

SLOVENSKA AKADEMIJA ZNANOSTI IN UMETNOSTI
ACADEMIA SCIENTIARUM ET ARTIUM SLOVENICA

RAZRED ZA NARAVOSLOVNE VEDE
CLASSIS IV: HISTORIA NATURALIS

ZNANSTVENORAZISKOVALNI CENTER SAZU
INŠITUT ZA RAZISKOVANJE KRASA - INSTITUTUM CARSOLOGICUM

SEPARATUM

ACTA CARSOLOGICA

KRASOSLOVNI ZBORNIK
XXVI/2
1997



1947 - 1997

International Symposium - Mednarodni simpozij
"ALCADI '96"
Postojna 1996



LJUBLJANA
1997

ACTA CARSOLOGICA

KRASOSLOVNI ZBORNIK

XXVI/2 (1997)

ACTA CARSOLOGICA is included into:

- GEOBASE (on line)
- Index to Scientific & Technical Proceedings® (ISTP®)
(print and CD ROM)
- Index to Social Sciences & Humanities Proceedings® (ISSHP®)
(print and CD ROM)

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Gradivo je bilo obravnavano na seji razreda za naravoslovne vede
Slovenske akademije znanosti in umetnosti
dne 15. oktobra 1997.

Uredniški odbor - Editorial Board
Franco Cucchi, Jože Čar, Ivan Gams, Andrej Kranjc,
Marcel Lalkovič, Mario Pleničar, Trevor R. Shaw, Tadej Slabe

Glavni in odgovorni urednik - Editor
Andrej Kranjc

Avtorji v celoti odgovarjajo za vsebino in jezik prispevkov.

Večino angleških besedil je pregledal T. R. Shaw.

The authors are fully responsible for the content and for the language of
their contributions.

The English of most of the papers has been revised by T. R. Shaw.

Zamenjava - Exchange
Biblioteka SAZU
Novi trg 5/I, SI - 1000 Ljubljana, p.p. 323, Slovenija

Naslov uredništva - Editor's address
Inštitut za raziskovanje krasa ZRC SAZU
SI - 6230 Postojna, Titov trg 2, Slovenija

Tiskano s finančno pomočjo
Ministrstva za znanost in tehnologijo RS,
Ministrstva za okolje in prostor RS,
Slovenske nacionalne komisije za UNESCO
in Zavarovalnice Triglav d.d., območne enote Postojna

Published by the financial assistance of
Ministry of Science and Technology RS,
Ministry of Environment and Physical Planning RS,
Slovene National Commission for UNESCO,
and of "Triglav Insurance Company Ltd., Main Branch Office Postojna"

Po mnenju Ministrstva za znanost in tehnologijo RS št. 415-01-137/94,
z dne 26. 4. 1994, je publikacija uvrščena med proizvode, za katere se
plačuje 5-odstotni davek od prometa proizvodov.

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UVODNIK

Prvič, odkar izhaja zbornik *Acta carsologica*, smo v enem letu uspeli, ali pa nas je obilica gradiva primorala, kakor pač gledamo na stvar, izdati kar dve številki. In to nista drobna zvezka, pač pa zbornika v običajnem obsegu. Še posebej sem vesel, ker se je to zgodilo ravno letos, ko Inštitut za raziskovanje krasa ZRC SAZU praznuje 50-letnico ustanovitve, kar je skromno prikazano na platnicah z letnicama 1947 - 1997. Letnik 1997 je jubilejni in lahko rečem, da smo 50-letnico proslavili tudi s preko 1000 stranmi obsegajočim letnikom *Acta carsologica* 1997.

Zato se mi zdi tudi primerno, da je v tej številki malo več poudarka na zgodovini krasoslovja in speleologije. Nedvomno si je v teh 50 letih tudi Inštitut prislužil primerno mesto v tej zgodovini.

Prvi del oziroma sklop tokratne številke obsega prispevke, predstavljene na mednarodnem simpoziju o zgodovini krasoslovja in speleologije, ALCADI '96, ki je bil spomladi 1996 v Postojni. Ni bil posvečen 50-letnici inštituta, pa vendar je vmes več prispevkov, zelo pomembnih za zgodovino našega krasoslovja in speleologije. Naj omenim le prispevek o geodetski izmeri Postojnske jame iz 1891, ko je ob predstavitvi direktor Speleološkega inštituta z Dunaja podaril Inštitutu popoln transkribiran zapisnik - knjigo meritev. Zgodovinski sklop je obenem tudi neke vrste priprava na pomembne obletrnice, ki so na vrsti v prihodnjem letu. Takrat bo 250 let, odkar je na našem krasu raziskoval J. A. Nagel. Rezultat njegovega dela je tudi prvi načrt Postojnske jame iz 1748. Istega leta praznuje Postojnska jama 180-letnico odkritja notranjih delov jame. To je tisti dogodek, zaradi katerega je postala Postojnska jama prava turistična jama (1819), zaradi katerega je postala svetovno znana in zaradi katerega je, posredno, tudi Inštitut za raziskovanje krasa lociran prav v Postojni.

Drugi sklop vsebuje gradivo, ki je bilo predstavljeno na mednarodni krasoslovni šoli "Klasični Kras" v Postojni 1996, katere vodilna tema so bila brezna. S šolo je Inštitut pričel na pobudo Slovenske nacionalne komisije za UNESCO, podpira pa jo tudi Slovenska znanstvena fundacija. Letošnja šola je bila že peta po vrsti, kar je tudi, sicer majhen, a pomemben jubilej, saj kaže na to, da se je šola usidrala. Vedno večje število udeležencev pa dokazuje, da jo cenijo tudi v tujini. Pri tem ima določen pomen tudi zbornik *Acta carsologica*, v katerem objavljamo gradivo s teh šol.

Vendar ne gre za same jubileje, čemur so dokaz "Ostali članki". Tudi za ta del je zanimanje med (bodočimi) avtorji vedno večje. Zelo je razveseljivo, da so med njimi tudi mladi in tudi taki, katerih ime je v stroki že uveljavljeno.

Da je bilo mogoče v enem letu toliko objaviti, gre največ zahvale Ministrstvu za znanost in tehnologijo kot najpomembnejšemu sofinanserju, ne smemo pa pozabiti tudi sponzorjev in neposredne denarne pomoči obeh soizdajateljev.

Urednik

PREFACE

For the first time in the history of editing *Acta carsologica* we have succeeded, or we have been forced due to lot of material, it depends on point of view, to publish two volumes in one year. And these are not thin issues but both contain normal number of pages. I am specially glad that this happened just in the year, when the Karst Research Institute ZRC SAZU, Postojna celebrates its 50-th anniversary. This is modestly shown on the front cover by the numbers 1947 - 1997. We can say that this year's volume is a jubilee one and *Acta carsologica* joins to the anniversary by more than 1000 pages.

Therefore it is right that the history of karstology and speleology is emphasized in this volume. The Institute earned in 50 years an appropriate place in this history also. First part of this number of *Acta carsologica* contains the papers, presented at the International symposium on the history of karst and cave science - ALCADI '96 - which was at Postojna in the spring of 1996. This was not dedicated to the 50th anniversary of the Institute, but there are some very important articles regarding history of our karstology and speleology. Let me mention the paper about the geodetic survey of Postojnska Jama cave from 1891. Together with this paper, the director of Speleological Institute of Vienna submitted to the Institute the complete and transcribed surveying book. The historical part is at the same time a sort of introduction to the forthcoming events of the next year. This is 250 years since J. A. Nagel investigated our karst. The result of his work is also the first plan of Postojnska Jama (1748). In the same year, 1998, Postojnska Jama will celebrate 180 years of discoveries of the inner parts of the cave. This was the reason that Postojnska Jama became a real show cave in 1819, that it became world known and indirectly also the reason that Karst Research Institute is located at Postojna.

The second part of the present *Acta carsologica* contains papers presented during the International karstological school "Classical Karst" held at Postojna in 1996. The main topic of this school was karst shafts. The Institute started to organise schools by the initiative of the Slovene National Commission for the UNESCO, and this is also supported by the Slovene Scientific Foundation. In this year the fifth school has been organised already. A small but important anniversary, showing that the school is being approved also in the foreign countries, evidenced by the every year bigger number of participants. For the school *Acta carsologica* is important too as the papers of the schools are printed in it.

But I must not speak of the jubilees only. There are also so called "Other papers". Also for this part the interest among the (future) authors increases every year. I am glad that among them there are young researchers and also recognized authors from the scientific circles.

That we were able to publish that much in one year I must thank the Ministry of Science and Technology as the biggest supporter. But we must not forget the sponsors and financial support of both publishers.

The Editor

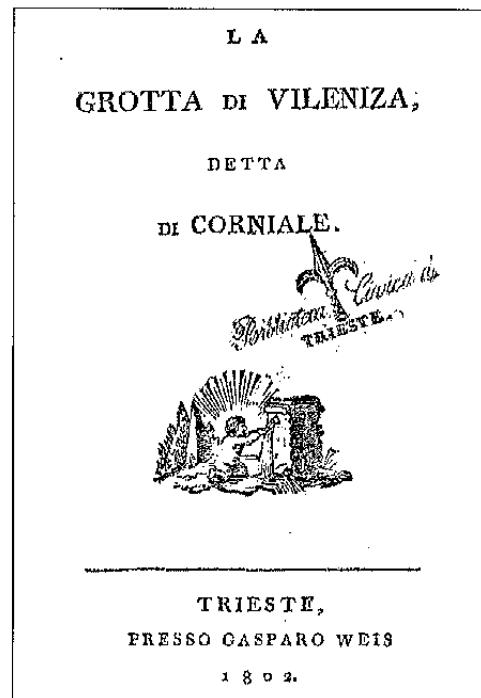
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POSTOJNA 1996**

The Editorial Board may print only the abstract of those papers which are not suitable for publication in full.

LA GROTTA DI VILENIZA, DETTA DI CORNIALE

FRANCESCO TREVISANI



R.P. Misc.
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Qui est ce, qui osa assigner des bornes précisees à la NATURE?

J. J. ROUSSEAU,

ALLA
SIGNORA CONTESSA
MARIA VOINOVICH
NATA
DEL-ROSSO

FRANCESCO DR. TREVISANI
fra gli amici di Roma Alzindo Liprato
dedica e consacra

Sorger la notte placida
dalle cimerie-mura,
quando coll'ali scosse mi
dai sonni miei NATURA;

Pendente tela candida
avea sul braccio:bello,
e nella destra morbida
l'animator pennello;

Reggea la manca il docile
pietra,... così m'apparve...
tutto m'offri, dicandomi,
canta, dipingi, e sparve.

D'estro novello, e insolito
sento nel sen cribarmi,
lascio le pigre coltriei,
stendo le mani all'armi;

E già la tela candida,
come il pennel la tinge
di tinte vivacissime,
e d'orride si pingue;

Già dentro il caldo cerebro,
che un dolce incanto bee,
vengono, vanno, e riedono
l'affice pittrici idée.

Scorre il pennello, e scorrono
gli istanti, e mentre sorge
Febo in Oriente, l'anima
compita l'opra scorge,

Cui t'offre unil la cetena,
DONNA GENTIL, che invano
l'Arno richiama, ed invido (*)
mirà da se lontano;

Ite, miei carmi,... i pallidi
timor sgombrate intanto,
è certo, s'Ella accoglievi,
il mio trionfo, e il vanto.

(*) Fu in Pisa ov'egli trasse i suoi Nataff la Signora Contessa.

— vii —

A V V I S O

DELLO STESO

AL LETTORE.

Il Sig. Compagnoni descrisse dottamente alcuni anni innanzi la stessa grotta: veramente dopo la sua bella descrizione è da mal accordo il presentarne un'altra; e non vi sono, che le circostanze particolari, che possano garantire il secondo, ed il cedere volontario la palma, per potere impunemente delineare, quanto il primo con tutta l'arte dipinse.

— viii —

*dolcemente all' orecchio glielo porta,
e lo desia per me, che i sonni suoi
non oso di turbar: . . . ma s'apre alfin
la mia soglia. . . , i placidi riposi
disgombati alfin, e greca man' il porge
nel boschino cristal le americane
spume col fresco latte accolte, e miste;
Tu le rifiuti, e delle pigre piume
sorti d'un salto, al piè adattando il molle
anglico croco, ed alle forme inchieste
atriche luce all'Europo costume. (a)*

*Già tutto è pronto; e Tu pur anco, vleni,
monta il cocchio ristretto in pia, che l'alto
rettor dei freni ai servidi cavalli
il conscio segno di partir dispensi.*

*Ma alfin si parte, e gli agili destrieri,
divorando il cammino, arrivan dove
sul verde prato incolto monte s'alza,
che quanto più s'estolle, orrido tanto,
e men fertil divien; ove cred'lo,
dell'utile Cerer, di Pomona bella
solò a dispetto, vedi pur talora
o mammola spuntar, e bionda spicin,
di cui dal prati in torbido aquilone
brasce sull'alt, e qui depose il seme.*

Ma vinto è l'erto dell'informe colle,



La veziosa del di fortuna, e madre
dal talamo di rose al vecchio amante
s'invola, e lucidissima rimonta
sull'oscuro Orizzonte: i tenebrosi
densi vapori, e gli astri Gunneggianti
fuggono al raggio, che gli insegue, e vince

*I sogni placidissimi disgombra,
divine Amico, e lor permette in pace, (a)
ridere all'ima chlosena, or che risorge
coll'alba il sole, o fa di lei quel, ch'ella
fa della notte, e delle vaghe stelle,
Già sul tuo limitar mordono i freni,
calcitrando il terreno impazienti,
gli ungui corridori, e il bieco enriga
Te d'inscreto, e negligente accusa,
che lo esbro martel sugli ahi bronzi
frementi ricadendo, annunzia l' ora,
che fissasti al partir: nobile aureta,
che intorno spargi il rombo furoioso,*

— ix —

*e l'ampia vetta al guardo offre sovve
ricompensa dell'ordito cammino,
che a manca vedi spumeggiar il salsio
immensurabil liquido Orizzonte,
per cui scorrendo mille prese e mille
d'estremo ciel, felicemente onesta
d'utilli merci, e peregrine stoffe,
l'aurea Cittado, che all'Adriaco flutto
frena l'orgoglio, fan sì ricca, e bella.*

*A destra i pratici floriti, e molli,
i culti poggi, i giardinetti amenti
fan sorridere il Ciel di lor bellezza,
v'igni son palgi, ostelli, case,
tetti, e vigne, che il guardo ammiratore
cento villette insieme crede raccolte,
e germogliate il fertile terreno,
come germoglie le vermenze, e i fiori,
talch'è dell'Argo tuo, DONNA GENTILE,
i popolani, e fertili contadri
rivedo in lor, di cui così cantava
sul dotto pletro il Ferrarese Omero.*

*Ma l'utile Ocean, l'ameno colle
egli occhi fura il più leggero, e pronto
de' fumanti destier, che in monte alteste
sgognan la zampa, ove la mano industro
dal molle asso tra feconda argilla;*

— XII —

né scuopre più per quanto acuto il guarda
dell' alte autene, e delle torti eccelse
traccia nel cielo, che dispare, e fugge
del Lombardo Apenio, e d'un' avosi
Alpini gioghi la senglio in fronte.

Ora tutto è orror, né per fuggir più fatto
cessa il terrore, onde NATURA volte
i palpiti sospender del core,
ed arrestare a mezzo il corso il sangue.
Fra rupi alpestri, ed ingenui montagne
ampie fosse ritrovi, ove s'arresta
il limpideito unor, che larga pioggia
qui provvida dispensa; ad esse corre
stilbondo nel giorno il pastorello
coll' assassinato bue, mentre alla notte
l'atre miscelle ancor del sangue lorde
d'incanto aguello, o di men presta lepre
forse viene a farar il lupo infesto,
presso le fosse limacciose in magro,
ma pur culto terren, che intorno serba
bassa muraglia di rathanni, e sassi,
qualche spica bianceggia, ove dimore
d'infestis angurio il turpe angello, e il gufo.

Ma spavce alfin l'ortido scoglio, e sorge
fragante, è chiaro-ombrifero boschetto,
che oltre nel proprio seno ai cittadini, (b)

— XIII —

ed alle oneste donzellente acceso
sicuro astio, che d' intorno investe
la virgin rosa, il vago giglio abella,
e la querincia ricopre, ove sciogliendo
flebile-tenerissimo ussiguolo
dolce canto d'amor, amore inspira.
In due divide la boscaiglia retto,
e ben lungo cammin, ove lassiva
la molle erbetta, e i vario-qnili fiori
grato olezzando guidano le plante
in rustico magion, che caro prezzo
su rozzo desco al passagger dispensa
scarsa insipida mensa; a Te Tu stesso
niega la soglia, ai mal-accorti aperta;
segui l'orme de' saggi impresse, a Amico,
sopra il destro cammin, che fra spugnosi
rottami, e cassi ammoniobifai appena
lascia libero il varco Ecco da lungi,
negri tuguri, a cui più negre canne
coprono il tetto ti rallegra è presso
la desolata Grotta, ove NATURA
fa in silenzio di Se pompa al nota.

Videli un giorno disadorna, brutta,
ed orfida così, che in cor le mosse
toma, e pietà, chiamid sua possa allora,
e il tetto orrore d'abbelliir risolse;

— XIV —

Il forte Veglio apportator degli anni
seco all'opra d'uni nel cielo albosso
alto bisbiglio fra i Superni, e v'era
chi oppor volesse, ma Giove allora (il solo
bilanciatore del comun destino),
agrottando l'austero sopracciglio
fe gli audaci tremar, e l'aureo freno
cauto pris raccogliendo, il guarda valse
indi a mirar l'audimentosa impresa.

NATURA igianto dai vicini monti
l'aque raccolse, e ne formò torrente,
che sull'erbe spargendosi, e sui fiori,
come verme il terren corrose; o quale
veggiam tallor entro sospesa conca
mezza, ricolma di minuta sabbia
a goccia, a goccia dal portuglio agusto
della conca ender il sopra-posto,
ed abbondante liquido elemento, (c)
tal per lo vie, che si formò sorpendo
fra il docile terren, parte dell'acqua
giunse nel vacuo della grotta informe,
ove sul sasso stilbondo, e pregno
d'alcali, e sali nel cader a stilla
a mezzo il corso s'arrestava, e forma
perdendo di liquor; di sale, e sasso
prendea l'aspetto, e la sostanza amara;

— XV —

Indi altera stilla ricadendo, e cento,
e mille ancor, come la prima tuttò
si trasformaro in solido elemento,
così il marmo dì se maggior si fea,
e della grotta s'adornava il tetto.
Altra parte dell'acqua in un raccolte
obbedienti alla tendenza prima,
che al centro universal lor dì NATURA,
accese fin nel profondo; u' ferri, e marmi,
e planto, e quanto ivi trovò, contrerà
in strumenti all'impresa: insinuata
nelle fibre del marmo, e i porti angusti
del dissimil metal, novella forma
al marmo diede, ed al metallo, e solo
degli arbori scorbì l'antico aspetto;
forse perchè Le piaceva allor formarsi
sotterraneo amenissimo giardino
non visto ancor, che il gran Compagno all'opra
d'ime piriti simili ell'erbe
ornò, e di statalitici floretti,
eui mentre il guarda umata stupidò mira
l'anima code al lusinghiero incanto,
che fra i mortali nou s'arresta solo,
ma sale in cielo a ridestar nei Numi
l'iovide flamma, mentre il Dio tonante

— XVI —

per stupore inarcando il sopracciglio
coll'Artefice immenso si rallegra.
Terma, auriga del destier; ascendendo, Amico,
ecco l'una spelonca . . . mi freddo orrore
serpe per l'ossa in simicarta . . . un'arco
immenso, e cieco allo spettacol vago
l'addito schiude; il rozzo condottiero
igneo scintille accoppia alle recate
faci, e discende ardimentoso innanzi,
poichè il costume, ed il ferrato cinojo,
che il dotto più g'l'investe, lo assicura.

Silenzio impenetrabile, profondo
rende sacra la soglia . . . i vasti massi,
la densa oscurità, la strada incerta
fanno orrendo l'albergo, ove di lucco
a podo, a poco 'un raggio vincitore . . .
torna agli oggetti l'esistenza, e forma.
Sotto l'arco magnifico, di cui
invan desio d'investigar ti punge
i cardini robusti, ove s'innalza,
(che il non premuto suol scendendo il vieta)
ampia sala si estende, ove colonne
maestose s'erigono fuggenti
sostenitrici le sublimi volte,
che fuggono con lor, talchè tu vedi.
rinovellata del Roman Teatro

— XVII —

diviso ei pur; che parte il suol profonda
al celo, e parte il ciel rimanda al suolo;
e questa sembra equilibrata in alto
da equin capello, ed ondagglier, ma invano
smuover la teneria Sterope, e Bronte;
d'intorno in ispiral giro strumenti,
florami, e statue lo scolpiscon tutto,
talchè il vanto con lor, su cui scalpello
segò d'Euci, e Marcumam le straggi
saceri a Trajanò, ed Antoninò, continuò.

L'esperto intanto condottier divide
senz'ordine qua, è là l'aride paglie,
e non visto l'accende . . . oh! quello sorge
improvviso spettacolo soave,
che il vasto immaglione rapisce, e vince!
Gotici vasi, candelabri Egizi;
arbori, guglie, tripodi, ed orchestre
tutti appajon distinti: osserva, Amico,
là quella siepe, che ricorda il verso
desforator degli onor sul, che il padre
dell'erbe Aprilo prodigo dispensa.
Voglihi, e mira quell'enorme sasso,
che eminente torreggia, e il sopra-posto
Cotico pedestal, ove furente
l'immagine del Nume arei-tonante
siede impugnando le saette, e i dardi;

— XVIII —

l'involubile scena, e l'ardua forma,
che Berga ancor conserva Dio perfetta;
illusio sollecita sen'vela:

l'inganno a persieder, che all'alma arreca
quelle, che in Lei destan le mobili fibre
dai fidi sensi in lor trasmesso idéo;
di tombe, di relami; addobbi, e freggi,
e fra i pilastri della doppia scena:
di statue, di mortali, di Déi il immago;

Ma per torto cammin'aducito, e angusto
ci attende il condottiero, il saldo braccio,
nostegno offrendo . . . no, n'ritutto, e passo.

Deli chi vegg'io? . . . dove sian giunti? . . .

à questa

d'Agamemnon la magion sublime;
e de'Thi la Reggia, e de'Neroni? . . .
che mai ridir, se attonito rimane
P'occhi, né val tutti a veder le parti
della sala superba? . . . I muri intorno
ricchi soa di raveschi, e di fiorami,
di statue, guglie, candelabri, e tombe
è smaltato il tetron; d'armi, di grappi,
d'archi, d'addobbi ricoperto il cielo.
In due divide la gran sala immenso
macigno gigantesco oltre Pusato,
(somigliante a vastissima colonna)

— XIX —

stagli il tripode appresso, su di cui
l'ardita guida aride canne scese,
che il furore del Dio fanno più vivo; . . .
glià la vendetta sull'alter fronte
stà pinta; e i lumi, altevo volti, in petto
ti raddoppan l'orror, mentre la manca
i folmini afferati al vichi foco
neccnde, e insorribile la destra
un ne scieglie, ló impugna, e il corpo tutto
di sterminare, e di vibrato à l'atu.
Terma, Giove, che fai? . . . sospendi l'ira...
Noi l'adoriam prostesi al suol . . . ma folle,
eh'io son!, è un sasso senza vita, e moto,
che moto, e vita fantasia gli diede!

Seemanò intanto delle poche paglie
le brillanti faville, e comè manca
dalle fiamme il chiaror, la forma goja
sfugge pur degli oggetti, e resta solo
qualche traccia di lor, come di luce,
che ammorza, e vince il redivivo orrore.
Di qui si v'd per tortuosa, ed erlo
calle, che guida ad alto scoglio in vetta;
ma pria vedi a sinistra spaventosa
antro profondo, infernal, bujo,
ove son volte le vestigia, e d'onda
orma impressa non v'd; forse; che il prima

— XXX —

della Tracia il Cantor l'avrà stampata,
se più severo, ed ororoso mono
serbava il gioco; e non cedeva al dubbio.
A destra il monte, incerto il fianco,
oltre altra via, che a quella verità è duece.
Fossepio, incomprendibile NATURA,
quanto nell'opra tua sei grande, e Dea!...
Più vasta ancor di quante in pria si mostra
reggia sull'atollo, a cui sian due macigni
immensi, e negri a custodir l'ingresso.
Passi fra loro, a lunghe areato, ad ampio
volte, portici, loggi osservi, e quindi
duplicati colonne, alti colossi,
armi, trofei, vestiboli con quanto
vasto pensier può immaginare, ed arte
dattamente eseguiti; sulle pareti
al tulpe; vedi la rosa accanto
rigrendersi il natio nivio-splendore,
che tal fu un di peja, che Ciprigna bella
col suo sangue sanglosso i suoi colori;
e se t'alletta, impunemente puol
strapparla, Amico, or che la vigli spina
tagliò NATURA in sasso innocuo, e rude.

Ma il nostro duce, odo gridar, ... venite
Ecco il confine ... malagevol varco

— XXXI —

ivi conduce; angusta è l'ardua cima,
e tetra sì, che in sen palpita il core,
Da lungi vedi, come torre eccelsa
dell'uno fondo dell'orrido abissos,
che sotto i più si spalanca, alzarsi
colossal magnifico cipresso;
a cui cento minor fan-serto, e omaggio;
tale soleas di Marte; in campo un giorno
mille rocche Inferitor, tratte 'n dorso
de' tardissimi punici Elesanti,
alla rocca maggior dell'Unico sommo:
prestar difesa, ed intrecciar corona;
L'arco, ed il ciel, che di cadér minaccia,
né mai cadranno per girar di lustri,
di così giganteschi alto profondi;
son ricoperti, a cui la punta acuta
ver l'imo, e all'alto l'ampia base, è volga
così tallon nel freddo verno osservi
pendex da' telli diafano splendente.
gruppo di gelo, che il divino raggio
pria dalla neve in bianco' umor disciolto,
e il notturno rigori mentre cadea;
cristallizzato in agli lo converse ...
Se purli; un'eco spaventoso, e basso,
rombando interno per la cava fossa,
le tue voci ripete, e al cor di porta

— XXXII —

nuovo terror; se mai desto ti pugno
un macigno scagliar nel caos humenso
della vorago interminabil, sorte
taiso orrendo fragor, mentr'ei discende
precipitosamente ruotolando,
che booridisce l'anima, e rifugge,
mentre l'aere densissimo commosso,
pregno d'altra morte, e basso puzzo,
il volto offende, e la brillante fiamma
delle faci minaccia: intanto sempre
fragoroso precipita il maelgno,
ove sicuro il piado uman' non giunge,
ché all'occhio indagator NATURA avara,
qui impose, e non a so' confin preciso;
qui imponiamo noi pure ... benchè deh!
quanto,

il veloce pennello trascorrendo,
sul quadro informe di tracce commisso
e quanto a pinger resterà! ... mi invano
l'estro mi punge di seguir, che il basso
Invincibile error le chiare tinte
oscuro, e arresta le pitture lide.

— XXXIII —

N O T E.

- (a) Il compagno di questo viaggio fu il sig. Niccolò Zograffo, Greco di endove, che vestiva sempre il costume del nostro paese colle iano del sun.
- (b) Egli è ammirissimo, ed i signori di Trieste vanno a godere sovente della sua ammirata nello giornate festive.
- (c) Si disse liquido elemento, come si dice posso innanzi solido elemento, per intendere acqua, e terra; il genio fisico è pregato a compatisse, se sol per questa volta si è adoperata una perfetta, che ricorda i racordum, e gli errori dell'antichità; per noi conveniamo coi dogmi novelli, e rinunziamo agli elementi.
- (d) Così detta è Vicenza dai monti Berici, che vagamente la ostendono; in essa vi è il famoso Teatro Olimpico sull'architettura degli antichi Romani.
- (e) Questo due famose colonne esistono in Roma; quand'anche fosse spogliata di tutti i suoi simboli avranno d'antichità, ostenderebbero esso solo per ricompensarne le perdite, ed eternarla; bisogna vederle per esserne convinto.

VILENICA, JAMA CORNIALE IMENOVANA

(prevedla Nadja Adam)

IX³

Milina, dneva znanilka, ter mati
iz rožnate zakonske postelje k ljubimcu staremu
odhiti, in se blešeča zavihti na temno obzorje: temačne
goste izparine, in iskreče se zvezde
pred žarkom bežijo, ki sledi jim, in jih premaga.

Mirne sanje preženc
božji Prijatelj, in jim dovoli v miru, (a)
v globoko se sotesko vrniti, sedaj ko z
zoro ponovno sonce vzide, in z njo opravi tako, kot ona
le-to stori z nočjo in zvezdami nestalnimi.
In že na tvojem pragu uzde brzdajoč,
in s kopiti nepotrežljivo zemljo udarjajoč,
ogrski tekači, in zlobni kočijaž
Tebe, brezobzirnosti in nemarnosti, obsoja,
da raskavo kladivo na visoke zvonove
drgetajoš udarja in oznanja čas,
ki določil si ga ob odhodu svojem: nestanovitna sapica,
ki naokrog glasno šumenje trosiš,

X

nežno mu ga k ušesu vodi,
in ga za mene, ki njegovega sna ne
upam si motiti, zbuditi; toda na koncu odpre
sc nemi prag ... in mehka mirovanja
dokončno odžene, in grška roka ponudi ti
v češkem kristalu ameriške pene, ujete in pomešane z mlekom svežim;
ti jih zavrneš, in iz lenega puha
odskočiš, nogo navajajoč na mehko
angleško usnje in atiško volno na oblike
zahtevane noše evropske. (a)

In že vse je pripravljeno; tudi Ti, pridi,
povzponi se spredaj na ozek voz, da prevzvišeni
vladar uzd, iskrim konjem
zavestno znak odhoda da.

Končno se potuje, in urni plemeniti konji
naglo pot požirajoč, prispejo tja,
kjer na neobdelanem travniku zelenem, gora kvišku se dviguje,
in bolj ko se tako strašna vzpenja,
manj plodna postaja; kjer mislim jaz,
da samo koristni Cereri, Pomoni lepi
navkljub, vidiš vijolico
celo pognati ali breskev rumeno,
katerih seme je s travnikov nemirni severnik
na krilih prinesel in tukaj ga odložil.

Toda premagana je strmina brezobličnega hriba

XI

kjer široki vrh pogledu sladko nagrado
po strašni poti nudi,
in z leve vidi peniti se slano,
neizmerljivo tekoče obzorje,
po katerem, nebu ncznanem, drsi
na tisoče in tisoče ladij, naloženih radostno
s tovorom uporabnim in blagi nenavadnjimi,
mesto zlato, ki ob morskem valu Jadrana
brzda svoj ponos, spreminjačo se v lepo in bogato.

Na desni travniki cvetoči, in mehki,
griči obdelani, vrtiči ljubki,
njih lepotu Nebu nasmeh izvablja,
oli, brczstevilni so dvorec, bivališča, hiše,
strehe, in vinogradi, katere občudujoči pogled
vidi kot sto hišic zbranih,
in klije rodovitna zemlja,
kot klijejo poganjki in cvetlice,
tako da tvoj Arno, prijazna gospa,
kraje, in njih plodno okolico,
v njih prepoznavam, o katerih pel je tako
učeni plektronom Homer iz Ferrare.

Toda koristni Ocean, prijetni grič
ocem je lahek bil korak, in poln
sopihajočih konjev, ki si v planino
pot utirajo, kjer delovna roka
vlažno kamenje v ilovico spreminja rodovitno;

XII

ne odkrije več, čeprav pogled pazljiv
anten visokih, in stolpe vzvišene
na nebū izginjajočem išče, in zbeži
iz lombardskih Apeninov, in iz zasneženih
Alp grobo lice si podjarmi.

Sedaj vse je groza, niti za urni pobeg
tesnoba ne prestane, kjer Narava hoče
utišati utrip srca,
in zaustaviti obtok krvi.
Med skalami planinskimi, in necnakimi gorami
najdeš brezna široka, kjer zaustavlja se
tekočina čista, in deževje dolgotrajno,
predvidelo je nje shrampo, k njej žegen
tekom dneva z volom sopihajočim,
pastirček hiti, medtem ko ponoči
druge čeljusti, še vedno s krvjo nepazljivega
jagnja ali manj hitrega kunca zamazane,
mogoče pride umit si osovraženi volk.

Poleg blatinih brezen in suhe,
toda vseeno grude rodovitne, ki zapira jo
nizek zid razbitin, in kamenja,

kakšna bledorumena breskev, kjer prebiva
grd ptič zlosrečnik ter čuk.

Končno izgine pečina grozljiva, in pokaže se
dišeč, svetlo senčen gozdlič,
ki v svojih nedržih meščanom, (b)

XIII

in poštenim gospodičnam varno
zatočišče prižge, ki okrog ga oklepa
vrtnica nedolžna, ljubka lilija krasí,
in hrast pokriva, kjer pojč
tožeči slavček občutljivi
sladko pesem ljubezni, ljubezen navdihuje.

Na pol razdeli goščavo ravna
in dolga pot, kjer spolzka
vlažna tratica, in cvetlice vseh barv
prijetno dišeče vodijo rastlinje
v podeželsko hišo, kjer za drago ceno
na neotesani mizi, popotniku razdele
boren občel plehak; Sebi Ti sam
prestopiti prag prepoveduješ, kateri nепrevidnim je odprt,
sledil stopinjam sem vtisnjenim, oh Prijatelj,
nad desno potjo, ki med gobastimi
razvalinami in kamenjem naloženim,
komaj prost dohod dopušča ... In glej, od daleč,
črne bajte, katerim še bolj črno trsje
pokriva streho ... te razvesele, ... in poleg
željene Jame, kjer NARAVA
v tišini delujoč baha se kot se opazi.

Videl sem jo nekoga dne brez okrasa, grdo
in tako grozljivo, da v srcu strah je prebudila,
in usmiljenje, poklicala je torej svojo moč
in mračno grozo, da od olepšav jo odreši;

XIV

mogočni čuvaj, leta prinašajoč
s seboj, se s stvaritvijo je združil, v nebo med višave
se je dvignilo glasno šepetanje, in bili so tisti,
ki upreti so se hoteli, toda ... Jupiter takrat (edini
naše skupne usode uravnalec),
obrv strogo je nagubal,
ter predzne še prestrašil, ko zlato uzdo
pazljivo poprej je zategnil, in pogled zatem
v občudovanje drznega dejanja usmeril.
Narava pa medtem je z bližnjih gora
vode združila, in jih v potok oblikovala,
ki po travi se razlil je, in po cvetlicah,
ki kot črv zemljo je prezrl, oh, koliko
tekočine je takrat v visečo,
z drobno mivko zapolnjeno kotanjo zlil,

in kapljo za kapljo skozi ozko odprtino
iz kotanje v prostor spustil,
in obilica tekočega elementa, (c)
tako po poti, ki ustvarila se je vijoč
prek voljnega terena, del vode
prispel v praznino jame je brezoblične,
kjer na kamen žejon, prepojen
z lužninami, solmi, kapljajoč
v sredino toka se je ustavil, in obliko
izgubil zaradi tekočine ter soli, in kamna
vídeč ter snov grenka sta postala;

XV

odtley še ena kaplja je padla, in sto
in tisoč še, tako kot prva vse
so v trden element se spremenile,
tako marmor vse večji je postajal,
ko strop z jamo se je zaljšal.
In druge vode v eno zbrane
poslušne prvtne težnji,
katerih vesoljno središče je NARAVA,
spustile so se vse do globin, žezeza, marmorjev,
rastlin, in kar tam so našle, izpremenile so
v orodje preoblikovanja: počasi vtisnjena
v vlakna marmorja, in v pore tesne
neenakih kovín, novo obliko
marmorju, kovini so dała, in samo
drevesom prihranila so stari videz,
mogoče, ker takrat všeč bilo jin je oblikovati
podzemni dražestni vrt,
nikoli še viden, katerega veliki Stvaritelj
je na dnú s pirití podobnimi dišavnicanam,
okrasil, in kapniškim cvetlicam,
katerim medtem ko jih presenečeno človeško oko občuduje (opazuje)
duša prepusti se laskavemu čaru,
in ne ustavi se samo med smrtniki,
temveč v nebo se vzdigne prebuditi ponovno pri Numih
plamene zavidanja, medtem ko Bog grmeč

XVI

zaradi začudenja čelo nagrbanči,
se s Stvarnikom razveseli.

Vstavi, jezdec konje: spustimo se, Prijatelj
v globoko jamo mrzla groza
se po kosteh ob snidenju ponovnem vije obok
neizmerni, slep ob predstavi blodni,
odpre, grob povljinik
gorče iskre z nosččimi bakljami
zdržuje, in spušča se smelo naprej,
ker obleka in usnje okovano,

ki nogo izkušeno mu obuva, ga pomirja.

Nedostopna globoka tišina
za svetega prag naredi velikanske skale,
gosta temna, negotova pot
gostišče v grozneg spremenljajo, kjer luč
malo po malem z zmagovalnim žarkom
vrne stvarem bistvo (obstoj), in obliko.
Pod čudovitim obokom, kateremu
zaman spodbode te želja raziskati
temelje trdne, kjer se vzdiguje,
(ker nestisnjena tla prepovedujejo jim spust)
velika dvorana se razširi, kjer stebri
veličastni dvigujejo se hitro
podpirajoč vzvišene oboke,
ki z njimi bežijo, kar tukaj vidiš
ponovljeno rimskega gledališča

XVII

nespremenljivo sceno, in ostro obliko,
ki jo Berga za nas še popolno hrani; (d)
iluzija nehotne zmoto
v prepričanje spodbuja, da duši dodeli
tiste, ki v njej prebude gibljiva vlakna
iz zanesljivih občutkov in vanje ideje zanese
o grobovih, zastorjih, okrasih in frizih,
ter med stebri dvojnosti
kipov, možnarjev, bogov podob.

Toda vzdolž zavite poti, razdrapanc ter ozke
nas vodnik pričakuje, trdno roko
v oporo ponuja jaz je ne odbijem, in mimo grem .

Oh! Kaj vidim jaz? ... le kam smo prispele? ...
in ta

Agamemnova prevzvišena palača,
oh, Titov Reggia in Neronov?! ...
kaj reči, če oko osuplo
obstane, so vredni ogleda ostali deli
dvorane sijajne? ... Okrog zidovi
polni so arabesk, cvetja,
kipov, obeliskov, lestencev in grobov
ter tla kot steklo; grbov, skupin,
lokov in okraskov nebo je polno.

Na dela dva deli neizmerno dvorano
skalina velika neobičajna,
(podobna stebru širokem)

XVIII

ki sama je deljena, ker del nje dviguje se iz globin
v nebo, in del nebo pošilja nazaj na dno;
in le-ta na vrhu izgleda uravnovešena
s konjsko grivo, in nihajoč, toda zaman

premagniti jo je skušal Sterop, in Bronte;
okrog pa polžasto zavita glasbila,
cvetlice in kipi popolnoma izklešejo jo,
tako da z njimi bahanje, na dletu katerih
znaki Dacijev, Markomanov pokoli
svetega Trajana, in Antonina, v nasprotju je.

Izkušeno medtem vodnik brez reda
sem ter tja razdeli, slamo suho,
in nevidno priže ... oh! in vzdigne se
nenadoma predstava mila,
ki brezmejno domišljijo ugrabi, in jo premaga!
Vaze gotske in lestenci egipčanski,
drevesa, konice, trinožniki, in orkestri
vsi se drugačni predstavijo: poglej, Prijatelj,
tjakaj tisto živo mejo, ki spominja na zimsko
defloracijo njegove časti, ki jo April,
oče trav, v izobilju podeljuje.

Obrni se, in poglej tisti kamen gromozanski,
ki prezvišen kvišku kipi, čez njega pa
gotski piedistal je položen, kjer besna
pojava numena strašno grmi
in sedeča, v roki strele in puščice drži;

XIX

tripod je ob njem, na katerega
drzni vodič brezčutne strelice usmeri,
ki bes Boga še bolj okrepijo; ...
že maščevanje na čelu ošabnem
se zariše, in svetila, drugam obrnjena, v prsih
podvojijo ti grozo, medtem ko levica
strelе ujete v bližnjem ognju
priže, in desnica privošči si
eno izbrati, v pest jo stisne, in celo telo
k pokončanju in vihtenju se pripravi.
Ustavi se, Jupiter, kaj počneš? ... jezo umiri ...
Mi, pri tleh živeči, te častimo ... toda nor,
sem jaz! ... to samo kamen je brez življenja, in gibanje,
le kakšno gibanje, ter življenje, mu domišljija je vdihnila.

Medtem pa moč izgubljajo ošamljenih slamic
iskre žareče, in kot plamenu
sij primankuje, tako oblike bogate
predmetom bežijo, in ostaja le
kakšna njihova sled, kot od luči,
ki jo uniči ter premaga, na novo oživljena groza.
Tu skozi se grc po vijugasti, strmi
poti, ki vodi nas na vrh do pečine,
poprej pa na levi zlovešč zagledaš
vhod globok, brezkončen, temačen,
kjer obrazi so sledi, in kjer
sledi vtisnjene se ne vidi; mogočč prvi

XX

iz Trakije pevec jo je opeval,
če bolj strog, in manj ljubeč
ohranjal je obljubo, in dvomom ni popuščal.
Na desni gora, razgibano pobočje,
drugo pot ponuja, ki k vrhu tistemu je vodnik.

Mogočna, nerazumljena NARAVA,
kako velika si v dejanjih svojih, o Boginja! ...
Še bolj obsežna kot postavlja se palača
kraljeva, v predverju kolosa dva postavljena (e)
velika in črna, ki vhodu sta čuvaja.
Mimo grem pod dolgimi oboki, lože si ogledam,
dvojne stebre tudi, visoke kipe,
orožje, trofeje, veže in vse kar
bujna domišljija lahko si predstavlja, ali umetnost
učena izpelje: na stenah
vidiš poleg tulipana vrtnico
pridobiti si prvotni čisti sijaj,
ki takšna bila je že dan poprej, kateri Venera prelepa
s krvjo svojo izpremenila ji barve je;
in če mika te, brez kazni
jo utrži; Prijatelj, sedaj ko trn varuječi
Naravo je v nedolžno in surovo skalo zbodel.

Toda voditelja našega, kričati slišim, ... pridite
Tukaj je konec ... težaven prehod

XXI

nas tja popeljc; ozek vrh in strm
ter mračen, da, v čigur nedržih srec bije.

Od daleč vidiš, kot stolp visoko
iz dna globokega in grozljivega brezna,
ki pod nogami odpira se, kvišku iti
čudovito cipreso velikanko,
kateri sto manjših okrog plete venec v poklon;
takšne prinesli so z Marsa nekoč
na polje tisoč manjših kamnov, noseč jih
na hrbitih sloni punski okorni,
da skali največji voditelja prevzvišenega
nudijo obrambo v venec se spletajoč.

Obok in nebo, ki pasti grozita,
a zaradi gibanja zvezd nikoli padla ne bosta,
s svečami velikimi, visoko-globokimi
sta pokrita, katerih ostra ost
se z globino spogleduje. In na vrhu široka ploščad, ki obrnjena
je tako, da v mrlzi zimi lesketajočo prozorno družbo ledu,
s strehe visečo, opazuje, kako božji jo žarek
poprej v belo tekočino iz snega raztopi,
in nočni mraz med spuščanjem svojim
v kristalne puščice prelčvi ...

Če izpregovoriš, grozljiv odimev, globoko
po jami in breznih zahrumi,
tvoje glasove ponovi ter srce ti zopet

XXII

z grozo napolni; če le kdaj želja te spopade,
v kaos neizmerni se podati,
deležen boš brezna brezkončnega,
trušča mogočnega kateri, ko spuščal se bodeš
naglo kotaleč, napolnil ti z grozo bo dušo,
medtem ko zrak gost in ganljiv,
nasičen s kužnimi blapi, rahlo zaudarjajoč,
obraz žali, in plamen žareči
bakljam grozi; medtem pa še zmeraj
bučno se spušča skalina,
kjer varno ne prispe človeška noga,
ki očesu raziskujujočem NARAVA skopa,
se tukaj vsili, in ne premore meje točne;
kar mi jo začrtajmo ... čeprav, oh!

koščiko,

hitri čopič po sliki brezoblični
šwigajoč pustil je sledil!
in koliko je še ostalo nenarisano! ... toda zaman
zanos spodbuja me k nadaljevanju, ko globoka
nepremagljiva groza barve svetle
potemni, in slikarju ideje zaustavi.

*OPOMBE*⁴

- (a) *Tovariš na tem potovanju je bil g. Niccola Zograffo, Grk po narodnosti, ki se je oblačil po običaju naše dežele, vendar v grška blaga.*
- (b) *Kraj je zelo prijeten, in tržaška gospoda ob prostih dnevih često uživa v njegovi prikupnosti.*
- (c) *Z uporabljenem besedo tekoci element in kasneje uporabljenem beseda trdi element, sta misljena voda in zemlja; genij fizike naj mi oprosti, če sem v tem primeru uporabili opis, ki spominja na staro šaro, in napake antike; kajti strinjam se s sodobnimi dogmami, in se odrekam elementom.*
- (d) *Tako poimenovana je Vicenza po hribovju (Monte Berico), ki jo obkroža in kjer se nahaja znani Teatro Olimpico s staro rimske arhitekturo.*
- (e) *Ta dva znana stebra obstajata v Rimu; če bi Rim oropali vseh njegovih antičnih zakladov, bi ta dva stebra nadomestila izgubo in ga kljub temu ovekovečila. Človek ju mora videti, da se prepriča.*

¹ Catalogo deglo incliti ed eruditi ed valorosi pastori e pastorelle arcadi dell'inclita adunanza letteraria di arcadia sonziana, colonia della insigne arcadia romana.

² Baronica Voinovich je dejansko živelja kar dokazuje oglas v "L'Osservatore Triestino", 15.7.1818.

³ Številka strani navedena po originalu.

⁴ Opombe kot jih je na koncu pesnitve navedel sam avtor.

PESEM O VILENICI

Leta 1802 je dr. Francesco Trevisani napisal pesem "La Grotta di Vileniza, detta di Corniale", ki jo je natisnila tiskarna Gasparo Weis v Trstu na 23 straneh knjižice malega formata. V knjižnici Biblioteca Civica v Trstu hranijo le zgoraj omenjeno delo tega avtorja, o njem ne obstajajo biografski podatki, tako da o samem avtorju lahko povemo le tisto kar je možno razbrati iz knjige. Trevisani nam na tretji strani knjige pove, da je med člani Akademije arkadijev v Rimu bil znan pod imenom Algindo Epireo. Akademije so v Evropi, predvsem pa v Italiji, nastajale od 14. stoletja dalje, zlasti so se razmarnile v času humanizma in renesanse (Accademia della Crusca, dei Lincei, pri nas Accademia Operosorum...). Akademija arkadijev (Accademia degli Arcadi ali Arcadia) je bila ustanovljena leta 1690 v Rimu kot kulturno zbirališče in torišče literatov in izobražencev ter z namenom, da prečisti književni stil, ki ga je pokvaril italijanski seicento (doba baroka in marinizma). Arkadijevi so imeli navado nadeti si grški ali pastoralni psevdonim. Razcvet akademije je trajal do sredine 18. stoletja, nato pa je začel z uveljavljanjem romantike in s svojim poveličevanjem pscvdopastoralnosti, crudicije in drobnjakarstva naglo propadati.

Akademija je imela je velik vpliv tudi na našem ozemlju, po več krajih je ustanovila podružnice: Ljubljansko akademijo (Accademia Emonina) leta 1709 in goriško akademijo arkadijev leta 1780.

Med novicami "L'Osservatore Triestino" iz dne 8. novembra 1802, št.90 omenja slavnostni zbor rimsко-goriško-tržaških arkadijev ob priliki odkritja doprsnega kipa predsednika njihove akademije. V čast dogodka so arkadijevi recitirali več pesmi napisanih prav za to priložnost, vendar na žalost avtorji niso navedeni. Seznam članov goriške podružnice, ki ga hranijo v Archivio Diplomatico e Storico v Trstu zajema le obdobje med leti 1780 - 1791, med njimi pa dr. Trevisani ni omenjen¹.

Trevisani je pesnitev posvetil baronici Mariji Vojnovič, rojeni Del Rosso², kateri je namenil tudi uvodno pesem v devetih kiticah. Pesnitev je sestavljena iz 351 svobodnih verzov, je neke vrste miselna poezija, ki je po večini patetična in brezosebna. Kot sam Trevisani v neposrednem sporočilu bralcu pravi, nikakor ne more doseči čudoviti Compagnonijev epos (op.p. iz leta 1795), vendar si je zaradi posebnih okoliščin, jamo v obliki pesnične dovolil opisati tudi sam. Pesnitev na katero me je opozoril dr. Shaw in na čigar pobudo je pravzaprav nastal pričujoči slovenski prevod pesmi, ki opisuje pot skozi podzemlje, ki s svojo lepoto očara, s svojim neizmernim breznom prestraši in vedno znova privlači. V prevodu, ki ne zajema Trevisanijeve uvodne besede ter uvodne pesmi temveč samo osrednjo pesnitev, sem se skušala držati originala pa vendar jezik iz začetka 19. stoletja približati današnjemu bralcu.

Jama Vilenica pri Lokvi je najstarejša turistična jama v Evropi, saj jo obiskujejo turisti že od leta 1633, ko jo je dal takratni lastnik grof Petač v upravo lokavski župniji. Velik sloves in obisk je doživljala v prvi polovici

prteklega stoletja, v Trstu je celo veljalo nenapisano pravilo, da je vladno vabiti angleške mornariške častnike v njeno podzemlje. Leta 1816 je jamo obiskal cesar Franc I. Sloves Vilenice je začel bledeti z odprtjem Postojnske jame in kasnejšim odkritjem Škocjanskih jam. Jama je nekoč z barvitimi kapniki različnih oblik in prečudovitimi kapniškimi zavesami močno burila domišljijo obiskovalcev in tako navdihnila tudi dr. Trevisanija, da je svoje občudovanje preliv v pesnitev.

EMILE G. RACOVITZA AND HIS IMPORTANT ROLE IN SPELEOBIOLOGY

VLOGA IN POMEN EMILA G. RACOVITZE V SPELEOBIOLOGIJI

EDE BARABÁS¹

Izvleček

UDK 57:551.44(091):929 Racovitza E.G.

Ede Barabás: Vloga in pomen Emila G. Racovitze v speleobiologiji

Emil G. Racovitza (1868-1947) je poleg prava študiral tudi geologijo in zoologijo. 1904 je obiskal jamo Cueva del Drach (Mallorca) in odkril novo jamsko žival. To je vzpodbudilo njegovo zanimanje za jamsko favno, ki ji je posvetil vse svoje življenje. 1907 je objavil najpomembnejše delo "Essai sur les problèmes biospéologiques". Z R. Jeannelom je ustanovil revijo Biospeologica. Poleg opisov jamskih živali vsebuje opise stotine jam iz Evrope in sveta, kjer so nabirali jamsko živalstvo. 1920 je ustanovil speleološki inštitut v Clju (Romunija).

Ključne besede: zgodovina speleologije, biospeleologija, speleološki inštitut, Racovitza E. G.

Abstract

UDC 57:551.44(091):929 Racovitza E.G.

Ede Barabás: Emile G. Racovitza and his important role in speleobiology

Emile G. Racovitza (1868-1947) qualified in law and studied geology and zoology too. In 1904 he visited Cueva del Drach (Mallorca) and discovered a new cave animal. This aroused his life-long interest in cave fauna. In 1907 he published his most important paper "Essai sur les problèmes biospéologiques". With R. Jeannel he established the journal Biospeologica. It included, among detailed anatomical papers, descriptions of many hundred caves all over Europe and elsewhere, in which fauna was collected. In 1920 he founded Institute of Speleology, at Cluj (Romania).

Key words: history of spelaeology, biospeleology, speleological institute, Racovitza E. G.

¹ Revärgatan 5, S - 25461 HELSINGBORG, SWEDEN



*The portrait of Emile G. Racovita
(from Livre du centenaire Emile G. Racovitza 1868-1968).*

Emile G. Racovitza was born on 15 November, 1868 in Iasi and there he studied at the primary school and comprehensive school. When he was nineteen years old he started at the Paris University. There he finished the study of law in 1889 because he wanted to carry out his father's wish. He studied also geology, anthropology and zoology at the same time. It was in 1891 when he finally took the state examination in natural science.

Later, in 1897, he took part of the Antarctic Expedition on the ship "Belgica". Roald Amundsen, who discovered the South Pole few years later, was also between the members of the expedition.

On July 13th 1904 Emile Racovitza was invited by Odon de Buen to the island of Mallorca where he visited the famous cave "Cueva del drach". It was there that he discovered a small, blind animal which they described together under the name of *typhlocirolana moraguesi*.

This aroused his life-long interest in cave fauna and a wide literature search resulted, in 1907, in his most important paper "Essai sur les problèmes biospéologiques". This long and fundamental paper established biospeleology (he called it "biospeleology") as a science, emphasized its importance and set out a plan for future work. In a paper, published in Paris few years later, Racovitza's student René Jeannel, stated about the mentioned paper: "Le premier mémoire de sa période, Essai sur les problèmes biospéologiques par Emile G. Racovitza, est encore aujourd'hui le statut fondamental de la biospéologie".

1900 his old professor named Racovitza "sous-directeur du laboratoire maritime ARAGO" at Banyuls-sur-Mer and "co-directeur de la revue Archives de Zoologie expérimentale et générale". Together with his student and colleague, René Jeannel, he established the journal BIOSPEOLOGICA. It included, among detailed anatomical papers, descriptions of many hundred caves, all over Europe (from Carpathians, Dinaric Mountains, Alps and Pyrenees, that is mainly from France, Spain, Slovenia, Romania) and elsewhere (Africa), in which fauna was collected. They worked together with well known cave fauna specialists as Endre Dudich from Hungary and J. A. Birstein from Moscow. The result of their co-operation were "Biospeologica hungarica" and "Biospeologica sovjetica". Between 1905 and 1929 he published 20 papers on *isopoda* only.

With R. Jeannel he established the journal Biospeologica. It included, among detailed anatomical papers, descriptions of many hundred caves all over Europe and elsewhere, in which fauna was collected. In 1920 he founded Institute of Speleology, at Cluj (Rumania). Racovitza and Jeannel are not only the pioneers of biospeleology but also very important regarding the international scientific co-operation. So it is not surprising that UNESCO inscribed his name between the great cultural persons to commemorate in the year 1968.

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VLOGA IN POMEN EMILA G. RACOVITZE V SPELEOBIOLOGIJI

Povzetek

Emil G. Racovitza (1868-1947) je doštudiral pravo na pariški univerzi 1889 in do 1891 dokončal tudi študij geologije in zoologije. 1904 je obiskal jamo Cueva del Drach na Mallorci in odkril novo jamsko žival, ki jo je poimenoval *Typhlocirolana moraguesi*. To je vzpodbudilo njegovo zanimanje za jamsko favno, ki ji je posvetil vse svoje življenje. Resno se je poglobil tudi v literaturo in rezultat tega je njegov najpomembnejši prispevek "Essai sur les problèmes biospéologiques" (1907). S tem obsežnim in temeljnim sestavkom je utemeljil biospeleologijo kot vedo, podčrtal njen pomen in predstavil načrt za bodoče delo. Skupaj s študentom in kasnejšim sodelavcem R. Jeannelom je ustanovil revijo Biospeleologica. Poleg anatomskih opisov jamskih živali vsebuje revija opise stotin jam iz Evrope in z vsega sveta, v katerih so nabirali jamsko živalstvo. 1920 je ustanovil speleološki inštitut v Cluju (Transilvanija, Romunija).

ERWÄHNUNG VON HÖHLEN IN MITTELALTERLICHEN UNGARISCHEN URKUNDEN

JAME V MADŽARSKIH DOKUMENTIH IZ SREDNJEVĒKA

GYÖRGY DÉNES¹

Izvleček

UDK 551.442(439)“14”

György Dénes: Jame v madžarskih dokumentih iz srednjega veka

V srednjeveških dokumentih so omenjene številne jame. Iskanje dokumentov, interpretacija srednjeveških imen in identifikacija prizora ali jame ni lahka naloga. Prispevek opisuje, kako so našli in identificirali jame v prvih takih štirih srednjeveških dokumentih. Samo ena izmed teh jam ima še danes enako ime, kot v srednjem veku: *Pest-kő* je v dokumentu iz 1391 zapisana kot *Pesthkw*. Avtor podrobnejše obravnava še *Öreglyuk* (1340), jamo oziroma grič z jamo *Jászói* (Jasovská) kot “lapis concavus seu perforatus” in jamo *Kölyuk*.

Ključne besede: zgodovina speleologije, imenoslovje, Srednji vek, Madžarska.

Abstract

UDC 551.442(439)“14”

György Dénes: Cave References in Medieval Hungarian Documents

The first written references to caves occur in medieval documents. The finding of the documents, the interpretation of the medieval name, the identification of the scene and cave is not an easy task. The paper describes the finding of four such early cave references in medieval documents. Only one of these caves still has its medieval name; the *Pest-kő* name appears in a document dated in 1391 as *Pesthkw*. The author talks in detail of *Öreglyuk* (1340), of the cave or better of the hill with the cave *Jászói* (Jasovská) as “lapis concavus seu perforatus” and of the cave *Kölyuk*.

Key words: history of speleology, cave names, Middle ages, Hungary.

¹ Borbely u. 5. II/4, HU - 1132 BUDAPEST, HUNGARY

Höhlen waren für Menschen jeden Zeitalters von großer Bedeutung. Seit der Urzeit können Höhlen einen festen Wohnsitz oder ein gelegentliches Obdach bedeckt haben und sind ihnen deshalb immer im Bewußtsein geblieben. Im Mittelalter wählte man als Grenzmarken von Grundstücken oder Herrschaftsbereichen gut bekannte geographische Charakterpunkte, wie etwa Höhlen, einen Höhlenfelsen oder Höhlenberg. Jedem war ein solcher Grenzpunkt ein Begriff, denn er war eindeutig und konnte nicht wie ein Pflock oder Grenzstein, oder wie ein Erd- oder Steinhafen in betrügerischer Weise verlegt werden.

