama boundary was not assigned between
layers HA 17 and HA 18 but the observation was made
that from layer 17 downwards, the magnetic orientation is
reversed. In the ESR study of the flowstone, the accumu-
lated dose /AD/ vs. depth graphs presented serve the pur -
pose of showing the strong contrast in AD found for 3 ver-
tical profiles sep'd. by only a few decimeters. The ^{14}C ,

U/Th and paleomagnetic data are in fairly good agreement for a long flowstone profile. However the age resolu. achieved is smaller than methodically expected. Since diagenetic processes modify the specific activities of ^{14}C , U and the isotopes and the no of trapped electrons used for ESR dating an exact fixation of the sediment boundaries between glacial and interglacial periods is not possible.

108.3. On the sources of radon in the caves in the northern part of the Moravian karst. - Stelcl, J.; Navratil, O.; Pribyl, J.; Cimbalnikova, A.; Zemen, A.; - Fac. Sci. J. E. Purkyne Univ. Brno Czech. - Scr. Fac. Sci. Nat. Univ. Purkynianae Brno 1987 17/5/ 233-40 /Eng/.

The Moravian karst caves occur in the in the Devonian clasticogenic rocks. In the atm. air in caves of the Moravian /Czechoslovakia/ karst the natural radioactivity is 7×10^{-4} to 0,15 Bq/L of air. The radioactivity is attributed to the presence of ^{222}Rn and ^{220}Rn in the air. The concn. of Rn in the cave air varied from place to place. Locality well - rock lithol. U and Th contents and total radioactivity in the caves are tabulated, along with the modal and chem. compn. of rocks.

108.4. Thermal genesis of dissolution caves in the Black Hills, South Dakota - Bakalowicz, M. J. ; Ford, D. C.; Miller, T. E.; Palmer, A. W.; Palmer, M. V.; - Lab. Souterrrian Cent. Nat. Rech. Sci. 09200 St. Giron Fr. - Geol. Soc. Am Bull. 1987 99/6/ 729-38 /Eng/.

Jewel Cave and Wind Cave /South Dakota/ are examples of 3 dimensional, rectilinear networks of solutional passages. Other caves in the Black Hills are similar. They occur in Mississippian limestone and dolomite. The caves were developed by regional thermal waters focusing on paleospring outlets in overlying sandstones. Four sets of criteria are evaluated: /1/ morphol. showing that 3-dimensional 1-phase mass from having convectional features is similar to known and supposed thermal caves in Europe; /2/ petrog. and mineralogical study of the chief pts. shows a record of car -

bonate soln. calcite pptn. consonant with a model of cooling then degassing waters;/3/ a thermal anomaly at regional hot springs extends beneath Wind Cave, where based lake-water samples show chem. and isotopic affinities with the thermal waters; and /4/ $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ measurements place all suspected paleothermal water ppts. in the domain of thermal calcites reported by other and being deposited at modern hot springs. Finally U-series dates show that the Wind Cave deposits are Quaternary and that the cave is still draining. Jewel Cave is truly relict and divorced from the modern thermal groundwater system; its great calcite spar sheets are probably 1,25-1,50 Myr. old.

108.5. Indications of Pleistocene man on Sardinia - Hofmeier, G.K.; Sondaar, P.I.; Alderliesten, C.; Van der Borg, K.; De Jong A.F.M.; - Inst. Aardwet., Rijksuniv. Utrecht, 3408 TA Utrecht, Neth./ Nucl. Instrum. Methods. Phys. Res. Sect. B. 1987 B29/1-2/ 166-8 /Eng/.

Human fossils found in a Pre-Neolithic cave deposit /Corbeddu cave, Sardinia/ represent the 1st human remains associated with an endemic impoverished island fauna. Radiocarbon dating by accelerator mass spectrometry in Utrecht provided the chronological framework of the cave sediments for better understanding of the time related human activities. The aberrant morphology of the human fossils and the unique character of worked deer bones discovered, suggest the development of an endemic Pleistocene human culture, adapted to the restricted island conditions and the hunting of ochotonids and deer.

108.6. Biogenic structures and micrite in stalactites from Grand Cayman Island, British West Indies - Jones, Brian; Motyka, A.; - Dep. Geol. Univ. Alberta, Edmonton AB Can T6G 2E3 - Can. J. Earth Sci. 1987 24/7/ 1402-11 /Eng/.