So stieß ich in zahlreichen mittelalterlichen Urkunden auf die Erwähnung von Höhlen, Höhlenfelsen und Höhlenbergen. Die meisten dieser Nennungen wurden bisher in den Urkunden nicht erkannt, da das in der gegenwärtigen ungarischen Sprache allgemein benützte Wort *barlang* im Mittelalter noch nicht mit der Bedeutung 'Höhle' in Verwendung stand. In den Urkunden wurde damals entweder das zusammengesetzte ungarische Wort *kőlyuk*, das wörtlich übersetzt 'Steinloch' bedeutet, oder das Wort *pest* (lse: pescht) verwendet (DÉNES 1973). Das Wort *pest* ist bulgarisch-slawischen Ursprungs und hat sich bereits vor einem Jahrtausend in der ungarischen Sprache eingebürgert (KNIEZSA 1963; DÉNES 1983). Ein Fels oder Berghang, in dem ein Höhleneingang gähnte, wurde *lyukas-kő* (= durchlöcherter Stein) oder *pest-kő* (= Höhlenfels) oder *pest-hegy* (= Höhlenberg) genannt (KISS 1988).

Aber das Wort *pest* hatte in der mittelalterlichen ungarischen Sprache ebenso zwei Bedeutungen, wie das ihm entsprechende deutsche Wort *Ofen* in einigen süd-deutschen und österreichischen Gegenden, wo es sowohl die Bedeutung 'Backofen' als auch die Bedeutung 'Höhle' hat (DÉNES 1985). Da aber das Wort *pest* in deren Bedeutung 'Backofen' in einem der ungarischen Dialekte, und zwar in dem der in Siebenbürgen lebenden Szeklern heute noch benutzt wird, und der Ortsnamen *Mészpest* (= Kalkofen) im ungarischen Sprachgebiet mancherorts vorkommt, erkennt die Mehrzahl der ungarischen Historiker und Sprachforscher nur die Bedeutung 'Ofen' des Wortes *pest* an, wie in Backofen oder Kalkofen. Die Bedeutung 'Höhle' wird nur ausnahmsweise bei einigen Ortsnamen anerkannt (BÁTKY 1925; HEFTY 1911; MELICH 1938).

Jahrelang sammelte ich die Nennung des Wortes *pest* in mittelalterlichen Urkunden und alten Schriften, und suchte danach die so benannten Orte auf. Es waren dies mehr als dreißig Orte im ganzen historischen ungarischen Sprachgebiet, die im ersten oder zweiten Wortteil ihrer Name die Bezeichnung *pest* trugen. Auf Grund meiner Forschungen konnte ich feststellen, daß das Hauptwort *pest*, wenn es in den Namen von Bergen oder Felsen vorkommt auf jeden Fall 'Höhle' bedeutet (DÉNES 1975b). Wenn man bei Bergen auf den Namen *kőpest* (= Stein-Pest) stößt, ist die Bedeutung nicht 'aus Steinen gebauter Backofen', sondern 'Felsenhöhle'; das Wort *pest-kő* bedeutet somit nicht 'für den Bau eines Backofens geeigneter Stein', sondern 'Höhlenfels'.

Die Bedeutung des Wortes *Pest-hegy* ist 'Höhlenberg'; der Ortsnamen *Pestes* bedeutet 'hohl', sowie 'Hohler-Berg', 'Hohler-Fels' (DÉNES 1978; DÉNES 1995).

Gleiches gilt auch für das ungarische Wort *luk ~ lyuk*, welches 'Loch' oder 'Höhle' bedeutet, wenn es in einem Ortsnamen vorkommt, der einen Berg oder Felsen benennt. Meiner Meinung nach bedeutet der Ortsname *Lukas-kő* 'durch-löcherter Stein' (in lateinisch geschriebenen Urkunden *lapis perforatus* bezeichnet) einen 'Höhlenfelsen' (DÉNES 1973) und nicht, wie ein ungarischer Historiker meint, einen Mühlstein der als Grenzmarke an der Grundgrenze aufgestellt war (SZABÓ 1969, 114).

Als Beispiele für die Erwähnung von Höhlen in den mittelalterlichen Urkunden zitiere ich nunmehr vier Objekte, die ich im Rahmen meiner Forschungen entdeckt habe:

1. Der Ortsname *Pesthkő* der in einer Urkunde von 1391 (OL. Dl. 7699) erwähnt wird bedeutet meiner Meinung nach 'Höhlenfels'. An Ort und Stelle stellte ich fest, daß das der Name des im Gerecse Gebirge westlich von Budapest gelegenen Berges Peskő ist, in seinem Hang öffnet sich auch tatsächlich eine geräumige Höhle.
2. Der Ortsname *Kwpesth* scheint in einer Urkunde aus dem Jahre 1340 auf (CAP. STRIG. Lad. 37. Fasc. 1), er bedeutet meiner Meinung nach 'Felsenhöhle'. An Ort und Stelle stellte ich fest, daß er mit jener Höhle im Gerecse Gebirge identifiziert werden kann, deren Eingang sich zwischen den Gemeinden Bajna und Epöl in einer Bergflanke öffnet. Gegenwärtig ist diese Höhle unter dem Namen *Öreglyuk* (= geräumige Höhle) bekannt.
3. Im Jahre 1331 pachteten die Einwohner der Siedlung Szepsi ein beidem Ufer des Flusses Bódva gelegenes Grundstück von der Jászóer Prämonstratenser Propstei. Ein Grenzpunkt des gepachteten Grundstückes liegt am Bódvaufer — aus der lateinischen Urkunde sei die Umschreibung zitiert: "*unus magnus lapis concavus quasi perforatus*" (GYÖRFFY 1963, 100), was in der deutschen Übersetzung heißt 'ein großer hohler bzw. durchlöcherter Stein'. Nach dem Text der Urkunde nahm ich an, daß dieser Stein wohl ein durchlöcherter Felsen Hügel sein werde. Bei der Begehung dieses in der Urkunde beschriebenen Gebietes wurde meine Vermutung bestätigt. Der angesprochene "große hohle durchlöcherte Stein" ist nämlich nicht anderes als der Berghang mit mehreren Öffnungen der wohlbekannten Jászóer Schauhöhle, Jasovská Jaskňa.
4. Der Ortsname aus einer königlichen Schenkungsurkunde aus dem Jahre 1266 (OL. Dl. 611) hat zu einem interessanten Ergebnis geführt. Als Grenzpunkt am Ufer des gegenwärtig zur Slowakei gehörenden Flüsschens Turóc (Turec) ist ein gewisser *rupes Munuhpest* erwähnt, der bisher nach der Meinung ungarischer Historiker und Sprachforscher als 'Mönchsstein, Mönchsberg, Einsiedlerberg' gedeutet wurde (MELICH 1938; KNIEZSA 1963). Ich war der Meinung, daß die Bedeutung des Ortsnamen *rupes*

Munuhpest in wirklichkeit 'Einsiedlerhöhlen-Fels' oder 'Eremitenhöhlen-Fels' bedeuten kann, obwohl in jener Gegend auch in ausführlicheren Landkarten keine Höhlen eingezeichnet waren. Nachdem ich jedoch diese Lokalität aufgesucht hatte, konnte ich die Grenzpunkte des in Frage stehenden Grundstückes klar identifizieren und dort, wo gemäß der Urkunde der Fels *Munuhpest* stehen soll, fand ich am Ufer des Flüsschens Turóc wirklich einen steilen Kalkstein-Felsen Spuren eines Gesteins-abbaues an der Wand. Die Einwohner der nahe gelegenen Gemeinde Harkács (Gemerská Ves) erzählten, daß es dort früher wirklich eine Höhle gegeben habe, die etwa acht Meter lang mannhoch war. Ende der 50er Jahre, wahrscheinlich 1958, ist diese Höhle jedoch bei Sprengarbeiten zerstört worden. Nachdem ich den Ort wieder aufgesucht hatte, kam ich zu der Ansicht, daß durch die Steinbruchsarbeiten nicht mehr als 3 bis 4 Meter Fels abgebaut worden waren und sich deshalb noch ein Rest der Höhle unter der Blockhalde am Fuß der Felswand befinden müßte. Aus diesem Grunde machte ich den Versuch, den Schutt am Fuß der Wand zu entfernen. Nachdem ich mehrere Stunden hart gearbeitet hatte, gelang es mir die Höhle hinter den Felsblöcken zu finden. Es war, wie vermutet, nur der vorderste Teil beim Gesteinsabbau zerstört worden und ich konnte die ersten fünf Meter aufrecht in die Höhle gehen, dann noch weitere fünfzehn Meter gebückt und kriechend vordringen (DÉNES 1975a). Das Ergebnis meiner Feldforschung bestätigt meine Vermutung, daß das Wort *pest* auch im Namen des Felsen *Munuhpest* 'Höhle' bedeutet. Ich identifizierte dadurch nicht nur den in der Urkunde von 1266 erwähnten Höhennamen, sondern exhumierte auch die Höhle selbst, die ansonsten durch die vom Gesteinsabbau entstandene Schutthalde endgültig verschüttet geblieben wäre (DÉNES 1995). Meines Wissens diese ist jetzt die erste schriftlich erwähnte Höhle in der Slowakei.

Es hat sich gezeigt, daß die Forschung nach Höhennamen, die in mittelalterlichen Texten aufscheinen keine vergebliche Mühe ist. Denn durch das Erkennen dieser Höhennamen und die richtige Deutung, kann der Zeitpunkt der ersten schriftlichen Erwähnung dieser Höhlen um mehrere Jahrhunderte früher angesetzt werden, als man dies früher angenommen hatte. Unsere wissenschafts-geschichtlichen Kenntnisse konnten hiemit wesentlich erweitert werden.

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JAME V MADŽARSKIH DOKUMENTIH IZ SREDNJEGA Veka

Povzetek

V madžarskih srednjeveških dokumentih so omenjene številne jame. Iskanje dokumentov, interpretacija srednjeveških imen in identifikacija prizora ali jame ni vedno lahka naloga. Prispevek opisuje, kako so našli in identificirali jame v prvih takih štirih srednjeveških dokumentih. Samo ena izmed teh jam ima še danes enako ime, kot v srednjem veku: *Pest-kő* je v dokumentu iz 1391 zapisana kot *Pesthkw* (= jamska stena). Ime jame *Öreglyuk* (= velika, prostorna jama) blizu mesta Bajna je bilo zapisano (1340) kot *Kwpesth* (= skalna jama). Jama *Jászói* (Jasovská jaskyna) - danes znana turistična jama na Slovaškem - ozioroma skalnat grič, v katerem je jama, je omenjena v dokumentu iz 1331 kot "lapis concavus seu perforatus" (= votla ali preluknjana skala). Jama *Kőlyuk* (= skalna luknja) ob slovaški reki Turóc (Turec) blizu mesta Harkács (Gömerská Ves) je v dokumentu iz 1266 imenovana *Munuhpest* (= puščavniška jama).

SPELEOLOGICAL DATA IN "THE DESCRIPTION
OF THE LAND OF THE SZÉKELYS"
BY BALÁZS ORBÁN

SPELEOLOŠKI PODATKI V "OPISU DEŽELE
SZÉKELYS" BALÁZSA ORBÁNA

ISTVÁN DÉNES¹

Izvleček

UDK 551.44(439):929 Balázs O.

István Dénes: Speleološki podatki v "Opisu dežele Székely" Balázsa Orbána

Balázs Orbán, "Veliki Székely", je bil popotnik, pisatelj in politik. 1864 - 1868 je prepočoval pet "széks" (okrožij) dežele Székelys (Transilvanija, Romunija) in 1868 - 1873 objavil v šestih knjigah "Opis dežele Székelys z arheološkega, naravoslovnega in etnografskega vidika". V tem opisu in še v enem kasnejšem omenja preko 50 speleoloških objektov v apnencu in drugih kamninalah. Jame opisuje, dodaja svoja geološka in hidrografska zapažanja, omenja arheološke najdbe in pripovedi v zvezi z njimi. Ilustracije v opisu so gravure, vendar narejene po avtorjevih fotografijah, kar ga uvršča med pionirje tamkajšnje fotografije. Tako štejemo Balázsa Orbána med odlične predhodnike raziskovalcev jam v Transilvaniji.

Ključne besede: zgodovina speleologije, Balázs Orbán, Transilvanija, Romunija.

Abstract

UDC 551.44(439):929 Balázs O.

István Dénes: Speleological data in "The description of the land of the Székelys" by Balázs Orbán

Balázs Orbán, "The Great Székely" was a traveller, writer and politician. In 1864 - 1868 he travelled through the five "Széks" (districts) of the land of the Székelys (Transylvania, Romania) and in 1868 - 1873 he published "The description of the land of the Székelys from the point of view of archaeology, natural history and folk history" in 6 volumes. In this and in one later description he mentioned over 50 caves in limestone and other rocks. He published cave descriptions, geological and hydrological observations, archaeological findings and the legends connected to the caves. Illustrations in his description are engravings based upon the author's own photographs. So he was between the pioneers of the Transylvania photography.

Key words: history of speleology, Balázs Orbán, Transylvania, Romania.

¹ 4023-BARAOLT, str.1 Decembrie 1918, nr.27., bl.6B., ap.5., jud. Covasna, ROMANIA

Balázs Orbán was a traveller, writer and politician. He travelled through the five "Széks (districts) of the land of the Székelys (Transsylvania, Romania), between 1864-1868.

During this journey he made scientific and archival research, took notes and photographs and made sketches. Between 1868-1873 he published "The Description of the Land of the Székelys from the point of view of archaeology, natural history and folk history", a work in 6 volumes (Orbán, 1868-1873). Later in 1889 he published "Torda, the town and its Surroundings". (Orbán, 1889).

In all these works the author mentioned or described 33 caves and 3 potholes in limestone, 2 caves in travertine, 2 caves in andesite, 3 caves in andesitic agglomerates and 3 artificial defensive caves in conglomerates. He also described 3 karst springs.

During his activity Transylvanian caves researching had just started. Fridvaldszky, Nédeczky, Benkő and Kleinkauf had just mentioned or briefly described the most famous caves (Dénes, 1992). The first important cave research was made by István Fekete, a surveyor in Udvarhely district. In 1835 he explored the cave of Homoródalmás and made a plan of it. This plan was the first to be made in Transylvania and his work was published in Kolozsvár (Cluj-Napoca) in 1836 (Dénes, 1990). Shortly before Balázs Orbán's research journey, between 1858-1862, Adolf Schmidl explored the caves of Bihar mountains (Dénes, 1992).

First of all Balázs Orbán's researches were concentrated in the following branches: history and archaeology, folk history and geography. In his geographical description, beside landscape description, demography, economical geography and geology, he showed great interest in cave researching which was scarcely known in Transylvania. He was not an expert in geography but during his travels abroad he learned a lot.

He was an accurate observer. The collected data are accurate, the descriptions are detailed. For all what he saw and experienced he tried to give explanations according to the scientific knowledge of his age. Where he was not able to manage this, he drew the attention of scientists to that ob-



Fig 1: Balázs Orbán (1829 - 1890).

ject or phenomenon. He published wonderful landscape descriptions, allowing us to learn about the surroundings of the caves, the name of the places, the routes of acces and historical data. He told us about the size of the caves, gave descriptions, geological and hydrologic observations, archaeological findings and the legends connected with the caves.

The cave descriptions are very interesting and he always wrote with great enthusiasm about dripstone formations. The hanging dripstones he called stalactites. Perhaps for the first time in Hungarian speleological literature he used expresions like caving and rope ladder.

Balázs Orbán recognized the importance of photography, a technique which had been just introduced in Transylvania at that time. The photo fixes the reality, but drawings can be inexact. Considering this fact he bought photographic equipment. Taking all this equipment with him, he took a lot of photos and they are important for us for we can see landscapes from last century "Székely Land". We are lucky because a great proportion of these photos has been preserved. The printing technology of that age could not reproduce them, so in his works we see only engravings.

The description of Vargyas-gorge (Cheile Virghisului) and its caves which was near his native land, is detailed; the names of the places, sights and curiosities are presented in romantic style. From his obsrvations he explai-
ned the origins of the gorge: the wa-
ters of Vargyas river had to struggle
to pass through the high limestone
mountain. Then we learn about the
historical data, the legends of these
places and then the description of the
Homoródalmás Cave (Pestera Mere-
sti) follows. The explanation of the
origins of the cave is wrong. He de-
nies the fact that the waters of the
river could create it because it is on a
higher level then the waters of the
river. He thought that the cave was
the result of karst springs work. We
also learn about the big bat colony
and guano deposits from the cave. To
his description he attached the cave
plan made by Fekete. As we read this
work we learn about the Lócsür (Hors-
Cave), Ugron-lyuk (Ugron-Cave) and
Köcsür (a natural stone bridge). Al-
ready he knew about the sinkhole in

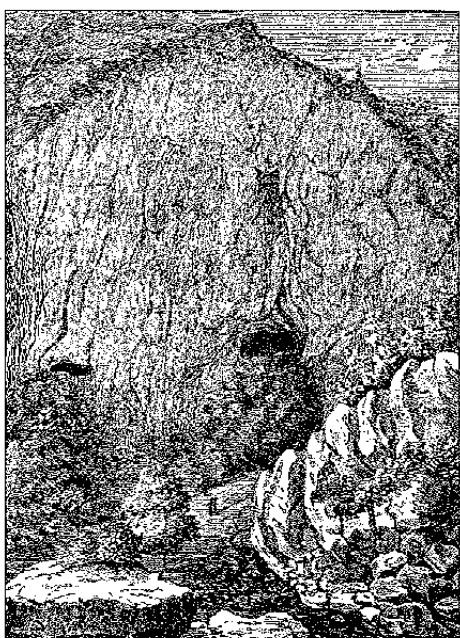


Fig. 2: The entrance of the Homoródalmás Cave.

which the waters were disappearing and about their underground route. The river rises at Vízkelet, a big karst spring which is situated at the south end of the gorge. Carrying his photographic equipment he took four photos. Two of them represent the entrance of the cave.

He also took three photos in the Olt-pass (Defileul Oltului) from Alsórákos (Racosul de Jos). Here he described three caves of which the most detailed was the Tolvajos Cave (Robber-Cave). At Olthéviz (Hoghiz) he described a cave in travertine and took a photo of the surroundings of the travertine hill.

In Barcaság (Barca-district, Tara Barsei), he noticed four caves and gave a short description of Ialomita Cave in Bucsecs (Bucegi) mountain.

He explained the functioning of the intermittent karst spring of Fort-yogóhegy (Gespreng berg) in Brassó (Brasov).

He gave a detailed description of three andesite caves full of volcanic gas at Büdös Hill (Stinking Hill) near Bálványos resort in Háromszék district.

From Csík district he mentioned the pothole on Likas mountain and the ice cave in travertine at Borszék (Borsec) resort.

Aranyos district is rich in karstic areas. From this region he described four caves situated at Székelykö mountain at Tborockó (Trascau) and seven caves at Kőköz-gorge (Cheile Aiudului). From these descriptions we learn about the position and size of these caves, about the dripstone formations, archaeological finds and historical data.

On top of the Gesteg hill he observed a lot of "crater like hollows ordered in lines" which are in fact a line of dolines. He took a photo of the Székelykö mountain, too.

Among the caves of the Torda-gorge (Cheile Turzii) he described the Balika Caves which were fortified caves. In this part of his work we find the first description of a cave accident. It took place on 13th August 1780 when Kis János a chimney sweeper from Torda (Turda) looking for the "Treasure of Darius" remained stuck in a pothole. The rescuers could not pull him out with ropes and after 7 days of terrible suffering he died.

Orbán also told us about the

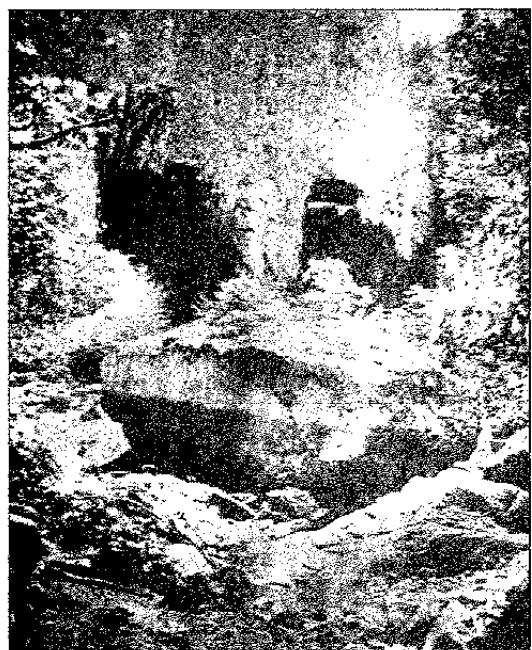


Fig. 4: The entrance of the Homoródalmás Cave (photo by Balázs Orbán).



Fig. 3: The plan of the Horomodalmás Cave.



Fig. 5: The Túr Gorge with the entrance of the Malom (Mill) Cave.

caves from the Tur-gorge (Cheile Turului) in which there were prehistoric settlements. He saw the entrances of a lot of caves situated at high level in the rock walls. Also he took a few photos in Torda- and Tur-gorges.

Through his works the author let us know a lot of valuable data about the caves of Transylvania and fixes a situation which we can not find today. By now the dripstone formations and the fortification walls have been destroyed and the archaeological finds have been lost.

Studying all his works we believe that Balázs Orbán was one of the excellent forerunners of cave researching in Transylvania. From 1931 as a memorial by posterity the biggest cave in the Land of the Székelys, the Homoródalmás Cave, was named after the "Great Székely" Balázs Orbán Cave.

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SPELEOLOŠKI PODATKI V "OPISU DEŽELE SZÉKELYŠ" BALÁZSA ORBÁNA

Povzetek

Balázs Orbán, "Veliki Székely", je bil popotnik, pisatelj in politik. 1864 - 1868 je prepotoval pet "széks" (okrožij) dežele Székelys (Transilvanija, Romunija). Na tem potovanju je preučeval naravo in arhive, zapisoval, fotografiral in skiciral. 1868 - 1873 v šestih knjigah objavil "Opis dežele Székelys z arheološkega, naravoslovnega in etnografskega vidika". Kasneje (1889) je objavil še delo "Torda, mesto in njegova okolica". V teh delih omenja preko 33 jam in 3 brezen v apnencu, 2 jami v lehnjaku, 2 v andezitu, 3 jame v andezitnem konglomeratu in 3 umetne jame obrambne narave v konglomeratu. Vključuje tudi 3 kraške izvire.

Balázs se je osredotočil predvsem na zgodovino in arheologijo, etnografijo in geografijo. Njegovi geografski opisi vsebujejo poleg opisov pokrajine tudi

demografske, ekonomsko-geografske in geološke podatke. Posebno zanimanje je kazal za raziskovanje jam, kar je bilo takrat v Transilvaniji zelo redko. Zbrani podatki so točni in opisi podrobni. Vse, kar je videl in doživel, je želel razložiti ustrezeno nivoju znanosti v njegovem času. Njegovi pokrajinski opisi so čudoviti, za nas so posebej pomembni opisi okolice jam, topografska imena, dostopi do jam in zgodovinski podatki o njih. Jame opisuje, dodaja svoja geološka in hidrografska zapažanja, omenja arheološke najdbe in pripovedi v zvezi z jamami.

Balázs Orbán je spoznal pomen fotografije, tehnike, ki je bila v njegovem času ravno vpeljevana v Transilvanijo. Nabavil si je fotografско opremo in napravil celo vrsto posnetkov dcélce Székelys, na srečo je večina njegovih posnetkov ohranjena. Ker takratna tiskarska tehnika ni mogla reproducirati fotografij, ilustrira svoje opise z gravurami. Balázsa Orbána tako štejemo med odlične predhodnike raziskovalcev jam v Transilvaniji.

CONTRIBUTION TO THE KNOWLEDGE ABOUT SPELEOLOGY IN CROATIA

PRISPEVEK K POZNAVANJU SPELEOLOGIJE NA HRVAŠKEM

MLADEN GARAŠIĆ¹

Izvleček

UDC 551.44(497.5)

Mladen Garašić: Prispevek k poznavanju speleologije na Hrvaškem

V prispevku so podatki o speleologih od 1584 dalje ter o speleoloških društvih od 1892, ko je bil ustanovljen "Odbor za uređenje Baračevih spilja". Od tedaj je na Hrvaškem delovalo okoli 50 društev. Ta so nastajala, delovala in iz različnih vzrokov prenchala z delom. Do danes se je okoli 1000 ljudi resno ukvarjalo s speleologijo, kar ni veliko v primerjavi z deželami, ki imajo podoben delež krasa. Toda rezultati speleoloških raziskav (število raziskanih jam, objave, vpetost v mednarodno speleologijo) so pomembni ne le v regionalnem, ampak tudi v širšem merilu.

Ključne besede: zgodovina speleologije, speleološka organizacija, Hrvaška.

Abstract

UDC 551.44(497.5)

Mladen Garašić: Contribution to the knowledge about speleology in Croatia

Basic data about speleologists from 1584 are presented, as well as speleological societies since 1892, when Committee for arrangement of Baračeva špilja (Odbor za uređenje Baračevih špilja) near Rakovica was founded. Since then about 50 societies were founded in Croatia. When established, they were active for some time, and many of them stopped the activities for various reasons. Until now data, serious speleological researches were done by thousand people, and it is not much comparing to other countries with such percent of karst. But outcomes of speleological resources (number of researched objects, published papers, presence in speleological world, etc.), are remarkable, not just in regional, but in wide contexts.

Key words: history of speleology, speleological organization, Croatia.

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1. INTRODUCTION

Speleological activity in Croatia started with the first human penetration underground, where shelters or dwelling places were found. Such examples of speleo people remains or paleolithic artifacts exist in the Croatian karst in several places (eg. Vindija Cave in Hrvatsko Zagorje, Hušnjakovo Cave near Krapina, Šandalja Cave near Pula in Istria, Cerovačke Caves in Lika, Bezdanjača pod Vatinovcem Cave in Lika, Veternica Cave near Zagreb, Gromaćka Vlaka Cave near Dubrovnik etc.)

2. THE FIRST SCIENTIFIC WORK IN CAVES

The earliest penetrations were due to the needs of man, not his curiosity. In the 16th century started the period of first researches and expeditions. A Croat from Dubrovnik, Nikola Gučetić had in 1584 recorded his observations on meteorological measurements in caves near Dubrovnik and Cavtat. That year is accepted as the beginning of scientific publishing on Croatian caves. Later on researches were made in some caves known in that time (eg. Marin Getaldić made some optical experiments in Betina Cave near Dubrovnik) and some researchers took part in investigating deeper parts of caves or discovering completely unknown ones (in 17th cent J.V. Valvasor described some caves in Trsat, Mt. Učka and Dalmatia), Ivan Lovrić together with Alberto Fortis in 1774 and 1776 explored Gospodska Cave on the Cetina river.

3. THE FIRST SPELEOLOGICAL ORGANIZATIONS

The first society that dealt with cave exploring in Croatia was **Odbor za uređenje Baraćeve Špilje** (Committee for Arrangement of Barač Caves) that was founded on 12th of August 1892 near Rakovica in region of the Plitvice lakes. That is considered as the first speleological organization in Croatia and is among the first in the world (after Vienna, Trieste and Postojna).

D. Gorjanović Kramberger and J. Poljak on 31st July 1910 had established a **Committee for Cave Researches** (**Odbor za istraživanje špilja**) under the Geological Council for the Kingdom of Croatia and Slavonija in Zagreb. That is regarded as the first Croatian scientific society dealing with underground karst phenomena.

4. SPELEOLOGICAL SOCIETY ACTIVITY

During more than hundred years many speleological societies existed in Croatia. Some of them left significant evidences of their activities; others had short existence but were important historic ally.

In tradition of the Committee for arrangement of Barač Caves (1892-1896),

and a legitimate successor of the Committee for Cave Researches is the Croatian Speleological Association (Hrvatsko speleološko društvo), established on 2nd April 1954 in Zagreb, and which is republic speleological association and a regular member of UIS (Union Internationale de Spéléologie) (Fig. 1).

Here is list of all the speleological organizations which were founded in Croatia before the Second World War (see Fig. 2 for locations):

“Liburnija” in Zadar (1900-1915); Spiljarski odio in Velika realka (gymnasium) in Split (1912-1915); “Runolist” in Lokve (1923-1935); “Mosor” in Split (1926-1935; 1950; 1956-1996); “Runolist” in Zagreb (1927-1929); “Orjen” in Dubrovnik (1933; 1950; 1986-1989; 1996); “Prijatelj prirode” in Zagreb (1936-1940); “Špiljar” on Knežija in Zagreb (1941-1944).

After the Second World War there were founded these speleological societies:

“Zagreb-matica” in Zagreb (1949-1988); “Željezničar” in Zagreb (1950-1996); “Rudar” in Raša (1950-1952); “Platak” in Rijeka (1950; 1962-1985); “Javor” in Zagreb (1951; 1955-1959); “Velebit” in Zagreb (1954-1956; 1960-1996); “Mosor” in Dugo Polje (1955-1959), “Speleološka sekcija Hrvatskog geografskog društva” in Zagreb (1956-1963; 1991-1996); “Komisija za speleologiju HPS” in Zagreb (1956-1996); “Vladimir Nazor” in Split (1957), “Dubovac” in Karlovac (1957-1963; 1966-1996); “Mosor” in Klis (1959/1960); “Zanatlija” in Zagreb (1960-1963); “Paklenica” in Zadar (1967-1990); “Velebit” on the Island of Hvar (1968); “Speleološki odred izviđača” in Zagreb (1969); “Split” in Split (1970-1978); “Umberto Giometta / Špiljar” in Split (1971-1979; 1983-1996); “Dubovac” in Vojnić (1970); “Otočani” in Novalja, Island of Pag (1974-1990); “Istra” in Pazin (1975-1996); “Japetić” in Samobor (1975-1996); “Proteus” in Poreč (1977-1996); “OKI” in Zagreb (1977-1982); “Biokovo” in Makarska (1977-1996); “Sutjeska” in Zagreb (1978-1986); “Speleološki odred izviđača” in Karlovac (1978); “Ursus Spelaeus” in Zagreb (1978-1989); “Svilaja” in Sinj (1978-1985); “Vis” in the Island of Vis (1979-1980); “Društvo za istraživanja i snimanja krških fenomena- DISKF” in Zagreb (1980-1996); “Myotis Myotis” in Karlovac (1984-1985); “Pauk” in Fužine (1986-1996); “Rovinj” in Rovinj (1986-1988), “Buje” in Buje (1987-1996); “Kamenar” in Šibenik (1988-1996); “Sv. Mihovil” in Šibenik (1996); “Jamar” in Han (1996); “Karlovac” in Karlovac (1996).



Fig. 1.- The sign of the Croatian Speleological Association (Hrvatsko speleološko društvo). The first speleological organization in Croatia was founded in year 1892 in Rakovica, near Plitvice lakes.



Fig. 2.- Positions of the towns in which were founded speleological organizations in Croatia (1892-1996):

LEGEND: 1- Rakovica; 2- Zagreb; 3- Zadar; 4- Split; 5- Dubrovnik; 6- Raša; 7- Rijeka; 8- Dugo Polje; 9- Karlovac; 10- Klis; 11- Hvar; 12- Vojnić; 13- Novalja; 14- Pazin; 15- Samobor; 16- Poreč; 17- Makarska; 18- Sinj; 19- Vis; 20- Fužine; 21- Rovinj; 22- Buje; 23- Šibenik; 24- Han; 25- Lokve.

Mostly they are situated in regions of Istria, Dalmatia, Gorski kotar and Zagreb region. No one is located in Lika karst region.

It is evident that in Croatia a relatively small number of societies (fifty) existed, but they explored more than 8000 speleological objects in the last hundred years. That is an impressive number considering the number of active speleologists and the area of Croatia.

5. INDIVIDUALS IMPORTANT FOR CROATIAN SPELEOLOGY

Significant contributions for Croatian speleology and karst researches were made also by many individuals (D. Hirc, R. Bujas, U. Girometa, M. Margetić, I. Krajač, F. Baučić, V. Redenšek, V. Horvat, G. Novak, J. Roglić, V. Blašković, S. Smolec, M. Malez and many others).

Altogether there have been over 1300 researchers in Croatian speleology in more than a hundred years, and today there are about 350 active speleologists.

6. CONCLUSION

More than 8000 speleological objects (caves and pits) are known in Croatia today, which is a great number related to the dimensions of karst area and the number of active speleologists. There are 15 tourist caves in Croatia. Speleologists are associated in 23 speleological societies that are active in Croatian territory.

Important are discoveries of endemic underground animals - *Proteus anguinus* in 26 Croatian caves and pits, and unidentified underground species in two pits deeper than 1000 m.

The deepest pit of the Croatian karst is Lukina jama on Velebit, 1392 m deep, and the longest cave system is Đula - Medvedica Cave System near Ogulin, 16,5 km long.

Croatian speleologists are respected in the world and have organized or participated at many international expeditions. Croatia is a member of UIS, International Union of Speleology, which has 60 members. Croatian karst is so-called locus typicus for all karst regions - it is considered as a classic example of karst in the world, where first scientific theories on speleogenesis and karst groundwater flow were born.

There will be more contributions to the history of speleological researches in Croatia due to the work of speleologists from Austria, Hungary, Italy, Slovenia, Czech Republic, Slovakia, France and Germany. ALCADI meetings will play a significant role because more data resources about Croatian speleological karst researches will become available.

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PRISPEVKE K POZNAVANJU SPELEOLOGIJE NA HRVAŠKEM

Povzetek

V prispevku so podani osnovni podatki o delovanju bolj znanih "speleistov" ali spelcologov od leta 1584 dalje, kot tudi o speleoloških društvih na Hrvaškem od 1892. leta, ko je bil ustanovljen "Odbor za uređenje Baraćevih spilja", pri Rakovici, kot četrto speleološko društvo na svetu. Od tedaj dalje je bilo na Hrvaškem osnovanih okoli 50 speleoloških društev, ki so se vsaka na svoj način ukvarjala s speleološkimi raziskavami. Ta društva so nastajala, delovala in mnoga so iz najrazličnejših vzrokov tudi prenehala z delom. Po razpoložljivih podatkih vemo, da se je do danes nekaj več kot 1000 ljudi resno ukvarjalo s speleologijo, kar je majhno število v primerjavi z drugimi kraškimi področji in glede na delež krasa na Hrvaškem. Vendar so rezultati spelcologih raziskav (število znanih oziroma raziskanih speleoloških objektov, objavljena dela, vpetost v mednarodno speleologijo, itd.) pomembni, lahko bi celo rekel občudovanja vredni in to ne le v regionalnem, ampak tudi v širšem smislu.

LE RÔLE DES BOTANISTES DANS LES DÉBUTS DE LA SPÉLÉOLOGIE FRANÇAISE

VLOGA BOTANIKOV PRI ZAČETKIH SPELEOLOGIJE V FRANCIJI

CHRISTOPH GAUCHON¹

Izvleček

UDC 58:551.44(44)(091)

Christophe Gauchon: Vloga botanikov pri začetkih speleologije v Franciji

Pogosto je prispevek botanikov k poznavanju podzemeljskega sveta neopažen, običajno omejen le na Tournefortov spust v jamo Antiparos (1700) in njegovo zmotno mišljenje o rasti kapnikov. Vendar so botaniki v 18. in 19. stol. veliko prispevali k odkrivanju in k raziskovanju jam, saj so po terenu nabirali gradivo za herbarije in često iskali lame, da bi pred njimi našli redke rastline. Najboljši primer je Villarjev opis Trou du Glas, glavnega vhoda v jamski splet Dent de Crolles, iz 1786.

Ključne besede: zgodovina speleologije, botaniki, Francija, Alpe, Dent de Crolles, Pireneji.

Abstract

UDC 58:551.44(44)(091)

Christophe Gauchon: The contribution of botanists to the development of speleology in France

The contribution of botanists to knowledge of the subterranean world is often undervalued. Sometimes only Tournefort's visit to the Antiparos cave in 1700 is quoted, together with his mistaken views about the vegetative origin of stalactites. But botanists did play a very important part because they systematically practiced field-work to full their herbarium; and they often looked for caves to find scarce plants, unusual elsewhere. The best instance of this contribution is the first description of the main entrance of Dent de Crolles system by Dominique Villars, in 1786.

Key words: history of speleology, botanists, France, Alps, Dent de Crolles, Pyrénées.

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Tantôt encore, un cercle se forme autour d'un alerte vieillard
Qui explore la nature et connaît sa beauté;
La vertu miraculeuse des plantes et leurs formes variées
Sa perspicacité les a dès longtemps scrutées, elle a nommé chaque mousse;
Il pénètre d'un oeil aigu les souterrains abîmes
Et c'est en vain que la terre cherche à lui dérober son or pâle.

Albrecht de HALLER. Les Alpes

La question que l'on peut se poser quant à l'histoire de la spéléologie est de savoir qui allait sous terre, qui explorait et rendait compte de ce que recélaient les cavernes, avant que les spéléologues n'existent? Bien sûr il est aisément d'apporter quelques éléments de réponse: les paléontologues, les archéologues viennent tout d'abord à l'esprit, mais, en France au moins, leurs premières investigations ne remontent pas au-delà de 1826, lorsque furent découverts des ossements d'ours des cavernes dans la grotte d'Osselle (Doubs). On pense ensuite aux physiciens qui dès le XVI^e siècle s'intéressèrent aux circulations d'eau souterraines: Palissy, Kircher, Perrault..., puis aux géographes, aux géologues... Mais il est une catégorie de savants que l'on oublie peut-être trop souvent et que l'on ne croirait pas avoir joué ici un rôle bien important, ce sont les botanistes.

Certes, il est au moins une célèbre figure de botaniste qui émerge de l'histoire de la spéléologie, c'est celle de Joseph Pitton de Tournefort, professeur de botanique au jardin des plantes de Paris, dont chacun connaît l'exploration de la grotte d'Antiparos, à la fin de 1700; les observations qu'il fit sur place le conduisirent à se prononcer pour la "végétation des pierres" comme mode de formation des concrétions et à défendre cette opinion jusqu'à sa mort, survenue en 1708. Même si Tournefort n'emporta pas l'adhésion de tous les savants, ses récits de voyage eurent une grande audience, connurent plusieurs éditions et furent même traduits et publiés en Angleterre (Shaw 1992, 244). On a beaucoup raillé Tournefort, et tous n'ont pas compris "la désignation d'un botaniste pour une recherche en minéralogie" (Minvielle 1967, 20). Or, juger sévèrement sur ce seul épisode, c'est méconnaître l'apport des botanistes en général à la découverte du monde souterrain.

Certes, les connaissances des botanistes ne trouvent guère leur utilité dans la compréhension des cavernes, et il n'y a sans doute rien de bon à en garder, mais nous verrons qu'en revanche, leurs façons de travailler les mettaient dans des situations propres à favoriser des découvertes importantes.

I. LA BOTANIQUE AU CENTRE DES SCIENCES NATURELLES:

Il n'est pas innocent que la connaissance des plantes et celle des cavernes soient souvent mises en parallèle, et attribuées aux mêmes hommes. La citation de Haller que nous avons mise en exergue en est une première illustration. Il en est bien d'autres. Bosc par exemple, vantant, en 1797, la diversité

des Grands Causses de l'Aveyron, écrivait ainsi: "Quelle étude plus attrayante que celle de ces plantes, de ces arbustes, de ces simples de toute espèce (...); de ces côteaux (...); de l'intérieur de ces grottes profondes, par lesquelles on semble pénétrer les entrailles de la terre, pour lui dérober les secrets mystérieux de la végétation, ou pour contempler les routes cachées des fontaines et des ruisseaux?" (Bosc 1797, I, 12). Les plantes rares sont autant de secrets, que la nature cache, comme elle cache les cavernes, et qu'il faut chercher et inventoriier de la même façon. De plus, l'évocation des plantes médicinales suppose une certaine initiation réservée à un petit nombre, et au secret s'ajoute alors un mystère. A cet égard, l'association entre cavernes et guérisseurs est significative: l'ermite qui séjournait au XVIII^e siècle dans la petite grotte de Loizia (Jura) faisait pousser, juste au-devant, sur un petit terre-plein, du cerfeuil, du cresson et de la valériane (Lequinio 1801, 246-247), et il est probable que l'ermite de la grotte de Saint-Antoine de Galamus (Pyrénées-Orientales) fournit des plantes abortives aux paysans des alentours (Fabre 1985, 23).

Mais cette parenté entre cavernes et plantes n'existe pas seulement dans les mentalités; au XVIII^e siècle, et dans une moindre mesure au XIX^e, avant que la spéléologie ne se soit constituée en discipline à part entière, les botanistes joueront souvent un rôle de premier plan dans la découverte des grottes. Le rapport entre les deux domaines n'est pourtant pas *a priori* évident, et mérite explication: au siècle des Lumières, la botanique est à la base de toute l'instruction scientifique; Saussure, quand il se rendit pour la première fois dans la vallée de Chamonix, avait surtout l'idée d'y herboriser, et ses "Voyages dans les Alpes" abondent de notations botaniques autant que de considérations géologiques.

Les deux disciplines sont d'ailleurs étroitement liées, ne serait-ce que pour reconnaître la flore fossile des gisements houillers; les années d'études du jeune Humboldt sont dominées par une réelle passion pour la botanique (Botting 1988, 16), passion qu'il sut prolonger lorsqu'il entra à l'Académie des Mines de Freiberg; nous y reviendrons.

Un siècle plus tard, Martel comptera parmi ses collaborateurs au moins deux hommes dont la première curiosité avait été pour la botanique: Félix Mazauric, qui dressa la topographie complète de la grotte de Bramabiau avant de s'orienter vers l'archéologie du pays nîmois, avait rédigé à l'âge de 20 ans le récit d'une excursion botanique au Mont-Aigoual; et Joseph Vallot, selon son biographe, était à 16 ans "un passionné de botanique, discipline dans laquelle il s'avérait un véritable spécialiste (et) les herbiers succédaient aux herbiers" (Vivian 1986, 36-37); il publia plus de 20 études de botanique, tout en s'intéressant aux gouffres des Causses, puis se consacra tout entier au Mont-Blanc. De même, Henri Poujol, qui fut le prédecesseur de Martel dans les gorges de la Jonte mais qui refusa ensuite de collaborer avec lui, s'était d'abord fait connaître par des travaux de botanique, avant de procéder à des fouilles archéologiques fructueuses dans les grottes des Causses. La botanique apparaît donc comme une

véritable et indispensable initiation à l'esprit scientifique, quelle que soit la discipline à laquelle on se destine finalement.

En plus des savants, la botanique jouit aussi au XVIII^e d'un grand effet de mode et toute personne distinguée qui se pique d'histoire naturelle tient forcément un herbier. En 1770, Jean-Jacques Rousseau herborisa autour de Grenoble, et le secteur du Vercors qu'il arpenta s'appelle, depuis lors, "Désert de Jean-Jacques"; atteint de la maladie de la persécution, il aimait à se retirer dans des endroits tranquilles, et en 1762-63, lors de son séjour à Môtières-Travers (Jura suisse), il s'était plu à méditer sous le grand porche de la grotte de Môtières.

II. LES BOTANISTES SUR LE TERRAIN:

Sérieux ou dilettantes, les naturalistes sont donc avant tout des botanistes, mais avec cet avantage formidable sur tous les autres savants que les botanistes, eux, allaient forcément sur le terrain, ne serait-ce que pour remplir leurs herbiers, alors que de nombreux géologues ou géographes ne quittaient guère leurs cabinets de travail. Et quand l'Europe découvrit les grands glaciers de Chamonix et de Grindelwald, les hauts massifs alpins captèrent tous les regards, draînèrent tous les curieux. Les botanistes ne trouvaient guère leur compte dans ces étendues rocaillieuses et englacées, et continuèrent à préférer la moyenne montagne, souvent plus isolée et, paradoxalement, plus difficile d'accès. En effet, alors que des touristes par milliers montaient déjà à Chamonix ou au cirque de Gavarnie, beaucoup de massifs moins prestigieux n'étaient desservis par aucune route, ce qui faisait dire à un savant de la fin du XVIII^e siècle que "les Pyrénées n'ont paru être ouvertes qu'aux seuls amateurs de la botanique" (Reboul 1788).

Ceux-ci cherchaient à illustrer par leurs trouvailles le principe de l'étagement de la végétation qu'avait, le premier, énoncé Tournefort à la suite de ses observations sur les flancs du mont Ararat (Broc 1991, 174) et arpentaient donc, entre autres, les massifs karstiques des Pyrénées et des Alpes. Le Casque de Lhéris (1595 mètres) au-dessus de Bagnères-de-Bigorre (Hautes-Pyrénées) fut ainsi un haut lieu de la botanique au XVIII^e siècle, mentionné par tous les ouvrages de l'époque, et, tout en herborisant, on ne pouvait manquer de remarquer les cavernes qui s'ouvraient sur ses flancs: "Le célèbre Tournefort a parcouru la montagne de Lheyris (à l'automne 1685); comme lui, venez y remplir votre herbier (...) Nous verrons le puits d'Arris, que le vulgaire, ami du merveilleux, croit un abîme incommensurable. Nous visiterons les grottes de la Gourgue et de Coume-Barade" (Joudou 1818, 137). Le peuple ignorant et superstitieux s'oppose donc au savant botaniste, seul qualifié pour observer avec sérénité et méthode les phénomènes de la nature.

De même, dans les Préalpes de Savoie, la grotte des Portes (commune de Doucy) est opposée à la grotte de Bangs, fréquentée par les curistes d'Aix-les-Bains: "Cette caverne, moins connue, n'est guère visitée que par les bota-

nistes qui viennent herboriser dans ces hautes régions" (Richard 1839, 109).

Cette pratique systématique du terrain est alors relativement rare, et il semble que tous les savants reconnaissent cette spécificité aux botanistes. Un exemple nous le montre bien, choisi dans les Alpes du Sud: sur le flanc Nord du Mont Ventoux, autour de 1400 mètres d'altitude s'ouvre une grotte aujourd'hui bien connue et longue d'environ 500 mètres: le Trou du Vent. Mentionné depuis longtemps, les descriptions en sont toutefois imprécises, et pourtant le courant d'air qui en sort intrigue. Le géologue Guettard, ayant fait le point des connaissances acquises sur cette grotte, aimeraient bien en savoir davantage, et conclut logiquement: "Le Mont Ventoux est fameux en Provence à cause des plantes qu'on y trouve: les botanistes le parcourront souvent; quelques uns d'eux probablement résolvera (sic) cette difficulté & nous décrira ces cavernes, si réellement elles existent" (Guettard 1779, XCVI). Les botanistes se trouvent ainsi en position d'arbitres des problèmes qui ne peuvent trouver leur solution que d'une fréquentation du terrain.

III. LES BOTANISTES SOUS TERRE:

Mais ce qui importe le plus pour nous, et qui est la conséquence logique de ce que nous venons d'exposer, c'est que les botanistes seront les premiers à signaler et à décrire toute une série de cavités; en un temps où la spécialisation scientifique n'existe pas encore, certains n'hésiteront pas à pénétrer sous terre et à en ramener des informations intéressantes. La première synthèse sur la Fontaine de Vaucluse, sur son fonctionnement et son bassin d'alimentation, est due à Joseph Guérin, créateur du jardin botanique d'Avignon (1775-1850).

Au cours de ses herborisations dans les Grands Causses, Antoine Gouan fut le premier, à la fin du XVIII^{ème} siècle, à décrire le site de Bramabiau; sa relation est précise et distingue bien l'orifice dans lequel se perd le Bonheur de la résurgence de Bramabiau à proprement parler (Gouan 1796, 196-197). Mais surtout, en 1768, il consacra deux journées à l'exploration de la Baume-Cellier (Monts de Saint-Guilhem, Hérault), élargit avec ses compagnons l'étroiture qui terminait la grotte et découvrit ainsi une nouvelle salle (*id.* 175-177). Une fois qu'il est entré sous terre, Gouan semble avoir laissé de côté ses préoccupations botaniques et ses investigations sont réellement spéléologiques.

Il n'en est pas de même de Dominique Villars; ce grand botaniste dauphinois de la fin du XVIII^{ème} parcourut pendant des années les montagnes de sa province, du massif des Ecrins jusqu'à la Grande Chartreuse, sans en laisser un coin inexploré. Les grottes l'intéressent pour elles-mêmes sans doute, mais surtout parce qu'il y traque les formes spécifiques de végétation: "Les grottes, les lieux bas marécageux, les aqueducs, les conduits souterrains, les puits, les galeries de mines, les endroits les plus infects qui refusent la vie aux plantes ordinaires, sont couverts de moisissures, de lichen, de biffus, de mousses et d'autres productions analogues. Ces plantes contribuent à la salubrité de l'air" (Villars 1781, 166-167). La lecture de son *Histoire des Plantes du Dauphiné*, et

surtout de son tome III consacré aux cryptogames, réserve ainsi de nombreuses notations sur les mousses qui croissent "dans les antres, les fentes, à l'entrée des grottes" (*Hypnum crispum*, 893), sur des lichens qui viennent "dans les pierres creuses, les grottes, dans les endroits où l'air circule difficilement et où le soleil ne pénètre presque jamais" (*Lichen lutescens*, 1003)... A plusieurs reprises, il cite des espèces qu'il a trouvées à l'entrée de la grotte des Cuves de Sassenage (Vercors) ou dans la grotte de l'Ermitage au Néron (Chartreuse). Mais sa contribution la plus importante tient dans sa description du Trou du Glaz, première mention connue de ce qui deviendra, bien plus tard, le réseau de la Dent de Crolles. Le passage mérite d'être cité *in extenso*:

En 1775, "nous visitâmes la fameuse grotte appelée trou-du-Glaz, c'est à dire trou de la glace, parce qu'elle en conserve souvent toute l'année. La direction de cette grotte est au Nord; sa hauteur est considérable, sa longueur est de plus de 700 pieds, dans un enfoncement régulier & presque horizontal; son élévation est à plus de 3600 pieds au-dessus de la plaine de Grenoble; on y trouve des stalactites d'une grosseur énorme et d'une assez belle transparence. La végétation ne se prolonge qu'à 30 à 40 pieds environ, quoique son ouverture ait plus de 20 pieds de diamètre. Les plantes, d'abord légèrement inclinées vers le côté du jour, deviennent de plus en plus penchées et plus minces à mesure qu'on s'enfonce davantage & finissent par être jaunes, étiolées, minces comme des cheveux, insipides, inodores et sans consistance, au moment où cette grotte leur refuse la vie" (1786, XXVI-XXVII). Le témoignage est certes précieux, à la fois sur le plan spéléologique, et sur le plan d'une étude écologique du monde souterrain. A n'en pas douter, Villars est ici un précurseur.

On voit bien par cet exemple que les botanistes ne visitent pas seulement les grottes à l'occasion de leurs excursions en montagne, en plus de leurs travaux sérieux, mais aussi pour y chercher des formes de vie végétale propres à ce milieu. Quelques années seulement après Villars, Humboldt fut animé de la même curiosité, même si elle ne s'appliquait pas aux cavités naturelles : "A l'occasion de ses nombreuses expéditions personnelles dans le sombre labyrinthe des mines de Freiberg, il est complètement fasciné par les mousses et autres plantes qui parviennent à produire une pigmentation verte avec, pour toute lumière, la faible lueur des lampes de mineur. Du coup, il se met à étudier, dans son petit jardin souterrain, l'effet de la lumière sur la croissance des végétaux" (Botting 1988, 21).

Depuis longtemps, la présence de végétaux à l'entrée des grottes avait dû intriguer; dès 1616, Chifflet, médecin de Besançon avait noté à la glacière de la Grâce-Dieu (Doubs) que "les pulmonaires poussent dans cette antre avec la saxifrage" (Chifflet 1616, 97). Mais il semble qu'au début du XIX^e siècle, de telles notations deviennent plus fréquentes. Dans les Pyrénées, par exemple, le grand botaniste Picot de Lapeyrouse relève la présence d'une fougère *Adiantum Capillus Veneris* "sur les rochers humides, dans les cavernes, dans les puits" (Picot 1813, 629).

A la même époque, Monteil explique que le bord du Causse Noir "présente un grand nombre de belles grottes: celles qui sont d'un accès facile servent à renfermer les troupeaux, les autres, où l'on ne pénètre qu'avec peine, offrent des concrétions pierreuses et plusieurs espèces de plantes, telles que le *polipodium*, le *politricum*, le *pinguicula* (qui sert à soigner les gercures des mamelles des vaches), l'*acrosticum* et l'*adiantum*" (Monteil 1802, 170). On retrouve ici cette préférence du botaniste pour des grottes d'accès un peu difficile, des grottes qui ne sont pas fréquentées pour les usages quotidiens et qui recèlent des plantes médicinales.

CONCLUSION

Cette inclination des botanistes, ou de certains d'entre eux du moins, pour les cavernes ne concerne certes pas souvent le karst profond, et leur curiosité s'arrêtait en général peu au-delà de la zone de pénombre. Ils se soucièrent rarement de considérations karstologiques ou hydrologiques, mais firent indubitablement faire ses premiers pas à l'écologie souterraine. Et surtout, dans bien des cas, ils ouvrirent la voie: à la suite de Villars, plusieurs auteurs mentionnèrent le trou du Glas, bientôt indispensable à toute description du massif de la Chartreuse; Gouan à la Baume Cellier fut suivi 30 ans après par un autre botaniste, Amelin, qui la fit connaître au grand public. Et il est évident que le travail de défrichement effectué par Poujol fut d'une grande utilité à Martel lorsqu'il vint à son tour explorer les grottes des Causses. Sans exagérer donc cet apport des botanistes, il convenait de leur rendre ici la place qui leur était due, aux côtés des autres pionniers de la spéléologie.

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VLOGA BOTANIKOV PRI ZAČETKIH SPELEOLOGIJE V FRANCIJI

Povzetek

Pogosto je prispevek botanikov k poznavanju podzemeljskega sveta neopazen. Običajno je omejen le na Tournefortov spust v jamo Antiparos (1700) in njegovo zmotno mišljenje, da kapniki rastejo kakor rastline. Vendar so botaniki v 18. in 19. stol., to je v času, preden se je speleologija uveljavila kot veda, veliko prispevali k odkrivanju in često tudi k raziskovanju jam. Od 18. stol. dalje je bila botanika temelj naravoslovne izobrazbe in naravoslovnega znanja. Tako sta Saussure in Humboldt, preden sta se odpravila na potovanji po Alpah oziroma po svetu, študirala botaniko; J. Vallot in F. Mazauric, Martelova tovariša, sta bila predvsem botanika. V drugi polovici 18. stol., ko je Evropa odkrila ledene k Chamonixa in Grindelwalda, so visokogorja pritegnili turiste in znanstvenike, medtem ko so botaniki nadaljevali s pohodi po manj obiskovanih in teže dostopnih predalpskih gorovijih. Zagotovo vemo, da so botaniki v času, ko večina geografov in naravoslovcov ni zapuščala svojih kabinetov, nabirali po terenu gradivo za herbarije.

Znani botanik iz Grenobla, Dominique Villars, je prvi objavil (1786) opis Trou du Glas, glavnega vhoda v jamski splet Dent de Crolles. Klasično Chaixovo delo o škrapljah temelji na seznamu, ki ga je sestavil botanik John Briquet. Na podlagi več primerov iz Alp in s francoskega krasa avtor v tem prispevku pomaga osvetliti vlogo botanikov pri nastajanju znanosti o jamaх.

UNE CAVERNE CLASSIQUE DU VERCORS: LA GROTTE DES CUVES DE SASSENAGE

CUVES DE SASSENAGE, KLASIČNA JAMA V VERCORJU

CHRISTOPH GAUCHON¹

Izvleček

UDC 551.442(44)(091)

Christoph Gauchon: Cuves de Sassenage, klasična jama v Vercorju

Jama Cuves de Sassenage leži v SV vzhodnem delu planote Vercors, blizu Grenobla. V jami, dolgi 9 km, se pojavlja voda iz breznične Berger. Tolmuna - "cuves" - v jamskem vhodu sta bila dvakrat opisana v prvi polovici 16. stol. in uvrščena v "Sedem čudes Dofineje". Vsako leto so se okoličani podali do tolmunov, da bi po njih sklepali na letino, globlje v jamo pa do raziskav Faujas de Saint-Fondsa 1781 ni šel nihče. J. Fonné je 1898-1899 izdelal prvi jamski načrt, nadaljevanja jame pa kljub prizadevanjem ni našel.

Ključne besede: zgodovina speleologije, Francija, Vercors, Gouffre Berger, Cuves de Sassenage.

Abstract

UDC 551.442(44)(091)

A classic cavern in Vercors, Cuves de Sassenage

The cave of the "Cuves de Sassenage" lies at the foot of Vercors, 5 km far from Grenoble. This more than 9 km long cave is the resurgence of the Gouffre Berger. Twice described in the first half of the XVIth century, the Cuves were two large rockbasins, considered as one of the 7 Wonders of Dauphiné. People scrutinized them each year to know if harvests would be copious but no-one passed beyond, before the first exploration by Faujas de Saint-Fonds in 1781. The first survey of the cave was drawn in 1898-1899 by Joseph Fonné, who could not find any extension in spite of his endeavours.

Key words: history of speleology, France, Vercors, Gouffre Berger, Cuves de Sassenage.

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L'histoire de la grotte des Cuves de Sassenage est tout entière placée sous le signe du paradoxe: "connue depuis toujours", citée par les érudits au moins depuis le XVI^e siècle, la grotte ne fut réellement explorée que bien plus tard. Cavité horizontale, elle opposa longtemps aux curieux l'eau froide de ses cascades, le réseau labyrinthique de ses galeries et les silex déchiquetés qui en ornent les parois; ces obstacles, que nous ne percevons plus guère aujourd'hui, retardèrent considérablement la connaissance de cette grotte dont l'exploration fut, pendant des siècles, d'une lenteur désespérante.

Et pourtant, on ne cessa jamais de s'intéresser à cette grotte qui, s'ouvrant au pied du Vercors, à 5 kilomètres de Grenoble, reste accessible en toutes saisons. Au fil des siècles, plusieurs centres d'intérêt se relayèrent, suivant l'évolution des mentalités, et assurèrent aux Cuves de Sassenage une renommée ininterrompue. L'histoire des Cuves, assez proche finalement de celle de beaucoup de cavernes connues de longue date, mérite bien d'être racontée.

I. LE TEMPS DES FABLES

La grotte des Cuves de Sassenage est, à ma connaissance, la cavité naturelle des Alpes françaises la plus anciennement citée: en 1525, dans une biographie du fameux chevalier Bayard, héros dauphinois disparu l'année précédente, Symphorien Champier décrit les "singularités" de sa province, parmi lesquelles "trois tines faites naturellement dans une roche auprès d'un château nommé Sassenage, en la montagne, lesquelles sont grandes à merveilles. Et un certain jour de l'année, ceux du pays vont voir lesdites tines dans le rocher assises, et si l'année doit être stérile, elles sont vides et n'y a comme point d'eau. Si l'année doit être abondante en biens, elles sont pleines d'eau. Et ainsi l'affirment ceux du pays entour." (Champier 1525, 39).

Neuf ans plus tard, un autre érudit dauphinois, Aymar Falcoz donne davantage de détails à propos de ces cuves: "On voit à Sassenage deux fosses que les habitants appellent tines, lesquelles sont dans un rocher et une pierre, et sont d'une grande capacité, dans lesquelles durant toute l'année on ne voit aucune marque d'humidité, et demeurent tout à fait sèches et on ne peut voir d'où l'eau peut sortir ou couler. Si ce n'est un jour de l'année et inévitablement la nuit de l'apparition de notre seigneur qu'on les voit pleines d'eau en abondance, toutefois l'eau n'y abondant toujours d'une égale façon mais l'une ou l'autre fait voir tantôt plus, tantôt moins d'humidité et les habitants de ce lieu tirent des conjectures de ce signe, de la fécondité ou de la stérilité de la terre. L'une de ces fosses dénotant l'abondance ou disette de vin, et l'autre marquant la grande quantité ou peu de blé qu'on cueillera cette année. Or, ce jour étant passé, toute l'eau s'écoule et disparaît merveilleusement sans que personne ne puisse apercevoir comment cela se fait" (Falcoz 1534, LXII-LXIII).

Ces deux textes, peu connus, méritent d'être cités *in extenso*, d'abord en raison de leur ancienneté, mais surtout parce qu'ils fixent pour près de 200 ans la vision dominante des Cuves. Si Champier et Falcoz ont jugé utile d'incorporer la description des Cuves dans le tableau qu'ils dressent de leur province, c'est que les Cuves de Sassenage font partie de ce qu'il sera bientôt convenu d'appeler les "7 Merveilles du Dauphiné": ces "Merveilles" ou "Miracles" sont des sites naturels comme le Mont-Aiguille ou la grotte de La Balme, auxquels l'imagination prêtait quelques vertus surnaturelles. Pendant des siècles, et jusqu'à aujourd'hui, toute description du Dauphiné comportait une évocation de ces Merveilles, et c'est pourquoi l'intérêt pour les Cuves de Sassenage n'a jamais faibli.

Le caractère miraculeux des Cuves tenait donc à cette valeur prophétique qu'on leur prêtait, et à la suite de Falcoz, tous les auteurs postérieurs ont repris la description de la procession qui, le jour de la fête des Rois, montait jusqu'à la grotte. Chacun ajoutait d'ailleurs des éléments propres à renforcer le mystère; en 1656, Salvaing de Boissieu attribue à la fée Mélusine, aïeule légendaire des seigneurs de Sassenage, l'origine de la vertu prédictive de ces deux grandes marmites. A partir de ce moment-là, le souvenir de Mélusine s'attache de façon indélébile aux Cuves de Sassenage, dont la toponymie souterraine va s'orner d'un "table de Mélusine", d'un "lavabo de Mélusine", d'un "labyrinthe de Mélusine", des "oubliettes de Mélusine", et même d'un "vase de nuit de Mélusine", ce qui est un peu irrespectueux!

Le phénomène des Cuves divinatrices est à coup sûr au centre du premier intérêt pour le site, au point que les deux cuves éclipsent la cavité elle-même, dont ne parlent ni Champier, ni Falcoz. Le premier à VOIR véritablement la grotte semble avoir été Nicolas Chorier, grand historien du Dauphiné. Avant même de décrire le miracle des Cuves, il écrit: "Les grottes de Sassenage ne sont pas moins dignes d'être contemplées. L'une est d'une grandeur incroyable, & elle jette de l'horreur dans les ames les plus fermes. En l'autre sont ces cuves si célèbres, & dans la troisième est une table de pierre, que l'on nomme la table de Mélusine" (Chorier 1661, I, 34). Sans doute la description est-elle brève, mais elle nous prouve peut-être que Chorier a pu aller sur place, et personne n'en dira plus jusqu'à la fin du XVIII^e siècle: la première grotte laisse échapper une bruyante cascade, susceptible en effet d'effrayer les visiteurs que Chorier encourage pourtant à venir. La seconde galerie, haute de trois mètres et large d'un, est entièrement occupée au sol par les fameuses bassines que personne n'ose franchir pour s'aventurer au-delà. La troisième est une galerie de peu d'importance, qui s'ouvre en contre-haut du porche principal. Au "miracle des Cuves", Chorier ajoute d'ailleurs une autre merveille, que sont les "pierres ophtalmiques": "Rien ne purifie les yeux ni ne les éclaircit à l'égal de ces pierres" que l'on fait glisser sous la paupière (id., 40). Il est difficile pour nous d'identifier ces pierres, que Chorier semble avoir vues, mais qu'il ne dit pas explicitement avoir trouvé dans les grottes mais "sur la même montagne de Sassenage".

Après quoi la plupart des auteurs piocheront dans le texte de Chorier pour donner du site une relation stéréotypée. Personne n'ose encore remettre en doute le caractère prophétique du lieu, mais certains cherchent à l'expliquer. En effet, Chorier avait provoqué la curiosité de ses lecteurs: "Quel esprit conduit si fidèlement cette eau en ce lieu, pour y être un oracle qui parle sans énigme? Comment l'eau perce-t-elle un rocher si dur? Comment disparaît-elle sitôt? Les savants se sont appliqués souvent à la recherche de la cause de cette merveille, mais leurs doutes en ont augmenté les ténèbres." (id., 39). Piqué au vif, le voyageur J. Dumont proposera une première explication: "Cela pourrait bien être parce qu'elles se remplissent suivant l'abondance des eaux qui descendent des montagnes toujours couvertes de neige pendant l'hiver, & comme vous savez, cette abondance n'est pas indifférente à la fertilité de la Terre. Mais avec cela je serais aisément porté à croire qu'il y aurait bien de l'abus & de la superstition" (Dumont 1699, I, 107). On voit par là que les premières interrogations rationnelles amènent à prendre un certain recul vis-à-vis des croyances ancestrales. Un certain scepticisme s'installe parmi les érudits, et Thomas Corneille écrira dans son Dictionnaire: "Ces Cuves passeraienr avec raison pour une des merveilles du Dauphiné, s'il n'y avait rien de fabuleux dans ce qui s'en dit" (Corneille 1708, III, 400). Certes, l'exploration de la cavité elle-même en est toujours au point zéro, mais l'incrédulité qui va gagner tout au long du XVIII^e siècle va constituer un nouveau moteur de la curiosité; dès lors il s'agit de venir aux Cuves pour vérifier le bien-fondé de la légende, et souvent pour la battre en brèche.

II. LE TEMPS DE L'INCRÉDULITÉ

Dans les premières années du XVIII^e siècle, les Académies parisiennes demandent à leurs correspondants en province de vérifier un certain nombre de faits tenus pour merveilleux: ainsi M. Dieulamant examina successivement la fontaine ardente et la grotte de la Balme, MM de Vaubonnays et Casset rendirent du Mont-Aiguille une relation plus conforme à la réalité; et en avril 1721, M. Lancelot prononça devant l'Académie des Inscriptions et Belles-Lettres un "Discours sur les 7 Merveilles du Dauphiné", tout entier placé sous le signe de l'incrédulité: ici il rabaisse le merveilleux, là il le nie, rien ne résiste à cet esprit cartésien. Des Cuves, il écrit: "C'est une vicelle fable que l'adresse maligne de quelques uns des habitants du lieu qui les remplissaient d'eau, a entretenue pendant plusieurs siècles. Il ne s'y en trouve plus à présent, & le miracle a cessé, sitôt qu'il a été examiné avec attention" (Lancelot 1729, 763). Le jugement est sévère, les Sassenageois étant tout simplement accusés de supercherie, bien que l'on ne comprenne pas exactement dans quel but. Heureusement pour les Cuves, Lancelot ajoute: "Ce qu'il y a de curieux à Sassenage, & dont on parle le moins, est une cascade qui est dans une grotte à côté de celle où sont les cuves. La source qui la forme, &

qui sort du creux du rocher, a communication avec un lac qui est à deux lieues de là sur le haut de la montagne de Lans. Cette chute d'eau est reçue dans un grand bassin naturel." (id., 764). Ce texte-là est fondateur car, alors que d'autres Merveilles du Dauphiné une fois désacralisées allaient sombrer dans l'oubli, Lancelot parvient à requalifier l'intérêt du site sassenageois: si les Cuves n'ont rien de remarquable, la grotte non seulement est admirable comme le disait déjà Chorier, mais encore elle pose aux savants un problème autrement plus intéressant, celui de la circulation des eaux à travers les masses calcaires du Vercors. Certes, il n'y a pas de lac à Lans, mais l'idée d'un bassin versant est déjà clairement exposée, et le fonctionnement de la grotte s'en trouve rationalisé. L'opinion de Lancelot est fréquemment reprise dans les décennies qui suivent, et les Cuves de Sassenage eurent ainsi l'honneur de la grande Encyclopédie de Diderot et d'Alembert (1765, X, 392-393), qui reprirent à leur compte l'explication du pseudo-miracle par la supercherie des Sassenageois.

Mais ces assauts de scepticisme ne faisaient pas progresser la connaissance réelle de la grotte, et il faut attendre pour cela l'intervention d'un nouveau personnage, Faujas de Saint-Fond, Lieutenant-Général de la ville de Montélimar. En 1781, ce magistrat publie une copieuse "Histoire Naturelle du Dauphiné", dans laquelle un chapitre entier est consacré à la "Description des

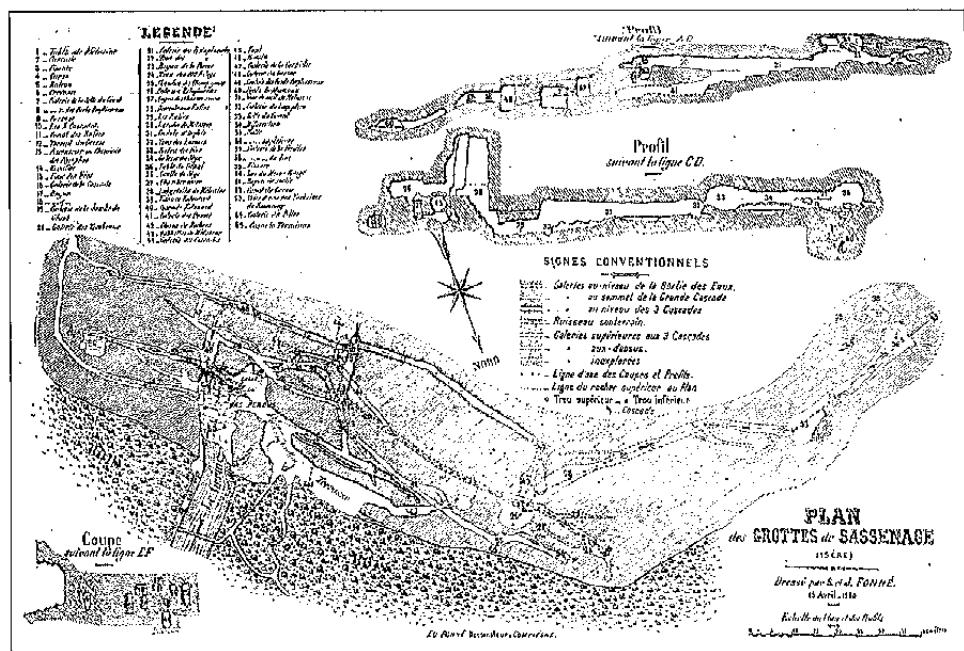


Fig. 1: Plan des Cuves de Sassenage (S. & J. Fonné 1900).

Grottes et des Cuves de Sassenage". Faujas avait lu ce que Chorier avait écrit des Cuves mais n'avait pu admettre "les choses extraordinaires et incroyables qu'il en débitait" (Faujas 1774, 246); il vint donc sur place par deux fois en 1774, puis une fois à nouveau en 1778. Faujas s'est donc livré à une véritable exploration, à une époque où les investigations souterraines connaissent en France une vogue notable.

La description qu'il donne de la grotte est précise; s'il n'en dresse malheureusement pas de plan, il a mesuré la hauteur, la largeur et la longueur des galeries qu'il a parcourues, d'autant plus systématiquement qu'il progresse avec un fil d'Ariane, pour être sûr de ne pas se perdre dans les dédales. Sa description suit les trois grottes qu'avait déjà distinguées Chorier: du côté où sortent les eaux, Faujas s'était heurté en 1774 à des eaux trop abondantes, mais son guide l'avait assuré que c'était par là que se trouvaient les pierres ophtalmiques (Faujas 1774, 249). "Pendant l'été 1778 & par un temps de sécheresse", Faujas revint donc aux Cuves et put progresser d'environ 100 pieds "dans un boyau étroit & humide", et fut tout déçu de n'y trouver ni stalactites ni fossiles (Faujas 1781, 277)..., ni pierres ophtalmiques (*id.*, 289).



Fig. 2: Portrait de Faujas de St. Fond (fonds et cliché Bibliothèque Municipale de Grenoble).



Fig. 3: Les Cuves de Sassenage vers 1770 (fonds Bibliothèque Municipale de Pau).

Ses efforts portent donc ensuite sur la galerie où sont les Cuves: ayant d'abord donné les mesures précises de ces deux grandes marmites, il avoue que "l'on imagine difficilement ce qui a pu donner tant de célébrité à deux simples creux ou excavations dans le roc vif" (id., 278). Faujas passe donc au-delà des Cuves, observe quelques bélémnites dans la galerie d'en face, découvre sur sa gauche une galerie qui le ramène jusqu'au cours d'eau souterrain où "l'on est étourdi par le bruit des caux & fatigué par le vent" (id., 279). Au total, Faujas n'a parcouru ici que 168 pieds, moins de 60 mètres, et il est passé au pied de la "Cheminée des Quatre Vents" sans penser à lever la tête et à chercher au plafond la suite de la cavité.

Enfin, tout comme Chorier, il signale la troisième grotte, celle où l'on remarque la "table de Mélusine". Au total, la longueur de l'ensemble ne dépasse pas les 100 mètres, et c'est bien peu de choses car il y a déjà en France plusieurs grottes connues sur plus d'un kilomètre (Osselles, Arcy, La Balme...). Les observations de Faujas seront connues du monde savant de l'époque, puisque le grand géologue Guettard s'en fera l'écho, et que 30 ans plus tard, l'Encyclopédie méthodique de Géographie physique en reprendra des éléments. L'opiniâtreté de Faujas, son entêtement à vérifier la réalité de ce qui avait été écrit avant lui, les mesures systématiques auxquelles il se livre et qui se substituent dès lors aux dimensions mythiques du lieu, tout cela inscrit bien cette démarche dans le XVIII^e siècle; on retrouve, au même moment, les mêmes attitudes chez les explorateurs de la grotte de La Balme, dans le Nord de l'Isère.

A partir de là, on pourrait penser que tout est dit, et que les Cuves, ayant perdu tout leur mystère, vont cesser d'attirer les curieux. La sensibilité du XIX^e prendra le relais à point nommé: le goût pour le moyen-âge entretient la curiosité pour la légende de Mélusine, et s'y ajoute même la croyance selon laquelle la "table de Mélusine" avait servi à des sacrifices druidiques. D'autre part, le pittoresque du site continue à faire venir les promeneurs qui admirent les jeux de lumière du double porche et s'amusent à s'effrayer du bruit de la cascade. Si l'on en croit Fonné, "tous les dimanches de la belle saison, on voit des centaines de promeneurs (...) s'avancer jusqu'aux grottes" (Fonné 1900, 178).

III. A LA RECHERCHE DE PROLONGEMENTS

Entre 1781 et 1900, il semble que plus personne ne se soit réellement soucié d'étudier les Cuves de Sassenage et de voir s'il serait possible de dépasser le terminus de Faujas. Certaines assertions audacieuses auraient pourtant pu provoquer la curiosité des chercheurs; Pallias n'avait-il pas écrit: "On assure que ces grottes conduisent jusque dans le Royans situé à plus de six lieues de là" (Pallias 1854, 5)? Toutefois, à travers certains ouvrages d'histoire locale ou certains guides touristiques, il semble bien que certains

prolongements étaient déjà connus vers le milieu du XIX^e siècle. Taulier parle ainsi de "vastes souterrains" dont la visite "n'est pas sans dangers, à cause des crevasses qu'il faut franchir, et au fond desquelles on entend mugir les eaux à une assez grande profondeur" (Taulier 1855, 78). On reconnaît là l'allée des Tombeaux, équipée de "deux rails à ornières gravés dans la paroi" (Fonné 1900, 255) pour faciliter le passage en opposition. Sans doute les visiteurs allaient-ils donc au moins jusqu'à la salle des Ratapanades. Un autre guide confirme qu'il s'agit d'une excursion assez éprouvante d'où "les curieux ne sont pas assurés de rapporter de leur expédition toutes les pièces de leur vêtement intactes" (Ferry 1869, 58). Ces quelques notations montrent combien, avant que la spéléologie ne se soit institutionnalisée grâce aux efforts de Martel, l'excursion touristique et l'exploration étaient mêlées, ces guides de promenade étant les seuls témoignages de cette époque.

La deuxième étude sérieuse sur les Cuves de Sassenage attendra donc la toute fin du XIX^e siècle, et l'intervention d'un personnage peu connu et qui se signala pourtant par deux séries d'explorations spéléologiques importantes, d'abord aux Cuves de Sassenage entre 1898 et 1899, puis, après 1900, dans les grottes des Echelles (massif de la Chartreuse): il s'agit de R. Joseph Fonné, aidé le plus souvent de son frère Edouard. Il semble que sa carrière de spéléologue se soit limitée à ces deux groupes de cavités, mais les mémoires qu'il en a laissés sont précieux et accompagnés de plans fort précis. Le plan qu'il dressa des Cuves, qui n'avaient jamais été topographiées, fut d'ailleurs reproduit à plusieurs reprises par Martel, qui remarqua en particulier "le degré de fissuration interne de la montagne" que Fonné s'était efforcé de restituer le plus fidèlement possible (*Spelunca Bulletin*, 1900, n° 21-22, p. 78). L'intérêt de Fonné pour les Cuves de Sassenage coïncide avec un moment où le propriétaire des lieux, le marquis de Bérenger envisage pour sa grotte de grands aménagements touristiques et industriels. Il est probable que les deux hommes se soient concertés, la plaquette de Bérenger étant illustrée d'un plan qui, quoique signé d'un certain Riboulet, ressemble étrangement à celui de Fonné.

Quoiqu'il en soit, les frères Fonné vont s'attacher à fouiller aussi complètement que possible les galeries labyrinthiques, et si possible à en découvrir les prolongements. Leurs investigations se font sous la conduite des guides habituels des grottes, qui s'amusent à les perdre sur le chemin du retour, ce qui prouve bien que jusqu'à la salle du Styx qui sera leur terminus, les frères Fonné ne font pas de véritables découvertes. Ils sont toutefois les premiers à décrire toute cette partie de la grotte, et ne se résignent pas à ne pas pouvoir progresser au-delà. Le 6 février 1898, ils s'acharnent donc à trouver un passage dans la salle du Styx, et, en se faufilant à travers les blocs, parviennent à descendre assez pour retrouver le cours d'eau souterrain en amont de sa partie connue : ce sera la "cascade Edouard", atteinte après 5 heures d'efforts. Pas moyen d'aller plus loin, l'eau sortant d'un trou impénétrable.

Mais Fonné n'a pas dit son dernier mot. En 1857, le géologue Lory avaient

expliqué que les caux ressortant aux Cuves de Sassenage venaient du “large plateau qui s'étend vers le Sud jusqu'au village de Saint-Nizier (Lory 1858, 18), et un écho avait paru au début de 1899 dans Spélunca, signalant l'existence à Saint-Nizier d'un puits: “on prétend qu'il doit communiquer avec les grottes ou cuves de Sassenage” (Spelunca, Bulletin n° 17-20, p.70). Le 12 février 1899, voici donc Fonné à pied d'oeuvre, à plus de 1000 mètres d'altitude; le puits, dans lequel se jette un ruisseau, est encombré de stalactites de glace, mais qu'importe, Fonné et ses trois compagnons descendront chacun à leur tour jusqu'à 35 mètres de profondeur, où ils constateront tous que le puits est irrémédiablement bouché. Là s'arrêteront les recherches de Fonné.

Conclusion: Martel, semble-t-il, n'est jamais venu aux Cuves, mais il en parle à plusieurs reprises. Avant les explorations de Fonné, il supposait que la navigation souterraine pourrait, ici aussi, faire progresser l'exploration (Martel 1894, 416), mais les lieux ne s'y prétaient vraiment pas. Si, par la suite, il chercha à protéger le site menacé par un projet de captage hydro-électrique, Martel ne cacha pas sa déception quant aux résultats obtenus par Fonné: dans une des comparaisons dont il est coutumier, il dit sa préférence pour les grottes des gorges de la Bourne explorées par Decombaz (1928, 165).

Il est vrai qu'au terme de tous ces efforts, le point ultime atteint dans les Cuves n'est distant de l'entrée que d'environ 160 mètres, et les centaines de mètres de développement acquis dans les labyrinthes ne font pas illusion: les Cuves restent une grotte bien modeste. Le terminus de la salle du Styx ne sera dépassé que le 27 octobre 1947 par Géo Mathieu et Louis Eymas qui, trouvant au sol un passage entre les blocs, allaient donner la clé des découvertes à venir. Fonné, qui n'avait pas épargné sa peine et qui avait minutieusement fouillé ce secteur, était passé tout près du but. Après quoi, Mathieu, Eymas et leurs camarades, au lieu de retourner sur le plateau de Saint-Nizier qui ne leur paraît pas intéressant (Cadoux et al. 1955, 88), investirent le plateau du Sornin où, le 24 mai 1953, ils allaient découvrir le Gouffre Berger. L'aventure ne faisait que commencer!

Même si la jonction avec le gouffre Berger n'a jamais pu être réussie, malgré de nombreuses plongées et escalades, les Cuves de Sassenage sont aujourd'hui connues sur plus de 9 kilomètres de développement, et jusqu'à plus de 400 mètres au-dessus de l'entrée. Les spéléologues grenoblois aiment donc à visiter ce réseau varié et agréable à parcourir, sans toujours penser aux efforts de leurs lointains prédecesseurs.

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CUVES DE SASSENAGE, KLASIČNA JAMA V VERCORJU

Povzetek

Jama Cuves de Sassenage, ki leži v SV vznožju planote Vercors, 5 km od Grenobla, je jamarjem dobro znana in jo pogosto obiskujejo. V jami, dolgi 9 km in v nadm. viš. 408 m (zgornji vhod), se pojavlja voda iz brezna Berger. Prvi del jame je urejen za turistični obisk. Jama je znana že stoletja, vendar je bila v glavnem raziskana šele 1947.

Nekdaj so jamo uvrščali v "Sedem čudes Dofineje", to je med sedem naravnih pojavov, ki so jih v srednjem veku šteli za čudežne. Enkrat letno so se okoličani v procesiji podali do jame in si ogledali tolmuna v živi skali; glede na to, ali sta bila polna vode ali suha, so sklepali na dobro ali slabo letino. Ta dva tolmuna - "cuves" - sta v samem jamskem vhodu in kaže, da globlje v jamo ni šel nihče. Od začetka 16. stol. dalje so številni opisi teh "cuves", toda pred 18. stol. nihče ni opisal jame in njenih rogov.

1781 je Faujas de Saint-Fonds izdal "Naravoslovni opis Dofineje", kjer je poglavje z opisom te jame, takrat preiskane v dolžini 178 čevljev. Do 1898 ni bilo o njej ničesar novega, takrat pa se je J. Fonné ponovno lotil raziskav, opisal labirint rogov in izdelal prvi jamski načrt (1898-1899). To je svojevrsten paradoks: velika jama v več nivojih, znana že zelo dolgo časa, v katero pa ni nihče stopil pred koncem 19. stol.!

INCIDENTI SPELEO D'ALTRI TEMPI - INFORTUNISTICA MINORE SUL CARSO TRiestino nel XIX SECOLO

JAMARSKE NESREČE V PRETEKLOSTI. MANJŠE NEZGODE NA TRŽAŠKEM KRASU V 19. STOLETJU

PINO GUIDI¹

Izvleček

UDK 551.44(450.361)“18”

Pino Guidi: Jamarske nesreče v preteklosti. Manjše nezgode na Tržaškem Krasu v 19. stoletju

Prispevek opisuje tri nesreče, ki so se pripetile v zadnjih dvajsetih letih devetnajstega stoletja jamarjem iz Trsta na Tržaškem Krasu (Škocjanske jame, brezno pri Padričah, Labodnica). Ti so bili člani Abteilung für Grotten Forschung des Section Küstenland des Deutschen und Österreichischen Alpenvereins, Club Alpino dei Sette in Commissione Grotte della Società Alpina delle Giulie.

Ključne besede: zgodovina speleologije, nesreča, Italija, Slovenija, Kras.

Abstract

UDC 551.44(450.361)“18”

Pino Guidi: Cave accidents in the past. Smaller mishances in the 19th century on the Trieste Karst

The paper describes three accidents, happened to the cavers from Trieste in the last 20 years of the 19th century on the Trieste Karst (Škocjanske jame caves, pothole near Padričano, Grotta di Trebiciano cave). The cavers were the members of the “Abteilung für Grotten Forschung des Section Küstenland des Deutschen und Österreichischen Alpenvereins”, “Club Alpino dei Sette” and “Commissione Grotte della Società Alpina delle Giulie”.

Key words: history of speleology, accident, Italy, Slovenia, Kras.

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PREMESSA

L'esplorazione delle grotte è un'attività che comporta sempre qualche rischio: ci si può far male per colpa propria (avventatezza, uso di materiali scadenti o impropri, inesperienza) o per cause esterne (frane o piene non prevedibili, cedimenti di ripiani ecc.). L'attività speleologica sul Carso triestino nell'altro secolo, che - almeno da quanto emerge dalle ricerche d'archivio tuttora in corso - doveva essere piuttosto intensa¹, non poteva non annoverare anche qualche incidente. A parte quello che ha provocato quattro morti al "Foro della Speranza", da quel giorno chiamato Grotta dei Morti e su cui ha scritto esaurientemente Mario GALLI², se ne conoscono parecchi altri, con esito mortale e non. Alcuni dei maggiori sono ricordati nel 2000 Grotte³, mentre ultimamente si è interessato all'argomento lo storico inglese Trevor R. SHAW⁴.

In attesa di poter dare una panoramica per quanto possibile completa dell'infortunistica speleologica (o legata alle grotte) degli ultimi due secoli si presentano qui di seguito tre incidenti che hanno coinvolto i grottisti triestini, episodi a modo loro peculiari di quei tempi pionieristici.

4 MAGGIO 1884 - GROTTA DI SAN CANZIANO

Dal gennaio del 1884 il Grottenabtheilung del D.O.A.V., gruppo di esploratori delle grotte della Società Alpina Austro-Tedesca costituito nel settembre dell'anno prima⁵, stava conducendo la sistematica esplorazione delle Grotte di San Canziano, esplorazione non più ripresa dopo i tentativi fatti da Adolf Schimdl (insieme all'ingegnere minerario di Idria Ivan Rudolf) nel 1852⁶. Il 4 maggio, durante l'esplorazione del tratto di grotta in cui il Timavo, dopo un percorso sotterraneo di quasi 300 metri, sbocca nella grande Voragine l'imbarcazione che trasportava Giuseppe Marinitsch, quarantenne uomo di punta della squadra, si rovesciava; il malcapitato, trascinato dalla corrente sino all'uscita della caverna, riuscì a mettersi in salvo su di uno sperone di roccia dove lo troveranno i soccorritori dodici ore più tardi. Ecco la cronaca dell'episodio come venne narrata il 6 maggio dal *Piccolo corriere del mattino* di Trieste:

"UN INTREPIDO NUOTATORE. Nel pomeriggio di ieri l'altro, alcuni signori facevano un'escursione in battello, nella grotta di S. Canziano, la quale come si sa, è attraversata dal Recca. Ad un tratto il signor Marinitsch, che faceva parte della comitiva, cadde nell'acqua. Trasportato dalla corrente, ben presto gli amici lo perdettero di vista. Egli però nuotava intrepidamente e riuscì a mettersi in salvo.

Il signor Marinitsch stanco e sfinito e tutto molle d'acqua, diede fiato ad un corno che teneva fortunatamente presso di sé. Gli amici intanto lo ceravano disperatamente. Infine, a notte inoltrata, udirono il suono del corno e guidati da quello trassero il compagno a salvamento... . L'avventura finì bene (anche per la

robusta fibra del Marinitsch, che nel 1906 troveremo ancora a San Canziano - sessantenne di ferro - ad esplorare la Galleria del Silenzio), ed oggi quel tratto delle grotte di San Canziano porta il suo nome⁷.

Il secondo incidente ricordato in questa breve nota avvenne quattro anni più tardi nel Carso più prossimo a Trieste, ed ebbe quali protagonisti un gruppo di giovanissimi studenti.

MAGGIO 1888 - POZZO PRESSO PADRICIANO,

Una comitiva del Club dei Sette (che però non si chiamava ancora così: il Club sarà formalmente costituito soltanto alcuni anni più tardi) si recò a visitare la prima parte (sino ai pozzi) della Grotta 12; poscia il gruppo andò ad esplorare una vicina grotta che inizia con un pozzo profondo 15 metri (probabilmente la Grotta presso Padriciano, 36 VG). Dalla relazione di Silvio Cavalli⁸ leggiamo:

“...ci portammo all'imbocco dell'accennato pozzetto di 15 metri di profondità, distante circa 150 passi, nella direzione di Lipizza, dove lo Chaudoin⁹ s'era proposto di scendere.

All'uopo avevamo fatto sulla famosa corda una serie di nodi per facilitare la discesa che seguì senza difficoltà. Raggiunto il fondo, il visitatore si limitò a constatare la direzione apparente che prendevano più rami della grotta, poi si accinse a risalire. dopo cinque metri di salita, lo Chaudoin aveva fatto una sosta su una sporgenza di roccia quando questa cedette e il novello speleologo precipitò con la schiena all'ingiù perdendo i sensi. Il nostro imbarazzo perdurò parecchio, finché lo Chaudoin si riprese e poté rispondere ai nostri appelli. Per facilitare la sua rampicata sostituimmo i nodi con dei lacci e così egli poté uscire quasi incolume, zoppicando solamente un pochino.”

Successivamente buona parte dei giovani del Club dei Sette passò all'Alpina¹⁰, vivificando la sua Commissione Grotte. A quei tempi gli speleologi della Società Alpina delle Giulie dedicavano gran parte delle loro energie alla Grotta di Trebiciano, non solo finestra sul Timavo sotterraneo, ma altresì, allora, la più profonda cavità del mondo. E qui, quasi alla fine del secolo, ecco verificarsi un altro incidente rimasto per fortuna senza conseguenze.

12 DICEMBRE 1897 - GROTTA DI TREBICIANO, 17 VG.

Nel corso di una visita alla Grotta di Trebiciano, 17 VG, i grottisti dell'Alpina provenienti dal Club dei Sette ebbero un drammatico contrattempo.

Ecco come racconta il fatto Eugenio Boegan¹¹ che partecipò all'escursione:

“Con la Commissione Grotte, nelle domeniche e nei giorni festivi, con costanza e pazienza non poca, riprese un rilievo particolareggiato e, per quanto possibile, scrupoloso dell'intera grotta, tanto per l'altimetria, quanto per la planimetria; fece osservazioni termometriche dell'aria a varie profondità, della

temperatura dell'acqua, ecc. quando il giorno 12 dicembre 1897, ad una delle nostre solite discese in grotta a circa 200 metri di profondità, successe un incidente che poteva avere serie conseguenze.

La comitiva, composta dai consoci Umberto Sotto Corona, Mario Zey, lo scrivente e un operaio, stava misurando alcuni particolari dei pozzi, quando improvvisamente uno scricchiolio fece comprendere che una impalcatura, che chiudeva trasversalmente il pozzo, cedeva.

Difatti questa dopo pochi secondi crollò tutta intera assieme alle scale sottostanti, trascinando con sé soltanto lo Zey, che, istintivamente afferratosi ad una scala di legno, precipitò con essa perforando altre tre impalcature, fermandosi sopra una quarta e rimanendo illeso miracolosamente!

Venne tosto soccorso dai compagni rimasti al di sopra del sito crollato; gli si calò un fanale e gli venne calata una scala a corda acciocché potesse risalire il tratto del pozzo mancante delle scale di legno, le quali, assieme al legname delle impalcature formavano una catasta aggrovigliata bizzarramente."

Incidente rimasto senza conseguenze, come quelli - la storia si ripete... - annoverati dall'infortunistica speleologica nella Grotta di Trebiciano nel secolo successivo: sempre per colpa delle scale di legno fradice mezza dozzina di speleologi si infortuneranno nella grotta più conosciuta del Carso triestino¹².

NOTE

- 1) FARONE Egizio, 1994: *Le ricerche sul Timavo sotterraneo in relazione all'approvvigionamento idrico della città di Trieste (1841-1842)* - Atti e Mem. Comm. Grotte "E. Boegan", 31: 95-158; sulle ricerche ed esplorazioni di grotte nel secolo XIX si vedano pure i vari contributi di Egizio FARONE, MARIO GALLI, Pino Guidi negli "Atti" del Simposio Int. sulla Protostoria della Speleologia, Città di Castello, 1991: 41-111 e Dario MARINI, 1981: *Prima ricerca dell'acqua sotterranea sul Carso - Alpi Giulie*, 75: 60-66
- 2) GALLI Mario, 1975: *Documenti inediti e biografie per una "Storia della Speleologia" (Friuli-Venezia giulia). La Grotta dei Morti - Mondo Sotterraneo*, 1974-75: 135-172, Udine 1975
- 3) Pur non riportando tutti gli incidenti sicuramente allora conosciuti (nella descrizione delle Grotte di San Canziano, per esempio, non si accenna all'incidente in cui perse la vita Federico Prez) l'opera contiene notizie su una dozzina di infortuni, di cui 7 avvenuti prima del 1900, Cfr. BER-TARELLI Luigi Vittorio, BOEGAN Eugenio, 1926: *2000 Grotte, quarant'anni di ricerche sul Carso???* T.C.I. ed., Milano 1926: 1-494
- 4) SHAW Trevor R., 1994: *Some cave accidents and rescue before 1894 - ALCADI-94, Zusammenfassung, Symp. zur Geschichte der Speläologie in Raum Alpen, Karpaten und Dinariden*, Wien 1994: 25-26. Nel riassunto

- l'A. ricorda l'incidente alla Grotta dei Morti (ott. 1866) ed il decessoo (dic. 1891), conseguenza di una pleurite contratta all'Ab. dei Serpenti, di Anton Hanke.
- 5.) Notizie sui primi anni di vita del Abtheilung für Grottenforschung (o anche Grottenanbtheilung), come pure degli altri due sodalizi più avanti menzionati, si trovano in GUIDI Pino, 1995: *Cenni sull'attività dei Gruppi Grotte a Trieste dal 1871 al 1900*, Atti e Memorie della Commissione Grotte "E. Boegan", 32: 85-127, Trieste 1995.
 - 6.) SCHIMDL Adolf, 1851: *Üeber den unterirdischen Lauf der Recca* -Sitz.: 655-682, Wien 1851; GALLI Mario, 1971: *Antonio Hanke e l'esplorazione delle Grotte di San Caziano - Alpi Giulie*, 66-85, Trieste 1971. Su Ivan Rudolf vedi NOVAK Dušan et al., 1988: *Gradivo za slovensko biografijo* - Naše jame 30, suppl.: 1-192, Ljubljana 1988
 - 7.) Galli, 1971, *op. cit.* pag. 78, (da cui è tratto il trafiletto del giornale) nella seconda parte del lavoro descrive con dovizia di particolari l'inizio delle esplorazioni a San Canziano.
 - 8.) Silvio CAVALLI, 1958: *Come conobbi il mio amico Eugenio Boegan*, pag. 3, dattiloscritto di 38 pagine, datato Trieste ottobre 1958 e conservato nell'archivio della Comm. Grotte "E. Boegan". Il Cavalli (all'epoca Kobau o, talvolta, Cobau) è stato compagno di esplorazioni del Boegan sin dai tempi del "Club dei Sette" e assieme allo stesso redasse nel 1897-98 uno studio sulla Grotta di Trebiciano premiato al concordo indetto dalla Reale Società Geografica Italiana. Il dattiloscritto che ci ha lasciato contiene moltissime notizie sul mondo speleologico giovanile di allora. Quanto all'anno cui il Cavalli riferisce l'incidente è doveroso segnalare che sussiste qualche perplessità: il Club dei Sette, costituito ufficialmente nel 1893, risulterebbe avere iniziato la sua attività almeno tre anni prima (cioè al massimo nel 1890-1891), per cui la data 1888 parrebbe troppo lontana, oltretutto quando il Boegan avrebbe avuto soltanto 13 anni.
 - 9.) Ferruccio Chaudion, figlio del comandante dei Vigili del Fuoco di Trieste, CAVALLI, *op. cit.*, pag. 3; descritto come elemento di notevole robustezza e coraggio, nel 1914 - all'avvicinarsi dell'entrata in guerra dell'Italia - diverrà capitano del corpo dei Vigili Fuoco volontari istituito dal Comune di Trieste.
 - 10.) Il "Club dei Sette", prima - in ordine di tempo - società alpinistico-speleologica giovanile triestina, svolse attività (soprattutto spelcologica) per almeno quattro anni (1891-1894); per le sue file passarono una sessantina di speleologi. Sciolta nell'estate 1894 dalla polizia in quanto non in regola con la normativa di allora sull'associazionismo, conflìi praticamente in toto (uomini, idee, materiali) all'Alpina delle Giulie.
 - 11.) La cavità, sin dalla sua scoperta oggetto di studi da parte del Comune di Trieste, era stata attrezzata con scale fisse di legno, varie volte sostituite in quanto soggette ad un rapido deperimento. La relazione dell'incidente e

riportata alla pag. 21 della monografia sulla cavità (BOEGAN Eugenio, 1909-1910: *La Grotta di Trebiciano - Alpi Giulie* 1909-1910, Tip. Caprin, estr.: 1-68);

- 12.) Dei molti incidenti registrati nella Grotta di Trebiciano (solo per gli anni '60 gli archivi del Soccorso Speleologico ne riportano cinque: 6.5.1961; 31.8.1961; 8.7.1962; 3.3.1963; 7.4.1968) alcuni erano dovuti al cattivo stato delle scale di legno fiesse, come quelli successi a Marino Vianelo, maggio 1961 (cedimento di due gradini) e ad Arturo Battaglia, tre mesi dopo (cedimento di un gradino). Ambidue gli speleologi si fermeranno sul ripiano posto qualche più sotto, riportando contusioni varie.

JAMARSKE NESREČE V PRETEKLOSTI. MANJŠE NEZGODE NA TRŽAŠKEM KRASU V 19. STOLETJU

Povzetek

Prispevek opisuje tri nesreče, ki so se pripetile v zadnjih dvajsetih letih devetnajstega stoletja jamarjem iz Trsta na Tržaškem Krasu.

Prva se je pripetila članom Abteilung für Grotten Forschung des Section Küstenland des Deutschen und Österreichischen Alpenvereins 4. maja 1884 v Škocjanskih jamah, v delu, ki se imenuje Mariničeva jama. Pri prečkanju Reke je J. Marinitsch padel in tok ga je odnesel, vendar je uspel niže ob vodi splavati na breg.

Maja 1888 se je v brezno pri Padričah (globoko okoli 15 m) spustil član-novince organizacije Club Alpino dei Sette. Pri plezanju iz jame, ob vrvi, se je odkrušila skala in padel je na dno ter se onesvestil. Vendar ni bil resneje poškodovan in je končno sam pripeljal iz jame.

12. decembra 1897 je skupina raziskovalcev, članov "Commissione Grotte della Società Alpina delle Giulie" merila značilnosti v vhodnem breznu, ko se je udrl leseni podest in zgrmel v globino. Enega izmed članov je potegnilo zraven. Podrlo je še tri podeste, jamar pa je, kot po čudežu, ostal nepoškodovan.

DER PLAN DER VILENICA VOM 20. APRIL 1818**NAČRT VILENICE DATIRAN "20. APRIL 1818"****HEINZ HOLZMANN¹****Izvleček**

UDC 551.442(497.4)"1818"

Heinz Holzmann: Načrt Vilenice datiran "20. april 1818"

Najstarejši načrt Vilenice J. A. Nagla iz 1748 predstavlja le skico tlorisa; drugi, iz Mollovega atlasa (1752) je bolj groteskna slika, kot pa načrt, tretji pa je Vicentinijev načrt v akvarelju iz 1818. Meri 77 x 50 cm in ima sivo osenčen obris ter barvni pogled s strani, s sigo in kapniki. Na sliki so tudi obiskovalci, ki se držijo za ograjo. Na vrhu je šest vrst opisa jamev rokopisu, po vsej širini lista, s podpisom. Najbrž načrt ni bil nikoli javno predstavljen, saj so 1818 odkrili notranje dele Postojnske jame in zanimanje se je usmerilo tja. avtor prispevka je dobil ta načrt pred 10 leti na boljem trgu na Dunaju.

Ključne besede: zgodovina speleologije, jamski načrt, Slovenija, Kras, Vilenica, Vicentini.

Abstract

UDC 551.442(497.4)"1818"

Heinz Holzmann: The map of Vilenica from 20. April 1818

The oldest map of Vilenica by J.A. Nagel (1748) is only a plan sketch; the second one from the Moll's Atlas (1752) is a rather grotesque painting; and the third one is watercolour by Vicentini from 1818. It measures 77 x 50 cm and shows a grey shaded outline and a coloured side view showing dripstonesan stalagmites. This layout also shows some visitors holding the handrail. At the top a signed six-line handwritten description of the cave covers the full map width. Probably this map was never exhibited publicly because in 1818 the new parts of Postojnska jama were explored and the interest was directed there. The author acquired the map at the Vienna fleamarket 10 years ago.

Key words: history of speleology, cave map, Slovenia, Kras, Vilenica, Vicentini.

¹ Straussengasse 3 a, AT - 1050 WIEN, AUSTRIA

Die Höhle, die wahrscheinlich die älteste Schauhöhle der Welt ist, hat im Laufe der Zeit verschiedene Bezeichnungen gehabt. Von den Landsleuten der Gegend wurde und wird sie als Vilenica bezeichnet, dann als Berggrotte von Triest oder Grotte von Corniale bzw. Höhle von Corniale oder deutsch Feenhöhle und heute heißt sie Vilenica. Man kann annehmen, daß bereits gegen Ende des 15. Jahrhunderts von Reisenden, Doktoren der Naturwissenschaften und Studenten, von Triest aus, die Höhle besucht wurde. Im 17. Jahrhundert waren es dann die Mannschaften, der Triest anlaufenden Handelsschiffe und besonders die Engländer ließen sich in die Höhle führen.

Der Graf Petazzi (Petač) vom Gute Schwarzenegg (Zavrhek) übertrug das Nutzungsrecht der Höhle 1633 der Kirche von Lokev (Corniale) mit der Auflage ihm die Hälfte der Einnahmen abzuliefern. Laut I. Gams (1973): Slovenska Kraška Terminologija (Ljubljana) 47, besuchte wahrscheinlich Kaiser Leopold I. die Höhle 1660. Aus der Chronik der Pfarre von Lokev ist ersichtlich, daß der Graf Petazzi im Jahre 1709 die Höhle der Pfarre vom Lokev abgetreten hat, um mit einem Teil der Einnahmen die Armen zu unterstützen. Dann muß es aber still um die Höhle geworden sein, denn als 1748 Josef Anton Nagel der Hofmathematikus des Kaisers Franzisko I besuchte schreibt er in seiner Handschrift die in der Österr. Nationalbibliothek liegt.

“Beschreibung deren / Auf allerhöchsten Befehl / Ihr Röm. Kaijl. und Königl. Majtt. FRANCISCI I untersuchten, in dem Herzogthum Crain befindlichen Seltenheiten der Natur.”

Nachdem er über 7 Seiten die Höhle mit all ihren Tropfsteinen beschreibt (einem Grundrißplan (Plan Nr. XII) sowie 3 Bilder fügt er bei), stellt dann am Schluß fest: “Diese von mir zu erst bekannt gemachte Höhle ist ohnstreitig die schönste unter denen die bisher entdeckt worden sind.” Und vergleicht weiter die in A. Kirchener (1679): Mundi Subterranei, 3. Auflage (Amsterdam), beschriebene Höhle auf Antiparos noch die Baumannshöhle in der Grafschaft Stollberg die in “actis eruditorum Lipsiensium” beschrieben und abgebildet ist, noch die von Keyssler so gerühmte Magdalenenhöhle, und ebensowenig die von Valvasor über alle andere erhobene Lueger-Höhle können mit der Corniale in Vergleich gestellt werden. Daher verewigte sich Nagel als Entdecker auf warzigem Tropfstein mit folgender Inschrift:

“Cum N.N. juhus / Augustishimi Imperatoris / Francisci I. hanc et alias / complures cryptas perlustrahset, / in Corniolia Cornialiensem / hanc omnium inventum principem. / Anno 1748 die 18er July”.

Nagel hat uns den 1. erhaltenen Plan der Höhle gezeichnet, der aber nur einen sehr einfachen Grundriß darstellt.

Ein weiterer Plan ist uns aus dem sogenannten Mollschen Atlas, 1752 Brünn, eine Handschrift mit 8000 Blättern erhalten. Der Plan und die Beschreibung zeigt, daß hier viel Fantasie mitspielt so ist es ca. 30 km Luftlinie nach Wipach und in der Höhle fließt ein Fluß. Hier liegt wahrscheinlich eine Verwechslung mit der Höhle von St. Kanzian vor, die der Künstler wahrschein-

lich von Einheimischen erzählt bekommen hat. Richtig wird aber bemerkt, daß die Höhle dem Grafen Petazi gehört. Dies läßt schließen, daß dieser Plan wahrscheinlich früher entstanden ist.

Die erste gedruckte Beschreibung erscheint 1795 in Trieste in alt italienischer Sprache und zwar Giuseppe Compagnioni: "La Grotta di Vileniza". Diese bibliophile Rarität wurde auch ins Deutsche vom Autor übersetzt, und liegt uns in einem Privatdruck (1986) vor.

Der Plan von 20. April 1818, der sich im Privatbesitz des Autor befindet, konnte vor 10 Jahren am Wiener Flohmarkt aus dem Nachlaß von dem akademischen Maler E. Fehlinger erstanden werden. Er war im Jahr 1892 wahrscheinlich in der Höhle und konnte diesen Aquarellplan, 77 x 50 cm, nach Wien mitnehmen. Ein Aquarell von E. Fehlinger, "Die Schmidel-Grotte", in der Höhle von St. Kanzian, 22 x 27 cm, das gleichzeitig mit dem Plan vom Autor gekauft wurde, läßt die Vermutung erhärten. Da 1818 die neuen Teile in der Adelsberger Grotte gefunden wurden und sogleich der Öffentlichkeit zugänglich gemacht wurden, war das Interesse zum Besuch der Vilenica mit einem Schlag vorbei. Da Adelsberg heute in Postojna, an der Eisenbahnlinie Wien - Trieste, liegt, war der Besuch dieser Höhle für das interessierte Publikum weitaus bequemer. So ist anzunehmen, daß dieser Plan nie zur Ausstellung gekommen ist und daher so gut erhalten geblieben ist.

Dieser vom Inspektor des öffentlichen Bauwesens VICENTINI, gezeichnete Plan gliedert sich in drei Abschnitte: Oben ist in sechs Zeilen in Schreibschrift die Höhle beschrieben. Dieser Text wird im nachfolgenden dem Artikel angefügt.

In der Mitte ist ein gestreckter Längenschnitt nur entlang des Führungsweges dargestellt. Es ist die große Tropfsteinsäule im Eingangsbereich, sowie die makanten Stalaktiten und Stalakmitten fein säuberlich gemalt und entlang des Führungsweggeländers stehen insgesamt 8 Besucher. Es ist auch die Höhe der Überdeckung der Höhle, vom Führungsweg bis zur Oberfläche, ca. alle 25 Klafter kotiert und beträgt zwischen 87 Fuß bei der Tropfsteinsäule und 150 Fuß am Ende des Führungsweges. Der Felsenschnitt ist rosa angelegt während die Tropfsteine in Brauntönen gemalt sind. An der Oberfläche ist eine vegetationsarme Karstlandschaft dargestellt.

Die untere Hälfte des Bildes nimmt der Grundriß ein, der in Grauschattierungen in einem grün angelegten Feld gemalt ist. Außer dem Führungswegbereich (180 Klafter) werden noch drei weitere Bereiche C, D und E planlich erfaßt und die Gesamtlänge mit ca 480 Klafter (= 910 Meter) angegeben.

BESCHREIBUNG DER GROTTE VON CORNIALE:

Diese Grotte ist vom Punkt des Einganges A. bis B. in einer horizontalen Länge von 180 Klafter begehbar. Außer den ebenen Flächen steigt man über 330 Stufen hinunter und über 90 hinauf, zusammen 420 Stufen.

Vom Plateau B. bis zum Punkt E. zu dem der Unterzeichncto mühselig vordrang, das heißt in C. D. E. fand er drei schräge Flächen, welche dem Betrachter viele leuchtende Säulen, Katarakte, Drapierungen, Girlanden und wunderschöne Nadeln zeigte. Zwischen denen in der Höhle D., eine hat die Form eines gotischen Kirchturms mit vielen Abschnitten, Kanellierungen und sind nachempfundene Arbeiten der Kunst; und ihr Durchmesser an der Basis ist 16 Fuß. An der Spitze läuft sie zu einem Punkt aus, und hat eine Höhe von ungefähr 90 Fuß. Diese Höhle von runder Form hat einen Durchmesser von 90 Fuß, sie wird getragen von einer großen Zahl von Säulen und der Himmel ist von einer gleichmäßigen ebenen Decke gebildet, in deren Mitte sieht man ein rundes Medaillon von 5 Fuß Durchmesser, umgeben von prismenförmigen Stalaktiten von verschiedener Länge und wunderbarer Großartigkeit.

In der Höhle E. ist der Abstieg sehr beschwerlich, weil es durch eine Passage zwischen zwei eng stehenden Säulen durchgeht, es bieten gleichfalls wunderschöne Ansichten; angrenzend gibt es Zimmerchen von sehr kurioser Form und einen mühselig begehbarer Weg, welcher sehr steil in die Tiefe führt und in welche man ohne Leitern und Seile nicht hineingehen kann.

Vom Horizont des Einganges A. bis B. ist die Tiefe 156 Fuß, im Punkt C 240 Fuß, im Punkt D 350 Fuß und schließlich bis dorthin, wo man vordringen konnte, sind es horizontal ca. 480 Klafter.

Trieste den 20. April 1818

Gezeichnet: Vicentini ausgezeichnet
von seiner Majestät mit dem Kreuz für zivile
Verdienste und Inspektor des öffentlichen Bauwesens

NAČRT VILENICE DATIRAN 20. APRIL 1818

Povzetek

Najstarejša turistična jama tega področja je "Cave of Triest = Grotta di Corniale = Vilenica = Feenhöhle", ki je bila obiskovana že konec 15. stol. Verjetno so vodniki imeli jamske načrte, vendar jih je le nekaj ohranjenih.

Najstarejši načrt Vilenice J. A. Nagla iz 1748 predstavlja le skico tlora; drugi, iz Mollovega atlasa (1752), je bolj grotoskna slika, kot pa načrt, tretji pa je Vicentinijev načrt v akvarelju iz 1818. Meri 77 x 50 cm in ima sivo osenčen obris ter barvni pogled s strani, s sigo in kapniki. Na sliki so tudi obiskovalci, ki se držijo za ograjo. Na vrhu je šest vrst opisa jame v rokopisu, po vsej širini lista, z avtorjevim podpisom in njegovimi naslovi. Po tem opisu ozioroma načrtu je jama globoka ca 480 kлаfter, to je 910 metrov.

Najbrž načrt ni bil nikoli javno predstavljen, saj so 1818 odkrili notranje dele Postojnske jame in zanimanje se je usmerilo tja. avtor prispevka je dobil ta načrt pred 10 leti na boljšem trgu na Dunaju.



Fig. 1: The plan of the Vilenica cave from 1818.

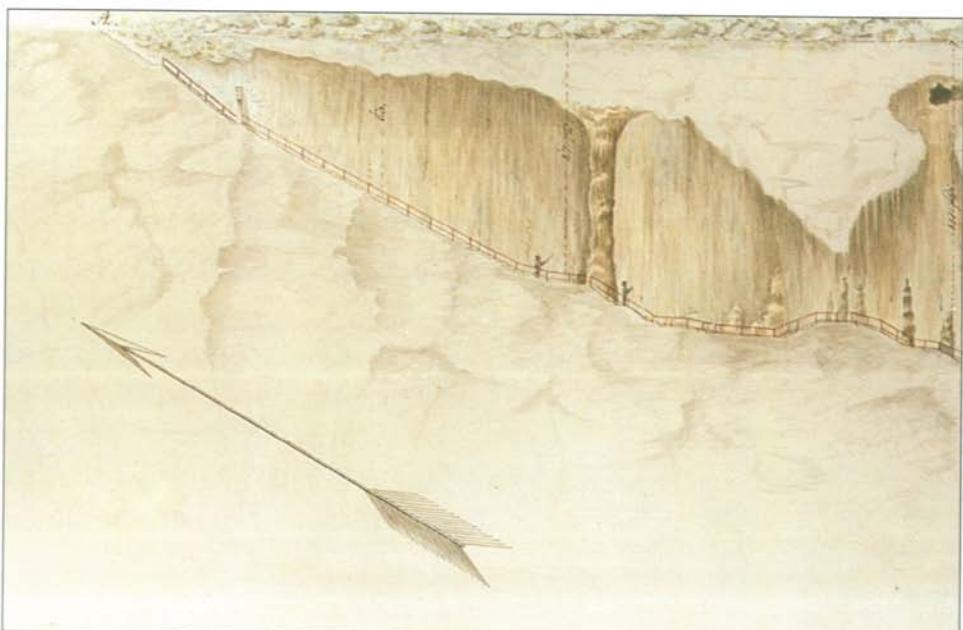


Fig. 2: The plan of the Vilenica cave from 1818, the detail.

SPELEOLOGISTS ON POSTAGE STAMPS

SPELEOLOGI NA POŠTNIH ZNAMKAH

HEINZ ILMING¹

Izvleček

Heinz Ilming: Speleologi na poštnih znamkah

UDK 551.44:656.835.91

Med znamenitimi osebami, ki jih prikazujejo poštne znamke, jih je tudi več zanimivih za speleologijo. Avtor jih našteje štirinajst in na kratko označi njihov pomen za speleologijo. Vsi so pomembni tudi za dežele v okviru "ALCADI".

Ključne besede: zgodovina speleologije, znameniti speleologi, poštna znamka.

Abstract

Heinz Ilming: Speleologists on Postage Stamps

UDC 551.44:656.835.91

Among the postage stamps with portraits of important persons are several that are interesting for speleology. The author enumerate 14 of them and shows their importance for the speleology. They are also important for the "ALCADI" countries.

Key words: history of speleology, important speleologists, postage stamp.

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The author presented pictures of postage stamps bearing portraits of people important in the history of speleology (reproduced from the collection belonging to Mrs. Helga Hartmann, Landesverein für Höhlenkunde in Wien und NÖ).

The earliest person we can connect with speleology is AVICENNA (Abu Sina) born 980 in Buchara, died 1037 during a battle against Hamadan. He was a philosopher, theologian and physician. Being also a scientist he became interested in the origin of dripstones.

Stamp: Poland 1952, Hungary 1987.

GEORG AGRICOLA - Agricola is Latin for "farmer" - the founder of modern metallurgy and mineralogy, was born 1494 in Glachau and died 1555 in Chemnitz where he had been mayor and town-physician. In the consequence of the mining methods of his time he became interested in natural subterraneous cavities and he also published a cave-map in 1646.

Stamp: DDR 1957.

We owe a summary of Karst and Caving, which is of special interest to speleologists, to JOHANN WEICHARD Freiherr von VALVASOR. It is included in his work "Die Ehre des Herzogthums Crain" in 4 volumes, published 1689 in Nürnberg and Laibach. In his work not only caves are included, but also the descriptions of the special hydrological situation of Zirknitzer lake.

Stamp: Yugoslavia 1989.

The Danish scientist NIELS STENSEN searched 1671 in Northern Italy, where he was well known under the name NICOLO STENONE. As a guest of the Count of Castelbarco he visited several already known ice-caves. In the same year he wrote his "Cave-letters", containing descriptions of the ice-caves, sketches of them and reflections about their origin.

Stamp: Denmark 1969.

The Italian naturalist L. SPALLANZANI, 1729 - 1799, realised - early already - that bats do not need their eyes for orientation.

Stamp: Italy 1979.

GEORGES Baron CUVIER, born 1769 (the same year as Napoleon) in Mömpelgard, died in Paris 1832. He was the founder of systematic anatomy - initiated the biggest anatomic collection in Europe - and introduced comparative osteology into palaeontology. His reconstruction of fossil vertebrates are of special importance for speleo-palaeontology.

Stamp: Italy 1979.

ALEXANDER Freiherr von HUMBOLDT, born 1769 and died 1859 in Berlin. He is considered the greatest scientist of his time. He contrasts the poetic/speculative tendency of his period with exact experiment. Many research-voyages brought results of an extraordinary synopsis over various fields of knowledge. Speleology owes him the exact descriptions of several caves among them the report about the Guacharo cave and about the birds in it which can locate themselves with sound reflection.

Stamp: Venezuela 1969, DDR 1969.

Of great importance for Belgium and especially for the Grotte de Han is ADOLPHE QUETELET 1796 - 1854. His excellently drawn cave-maps show the progress in research in his time.

Stamp: Belgium 1974.

The scientist HERMAN OTTO lived 1835 to 1914 and is considered the father of Hungarian speleology. Herman's findings of stone-tools caused a discussion about prehistoric man in Hungary and inspired for the foundation of the Hungarian Society of Speleology.

Stamp: Hungary 1954, 1960.

JOVAN CVIJIĆ born 1865 in Loznica, died 1927 in Beograd. Finished his studies with a dissertation on "The Karst". He was the most important geographer who in the course of modern research was able to combine all aspects of geography, as for instance geomorphology, hydrology of karst, ethnography, anthropogeography and also speleology.

Stamp: Yugoslavia 1970.