Stalactites from modern and old caves developed in the Bluff Formation of Grand Cayman Island contain laminae and bulbous masses of micrite intercalated with sparry calcite. The micrite as well as some of the spherical bodies that have a high concn. of either Mn or Fe. Such bodies may be of

bacterial origin. The micrite contains numerous calcified filaments that are probably of algal origin. Calcification of the filaments occurred either during life or shortly after death of the algae. The algae were important in trapping and binding the micrite. The algae may be directly or indirectly responsible for the formation of much of the micrite.

108.7. Preliminary ESR research on the age of geological samples - Liang, Renyon; Huang, Peihua; Jin, Sahao; Peng, Zicheng - Univ. Sci. Technol. China Hefei, Peop. Rep. China - Bopuxue Zazhi 1984 4/3/ 211-19 /Ch/.

The development principles and recent applications of ESR dating of spring travertine, a stalagmite and Lamprotula fossils of China are discussed. The relation of ESR dating to some geol factors is considered.

108.8. ESR dating theoretical foundations and preliminary results - Witala Borena; Pazdur Miecyslaw F.; - Inst. Fiz. Politech. Slask, Gliwice Pol. - Zesz. Nauk. Politech. Slask Mat. Fiz. 1986 46 179-95 /pol/.

A review with 19 refs describing the phys. basis for ESR effect and discussing the potential use of ESR in dating Quaternary sediments. Examples of ESR dating of cave deposits, fossil shells, and quartz are discussed as well as examples of the use of ESR in study of ancient flint tools. Preliminary results of investigations of the ESR effect in quartz and recent stalagmites are presented.

108.9. Study of atmospheric aerosol particles by vibrational spectroscopy - Pineau P.; Latzague, M.; Quabil, Said; Freour, P.; Tessier, F.; Saugue, J. Guy; - Lab. Spectrosc. Mol. Cristalline Univ. Bordeaux 33405 Talence Fr. - J. Aerosol Sci. 1988 19/1/ 33-9 /Fr/.

IR spectroscopy with Raman microscopy are used to study the nature of atm. aerosols. Results obtained for samples collected in a forest and in caves are presented.

108.10. Calcite-hyalite dripstones in caves encountered

during drilling of the tunnel at southern Velebit Mountain /Yugoslavia/ - Boriceric, Srecko; Zebec, Vladimir; - Geol. Zavod YU41000 Zagreb. Yugoslavia - Geol-Vjesu 1987 40.

101-9 1. plate /serbko- h./

About 10 speleol features were found during the tunneling. A crystal cavern was explored over its length of 170 m. In addn. to specific geomorphol features and of the former drainage channel, there are accumulations of calcite crystals. Samples were taken and goniometric measuring were carried out. Three types of crystals were detd and 2 of them are shown. Hyalite participated during dripstone growth. It was deposited from soln. after calcite.

108.11. Karst caves in gypsum on the Vilyui River /Yakutia/ - Filippov, A.G. - Vost.-sib. Inst. Geol. Geofiz. Miner. Irkutsk USSR - Dokl. Akad. Nauk. SSSR 1988 229/3/ 696-701 /Rus/

Karst vaverns/KC/ are developed in the Upper Ordovician Kharyalakhst Suite gypsum beds in the Vilyui River basin /USSR/. Morphometric characteristics /length, depth, areal extent, vol. ext./ of the caverns were detd. In mos of the KC ice occurs as stalagmites, stalactites and coatings on the cave walls and floor. The pH /7,75-7,90/ total mineralization /1,469-1,515/ and contents of Na/0,63-0,91/, K/0,21-22/ Ca /78,92-92,82/; Mg/6,32-19,94/, Cl^- /0,26-0,32/, SO_4^{2-} /95,13-95,18/, and HCO_3^- /4,54-4,55 % equiv/L/ were detd of the melt water from ice stalagmites and layers. In KC on July 11 1985 when the outside temp was 22° the air temp. was 7-12° near the entry way and 1,2 to -7,8 C° further in. The origin of KC is discussed.

108.12. Detection of speleothems by radiological methods - Papastefanou, C.; Charalambous, G. - Nucl. Phys. Rep. Aristotle Univ. Thessaloniki, Thessalonik Greece 54005 - Nucl. Instrum. Methods Phys. Res. 1989

LE KULL TAKARMI

107.1. Karst-type mineralization. Major characteristics and formation types - Moroskhin V.V. - Inst. Mineral. Geokhim. Kristallogchim. Redk. Elem. Moscow USSR - Mineral Zh. 1986 8/5/ 10-21 /Russ/

A review with 14 references, is presented on the major genetic groups of mineral formations in karst structures /esp. the caves/. General conditions for the genesis of mineral aggregates and their typical traits are discussed. A classification of the morphol types of mineral aggregates in cover and other cavities is presented.