The important bio-speleologist EMILE RACOVITZA 1868 - 1947 was one of the first to construct a subterranean laboratory for the study of cave animals and who was working on their systematics.

Stamp: Rumania 1958.

CESARE BATISTI born 1875 in Trento is without doubt better known as a politician and a fighter for the independence of his native country - he was sentenced to death by a court martial in 1916 - than as a speleologist. Still, as a geographer he was passionate in describing the mountains of his country and in exploring new caves. As an organiser he was the father of speleology in the country of Trento and a leading person for the speleology in Italy.

Stamp: Italy 1966.

ABBÉ BREUIL (1877 - 1961) and

PIERRE TEILHARD DE CHARDIN (1881 - 1961) are of great importance, having set up the basic perception in the investigation of the history of

early man. BREUIL recognised, against many antagonists, the authenticity and importance of cave wall-painting and became its first expert. His disciple TEILHARD DE CHARDIN, a highly cultivated Jesuit priest, devoted himself to excavations in caves. His finds in the Zhoukoudian cave in China are world famous. In all his works he endeavours to reconcile "Darwin and the Bible".

Stamp: France 1977 and 1981.

GIULIO NATTA 1903-1979, received in 1963 the Nobel prize for Chemistry. This great scientist was also a passionate caver and president of the Gruppo Grotte Milano.

Stamp: Italy 1992.

SPELEOLOGI NA POŠTNIH ZNAMKAH

Povzetek

AVICENNA (Abu Sina) (980-1037), se je zanimal za nastanek kapnikov. (Poljska 1952, Madžarska 1987).

GEORG AGRICOLA (1494-1555), osnovatelj moderne metalurgije in mineralogije, je 1646 objavil jamski načrt. (DDR 1957).

Baron JOHANN WEICHARD VALVASOR je najbolj pomemben zaradi objave "Die Ehre des Herzogthums Crain" v 4 oblikah (1689), kjer je veliko tudi o krasu in jamah. (Jugoslavija 1989).

NIELS STENSEN (NICOLO STENONE) je obiskal ledenc Jame v Severni Italiji in 1671 objavil "pisma o jamah" z opisi ledenih jam in razglašljanjem o njihovem nastanku. (Danska 1969).

L. SPALLANZANI (1729-1799) je ugotovil, da netopirji za orientacijo ne potrebujejo oči. (Italija 1979).

GEORGES CUVIER (1769-1832), utemeljitelj sistematske anatomije, znan predvsem po rekonstrukcijah fosilnih sesalcev, pomemben za "speleo-paleontologijo". (Italija 1979).

ALEXANDER von HUMBOLDT (1769-1859) je s svojih potovanj opisal več jam, posebej je pomembna jama Guacharo, kjer živijo ptice, ki se orientirajo s pomočjo zvoka. (Venezuela 1969, DDR 1969).

ADOLPHE QUETELET (1796-1854), risar načrtov Jame Grotte de Han (Belgia 1974).

OTTO HERMAN, (1835-1914), odkritelj paleolitskih kultur in ustanovitelj Madžarskega speleološkega društva. (Madžarska 1954, 1960).

JOVAN CVIJIĆ, (1865-1927), je objavil disertacijo "Kras" in utemeljil speleologijo kot vedo, ki povezuje razne naravoslovne veje. (Jugoslavija 1970).

EMILE RACOVITZA, (1868-1947), znan po podzemeljskem laboratoriju za preučevanje jamske favne in kot sistematik. (Romunija 1958).

CESARE BATISTI, (1875-1916), geograf in raziskovalec alpskih jam, vodilni med italijanskimi speleologi. (Italija 1966).

ABBÉ BREUIL (1877-1961), raziskovalec prazgodovine človeka in strokovnjak za jamsko umetnost.

PIERRE TEILHARD DE CHARDIN, (1881-1961), učenec A. Breuila in jezuit, odkritelj znane jame Zhoukoudian na Kitajskem, ki je skušal uskladiti Darwina z Biblijo. (Francija 1977 in 1981).

GIULIO NATTA, (1903-1979), Nobelova nagrada za kemijo 1963, navdušen jamar in predsednik Gruppo Grotte Milano. (Italija 1992).



CONTRIBUTION TO THE HISTORY OF THE EXPLORATIONS OF THE CAVE VJETRENICA IN ZAVALA TO 1914

PRISPEVOK K ZGODOVINI RAZISKAV VJETRENICE V ZAVALI DO 1914

ANTON KAPEL¹

Izvleček

UDK 551.442(497.6)(091)

Anton Kapel: Prispevek k zgodovini raziskav Vjetrenice v Zavali do 1914

Prispevek navaja najpomembnejše raziskavce in avtorje, ki so raziskovali Vjetrenico oziroma objavili opise ali načrte. Prva omemba Jame je že iz 15. stol., prve raziskave pa so s konca prejšnjega stoletja (Vavrović), z začetka tega pa so pomembnejši raziskovalci inženirji sarajevske želežniške direkcije, K. Absolon in K. Paž.

Ključne besede: zgodovina speleologije, Hercegovina, Vjetrenica.

Abstract

UDC 551.442(497.6)(091)

Anton Kapel: Contribution to the history of the explorations of the cave Vjetrenica in Zavala to 1914

The most important explorations of Vjetrenica by those published the results of their work with surveys, are dealt with. Vjetrenica was first mentioned in 15th century. The most important investigators from the end of the 19th century and the beginning of the 20th were Vavrović, the engineers of the Sarajevo's Railway Administration, K. Absolon and K. Paž.

Key words: history of speleology, Herzegovina, Vjetrenica Cave.

¹ Zavod za zaštitu kulturno-historijskog i prirodnog nasljedja BiH, Alekse Šantića 8/III, SARAJEVO, REPUBLIKA BOSNA I HERCEGOVINA

Bosnia and Herzegovina lie in the mountainous heart of the Dinardis, between the Adriatic Sea and the Pannonian plain. The territory covers 51.129 km² of which 30 % are karst. It is understandable that in such a large territory there are numerous karst phenomena, the caves being the most important. The karst of Bosnia and Herzegovina has numerous surface and underground phenomena which are seldom found in other lands. One of them is Vjetrenica cave, which is one of the most interesting karst phenomena in Bosnia and Herzegovina. Owing to its flowstone formations, abundance of water, natural beauty and rarity, and to its scientific value as well, it was put in the Register of protected phenomena as the first speleological natural monument under the number 3, under the Cultural and Natural Monuments Protection Act (Kapel 1980).

Vjetrenica cave is situated at Zavala in the SW corner of Popovo Polje, about 15 km from the Adriatic coast. It is a very interesting underground feature and the most impressive one in the Dinaric karst, with regard to its genesis. The cave is very interesting from the hydrogeological, geological, geomorphological, speleological, palaeontological and biological points of view. Because of its flowstone decoration and the wealth of water, Vjetrenica became a show cave in 1964.

Taking into account the fact that Vjetrenica is the biggest and the most complex system in the Popovo Polje region, it is natural that it interested travellers as well as local and foreign scientists long ago. Vjetrenica is over 7,5 km long and thus also the longest cave in Bosnia and Herzegovina. There are many published works about its speleological characteristics, professional and scientific papers, reports, studies, etc.

In the paper Contribution to the knowledge of speleological investigations in Bosnia and Herzegovina by Malez and Lenardić - Fabić (1988), there is a chronological overview of the more important investigations including those of Vjetrenica. The authors suggested that it is necessary to continue the historical investigations of cave data in Bosnia and Herzegovina, so I would like to present a short contribution to the history of Vjetrenica exploration.

The Vjetrenica cave is first mentioned in 15th century, according to M. Vego's (1957) book Places of Bosnia in the Middle Ages, where he stated: "Zavala is mentioned as a village in 1372. It is mentioned again in 1461, when the Vjetrenica cave is mentioned too."

After the Austro-Hungarian occupation of Bosnia and Herzegovina in 1878, the scientific research about the land started too. To achieve this aim the "Zemaljski muzej" (Country Museum) was founded in Sarajevo, the first scientific institution in the country. It began to function by the 1st February 1888 investigating Bosnia and Herzegovina from different aspects. It started its own publication (*Glasnik Zemaljskog muzeja*) where the results of its investigations were published (Gašparović 1984).

Josip Vavrović, an ex-Austro-Hungarian officer, surveyed and described the

first part of Vjetrenica (1893). He made a good description of the main channel, from the entrance to a point 700 m in. He has drawn a plan of this part of the cave too, at a scale of 1:4000 and a longitudinal section (horizontal scale 1:800 and vertical 1:1000). There are some inaccuracies in his plan but all the same it is much better than the previous one made by H. Mihajlović, which shows only the first 250 m of the cave.

In 1904 the engineers of Sarajevo's Railway Administration succeeded in reaching "Veliko jezero" (the Big lake). They made the plan and longitudinal section of a part of the main channel at a scale 1:1000. The shape of the main channel, up to a distance of 770 m from the entrance, is shown on the plan and the base line only to Veliko Jezero was drawn (Radovanović 1929).

The well-known Czech speleologist Karel Absolon, a curator of the museum of Brno, investigated cave fauna in our caverns. He visited some of them many times, Vjetrenica for example 27 times (Mikšić 1978). In the years 1912 - 1914 he organised three expeditions to Vjetrenica. In the summer 1912, during the first one, they reached "Veliko Jezero" and collected rich underground fauna, which made Vjetrenica well known over the World. In 1913 he and some members of his team reached the top of "Brdo" (the Mountain); while the third expedition was organised with the help of A. Kral in 1914. K. Absolon was the first to enter the channel which starts 600 m from the entrance and leads under the main channel of Vjetrenica (Absolon 1916). In honour of him the channel was called "Absolonov Kanal" (Absolon's Channel) by Radovanović.

Absolon's friend K. Paž, ex-officer of Austro-Hungarian army, brought a big boat into Vjetrenica in 1913 with the help of the army. With the boat they were able to cross "Malo Jezero" (Small Lake) and "Veliko Jezero" thus reaching collapsed limestone blocks beyond (Radovanović 1929).

Finally it is necessary and sad to mention that a lot of written material about Vjetrenica was destroyed during the war in the Republic of Bosnia and Herzegovina (literature in the National and University Library and in the Institute for the protection of cultural-historical and natural heritage of Bosnia and Herzegovina in Sarajevo).

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PRISPEVEK K ZGODOVINI RAZISKAV VJETRENICE V ZAVALI DO 1914

Povzetek

Prispevek navaja najpomembnejše raziskave in avtorje, ki so raziskovali Vjetrenico oziroma objavili opise oziroma načrte.

Prvič je Vjetrenica omenjena že v 15. stol., kot pravi M. Vego v svoji knjigi "Naselja Bosanske srednjovjekovne države" (1957): "Zavala je omenjena 1372 kot vas. Ponovno se omenja 1461, takrat je omenjena tudi jama Vjetrenica."

J. Vavrović (1893), bivši avstro-ogrski oficir, je objavil opis in načrt prvih 700 m glavnega rova Vjetrenice. Tloris je v merilu 1:4000, vzdolžni profil pa ima horizontalno merilo 1:800, vertikalno pa 1:1000. Kljub pomanjkljivostim predstavlja načrt bistveni napredek v primerjavi z načrtom H. Mihajlovića, ki prikazuje le prvih 250 m rova.

1904 so jamo raziskovali inženirji Sarajevske železniške direkcije. Prodrali so do Velikega jezera, napravili načrt v merilu 1:1000 do dolžine 770 m, do Velikega jezera pa so potegnili poligon.

Češki spelcolog K. Absolon je obiskal Vjetrenico kar 27 krat in med 1912 - 1914 pripravil vanjo tri odprave. Jama je postala svetovno znana prav zaradi njegovih favnističnih odkritij. Po njem so kasneje imenovali Absolonov kanal, rov, ki poteka pod glavnim rovom.

1913 je Absolonov prijatelj K. Paž s pomočjo vojske spravil v jamo velik čoln. Z njegovo pomočjo so prečkali Malo in Veliko jezero in prodrali do podornih apnenčevih blokov.

Na koncu je treba povedati, da je bilo o Vjetrenici veliko zapisanega gradiva (Narodna i univerzitetska biblioteka BiH, Zavod za zaštitu kulturno-historijskog i prirodnog nasledja BiH), ki je bilo, žal, uničeno med vojnimi dogodki v Republiki BiH.

BRIEF ACCOUNT OF THE DEVELOPMENT OF SPELEOLOGY IN SLOVENIA (to 1914)

KRATEK PREGLED RAZVOJA SPELEOLOGIJE NA SLOVENSKEM (do 1914)

ANDREJ KRANJC¹

Izvleček

UDC 551.44(497.4)(091)

Andrej Kranjc: Kratek pregled razvoja speleologije na Slovenskem (do 1914)

Med starejšimi predhodniki speleologov so najpomembnejši Valvasor, Nagel in Hacquet, ter raziskovalci najstarejših turističnih jam (Vilenice, Postojnske in Škocjanskih). V prvi polovici 19. stol. so najpomembnejše speleološke raziskave za iskanje vode za Trst, v drugi polovici pa globokih brezen in velikih vodnih jam na Notranjskem, 1882 ("Slovenski gadje") oziroma 1883 (prve speleološke organizacije v Trstu) pa se prične na Slovenskem čas organiziranega jamarstva.

Ključne besede: zgodovina speleologije, Slovenija.

Abstract

UDC 551.44(497.4)(091)

Andrej Kranjc: Brief account of the development of speleology in Slovenia (to 1914)

The most important predecessors in speleology are Valvasor, Nagel and Hacquet, and the explorers of the first show caves (Vilenica, Postojnska jama, Škocjanske jame). In the first half of the 19th century the most important speleological explorations were those intended to find drinking water sources for Triest, and in the second half the explorations of deep potholes and big water caves of Notranjsko. In the years 1882 ("Slovenski gadje") and 1883 the period of organised caving activity began.

Key words: history of speleology, Slovenia.

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On the territory of present-day Slovenia people have known and used caves since Palaeolithic times. The caves were used as shelters, campsites, stores, for water supply (e.g. Podpeška Jama on Dobrepolje) and as sanctuaries. Among them Sveta Jama (The Holy Cave) is maybe the best example. The martyr Saint Socerb (Scrvulus) lived in the cave and, soon after he died (24th May 284 AD), the cave was visited as a sacred place and an altar was erected in it (Kranjc 1995).

However we cannot speak about "speleological approach" before the Enlightenment. Our first predecessor of Slovene speleology is J. W. Valvasor (1641-1693) who visited, studied, and published about 70 caverns from Kranjska (Carniola). He published the first cave plan of a Slovene cave - Podpeška Jama in 1687 (Fig. 1) - being, according to our knowledge, the second published cave survey in the Western World. A true "speleological project" were Nagel's investigations in 1748. In his manuscript, the first plans of some of our caves (Postojnska Jama, and Željnske Jame near Kočevje) appeared. Although F. A. Steinberg did not take a special interest in caves, his book about Cerkniško Jezero (1758) is very important for the history of Slovene karst and cave science. In the second part of the 18th century the "scientific discovery" of Proteus by Laurenti (1768) gave new aspect to visiting caves. Hacquet, who lived in Kranjska from 1766 to 1786, was the first man who was scientifically interested in karst and caverns. He was aware that karst features are due to a sort of corrosion and that "karst" (he wrote a native expression "krš" or "karoš") is not limited to the Kras region only. It is a pity that he left Kranjska because of ignorant, hypocritical and religious inhabitants. Gruber was the first who understood (and published in 1781) the hydrology of karst in

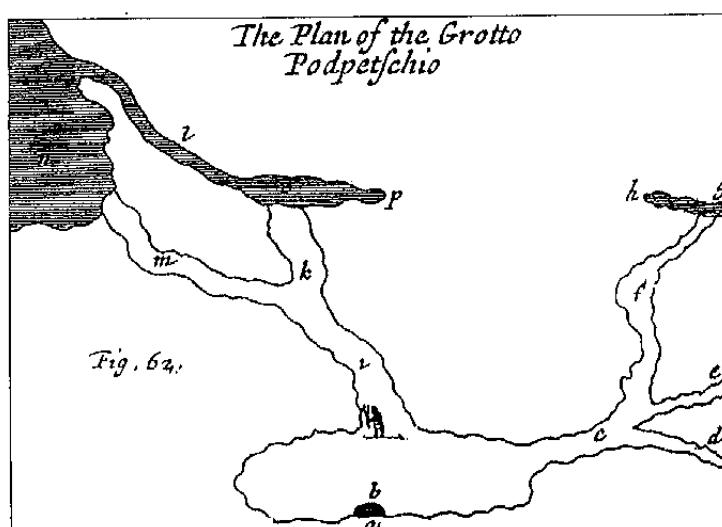


Fig. 1: Valvasor's "Plan of the Grotto Podpešchio" (Podpeška jama), published in Philosophical Transactions in 1687.

Kranjska. He was not specially interested in caves, but he visited quite a lot of them and made possible a much better knowledge about our water caves.

Cave tourism was very important too. It had been practised already in different forms (for example a religious one) for centuries. According to documents Vilenica was a "real" show cave already in 1633. At the end of the 18th century the discovery of *Proteus* in Črna Jama (at that time called Magdalena Grotte) aroused new interest in visiting caverns. Postojnska and Škocjanske Jame caves were officially opened as show caves in 1819. The names such as Luka Čeč and Josip Jeršinovič, Tominc and Mahorčič are closely connected with discoveries and display of these caves.

The first half of the 19th century is marked by investigations for the water supply of Triest; great explorations were carried out in Škocjanske Jame (by J. Svetina in 1839) as well as in deep shafts on Kras by F. Lindner with considerable help of native workers, such as L. Kralj (Jama na Hudem Letu -226 m, Labodnica -329 m). A group of Idrija miners, headed by Arh, formed the "Exploration Commission for Water and Shafts above Triest" (Savnik 1961). Although the exploring technique was such as in mines, we can speak about the great speleological achievements of the period. When they reached the bottom of Labodnica (1841), this pothole kept the world's depth record for nearly 70 years (Shaw 1961).

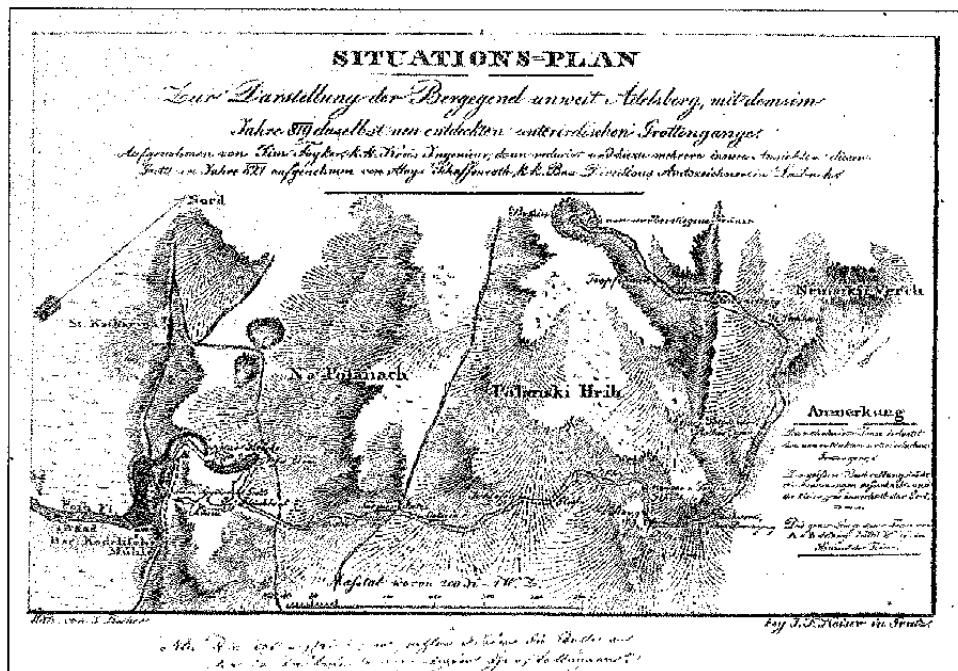


Fig. 2: Schaffrenrath's 1821 plan of Postojnska jama from the year 1821.

The first half of 19th century can be considered as the time when real speleology developed in Slovenia, from the technical as well as of the scientific point of view, with important contributions by Slovene speleologists. Besides the above achievements in Labodnica, discoveries in water caves were also very important: J. Cerer's at Križna Jama (1825) (Zörrer 1838), G. Kebe at Velika Karlovica and Zelške Jame (1844) (Kebe 1860) and A. Urbas at Planinska Jama (1847-48) (Urbas 1849). Luka Čeč discovered the inner parts of Postojnska Jama in 1818 and the first plan was made by A. Schaffernath in 1821 (and the next one by A. Fercher in 1834) (Fig. 2). Among scientific achievements, Hohenwart's paleontological excavations in Postojnska Jama (1830 - 1836) must be mentioned. They were continued by H. Freyer of Ljubljana museum, who explored caves in different parts of present-day Slovenia, including ice-caves on Trnovski gozd and caves in the Alps. Also Hohenwart's guide-book to Postojnska Jama (1830) can be regarded as a speleological monograph. With the discovery of the first cave beetle in Postojnska Jama by I. Čeč, the new study, speleobiology, started.

The second half of the 19th century may be regarded as the classical period of speleology in Kranjska. It began with Schmidl's explorations in the fifties, helped by the cave-surveyor I. Rudolf and Idrija miners. Due to his achievements underground Schmidl is often called "the father of modern spelcology" (Shaw 1978), but for Kranjska karst his book "Die Grotten und Höhlen von Adelsberg, Planina und Laas..." (1854) is the most important. Schmidl's description together with additional chapters by other specialists on mineralogy and spelobiology, places the book among the true speleological monographs.

The speleological investigations were carried out mostly in two regions: on the Primorski Kras (Littoral Karst) and in Notranjsko (Inner Carniola). In Notranjska, besides Schmidl's explorations, the explorations of W. Putick must be mentioned. His first big achievement was the descent to the Gradišnica pothole near Logatec in 1886 (Schmidl did not succeed in this) (Putick 1887), later his explorations and flood control works in water caves between the karst poljes of Lož, Cerknica and Planina were a great success (Kranjc 1995a).

Schmidl explored caves in the Primorski Kras too. In a later period the discovery of Divaška Jama (1867) must be mentioned, the explorations of Škocjanske Jame after 1884 (by members of the "Abteilung für Grottenforschung" of the "Section Küstenland d. DÖAV" at Trieste) and the descent into the 200 m deep entrance of Kačna Jama shaft in 1889 (Pazze 1893). F. Kraus was maybe not so important a the field researcher but he was the initiator of the first Austro-Hungarian speleological society, and important for E. A. Martel's visit and explorations of the karst of Primorska in 1893.

Martel's 1893 exploration of Postojnska Jama (the boat descent downstream on underground Pivka river) is a good example how important the caves of Carniola were for the history of speleology (Martel 1894). Court Counsellor von Hauer came from Vienna to Postojna to introduce Putick to Martel and

Kraus. While Martel was exploring down the Pivka river, helped by the Postojna cavers from the speleological club "Anthron" and by the cave guides of Postojnska Jama. Kraus with his team was at the entrance to Postojnska Jama and Putick were awaiting them at the entrance to Magdalena Jama.

The end of the last century is the time when organised speleology was born and karst of Kranjska was soon included: the Verein für Höhlenkunde was founded in 1879 at Vienna, largely due to Kraus' efforts. The Society's sections at Postojna and Planina were foreseen too by Kraus from the beginning. Kraus friends reported about 50 members. But instead, the Anthron society at Postojna was founded in 1889, thus being the first speleological organisation in the territory of today's Slovenia (Kranjc 1988). In the Jama cave near Predjama, is an inscription on the cave wall far away from the entrance: "Slovenski Gadje 21/V 82" (Slovene Vipers) - maybe the predecessor of Anthron. Kraus was also in some way the founder of the Slovene cave register. Before he died he permitted O. Gratzl to publish a part of his cave data, the

data of the caves from Carniola (1897). The whole collection he willed to Martel (for the Société de Spéléologie) and after Martel's death, I am sorry to say, all the material was dispersed to collectors in France and elsewhere.

But already in 1883 at Triest two speleological organisations had been formed: "Abtheilung für Grottenforschung des Section Küstenland des Deutschen und österreichischen Alpenvereins" and "Commissione Grotte della Società Alpina delle Giulie", both having the karst of Kranjska as a field of their explorations. In 1893 the

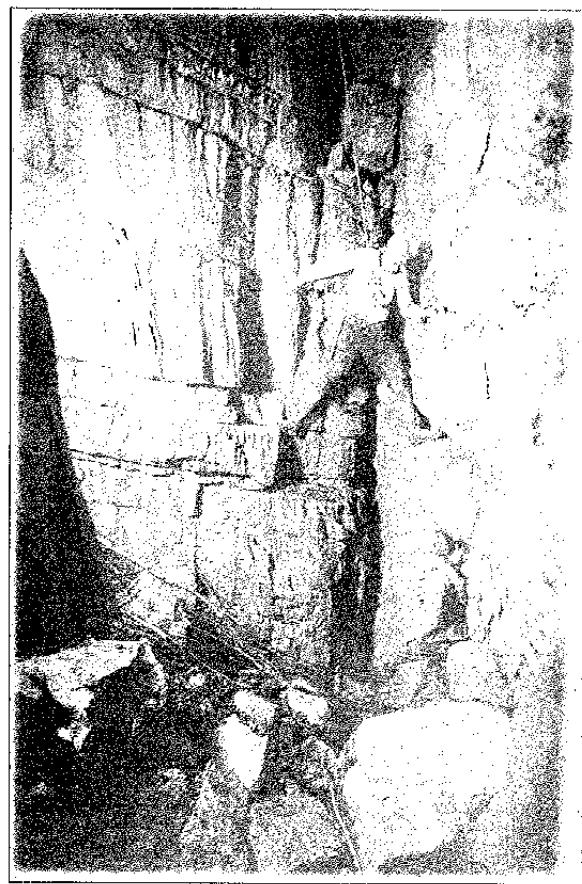


Fig. 3: Caving technique from the beginning of the 20th century (Mačkova jama above Dobrepolje) (Photo B. Brinsek).

"Slovensko planinsko društvo" (Mountaineering Society of Slovenia) was founded and some of its sections (Ajdovščina, Luče, Radovljica, and Trst) immediately started to explore caves too. Before 1900 a caving club existed at Kočevje, probably directly linked with the Vienna's "Verein" but details about it and its work have still to be searched. In 1909 I.A. Perko came to Postojna as the secretary of the Postojnska Jama administration. He tried to make Postojna "the world's speleological centre" by combining tourism (Postojnska Jama), culture (speleological museum) and science (speleological institute). Postojnska Jama became world famous in this period, the speleological institute was founded at Postojna in 1929, and we are still hoping to get the speleological museum.

Perko and Putick are among the founders of the "Društvo za raziskovanje podzemeljskih jam na Kranjskem" (Society for investigation of underground caverns in Carniola) at Ljubljana in 1910, which marked the beginning of the present-day Speleological Association of Slovenia and thus "the modern times" of speleology in Slovenia. The nucleus of the society was "speleological section" consisting of the members of the mountaineering group "Dren", where specially Brinšek, Cerk, Kunaver and Michler became well-known Slovene caving pioneers (Fig. 3) (Habe & Kranjc 1981).

The First World War did not only bring fundamental changes regarding the territory and national life of Slovenes, but it also marked an important change and a hiatus in speleological activity.

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KRATEK PREGLED RAZVOJA SPELEOLOGIJE NA SLOVENSKEM (DO 1914)

Povzetek

Čeprav so bile jame na današnjem Slovenskem ozemlju znane in obiskovane že od starejše kamene dobe, o speleoloških raziskavah ne moremo govoriti pred Razsvetlenjem. Med starejšimi predhodniki speleologov je najpomembnejši Valvasor, ki v svojem delu "Slava vojvodine Kranjske..." (1689) omenja okoli 70 jam in je nekatere tudi v resnici raziskoval. Pravi "speleološki projekt" je Naglovo (po cesarskem naročilu) raziskovanje naših jam 1748. Poleg Hacqueta (na Kranjskem je živel 1766-1786), ki je že spoznal, da "kras" ni samo na "Krasu" in da je kras rezultat raztopljanja apnenca (korozije), je treba omeniti še Steinbergovo delo o Cerkniškem jezeru (1758), Laurentijev opis Proteusa (1768) in Gruberjeva (1781) "pisma" o kraški hidrologiji.

Za zgodovino speleologije je tudi zelo pomemben jamski turizem. Tako je bila Vilenica turistična jama že vsaj 1633, Postojnska in Škocjanske jame pa so bile uradno odprte 1819. V zvezi z njihovimi raziskavami omenjam Luka Čeča, Jeršinoviča, Tominca in Mahorčiča.

V prvi polovici 19. stol. so bile najpomembnejše speleološke raziskave namenjene iskanju vode za Trst. Do podzemeljske Reke so skušali prodreti skozi Škocjanske jame (Svetina 1839) in skozi globoka brezna. Pri tem so prodri 1841 (Lindner) do dna 329 m globoke Labodnice, ki je ostala najgloblje znano brezno na svetu še okoli 70 let. V tem času se je v Sloveniji razvila spelcologija tako s tehničnega kot z znanstvenega vidika. Takrat so raziskovali velike jame, kot je Križna (Cerer 1825), Velika Karlovica in Zelške jame (Kebe 1848) ter Planinska jama (Urbas 1847-48). Čeč je odkril notranje dele Postojnske jame (1818) in v njej našel tudi prvi primerek jamske kopne favne (1831); Schaffennrath, Fercher in Hochenwart so merili in izkopavali v Postojnski jami, Freyer pa je raziskoval tudi lednice in alpske jame. Druga polovica 19. stol. je "klasična doba" speleologije na Slovenskem. Začela se je s Schmidlovimi raziskavami (1850-1854), vrh pa dosegla s Putickovimi odkritji in Martelovim podvigom v Postojnski jami (1893). Izredno zahtevne so bile raziskave Škocjanskih jam (od 1884 dalje) in Kačne jame (od 1889).

Morda bi lahko za začetek organiziranega jamarstva v Sloveniji šteli obisk (1882) "slovenskih gadov" Jame pri Predjami, o čemer sicer ni dosti znanega.

Na vsak način je pa to leto 1883, ko sta bili v Trstu ustanovljeni skupini "Abtheilung für Grottenforschung des Section Küstenland des Deutschen und Österreichischen Alpenvereins" in "Commissione Grotte della Società Alpina delle Giulie". 1889 je bilo v Postojni ustanovljeno prvo pravo slovensko jamarsko društvo "Anthron". 1893 je nastalo Slovensko planinsko društvo, katerega sekcijs so se takoj lotile tudi raziskovanja jam. Društvo za raziskovanje podzemeljskih jam na Kranjskem (jedro raziskovalcev so sestavljali Drenovci), ustanovljeno 1910 v Ljubljani, pa je že neposredni predhodnik današnje Jamarske zveze Slovenije.

DANIEL FISCHER UND DIE ANFÄNGE DER SPELÄOLOGIE IN DER SLOWAKEI

DANIEL FISCHER IN PRIČETKI SPELEOLOGIJE NA SLOVAŠKEM

MARCEL LALKOVIČ¹

Izvleček

UDC 551.44(437.6)(091)

Marcel Lalkovič: Daniel Fischer in pričetki speleologije na Slovaškem

Začetki speleologije na Slovaškem segajo v prvo polovico 18. stol. Pri tem je igral pomembno vlogo Matthias Bel in krog njegovih tovarišev. Z vidika zanimanja za jame pa je bil pravo nasprotje M. Belu Daniel Fischer. Poleg medicine, farmacije, fizike in kemije se je Fischer ukvarjal tudi z naravoslovjem. Rojen je bil v Kežmarku 1695, 1713-1716 je študiral v Wittenbergu in umrl v Debrecenu 1764. Jame ga niso zanimale kot objekti, ampak kot kraji in snov, ki mu je omogočala opravljati poizkuse. Preučeval je predvsem rast in obliko kapnikov. Bil je prvi, ki je v okvirih Slovaške in Madžarske pokazal na potrebnost reševanja takih vprašanj.

Ključne besede: zgodovina spelcologije, kapnik, Slovaška, Fischer D.

Abstract

UDC 551.44(437.6)(091)

Marcel Lalkovič: Daniel Fischer and the beginnings of speleology in Slovakia

Beginnings of speleology in Slovakia go back to the first half of 18th century. M. Bel and circle of his fellows played important role. Opposite pole of M. Bel was Daniel Fischer in terms of interest in caves. Beside medicine, pharmacy, physics and chemistry Fischer dealt with natural science history too. He was born in 1695 at Kežmarok, 1713-1716 he studied at Wittenberg and died at Debrecen in 1764. Caves interested him as the objects that enabled him to develop his experiments. He studied the most the growth and the forms of flowstone formations. He was the first in Slovakia and Hungary who showed the interest of such questions.

Key words: history of speleology, flowstone, Slovakia, Fischer D.

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Nach den Erwähnungen über die slowakischen Höhlen in der Literatur im 16. und 17. Jahrhundert begannen in der Slowakei die Anfänge der Speläologie an Anfang des 18. Jahrhunderts zu formieren. Die erste Angaben über die Höhlen publizierte Georg Wehrner, humanistischer Gebildete aus dem Schlesien im Jahr 1549, Pietro Ranzano, der Gesandte des Neapelskönigs am ungarischen königlichen Hofe im Jahr 1558, Johann Paterson Hain, der Arzt im Kesmark (Kežmarok), Leutschau (Levoča) und Preschof (Prešov) im Jahr 1672, und Martin Szentiványi, der slowakische Jesuit und Professor der Universität in Tyrnau (Trnava) im Jahr 1689. Mit dem Verdienst dieser Gebildeten und mit ihnen Informationen über die Höhlen entstand auch in der Slowakei die Klima, die für die Forschung der Höhlen aus dem naturissenschaftlichen Interesse sehr günstige war. Die Bedeutungsrolle trugen hier auch Matias Bel und seine Mitarbeiter aus. Zu diesen gehörten auch Georg Buchholtz der Jüngere und Juraj Bohuš.

Slowakischer Polyhistor und Rektor des evangelischen Lyceums in Pressburg (Bratislava) Mathias Bel führte als der erste in der Literatur die breitere Erkenntnis über in damaliger Zeit bekannte Höhlen der Slowakei an. Er publizierte diese im Werk *Hungariae antiquac et novae prodromus* aus dem Jahr 1723. Hier widmete er den Höhlen ein ganzes Kapitel. In seinem Werk konzipierte er seine Wissenschaftsbestrebung - Kollektivsbearbeitung der komplexen Monographie über Ungarn. In Einzelbänden dieses Werkes *Notitiae* (4 aus ihnen erschienen in Jahren 1735-1742) beschrieb er dann auch die Mehrheit der bekannten slowakischen Höhlen. Mit seiner Tätigkeit begann Mathias Bel die Epoche des neuen Interesses über die Erkenntnis der slowakischen Höhlen. Mit den Ergebnissen ihrer Arbeit dokumentierten es später nicht nur F.E. Brückmann, oder R. Towson sondern auch andere.

Im Fall Georg Buchholtzs der Jüngere begegneten wir mit dem ersten wirklichen Interesse über die Erkenntnis der einigen slowakischen Höhlen. Unter seinem Einfluss in der lateinischen Schule im Paludza in Jahren 1714-1723 interessierte er sich für die Höhlen des Gebiets Liptau. Viele Höhlen forschte, skizzierte und beschrieb er. Die Ergebnisse seiner Tätigkeit waren den Unterlagen der Informationen, die M. Bel in seinen Publikationen übergab. Die Bedeutungsrolle hatte auch Juraj Bohuš, der Rektor des Kesmarksgymnasium. Er interessierte sich für die Höhlen des Gebiets Zips.

Der ausdrucksvolle Gegenpol von M. Bel, aber nicht nur mit dem Interesse über die Höhlen in der Slowakei, war die Persönlichkeit Daniel Fischers (1695-1746). Dieser gebürtiger Kesmarker und M. Bel gehörten zu den ersten Vorkämpfern der modernen Wissenschaft in der ungarischen Kulturwelt, vor allem aber in der Slowakei. M. Bel mochte ihn für die Zusammenarbeit in seinem heimatkundlichen Projekt erwerben, aber D. Fischer ging in der wissenschaftlichen Forschung mit anderem Weg. Er arbeitete wissenschaftlich in der Medizin, Pharmazie, Physik und Chemic, aber beschäftigte sich auch mit der naturwissenschaftlichen Forschung von Liptau, Zips und Hohe Tatra.

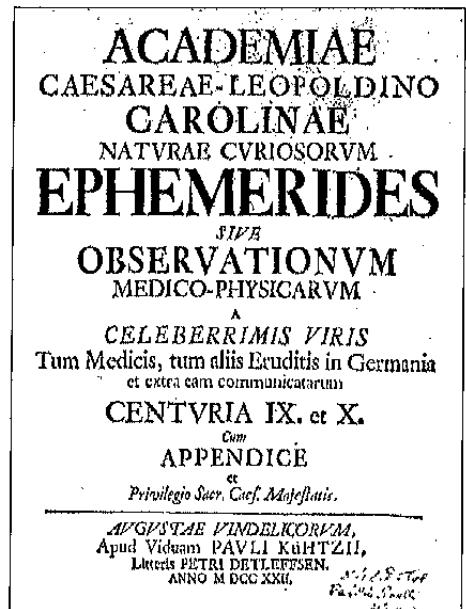
Er wurde am 9. November 1695 im Kesmark (Kežmarok) geboren. Nach den Studien im Kesmarksgymnasium im Jahr 1713 ging es in die medizinischen Fakultät der Universität im Wittenberg studieren weg. Nach dem Gewinn des Lizentiats im Jahr 1716 begann er seine ärztliche Praxis in seinem Geburtsort.

Im Jahr 1718 gewann er auf der Wittenbergsuniversität den Titel Doktor der Medizin. In Jahren 1719-25 wirkte er in der Stadt Liptauer Nikolaus (Liptovský Mikuláš) als Amtarzt des Liptauer Komitats. Von hier ging er im Kesmark (Kežmarok) weg. Hier wurde er Stadtarzt und Amtarzt des Zipsauer Komitats. Zu dieser Zeit war er auch der Leibarzt des Zipsgaugraf Nikolaus Csáky. Er starb im Debrecen im Jahr 1764.

Ähnlich als M. Bel bemühte er sich den Mitarbeiterkreis zu gründen, mit den sein wissenschaftliche Programm realisieren möchte. Er war bewundernswert gebildeter Mensch und orientierte sich sehr gut in der damaligen wissenschaftlichen Literatur. Die Zusammenarbeit mit M. Bel lehnte er strikt ab. Die Problematik der wissenschaftlichen Forschung darstellte nach ihm sehr anspruchige Rolle und er hielt Bels für ihre Lösung fachlich nicht zu bereiten. Den Charakter seiner Individualität erfasste auch es, dass er allein das Mehrbandwerk Admiranda Hungariae varia naturae curiosa exhibentia (Verschiedene Besonderheiten der Ungarnnatur) zu schreiben möchte. Diese Ansicht realisierte er aber niemals. Er hatte die Kontakte mit Georg Buchholz der Jüngere und Juraj Bohuš, obwohl sie beide zu grossen Förderern der Belsbestrebungen gehörten. Auch ihnen Grundlagen entwickelte er auch sein Interesse für die Höhlen. Er trat so isoliert deshalb auf, dass er in den Höhlen für etwas anderes interessierte, um was widmeten sich nicht seine Vorgänger und Zeitgenossen.

Wissenschafts-publikationsanfänge von Daniel Fischer hängen mit der Universität von Wittenberg zusammen. Er begann systematisch wissenschaftlich arbeiten, wenn er im Kesmark (Kežmarok) sich siedelte an. Seine Erkenntnisse sendete er für die Veröffentlichung in Zeitschriften der Academic Leopoldina - Ephemerides und Acta und in der Zeitschrift Sammlung von Natur- und Medizin-Geschichten, die im Wrattislaw erschien. Im Jahr 1719 war er zum Mitglied der gelehrten Gesellschaft Sacri Romani Imperii Academia Cacsareo - Leopoldina gewählt.

Daniel Fischers Interesse über die Höhlen hatte gegenüber Mathias Bel ausdruckvolle andere Dimensionen. Er interessierte sich nicht für die Existenz der Höhlen im Kontext der Naturbesonderheiten, oder über die Umschreibung und die Darstellung ihnen Räumen. Die Höhlen nahm er aus die Objekte wahr, mit Vermittlung welchen seine Experimente entwickeln konnte. Die Höhlen boten ihm den Material, der ihre Realisation zu ermöglichten. Das Fischersinteresse über die Höhlen hängt mit dem ersten Zeitabschnitt seiner wissenschafts-fachlichen Tätigkeit zusammen und bindet sich an seiner Aufenthalt im Liptauer Nikolaus (Liptovský Mikuláš). Die dominierende Elemente dieses Interesses war die Aktivität von G. Buchloltz der Jüngere in Höhlen



ein Fachmann, der die Antworten auf die Fragen, mit welchen G. Buchholtz der Jüngere bei der Forschung in den Höhlen des Demänová Tals traf, finden möchte. Wir schalten nicht diese Möglichkeit, dass das naturwissenschaftliche Interesse von D. Fischer die wichtige Rolle in der Beziehung mit Georg Buchholtz der Jüngere spielte, von ihm er die Materialien für wissenschaftliches Verfahren erwarb. Sie waren beide die gebürtige Kesmarker und diese Wirklichkeit flusste ihre wechselseitige Beziehung beein und hatte die grosse Rolle auch bei der Formierung des Fischersinteresses für die Höhlen. Mit dem Verdienst von Johann Paterson Hain erschien im Jahr 1672 in der Literatur die Erkenntnisse über die Höhle, die im Zipsen Komitat bei dem Kartäuserkloster neben dem Dorf Helbingsau (Haligovce) fand. Er beschrieb auch die Funde der Drachenknochen. Die Kenntnis der damaligen Fachliteratur flusste die Entscheidung D. Fischers diese Höhle (die heutige Höhle Aksamitka bei dem Dorf Haligovce) zu besuchen beein. Auch er fand in dieser Höhle die Drachenknochen. Wir haben Gründe zu der Annahme, dass es nach dem Jahr 1716 wurde. Es ist sehr schwer vorauszusetzen, dass er mit dieser Höhle während der Gymnasiums- und Universitätsstudien beschäftigte. Es ist sehr regelmäßig, dass er mit der Forschung erst in der Zeit, wann begann er seine ärztliche Praxis in seinem Geburtsort, beschäftigte. Er mochte vor den Gewinn des Titels Doktor der Medizin einige mit Studium die Erwerbungskenntnisse bewiesen. Aus seinen Funden stellte er das ganze Skelet zusammen. Er schenkte es dem Kaiser, für was diente er den Landadel und den Titel des Hofvertrauensmannes Aulae familiaris aus.

des Demänová Tals und von Juraj Bohuš in den Höhlen des Gebiets Zips. Sie beide gehörten zu den Mitarbeitern des Mathias Bels, aber die Informationen und Erkenntnissen zu welchen sie beendigten, bewies Daniel Fischer wesentlich anders.

D. Fischer knüpfte mit Georg Buchholtz der Jüngere die Kontakte schon am Anfang seines Aufenthaltes in Lipptauer Nikolaus (Liptovský Mikuláš) an, und diese folgten aus dem Interesse für die naturwissenschaftliche Forschung. Diese Kontakte überdaurten auch nach dem Abgang des Buchholtzs auf einen Post des Rektors des Evangelischen Lyceums im Kesmark (Kežmarok). Mathias Bel war nur der Empfänger der Buchholtzerkenntnisse über die Höhlen, aber D. Fischer war

Es ist ganz natürlich, dass ihm Georg Buchholtz der Jüngere im Jahr 1719, wenn er die Drachenknochen in Demänová Höhle Beníková fand, ein Teil der Funden für die Bestimmung sandte. Den zweite Teil dieser Sendung waren einige Tropfsteine aus dieser Höhle und gewann er gerade in ihnen die Matric, die ihn sehr zog. Fischer diese Tropfsteine beschrieb und erforschte. Er widmete nicht nur mit der Aussenform, aber er forschte auch ihre chemische Eigenschaften. Er dachte, dass sie die Wasserquellen sind, die aus dem Felsen flossen heraus, und dann wieder auf die felsartige Materie hart geworden. Sie hatten verschiedene und bewundernswerte Formen. Einige aus ihnen hatten die Kegelformen und andere hatten die rauhe Wände. Manche aus ihnen hatten Erbsen- oder Rundformen, eventuell sie aus einigen kleineren und grösseren Kugelchen bestanden. Überwiegende Mehrheit aus ihnen hatte schneeweisse Farbe mit der gelblichen Abstufung.

In seinen Abhandlung ging er von der Dissertation des deutschen Wissenschaftlers Martin Gotthard Lerschen über die ausfälltenden und anwachsenden Felsen. Auch der Arzt von Wittenberg Abraham Vater beschäftigte sich mit den Felsenformen. Im chemischen Vorgang setzte er bei der Bildung der Tropfsteinen auch das Vorhandensein von weissen Vitriol, Kochsalz, Schwefel, Salpeter, Weinstein, Erdmasse, Alkohol, Wasser und Luft voraus.

Bis jetzt wissen wir nicht zu beurteilen, inwiefern mit diesem Interesse Daniel Fischers hängten auch seine weitere Besuche in einigen Höhlen des Demänová Tals zusammen. Während der botanischen Forschung in felsenreichen Bergen Ende August 1720 besuchte er mit Georg Buchholtz der Jüngere auch nähere unbekannte Höhle. Im August 1723 wanderte er über das Demänová Tal. Neben der Höhle Fenster (Demänovská jaskyňa Okno) forschten sie zusammen die Höhle Brunner (jaskyňa Studňa) durch, und hier stiegen sie in einer Tiefe von 22 Klafter ab. Wir wissen nicht zu erzählen, ob es nur diese Besuche waren, oder er in die Höhlen oft ging. Die Angaben im Tagesbuch von Georg Buchholtz der Jüngere sind in dieser Richtung sehr kurzgefasst.

Es ist sehr wahrscheinlich, dass er mit den Höhlen sehr interessierte. Ausser den Höhlen des Demänová Tals, sie lagen in der Nähe von seinem Aufenthalort, beschäftigte er sich auch mit einigen Höhlen des Gebiets Zips. Georg Buchholtz der Jüngere sendete ihm die Tropfsteinsstücke aus der Drachenhöhle im Benediksfelsen, begann er über es nachzudenken, dass etwas ähnliches auch in den Höhlen der Zipsen Karpathen vorkommen muss. Die Erwähnung dieses Charakters skizzierte indirekt auch eventuellen Besuch in diesen Höhlen. In seinem Fall können wir nur sehr schwer voraussetzen, dass der Mensch dieses Formats und der grossen Wissenschaftsamtionen auf die Vermittlungsinformationen jemand anderes verlassen konnte. Bei seinen Erwähnungen über die Höhlen der Zipsen Karpathen ist sicher, dass er etwas über die Existenz dieser Höhlen wissen musste. Er dachte nicht nur die Höhle unweit dem Kartäuserkloster. Man kann sagen, dass gerade auf diese Frage wir die

Antwort in der Tätigkeit J. Bohuš finden, er war Fischers Zeitgenosse und Rektor des Gymnasiums im Kesmark. Zur Zeit seines Aufenthalts im Liptauer Nikolaus (Liptovský Mikuláš) beschäftigte sich D. Fischer mit den Höhlen im Gebiet der Belaer Tatra. Hier forschte er eine Höhle über der Stadt Bela (kleine zipsere Stadt unweit der Stadt Kesmark) und das Drachenloch, welches eine halb Meile vom Dorf Morgenröte (Ždiar) entfernt ist. Es ist fast sicher, dass der Bohušaufmerksamkeit auch einige Höhlen in der Nähe der Belianska Höhle (Belianska jaskyňa) nicht entgangen. Wir wissen nicht, inwieweit konnte auch die Belianska Höhle sein. Bei seiner Entdeckung im Jahr 1881 waren an den Wänden ihrer Vorderteilen auch Namnen und Anschriften aus dem Jahr 1718 gefunden.

Daniel Fischer interessierte sich auch im Fall der Höhlen der Zipsen Karpathen für die Tropfsteindekoration. In der Sammlung, die er von dem ständigen Besucher der karpathen Bergen erwarb, beschäftigte er sich in erster Reihe mit den Steinen verschiedenen Formen und nicht mit den Knochen des grossen Tieres, welches aus diesen Höhlen kam her. Diese Steinen nannten Stalaktiten und sie waren pyramidenförmig mit einem spitzen Winkel. Mit dem Schlag an dem Felsen klangten sie. Nach der Zerschlagung floss aus ihnen klares Wasser aus. Es schmeckte nach dem iridischen Flusswasser. Einige hatten rundliche Formen in der Grösse der Erbse oder Nuss, und andere waren die Kückelchen verschiedener Grösse mit glatter oder rauher Oberfläche. Er tat auch mit diesen Felsen die Experimente und erarbeitete sich zu ähnlichen Erkenntnissen als im Falle der Funden aus der Höhlen des Demänová

SUPPLEMENTUM IV.
Curioser und nutzbarer
Nummernungen
Bon
Satyr-
Kunst-Geschichten,
Durch
Eigene Erfahrung und aus vielerley
Correspondenz gesammlet
von
JOHANNE KANOLD,
Medicina Doct. et Practico in Breßlau,
per Acad.
der Kärtner, Aeropolitiss., Carolinensis Medicis, Academias
Nature Carolinorum, Mitgliede
Breslau
Verlegt David Richter, 1729.

Artic. 17.
III. Descriptio lapidum stalactites in annis Carpathi Scopulensis inventorum.

Quod est deinde Relation de Gen. & Sibth. Lapideo. Cum milles annis sufficiunt a Cl. Da. Georg. Barolo, Recorde Nagy-töl legyense, lapides & hydriæ aquæ concretæ inventæ in annis quicunque Lypotoviensibus, præcipue vero in anno draconum per se "Baudiles", nam cum coagulatis, fulmi gold, etiam in annis Carpathi concretæ Scopulensis. Inventæ debet ab concretiæ, sanguiniæ, blæ mæ rufiæ, cum oleum, continet. Carpathicorum monitione visitatores, perducentur, ut pellit latentes. Ceterum tum plane ob prædictæ statueris non possumus quod sit, etiamque ubi sit, offi maximi cuiusdam annals, & prædictæ lapides, varia figura præstiles, scutulatæ, foliæ, &c. & ceteræ figuræ, aliqui enim eorum reserbat, scutulatæ, & ceteræ figuræ, vel alicuius, quidam vero planæ gaudieant. Hi lapides conformati per se sunt, insinuatori implieant, non tamem omnes, sed illi, illos tantum, ex his etiam cavitate, et ceteris, etiamque, & frangentur, ut cunctæ cavitate aquæ pellit. Et clara emanabat, cunctæ spuma cum aquæ levitati, ut ceterum tamem neccedit. Aliquid prædicti etiam erant figura rotunda, magnitudine pli levioribus, int. & tunc vel maxima, aliud sub predictis, magnitudine figura erant planæ, superficie vel planæ vel afora, quadratae, Ex aliis globulæ, magnitudine rimen inserviunt, tam rotundis, quam planis, quidam complicit erant. Atque hoc lapides globulos, plasti, Reges in Comitatu de Tiszae Carpathi Cap. III. p. 11. statuantes vel cunctis rotundis angelis vultu. Color horum lapidum, quibusdam vero ex alto albicans, ploribusque flavescens, quibusdam vero ex alto albicans, turces primo virilio, quod sit grecum albano dicitur. His lapidis etiis plasti virilio effervescent potenter, non tamem diffite-

Tals. In seiner Abhandlung, die er im Jahr 1729 publizierte, auf der Grunlage des Studium der Literatur, wo zitierte er die Werke von Daniel Hartnacius, Martin Gotthard Lerschen, Johan Heucber, Athanas Kircher, Matthias Tilingar und anderer Authoren, gelangte zu dieselben Ansichten:

- a) Die erwähnte Tropfsteine nennen von Rechts die Slalaktiten - in seiner Auffassung bewiesen die Sinne, dass das abgezogene Wasser der Stein ist, aber sein Ursprung ist nicht bekannt. Ihre Benennung übernahm er von Gassendi und stellte fest, das dieses Wort aus dem griechischen Wort stillo deduzierte ist, und bedeutet es tropfeln. Dieselbes Ursprungs sind auch die Worte die Säule (das versteifte Wasser hat oft dieselbes Form) und Tropfen, weil das Wasser mit den Tropfen aus der Höhlendecke falle.
- b) Die Flüssigkeit mit der Fossilmöglichkeit befindet sich manchmal im Boden - diese Ansicht von Daniel Fischer billigten auch alle Physiker, aber sie stimmten nicht in der Benennung der Flüssigkeit überein. Sie ernannten diese Flüssigkeit der Steinsame oder die gummiartige Flüssigkeit. Für Fischer war nicht wesentlich, wer und wie sie nennt. Er gewann die Übergewicht, dass auch ihr natürliche Charakter zu forschen sollte, aber selbst bei berühmten Authoren fand er keine richtige Erklärung, was diese Flüssigkeit in der Wirklichkeit ist. Auf der Grundlage des Versuchs, der Hamelius im Jahr 1667 publizierte, gelangte er zur Erkenntnis, dass die steinartige Flüssigkeit aus Wasser, Festsalz und Steinspanne (Sand) ist. Ihre Fliessbarkeit bewies das Vorhandensein des Wassers im Inneren einigen Tropfsteinen. Sie musste die gummiartige Form haben, weil sie mit ihrer eigenen Kraft als die Gummi sich verbindeten. In dieser Flüssigkeit befand auch das Festsalz und es bestätigte ihre augenblicke Verdichtung. In beträchtlichem Masse setzte sie aus dem Sand zusammen und diese folgte aus destillierter Flüssigkeit, die bei rauh als Sand war.
- c) Die Verschiedenheit in der Tropfsteinform hat den Ursprung im verschiedenen Strom der Tropfenflüssigkeit - hier gelangte er zu der Ansicht, dass diese Tropfsteine andren Charakter haben, als die Tropfsteine, die in dem Innere der Erde aus der steinartigen Flüssigkeit bildeten. Die Tropfsteine in den Höhlen habcn die Formen, die mit dem Strom der steinartige Flüssigkeit aus der Decke der Höhle tropft, beienflussten. Diese Form können wir nicht von verschienem Charakter des Salzes, welches diese steinartige Flüssigkeit bildete, ableiten. Anderst hätten sie Oval- oder Kegelformen oder die andere Formen, so in dem Fall der Tropfsteinen aus einer Landschaft Galliae. Nach Meinung von Gasendi schrieb über sie auch kartezienischer Philosopher Antonius le Grand.

Mit Rücksicht darauf mangelhafte Erkenntnisse der Chemic konnte nicht der chemische Aufbau und Genese der Tropfsteinbildung verstehen und erklären. Einige Prozesse erklärte er sich sehr mechanisch. Zum Trotz aus dem Ansicht der Slowakei und des damaligen Ungarn mochte er wie der erste

dieses Problem zu lösen. Ausser näher Erkenntnis der Höhlen, oder der Funden der Drachenknochen, identifizierte er auch weiter den Fachkreis des naturkundliche Interesse, welches aus Ihrer Existenz folgte. Mit es beschäftigte sich nicht einmal F.E. Brückmann während der Forschung in der slowakischen Höhlen im Jahr 1724 aber nur später suchte er seine Nachfolgern.

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DANIEL FISCHER IN PRIČETKI SPELEOLOGIJE NA SLOVAŠKEM

Povzetek

Začetki speleologije na Slovaškem segajo v prvo polovico 18. stol. Pri tem sta igrala pomembno vlogo Matthias Bel in krog njegovih tovarišev. Bel je objavil podatke o do takrat znanih jamah.

Z vidika zanimanja za jame je bil Daniel Fischer pravo nasprotje M. Belu. Kulturna zgodovina Madžarske sicer šteje oba za pionirja moderne znanosti, to pa še posebej velja za Slovaško. Poleg medicine, farmacije, fizike in kemije se

je Fischer ukvarjal tudi z naravoslovjem Liptovskega in Spiškega področja. Rojen je bil v Kežmarku 1695, 1713-1716 je študiral v Wittenbergu in dosegel naziv doktorja medicine. Deloval je v Liptovskem Mikulašu in Kežmarku kot zdravnik za Liptovsko in Spiško okrožje. Umrl je v Debrecenu 1764.

Fischer je bil zelo izobražen in je dobro poznal znanstveno literaturo. Vzdrževal je stike z G. Buchholtzem Jr. in J. Bohušem, čeprav sta ta dva podpirala Belova prizadevanja. Tem stikom navkljub se je Fischer zanimal za jame v čisto posebni smeri. Njegovo zanimanje je bilo veliko bolj poglobljeno, tako v primerjavi z njegovimi predhodniki kot sodobniki. Jame ga niso ga zanimale kot objekti, ampak kot kraji in kot snov, ki mu je omogočala opravljati poizkuse.

Fischerjevi stiki z G. Buchholtzem Jr. so izvirali iz skupnega zanimanja za naravoslovne raziskave. Skupaj sta obiskala nekaj jam v Demänovski dolini. 1719 mu je Buchholtz poslal "zmajeve kosti" in kos sige iz Bacikove jame. D. Fischer je to sigo podrobno preiskal in opisal. Poleg oblike je pregledal tudi njene kemijske značilnosti. Enake metode je uporabljal tudi pri preučevanju jam na Spiškem področju. Delal je poizkuse s kamenjem iz tamkajšnjih jam in dobil podobne rezultate.

Na podlagi zapažanj iz 1729 je prišel do sklepa, da izhaja ime za kapnik iz grške besede "stillo", kar pomeni "kapljanje". Preučeval je značilnosti tekočine, iz katere nastajajo kapniki in zaključil, da je ta "tekočina, ki okameni", voda, ki vsebuje pesek. Različne oblike kapnikov naj bi nastajale zaradi različnega načina pritekanja "petrificirne tekočine", ki kaplja z jamskega stropa. Njihovo obliko določa mesto, na katerem nastajajo ali pa ovoj, v katerem nastajajo, ne pa razne prsti, ki jih vsebuje voda. Rast kapnikov pa je odvisna od njihove lastne tekočine.

Glede na stopnjo tedanjega poznavanja kemije Fischer ni mogel pravilno določiti kemijske sestave in nastajanja kapnikov. Nekatere pojave je razlagal preveč mehanistično. Kljub temu pa je bil prvi, ki je v okvirih Slovaške in Madžarske pokazal na potrebnost reševanja tudi takih vprašanj.

FRIEDRICH SIMONY (1813-1896), HIS CONTRIBUTIONS TO KARST AND CAVE SCIENCE

FRIEDRICH SIMONY (1813-1896) IN NJEGOV PRISPEVEK H KRASOSLOVJU IN SPELEOLOGIJI

KARL MAIS¹

Izvleček:

UDC 551.44:929 Simony F.

Karl Mais: Friedrich Simony (1813-1896) in njegov prispevek h krasoslovju in speleologiji

F. Simony, alpinist, naravoslovec in geograf, se je ukvarjal tudi z glaciologijo in speleologijo, še posebej v pogorju Dachstein. Terensko delo je dopolnjeval z lastnimi risbami, ki jih je kasneje uporabljal kot ilustracije pri objavah in predavanjih. Že 1842 je apneniške planote imenoval "kraška območja". Ukarjal se je s kraško hidrologijo in morfologijo. Pripomogel je k uveljavitvi dunajskega geografskega inštituta, kjer ga je nasledil A. Penck in kjer je študiral tudi J. Cvijić, in sploh k uveljavitvi spelcologije v drugi polovici 19. stol.

Ključne besede: zgodovina spelcologije, dunajska geografska šola, Avstrija, Simony F.

Abstract

UDC 551.44:929 Simony F.

Karl Mais: Friedrich Simony (1813-1896), his contribution to karst and cave science

F. Simony, an alpinist, naturalist and geographer interested in glaciology and spelaeology, in particular in the massif of Dachstein. In the field he made the drawings as a scientific documentation and also for the illustrations of lectures and publications. In 1842 he called the alpine limestone plateaus "karstic areas". He studied karst hydrology and morphology. He contributed to the high reputation of the Vienna Geographic Institute, where A. Penck followed him and where J. Cvijić graduated and to the development of cave science in the second half of the 19th century.

Key words: history of spelaeology, geographical school of Vienna, Austria, Simony F.

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The beginning

In 1896 Friedrich Simony died in St. Gallen, a place in the Styrian Ennstal, Austria. He was well known as an alpinist, naturalist, geographer and, above all, a scientific explorer of the Dachstein. In this paper we are not going to deal with his main work, the "Region of the Dachstein" (*Das Dachsteingebiet*), which he was able to complete on the eve of his life as a sort of retrospective view. His work appeared in three numbers between 1889 and 1895. We will look into a very important aspect of his work, i.e. his little known contribution to karst and cave research.

Friedrich Simony's life and work

Simony was born in Bohemia at Hrochuv Tynec (Hrochowtaintitz), southeast of Pardubice on November 30th, 1813. He attended Grammar School at Mikulov (Nikolsburg), left school in 1827 and became an apprentice in a pharmacy. As a laboratory assistant he moved from Znojmo (Znaim) to Vienna, where he began his studies in 1833. Having completed his pharmaceutical studies in 1835 he was able to devote himself to natural history, especially in the circle of the "Mining museum" (Montanistisches Museum). In 1840 he joined Franz v. HAUER among others on an excursion to the Gesäuse in the Salzkammergut. In the course of this tour he travelled through the Ausseerland to Hallstatt, ascended the Dachstein plateau as far as the glacier region. He was so fascinated by the area that he studied it throughout his life. He explored the plateau and climbed the peak in summer as well as in winter (first ascent), promoted tourism, made drawings of landscapes, and produced panoramas of the summit region. He conveyed to the world of science the findings from the Hallstatt time, discovered by the pitman J. G. RAMSAUER on the Salzberg at Hallstatt. He drew geological maps, collected rocks, performed systematic depth measurements and measured temperatures in the Salzkammergut lakes, studied glaciers as well as the botany and ecology and many other facts of the area.

With his studies he attracted the attention of the circle of "Friends of Natural Sciences in Vienna" (Freunde der Naturwissenschaften in Wien), which was established in 1846 as a regular meeting around Wilhelm HAIDINGER in the Mining Museum of Vienna. He reported to this society about his field work and thus was able to establish himself in the professional circles of the residential capital Vienna. In 1850, after the foundation of the Geologische Reichsanstalt, SIMONY, as chief geologist, was entrusted with the survey of the Salzkammergut (SIMONY 1850). He was interested in geology and biological history as well as in general integrative matters of geography. These sciences were of special concern to him, and so he applied himself to promoting them. In 1851 he became professor of geography at the University

of Vienna - a success due to his dedication. From then on he engaged in teaching physical geography and establishing the geographical institute at the University of Vienna. He also played a decisive role in the foundation of the Geographical Society in Vienna (Geographische Gesellschaft in Wien) and the alpine association of Austria (Alpenverein).

In 1885 SIMONY, at 73, introduced his successors into their offices: Albrecht PENCK for physical geography, and W. TOMASCHEK for historical geography. Then he retired. He left to his institute most of his library as well as other material, teaching equipment and posters, which he had constructed himself for his lectures. Further important material from his legacy was given to the Museum of Natural History in Vienna by his son Oskar.

In 1890 SIMONY, at 77, started for his last tour on the Dachstein. After that, with the help of his son Oskar, he devoted himself to the "Dachsteinwerk", which appeared in three parts (numbers) in 1889, 1893 and 1895.

On July 20th, 1896 Friedrich SIMONY died in his 83rd year after "a lingering illness of several months caused by decrepitude" - as it says on his obituary. He was buried in St. Gallen in Styria, where he had mostly lived in his later years and died.

Friedrich SIMONY received numerous distinctions due to his success as a teacher and scientist: The title of k.k. Hofrat, privy Councillor of the Imperial and Royal Court, was bestowed on him; he was an honorary member of the Geographic Society of Vienna, of the Austrian Meteorological Society, of the Geographic Society in Berlin and of many other scientific associations. He was a well-known and respected member of Vienna's social circles. In 1877 he received the Grand Medal for Arts and Sciences by crown prince Rudolf and was invited to cooperate in the oeuvre of the crown prince: "The Monarchy in words and pictures" (Das Kronprinzenwerk: Die Monarchie in Wort und Bild).

His private life: Friedrich SIMONY married Amalie KRAKOWITZER from Wels in 1851. On April 23rd, 1852 a son, Oskar, was born, a second son Arthur on Mai 15th, 1854. His daughter, born in 1858, died early.

Friedrich SIMONY's main works

Friedrich SIMONY'S studies and career were based on his very own talents and abilities. He was such an outstanding student that he was encouraged and sponsored by his teachers, such as J.F. JAQUIN. His knowledge of botany and geography soon made him an acknowledged "colleague" in the scientific circle of Vienna in the time before March 1848. After having become acquainted with the Dachstein area in 1840 he devoted his studies to the alpine regions. His knowledge of geology enabled him to concentrate on glaciology and related fields. His studies included the observation of water, moraines, sediments as well as suspended sediment transport in water, climate, vegetation and forest development (1876).

The wide range of his interests, the size of his field work and the conveyance of his experience can be seen from his reference list and a catalogue of his graphic works (among others BÖHM 1899, FORSTER 1893, PENCK 1898, recently e.g. GRIMS 1996 and KAINRATH 1993.) The titles of his publications are of general nature and do not easily reveal their contents. In this study SIMONY's earlier reports and publications are used, since they are of great importance for the history of research. Later publication are not dealt with.

Friedrich SIMONY had a remarkable talent for drawing, which he used for the scientific and objective presentation of the landscape. In the field he made sketches and drawings in his diaries, which he could use as illustrations in his lectures and reports. Later on these sketches served as patterns for figures in publications and posters used in speeches and lectures. Documentation was the main concern of his drawing activities, thus he readily included photographic techniques in topographic presentations and used them consequently from 1877 onward.

SIMONY's contribution to karst science and speleology

Friedrich SIMONY was no caver in search of new underground territory, but a natural scientist, who included karst phenomena in his studies. In this paper we present his hardly known contribution to speleology and investigate some topics in detail.

The Koppenbrüller Cave was well known already in the first half of the 19th century. It was mentioned as a rewarding tourist attraction in the guide books (SCHULTES and also SCHADEN 1833). This cave was the only one in the Dachstein area with its entrance at valley level. In this cave SIMONY measured air and water temperatures and watched the variation of the water flow caused by precipitation and the melting of snow on the Dachstein plateau.

As early as 1842 he used the term "**KARST**" for the alpine limestone massif, noting that the foot of the Dachstein "covers an area of more than 8 square miles / = 460,33 km², and its karst like plateau covers a range of 50 to 60 walking hours." He also wrote: "The numerous caves, gorges and crevices inside the mountain, the rugged soil of its plateaus; .. indicate a long lasting fight of the elements .. to which these caves were once subjected." The plateau showed "holes and ridges, which have eaten vertically or slantingly into the rock", giving the whole area "an almost sieve-like aspect". He mentions "the rare appearance of granite foundlings, quartz and crystals on the plateau", indicating "the former presence of a primeval glacier, which might have carried off this rubble from the mountain chain .. of the Hochtauern .. and deposited it .. on the Dachstein." SIMONY characterizes the Dachstein plateau undoubtedly as a karst area, mentioning unnamed Karren, caves and shafts. His view of the crystalline sediments (Augensteine) on the plateau shows that he

assessed their origin much more correctly than it did Eduard SUESS later on, who believed volcanic processes to be responsible.

In a lecture delivered on June 15th, 1846 for the Friends of Natural Sciences he spoke about karst formation in the alpine limestone massifs in particular. He considered the "roly nature and raggedness of the surfaces of the Dachstein- and Priel-mountains" as a "type of karst formation" (HAIDINGER 1847: 55-59). Thus in 1842 and 1846 he used the term **karst** for alpine limestone regions in the modern sense.

Karst springs

Karst springs were of great interest to Friedrich SIMONY. He put down his observations in 1865, characterizing the water flow in the limestone areas from the surface through the "layers, raggedness und hollowing" of the rocks "forcing its way .. deeper and deeper .. until they become formidable water drains" and then surface again in the valley.

As examples SIMONY mentioned (1865) the "Kaiserbrunnen am Wiener Schneeberg", which he regarded as one of the most powerful springs of the Eastern Alps, as well as the "Waldbachursprung", which he called a subterranean outlet of the "melted snow and ice of the Hallstatt Glacier." He pointed at the seasonal variations of the suspended sediment transport from the glacier region and drew a correlation of the daily variation of the discharge with the differing radiation of the sun on the snow covered plateau. He found out that six hours after the beginning of sunshine the springs started to swell and reached their maximum around 8 or 9 p.m.

Later on, in 1871 (page 26) and 1878 (page 99) he considered the correlation between the Dachstein glaciers and the Waldbachursprung in greater detail: "Although .. there is no doubt that in the bed of the Hallstatt Glacier there exist numerous subterranean outlets, it seems nonetheless.. that most of them flow together .. into one canal, which eventually .. reappears .. at the foot of the Ursprungskogel. Here an icy cold creek appears, the Waldbachursprung .. under a small grove." This clearly formulated subsurface connection between the glacier waters and the Waldbachursprung has been exactly proved today by tracer trials (BAUER 1989). The subterranean passage is not accessible though.

In 1865 (page 189) SIMONY accurately noted the temperatures of the Hirschbrunn springs: Before the snowmelt in spring temperatures were around 5.61°R ($=7.00^{\circ}\text{C}$), during the snowmelt they lapsed to 4.2°R ($=5.25^{\circ}\text{C}$), during the summer they varied between 4.2°R ($=5.25^{\circ}\text{C}$) and 4.6°R ($=5.75^{\circ}\text{C}$), in autumn between 4.4°R (5.50°C) und 4.5°R (5.62°), whereas they rose in winter up to 5.6°R (7.00°C).

SIMONY focused on the area of the Hirschbrunn-Kessel with its various surfacing springs, comparing temperatures, discharge and water levels, as he

had done at the beginning of his Dachstein research in the Koppenbrüller Cave. He also observed other springs and in the area of the Gosauumühle he found thermal springs not detectable any more. Their temperatures ranged at that time (SIMONY 1865: 190) from 8°R and 17°R (10,00°C and 21,25°C). Furthermore he detected springs below the level of the Hallstatt lake.

He observed that the temperatures of the karst springs did not correspond to the mean annual temperatures at the altitude of their surfacing, which he would have expected. He tried to explain these remarkable deviations with the altitude of the source area. When investigating limestone springs in the area of the upper Traun river he distinguished between "shallow waters of mixed origin" with strong temperature variation and the "real karst waters". He presented a table for the latter (1865: 188), using "Wiener-Fuß" for altitude readings and "Reaumur" for temperatur readings as indices, which have been converted into meters and degree Celsius in the table shown below:

1. (a) Altitude of source (spring) in Vienna Foot	1. (b) Altitude of source (spring) converted in meter	2. Temperatur of springwater in late summer	3. Annual mean temperatur of spring water	4. Annual mean temperuture of mountain region
7600 ft	2401 m	1,12°C	—	- 1,50°C
5700 ft	1801 m	2,37°C	—	+ 1,75°C
4500 - 5000 ft	1422 - 1580 m	3,50 - 4,50°C	4,25°C	3,00 - 3,75°C
4000 - 4500 ft	1264 - 1422 m	3,62 - 5,50°C	4,50°C	3,75 - 4,50°C
3500 - 4000 ft	1106 - 1264 m	1,50 - 5,50°C	4,87°C	4,50 - 5,25°C
3000 - 3500 ft	948 - 1106 m	1,75 - 6,25°C	5,12°C	5,25 - 6,00°C
2500 - 3000 ft	790 - 948 m	3,62 - 6,87°C	5,50°C	6,00 - 6,75°C
2000 - 2500 ft	632 - 790 m	5,12 - 7,50°C	6,12°C	6,75 - 7,50°C
1400 - 2000 ft	442 - 632 m	5,37 - 9,62°C	7,25°C	7,50 - 8,50°C

The original descriptions of the columns by SIMONY are the following:

Column 1.: "Altitude of the springs /sources/ in Wiener Fuß" /column 1(a): original footage; column 1(b): converted into meters/.

Column 2.: "Observed spring temperatures in late summer" /notated in half degrees Reaumur, converted into degrees Celsius/.

Column 3.: "Mean annual temperature of all studied springs" /notated in half degrees Reaumur, converted into degrees Celsius/.

Column 4.: "Approximate climatic annual mean of the corresponding altitude" /notated in half degrees Reaumur, converted into degrees Celsius/.

Limestone removal

SIMONY often focused on moraines, rubble and water with suspended sediments in his field work. He called the removal of material and its origin "erusive processes" ("erosierende Kräfte"), summarizing erosion and corrosion in one single term.

He assigned water a special role in the "erusive" ("erosirenden Abtrag") limestone removal, defining it "the omnipresent means of destruction connected with an incessant change of temperature" (1871: 3); in connection with the climate he considered water as "atmospheric erosion". He said that "rain and snow water" served as "chemical solvent, eroding the rocks on the surface." In this way SIMONY expressed and described the origin of karst phenomena: "The whole surrounding area looks as ragged, gnawed at and hollowed as if strong acids had rained on the rocks for centuries." He continues (1871: 5): "The share of atmospheric precipitation in the formation of the terrain must not be underestimated. In any case the latter is being continually 'gnawed off' by the .. corrosion of the surface of the rocks, and .. every crevice rippled by water .. is slowly and continually deepened and enlarged .. to an unmeasurable degree." This limestone removal which was not only mentioned in 1871, is still a prominent topic in modern research!

SIMONY realized that besides the change of temperature of the water there exists another essential influence on the limestone, as he wrote in 1871 (page 10): the carbonic acid, "substantially increasing the effect of atmospheric precipitation, is brought into the system from the air, but is absorbed to a much larger extent from layers of plants and soil. The corrosive power of the water may be increased .. many times .. by carbonic acid." The limestone removal = eroding effect of the biogene carbonic acid from algae and layers of moss was stressed in his later work. In 1869 SIMONY had already written a paper on these "means of destruction in high mountains" and had made it public (1870) in a popular calendar (an almanac with calendar and a lot of informative and educational items). There are hints to be found in earlier publications.

SIMONY calculated the limestone removal especially for the "Kaiserbrunnen am Schneeberg" (Lower Austria). He said (1871: 43-44) that "25.000 Kubikfuß [= 7.900 m³] of solid rock were annually removed by the Kaiserbrunnen as a product of erosion, which corresponds to the volume of a kubicle 29 feet [= 9.16 m] high". From this he calculated the general surface removal, noting that "in a thousand years a layer of not more than 5/4 Zoll [= 3.29 cm] would be removed. He tried to compare these rates of removal from the limestone areas with those of the crystalline. He concluded that the surface removal rate by the glaciers was not very substantial. Not a period of a thousand, but hundred thousand years would be required for the big diluvial sediments in the forelands. A remarkable view for that time, which he gained by empirical observation, measurements and calculation.

Karst phenomena, especially karren

Already in his first publications SIMONY gave a realistic presentation of limestone massif morphology in the mountains of Totes Gebirge and Dachstein. He documented the various karst phenomena such as karren, dolines and caves.

He described the phenomenon of karren and made drawings thereof. At first he ascribed the conspicuous formations to the effect of glaciers, he also limited their appearance to the glacier zone. He was of that opinion at the beginning of his research and also later, although he had clearly realized the effect of the water. In 1878 he wrote (on page 114): "Even if the origin of the karren still seem .. to be doubtful, this question appears to have found .. a sure answer. These strange hollowings are solely the product of the concurrence of melt water from the glaciers and the rubble of the moraines serving as abrasives."

This statement does not correspond with the present state of knowledge and actually differs from SIMONY's other views on karst processes. For, in his above mentioned paper from 1871, he clearly considered the rain- and soil water with its CO₂ to be a driving force for karst processes. However you can see from his drawings that he observed the karren and karren areas correctly and portrayed them in all details. Apparently he could not correlate the relief of the karren with the effect of the surface removal. In the present it is easier to find different conclusions. His drawings are nonetheless important and correct evidence, such as a sectional drawing of a karren area in his diary, and the drawing Nr.382 from 1844 (Fig. 1).

The caves

Caves are normal phenomena of limestone mountains for SIMONY. Precipitation made its way into the subsoil, as described above, through crevices and "Karrenbrunnen" (karren-pit). Smaller crevices and canals were widened, and caves developed in the course of time due to subsurface waters, which streamed again through the "canals" to the outer world. Thus he perfectly explained the circle of karst water by the direct connection between sinking surface waters, their subsoil course to the surfacing of the spring.

As to the origin of the caves, SIMONY stated (1871: 11) "that at least a substantial number of them owe their origin their .. continual enlargement .. and also their final collapse to the combined attacks .. of the water." Therefore he must have realized, "that the number of known and accessible caves was infinitely little, .. compared to that of the ones existing. Innumerable caves lie .. inside the mountains ..". Still, about a hundred years later scientists fiercely discussed "caves without entrances" as a "remarkable" phenomenon, although this had been no problem, but a fact in earlier times.

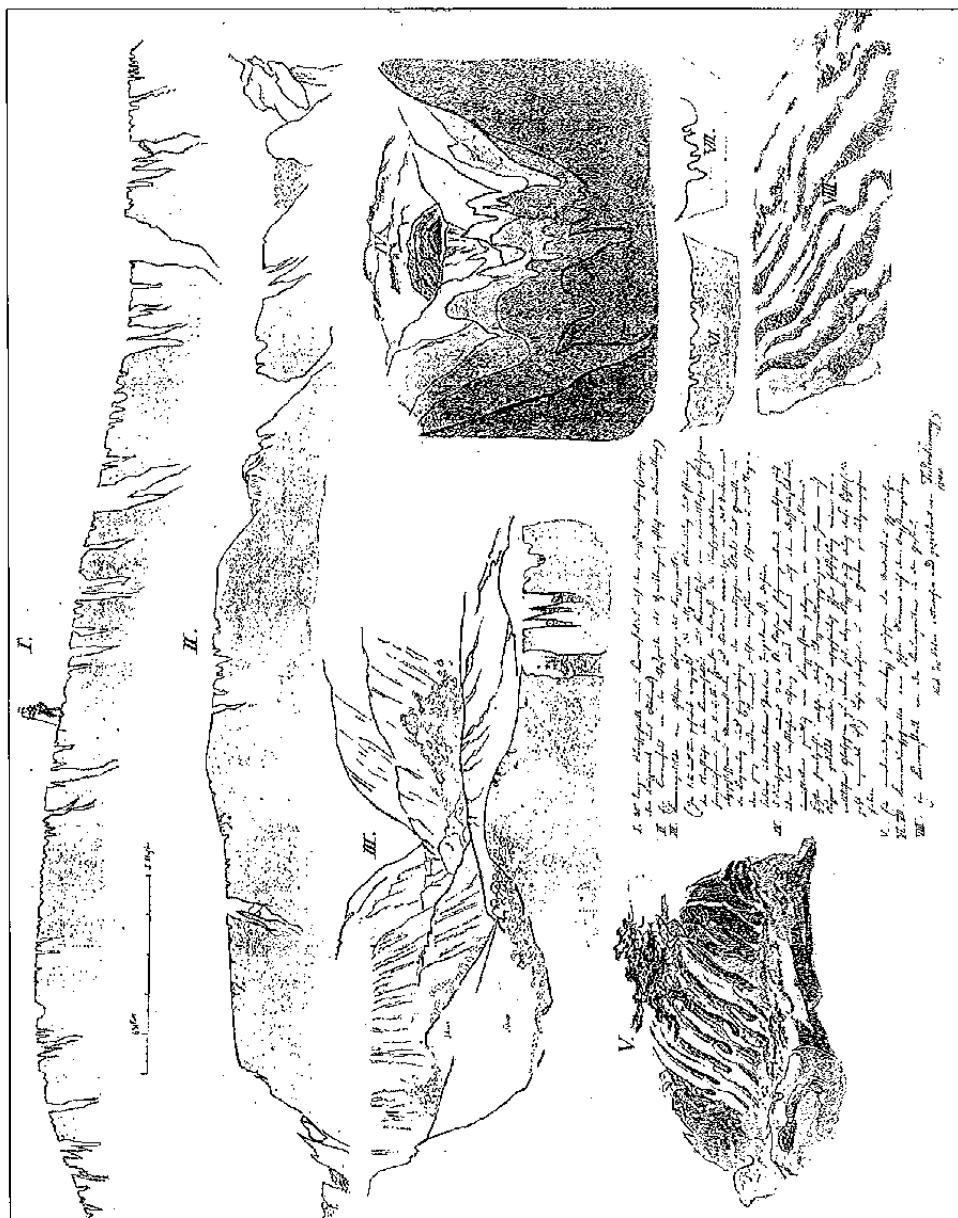


Fig. 1: Karren-Poster by Friedrich SIMONY 1844. Different views of karren in didactic combination with explananetary legends. See translation on page XXX. Drawing, water coloured, approx. 55x37cm. Archiv des Naturhistorischen Museums Wien: Material SIMONY Blatt Nr. 382.

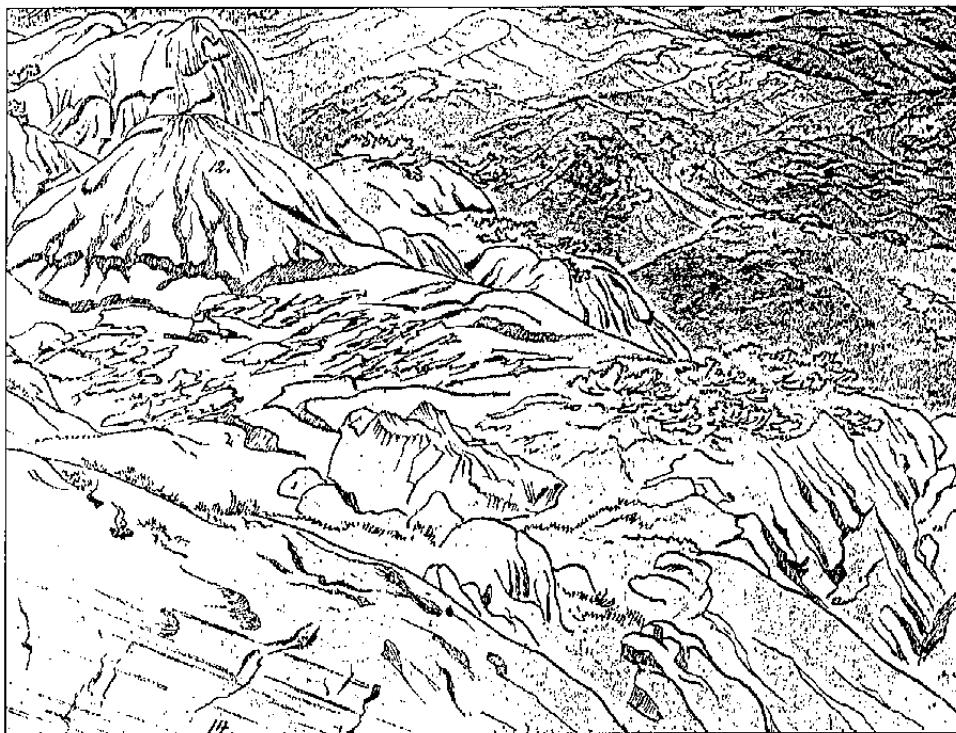


Fig. 2: Presentation of karrenforms: bolder with Firstkarren, "Karrenköpfe" with grooves and subsoilforms. Part of a greater sheet entitled "Zur Charakteristik von altem Gletscherterrain im Kalk Hochgebirge, Aussicht vom Steige von der Ochsenwieshöhe nach dem Taubenkar (Dachsteinplateau)", made in september 1844. At the side are legends explaining items, with number 12 there are "Karrenköpfe" inscribed. Archiv des Naturhistorischen Museums Wien: Material SIMONY Blatt Nr. 338.

SIMONY named practical examples of the development and collapsing of caves from the Nördliche Kalkalpen. He studied the Almbergloch in the Totes Gebirge and the Thiergartenloch in the Dachstein. He had made drawings already in 1845 (Nr.190) and commented on the development of caves at a meeting of the "Freunde der Naturwissenschaften" (HAIDINGER 1847, GRAF 1979). At that time he had little experience, yet he drew justifiable conclusions on this matter (HAIDINGER 1847: 55-59). He made a distinction between primary and secondary caves, the karst caves belonging to the latter. As to basins, gullies and partly also blind valleys (Sacktäler) he believed them to be formations, which owed "their first appearance to the collapse of large primitive or secondary caves". This opinion can only be agreed to in a few cases.

SIMONY did not consider the caves suitable for tourism, in any case not as shelters for alpinists or hikers. Unfortunately there are no diary notes on the "Gschlößlkirche", which he visited in 1844 and where he found fireplaces as evidence of earlier visits. We are in possession of diaries only from 1847 onward. At the occasion of a later visit he explored the cave more thoroughly and found it apt to be used, to a limited degree, as a shelter for tourists. He wrote (1877: 126 right below): "Although .. our experience generally speaks against the use of caves for touristic purposes, the Gschlößlkirche seems to offer favourable conditions for such usage .. however only if any expensive development is avoided, and only the most necessary equipment should be procured." From this statement we can surmise that SIMONY wanted nature to be changed as little as possible, and not "conquered". Changes should not be noticeable within the cave nor on the outside. This attitude may be regarded as a very first attempt of "soft tourism".

One of SIMONY's studies in caves can be traced from his second diary in 1848 (Nr.1756), containing notes on an excursion to the Loserloch on August 3rd. SIMONY took different temperatures during his ascent, inside the cave



Fig. 3: Drawing according to the speleogenetic questions, "Ausseer Gebirge" = Totes Gebirge, 1845, pencil sketch, approx. 55x37cm; Archiv des Naturhistorischen Museums Wien: Material SIMONY Blatt Nr.190. This sketch is also published by GRAF 1979.

he measured 2.2°R ($=2.75^{\circ}\text{C}$). He described the chambers of the cave, made a drawing of the entrance area, as well as the way through the cave, producing a horizontal projection as well as a vertical section.



Fig. 4: The great entrance of Almbergloch, Totes Gebirge, Styria. Pencil. "Bleistiftzeichnung nach der Natur von F. SIMONY im Jahre 1845". Archiv des Naturhistorischen Museums Wien: Material SIMONY. This drawing was used on end of the 70ths up to the early 80ths as cover of the local cavers journal "Mitteilungen der Sektion Ausseerland des Landesvereins für Höhlenkunde in Steiermark".

The graphic work

From the rich fund of drawings by Friedrich SIMONY one item (Nr.382) from 1844 is presented here. It is neither a picture nor a drawing, but a poster - in modern sense. This poster on karren in the high mountains is titled "Profiles and Views of the Karren in the Dachstein Area" (*Durchschnitte und Ansichten von Karren aus dem Dachsteingebirge*). It is made on a sheet of drawing paper, size of 39x54 cm, several water coloured sketches are placed together.

Two sections show karren, ravines of different width cut deeply into the limestone layer (I. and II.). Below to the left we find a view through a "Karstgasse" (III.) Various types of karren have developed in horizontal and steep vertical parts of rocks. Below there is a water color drawing of a "Karrenkopf" (V.) with vegetation on top of it, clearly showing karren. The right side of the poster shows five profile sections of a "Karstgasse" (IV) leaning to the entrance of a cave. The section clearly shows the variability of karren types. Below there are two more profile sections of karren (VI und VII). The text in between runs as follows:

The original text of the poster in translation:

- I.: 30° (=Klafter) long section of a karren field (*Karrenfeld*) in the Dachstein mountains (between Krippeneck and Tenneck).
 - II.: A karren field on the west side of the Speikberg (east of Däumelkogel).
 - III.: Karren formations (*Karrengebilde*) on the eastern slopes of the Krippeneck. (In I., II. and III. the rounding and flattening of the surface of karren and karren fields (*Karrenfelder und Karrenköpfe*) seems to be a product of ancient glaciers. In II. and III. the scated marble spots and layers point to that as well as the deposition of erratic boulders and gravel in a vast terrain surrounded by higher areas covered with vegetation.
 - IV.: 5 sections of a 3-4 Klafter deep rock pit running from a small cave through the western slope of a ridge south of Krippenstein. The cave was formed by water erosion probably as a product of ancient glacier water running through the cave (now filled with sand).
 - V.: A peculiar *Karrenkopf* between Modereck- and Gjaidalpe.
 - VI., VII.: Karren sections (*Karrendurchschnitte*) on the high Dürren in the Dachstein.
 - VIII.: A karren spot (*Karrenfleck*) from the Brunngräben in Gosau.
- Composed true to nature and painted by F. Simony 1844.

The sheet Nr.382 was composed apparently for didactic reason to show the variety of karren types. In the large section through the karren fields there is a human figure drawn, also a yardstick of 9 Klafter (= 9,48m) length. The backstage presentation of III. and the several profile sections in IV. try to

present the different appearances of karren in a perspective or geometrical way. These combined illustrations were obviously composed for a lecture on this topic. The conspicuous numbering of each drawing on the poster shows the documentary/didactic purpose of the illustration.

Contributions to glacier speleology and other items of karstology

SIMONY was fascinated by the investigation in glacial areas, also he found interest in glacier caves. His observations thercof date back as far as 1840. At the 4th Int.UIS Symposion on glacial caves a special paper is presented.

It must be mentioned that SIMONY compared his earlier drawing with later photos, to assess the dynamic changes of ice and glacier status. For other comparisons he did not use his material. This was done later by the scientists of the Speleological Institute in Vienna. In the karst research program of this institute, especially from 1950 onward, SIMONY's photos were used for comparative studies of plant development in this karstregion. Georg KYRLE (around 1930), as well as Fridtjof BAUER made new photos in these places. Otto CECH analyzed the dynamics of the vegetation with plant-sociological methods (BAUER 1958). Such investigations are still being carried out.

SIMONY's drawings and photos

His drawings, water color paintings and photos are documents of karst and caves that have not yet been given a satisfactory classification. The bibliography set up by BÖHM in 1899 and of late by KAINRATH in 1993 offer a step for beginning. In SIMONY's graphic work several karst regions are presented. It contains the Polauer Berge, the limestone alpine regions of Lower Austria Styria, Upper Austria, Salzburg, than karst massifs like Schneeberg, Rax, Hochschwab, Totes Gebirge, Dachstein, Schafberg, Tennengebirge, Steinernes Meer, Watzmann, as well as the regions of the southern limestone alps in Carinthia and Krain (Slovenia). Besides that we must mention the pseudokarst areas of the Riesengebirge.

The first karst object drawn by SIMONY was the chasm of the Mazocha in Mähren on a water color painting in 1830. Other karstobjects he draw in the early fieldwork in the Totes Gebirge and the Dachstein. Karren and dolines are shown on gearter pictures with a high exactness, also springwater and caveparts like Waldbach, Hirschbrunn, Kessel, Koppenbrüllerhöhle.

The early drawings and graphic works of F. SIMONY still show a little clumsiness, but SIMONY soon reached great perfection. In order to draw the landscape true to nature he used a frame, and only for the sky and the clouds he permitted himself a certain artistic touch. Later on his drawings became more and more precise and less artistic, as SIMONY refrained from painting the sky and artistic manipulations. On his drawings he made captions emphasizing the documentary character of the pictures. With the help of a drawing

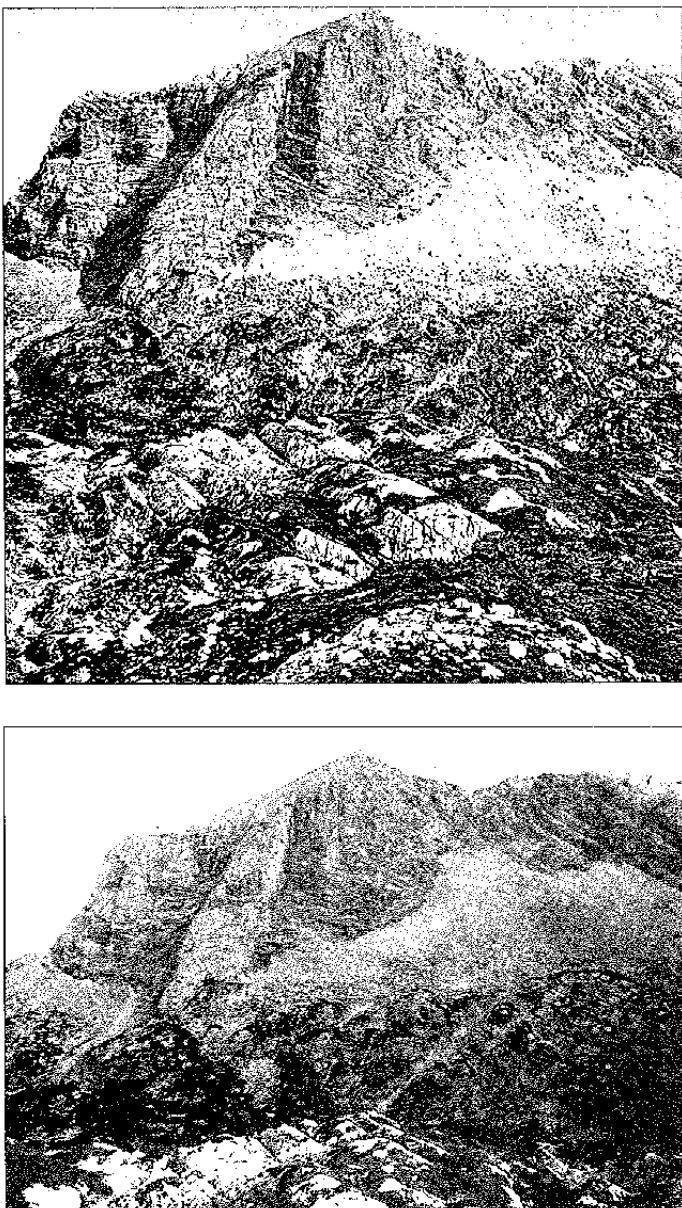


Fig. 5: Taubenkogel, view from Ochsenwieshöhe (1989m), the photograph a: taken by F. SIMONY 1875-08-12 (SIM XXV, SP.J. 35) and b: by F. BAUER 1955 (SP.J. 481) were used in studies on changes of karst vegetation (O. CECH & F. BAUER).

aparatus, he had developed himself, and the systematic superelevation of the relief his pictures became purely documentary. This becomes evident when he makes objective pictures from his photos.

Apart from the documentary drawings and photos SIMONY also painted idealizing pictures. On the one hand they were character sketches of landscapes, where he focused on composition and included the portrayal of clouds, on the other hand they were expressive teaching material for his lectures at the university. With his photos he used retouch techniques to stress parts of the pictures that lacked clearness. Thus he emphasized indistinct contours caused by under-exposure or over-exposure, and added suitable skies. He used this kind of picture improvement in his "Dachsteinwerk".

Final remarks

Friedrich SIMONY's speleological works are numerous and were presented in a small scale only. Their high value would favor a closer study of this scientist's achievement. The importance of his research for scientific speleology is only partly known. His publications, drawings and diaries should be studied and presented, as his life's work is practically unknown, but still valuable today.

The results of SIMONY's research had a substantial impact on his colleagues, his students as well as on other contemporaries. His work was reflected in the scientific literature of his time, and its contents became part of common knowledge. Especially the knowledge he conferred in his lectures and speeches was carried on in the educated circles of the 19th century. Therefore references are rarely to be found in contemporary literature. In 1898 JOVAN CVIJIC mentioned SIMONY's reports on karren and dolines. Later on, in 1913, BOCK, LAHNER and GAUNERSDORFER refer to him in "Die Höhlen des Dachstein" ("The Caves of the Dachstein"). Recently his work has been recalled to a certain extent. In 1977 SEEMANN gave proper attention to his work of the Dachstein area, and GRAF (1979) to that of the Totes Gebirge. Yet SIMONY's field work is not only important for retrospective, but also for actual research - as introduced and presented by G. KYRLE and Fridtjof BAUER, who compared his pictures with modern ones of the same sites. Today SIMONY's historic material is of great importance for research in the field of speleology. Only a minor part of it has been evaluated so far. In SIMONY's memorial year many of his works will appear accompanying publications and exhibitions. SIMONY's work will be acknowledged to a greater extent, see also the catalogue for the exhibition in the Landesmuseum Linz (SPETA & AUBRECHT 1966, with contributions by Franz GRIMS among others).

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FRIEDRICH SIMONY (1813-1896) IN NJEGOV PRISPEVEK H KRASOSLOVJU IN SPELEOLOGIJI

Povzetek

F. Simony, ob svoji smrti 1896 znan predvsem kot alpinist, naravoslovec in geograf, se je ukvarjal tudi z glaciologijo in speleologijo, še posebej v pogorju Dachstein v avstrijskih Alpah. Térensko delo je dopolnjeval z lastnimi risbami, posnetimi po naravi, ki jih je kasneje uporabljal kot ilustracije pri objavah in predavanjih. Danes je njegovo speleološko delo zelo slabo poznano. Vendar je že 1842 apneniške planote imenoval "kraška območja". Ukvarjal se je s kraško hidrologijo in morfologijo. Tako je preučeval hidrologijo jame Koppenbrüller ter sosednjih kraških izvirov na severnem obrobju Dachsteina, meril je temperature vode in zraka v jamah, preučeval vodni transport trdnega in raztopljenega tovora, intenzivnost korozije tako v kraškem podzemlju kot tudi na površju, itd. Danes lahko ocenujemo njegovo delo predvsem po njegovih objavah in risbah. S svojim poročanjem v znanstvenih družbah in s svojimi predavanji na univerzi je bistveno pripomogel k uveljavitvi dunajskega geografskega inštituta, kjer ga je nasledil Albrecht Penek, kot profesor fizične geografije, in kjer je končal študije tudi J. Cvijić. F. Simony je bil tisti, ki je v drugi polovici 19. stoletja zelo veliko pripomogel k uveljavitvi in popularizaciji speleologije.

GEODETIC SURVEY OF POSTOJNA CAVES IN 1891 BY J. SCHMID

SCHMIDOVA GEODETSKA IZMERA POSTOJNSKE JAME LETA 1891

KARL MAIS¹

Izvleček

UDK 091:551.44(497.4)“1891”

Karl Mais: Schmidova geodetska izmera Postojnske jame leta 1891 - Prispevek k transkripciji dokumentov, pisanih v gotici, pomembnih za zgodovino speleologije

V zvezci s preučevanjem speleološke dokumentacije sta se Inštitut za raziskovanje krasa (Postojna) in Oddelek za jame in kras dunajskega Naravoslovnega muzeja lotila projekta - transkribiranje nemških rokopisnih dokumentov, pisanih v gotici. Prvi primer je zapis geodetsko izmere Postojnske jame iz 1891 J. Schmid-a iz knjižnice na Dunaju. Trenutno so v transkribiraju dokumenti iz lastnih arhivov (F. Simony, G. Abel), načrtujejo še transkripcijo pisem in dokumentov F. Krausa, A. Silberhuberja, W. Puticka iz arhiva Inštituta za raziskovanje krasa.

Ključne besede: zgodovina speleologije, jamomerstvo, dokumentacija, Avstrija, Slovenija, Postojnska jama, Schmid J.

Abstract

UDC 091:551.44(497.4)“1891”

Karl Mais: Geodetic survey of Postojna Caves in 1891 by J. SCHMID - about the transcription of handwritten (“kurrent” - “german script”) speleohistoric documents.

For the purpose of speleo-documentation a project was started by the Karst Research Institute (Postojna) and the Department of Karst and Caves of the Museum of Natural History (Vienna) to transcribe documents in German Script into normal. A first transformation was made with geodetic survey record of the Postojna Caves in 1891 (“Berechnung der Adelsberger u. Ottoker Grotten - Vermessung... ausgeführt im Jahre 1891”) by J. Schmid, from the cave department library in Vienna. Now documents from our collections (F. Simony, G. Abel) are transcribed for further investigations. A greater project to transcribe the letters and documents from the archives of the Postojna Karst Research Institut (F. Kraus, A. Silberhuber, W. Putick) is foreseen.

Key words: history of speleology, cave survey, documentation, Austria, Slovenia, Postojnska Jama, Schmid J.

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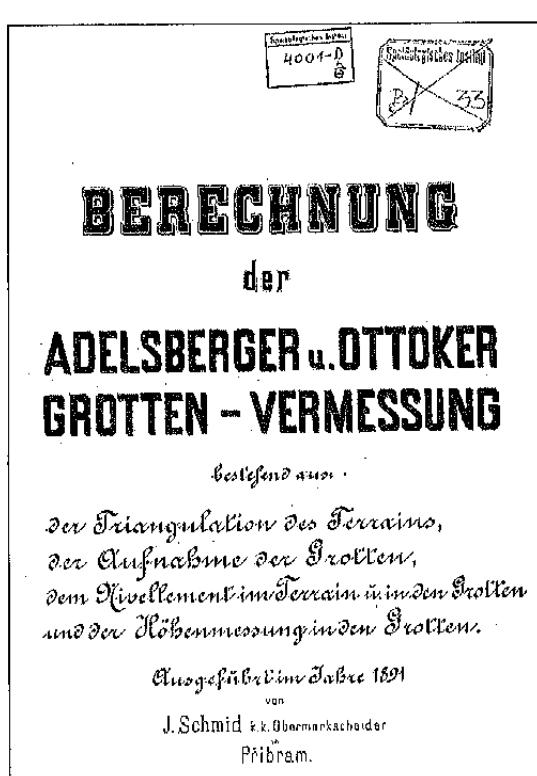
About handwritten data

Handwritten documents do constitute the most important sources for works about the history of speleology. Although it is rather difficult to work with these sources due to "old fashioned" expressions and older hardly legible fonts. Especially young researchers face difficulties when dealing with documents which are written in gothic letters. Naturally for foreign researcher the comprehension of such original documents is even more arduous.

Projects concerning the transcription of historic documents

The Institute for Karst Research of Postojna and the Department of Karst and Caves of the Museum for Natural History Vienna do intend to transcribe and transform the documents concerned into a more comprehensible form in order to ease source research. Hence translation and interpretation will be less challenging.

Josef SCHMID: "Vermessung der Adelsberger Grotten"



Certainly the transcription of the by Josef SCHMID of Příbram penned protocols was a paying subject. These protocols of 1891 were calligraphical transcribed ("mundiert") by Karl KORB in 1892 (Fig. 1).

The protocol was written in a leather bound blank book. The embossed cover carries the title "Vermessung der Adelsberger Grotten 1891". The content of the first page is as follows: "Berechnung der Adelsberger und Ottoker Grotten - Vermessung bestehend aus: der Triangulation des Terrains, der Aufnahme der Grotten, dem Nivellement im Terrain und in den Grotten und der

Fig. 1: Title page of the geodetic survey of Postojna caves in 1891 by J. SCHMID (1892: page 1).

Differenzierung über 1 mm. kleinste Einheit.
Die auf das Horizontal reduzierte Länge beträgt:
257116.3 mm; log E = 5.4101296.

Fan-zeile	Tabelle	Schmiede, mm/m.	reduzierte Länge.
ab - 1	0	20	20973.8
1 - 2	2	08	20728.2
2 - 3	1	15	21255.2
3 - 4	2	12	22731.0
4 - 5	2	12	22718.7
5 - 6	1	58	25303.6
6 - 7	0	30	22436.0
7 - 8	0	10	22766.2
8 - 9	0	17	23556.2
9 - 10	2	50	23256.6
10-B	2	20	26320.0
			257216.5
			257116.3

Triangulations Skizze.

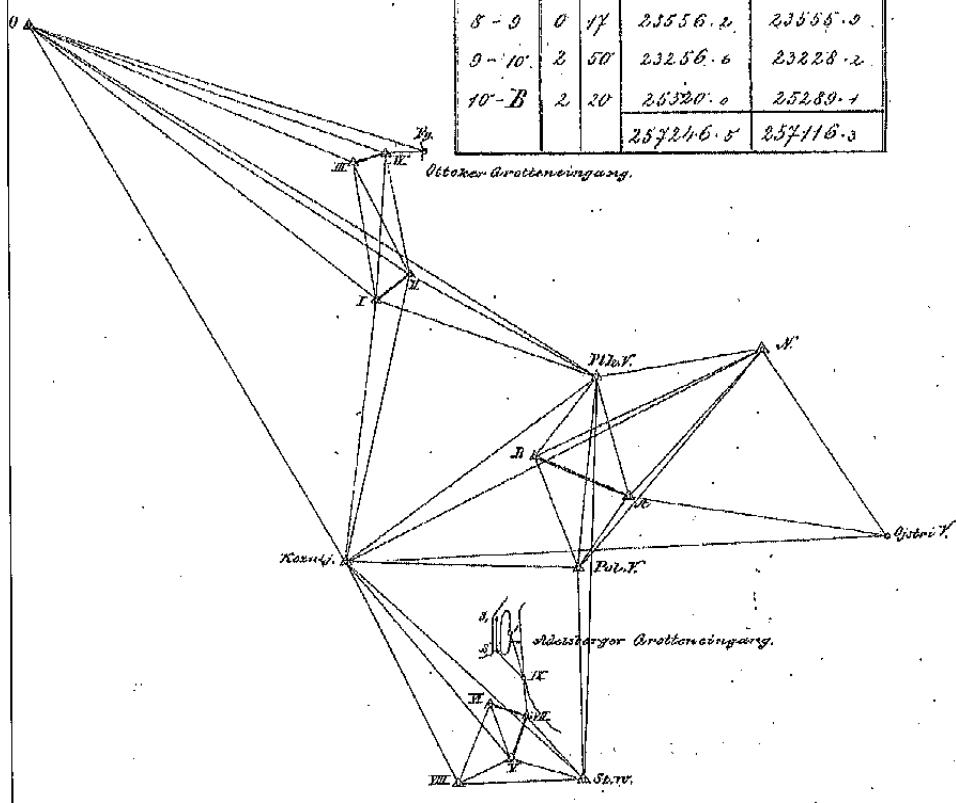


Fig. 2: Triangulation; example for the use of different fonts, of tabular layout and geodetic drawings; (SCHMID 1892: page 8).

Höhenmessung in den Grotten. Ausgeführt im Jahre 1891 von J. SCHMID "k.k. Obermarkscheider in Příbram; mundiert: Karl KORB."

Texts and tables are written in calligraphic fonts. Headings and heightenings are written in Latin fonts and in black ink, normal text in gothic letters and in a dark brown ink. The various tables come in different layouts and fonts, nevertheless, the layout is very clear. The tables are framed single or double line and are red (Fig. 2).

The polygonal sketches of the survey afield are clear original drawings. The points of survey are named in local language and enclose "*Ojstri vrh*", "*Polane*", "*Polanski vrh*", "*Kozulj vrh*", "*Visuren zum Kreuz der Kirche 'St. Andrä'*", the church towers of Adelsberg and the entrances of the caves "*Adelsberg*" and "*Ottoker*". The lines are black and sometimes red or in different colors. See Fig. 3 and 4.

The surveys afield and of the principal polygon in the interior of the caves were done with a smal mining instrument, a "*kleiner Gruben-Theodoliten von Aug. LINGKE et Co.*" The side aisles were measured with a bussole. Under-ground the height was determined by leveling (Nivellement). The survey team used 8 meters long battens. In addition they employed a hot air baloon which was fixed on a band. The balloon which had a diameter of 1 meter was driven by spirit drenched ball of wool. By the latter method heights of up to 33

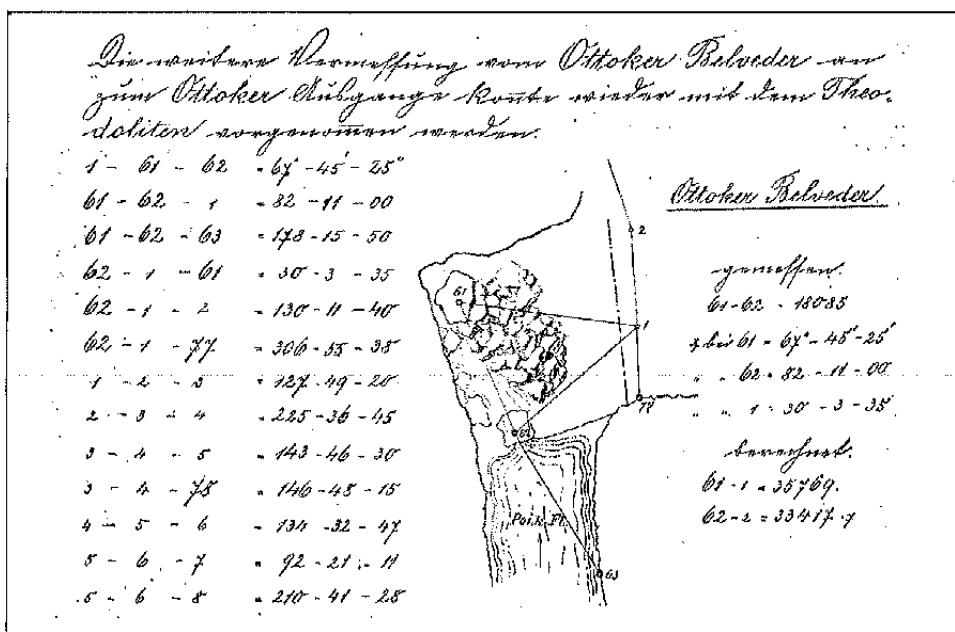


Fig. 3: Measurings in the region of "Ottoker Belvedere"; fonts, tabulations and sketch of the measure point situations (SCHMID 1892: part of page 52).

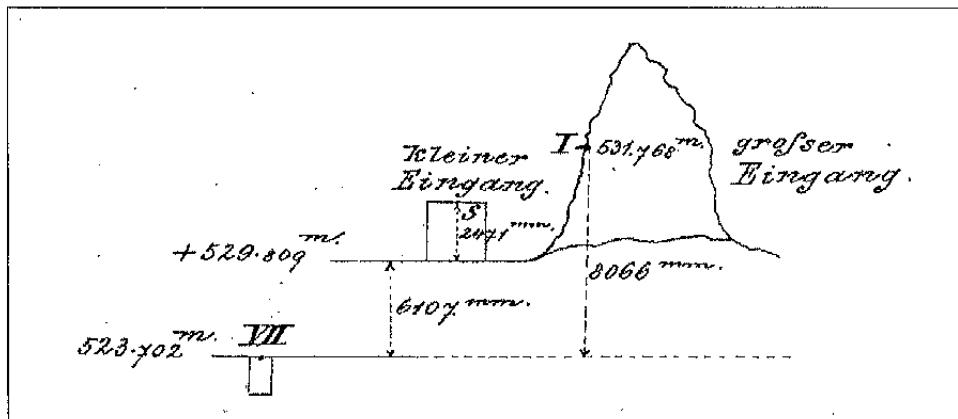


Fig. 4: Sketch of measure points with elevations, Main Entrance of the Postojna Cave; (SCHMID 1892: part of page 81).

meters could be determined, as for instance, the height of the Dome of the Cave of Adelsberg in the river level ("vom Poik-Niveau") and on the "Calvaria Plateau". The survey lists also give evidence of the then used notations for the various rooms.

When performing the transcription of the protocol it was subsequently paginated to enable the relation of textpassages to pages. Furthermore, the gothic writing was converted to a common printed font and normal writing and headings were converted to a bold font. Table contents were only converted if they had been in gothic writing. Numbers were left unchanged. Tables, drawings were numbered. A "T-" (T=Tabelle) stands for table and a "Z-" (Z=Zeichnung) for the drawings. Below the drawing often the description of polygons can be found as well as two index maps of the triangulation which indicate the cave entrances and drafts of some branches of the grotto. Additional remarks, not in the original text, figure between two slashes (/.).

Further amendments of the protocol have not been made. Orthographic idiosyncrasies were left unchanged. The archaic spelling might confuse some readers (for instance "Tor" was then written as "Thor"), but they enables to read or to revert the original text.

The original protocol is stored in the Karst and Cave Department of the Museum for Natural History in Vienna. Most probably it formed part of the stock of the Ministry of Agriculture which then had competencies in speleology and it was a entry gift founding the "Speleologisches Institut" in the 1921. It carries the institute stamp "B-33". Later on, after WW-2 the Speleological Institute was re-established and the library reorganized. The stock of Prof. KYRLE was added to the re-numbered institut's library. Then the number "4001-D" was assigned to the new library list.

According to Andrej KRANJC a sketch of the 1891 survey is stored at the Postojna Institute. Other sketches and drawings of the here presented survey data are not yet ascertained. The big effort made in carrying out the survey, detailed calculations and the makeout of the here presented calculation protocol (sheet) make the official state importance of the Adelsberg Caves clear.

Other documents

Albert AUSOBSKY, a speleologist of Salzburg, left us a report concerning the discovery of the body of Franz RATHSCHÜLER for transcription. Rathschüler died by an accident in the "Frauenmauerhöhle" in Summer 1928. His body was found by the two speleologists Johann GANGL and AUSOBSKY in December 1928. AUSOBSKY's report differs from the official police report, the reporting of the news papers and a report by HOFMANN-MONTANUS (1952) covering the same subject. Albert AUSOBSKY is holder of the original document. A copy of the report is stored with the transcription in the archive of the Department of Karst and Caves - Museum of Natural History Vienna for the purpose of further investigations. According to the will of AUSOBSKY the public does not yet have access to the document, likewise the report is not open for publishing.

Further reports documenting the development of the Salzburg Caving Club are about to be transcribed by its members, as for instance the narrative minutes of the early discoveries in "Bücher der Expeditionen". Thus the younger members will gain interesting insights into the early works of their colleagues. Transcriptions of biographic documents about Walter CZOERNIG could already be used as interesting source for other works (MAIS 1996). The original documents are part of the archive staff "Material Gustave ABEL", stored at the Department of Karst and Caves of the Museum of Natural History Vienna.

Parts of the dairy of Friedrich SIMONY (1813-1896) had been described as they were needed for current research work, e. g. a description of the

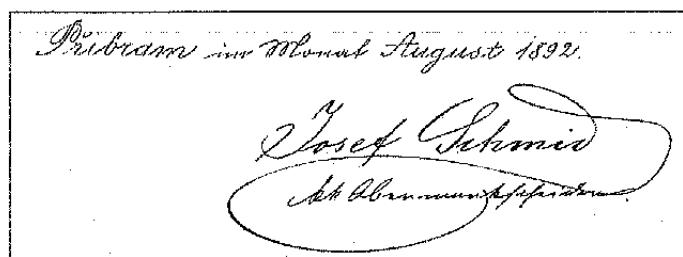


Fig. 5: Closing signature: Pribram im Monat August 1892,
Josef SCHMID k.k. Obermarkscheider"; (SCHMID 1892;
Part of page 102).

"Loserhöhle" of 1848; he drew a sketch of the longitudinal section and of the horizontal projection (Fig. 5). The dairies of SIMONY contain several unpublished speleological observations which are subject to a future subscription. The

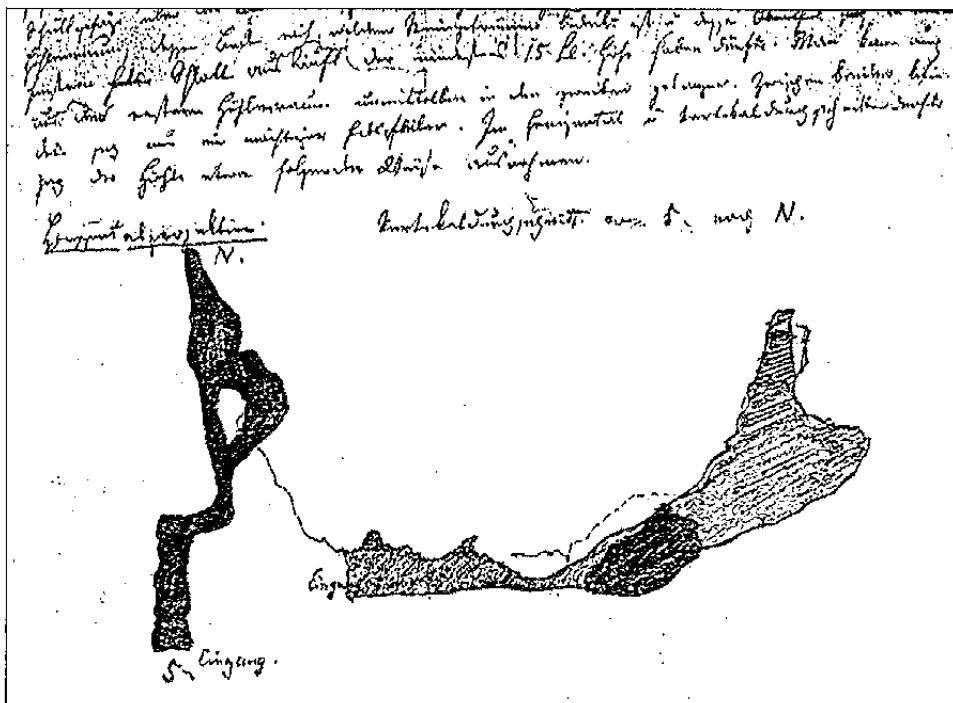


Fig. 6: Map of Loserhöhle in horizontal and vertical projection ("Horizontalprojektion und Vertikaldurchschnitt von S nach N."); F. SIMONY's diary (Nr. 1756) with the date of 3rd of august 1848, description of Loserhöhle; Original stored in the Department Archive of the Museum of Natural History Vienna.

respective documents are stored in the Archive - Department of the Museum of Natural History, copies of parts with speleological content can be found in the archive of the Karst Department in Vienna.