107.2 Isotopic evidence for the diverse origins of nitrate minerals - Heaton T.H.E. - Natl. Phys. Res. Lab. CSIR Pretoria 0001 S.Afr. - S. Afr. J. Sci. 1987 83/2/ 118-19 /Eng/

The $\delta^{15}\text{N}$ values of nitrate minerals from South African caves were detd. and are compared with literature values reported for these minerals from the Antarctic soils, the Chilean desert and Antana Cave /Venezuela/. The nitrate minerals from the South African caves have $\delta^{15}\text{N}$ 7,9-13,5 ‰, which precludes the conversion of volatile NH_3 gas to nitrates by nitrifying bacteria. The low $\delta^{15}\text{N}$ values for desert nitrate minerals preclude soil or animal waste sources of N and suggest derivation from atm. pptm. In wetter climates the nitrates ppt. either from NO_3^- in solns. directly from animal waste or from soil derived NO_3^- carried into caves by groundwaters.

107.3. A log interpreted mineralogical composition for solution mining of underground caverns in Mount Sedom - Schlein, M.; Spirak, D.; - Oil Explor./Investments/ Ltd. Tel Aviv Israel - Isr. J. Earth Sci. 1986 35/2/ 136-48 /Eng/.

The mineral Compn. of the salt formation of Mt. Sedom /Israel/ was studied as a feasibility study for future oil storage cavern design and was solved simultaneously by using computed log interpretation. The logs that were ran in each well were: neutron, sonic, d, and γ -ray. From

log equations vol. fraction of the following minerals were calcd.: halite, polyhalite, sylvite, carnallite and insol. minerals quartz, anhydrite, magnesite, gypsum and clay minerals. The log readings were later calibrated with the chem. and X-ray analyses and the whole mineral compn. of each well was simultaneously detd.. The result of this feasibility study in 3 wells is that the impurity percentage of the halite beds in the studied area of Mt. Sedom was within the acceptable range of leaching

107.4. Fluid inclusion and stable isotope studies of calcite, quartz and barite from karstic caves in the Masua mine, southwestern Sardinia, Italy - De Vivo, Benedetto; Maiorani, Amando; Perna, Giuliano; Turi, Bruno; - Dip. Sci. Terra Univ. "La Sapienza", 00100 Rome Italy - Chem. Erde 1987 46/3-4/ 259-73 /Eng/

Stable isotope and fluid inclusion analyses were made of 24 carbonates 2 barites and 1 quartz from karstic features developed within the Cambrian waxy limestone hosting the Masua mine in the Pb-Zn-Ba Iglesias district /Italy/. Phreatic-zone calcite crystals from the caves display $\delta^{18}\text{O}$ 13,76-22,20 ‰ $\delta^{13}\text{C}$ -6,76 to +0,40 ‰, mean homogenization temp. / T_h / 50-75° and salinity 0,5-2,7 wt% NaCl equiv.. Their parent solns. have calcd. $\delta^{18}\text{O}$ /-7,0 to 4,5‰/ values typical of waters of meteoric origin. Vadose zone calcites either show no inclusions or contain inclusions not amenable to microthermometric measurements. However there is evidence that the late stage cave carbonates / $\delta^{18}\text{O}$ 24,51-26,51 ‰ ; $\delta^{13}\text{C}$ = -10,50 to -8,00 ‰ / formed at ambient temps. just prior to the lowering of the former water table due to mining activities. Waters in equil with such carbonates should have had $\delta^{18}\text{O}$ -5 to -4 ‰. Vein calcites have $\delta^{18}\text{O}$ 17,21-17,45 and $\delta^{13}\text{C}$ -0,49 - +0,08 ‰ and may have been deposited from meteoric hydrothermal solns. Barites show only single phase inclusions indicating relatively low temps. of formation. Quartz has $\delta^{18}\text{O}$ 20,40 ‰ and contains primary fluid inclusions, for which a mean calcd. These data and the $\delta^{18}\text{O}$ value /-1,5‰ / calcd. for the parent soln. are very similar to those of several Mississippi Valley -type ore fluids.

Two types of solns. with totally different chem. and isotopic characteristics, circulated through the karstic network in the last 500 Myr.