The transcription of the archive records of the Institute for Karst Research in Postojna constitutes a major project. It is still in its beginnings. The documents concerned will reveal interesting details with respect to the "Karst-Comités" as the correspondence of F. KRAUS, A. SILBERHUBER, W. PUTICK and others will be examined. Andrej KRANJC presented some of these documents at the ALCADI-94 Symposium in Semriach. Major revealings could not be made. The documents examined so far deal with the field work and frequent financial problems. The examination of these documents will offer a clearer picture of the local research work as it currently available reports do. The original documents are stored in the archive of the Institute for Karst Research in Postojna. Photocopies are kept in the Karst and Cave Department of the Museum in Vienna. The documents will be transcribed and indexed in a data base for easier information retrieval.

CONCLUSION

The Department of Karst and Caves (Vienna) offers interested colleagues the transcription of gothic writings (kurrent od german script) which are in the context with speleology or the biography of speleologists. These writings can be dairies, tourbooks, letters, post cards, biographical notes, etc. Thus we hope to save documents which otherwise would be lost due to their illegibility.

We suggest to store the original document with its owner and to deliver a copy of the original document and its transcription to the archives of official Karst Research Institutes. This would guarantee a competent source research and a save backup of the documents concerned. Archives in question are the respective institutes of Budapest, Postojna and Vienna.

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SCHMIDOVA GEODETSKA IZMERA POSTOJNSKE JAME LETA 1891 - PRISPEVEK K TRANSKRIPCIJI DOKUMENTOV, PISANIH V GOTICI, POMEMBNIH ZA ZGODOVINO SPELEOLOGIJE

Povzetek

Dokumenti, pisani v gotici, četudi v nemščini, često povzročajo težave preučevalcem zgodovine speleologije. Nekatere rokopise oziroma črke je težko brati celo v materinem jeziku. Iz leta v leto je manj ljudi, še posebej mladih, ki znajo brati nemščino, pisano v gotici. V zvezi s preučevanjem speleološke dokumentacije sta se Inštitut za raziskovanje krasa (Postojna) in Oddelek za

jame in kras dunajskega Naravoslovnega muzeja lotila posebnega projekta. Originalni dokumenti, pisani v nemški gotici, bodo transkribirani v "normalno" pisavo in jih bodo lahko preučevali in uporabljali celo taki, ki bolj slabo obvladajo nemščino. Prvi primer takega dokumenta je zapis geodetske izmere Postojnske jame iz 1891 (Berechnung der Adelsberger u. Ottoker Grotten - Vermessung... ausgeführt im Jahre 1891), ki jo je opravil J. Schmid. To natančno geodetsko poročilo kaže tudi na tedanji pomen Postojnske jame. Original hrani oddelek za jame knjižnice na Dunaju.

Trenutno so v transkribiranju, pripravljeni za nova preučevanja, dokumenti iz zasebnih zbirk, kot je npr. rokopisno poročilo A. Ausobskega o odkritju trupla F. Rathschülerja v jami Frauenmauer, dokumenti salzburškega jamarskega društva in dokumenti iz lastnih arhivov (o F. Simonyju, G. Ablu, itd.). Več dela bo potrebnega za transkripcijo pisem in dokumentov F. Krausa, A. Silberhuberja, W. Puticka in drugih, ki so shranjeni v arhivu Inštituta za raziskovanje krasa. To so dokumenti o delu nekdanjega "Kraškega komiteja" na Krasu v 1880tih in 1890tih letih.

Tako so oziroma bodo strokovnjakom za zgodovino speleologije dostopni transkribirani dokumenti, pisani v nemščini in gotici. S tem bo omogočena priprava prispevkov, pomembnih tako za dokumentacijo kot za raziskovanje zgodovine speleologije.

ABBILDUNGEN DER VETERANI-HÖHLE AUS DEM 17.-18. JAHRHUNDERT

UPODOBITVE JAME “VETERANI” IZ 17. IN 18. STOLETJA

KLÁRA PATAY¹

Izvleček

UDK 94(436-89)“16/17”

Klara Patay: Upodobitve jame “Veterani” iz 17. in 18. stoletja

Prispevek govoriti o zemljevidih in drugih upodobitvah jame Pescabara (Veterani) iz 17. in 18. stol. Jama leži na bregu Donave v bližini Železnih vrat. V času “turških vojn” so bile v bližini hude bitke v letih 1692 in 1788 in zato je cesarska vojska jamo utrdila. Danes je jama pod vodno gladino akumulacijskega jezera.

Ključne besede: zgodovina spelkologije, utrjena jama, Romunija, Pescabara (Veterani).

Abstract

UDC 94(436-89)“16/17”

Klara Patay: Illustrations of Veterani cave from 17th and 18th century

The article is treating maps and other illustrations of the cave Pescabara (Veterani) from the 17th and 18. centuries. The cave is in the bank of Danube, near Iron gate. In 1692 and 1788, during the “Turkish wars” there were hot battles nearby and therefore the emperor’s army fortified the cave. Today the cave is under the water of the accumulation lake.

Key words: history of speleology, fortified cave, Romania, Pescabara (Veterani).

¹ Rákóczi út 19, HU - 1088 BUDAPEST, HUNGARY

Die zwei Kaiser - namentlich der deutsch-römische und der türkische - standen während des 16., 17. und 18. Jahrhunderts wiederholt im Kriege. Im Laufe dieser war eine Höhle sogar zweimal der Schauplatz von heftigen Kämpfen. Das war die Pescabara-Höhle, am linken Ufer der Donau, in der Kazan-Eng, 22 km südwestlich von Orsova.

Den erfolglosen Angriff von Wien im Jahre 1683 folgend bemühte sich das kaiserliche Heer durch langjährigen Feldzügen Ungarn, dessen ein drittel unter türkischen Herrschaft stand, zu befreien. Im Laufe dieser hat 1691 der in Siebenbürgen tätig gewesene, aus Venedig gebürtige General Friedrich Veterani die Gegend des Eisernen Tores besetzt. Da die Donau war für den Türken ein wichtiger Nachschubweg für die strategisch besonders bedeutende Festung Belgrad, hat er die Pescabara-Höhle für ein Stromsperr-Fort bestimmt. Deswegen wurde sie später durch die wiener Heeresleitung Veterani-Höhle benannt. Diese Stelle war für eine Stromsperr besonders geeignet, da die Donau war an dieser Stelle nur 19 m breit, so konnten die stromaufwärts fahrende Schiffe den Kanonen leichten Ziel dienen.

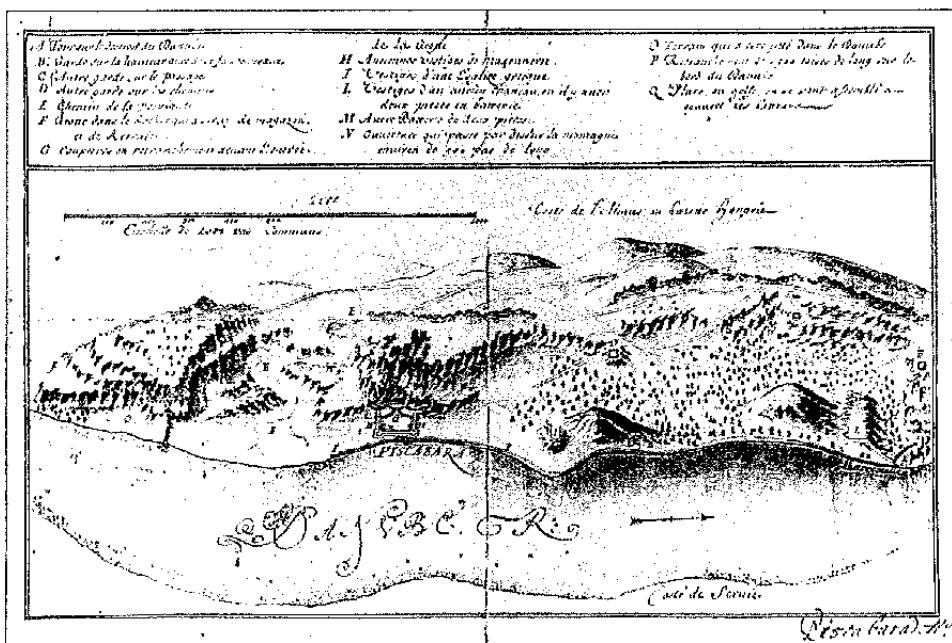


Abb. 1: Die Gegend der Veterani-Höhle. Anonyme Karte, 1692. Kriegsarchiv, Wien, Inv. Nr. H. III. e. 185.

Im folgenden Jahr, das heißt 1692 begannen die Türken einen Gegenangriff. General Veterani stellte für die Stromsperre eine Wache von 300 Mann und 5 Kanonen unter der Kommandatur vom Hauptmann D'Arnan auf. Am 29. März belagerten die Türken die Höhle und den darüberliegenden Berg, doch erfolglos. Ebenso vergeblich blieben die Angriffe am 15. und 27. April. Doch am 2. Mai rückten sie mit vielen Schiffen auf. Die ans Land gestzste türkische Infanterie - 2000 Mann - bestiegen den felsigen Berg - womit d'Arnan hat nicht gerechnet - und besetzten ihn. Die Verteidiger zogen in die Höhle zurück. Die Türken blockierten den Eingang der Höhle, gleichzeitig beschossen sie ihn mit Kanonen vom rechten Flußufer. Dadurch angeregt war D'Arnan gezwungen am Abend unter Bedingung von freiem Abzug zu kapitulieren.¹

Die Veterani-Höhle wurde im Türkenkrieg Josefs II. erwiedert Schauplatz von Kämpfen. Der Kaiser erklärte als Verbündeter der russischen Zarin Katarina am 9. Februar den Krieg. Bis die Hauptarmee bereitete sich unter der persönlichen Kommandatur des Kaisers in Syrmien für die Belagerung von Belgrad, wurde aus den anderen Truppen eine Kordon von der Adria entlang der Sau, der Donau und den Karpaten bis Moldau aufgestellt. Eine Wachstation dieser bildete die Veterani-Höhle. Sie wurde durch den Major Stein mit einer Division des Bréchainville-Regimentes und zwei Companien des Wallachisch-illyrisches Grenzregimentes so auch mit Kanonen des 2. Artillerieregimentes (ihre Zahl - 11-17 ist abweichend in den Angabenquellen). Diese wurden teilweise in den Redouten (Schanzen) von dem Eingang der Höhle, teilweise in denen entlang der Donau und teilweise auch am Berg über die Höhle aufgestellt. Das türkische Heer, unter dem Großvezir Pascha Jusuf, welches für die Entsetzung von Belgrad aufrücken sollte, verändernd seinen ursprünglichen Plan, überschritt am 7. August bei Orsova die Donau, drückte die kaiserlichen Truppen von dort und aus der einige km weiter hinten liegende Wachtstation Schupaneck (Jupalnic - Rumänien) zurück und am 10. unternahmen sie mit 36 Tschaiken (Schiffe) einen Angriff gegen die Höhle. Das wurde noch zurückgeschlagen. Doch der während der Nacht mit großer Übermacht - 5000 Männer - aufrückende Feind eröffnete am nächsten Tag, das heißt am 11. August eine neue Aktion gegen die am Berge sich befindliche Stellungen. An diesen konnten die Verteidiger schon nicht mehr widerstehen. Nach dem Verlust von 400 Männer zog Major Stein mit dem Rest seiner Division in die Höhle zurück. Inzwischen wurden zwei Röhren der auf den Berg aufgestellten Kanonen eingenagelt und von ihren Lafetten abhebend in die Tiefe hinuntergeworfen.

Während beinahe drei Wochen lang war die Höhle heldhaft verteidigt, doch wegen an Mangel der Besatzung, auf den dritten angebotenen Accord der Türken, übergab sie unter Bedingung von freiem Abzug Major Stein ihnen. Die Offiziere konnten ihre Seitengewährle und Pistolen behalten. Infolge dessen sind die kaiserliche Truppen entlang der Donau bis Belgrad aus ihre

Wachstationen zurückgezogen. Wegen ihre bei der Verteidigung bestätigte Tapferkeit wurde Hauptmann Machowatz aus dem Wallachisch-illyrischen Grenzregiment zu Major, und Artillerie-Leutnant Foitte zu Oberleutnant befördert und auch mit dem Maria-Theresia-Orden ausgezeichnet.²

Die Verteidigung der Höhle fand einen großen Widerhall im Deutschen Kaiserthum; schon im nächsten Jahr wurde in Frankfurt und Leipzig ein Büchlein verlegt mit dem Titel "Die Geschichte der Veteranischen Höhle".

Im Zusammenhang mit den beiden Anlässen wurden Karten, Ansichten hergestellt. Von diesen bewahrt die Széchényi Nationalbibliothek in Budapest 3, das Kriegsarchiv in Wien 20 Exemplare. Ausser diesen kennen wir noch eine Abbildung in dem in Wien im Jahre 1790 erschienenen Atlas "Schauplatz des oesterreichisch-russisch türken Krieges".

Unter den in Wien bewahrten Exemplaren steht ein mit den Kämpfen von 1692 in Zusammenhang. Es stellt die Umgebung der Höhle vor, halb ansichtsartig. Die Öffnung der Höhle ist aufgezeichnet, doch noch unter dem Namen Piscabara-Höhle, so auch Schanzen entlang der Donau und vor dem Eingang.³

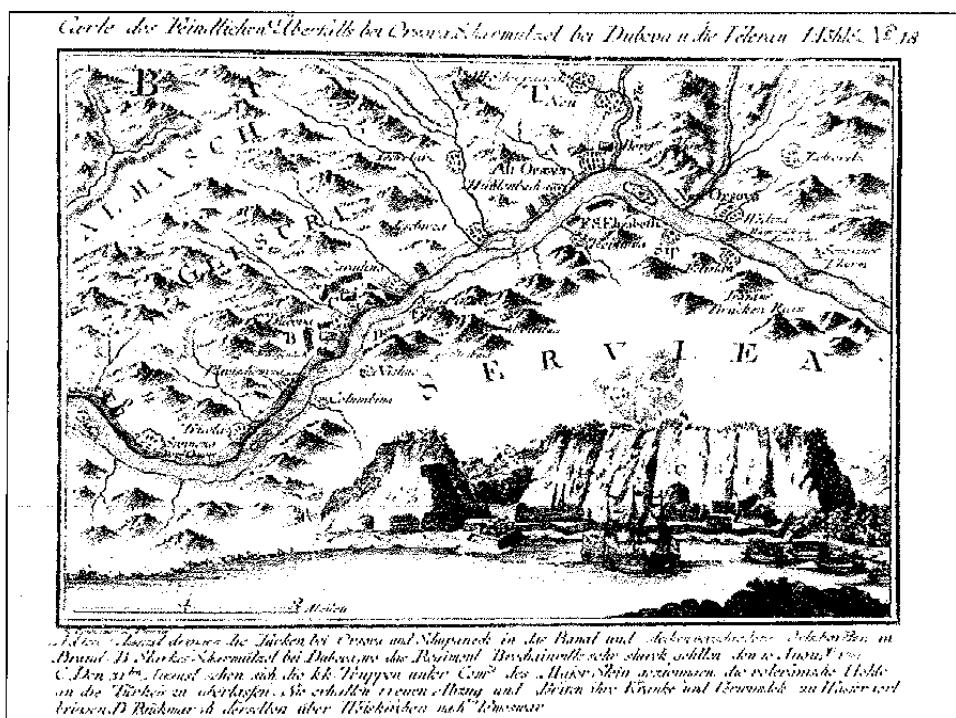


Abb. 2: Karte der Umgebung der Donau zwischen Svinita und Turnu Severin und Ansicht der Veterani-Höhle. Blatt 18. eines anonymen Atlases, Wien 1790, Széchényi Nationalbibliothek, Budapest, Kartensammlung, Inv. Nr. TA 55.

Sämtliche andere Abbildungen sind mit den Kämpfen von 1788 in Zusammenhang. Eine ist eine Ansicht, die die Umgebung von der Donau aus sehend vorstellt.⁴ An einer anderen befinden sich vier Ansichten, von denen zwei bilden den wegen Verteidigungszwecke vermauerten Eingang ab, doch in zwei verschiedenen Formen.⁵ Einen Ansicht treffen wir auch an den erwähnten Atlasblatt, neben der Karte von einem längeren Abschnitt der Donau.

An weiteren 19 Blättern finden wir die Karte der näheren Umgebung der Höhle mit den Redouten, Retrenchments (Schanzen) entlang der Donau und am Berg über die Höhle, so auch die Stellungen der kaiserlichen und türkischen Truppen vor und nach der Schlacht vom 11. August.⁶

Von der Höhle selbst - was uns besonders interessiert - finden wir auch Abbildungen, und zwar Grundrisse und Profilschnitte. An zwei Blättern befinden sich diese allein,⁷ an neun anderen (von denen aber drei als Duplikate zu betrachten sind)⁸ dieselben als Nebenabbildungen der Karten. An diesen ist aber die Höhle in drei Variationen abgebildet.

In den meisten Fällen⁹ ist der Grundriß in einer ellipsoiden Form gezeichnet, in den ein 4 Klafter und 3 Fuß langer, 2 Klafter breiter und 4 ein halb

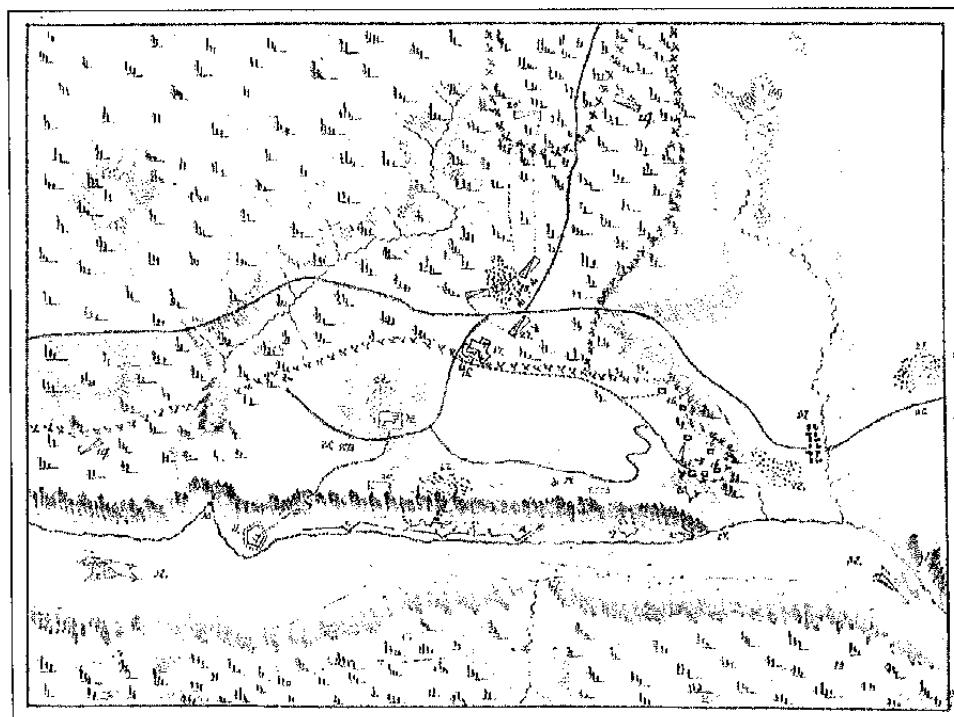


Abb. 3: Die Umgebung der Veterani-Höhle. Anonyme Karte, nach 1789. Széchényi Nationalbibliothek, Budapest, Kartensammlung, Inv. Nr. TK 90.

Fuß hoher Gang führt. Der innere Raum hat eine Ausdehnung in der Richtung des Einganges von 12, darauf senkrecht von 16 Klaftern und 3 Füsse. Rechts vom Eingang ist eingezeichnet der Backofen, an der östlichen Wand der Herd, hinten, in der Mittellinie der Brunnen. An der westlichen Seite finden wir eine vermauerte Höhlung; das Pulver-Magazin. Der Boden der Höhle steigt nach hinten; nach der Beschreibung ist er sehr uneben. Im östlichen Profil ist auch ein Loch bezeichnet, woraus das Licht "in die Höhle fällt."¹⁰

An zwei anderen Blättern ähnelt der Grundriss an einen Rechteck mit abgerundeten Ecken. Die Einteilung des Raumes weicht auch vollständig von den obigen ab. Es befindet sich kein Eintrittsgang und an der westlichen Seite auch keine kleine Höhlung. Doch der große Raum wird durch Mauern geteilt. Die Tür des vermauerten Einganges öffnet in den "Vorkeller". Links von diesem, in einem "Zimmer" finden wir den Herd. Zu diesem schließt sich das "Gewölb", das heißt das Proviantenmagazin. Links hinten befindet sich das weite Pulvermagazin, rechts, direkt hinter dem "Vorkeller" ist der Backofen. Im mittleren Raum entlang der Wände und in der Mitte sind Pritsche für 250

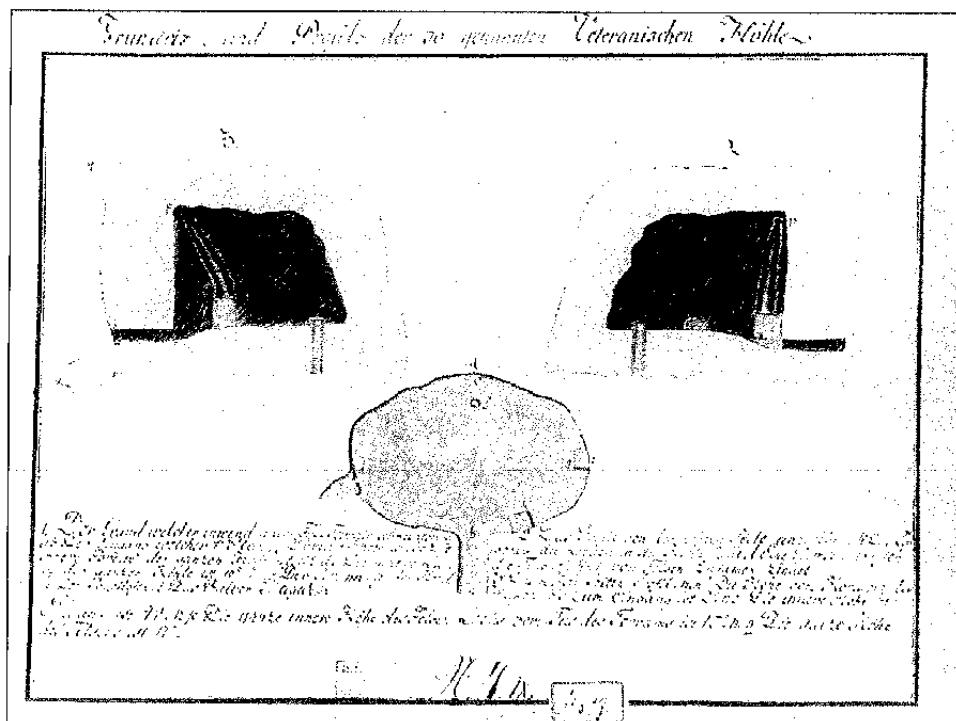


Abb. 4: Grundriss und Profile der Veterani-Höhle. Anonymen Karte, nach 1789. Széchényi Nationalbibliothek, Budapest, Kartensammlung, Inv. Nr. TK 134.

Mann eingezeichnet. Übrigens ist die Höhle für die Beherbergung von 500 Mann geeignet. Auch eine Abweichung vom vorigen Grundriß ist, daß der Brunnen liegt nicht in der Mittellinie. Im Profilschnitt ist der Boden in einem Abschnitt steigend (doch hinten senkend) abgebildet. Die Höhe ist nur ein sechstel der Tiefe, was höchstens 3 und ein halb Klafter bedeuten möchte.¹¹

Es gibt auch eine andere Variante dieses Grundrisses. Sie weicht nur damit vom vorigen ab, daß sie ist weniger Rechteckförmig und ihre größte Tiefe befindet sich nicht an der linken, sondern an der rechten Seite, ihr Boden ist völlig glatt und der Plafon senkt gleichmäßig nach hinten.¹²

Es ist nicht bekannt, wann wurden diese Abbildungen gezeichnet; vor oder nach der Schlacht von 1788. Jahreszahl eins ausgenommen¹³ - 1805 - befindet sich an keinem; der Name des Zeichners ist auch nur an manchen zu finden. Da an vielen Exemplaren sind die Stellungen der Truppen aufgezeichnet und vom Ablauf der Kämpfe gibt es auch Beschreibungen, sind - mindestens diese - unbedingt nachträglich verfertigt. Doch die Abbildung des Geländes, so auch die Tatsache, daß zur ersten Variante des Grundrisses und Profile sind auch Maße angegeben, läßt darauf hinweisen, daß das Gelände und die Höhle

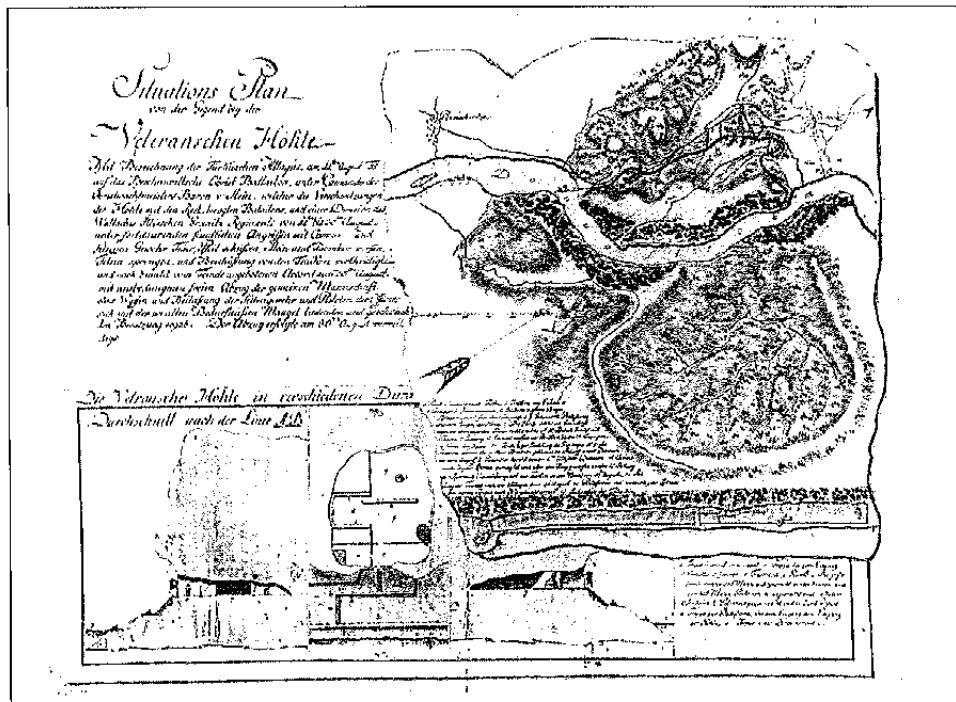


Abb. 5: "Situations Plan von der Gegend bey der Veteranschen-Höhle". Anonyme Karte, nach 1789. Kriegsarchiv, Wien, Inv. Nr. H. III. e. 2953-I.

wurden noch vor der Belagerung aufgemessen und die Zeichnungen wurden aufgrund dieser hergestellt.

Es ist merkwürdig, daß bis die erste Variante bildet die Höhle als von einem einzigen weiten Raum bestehend ab, die zwei anderen schon mit Wänden aufgeteilt. Man könnte vorstellen, daß da die Türken zogen bald vom linken Ufer der Donau zurück, waren diese Abbildungen Pläne für eine neue Ausbildung der Höhle zu ein Fort. Die Ausbreitung des Einganges könnte auch damit in Zusammenhang sein. Vielleicht die Ansichten des vermauerten Einganges¹⁴ dienten auch nur als Pläne. Daß diese später verwirlicht wurden - ist uns augenblicklich nicht bekannt.

Doch entweder wurden die Abbildungen vor, oder nach der Belagerung hergestellt, gehören sie auf jede weise unter den ältesten Höhlenkarten des Karpatenbeckens; die mit den Kämpfen von 1692 in Zusammenhang stehende ist sogar vielleicht die älteste. Doch ob Wände in Innerem der Höhle wirklich errichtet wurden, können wir heute schon nicht entscheiden. Der Eingang der Höhle war nur mit 2 Klaftern höher als der Wasserspiegel zur Zeit der Aufmessung, so ist sie wegen dem Bau des Staudamms am Eiscernen Tor unter Wasser gekommen.

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UPODOBITVE JAME “VETERANI” IZ 17. IN 18. STOLETJA

Povzetek

Prispevek govori o zemljovidih in drugih upodobitvah jame Pescabara (Veterani) iz 17. in 18. stol. Jama leži na levem bregu Donave v bližini Železnih vrat (Kazan, 22 km jugozahodno od Orsove). V času “turških vojn” 1692, ko so Turki pripravljali protinapad, je general Veterani v jami namestil 300 mož s petimi topovi. Turki so jih oblegali, dokler se niso predali. 1788, je zopet izbruhnila vojna in cesarskim četam je osebno poveljeval cesar Jožef II. Tudi tokrat je bila jama pomembno stražarsko mesto, varovana s tremi oddelki pchote in artilerijskim regimentom in posebej urejena ter utrjena, vključno s posebej obzidanim skladiščem za smodnik. Turki so jamo oblegali z ladjami in veliko premočjo v četah. Cesarski so se tri tedne branili globlje v jami, 400 jih je padlo, nato pa vdali.

Zaradi teh dogodkov je jama pogosto označena na takratnih zemljovidih in panoramah (iz Budimpešte so znani 3, z Dunaja pa 20 dokumentov) in prikazana z najrazličnejših vidikov, vključno z jamskimi načrti.

Ker je bila jama prvotno le 2 scžnja nad vodo, je danes pod vodno gladino akumulacijskega jezera.

DIE ERGEBNISSE DER ARCHÄOLOGISCHEN HÖHLENFORSCHUNGEN IN UNGARN

REZULTATI ARHEOLOŠKIH RAZISKAV V JAMAH NA MADŽARSKEM

PÁL PATAY¹

Izvleček

UDC 903.3(439)

Pal Patay: Rezultati arheoloških raziskav v jamah na Madžarskem

Na Madžarskem so pričeli z arheološkimi izkopavanji v jamah v 70-tih letih prejšnjega stoletja. Pozitivni rezultati izkopavanj O. Kadiča 1906 v jami Szeleta, so bili vzpodbuda nadaljnje izkopavanjem, ki niso bila prekinjena niti med I. Svetovno vojno. Najdbam iz mlajšega paleolitika so sledila odkritja neolitika, bakrene in mlajše bronaste dobe. Zelo pomembne so bile raziskave 1932 v jami Subalyuk, kjer so poleg srednjepaleolitskih artefaktov naleteli tudi na kosti neandertalskega človeka. Naloga sedanjih raziskav je odkrivati in raziskovati nove jame ter na novo ovrednotiti starejše najdbe.

Ključne besede: arheologija, speleologija, jamske najdbe, paleolit, neolit, Madžarska.

Abstract

UDC 903.3(439)

Pal Patay: The results of archaeological investigation in the caves of Hungary

Archaeological investigations of Hungarian caves began in the seventieth years of the last century. O. Kadič's success in the cave of Szeleta from 1906 was the impulse to continue the investigations which did not stop even between the 1st World War. The remains of the younger Palaeolithic were followed by those of Neolithic, Copper Age and younger Bronze Age. The investigations of the cave Subalyuk in 1932 were specially important, because besides the artifacts from the middle Paleolithic also the bones of the Neanderthal man were found. The tasks of recent investigations is to find and to explore new caves and to evaluated anew the older findings.

Key words: archaeology, speleology, cave findings, Palaeolithic, Neolithic, Hungary.

¹ Rákóczi út 19, HU - 1088 BUDAPEST, HUNGARY

Die archäologische Höhlenforschungen kamen in Ungarn als Folge den erfolgreichen westeuropäischen in den 70-er Jahren des vorigen Jahrhunderts in Gang. Die ersten Ausgrabungen fanden in den verschiedenen Teilen das damaligen Ungarns statt. Unter ihnen zählen auch diejenige von Zsófia Torma, über denen wir, gemeinsam mit Kinga Székely an der Tagung ALCADI '92 in Budapest ein Referat geben.¹ Diese Forschungen befanden sich aber im Areal der heutigen Slowakei und Siebenbürgen und nur eine einzige in dem von heutigen Ungarn, namentlich in der Baradla-Höhle von Aggtelek.

Hier führte Baron Jenő Nyáry am 24.-26. August 1876, mit 60 Arbeitern eine Ausgrabung. Im Laufe dieser wurden auch 27 Skelette aufgedeckt. Über dieser Forschung gab er schon 16 Tage später, am VIII. Internationalen Anthropologischen und Archäologischen Kongress in Budapest einen Bericht.² Die Ausgrabung setzte er noch zweimal fort und 1881 gab er die Ergebnisse in einer Monographie bekannt.³ Es ist anerkennungswürdig, daß er ließ die Funde durch in der Anthropologie, Zoologie und Botanik hervorragende Fachleute untersuchen, doch infolge seiner genauen Beobachtungen und Angaben entbehrenden Beschreibungen hat seine Arbeit heutzutage nur noch einen forschungsgeschichtlichen Wert.

Da weder in Aggtelek, noch in anderen Höhlen wurden paläolithische Funde gefunden, bzw. wo - wie es sich nachträglich herausstellte - solche vorkamen (wie z. B. in der Großen Höhle von Oružin - Ružin, Slowakei), erkannten die zeitgenössische Geologen den pleistocänen Alter der die Funde liefernden Schicht nicht, sogar sie verneinten während langer Zeit, daß in Ungarn der Nachlaß des diluvialen Menschen zu finden wäre. So - man kann sagen - hörten die archäologischen Höhlenforschungen auf.

Diese Untätigkeit dauerte bis dan Anfang von unserem Jahrhundert. Es ist merkwürdig, daß ein Freilandsfund gab den Impuls zur Neubeginnung der Höhlenforschungen. Zwei in Miskolc, am Fuß des Bükk-Gebirges gefundene Steinartefakte wurden durch unseren letzten Polihistor, Ottó Herman als diluvial-altrig anerkannt. Mit unverbrüchlicher Ausdauer erreichte er, daß fachmäßige Forschungen wurden in den Höhlen des Bükk-Gebirges begonnen. Die Durch Ottokár Kadić 1907 durchgeföhrte Ausgrabung in der Szeleta-Höhle führte zu unerwarteten positiven Erfolg. Infolge diesem setzten sich die Arbeiten unter seiner Leitung, später auch unter dieser von Jenő Hillebrand jährlich fort, zu denen sich aber auch andere Forscher, z. B. Tivadar Kormos anschalteten. Sogar der erste Weltkrieg machte diesen Forschungen kein Ende. Das war die Blütezeit der ungarischen archäologischen Höhlenforschung.

Aufgrund der in der Szeleta-Höhle erreichten Ergebnisse dehnten sich die Forschungen überwiegend nur auf die Höhlen des Bükkgebirges aus. In beinahe sämtlichen größeren, oder leicht erreichbaren Höhlen, wie die Balla-, Istállóskő-, Peskő-, Büdöspest-Höhle usw. fanden Ausgrabungen statt. Doch nach einigen Jahren wurden solche auch in den Bergen am Donauknie (z. B. Kiskevély-, Jankovich-Höhle, Felsnische von Pilisszántó) durchgeführt. Obwohl

zahlreiche höhlenführende Gebirge befanden sich im vorkriegszeitlichen Ungarn, die in der heutigen Slowakei und in Siebenbürgen liegenden waren durch den Forschern nur hier und da aufgesucht.

Über die Ergebnisse der Ausgrabungen gaben die Forscher ständig Berichte. Bei der Auswertung der Funde nahmen sie die Resultate der französischen Forschung an und verwendeten auch die Terminologie dieser für die heimischen Funde. Aufgrund dieser meinten sie den Nachlaß des Solutréens, Aurignaciens und Magdaleniens zu erkennen. Doch sie stellten schon fest, daß im Bükk-Gebirge wurde das Hochsolutréen durch ein eigenartiges Protosolutréen vorangegangen.

Im Laufe dieser Forschungen kamen auch Funde aus Holocän-Schichten zum Vorschein - im Bükk-Gebirge besonders neolithische - doch im Schatten der Paläolithen legte man weniger Gewicht auf sie.

Wegen der schweren wirtschaftlichen Lage des Landes nach dem ersten Weltkrieg setzten sich die archäologischer Höhlenforschungen nur in der Mitte der zwanziger Jahren fort. Kadić und Hillebrand suchten vorwiegend die schon bekannten Höhlen mehrmals auf. Zu diesen Arbeiten schaltete sich auch Andor Saád, Arzt in Miskolc, zu.

Unter den neu begonnenen Ausgrabungen war diese der Subalyuk-Höhle im Jahre 1932 von großer Bedeutung. Hier kamen zum ersten Mal ohne Zweifel zum Mousterien gehörige Funde zum Vorschein. Ja sogar Knochenreste einer erwachsenen Frau und eines etwa dreijährigen Kindes des Homo Neandertalensis kamen aus der oberen Schicht des Mousteriens ans Tageslicht.⁴

Größere Arbeit fand auch 1934-37 unter der Leitung von István Gaál in der Szélim-Höhle statt. Doch neben diesen besuchten Ottokár Kadić und Mária Mottl im Laufe der dreiziger Jahren mit großer Intensität zahlreiche Höhlen, die aber keine besondere Ergebnisse leisteten.

In den dreiziger Jahren sahen die laitende Forscher - Kadić und Hillebrand - die Zeit an kommend um die Ergebnisse der Forschungen monographisch zusammen zu fassen.⁵ Doch ihre chronologische und kulturelle Festlegungen deckten sich nicht in jeden Fällen. Hillebrand hat schon z. B. bemerkt, daß die Entwicklung des heimischen Solutréens ist unabhängig von dem französischen. Unseres "Protosolutréen" geht dem echten französischen Solutréen voran, ist sogar mit dem Aurignaciens gleichzeitig. Er hat auch erkannt, daß unseres, bis an der Zeit ins Magdaleniens eingereihte Funde sind auch nicht völlig gleich mit dem französischen.

Nach dem zweiten Weltkrieg übernahm eine neue Forschergarde - vor allem László Vértes, dann Miklós Gábori, bzw. Vera Gábori-Csáink, in den letzten Jahrzehnten Viola Dobosi - mit großen Fleiß und Begeisterung die Aufgaben der Paläolithforschung, so auch natürlich auch der Höhlenforschung. In zahlreichen, früher noch nicht erforschten Höhlen wurden durch ihnen Ausgrabungen durchgeführt, doch in manchen Fällen suchten sie auch einige, durch die Fachliteratur schon wohlbekannte auf. Von diesen sind die Grabungen der

Lambrecht-, Hillebrand-, Istállóskő-Höhlen und der in der Gemarkung der Stadt Budapest sich befindliche Obere-Remete- (Eremiten-) Höhle die bedeutendsten.

Die Funde der Lambrecht-Höhle kann man auf faunistischem Grund in die zweite Hälfte des Riss-Würm Interglacials, nach ihrem Charakter in ein kiesbearbeitendes frühes Mittelpaläolithikum einreihen.⁶ An den Wänden der Hillebrand-Höhle, dessen Öffnung war seit dem Neolithikum verstopft, waren Kratzer zu beobachten. Doch nach den vergleichenden Untersuchungen von László Vértes waren es nicht Spuren der Höhlenbären, sondern von Menschen.⁷

In der Istállóskő-Höhle deckte László Vértes eine, bei den vorigen Forschungen noch nicht bekannt gewordene, reiche Knochenwaffen und Geräte liefernde Schicht des Aurignacians auf.⁸ In der Oberen-Remete-Höhle fand Vera Gábori-Csánk in einer, vor dem Höhepunkt der Würm I. Glacialperiode stammende Schicht drei Zähne, und zwar den I₁, I₂ und C von dem rechten Unterkiefer eines *Homo Neandertalensis*.⁹

Die neue Forschergarde - vor allem László Vértes - legte die Forschung auf neue Gründe, indem er - neben den typologischen, faunistischen und floristischen Angaben - auch die Ergebnisse verschiedener physikalischer und chemischer Sedimentuntersuchungen der, die Höhle ausfüllenden Schichten, so auch mathematisch-statistischer Rechnungen mit Erfolg anwendete. Er hat auch die Ergebnisse der ersten zwanzig Nachkriegsjahren - drei Jahre vor seinem Tod, d. h. 1965 - in einer handbuchartigen Arbeit zusammengefaßt.¹⁰ Hier hat er auch die naturwissenschaftlichen und archäologischen Angaben der einzelnen Höhlen ausführlich und systematisch aufgczählt. Einige zusammenfassende Berichte wurden auch durch Miklós Gábori hergestellt.¹¹

In den letzten Jahrzehnten ist die Tätigkeit der Höhlenforscher-Archäologen ziemlich beschränkt geworden, da es gibt schon kaum Höhlen, in denen keine Ausgrabung durchgeführt wurde. So man kann aus den Höhlen keine neuen bedeutende Ergebnisse erwarten. Deswegen befassen sich die Forscher einerseits mit der Revision und Neuauswertung der Ergebnisse der alten Ausgrabungen, andererseits legten sie den Schwerpunkt der Paläolithforschung auf die Freiland-Fundstellen über.

Aufgrund der Ergebnisse der Freiland- und der Höhlenforschungen haben unsere Forscher erkannt, daß das Paläolithikum des Karpatenbeckens ist nicht gleich mit dem französischen. Hier kann das Schema folgend zusammengefasst sein:

Unter den Höhlenfunden ist die älteste eine kiesbearbeitende frühmittelpaläolithische Kultur; sie ist am charakteristischsten in der Lambrecht-Höhle representiert.

Das Mousterien kennen wir schon aus mehreren Fundstellen. Sein charakteristischer Fundort ist die Subalyuk-Höhle, mit ihre zwei, sich schart trennende Schichten, deren Material - zumindest laut Zsolt Mester - zeigt keine

genetische Beziehungen zwischen ihnen.¹² Übrigens das Monstrieren der Höhlen des Bükk-Gebirges und das Mittelpaläolithikum der Fundstellen von Westungarn weicht teilweise von einander ab.

Der Unterschied der zwei Regionen erscheint auch während dem oberen Paläolithikum. An der östlichen Seite des Bükk-Gebirges (z. B. Szeleta-Höhle) ist sein erster Abschnitt das Szeletien, dessen ältere Phase (früher Protosolutréen benannt) weist mousteroide Züge auf. Deswegen betrachten es manche Forscher noch zum Mittelpaläolithikum gehörig. Es wurde aber erkannt, daß zu selber Zeit lebten in den westlich liegenden Höhlen des selben Gebirges (z. B. Istállóskő-Höhle) Leute des Aurignacien, die aber genetisch und kulturel waren überhaupt nicht mit den Szeletien-Menschen in Beziehung. Die Funde der Donauknick-Berge (z. B. Jankovich-Höhle) die ebenso Bifazial-Spitzen aufweisen, sind doch nicht identisch mit dem Szeletien; sie werden mit den Namen Jankovichien benannt.

Durch den Neuauswertungen wurde auch bekannt, daß die früher als Magdalenien bezeichnete Funde (z. B. Kiskevély-Höhle) stellen eigentlich eine Variante des Gravettiens dar. Es war aber auch zu beobachten, daß dieses Gravettien lebte bis in die Postglacial-Periode (z. B. Felsnische von Pilisszántó). Diese wurde durch László Vértes Pilisszántoien erkannt.

Das Mezolithikum ist in unseren Land besonders ärmlich. Aus Höhlen kam vielleicht nur in der Remete-Höhle eine einzige Obsidian-Klinge zum Vorschein, die nach stratigraphischen Angaben hierher zu reihen ist.

Die Holocän-Ablagerungen der Höhlen lieferten auch in größerer Menge archäologische Funde. Sogar man kann sagen, daß sie durch den Menschen bis den Mittelalter stetig aufgesucht wurden; doch nicht mit gleicher Intensität in jedem Zeitalter. Die Aggtelek Höhle, zu der die Archäologen beinahe in jedem Jahrzehnt zurückkehrten, soauch die Höhlen des Bükk-Gebirges sind reich an neolithischen Funden. Aufgrund dieser gab Ferenc Tompa, der, für diese Gegend charakteristische jungsteinzeitliche Kultur den Namen Bükk-Kultur. Übrigens deckte er in Aggtelek einen Opferplatz dieser Kultur auf.¹³ Ein ähnliches Objekt beobachtete man auch in der Hillebrand-Höhle.¹⁴ Doch in diesen beiden Höhlen waren auch im Boden zahlreiche Pfostenlöcher eingetieft, aus denen die Forscher - so Sándor Gallus, wie József Korek - darauf folgerten, daß die neolithische Bewohner haben sich gegen das abtropfende Wasser durch Errichten von Hütten geschützt.¹⁵

Währen der Hochkupferzeit waren besonders die Höhlen im Donauknick durch das Volk der Ludanice-Kultur bewohnt.

Ein mittelbronzezeitlicher Gold-, Bronze- und Bernstein-Schmucksachen, bronzenen Beil und Rohmaterial enthaltender Varwahrfund kam in der Oberen-Remete-Höhle zum Vorschein.¹⁶

Die Höhlen des Bükk-Gebirges, soauch diejenige von Aggtelek sind auch reich an Funden der spätbronzezeitlichen Kyjatice-Kultur. In der letzteren fand Ferenc Tompa 1927 einen aus bronzenen Waffen und Schmucksachen zusam-

mengestellten Verwahrfund, ja sogar einen anderen aus goldenen Ringe und Drähte von einem Gesamtgewicht von 140,83 Gramm.¹⁷ Er deckte auch ein gleichzeitiges Skelett auf. Aufgrund dessen ist es glaubhaft, daß die durch Jenő Nyáry ausgegrabene Skelette stammen auch aus der Spätbronzezeit.

Merkwürdigerweise fehlten völkerwanderungszeitliche Funde in den Höhlen. Dementgegen hochmittelalterliche sind schon - doch nicht zahlreich - zu finden. Doch in der Szelim-Höhle deckte István Gaál 102 Skelette auf, die - aufgrund einer Münze und Schmucksachen - aus dem 11.-13. Jahrhundert stammten.¹⁸

Als Sonderbares erwähnen wir, daß Laut den Funden wurde in 15. Jahrhundert in der Legény- (Burschen-) Höhle im Donauknie-Gebirge Falschmünzerei geübt.¹⁹

Leider es befinden sich in Ungarn relativ wenige Höhlen. Infolge der intensiven Forschungen kann die Zahl der noch unbekannten Höhlen gering sein. Unter den bekannten gibt es vielleicht keine einzige in der keine archäologische Aufschließung durchgeführt wurde. Ja sogar ein Großteil dieser ist schon beinahe fast erschöpft. So gibt es eigentlich für die zukünftige Forschung im Gelände - ausgenommen von Neuentdeckungen in glücklichen Fällen noch intakter Höhlen - nur eingeschränkte Möglichkeiten.

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Ergänzung zu Anm. 5

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REZULTATI ARHEOLOŠKIH RAZISKAV V JAMAH NA MADŽARSKEM

Povzetek

Sledeč zgledu raziskav po Zahodni Evropi, so na Madžarskem pričeli izkopavati v jahah v 70-tih letih prejšnjega stoletja. Dolgoročni cilj in želja strokovnjakov, ki so se lotili teh raziskav, je bil dokazati, da je pleistocenski človek živel tudi v karpatskem bazenu. Pozitivni rezultati izkopavanj O. Kadiča 1906 v jami Szczleta, so bili močna vzpodbuda nadaljnjam izkopovanjem, ki niso bila prekinjena niti med I. Svetovno vojno. Najdbam izumlajšega paleolitika so sledila odkritja neolitika, bakrene in mlajše bronaste dobe.

Zelo pomembne so bile raziskave 1932 v jami Subalyuk, kjer so poleg srednjepalolitskih artefaktov naleteli tudi na kosti neandertalskega človeka.

Ker so bila v najpomembnejših madžarskih jahah izkopavanja opravljena že pred II. Svetovno vojno, je naloga zadnjih desetletij po eni strani odkrivati in raziskovati nove jame, po drugi strani pa na novo ovrednotiti starejše najdbe. Jamske raziskave naj bi tudi osvetlite bivalno okolje neolitskega človeka.

A.C. MORLOT, A GEOLOGIST AND A LESS KNOWN RESEARCHER OF KARST PHENOMENA

GEOLOG A.C. MORLOT, MANJ POZNANI
RAZISKOVALEC KRAŠKIH POJAVOV

RAJKO PAVLOVEC¹

Izvleček

UDK 551.44:929 Morlot A.C.

Rajko Pavlovec: Geolog A.C. Morlot, manj poznani raziskovalec kraških pojavov

A. C. Morlot (1820 - 1867) je raziskoval Istro in sosednje Zunanje Dinaride. V svojih delih omenja tudi kraške pojave. Skušal je pojasniti njihov nastanek, vendar njegove razlage niso vedno pravilne. Vseeno pa lahko štejemo Morlota za zanimivega raziskovalca kraša, še posebej, če upoštevamo, da je pisal sredi 19. stol.

Ključne besede: geologija, krasoslovje, zgodovina krasoslovja, Slovenija, Kras, Morlot A. C.

Abstract

UDK 551.44:929 Morlot A.C.

Rajko Pavlovec: A.C. Morlot, a geologist and a less known researcher of karst phenomena

A. C. Morlot (1820 - 1867) was researching Istria and the neighbouring parts of the External Dinarids in addition to other areas. Besides other geological data he also mentioned karst phenomena in his publications. He tried to establish the origin of various forms, but his explanations were not always correct. However, Morlot can be regarded as an interesting researcher of Karst, especially bearing in mind that he wrote in the middle of the 19th century.

Key words: geology, karstology, history of karstology, Slovenia, Kras, Morlot A. C.

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Adolphe Charles Morlot was born on 22nd March, 1820 in Napoli and died on 10th February, 1867 in Lausanne at the age of only 47. Taking a look at both years we can see that in the year 1995, 175 years have passed since his birth and, in the year 1997, 130 years will have passed since his death. Morlot studied mathematic and geology in Paris, Freiberg and Bern. In the year 1846 he joined the researching activities of our countries. At that time (1843) "Der geognostisch-montanistische Verein für Innerösterreich, das Land ob der Enns und das Königreich Ilyrien" was founded. Morlot was a busy researcher, especially at fieldwork. This was as well pointed out in the year 1867 by Dr. Franz Hauer, the manager of the geological institute in Vienna. According to his words Morlot was working at the field during the summer, and in the winter he was handling the material; he was hard-working and full of energy.

Morlot's field of research was very wide. He was interested in petrology and ore deposits, and he observed Pleistocene sediments. In the field of regional geology he took part in the geological mapping of East Alps, Styria and Illyria.

ABOUT THE KARST

In 1848 Morlot published his most important work regarding the External Dinarids (1848-a). In the same work he mentioned karst phenomena. In a special publication from the year 1848 Morlot describes the Lobodnica cave (Trebichgrotte; 1848-b). Morlot characterizes the Karst landscape as a limestone region with waste, stony and eroded ground. It would be quite interesting to establish whether Morlot himself created the incorrect explanation of the word karst. He thus presumed that the word derived from the Slovenian word "hrast" (*Quercus*), meaning oak. He wrote that the country was once overgrown with oaks, but there was only a treeless surface in his days. The word karst in fact derives from the word "carra", which means stone (Gams 1974).

Besides, Morlot describes stalactites, whereby all kinds of stalactites and stalagmites are meant. According to his opinion the stalactites in the so called "great caves" appeared in the "younger period" and are growing very slowly at present. According to his deductions the majority of karst phenomena appeared in the Pleistocene, which does not coincide with present opinion.

Although Morlot made a vivid description of karst phenomena it was not he who found that limestone country was full of caves. He stated that limestone countries were so porous that no drop of water could stay there. According to his opinion such a country was similar to a great porous sponge. Morlot mentioned various caves, as for example the caves of Škocjan (Škocjanske jame), Lobodnica (Trebichgrotte), the caves in the neighbourhood of Općine (Opicina) and Bazovica (Basovizza) near Trieste, the Postojna cave, the Cerknica polje (Cerkniško polje) and others. Morlot spent quite a lot of time on some of them. He seemed to be fascinated by the research activities in

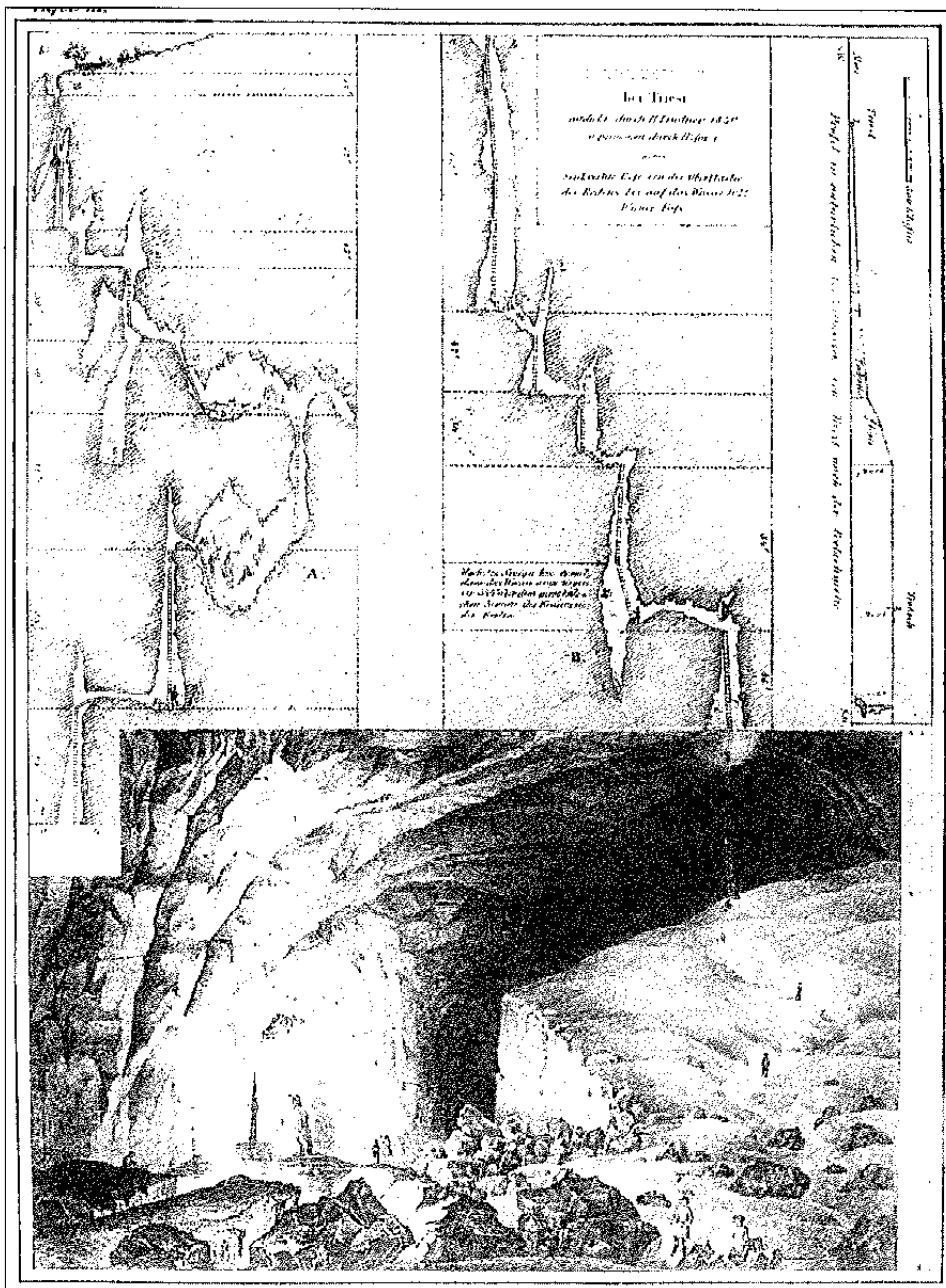


Fig. 1: "Tafel III" of Morlot's work "Über die geologischen Verhältnisse von Istrien mit Berücksichtigung Dalmatiens und der angrenzender Gegenden Croatiens, Unterkrains und des Görzer Kreises" (1848) showing Trebich Grotte (Labodnica).

Lobodnica (Morlot 1848-a, b) which was carefully measured by Sforzi, an engineer from Trieste. The cave was discovered in the year 1840, which is the almost the time when Morlot was researching these places. At that time they were searching for water to supply Trieste. As water rose at some places during the rainy weather and there was a strong current of air flowing through the cracks, they expected to find water in the underground.

Morlot was thinking about karst caves. He observed some of the approximately horizontal ones, that divide and are irregularly shaped. As an example Morlot mentioned the Postojna cave. He knew the Pivka river that vanished into the cave and appears after one hour as Unica in The Planina cave. He was also familiar with the Reka river that disappears into the caves of Škocjan and reappears at Devin (Duino). He explained that the impermeable flysch layers prevent the Reka river from flowing faster into the sea.

As far as the horizontal caves are concerned, Morlot states that they are easy to research and therefore most frequently visited. Hence, we could conclude, that most caves in Karst are of that type. However, according to Morlot one can easily find out how the majority of caves extend into depth. He gives some examples with their depths. Most probably Morlot did not visit all the caves, for many times he states that he got the data "by oral tradition".

Morlot's consideration about inclined or vertical caves, respectively, which should in most cases extend into sack-formed tubes, is very interesting. He believed that mechanical action without chemical processes could not form the caves. According to his explanations the caves are supposed to appear in a similar way as "iron ore deposits" in karst regions, where "acid mineral waters" were present.

Morlot has correctly explained the origin of karst sinkholes, which he named "die Dollinen". He believed that they had appeared due to the subsiding of the roof in the caves.

TERRA ROSSA AND BAUXITE

Morlot speaks about iron oxide that makes the surface red. Therefore he knows the red Istria (Istria rossa) very well and states that the colour depends on the fundamental rocks, because they can always be found on limestone and never on flysch. Consequently he named flysch "Tasello". Morlot compares the appearance of the red weathered soil with the appearance of brown iron oxide (that can be found in form of small grains in clay) and sediments in karst caves, where there is also a clay with brown iron ore. In the vicinity of Karojba in central Istria, Morlot found such formations at the edge of funnel-shaped holes which resemble caves that collapsed. According to Morlot's opinion they were once most probably filled with iron oxide. Bauxite deposits can in fact be found in the karst caves and gulfs near Karojba (Pavlovec 1995).

Already in Morlot's time many people were wondering how the enormous quantities of terra rossa in Dalmatia and Istria appeared. Morlot was obviously amazed at that, otherwise he would not have written this remark.

Sometimes Morlot most probably equated terra rossa or even bauxite with brown iron ore, but his explanation of its origin was not correct. To infer from his treatise, he obviously set his heart upon the explanation of Gressly's, describing similar phenomena in the Jura mountains. Supposedly the rising of mountains created cracks, which mineral waters enlarged into caves. The waters also brought clay and iron solutions.

LOWER AND UPPER KARST LIMESTONE (KARSTKALK)

Morlot introduced the term of lower or older karst limestone where the fossils can very rarely be found. It is light in colour, in most cases white, layered, not bituminous, and sometimes it sounds like glass or metal. On the other hand, Morlot describes fossils in that limestone. It was extracted in Roman quarries near Pula. There were many rudists in it that can also easily be found elsewhere. However, Morlot states that the limestones with the fossils differ from that without them. Most probably he classified the Cretaceous rudist limestones and Cretaceous limestones without rudists among the older karst limestones. There is coal in these beds near Lipica, at Vreme and in other parts. Morlot describes the older karst limestone as being corroded and bare. He did not know its thickness. Yet he stated that the entire Lobodnica cave (Trebichgrotte) is situated within this limestone with a thickness of 300 m.

Morlot called the upper karst limestone also the nummulite limestone. He states that the nummulite formation is spread from the Atlantic Ocean over the Pyrenees, the Alps, Turkey, Asia Minor, and Iran to the Himalayas. The rock forms thick beds, which are mostly compact, light limestone. When struck it smells like bitumen, falls into sharp pieces and very often it "sounds". Its surface is eroded and bare.

In addition to alveolinids and coal, Morlot mentions nummulites as a special characteristic of this limestone. This way we can conclude that Morlot joined all the Paleogene limestones, that is Kozina, miliolids and alveolina-nummulites limestones under the term upper karst limestone.

FOSSILS IN THE CAVES

Morlot did not miss out some of the fossil finds in the caves or karst shafts. He mentioned bone breccias from Roman quarries south from Pula, as well as from some other deposits. It is not quite clear whether Morlot had in mind bone breccias in fact, or whether he was thinking of some other deposits of Pleistocene mammals. He knew some bone breccias from Dalmatia, where they can be found in the cracks or open caves. The cement is red, and the

bones are broken into small pieces. Morlot states that there are mostly cervids with terrestrial and freshwater snails among the fossil finds. There are no marine fossils. Morlot based his statement on the fact that bone breccias have appeared in karst caves.

The almost forgotten data about The Pleistocene mammals from The Postojna cave are very interesting. In the year 1821 (J. Volpi) the finding of *Ursus spelaeus* was described and illustrated with good pictures. He then classified it to the *Palaeotherium* genus, but Morlot referred to it as *Ursus spelaeus*. As the cave bear was found among pieces of stalactites, Morlot inferred that the animal had fallen into the cave and had not been washed in.

CONCLUSION

Adolphe Charles Morlot was not an expressive researcher of karst. However, as a thorough and meticulous describer of geological and other phenomena, he met karst caves and other karst phenomena. He tried to explain them as much as possible — consistently with the opinions of the middle of the last century. Although Morlot did not make a great contribution to the field of karstology and speleology, he was one of the most interesting researchers during the time of the first serious attempts to get to know karst phenomena in our country.

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GEOLOG A.C. MORLOT, MANJ POZNANI RAZISKOVALEC KRAŠKIH POJAVOV

Povzetek

Adolphe Charles Morlot (Napoli 1820 — Lausanne 1867) je predvsem poznan po raznih področjih geologije, med drugim pleistocena, sedimentologije, petrologije, rudnih ležišč, regionalne geologije, manj na področju krasa. Raziskoval je tudi v Dinaridih, kjer ni šel mimo kraških pojavov.

Izvor besede kras si je Morlot napačno razlagal, češ da pride od hrasta, s katerim je bila poraščena ta pokrajina. Za kapnike je bil prepričan, da jih je večina pa tudi večina drugih kraških pojavov nastala v pleistocenu, danes jih nastaja malo. Morlot omenja vrsto kraških pojavov pri nas, med drugim Postojnsko jamo, Škocjanske jame, Lobodnico, jame v okolici Trsta, Cerkniško jezero in druge.

Morlot govorji o horizontalnih jama, vendar pravi, da so poševne oziroma vertikalne pogosteje. Sklepa tudi na to, da niso nastajale samo na mehanski, ampak tudi na kemični način. Nastanek jam vzporeja z nastankom rjavega železovca. Pri tem misli deloma tudi na jerovico, deloma na boksit, kjer naj bi povsod delovale kisle mineralne vode.

Morlot je uvedel izraza spodnji kraški apnenec, pri čemer misli predvsem na rudistni in druge kredne apnence, ter zgornji kraški apnenec, s čemer združuje paleogenske kozinske, miliolidne in alveolinsko-numulitne apnence. Vsi imajo zakraselo površino.

Morlot omenja kostne breče iz Istre in Dalmacije. Posebno zanimivi so podatki o odlično ohranjeni lobanji jamskega medveda iz Postojnske jame.

A.C. Morlot ni bil izraziti raziskovalec krasa. Kot veden in dober opisovalec geoloških in drugih pojavov pa se je srečal s kraškimi jamami in drugimi kraškimi fenomeni. Kolikor je bilo mogoče, jih je skušal razložiti, scveda sredini prcjnjega stoletja primerno. Morlot na področju karstologije in speleologije ni prispeval velikega napredka, bil pa je eden zanimivejših raziskovalcev v času prvih resnejših korakov pri spoznavanju kraških pojavov pri nas.

A HISTORICAL SIGNIFICANCE OF EGON PRETNER FOR BIOLOGY

ZGODOVINSKI POMEN EGONA PRETNERJA ZA BIOLOGIJO

TANJA PIPAN *†

Izvleček

UDK 57(091):929 Pretner E.

Tanja Pipan: Zgodovinski pomen Egona Pretnerja za biologijo

Egon Pretner (1896-1982), čeprav samouk, je bil v mednarodnem merilu eden najboljših poznavalcev evropskega krasa in živali v kraških jamah, še posebej hroščev. Odkril je nad sto novih živalskih vrst (migetalkarjev, polžev, dvojenog in zlasti hroščev), preko 20 vrst pa se jih imenuje po njem. Obiskal je 1492 jam: 649 na Slovenskem, 773 v drugih deželah Balkana, 70 v drugih evropskih državah. Bil je neutrudljiv terenski delavec, slovenski in celotni balkanski kras, pa tudi kraške predelce v sosednji Italiji in Avstriji, je poznal bolje kot kdorkoli. Napisal je nad 70 razprav in člankov v domačih in tujih znanstvenih revijah. Za opravljenoto delo je prejel mnoga društvena priznanja in odlikovanja.

Ključne besede: zgodovina speleologije, biospeleologija, *Coleoptera*, Pretner E.

Abstract

UDK 57(091):929 Pretner E.

Tanja Pipan: A historical significance of Egon Pretner for biology

On the international scale Egon Pretner (1896-1982), self-taught person, was one of the best authorities of the European karst and animals in the caves, beetles in particular. He discovered more than hundred new animal species (ciliates, gastropods and arthropods, and notably the beetles), more than 20 species are named after him. He visited 1492 caves: 649 in Slovenia, 773 in other parts of Balkans and 70 in other European countries. He was a tireless expert in the field of knowing better than anybody the Slovene and Balkan karst and also karst regions in neighbouring countries of Italy and Austria. He published more than 70 papers and articles in Slovene and foreign scientific magazines. For his work he gained numerous awards and medals from learned societies.

Key words: history of spelaeology, biospeleology, *Coleoptera*, Pretner E.

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TO LIGHT UP LIFE IN DARKNESS

It is justified to call Postojnska jama "the cradle of biospeleology". In 1831 the cave guide Luka Čeč discovered on Calvary (Velika Gora) in Postojnska jama the first cave beetle *Leptodirus hochenwartii* (Schmidt 1831). By 1860 researchers discovered in Slovenia almost all the genera and most of the species of cave beetles. The studies of our cave fauna began anew in the beginning of the 20 th century when J. Müller was appointed professor at the grammarschool in Triest. Full of zeal he very systematically explored the caves in the Trieste karst, Istria and the Gorica karst. He educated a lot of entomologists, among others Egon Pretner who attended the grammarschool at this time. During field excursions he met many distinguished European scientists and he preserved these contacts during all the time of his research activity. Among the others they were: Fr. Blasich, O. Chenda, E. Gridelli, Vl. Kodrič, J. Kreckich-Strassoldo, Ljudevit and Vladimir Kuščer, C. Lona, C. de Mayer, Carlo and his son Giorgio Ravasini, A. Schatzmayr, H. Springer and St. Gabersčik. E. Pretner also maintained friendly and professional contacts with the following experts: B. Drovnik (Ljubljana), Cl. Besuchet (Geneva), J.



Fig. 1: At the entrance of Jelena jama (Kras), 13th November 1910. E. Pretner, 14 years old, is in the first plan, pulling the rope (photo Dr. Lennig).

Bole (Ljubljana), P. Brandmayr (Trieste), S. Brelih (Ljubljana), G. Castellini (Firenze), M. Seguin (France), B. Čurčić (Beograd), P. R. Deeleman (Holland), C. D. Deboutteville (France), G. Drioli (Trieste), D. Mihajlović (Valjevo), H. Frank (Laichingen), D. Godard (France), A. Gspan (Ljubljana), B. Hauser (Geneva), R. Husson (France), B. Jalžić (Zagreb), G. Karaman (Titograd), R. Mezzena (Trieste), S. Mikšić (Sarajevo), E. Pichl (Trieste), L. Quaia (Italy), I. Rakovec (Slovenia), F. Anelli (Italy), M. E. Schmidt (Austria), R. Seemann (Austria), J. M. Thibaud (France), T. Tischler (Germany), M. Vachon (France).

An interesting story is told by B. Drovenik about cave beetle collecting at Dobrovilje. He was helped by Pretnar who was the only one who succeeded in finding several specimens of the species *Anophthalmus crebus erebus* (Kraus), *A. schaumi knirschi* (Winkler) and *Aphaenopodius treulandi cephalotes* (Knirsch) although he used the same method as Drovenik and others. Before the last World War the beetles of Slovene caves were scientifically studied mostly by J. Müller, R. Jeannel and A. Winkler and after the war by E. Pretnar. The interest of the Slovene biologists in cavernicolous fauna became very strong after the Second War. The biologists of Ljubljana University organised a series of excursions to the caves of former Yugoslavia and brought back very interesting material. By systematic researches they discovered new species and subspecies and got to know the geographical distribution of cave beetles. According to Pretnar it is interesting zoogeographically that in the Dinaric part of Dolenjska the beetle's species *Antisphodrus schreibersi* (Küster), and in the mountains between Postojna basin and the Notranjska Reka *Leptodirus* are not found, and that in some caves there live together two species of the genus *Bathyscimorphus* and two species of *Antisphodrus* (*A. cavicola* and *A. schreibersi*). Furthermore, "the centre of Carniola's fauna" is in fact located around Plitvice (Croatia) while almost all the genera described of Slovenia (*Leptodirus*, *Astagobius*, *Anophthalmus*, *Bathyscimorphus*, *Machaerites* and *Troglorrhynchus*) extend far to the south over the Slovene-Croatian border. In the years 1934-1938 Wolf's *Animalium Cavernarum Catalogus* was being published with a review of cave fauna, location of finding sites and references for each animal. In this voluminous work the cave fauna of Slovenia is included, studied minutely and in detail, mostly due to Pretnar's research work and publications (Pretnar 1974b).

Pretnar's first published paper is "Neue Hydrophylden aus dem örtlichen Mittelmeergebiet"; in 1930 two papers were published in Italian and the next year another three. However it was not until his undisturbed professional work in Postojna, that he could dedicate himself entirely to research (mostly to biospeleology and entomology) to such an extent that he became an expert in karst all over Yugoslavia and in particular on the underground fauna. Pretnar also knew the karst landscapes elsewhere in Europe, in Italy, Austria, France, Romania, Bulgaria and so on, and he has taken part not only in all speleological congresses in Yugoslavia but also in numerous international congresses

where he usually presented an interesting and fundamental communication. Thus he found at home and abroad a large number of followers (Pirjevec - Rebula 1986).

Pretner's researches in the fauna of Postojnska jama were extremely extensive. He introduced the scientific importance of the Postojna area as a centre of the classical karst. Many are grateful for his professional list of the underground animals that lived, and unfortunately only partially live still in Postojnska jama (Annex 1).

In the years 1970-1975 many reported about cave beetles appearing outside caves. Also in northern Italy and in Yugoslavia they appeared provided that the conditions of low temperature and high humidity were fulfilled. Due to this reason the abundance of beetles in some caves is smaller than under stones and rocks deeply buried in forest soil or higher in the mountains, close to the snow. In a special treatise E. Pretner explained this confusing phenomenon: "Primary habitat of cave beetles is fissures within the karst massif. From these cracks the animals migrate into the caves and thus the caves may be considered as their secondary habitat. To some extent some species may be found below rocks and stones but only in the period from autumn to spring, while they disappear during warmer seasons into cooler and more humid lower layers. Due to microclimate changes from cave to cave some species may be found at the entrance and other, deeper inside. The presence of animals is controlled by local temperature and humidity. Microclimatic conditions define whether the cave beetles are inside or outside the cave" (Pretner 1977a).

The fissures underground are a true living habitat of the underground fauna and from them they come into accessible caves or artificial channels. Abandoned mine passages, catacombs and artificial underground cavities of any kind offer a habitat to the underground fauna and E. Pretner (1979) pointed out that their importance must not be neglected as the fauna is there extremely rich. The underground organisms find much more stable living conditions within the fissures than are provided in large passages of the caves. E. Pretner composed a finding site list of underground coleopterological fauna in artificial caverns of Slovenia, Croatia, Austria, France and Italy (Annex 2).

When E. Pretner retired he deciphered the notes of L. Weirather relating to finding sites of cave beetles and prepared for the Natural Science Museum, Geneva, a 155 page study "Die Verdienste Leon Weiraths um die Biospäleologie, insbesondere Jugoslawiens, sein Höhlenkataster und seine Sammelplätze". L. Weirather was a famous biospeleologist who marked the finding sites of cave beetles by a number in his own cave register and by a false name of a cave or a region where the cave lies. By such a mode he protected himself against the concurrence although he disclosed to his friends, E. Pretner among them, the real name of a cave. The Natural Science Museum bought Weirather's collection of beetles together with all the notes and remarks which E. Pretner that he deciphered and studied from the German shorthand. He also

elaborated the manuscript "Travunia" of K. Absolon about the underground beetles of Bosnia and Hercegovina and succeeded in determining the location and names of almost all the finding sites cited by Absolon (Letopis SAZU 1975; Pretner 1974a).

A CHRONOLOGICAL REVIEW OF EGON PRETNER'S RESEARCH WORK FROM 1949 TO 1979

In 1949 Pretner published a newly discovered finding site of a species *Anophthalmus egonis* J. Müller. This species was then known only from the cave Pesjakov Buden, on the northern Pokljuka slopes; however he later found more than eight different caves containing this species. He discovered a new species *Anophthalmus besnicensis* that lives in Bidovčeva Luknja on the hill called Rovnik near Kranj. Probably he traced the same species in Častitljiva Jama, on the northern slopes of Jelovica. He discovered new finding sites for a species *Anophthalmus eribus* Krauss which is endemic for Kamnik Alps. At the same time he confirmed the finding site of a species *A. nivalis* G. Müller on Triglav discovered by A. Gspan. He discovered a new species *A. bukoveci* in Turkova Jama, near Logatec. E. Pretner described also the species *A. pubescens* Joseph and its subspecies. All of them live in the caves of Logatec plateau between Ljubljana Moor and Planinsko Polje. During his research work he dealt with the rules of nomenclature and, among others, explained the incorrectness in naming a species *Anophthalmus scopolii* Sturm while correct is Schmidt. In the literature all the coleopterists quoted Sturm as the author of a species *A. scopolii* with the exception only of Sturm himself (Pretner 1949a).



Fig. 2: E. Pretner in the entrance to Gorjanska jama near Bled, 21st May 1939 (photo E. Bar).

A species that E. Pretner discovered in a shaft Covška Prepad near Dobrovlje is called *Aphaobius (Aphaobiella) budnar-lipoglavšek*. He discovered a subspecies *A. (A.) b.-l. mozirjensis* in a small snow cave on Mozirska Planina in the eastern Kamnik Alps. At both finding sites he found also a species *Aphaobius milleri* Schmidt (subsp.). E. Pretner named newly discovered species after a curator of the Natural Science Museum, Ljubljana, Dr. A. Budnar-Lipoglavšek. *Näphaobius (Aphaobiella) tisnicensis* is a newly discovered species that Pretner found in many caves on a mountain Tisnik near Mislinja. This finding site lie on the northeastern border of the area in the Eastern Alps where cavernicolous silfides? live. The distance from it to the cave Covška Prepad, where *A. budnar-lipoglavšek* was found, is about 18 km towards the south-west. In the hills above these finding sites Pretner did not find any example of the *Aphaobius* genus although in the caves and passages of the area live *Anophthalmus hitleri* Schreib. and *Laemostenus schreibersi* Küst. Pretner described and determined all the properties of silfides; it is important that he did not just cite the names but he described anatomic-morphological, physiological and ecological characteristics. He also composed a simple key for determining the genera of *Aphaobius* filogenetic species. According to Müller *Pretneria* is a subgenus of the genus *Aphaobius*; but Pretner determined *Pretneria* as an independent genus as it ressembles *Orostygia* and *Oryotus* in respect to its habitat and represents an intermediate to these two genera. Pretner also represented the differences between the species *Pretneria latitarsi* G. Müller and *Pretneria saulii* G. Müller. During long years of researches he found out that an important living condition for a genus *Pretneria* is low temperature; this is why it lives only high in the mountains or in ice caves (Pretner 1949b).

Pretner reviewed the genera *Oryotus* L. Miller, *Pretneria* G. Müller, *Astagobius* Reitter and *Leptodirus* Schmidt (Coleoptera). He described new finding sites that he discovered and described known species of these genera, many of them new. He also composed a key for determining the species of *Oryotus* L. Miller genus, and keys for subspecies *Astagobius angustatus* and subspecies *Leptodirus hochenwartii* Schmidt. He also collected ecological data on all the three genera (Pretner 1955).

Pretner's researches of the rare genus *Aphaenopsis* confirmed that these organisms are rightly classified into phylogenetic series that had baffled the researchers. Based on copulation organs of the male of *Aphaenopsis*, *Scotoplatynetes* and *Adriaphaenops* genera Pretner started to solve the question whether three different genera are concerned or whether there is only one. He assessed the appurtenance to one genus only *Aphaenopsis* J. Müller and at the same time he investigated the distribution of this Dinaric genus spread in a wide area of the southern Bosnia and Montenegro. Due to confusion within the systematics of genus *Ceutmonocaris* Jeannel, Pretner decided to resolve it and he found a lot of irregularities. He determined to this genus five species and

subspecies: *C. freyeri* L. Müller, *C. netolitzkyi* J. Müller, *C. robici* Ganglbauer, *C. pusillus* Jeannel and *C. Matjasici* n.sp. He elaborated the key to determine these species and subspecies and their distribution (Pretner 1959a, b).

In spring 1959 a team of Karst Research Institute SAZU workers visited Prekonoška Pećina which was considered as the most beautiful cave of Serbia. A team surveyed the cave and prepared suggestions for its touristic display. In the final part of the cave Pretner discovered new blind species of the genus *Duvalius* (Coleoptera) and new genus of a blind arthropod *Serboiulus lucifigus* Strasser; both organisms are true troglobionts (Pretner 1959 c). Since 1963 only three superficial species of this genus were known from Macedonia. They were mostly found below the stones, at the altitude above 2000 m: *D. fodori* Scheibel, *D. peristericus* J. Müller and *D. macedonicus* J. Müller. In 1962 M. Gogala discovered the first true cavernicolous *Duvalius* in Macedonia *D. s. str. gogalai* (Pretner 1963 a).

E. Pretner was enthusiastic about the Montenegro karst, wild and interesting, as he said, and almost untouched from the speleological point of view. He gathered all the known data about previous researches in Montenegro listing explored and published caves, explored but not yet published caves unexplored caves. Due to his better understanding he classified the caves according to mountain massifs around bigger towns. He also noted a name of the cave, if it existed, and if the cave appeared in the literature under some other name he put it down also; he also quoted the author, the year and the name of publication where it was cited. In this way he wished to contribute his part in preparing a register of caves and shafts of Montenegro. Pretner studied the cave fauna in Boka Kotorska and around Titograd and Virpazar in 1933 and he discovered some new species. From 1955 to 1973 he organised shorter or longer biospeleological excursions to Montenegro, except for the years 1960, 1961 and 1964. In the years from 1955 to 1957 the Slovene and Serbian biospeleologists and cavers explored the shafts, caves and swallow-holes on Nikšičko Polje for a planned hydro-power station "Gornja Zeta". They together explored the cave Duboki Do and other caves in Lovćen. In the years 1965-67 Spéléo Club des Ardennes explored underground in Krivošije and Grahovo (Serbia). These explorations were controlled by E. Pretner who also carried out a lot of research excursions together with the family of Dr. P. R. Deeleman. They were good friends and they travelled and cooperated together a lot. In 1969 they explored 16 caves, in 1970 20, in 1971 30 and in 1975 17, altogether 85 speleological objects (Pretner 1961, 1977).

Skakavac is an active cave located in SE Bosnia biologically explored by E. Pretner in 1956. He found two new troglobionts: *Macrochaetosoma drinae* Strasser and a new subspecies of a beetle *Apholeuomus nudus* subsp. *petrovići*. In the sixties he studied the cave fauna in Serbia and composed a list of cavernicolas endemic in Serbia. Besides the discoveries in Prekonoška Pećina he found in Ravnička Jama a new diplopod *Bulgarosomamacrurus* Strasser, and in

Mirkina Jama a diplopod *Typhoiulus albanicus* Attems; for the latter it was the northernmost finding site (Pretner 1963 b, c).

In the years 1964 and 1965 E. Pretner, together with J. Bole and S. Červek, succeeded in finding three new finding sites of a cave beetle *Speleodromus pluto* Reitter 1881. Till then it was only known that in the caves of Velebit. Like the genera *Astagobius* and *Pretneria* *Speleodromus* also lives only in caves with low temperature, i.e. in snow- and ice-caves at high altitudes. The animals walk over the walls and the rocks lying on the floor. Pretner reached these data by careful, long-lasting and patient sampling and contemporaneous measurement of physico-chemical parameters (Pretner 1966).

At the end of 1967 the Laneyrie's *Nouvelle classification des Bathysciinae* was published, based mostly on different internal structures of the male copulative organ. In 1970 Pretner wrote the remarks to the Laneyrie's catalogue which substantially differs from Jeannel's classical classification although the material was not yet studied in detail. The first part of his remarks appears on four typed pages and includes mostly corrections of finding sites, wrongly written names and deficiencies. Typical finding sites of numerous species of the subfam. *Bathysciinae* cited by the authors often differ from those, described in Pretner's list (Catalogus Faunae Iugoslaviae, III/6, Subfam. *Bathysciinae*, 1968). People who gathered the material were mostly foreigners, not understanding the language, and this is why they frequently cited the names of bigger places nearby or the names of the mountains. The gatherers, interested in cave beetle as dealers mostly, intentionally provided insufficient data about the finding sites. Pretner visited numerous caves and again he succeeded for many organisms in finding out the typical finding site and its correct name. He replaced German or Italian names by the original Slavs names. Remarks and completed literature were published on additional 7 typed pages (Pretner 1970 c).

In the huge cave Vrtlina in the southern Velebit Pretner, together with J. Bole and H. Freud, found with surprise that typical representatives of "Carniolian cave fauna" *Leptodirus* and *Astagobius* reach so far to the south. Biospeleological researches in Gorski Kotar, Croatian littoral, in Lika and Velebit indicated that this area, compared to the vicinity, bears the most similarity with the cave fauna of Slovenia, in respect to the genera *Bathysciotes* Jeannel, *Bathyscimorphus* Jeannel, *Parapropus* Ganglbauer, *Astagobius* Reitter, *Leptodirus* Schmidt, *Typlotrechus* J. Müller. From Dalmatia and Bosnia only *Neotrechus* J. Müller and *Duvalius* subgen. *Neoduvalius* J. Müller reach to Slovenia. Post-war researches showed that a line Zagreb - Krk (that had been set up by Jeannel in 1928) as the south-eastern border does not hold, as the cited genera appear also more to the south. E. Pretner (1970 c) described all these genera ecologically and morphologically in detail, sketched them, described the finding sites and noted locus tipicus and added his own thoughts and conclusions based on the years of experience and observation.

Pretner is found also among those who studied the genus *Hydraena*; most of this material he collected in Slovenia, but also in Bosnia and Herzegovina and in Montenegro. He found out that hydraena are not known in some regions or they appear with single specimens only; he assessed that the subgenus *Haenhydrus* Rey is represented in the area of the former Yugoslavia by 17 species. Among them Pretner found and described 6 endemites living in relatively narrow area: *H. carniolica* sp. n. is known only in Gorenjska, *H. czernohorsky* (J. Müller) from southern Slovenia, Croatian Istria, around Triest and Gorica in Italy, *H. dalmatina* (Ganglbauer) from south Dalmatia and coastal belt of Montenegro, *H. montenegrina* sp.n. from central Montenegro, *H. devincta* Orchymont and *H. muelleri* Pretner from Slovenia and Venetian Slovenia in Italy (Pretner 1970 b).

In 1968 Pretner discovered a new species *Antrosedes longicollis* in the cave Kruščica near Ilijča in Bosnia. When he published the description of this new species he also corrected the name of a species *Blattodromus herculeus* Reitter which is an extreme rarity. He states (1970 a) that the right adjective form is *herculeus* and not *herculaneus*. The species that Pretner found belong to the caves of higher mountains.

He concluded the biospeleological explorations of the Croatian karst by publishing papers (1973, 1977, 1979) in which he provided for each area a short historical review of the explorations in chronological order of discoveries of new species and subspecies. He also described the caves and shafts and cited discovered species of beetles belonging to families *Carabidae*, *Bathysciinae*; *Pselaphidae*, *Scydmaenidae*, *Curulionidae*. In the systematic part he included for each species or subspecies a finding site, divided by areas. A shorter chapter is dedicated to zoogeography.

Egon Pretner was modest and hard-working up to the end, full of new projects that remain our responsibility to complete. We shall hold him in fond remembrance, full of gratitude for everything he has done for Slovene speleology and the young generations that he introduced with love and rich experiences into this marvellous world of the underground.

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ANNEX 1: THE LIST OF POSTOJNSKA JAMA FAUNA BY E. PRETNER

Deblo: SPUŽVE (SPONGIARIA)
Spongillidae, species

Deblo: NEČLENARJI (AMERIA)
Razred: Vrtnčarji (*Turbellaria*)

Dendrocoelum lacteum O. F. Müller
Dendrocoelum tubuliferum Beauchamp 1919
Fonticola albissima Vejdovsky
Fonticola dalmatina Stanković & Komarek

Razred: Mehkužci (*Mollusca*)
Podrazred: Polži (*Gastropoda*)

Carychium tridentatum Rissó
Zospeum spelaeum Rossmässler 1837
Zospeum alpestre rossmässleri Wagner 1912
Oxychilus cellarius O. F. Müller
Frauenfeldia lacheineri Küster
Iglica luxurians Kuščer

Hauffenia subpiscinalis Kuščer
Acroloxus tetensi Kuščer

Deblo: MNOGOČLENARJI (POLYMERIA)

Poddeblo: Kolobarniki (*Annelida*)

Razred: Maloščetinci (*Oligochaeta*)

Nais communis Piguet
Tubifex velutinus Grube
Aulodrilus pluriseta Piguet
Eiseniella tetraedra Savigny
Helodrilus constrictus Rosa

Razred: Pijavke (*Hirudinea*)

Herpobdella octoculata Linné
Species

Poddeblo: Členonožci (*Arthropoda*)

Razred: Raki (*Crustacea*)

Nižji raki (*Entomostraca*)

Red: Listonožci (*Phyllopoda*)

Simocephalus vetulus O. F. Müller
Ceriodaphnia affinis Lilljeborg
Bosmina longirostris O. F. Müller
Rhynchotalona rostrata Koch
Pleuroxus laevis Sars

Red: Dvoklopniki (*Ostracoda*)

Cypria ophthalmica Jurine
Cypria pellucida O. F. Müller
Candonia candida O. F. Müller
Candonia trigonella Klie 1931
Typhlocypris schmeili Müller

Red: Ceponožci (*Copepod*)

Diaptomus spec. ?
Macrocylops albidus Jurine
Eucyclops macruroides Lilljeborg
Eucyclops serrulatus Fischer
Eucyclops prasinus Fischer
Paracyclops fimbriatus Fischer
Paracyclops fimbriatus f. *iminuta* Kiefer
Cyclops bisetosus Rehberg
Cyclops charon Kiefer 1931
Cyclops languidoides f. *gotica* Kiefer 1931
Cyclops viridis Jurine
Mesocyclops dybowskyi Lande
Paracamptus schmeili Mrázek
Bryocamptus zschokkei Schmeil

- Echinocamptus georgevitchi* Chappuis
Echinocamptus unicus Kiefer 1931
Echinocamptus dacicus Chappuis
Echinocamptus luenensis Schmeil
Attheyella crassa Sars
Elaphoidella jeanneli Chappuis
Višji raki (*Malacostraca*)
- Red: Dsceteronožci (*Decapoda*)
Astacaus fluviatilis Fabricius
Troglocaris anophthalmus Kollar
- Red: Enakonožci ali prašički (*Isopoda*)
Titanethes albus Schiödte 1848
Androniscus cavernarum tschammeri Strouhal
Asellus aquaticus Linné
Asellus aquaticus caverniculus Racovitza 1925
Asellus istrianus Stammer
- Red: Postranice (*Amphipoda*)
Niphargus stygius Schiödte 1848
Niphargus puteanus speeckeri Schellenberg 1933
Niphargus kochianus wolfi Schellenberg 1933
- Razred: Pajkovec (*Arachnoidea*)
- Red: Palpigrada
Koenenia austriaca Hansen
- Red: Pajki (*Araneidea*)
Stalita taenaria Schiödte 1848
- Red: Paščipalci (*Pseudoscorpionidea*)
Neobisium spelaeum Schiödte 1848
Neobisium pusillum Beier 1939
Chtonius cavernarum Ellington
Roncus stussineri Simon
- Red: Suhe južine (*Opilionidea*)
Hadziana postumicola Roewer 1935
Nelima aurantiaca Simon
- Red: Pršice (*Acarina*)
Asca affinis Oudemans
Ixodes vespertilionis C. L. Koch
Labidostoma lyra Willmann 1932
Eugamasus loricatus Wankel
Veigeia kochi Trägardh
Cyrtolaelaps mucronatus G. & R. Canestrini
Hygrobates longipalpis Hermann
Neumannia limosa C. L. Koch
Arrenurus albator O. F. Müller

Razred: Stonoge (*Myriapoda*)

Podrazred: Strige (*Chilopoda*)

Lithobius stgius Latzel 1880

Podrazred: Kačice (*Diplopoda*)

Acherosoma troglodytes Latzel 1880

Attemisia stygium Latzel 1880

Brachydesmus subterraneus Heller

Gervaisia costata Waga

Razred: Žuželke (*Insecta aut Hexapoda*)

Podrazred: Pražuželke (*Apterygota*)

Hypogastrura purpurascens Lubbock

Hypogastrura sigillata Uzel

Achorutes spelaeus Joseph 1882

Onychiurus armatus Tullberg

Onychiurus boldorii Denis 1938

Onychiurus giganteus Absolon 1901

Onychiurus postumicus Bonet 1931

Onychiurus stachi Denis 1938

Onychiurus stillicidii Schiödte 1848

Anurophorus coecus Joseph (?)

Isotomurus alticolus Carl

Heteromurus nitidus Templeton

Tomocerus niveus Joseph 1882

Oncopodura cavernarum Stach 1934

Sminthurus coecus Joseph 1882 (?)

Plusiocampa erebophila Hamann 1896

Podrazred: Krilate žuželke (*Pterygota*)

Red: Pravokrilci (*Orthoptera*)

Troglophilus cavicola Kollar

Troglophilus neglectus Krauss

Red: Enodcynice (*Ephemeroidea*)

Baëtis bioculata Linné

Ličinke (*larvae*) spec. ?

Red: Přibrežnice (*Plecoptera*)

Ličinke (*larvae*) spec. ?

Red: Mladoletnice (*Trichoptera*)

Ličinke (*larvae*) spec. ?

Red: Metulji (*Lepidoptera*)

Triphosa dubitata Linné

Scoliopteryx libatrix Linné

Red: Hrošči (*Coleoptera*)

Anophthalmus schmidtii Sturm

Anophthalmus hirtus confusus G. Müller 1935

Laemostenus elongatus Dejan
Laemostenus schreibersi Küster 1846
Bathyscimorphus byssinus Schiödte 1848
Bathysciotes khenvenhülleri L. Miller 1852
Aphaobius milleri F. Schmidt (subsp.)
Leptodirus hochenwarti F. Schmidt 1832
Atheta spelaea Erichson
Quedius mesomelinus Marsham
Machaerites ravaasini G. Müller

Rcd: Dvokrilci (Diptera)

Neosciaria vivida f. *tenuicornis* Lengersdorf 1932
Chironomus viridulus Linné
Triphleba aptina Schiner & Egger 1854
Chiromia oppidana Scopoli
Nycteribia biarticulata Hermann
Nycteribia schmidli Schiner & Egger
Ličinke (larvae) fam. Culicidae

Deblo: STRUNARJI (CHORDONIA)

Poddeblo: Vretenčarji (Vertebrata)

Razred: Ribe (Pisces)

Phoxinus laevis Linné
Leuciscus spec.
Trutta spec.

Razred: Dvoživke (Amphibia)

Proteus anginus Laurenti

Razred: Sesalci (Mammalia)

Rhinolophus hipposideros Bechstein
Rhinolophus ferrum-equinum Schreber
Miniopterus schreibersi Kuhl

ANNEX 2: THE LIST OF COLEOPTEROLOGICAL FAUNA OF ARTIFICIAL SPACES BY E. PRETNER

CARABIDAE

Geotrechus saulcy subsp. *metallorum* Jeannel
Rudnik hematitnega železa, Privas (Ardéche)
Aphaenops loubensi Jeannel
Aphaenops cabidochei Coiffait
Hydrphaenops vasconicus subsp. *delicatus* Coiffait

Tunel do dvorane Verna na dnu brezna Aven de Pierre-Saint-Martin in do jame Grotte d Arphidia, Basses Alpes

Speotrechus (s. str.) *mayeti* Abeille

Rudnik hematitnega železa, Privas (Ardéche)

Orotrechus (s. str.) *carinthiacus* Mandl

Rovi na Obirju v višini 900 do 2000 m

Orotrechus (s. str.) *globulipennis* Schaum

Rov pod Plano nad Plužno pri Boveu

Orotrechus (s. str.) *muellerianus* Schatzmayr

Kaverna pri železniški postaji Prosek (Prosecco) na Krasu

Orotrechus (s. str.)

Rov na vzhodnem rovu Tisnika blizu Hude luknje

Orotrechus (s. str.) *fabianii* Gestro

Podzemeljska kamnoloma Cogolo di Costozza in pri Covolo del Tesoro,

Monti Berici

Duvalius (s. str.) *carantii* Sella

Podzemeljski prostori samostana Certosa di Pesio, Alpi Marittime

Duvalius (s. str.) *exaratus* Schaum

Knapovka jama, Paka severno od Velcnja (obronki Karavank)

Duvalius (*Euduvalius*) *lucidus* J. Müller

Spilja-rudnik "Minera", Škrip (otok Brač)

Anophthalmus bernhaueri Ganglbauer

Obir: rov nad prevalom Šajda, rovi svinčenih rudnikov "Fladung" in "Seealpe", rov v gorskem hrbtnu zahodno od Železne Kaple, približno 600 m visoko

Karavanke v Sloveniji: gornji rov na Počivalu nad kmetijo Počivalnik na južnem pobočju kota 1172 Samuh; gornji in doljnji rov v Podljubelju nad kmetijo Potočnik

Anophthalmus kaufmanii subsp. *weingärtneri* (Winkler)

Rudarski vrt, Sv Jakob na Medvednici nad Zagrebom

Anophthalmus mariae Schatzmayr

Rov pod Valvazorjevo planinsko kočo na Stolu (Karavanke): rudnik "Pri štolnu" pod planino Trento (Julijске Alpe)

Anophthalmus egonis J. Müller

Julijске Alpe: rov nad Rudnim poljem ob stezi za Konjšco planino, rovi "Janez I-III" na Rudnici kota 946 pri Studorju v Bohinju; rov na prevalu med Uskovnico in Ovčarijo; okolica Viševnik planine: rov ob stezi na preval nad Viševnik planino, tretji od zgoraj navzdol, rov pod "Jamo na sedlu"

Anophthalmus ajdovskanus subsp. *fodinae* Mandl

Obir: rov pod Rainerjevim domom na Ojstercu, rovi svinčenega rudnika "Seealpe"

Anophthalmus ajdovskanus subsp. *pretneri* J. Müller

Rov pod Valvazorjevo planinsko kočo na Stolu in rov "Pri knapih" pod stezo na Begunjščici (Karavanke)

Anophtalmus ajdovskanus aff. subsp. *muelleri* Jeannel

Viševnik planina (Julijanske Alpe): rov ob stezi od Viševnik planine na preval, tretji od zgoraj navzdol, veliki rov pri mostu v steni nad jamo Zlatico

Anophtalmus ajdovskanus aff. subsp. *santiacus* G. Müller

Italijanska kaverna iz prve svetovne vojne za Gomičekovim zavetiščem pod vrhom Krna 2245 m visoko (Julijanske Alpe)

Anophtalmus ajdovskanus /Ganglbauer/ (subsp. spec.)

Trenta v Julijskih Alpah: rudnik "Pri štolnu" pod planino Trento in rudnik na Srednici pod Vršacem v Zgornji Trenti

Laemosthenes (A.) schreibersi Küster

Julijanske Alpe: kaverna na Lajnerju nad Soriško planino, rovi "Janez I-III" na Rudnici kota 946 pri Studorju v Bohinju, rov ob stezi od Viševnik planine na preval, tretji od zgoraj navzdol; italijanska kaverna iz prve svetovne vojne na južnem pobočju Krna 1600 m visoko, rov pod Planjo nad Plužno pri Bovec; rudnik na Srednici pod Vršacem v Zgornji Trenti, 1800 m visoko in rudnik "Pri štolnu" pod planino Trento Karavanke: rovi "Pri knapih" na Begunjščici, nad in pod stezo ter tik ob stezi

Menina planina: Selska luknja pri vasi Selo zahodno od Zgornjega Tuhinja

Pohorje: Rov nad kasarno v Bukovju, Dravograd

Kobansko: rov v Sturmovi grabi, Fala

Škofjeloški hribi: rov Arnežov bavhenk na vznožju Šmarjetne gore pri Kranju

BATHYSCIINAE

Bathyosciola (s. str.) *linderi* Abeille

Rudnik galenita, Sainte-Marguerite-Lafigére (Cévennes)

Bathyosciola Boldoria (*ghidinii*) F. Lona

Podzemeljski prostori trdnjave v mestu Brescia

Aphaobius heydeni subsp. *robustus* J. Müller

"Štoln" pri Dobravškem mostu pri Kamni gorici (Škofjeloško hribovje)

Aphaobius milleri subsp. *pretneri* J. Müller

Rov pod Valvazorjevo kočo na Stolu in 3 rovi "Pri knapih" na Begunjščici (Karavanke)

Aphaobius milleri subsp. *winkleri* Mandl

Rov pri Uletovega planinskega doma na Peci; rova Kolša in Heller na avstrijskem pobočju Pece ("Petzen") v Karavankah

Aphaobius milleri subsp. *brevicornis* Mandl

Obir v avstrijskih Karavankah: rovi v višini 1400 do 2000 m, rov nad prevalom Šajda in rovi svinčenega rudnika "Seetalpe"

Aphaobius milleri /F. Schmidt/ (subsp.)

Karavanke: gornji rov na Počivalu nad kmetijo Počivalnik na južnem pobočju kote 1172 Samuha in dolnji rudniški rov nad kmetijo Potočnik v Podljubelju

Menina planina: Selska luknja pri vasi Selo (Zgornji Tuhinj)

Julijske Alpe: rov ob stezi Viševnik planina-preval, t.j. tretji rov od zgoraj navzdol, rov z navpičnim vhodom levo od steze Viševnik planina-preval, veliki rov pri mostu v steni nad jamo Zlatico; rudnik na Srednici pod Vršačem v Zgornji Trenti in rudnik "Pri štolnu" pod planino Trento

Lotharia angulicollis Mandl

Rov nad prevalom Šajda na južnem pobočju Obirja

Oryotus micklitzi Reitter

Julijske Alpe: rov nad Rudnim poljem na Pokljuki; rov ob stezi od Viševnik planine na preval, t.j. tretji od zgoraj navzdol, rov z navpičnim vhodom levo od steze Viševnik planina-preval, veliki rov pri mostu v steni nad jamo Zlatico pod Viševnik planino, rov ob navedeni stezi na levo, kjer ta ne traverzira več pobočje, ampak krene navzgor proti prevalu

Spelaeobates kraussi J. Müller

Spilja-rudnik "Minera", Škrip (otok Brač)

STAPHYLINIDAE

Lathrobium (Glyptomerus) cavicola H. Müller

Menina planina: Selska luknja pri vasi Selo (Zgornji Tuhinj)

Phloeocaris (Scotodytes) winkleri Coiffait

Les Cabesses, rudnik mangana, Rivérenert (Ariège)

CURCULIONIDAE

Troglorhynchus anophthalmus F. Schmidt

Menina planina: Selska luknja pri vasi Selo (Zgornji Tuhinj)

ANNEX 3: SPECIES NAMED AFTER EGON PRETNER

HROŠČI Coleoptera

družina KREŠIČEV, Carabidae

Carabus croaticus pretneri Drovnik-Krätschmer, 1977

Adriaphaenops pretneri Scheibel, 1935

(Vjetrenica, Zira jama, BIH - endemit)

Neotrechus suturalis pretneri Scheibel, 1936

(Jama pri Vlaništu, Črna gora - endemit)

Anophthalmus egonis J. Müller, 1923

(Jame na Pokljuki in Pršivec, Slovenija - endemit)

Anophthalmus ajdovskanus pretneri J. Müller, 1913

(Karavanke, Slovenija - endemit)

Anophthalmus micklitzi pretneri J. Müller, 1913

Anophthalmus milleri pretneri J. Müller, 1913

družina MRHARČKOV, *Catopidae*, *Bathysciinae*

Aphaobius milleri pretneri J. Müller, 1913

(Stol, Karavanke, Slovenija - endemit)

Pretneria G. Müller, 1931

Pretneria latitarsis (G. Müller, 1931)

(Golobja jama, Trnovski gozd, Slovenija - endemit)

Pretneria saulii (G. Müller, 1941)

(Snežnice na Kaninu, Slovenija - endemit)

Orostygia pretneri G. Müller

(Julijska krajina, Italija)

Speonesiotes pretneri G. Müller, 1934

(pećina Magara, Skadar - endemit)

Leptodirus hochenwartii pretneri (G. Müller, 1926)

(Jama nad Zosten, Čičarija, Istra)

družina RILČKARJEV, *Curculionidae*

Troglorhynchus pretneri Solari 1955

(Velika severna Notranjska planota)

PAJKI, *Aranea*

Troglohyphantes pretneri Deeleman-Reinhold, 1978

(špela Koruns, gora Prokletije, Črna gora - endemit)

Stalita pretneri Deeleman-Reinhold, 1971

(Donja Cerovačka pećina, Lika, Hrvatska - endemit)

STONOGE, *Chilopoda*

Scolopendrellopsis pretneri Juberthie-Jupearu, 1963

DVOJNONOGE, *Diplopoda*

Attemisia pretneri Strasser, 1933

(Križna jama, Lož, Slovenija - endemit)

Acherosoma pretneri Strasser, 1940

(Medvedja pećina, Lokve, Hrvatska - endemit)

Orobainosoma pretneri Strasser

Leptoijulus pretneri minor Strasser, 1940

(Menina planina, Savinjske Alpe, Slovenija - endemit)

Brachydesmus inferus pretneri Verhoeff

Egonopretneria Strasser

RAKI, Crustacea

Spelaeocaris pretneri Matjašič, 1958

• *Niphargus aquilex pretneri* Sket, 1959

(Gornja Cerovačka pećina, Hrvaska - endemit)

Monolistra pretneri pretneri Sket, 1969

(Pećina kod Vrane, Hrvaska - endemit)

Pseudocandona pretneri Danielopol, 1978

POLŽI, Gastropoda

Zospeum pretneri Bolc, 1961

VRTINČARJI, Turbellaria

Bubalocerus pretneri Matjašič, 1958

ZGODOVINSKI POMEN EGONA PRETNERJA ZA BIOLOGIJO

Povzetek

Egon Pretner (1896 - 1982) je bil v mednarodnem merilu eden najboljših poznavalcev evropskega krasa in živali v kraških jamah, še posebej hroščev. Največ v tem življenjskem okolju je odkril nad sto novih živalskih vrst in je s tem bistveno prispeval k jamskim katastrom Slovenije in drugih dežel bivše Jugoslavije, saj je bil zanesljivo jamar, ki je obiskal največ jam v Jugoslaviji. Po svojih zapiskih je obiskal 1492 jam: 649 na Slovenskem, 773 v drugih deželah Jugoslavije, 70 v drugih evropskih državah in sestavil je katalog za večino kraških jam v Sloveniji in republikah bivše Jugoslavije. Za opravljeno delo je prejel mnoga društvena priznanja in odlikovanja. Bil je častni predsednik Slovenskega entomološkega društva ter častni član Jugoslovanskega in Francoskega entomološkega društva. Za znanstveno delo je prejel Prešernovo in Jesenkovo nagrado. Ob 80- letnici je bil odlikovan z redom dela z zlatim vencem. Skromen in delčaven je ostal do konca, še poln načrtov, ki pa so ostali naša obveza, da jih dokončamo.

Na področju, kjer je dosegel mednarodni sloves, je bil E. Pretner samouk in dolga leta po statusu zgolj amater. Bil je neutrudljiv terenski delavec, slovenski in celotni jugoslovanski kras, pa tudi kraške predele v sosednji Italiji in Avstriji, je poznal bolje kot kdorkoli. Pridobil si je pomembne zasluge na raznih področjih krasoslovja (evidenca jam, geografija krasa, tehnika jamarstva in jamarskega raziskovanja itn.), predvsem pa se je posvečal raziskovanju

življenja v kraškem podzemlju. Tu je odkril številne nove vrste migetalkarjev, polžev, dvojenog in zlasti hroščev. Kot žužkoslovec je posegel tudi na nekatere druga področja, tako je bil na svetu največji specialist za skupino vodnih hroščev *Hydraena*, vendar pa slovi predvsem kot raziskovalec jamskih hroščev. Razvil je izvirne načine za zbiranje tovrstnega študijskega gradiva. Poleg odkrivanja novih vrst je preverjal tudi že publicirane podatke in ustvaril si je celovito sliko o geografski razširjenosti posameznih vrst. Napisal je nad 70 razprav in člankov v domačih in tujih znanstvenih revijah, za sintezo raziskovalnega dela - monografijo o jamskih hroščih Slovenije - pa mu je zmanjkalo časa. Kot velik altruist je E. Pretner zbrano gradivo pogosto prepuščal v obdelavo raznim specialistom, da so tako prvi opisali mnoge živalske vrste, ki jih je sam odkril. Preko 20 vrst pa se le imenuje po njem, kar kaže na veliko spoštovanje in cenjenost s strani biologov. E. Pretner se je med prvimi zavedel ekološke ogroženosti kraških jam in postal je zgoden bojevnik za varstvo narave tudi na tem področju.

**A FAIRY PHANTOM
DOES AGAPITO'S 1802 BOOK ON VILENICA
EXIST?**

**ALI OBSTOJA AGAPITOVA KNJIGA O VILENICI
IZ LETA 1802?**

TREVOR R. SHAW¹

Izvleček

UDK 551.44:929 Agapito G.

Trevor R. Shaw: Ali obstoja Agapitova knjiga o Vilenici iz leta 1802?

Avtor sklepa da pogosto omenjene Agapitove knjige o Vilenici "La Grotta di Corgnale" sploh ni. V prispevku je avtorjeva razlaga za to trditve.

Ključne besede: zgodovina speleologije, Slovenija, Kras, Vilenica, Agapito.

Abstract

UDC 551.44:929 Agapito G.

Trevor R. Shaw: A fairy phantom - does Agapito's 1802 book on Vilenica exist?

It is concluded that the often-cited La Grotta di Corgnale, by Agapito, does not exist. A possible explanation for the error is suggested.

Key words: history of speleology, Slovenia, Kras, Vilenica, Agapito.

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A very early book about the cave Vilenica has been frequently referred to for nearly a century, but there has been considerable doubt whether it ever existed. This is the supposed *La Grotta di Corgnale*, written by G. Agapito and published in 1802.

Girolamo Agapito was born in 1783 at Buzet in Istria and educated at Koper (Faraone 1994). Of his several publications, *Le Grotte di Adlersberg, di S. Canciano, di Corniale e di S. Servolo...*, published in 1823, is the best known.

The earliest reference traced to Agapito's 1802 book occurs in a bibliography of caves in and near the classical Karst, published in *Alpi Giulie* (Anon. 1897). Here it is listed as "Relazione, della grotta di Corniale, di Girolamo Agapito, in 16°, Trieste, 1802". No part of this entry was printed in italics, as book titles elsewhere in the text were, so "Relazione, della grotta di Corniale" must be a description of its subject and not its actual title, indicating that the book itself had not been seen. The sources of the information in the list include, according to a footnote, "notizie vocali fornitaci gentilmente, de soci e non soci" (verbal information kindly supplied by members and non-members [of the Societa Alpina delle Giulie]).

Later in the same year Boegan (1897b) cited the 1802 book in the same words, "Relazione della grotta di Corniale - Girolamo Agapito", but this time italics have been used so that, by the convention of that article, the description of the book appears as a true title.

When the book is next listed, in a bibliography for the Istrian region (Parona et al. 1923, p. iii), its title has become *La grotta di Vileniza detta di Corniale*, published at Trieste. A few years later *Due mila Grotte* (Bertarelli and Boegan 1926) referred to "Agapito, G., La grotta di Corgnale, Trieste, 1802", translating the former name into Italian which is not normal practice in that book. This latest form of the title has continued to be cited to the present day (e. g. Kranjc 1995).

Despite these many statements that the 1802 book by Agapito does exist, there are also many places where it might have been expected to be mentioned but was not. Agapito's own book of 1823 does not refer to it. Boegan (1897a) points out a measurement error in Agapito's 1823 description of the cave, but does not there mention any earlier book by him. Three bibliographies do not include it. The Austrian *Literatur-Anzeiger* (Anon. 1880) does not contain it, but it has only two entries for the cave anyway. Gratzy (1897) omits the cave from his bibliography altogether. Herak et al. (1976) do not list it, but their references for that period are very sparse. Much more significant is its absence from the careful and comprehensive annotated bibliography of the cave by Faraone (1993).

It is noticeable that none of those who refer to the book quote extracts from it or derive information from it. Nor is the total number of pages or any other physical fact about it given. Even the title is written in three forms in

successive publications. In every case it is only its existence that is mentioned, with no indication that the book itself has been seen.

So, does the book in fact exist? Was it ever written? This author has never met anyone who has seen a copy. The major national libraries and karstological libraries of the world have no copies. Neither the Biblioteca Civica nor any other library in Trieste has any record of the book (dr. Anna Rugliano, pers. comm. 1994).

It may be noted also that in the year of its supposed publication Agapito was only 18 or 19 years of age, and so was unlikely to have written such a book.

If Agapito's 1802 book does not exist, how can so many references to it be explained?



Fig. 1: The title page of Trevisani's book (reproduced by permission of the Biblioteca Civica, Trieste).

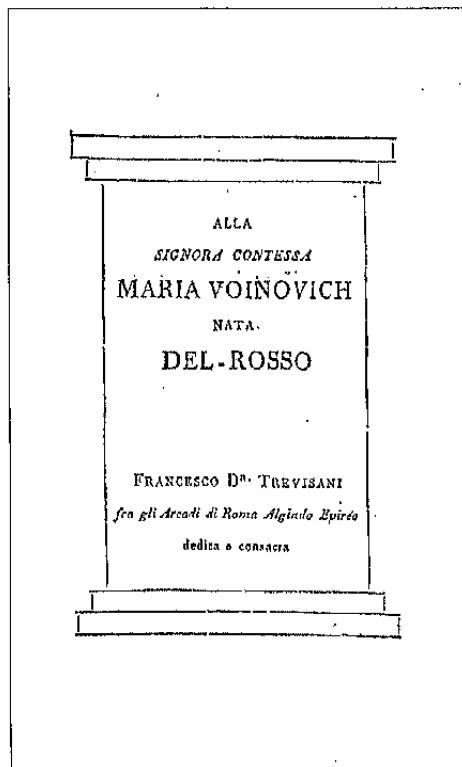


Fig. 2: The author's name is given on the dedication page of his book, 'La Grotta di Vileniza, detta di Corniale' (reproduced by permission of the Biblioteca Civica, Trieste).

First of all, another book about the Vilenica cave was published in 1802 - La Grotta di Vileniza, detta di Corniale, a poem by dr. Francesco Trevisani, published in Trieste as a small volume of 23 pages (Figs. 1 and 2). It was cited (with the title abbreviated) in Anon. (1897) and Boegan (1897b). Duemila Grotte (Bertarelli and Boegan 1926) did not include it, but it is listed accurately by Parona et al. (1923, p. cxliv), who also list Agapito's supposed book of the same year under the identical title.

It does seem exceedingly likely, though unprovable, that the person who provided the information for the first entry for the Agapito book (Anon. 1897), was confusing Agapito, as the author of the 1823 book containing a section on Vilenica, with Trevisani's book of 1802. The references then gradually gained respectability and authority. In Boegan's (1897b) article the use of italics provided a quotable title, and Boegan's name in a citation implied reliability. Once the book was listed in Parona's bibliography and in the standard reference book Duemila Grotte, its existence became widely accepted.

While non-existence can never be proved, it does seem almost certain that there never has been a Vilenica book of 1802 by Agapito. If so, it is another phantom book of the karst, like Herberstein's *De Admirandis Rebus Naturae* of the 16th century (Shaw 1994). Perhaps, after all, it was produced by a *vila* (fairy) of Vilenica.

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ALI OBSTOJA AGAPITOVA KNJIGA O VILENICI IZ LETA 1802?

Povzetek

Že skoraj sto let pogosto citiramo staro knjigo o Vilenici, a že dolgo obstojajo tudi dvomi, da je bila v resnici sploh tiskana. To je domnevna "La Grotta di Corgnale" avtorja G. Agapita, izdana 1802.

Girolamo Agapito je bil rojen 1783 v Buzetu v Istri in se šolal v Kopru. Izmed njegovih del je najbolj znana "Le Grotte di Adlersberg, di S. Canciano, di Corniale e di S. Servolo...", tiskana 1823.

Prva omemba njegove knjige iz 1802 se pojavi v bibliografiji o jamah klasičnega Krasa in soseščine (Anon 1897), torej 95 let po tem, ko naj bi knjiga izšla. Nekateri podatki, ki jih navaja bibliografija, so izrecno dobljeni od različnih pomočnikov in takrat niso bili preverjeni. Ta navedba iz 1897 je najbrž vir, po katerem je bila knjiga kasneje citirana, vendar pod dvema malce različnima naslovoma, Boeganovim (1897 b) in v bibliografiji Istre (Parona et al. 1923) ter 1926 v Duemila grotte.

Tako je bila Agapitova knjiga iz 1802 sprejeta v strokovno literaturo, čeprav ni nobenih dokazov, da je kdo izmed teh avtorjev knjige sploh kdaj videl. Tudi z resnim iskanjem po narodnih in regionalnih knjižnicah ni bilo mogoče odkriti niti enega izvoda. Še več, Agapito je bil 1802 star šele 18 ali 19 let, razlog več, da ta knjiga ni bila nikoli napisana. Pač pa je izšla druga knjiga o Vilenici 1802. To je pesnitev dr. Francesca Trevisanija, izdana v Trstu, z omembom avtorjevega imena šele na strani s posvetilom. Na naslovnični ni imena avtorja, v čemer je morda vzrok, da so knjigo nepazljivo pripisali Agapitu, za katerega se je vedelo, da je kasneje pisal o tej jami.

ŠKADAVNICA CAVE EXPLORED BY ENGLISH TRAVELLERS IN 1737

KAKO STA ANGLEŠKA POPOTNIKA 1737 RAZISKOVALA JAMO ŠKADAVNICO

TREVOR R. SHAW¹

Izvleček

UDK 551.44(497.4)(091)

Trevor R. Shaw: Kako sta angleška popotnika 1737 raziskovala jamo Škadavnico

Majhno jamo Škadavnico sta raziskovala leta 1737 dva angleška potnika, Richard Pococke in Jeremiah Milles. Ta obisk pa je bistveno starejši od kasnejših raziskav te štajerske jame severovzhodno od Ljubljane. Njuni opisi Škadavnice so prvič objavljeni v tem prispevku, z nekaj poročili o krajših potovanjih po Sloveniji, na Cerkniško jezero in o obisku štirih jam iz okolice Postojne.

Ključne besede: Pococke, Milles, speleologija, geologija, zgodovina, biografija, Slovenija, Škadavnica.