107.5 Iron-manganese formations of the „Zolushka cave - Volkov, S.N.; Szmirnov, B.I.; Yanchuk, E.A.; - *Proizvod Geol. Obledin. "Zapadukrgeologiya" Lvov USSR - Dokl. Akad. Nauk. USSR* 1987 292/2/ 451-4 /Geochem/ /Russ/

The Zolushka karst cave of Volyn-Podolia is developed in Tortonian gypsum /anhydrite/ beds. Examn. of the sediments in the cave shows an alternation of layers of gray clay with red and black podwery material. The cave walls and ceiling are covered by black small hemispherical stalactite-like /5-6 cm long/ growths. The red material contains > 50% Fe and the black material has > 50% Mn; both show concns. of Co, Ni, Cu, Zn, and Mo. The black layers consist of a mixt. of asbolan-buserite, birnessite with both 10 Å and 7 Å manganese or birnessites. The empiried formula is given of Calcium birnessite; it has the unit-cell parameter C=0,742 nm.

107.6. Aragonite-calcite relations from caves in west Rhodopes /Bulgaria/ - Filipov A. - *Univ Sofia 100 Sofia Bulg. - Dokl. Bolg. Akad. Nauk.* 1987 40/4/ 73-6. /Eng./

The studied caves contain aragonite, calcite, aragonite and calcite dripstone and flowstone speleothems. The main factor promoting the deposition of aragonite instead of calcite is the increased concn. of Mg in the parent soln. Small pools occur in the caves with a floating calcite film on the water surface; the calcite film has the crystallochem-formula $\text{Ca}_{0,99}\text{Mg}_{0,01}\text{CO}_3$. The crit $\text{Mg}^{2+}/\text{Ca}^{2+}$ ratio in the parent soln. prompting the aragonite crystn. is $[\text{Mg}^{2+}]/[\text{Ca}^{2+}] = [\text{Mg}^{2+}] / [\text{Ca}^{2+}] \cdot \frac{S}{D_{\text{Mg}^{2+}} C} = 0,41$ where S and L are molar conc. ratios in liq. and solid phases, resp., and $D_{\text{Mg}^{2+}} C$ is the distribution coeff of Mg^{2+} .

107.7. Gibbsite in the Batori Cave /Hungary/ - Biddlo Gábor - *Budapesti Műszaki Egyetem, Budapest Hungary/ - Földt. Közl.* 1986 116 /3/ 283-5 /Hung/

Some kaolinitic samples from Batori Cave contain a considerable amt. of gibbsite, in addn. to kaolinite. Gibbsite does

not show a uniform distribution in the material. As shown by X-ray diffraction measurements the reflection of gibbsite at 0,481 nm has an intensity of 410, whereas the basal reflection of kaolinite at 0,713 shows an intensity of 1609. The gibbsite is of hydrothermal origin.

107.8. The origin of sulfates in Castleguard Cave Columbia Icefields, Canada - Yonge, C.J.; Krouse, H. Roy; - Dep. Phys. Univ. Calgary, Calgary AB Can T2N 1N4 - Chem. Geol. 1987 65/3-4/ 427-33 /Eng/.

The $\delta^{34}\text{S}$ values of sulfate minerals from Castleguard Cave /Alberta/ and the bedrock that encloses the cave suggest, that the oxidn. of pyrite is a possible source for the majority of gypsum seen in the cave. One gypsum sample provides an exception suggesting that anhydrite may also be a source in some cases. The provenance of a sample of mirabilite is harder to det. since its compn. may have been affected by bacterial activity as suggested by $\delta^{34}\text{S}$ and $\delta^{18}\text{O}$ values of the SO_4^{2-} ion. Mechanisms of sulfate form. in the cave were examd. with ref. to $\delta^{18}\text{O}$ and δ^{D} values of the sulfate mineral crystn. waters and the cave water. Gypsum was pptd. at an earlier stage, partly by evapn. and partly by expulsion of CO_2 from sulfate-bearing solns. In contrast mirabilite may have formed in a highly evaporative environment such as is presently encountered. Valley deepening breached the cave in post-Wisconsin times allowing air to more through it; subsequent evapn. may have led to the formation of mirabilite.

107.9. Incorporation of aluminium, magnesium and water in opal-A; Evidence from speleothems. - Webb, John A.; Finlayson, Brian L.; - Dep. Geol. La Trobe Univ. Victoria 3083 Australia - Am. Mineral 1987 72/11-12/ 1204-10 /Eng/

Opal-A speleothems from a variety of caves /in Queensland and Victoria/ show a wide range of compn. contg. $> 5\%$ Al_2O_3 and MgO . The IR spectra of the samples show that the Al is substituting for Si with OH groups compensating for the resultant charge imbalance. The Mg occurs as interstitial ions to which OH groups are bonded to balance the charge.

Thus, the OH groups in opal are present not only as surface silanol groups, but also as OH groups within the opal structure to balance the charge of the substituted Al and as OH groups bonded to interstitial elements like Mg.

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