Abstract

UDC 551.44(497.4)(091)

Trevor R. Shaw: Škadavnica cave explored by English travellers in 1737

The small cave of Skadavnica was explored in 1737 by two English travellers, Richard Pococke and Jeremiah Milles, thus doubling the length of time since the first cave was reported in north-eastern Slovenia east of Ljubljana. Their descriptions of it are printed here for the first time, with some account of the rest of their short tour in Slovenia during which they visited Cerkniško jezero and four caves near Postojna.

Key words: Pococke, Milles, speleology, history, biography, Slovenia, Škadavnica.

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INTRODUCTION

It had been thought that the earliest record of a cave in Slovenian Styria, indeed of any cave in north-eastern Slovenia east of Ljubljana, was a mention of jama Pekel near Šempeter in 1860 (Štorman 1991). Habc et al. (1978) state that it was discovered in that year.

Škadavnica, a small cave about 1,5 km north-west of Vransko and 42 km north-east of Ljubljana (Fig. 1) was thought to have remained unrecorded until 1902, when cave fauna was collected there.

This paper shows that Škadavnica had, in fact, been explored and described by two English travellers, Richard Pococke and Jeremiah Milles, in 1737.

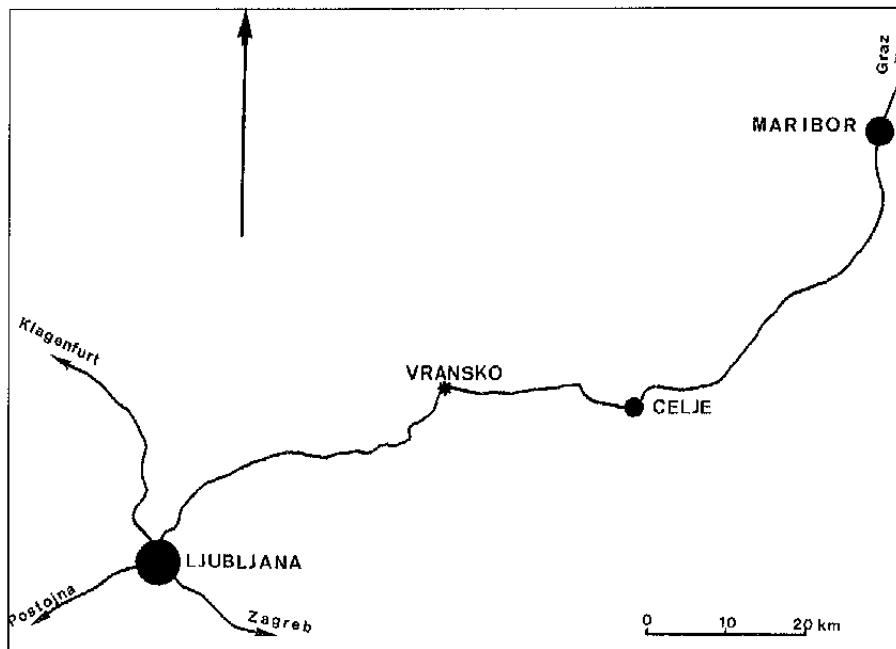


Fig. 1: Map showing location of Vransko.

ŠKADAVNICA TODAY

The name of this cave has been spelled in several ways. 'Škadavnica', as preferred here, is used in the *Krajevni Leksikon Slovenije* (Natek 1976a; b), by Radešček (1993) in his description of the cave, and in the unpublished Kataster folder in the Karst Research Institute at Postojna; it is also the form painted on the rock outside the cave entrance. Naraglav (1977) uses "Ško-

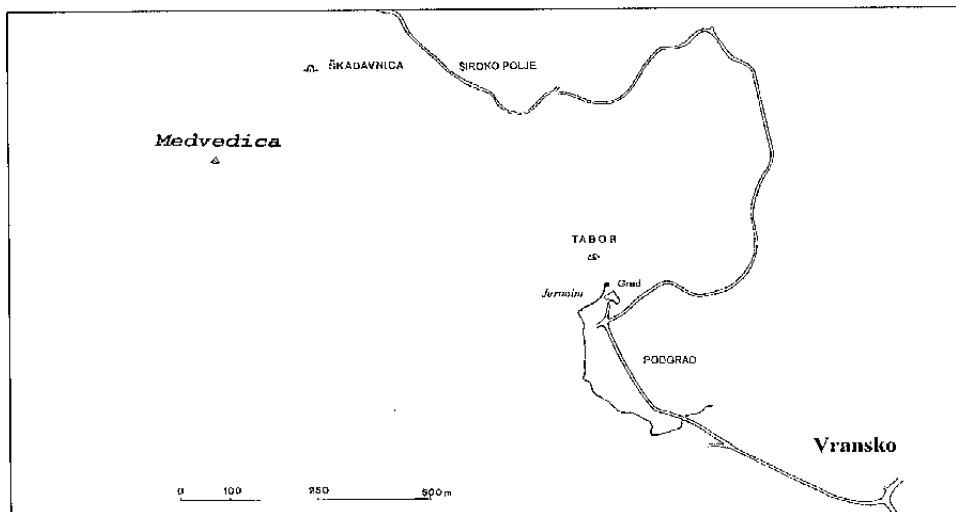


Fig. 2: Škadavnica cave and its surroundings, showing also Podgrajska graščina (described by Pococke as "a Gentleman's house") and the rising at Pogreška jama.

davnica" (which is also given as an alternative in the Kataster and used on the 1973 plan). Kočbek (1926) uses 'Škadovnica' and Radčeček (1993) gives this also as an alternative.

The entrance is approximately 1,5 km in a west-north-westerly direction from the church in Vransko. Part way up the north-east slope of the hill Medvedica (Fig. 2), it is best approached by the motorable track from Podgrad, through Široko polje towards Treska. The final 150 m from the track is done on foot through a plantation of conifers which makes the entrance very difficult to locate. The cave is some 700 m west-north-west of Tabor, the prominent white-painted church on the hill top above the buildings at Jeronim, and which is mentioned in the 1737 account.

The 1973 survey (Fig. 3) makes detailed description of the cave unnecessary. The entrance (Fig. 4) is 5 m

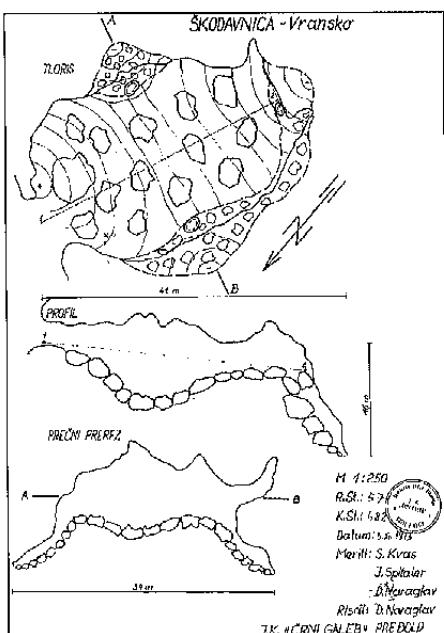


Fig. 3: Survey of Škadavnica cave made in 1973 by members of the Jamarski Klub "Črni galeb" of Prebold, reproduced with their permission.

wide and opens directly in the hillside, with no cliff or other indication of its presence. The main chamber, the only chamber in fact (Fig. 5), is oval in shape and measures 41 m long by 34 m broad at its widest point. It slopes downwards from the entrance and its floor is entirely covered with boulders. There are many holes between and beneath these boulders, three of which are deeper than the rest; the largest of all is at the back of the cave and reaches its deepest point, 16 m below the entrance. A little flowstone remains on the walls near some of these holes. The cave is dry, and daylight penetrates, dimly, even to the back.

Another small cave in the vicinity was also visited in 1737 and so is described here too. Immediately to the south of the church Tabor, at the foot of a steep wooded hillside, is a large house Podgrajska graščina (Fig. 6) together with its block of former stables. The building is now (1996) being restored but, as will be seen, it is much the same as it was 250 years ago. Behind it, close up under the cliff, is the rising of the Podgrajščica (or Pogrešča) stream which emerges from Pogreška jama (Fig. 7). The stream outside the cave is now confined in a concrete channel which may have raised the water level somewhat. The stream entrance is about 1,5 m wide and 1 m high above the water; a dry entrance close by (50 cm x 1,2 m high) leads to the water also.

20th CENTURY HISTORY OF ŠKADAVNICA

The earliest reference to Škadavnica known until now has been that of Penecke (1904), who in 1902 discovered there and in Štabirnica cave the first cave beetles to be found in Štajerska (Slovenian Styria). Naraglav (1977) drew attention to this but did not cite the original paper.

In 1926 Kocbek described Škadavnica briefly, saying that it was 40 m long and 30 m wide, with stalactites. He mentioned also the rising at Pogreška jama, which was said must be long because a draught can be felt at the entrance.

Egon Pretner (1937) visited the Škadavnica cave in July and September 1937, just 200 years after Pococke and Milles, collecting beetles. The hillside around the entrance was overgrown with scrub at that time. His sketch plan and section are reproduced as Fig. 8, and he described the main chamber as 50 m long and 30 m wide. One of the holes in the floor was said to continue for a long way but he did not explore it. Some flowstone was noticed on the right hand side.

Members of the future Jamarski Klub "Črni galeb" of Prebold made their first exploration of the cave on 25 May 1969, Tito's birthday holiday (Vedenik, pers. com., 3 Oct 1995). Some flowstone and dull stalactites on the roof were noticed. The Club returned on 6 November 1973 and made the survey printed here as Fig. 3 (Naraglav & Kvas 1973). A path then led to the entrance, around

which was a more open mixed woodland than today.

Both Škadavnica and Pogreška jama were made more widely known by Natek (1976 a; b) in the *Krajevni Leksikon Slovenije* but this contains no new information.

The latest account of the cave appears in Radešček's (1993) "Guide to the Postman's Cave Route".

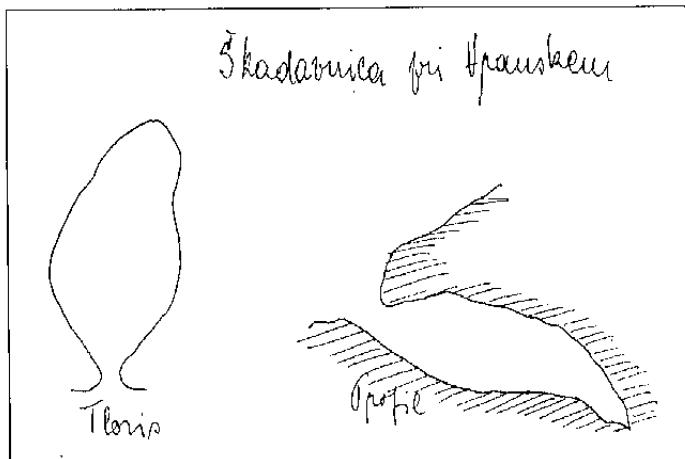


Fig. 8: Sketch plan and section of Škadavnica, made in 1937 by Egon Pretner (from the Cave Kataster of the Karst Research Institute, Postojna. No scale).

POCOCKE

Turning now from the present to the past, an outline is given of the lives of the two men who explored Škadavnica in 1737.

Richard Pococke (Fig. 9) was born at Southampton in England in 1704. He went to Corpus Christi College Oxford in 1720 and graduated BA (Bachelor of Arts) in 1725 and DCL (Doctor of Civil Law) in 1733. Already in 1725 he was appointed Precentor, one of the Canons, at Lismore cathedral in Ireland.

Immediately after gaining his doctorate in 1733 he started on his series of foreign tours, which continued until 1741. These tours, together with those of Miles who accompanied him on some of them, are treated separately below. He was made a Fellow of the Royal Society in the year of his return from his travels, perhaps in recognition of their value. It is probable that he was awarded an honorary LL D



Fig. 9: Richard Pococke in later life (from Pococke 1887). A younger portrait is reproduced in fig. 11.

(Doctorate of Laws) for the same reason, for he uses this degree on the title page of his book in 1743, rather than DCL.

In 1744, when his first series of travels was over and his book written, he was made Precentor of Waterford cathedral. Then in 1756 he became Bishop of Ossory, also in Ireland. In July 1765 he was appointed Bishop of Meath but a few months later he died, on 25 September (Anon. 1765; Kemp 1887; Foster 1891; Wroth 1896).

MILLES

Jeremiah Milles (Fig. 10) was Pococke's cousin. He was born in 1714, probably in Cornwall. In 1729 he entered Corpus Christi College, Oxford, becoming BA in 1733 just before his travels with Pococke, and DD (Doctor of Divinity) in 1747. From 1735 to 1745, as a priest, he was Treasurer of Lismore cathedral and for much of this time he was also Precentor at Waterford. In 1747 he was made Precentor of Exeter cathedral (England), a post he retained until he was appointed Dean there in 1762. Milles was interested in archaeology from an early age, being elected Fellow of the Royal Society in 1742 and becoming president of the Society of Antiquaries in 1768. He died in London on 13 February 1784 (Courtney 1894).

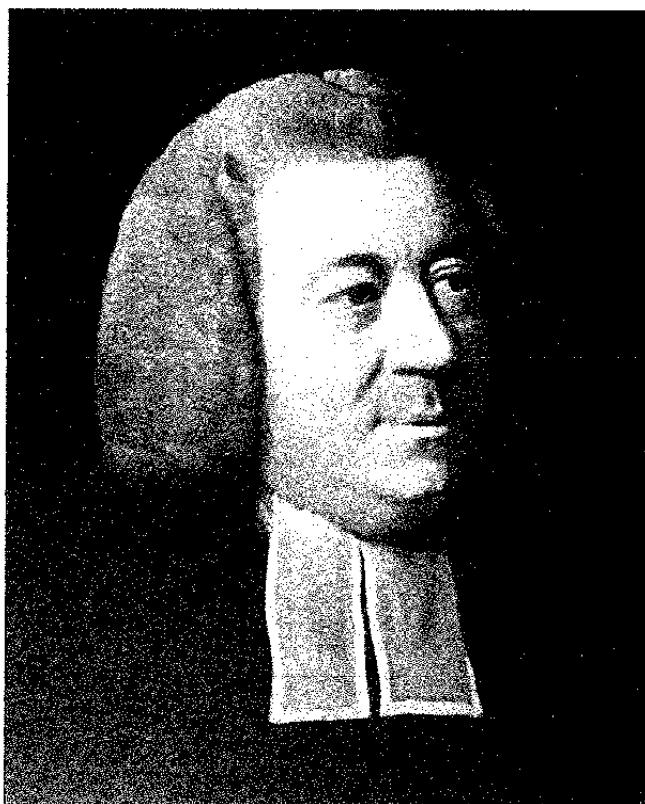


Fig. 10: Jeremiah Milles in later life. An oil painting by Nathaniel Dance, or a later copy of it, in the collection of the the Society of Antiquaries of London and reproduced with their permission. His strange wig was apparently so notorious as to attract a humorous cartoon in *The Gentleman's Magazine* (Anon. 1782).

THEIR TRAVELS

Before coming to their Slovenia visit of 1737 and their exploration of Škadavnica and other caves there, it is useful to summarize Pococke and Milles's other travels, and to review the extent of their interest in caves elsewhere. In this way the characters and interests of the two men should become apparent.

Their first tour abroad was in France and Italy, from September 1733 to July 1734. Thus they were about 29 and 19 years old respectively when they set out from England. Milles had just left Oxford and Pococke had gained his doctorate in the same year. In the summer of 1735 Milles alone travelled in central and eastern England.

Then came their major tour together which included Slovenia and from which Pococke (1743-45) continued alone to Egypt and the Middle East. They left England on 31 May 1736 and travelled through Belgium, Holland, Germany, Bohemia, Hungary, Austria, Italy, Slovenia and Istria to Italy again. From there Pococke sailed from Livorno for Alexandria on 18 September 1737, and Milles (1737a; 1737b) returned over the Brenner Pass and through Austria, Germany and Belgium to Dunkerque (29 November 1737) and London. Pococke meanwhile landed in Egypt in October and spent the next four years travelling there and in the region which is now Israel, Lebanon and Syria, in Cyprus, Crete and the Greek islands, and then through Turkey, Greece, Italy, Germany, Switzerland, France, Holland and Belgium, reaching London on 10 September 1741. So enthusiastic had Pococke become after travelling in the Middle East that he had his portrait painted in Turkish dress (Fig. 11).

At the time of these travels, dates were sometimes reckoned by the Old Style (Julian) calendar, and sometimes



Fig. 11: Richard Pococke in Turkish dress. Probably painted in 1740 when he and the painter were both in Constantinople, it shows him three years older than when he was in Slovenia. An oil painting by Jean-Etienne Liotard in the Musée d'Art et d'Histoire at Geneva and reproduced with their permission.

by the New Style (Gregorian) calendar used today which was not formally adopted in Great Britain until 1752. In the New Style calendar the same day had a date eleven days 'later' than it did by the Old Style. Pococke and Milles used both forms in their writings but in this paper all have been converted to New Style.

Later in life Pococke (1887; 1888) made several series of tours in the British Isles visiting many parts that were little known and describing them accurately in his diaries. His travels in England were made mainly between 1750 and 1757, with a few later. Irish tours took place in 1749, 1752 and 1758; and he visited Scotland in 1747, 1750 and 1760.

Milles (1735-43), too, explored parts of Great Britain, but less extensively than his cousin. Between 1738 and 1743 he made several tours in southern and western England and in Wales, but there is no record of his going further afield.

THEIR INTEREST IN CAVES

As will be seen shortly, the caves that Pococke and Milles found in Slovenia in 1737 occupied a great deal of their attention. The earlier parts of their European travels seem to have resulted in no such visits and it is likely that they had not, by that stage, seen any of the British caves. Not only had neither of them made any extensive tours in Britain, but they never compared what they saw in Slovenia with caves they had known at home, as travellers so often did. Cadell (1820), for example, likened Vilenica jama with Peak Cavern in Derbyshire; and Pococke (1751) in his later tours compared caves in the north of England with two he had seen previously in the Midlands.

Nevertheless when they passed near the Drachenloch at Mixnitz on 13 June 1737, only a few weeks before arriving in Slovenia, they were sufficiently interested to comment on it and to regret that they were unable to explore it.

In the later stages of his tour Pococke visited several caves and it seems that he made a point of enquiring if there were any to be seen. On 23 June 1738 he went into a cave 29 km south-east of Tripoli in the Lebanon, comparing the stalactites in it with those "in the grotts of Carniola". In Crete the following year he explored a small cave on Mount Ida (7 September) and a larger stalactite cave near Hania on 24 September. The ice cave of Grace Dieu near Besançon in France was visited in June 1741.

The very fact that the caves in Slovenia were described in such detail in Pococke's (1743-45) published book is evidence of the interest they held for him, for in this *Description of the East, and some other countries* only about 140 pages out of a total of 886 are devoted to his crossing the whole of mainland Europe, and many parts of his journey are not described at all.

In England Pococke (1750; 1888, p.152-3) went into Wookey Hole in Somerset on 22 October 1750. On 24 and 28 May of the following year

(Pococke 1751 ff.17-19; 1888 p. 192, 196-8) he visited several caves in western Yorkshire - Boreham Cave, Dowkabottom Cave, Weathercote Cave, Jingle Pot, Hurtle Pot, Yordas Cave and Tatham Wife Hole, though of these it was only Borcham and Yordas that he actually entered. Jingle Pot and Yordas he compared with Eldon Hole and Peak Cavern respectively, as if he had seen these previously. He may have done this when he was in Derbyshire in 1743 but his manuscript record of that journey, formerly "in the possession of an Irish gentleman" (Kemp 1887), cannot now be traced.

The Scottish cave of Smoo, a limestone cave on the extreme northern coast of Sutherland, was seen at the end of June 1760 and the then celebrated stalactite cave at Slains in Aberdeenshire a month later (Pococke 1887).

Milles did much less travelling than Pococke after their two European tours together. In England he seems not to have visited the limestone areas of Derbyshire and northern England, and when he was in Somerset his travel diary makes no mention of Wookey Hole. Nevertheless his name is coupled with early records of caves in Devon, the county surrounding his cathedral at Exeter. He accumulated information about Devon with the intention of producing a history and description of it. This was never published but the manuscript materials for it still exist in the Bodleian Library at Oxford. The answers to a series of questionnaires he sent out (Milles c.1750) are supplemented in the draft text written in his own handwriting (Milles c.1760). The latter includes references to caves which Milles himself had explored in Buckfastleigh and the nearby village of Dean Prior.

His continuing interest in caves is again shown by two letters he wrote in 1775 and 1776 to George Catcott, commenting on the draft of Catcott's (1792) book on Penpark Hole at Bristol. The letters were printed with the book.

SLOVENIA JULY 1737

The Sources

As with much of the travels made jointly by Pococke and Milles between 1733 and 1737, there are four sources of information on the Slovene part of their tour. These supplement and complement each other, as well as (sometimes) copying one from another.

The most accessible source is Pococke's published book (1743-45) (Fig. 12), most of which is devoted to his travels in Egypt and the Middle East, together with Cyprus, Crete and parts of Greece. Physically it is a large and impressive book, consisting of two folio volumes 42 cm in height and containing almost 900 pages besides maps and illustrations. As already mentioned, it contains a much fuller account of the visit to Slovenia than it does of most of the travelling in mainland Europe, but the dates of particular visits are often not stated in it. The English edition was followed by a German translation (Pococke 1754-55), a French translation (1772-73) and then a Dutch translation

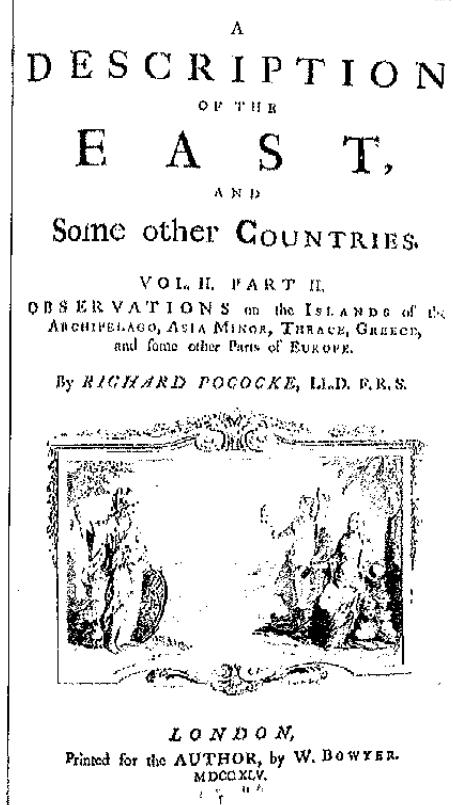


Fig 12: The title page of the volume of Pococke's book which describes the journey in Slovenia.

for the Škadavnica accounts, which are different (but not conflicting) in all the sources.

Carmichael (1991; 1992) has commented on their principal interests in Slovenia which she regards as mainly botany and architecture, and on the different styles of their writing.

The Journey

The two men entered Slovenia from Gorica on 7 July 1737 and travelled through Vipava to the mercury mines at Idrija, as most travellers did at that time. Thence they continued to Vrhnika (10 July) and, because the road to Ljubljana was so bad, they went there by boat down the Ljubljanica river, arriving at Ljubljana on 11 July. It was in the course of a four day excursion from there to Celje and back (Fig. 1) that they visited the Škadavnica cave,

published at Utrecht in 1776-86. So the travels were widely known throughout Europe.

Of the manuscript sources the most detailed is Pococke's 'Journal of Travels' between 1733 and 1741, in 19 volumes, of which volume 16 (Pococke 1737) describes the journey through Slovenia and includes the detailed description of the Škadavnica cave printed here as an Appendix (pp. 000-000). Again, though, precise dates are often lacking. The letters that Pococke (1736-37) wrote to his mother have far less detail but do furnish reliable dates.

Milles's main travel diary (1736-37a) ends on 10 June 1737, just before arrival in Slovenia. But his volume of letters written to the Bishop of Waterford (Milles 1736-37b) covers the Slovene visit, providing considerable detail in places, and also dates. Although these sources differ in many ways it so happens that the descriptions of the caves around Postojna are almost identical in three of them, for the printed book is based on Pococke's journal, which in turn is copied from Milles's letters to the Bishop. Not so

Milles's letters to the Bishop. Not so

Pococke's account of which (1737, ff.120-122) is considered later. Then they went to Cerknica (18 July) and stayed there for two days, giving a detailed description of the lake and its water sinks, followed by a short visit to Rakov Škocjan. At Planina (21 July) they saw the entrance of Planinska jama though the water was too high for them to enter, and on the same day they explored the main Predjama cave beneath the castle. On the following day they saw both Postojnska jama and Črna jama.

Overall, five of the eighteen days they spent in Slovenia were occupied in visiting caves including those at Cerknica. Of the 45 pages of Pococke's diary devoted to Slovenia, eleven describe caves and karst phenomena.

They left Slovenia and arrived in Trieste on 23 July, having travelled across the Classical Karst for most of the previous night "for coolness". Two days later they went by boat to Koper, and the next day on to Izola and Piran en route to Pula. Having returned to Trieste on 3 August, they visited Socerbska jama a few kilometres to the east, either the next day or the day after, noting the presence of stalactites and an altar (Milles 1736-37b, f.120v). On 6 August they left Trieste for the last time, looking at the Timavo rising Duino on their way on into Italy.

VISIT TO ŠKADAVNICA

The description of Škadavnica cave and of their visit to it in Pococke's manuscript journal is printed complete as the Appendix to this paper, and one page is reproduced in facsimile as Fig. 13.

The one fact which Pococke does not supply — namely the date of the visit — is provided from Milles's letters. They had left Ljubljana on 12 July and travelled via Trajaniberg [Trojane] to Frantz [Vransko] where they stayed the night. Then "the next morning [13 July] we saw a Grotto in the mountain pretty large and curious, but not abounding much with petrifactions." (Milles 1736-37b, f.92v). They went on to Celje the same day. The road from Ljubljana to Celje, then as now,

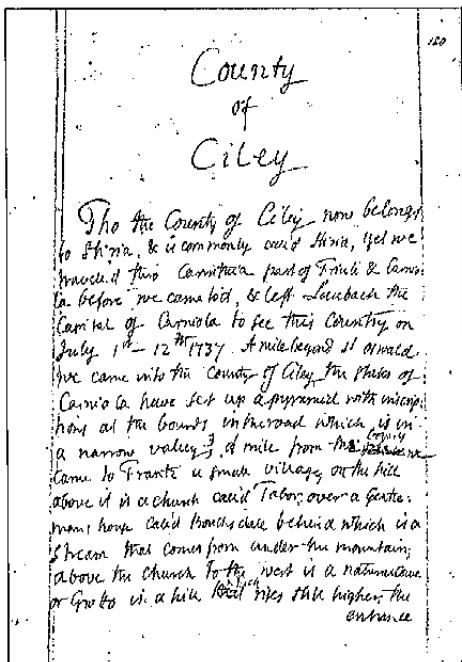


Fig. 13: Part of Pococke's detailed description of the Škadavnica cave on f.120 of his journal, vol. XVI, reproduced from the British Library Add. MS.22993 with their permission. The date "July 1st - 12th" is given in both the old and new styles.

suffered from heavy traffic and the road had been improved in 1728, just nine years before their visit (Natek 1976b).

Before considering Pococke's (1737) detailed description of the visit to the Škadavnica cave, the statements made about it in the other two sources are printed here for completeness.

In his published book, Pococke just records:

... saw a grotto at Frantz, where there are some curious petrifications; but we could not find that it had any communication with the rivulet below it ...
(Pococke 1743-45 2(2), p.254)

And in his letter to his mother he wrote:

We went to see a natural Grotto in the side of a hill about 100 feet diameter and very curious, where we saw many stalactities or stone's like icicles formed by the dropping of the water; when broke it is like Alabaster, & one was large & rise up like a pillar to the top of the Grott.

(Pococke 1736-7, f.64v)

It is to be noted that this was written before he had seen the stalactities in Črna jama nine days later. Nevertheless the pillar, which is mentioned also in his fuller account, must have been quite impressive. It does not exist now.

As Pococke's (1737) entire journal account is printed in the Appendix, it is necessary here only to note those points that require comment such as those by which the identity of the cave has been confirmed.

(f.120) ... we came to Frantz [Vransko] a small village on the hill above it is a church call'd Tabor, over a Gentlemans house call'd Bouchsdale behind which is a Stream that comes from under the mountain;

The "Gentlemans house" is the house at Podgrad, Podgrajska graščina, shown on the map (Fig. 2). Its present appearance (Fig. 6), compared with the view engraved by Vischer (1681) (Fig. 14), shows that it has not greatly changed in three centuries. No doubt Vischer's picture is the closer representation of what Pococke and Milles saw. "Bouchsdale", recorded by Pococke as the name of the house, would be his understanding of the old German word Burckstal, which is what Vischer called it. The "Stream that comes from under the mountain" is the Podgrajščica, emerging from Pogreška jama.

The position of the "natural cave or Grotto in a hill which rises still higher ... above the church to the west" (f.120) is consistent with that of Škadavnica on the slope of Medvedica (604 m compared with 428 m for the church Tabor). The cave entrance is described as "about fifteen feet [4,6 m] wide & eight [2,4 m] high" (f.121), which is not significantly different from the 5 m by 3 m of the 1973 survey. "the cave seems to be about a hundred feet [30,5 m] in diameter being round" compares quite well with its measured dimensions of

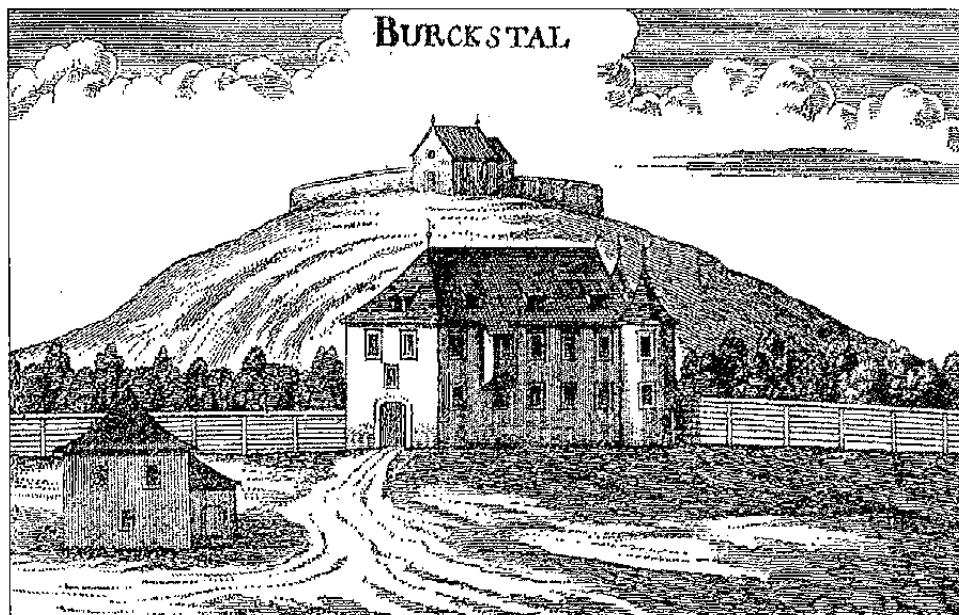


Fig. 14: Podgrajska graščina in 1681. An engraving by J. M. Vischer.

34 m by 41 m. Again, the “confus’d heap of great stones” on the floor and the “rough [ceiling], as if those stones had fallen from it” is a fair description of Škadavnica. The statement that “there are several holes & cavities round it especially three larger than the rest”, matches with the holes shown in the 1973 plan (Fig. 3). The word “crow”, to which Pococke likens some of the stalactites, is an obsolete English word meaning the membranes which secure the intestines within the abdomen of a pig or other animal. The evidently greater quantity of stalactites in 1737 than now is what would be expected of a cave known to the people of the local town, even if it were only occasionally visited by foreigners who brought away “one peice growing like a Coley flower [cauliflower] but in the shape of a Cone.” (f.122).

CONCLUSION

Pococke and Milles's exploration of the Škadavnica cave is significant for two reasons.

Firstly, any previously unpublished information about a cave deserves being made accessible. It is particularly significant, at least in a local context, when it doubles the length of time since the previous earliest record of any cave in the region and more than doubles the period for which the cave itself has been known.

More generally, the interest which Pococke and Milles showed in caves, visiting most of the recognized tourist caves in Slovenia and even going out of their way to see a small and not very impressive cave, demonstrates that there were some highly educated travellers who regarded such natural phenomena as important and worth their attention. In this way they were somewhat similar to Edward Brown (1673) whose description of the Cerknica lake and the Idrija mine are well known. Many of the better-known early reports of caves had been either as part of a deliberate regional survey, as in Valvasor's *Die Ehre dess Herzogthums Crain* (1689) or compiled on royal instructions as were those of Strein in Austria in 1592 (Schallenberg 1592; Schmidl 1857), and Nagel (1747) in Austria and (1748) in Moravia and Carniola.

Very many travellers had only the conventional interests of more conventional educated men, in art, architecture and antiquities — the subjects which were originally chosen to further the education of young men travelling with their tutors on the Grand Tour of parts of Europe.

It is the breadth of Pococke and Milles's interests which is important to the history of foreign travellers, while it is their specific interest in caves and other karst phenomena that is important for the historian of karst studies and of caves in Slovenia.

ACKNOWLEDGEMENTS

I am grateful to Tone Vedenik and members of the Jamarski Klub "Črni galeb" of Prebold for relocating the entrance of the Škadavnica cave and for taking me to it. They have also permitted reproduction of their 1973 survey with this paper. My colleagues in the Karst Research Institute at Postojna have helped, especially by accurate determination of the entrance position (Franjo Drole), taking photographs (Jurij Hajna), preparing the map for publication (Leon Drame) and for finding much of the 20th century literature (Andrej and Maja Kranjc). The staff of the British Library in London, which holds the 18th century diaries quoted here, have been their usual helpful and efficient selves.

APPENDIX

POCOCKE'S ACCOUNT OF THE VISIT TO ŠKADAVNICA CAVE ON 13 JULY 1737

FROM HIS MANUSCRIPT JOURNAL (BRITISH LIBRARY ADD. MS.22993)

Came to Frantz a small village, on the hill above it is a church call'd Tabor, over a Gentleman's house call'd Bouchsdale behind which is a Stream that comes from under the mountain; above the church to the west is a natural cave or Grotto in a hill which rises still higher, the entrance to it is about fifteen feet wide & eight high, it is a descent & the cave seems to be about a hundred feet in diameter being round, it is at bottom a confus'd heap of great stones, & the top is rough, as if those stones had fallen from it by some accident as an earth quake or a unhingin of the ground under, there are several holes & cavities round it especially three larger than the rest into which we went & saw the furthest extent of 'em being not above 4 or 5 yards, all over the Grotto are Stalactites or Stone made by the droppings of the water, but there are more in the holes than in the other part of the Grot, & one always sees the water dropping in several parts; some of these are of the Stalagmate kind that on the stones rising up about an inch & look like tallow growing cold, Some rise up like a cone, one to a good heighth, & large like a pillar broke off. & there is a pillar yt [= that] rises up to the very top as if it supported the arch, some are like Icicles hanging from the vault, & some hangs about six or eight inches deep for six or seven feet exactly like what is calld the crow in the entrails of swine, & is transparent, all this stonie being of the nature of Alabaster is brittle & shining; we examin'd this Grotto very nicely because they said there was a hole which went down to the notch[?] by the Gentle mans house, before mentiond, & that a bull had fallen in & came out at that place, all which we found to be false, & concluded it was only a story to frighten children, & prevent the danger of breaking their legs or bones by going in which they might easily do; we brought away of the stalactites, particularly one peice, growing like a Colcy flower but in the shape of a Cone. When we left Frantz the ncxt day we came into the fine plain in which Ciley [Celje] stands.

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KAKO STA ANGLEŠKA POPOTNIKA 1737 RAZISKOVALA JAMO ŠKADAVNICO

Povzetek

Manjša jama Škadavnica leži 1,5 km SZ od Vranskega, med Ljubljano in Celjem v Sloveniji. Sestavlja jo en sam podzemeljski prostor, velik 41 x 34 m. Do sedaj se je mislilo, da je prvi dokumentiran obisk jame iz 902, ko so v njej lovili jamske živalice. Enako se je verjelo, da je prva jama, ki je omenjena v literaturi iz SV Slovenije, jama Pekel okoli 1860.

Ta prispevek predstavlja in tudi ponatisuje podrobni zapis o obisku dveh angleških popotnikov 13. julija 1737. To sta bila Richard Pococke (1704-1765), kasnejši škof v mestu Ossory in kasneje v Meathu na Irskem, in Jeremiah Milles (1714-1784), kasneje dekan v angleškem mestu Exeter. Popolnejši opis njunega obiska, ki je ponatisnjen v dodatku, je iz Pocockovega popotnega dnevnika v rokopisu (1737), je pa na kratko omenjen tudi v njegovi knjigi (1743-45) in v njegovih (1736-37) ter njegovega tovariša Millesa (1736-37 b) pismih.

Moža sta že prej, od 1733 do 1734, potovala skupaj. Slovenijo sta obiskala med potovanjem, ki sta ga pričela 1736 in na katerem sta obiskala velik del celinske Evrope. V Sloveniji sta bila 20 dni, med 7. in 23. julijem ter ponovno 25. in 26. julija ter 4. ali 5. avgusta. Pot ju je vodila preko Gorice v Idrijo, Ljubljano, Celje, v Cerknico, v Postojno in iz Trsta v Koper, Izolo Piran in na Socerb. Posebej ju je zanimalo Cerkniško jezero in 4 jame v okolici Postojne, o katerih sta pisala veliko več, kot pa o drugih krajih, ki sta jih obiskala. Konec leta 1737 se je Milles vrnil domov, medtem ko je Pococke šel še v Egipt, Izrael, Libanon, v Turčijo, Grčijo, na Ciper in na Kreto, preden je odpotoval preko Evrope nazaj v London, kamor se je vrnil 1741. Da ga zanimanje za jame ni minilo, dokazujejo misli na jame tudi v drugih deželah. Tudi na kasnejših potovanjih po Angliji in Škotskiji obiskal več jam daleč izven njegove poti. Tudi Milles je ohranil zanimanje za jame.

Njuno zanimanje za jame ni pomembno le za krasoslovce, ampak tudi kot primer redkih popotnikov, ki so se zanimali tudi za druge zanimivosti, ne le ustaljeno za umetnost in starine.

Pocockov opis Škadavnice je zelo podroben in natančen, tako da jame, ki jo je videl, ni težko določiti po legi, merah in opisu. Tak natančen opis je nenavaden za tedanje čase. Poleg tega je obiskal tudi razmeroma majhno jamo brez posebnosti zgolj v lastno zabavo. Poleg Škadavnice si je ogledal tudi kraški izvir Pogreško jamo ter omenja graščino Podgrad (Burgstall), ki je še vedno bolj ali manj taka, kot jo je videl Pococke.

REMARK:

In April 1996, after the above paper was written and while revising the plan for publication, F. Drole of the Karst Research Institute ZRC SAZU found several fragments of pottery in a narrow passage leading from among the breakdown blocks at the NW side of Škadavnica Cave. After cleaning and treating them we established that they all belong to one pot. The partly preserved pot has a lip inclined outwards and its edge is shaped. The pot's shoulders are slightly embossed. The clay contains a lot of sand and is well baked. The colour outside and inside passes irregularly from grey-brown to black. The outer surface of the pot is decorated by a comb or twig brush before being baked. Due to its shape and decoration the pot may be dated as of Late Antiquity between the 4th and 5th centuries.

(By Alma Bavdek, Museum of Postojna)



Fig. 4: The entrance of Škadavnica cave, October 1997 (phot. J. Hajna, IZRK collection).



Fig. 5: The main chamber of Škadavnica (phot. J. Hajna, IZRK collection).



Fig. 6: *Podgrajska graščina*, 3 October 1995 (phot. J. G. Shaw).



Fig. 7: The rising at *Pogreška jama*, behind *Podgrajska graščina*, October 1997 (phot. J. Hajna, IZRK collection).

ROBERT TOWNSON, TRAVELLER IN HUNGARY IN 1793 - HIS LIFE AND WORK

ROBERT TOWNSON, POPOTNIK PO MADŽARSKEM LETA 1793 - NJEGOVO ŽIVLJENJE IN DELO

TREVOR R. SHAW¹

Izvleček

UDC 55(439)(091):929 Townson R.

Trevor R. Shaw: Robert Townson, popotnik po Madžarskem leta 1793 - njegovo življenje in delo

Robert Townson (1762 - 1827) je študiral medicino, kemijo in naravoslovje na univerzah v Edinburgu, Parizu, Dunaju in Göttingenu in bil imenovan za častnega doktorja prava v Edinburgu leta 1796. Bil je na petmesečnem potovanju po Madžarski in Slovaški ter leta 1797 objavil knjigo Travels in Hungary. V tem delu opisuje jame pri Aggteleku, na Silicki planini ter brezna v Alsó-hegy. Dodana je tudi geološka karta, sestavljena na podlagi Townsonovih lastnih opazovanj. 1798 in 1799 je izdal še deli geološke in naravoslovne vsebine. 1807 se je izselil v Avstralijo.

Ključne besede: Townson, speleologija, geologija, zgodovina, biografija, objave, Madžarska, Slovaška, Baradla, helectit.

Abstract

UDC 55(439)(091):929 Townson R.

Trevor R. Shaw: Robert Townson, traveller in Hungary in 1793 - his life and work

Robert Townson (1762 - 1827) studied medicine, chemistry and natural history at the universities of Edinburgh, Paris, Vienna and Göttingen and he was made an honorary Doctor of Laws by Edinburgh in 1796. He made the 5-month journey in Hungary and Slovakia which resulted in his Travels in Hungary (1797). Besides describing the caves at Aggtelek and Silica, and mentioning the Alsó-hegy shafts, this book contained a very early geological map, prepared by Townson from his own observations of rocks. Other books on geology (1798) and natural history (1799) followed. Then in 1807 he emigrated to Australia.

Key words: Townson, speleology, geology, history, biography, publications, Hungary, Slovakia, Baradla cave, helictite.

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INTRODUCTION

Robert Townson's book *Travels in Hungary...* (1797a) is well known in Central Europe for its account of his visits to caves in Hungary and Slovakia.

The extracts containing the descriptions of Baradla cave at Aggtelek, the Silica ice cave and the open shafts in the Alsó-hegy plateau have frequently been reprinted (e. g. in Dénes 1972; and Hadobás 1991; 1992) with topographical and speleological comment. For convenience, and to make Townson's text more widely accessible, they are reprinted here as Appendix I.

There has previously been little written on Townson's geological background, and much of the biographical information provided has been incorrect.

Indeed, Townson's life has hitherto remained something of a mystery. What has been published about him in Europe has been largely wrong and seriously incomplete. His place of birth, for example, is recorded in The Dictionary of National Biography (Carlyle 1899) as "probably... Yorkshire", with no year given. Britten & Boulger (1914; 1931), Desmond (1977) state that he was born in Shropshire, again with no year. Goodin (1967) has him born in 1763; Hadobás (1992) states "He died in 1799". None of these 'facts' is true.

This paper therefore concentrates on his life, work and travels. In so doing it adds 28 years to the life previously recorded in European biographical dictionaries, takes him to a successful new career in another continent, and provides a portrait.

A further intention is to provide a fuller picture of Townson himself - his interests, abilities and achievements - so as to throw more light on the man that travelled in Hungary, the quality of his observations there and the authority with which he wrote on geological matters.

BIRTH AND YOUTH, 1762-1782

The clue to new sources of information on Townson's life came to the present author when he was using the much revised second edition of A Biographical Index of deceased British and Irish Botanists (Britten & Boulger 1931). Here, unlike the entry in the first edition of 1893 (one of the sources of the erroneous entry in the Dictionary of National Biography), is the key phrase "d[ied] Australia". No date of birth was given and much of the other information was incorrect but that one simple statement led to the examination of Australian publications and other sources in Australia. In the course of this, I learned that my friend Dr Hugh Torrens, geologist and historian of science at the University of Keele, was already aware of Townson's Australian existence and had done extensive research in the course of preparing a revised entry for The Dictionary of National Biography (as yet unpublished). Much of the biographical information in this paper is derived from his published work.

Robert Townson was born, not in Yorkshire or in Shropshire, but in

Richmond near London. Vallance & Torrens (1984) have investigated parish registers of baptisms, an act of parliament and family divorce papers, and establish that:

Robert Townson was born between January and March 1762 at Spring Grove, Marshgate, Richmond, Surrey and baptised there on 4 April 1762. His parents were married well over four years later at Richmond on 23 December 1766. His father John (c. 1720-1773) was a London merchant and insurer; his mother Sarah Shewell (1731-1805) came from a family with... connections with London brewing and publishing companies.

Robert's father died when he was only ten years old. He served an apprenticeship in Manchester and then, from 1777, lived with his brother-in-law, the Rev. John Witts (1750-1816), at Cardington near Church Stretton in Shropshire.

UNIVERSITIES AND EUROPEAN TRAVEL, 1783-1795

From 1783 to 1787 Townson travelled on foot through France and Italy to Sicily, and on his return from there he attended lectures in Paris on chemistry and probably on mineralogy also.

In December 1789 he enrolled as a medical student at the University of Edinburgh, where he remained for two years without taking a medical degree. Later, however, on 11 April 1796, he was made an honorary Doctor of Laws (LL. D.) by that University (Jo Currie, pers. comm. 1994, quoting the Senate Minutes). This is likely to have been in recognition also of his achievements elsewhere in Europe by the university of what had then become his 'home' town. This LL. D. degree was printed after his name on the title pages of all his books. While at the University he joined the student Natural History Society, appearing on the membership list of 7 January 1790 and presenting two papers on local geology which will be referred to again later, along with his other publications. In 1791 he was elected a Fellow of the Royal Society of Edinburgh, an honour he also used on his title pages.

The influence on Townson of his friends and teachers at Edinburgh will be referred to at the end of this paper. In 1791 they recommended that he be appointed as naturalist to accompany a new Lieutenant-Governor to Canada. This did not happen so he travelled in Europe again, via Uppsala (Sweden) and Copenhagen (Denmark) to Göttingen (Germany). There he enrolled as a student in the Department of Natural History on 19 December 1791 (Selle 1937, and Ulrich Hunger, pers. comm. 1994). Although The Dictionary of National Biography (Carlyle 1899, Desmond 1977) credit him with becoming a Doctor of Medicine there in 1795, and the Australian Dictionary of Biography (Goodin 1967) states that he was made a Doctor of Civil Law (DCL) there in the same year, Hunger (pers. comm. 1994) says that there is no evidence for either degree; furthermore the absence of any leaving certificate suggests that

he did not take any degree there at all. It is significant that neither MD nor DCL degrees are printed on the title pages of his books.

During his three and a half years at Göttingen University, Townson spent the winter of 1792-93 in Vienna, where he studied the respiration of amphibia. A paper written there on that subject, and another completed later in Göttingen, were later published. Leaving Vienna on 5 May 1793, he set off on his Hungarian travels, returning in the middle of October. The Hungarian tour, his geological observations there, and the resulting book, are considered separately.

WRITING, 1795-1806

In May 1795 Townson returned home from Göttingen to Edinburgh. He worked there on his Hungarian book and attempted, unsuccessfully, to get himself appointed by the East India Company to study the physical geography, mineralogy and natural history of India (Townson 1797a, p. vi; 1799, p. 150). It was at this time, as already mentioned, that his honorary LL. D. was awarded by the University of Edinburgh. His *Travels in Hungary...* was published in 1797 and two other books, also discussed later, in 1798 and 1799. After this he started preparing a "County History of Yorkshire", but it was never published.

AUSTRALIA, 1807-1827

When his mother died in May 1805 Townson decided to emigrate to Australia. His elder brother John (1760-1835) had served in New South Wales as a military officer from 1790 (Austin 1967) and returned there as a settler in 1806. Robert followed him, arriving in July 1807. As a naturalist and scholar, and known to the influential Sir Joseph Banks who had accompanied Captain Cook's expedition round the world in 1768-71, he was promised grants of land and also given a sum of money to buy books and laboratory equipment for use in the still young colony (where the first settlers had landed only 18 years before). Strangely, the then Governor of New South Wales (William Bligh, who had been on Cook's third voyage and is known as victim of the Bounty mutiny at Tahiti in 1789) seemed opposed to Townson. The promised grants of land were not made and his scientific work was hindered (Goodlin 1967). Thus alienated, he joined other influential and dissatisfied settlers in forcing the deposition of Governor Bligh. Bligh's replacement, Lachlan Macquarie was governor from 1808 to 1821 and his name is remembered in the Macquarie River and Macquarie Island. The grants of land were at last made in 1810, and Townson established a farm at Varroville, near Sydney, as described later.

Perhaps still affected by the treatment he had received from Bligh, Townson

seemed to lose almost all interest in scientific matters, and became discontented and unsociable. Many letters of this period are in the Mitchell Library in Sydney. He devoted himself almost exclusively to developing his farm, where he raised cattle and sheep, planted experimental crops and established a thriving vineyard (Anon. 1827; 1963: Leister, pers. comm. 1995). He was associated with the Philosophical Society in Sydney about 1820 (Finney 1993) but this was more a social club for those opposed to Governor Macquarie than a learned society.

When Macquarie left in 1821, Townson became a more normal member of the community. He was vice-president of the Agricultural Society of New South Wales (Goodin 1967) and worked on its committees, he supported the foundation of a Sydney Dispensary to provide free medical attention for the poor, gave dinners at his home, and in 1826 was appointed a magistrate.

He died at Varroville on 27 June 1827, aged 65, and was buried on 2 July at Parramatta.

PORTRAIT

An oil painting of Robert Townson in his later years (Fig. 1) was made by Augustus Earle (1793-1838), who a few years later was the artist in HMS Beagle during her South American voyage with Darwin. The picture is undated but must have been painted between 1825, when Earle arrived in Australia, and 1827 when Townson died. It was presented to the Australian Museum in 1873 and transferred to the Mitchell Library, in the National Library of New South Wales, in 1961. Although untitled, the recorded identity of the sitter is supported by the lettering on the spines of the books on the table by his right hand, all of which were written by him.



Fig. 1: Robert Townson between 1825 and 1827, a portrait by Augustus Earle. Oil painting 81,3 x 64,5 cm. Reproduced by permission of the Mitchell Library in Sydney.

VARROVILLE, HIS HOME IN AUSTRALIA

The delayed grants of land near Sydney were made by Governor Macquarie in 1810 (Anon. 1963), but there still was some further administrative delay after that. The area granted, on which Varroville was built and the farm created in the present-day district of Minto on the south-west outskirts of Sydney, was 1000 acres (404.7 hectares) and there was more land near Botany Bay. Macquarie visited the place in 1810 and remarked in his diary that Townson's land and some more nearby "are by far the finest soil and best pasturage I have yet seen in the Colony" (Anon. 1963). Townson named his property Varroville after the Roman agricultural writer Marcus Terentius Varro.

Just what remains of Townson's house is not completely clear.

There is no documentary evidence to prove that he built the [present] house at Varroville, but the two owners after Dr. Townson were not long in occupation, and it is reasonable to assume that Townson, a wealthy man, erected a comfortable house for himself on his land (Anon. 1963, p. 25).

Recent information received from Campbelltown City Council (1995) is accompanied by a map (Fig. 2) in which one building is labelled "House, c.

1816 (Robert Townson's)" and there is also, nearby, "Approx. site of house, c. 1810". A wooden 'slab hut' of about 1810 does exist but whether it was already on the land when it was granted to Townson, or whether he had it built as temporary accommodation, is not known. The house of c. 1816 (Fig. 3) also survives and is still occupied. The main house, "Varroville" (Fig. 4), a little to the north, was formerly thought to have been built, or at least much modified, in 1859. Its main character, including the cast iron columns on

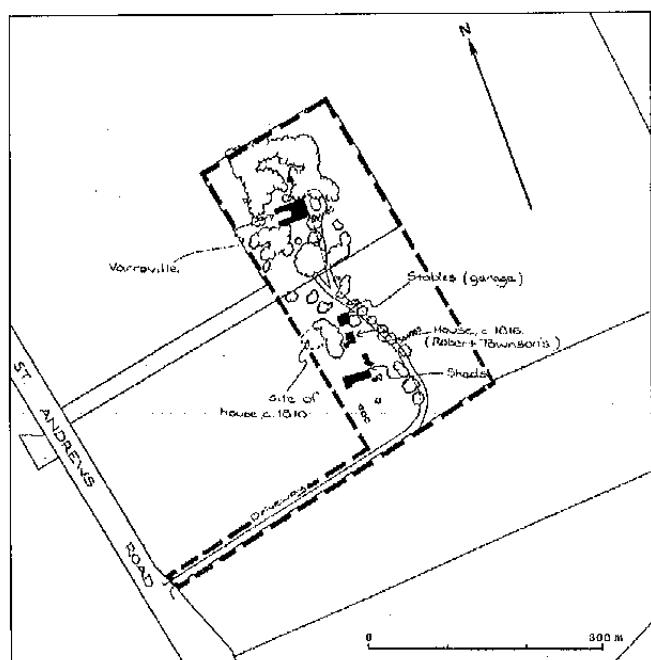


Fig. 2: The buildings at Varroville. A recent map supplied by the Campbelltown City Council.

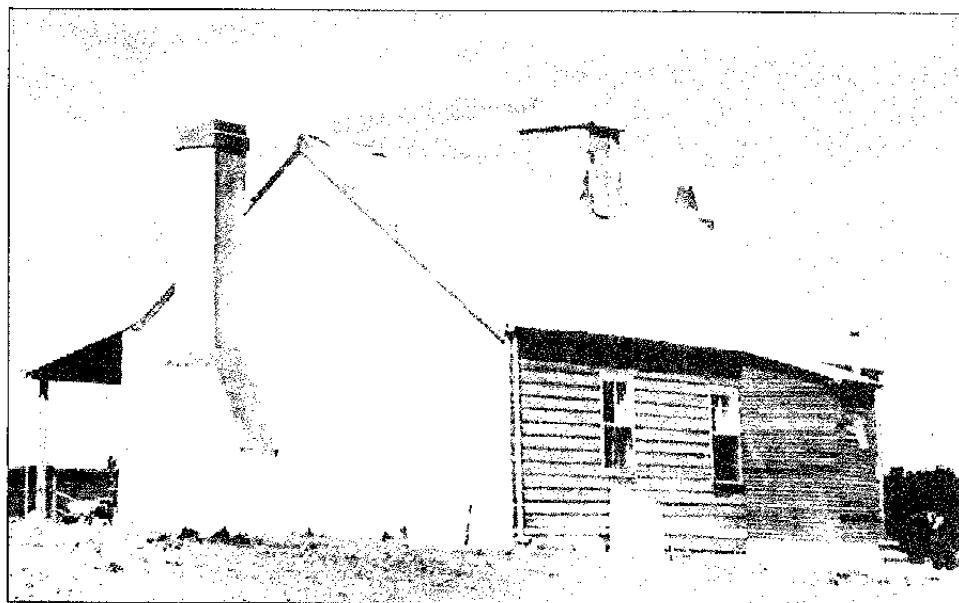


Fig. 3: The house of c. 1816-1820 at Varroville, which Townson probably occupied while the larger house was under construction. Photographed in 1950.



Fig. 4: Part of the south side of the main house at Varroville. The cast iron veranda columns on the right were added in 1859, but at least part of the house was built in the 1820s. Photograph by Ian Leister 17 Sept. 1995.

the east side (Fig. 4), are of that period. The present owners, Kenneth and Virginia Pearson-Smith, who bought the property from the National Trust, are both architects and they believe that the basic building is older.

The original wooden roof tiles exist under parts of the iron roof and that the practice of using these was discontinued in the 1830s. The two west wings, at least, therefore date from some time in the 1820s. Although the front section was probably modernised in 1859, Varroville was one of the houses in the area that was used for entertaining before that, so a sizeable house must have already existed (Ian Leister, pers. comm. 21 Sept. 1995).

So, to what extent the present house was known to Townson, and whether he lived in succession in the c. 1816 building and then the present building before its later modification, is uncertain. A plan of the present house, and drawings of its appearance from all four sides, are printed in Anon. (1963).

Later owners, after Townson's time, included Charles Sturt the explorer who in 1828 had been almost certainly the first person to explore the caves at Wellington, in New South Wales.

THE 1793 TRAVELS IN CENTRAL EUROPE

Townson's travels in Hungary and Slovakia during 1793 resulted not only in his classic descriptions of the Baradla and Silica caves, but also, and probably more importantly for the historian of geology, the very early geological map which accompanies the book and the observations on rocks which occur throughout. There are also accounts of towns and the people he met, travels over mountains, visits to mines and remarks on vine growing and wild plants.

His route, described below, is marked in red on his map. Where the spelling of place names differs between those on the map and in the text, the latter are used here. The equivalent modern names are given in brackets.

From Vienna he crossed the border into Hungary and passed through Oedinburgh (Sopron), Komorn (Komárom) and St. Andrée (Szentendre) to Bude and Pest (Budapest). After a spell there he travelled east to Gyongyes (Gyöngyös) and through Debretzin (Debrecen) to Gross Wardein (Oradea in Transylvania). Turning back there, he passed through Debrecen and went on to Tokay (Tokaj) before crossing the present-day frontier to Caschau (Košice) in Slovakia (which was then a part of Hungary). It was while he was at Košice that he was told of the caves and consequently visited those at Aktelégl (Aggtelek) and Szilitze (the ice cave at Silica, now in Slovakia). He also saw, near Nadaska (Tornanádaska), the entrances of some of the deep shafts on Alsó-hegy (not named in the book or on the map). From Rosenau (Rožnava) he travelled north to Poprad and across the High Tatra to visit the Wieliczka salt mine and the nearby city of Krakow in Poland. Returning south again across the Tatra, he was unable to make his planned visit to the Demänova ice cave and went on south to the mining towns of Schemnitz (Banská Štiavnica)

and Kremnitz (Kremnica) which interested him particularly. On through Neutra (Nitra) to Presburg (Bratislava) and back to Vienna.

THE BOOK "TRAVELS IN HUNGARY" AND ITS GEOLOGICAL MAP

The resulting book, Travels in Hungary... (Fig. 5), is a substantial volume of xix + 506 pages, measuring about 27 cm by 21 cm. Besides the map, with the areas containing different rock types outlined in colours, there are 16 engravings, of hills, the entrance to the Silica ice cave, a section through the Wieliczka salt mine, minerals, insects and plants. The text provides not only a general account of his travels, including the visits to mines and an alum works, but throughout he is constantly describing rocks, soils, "pseudo-volcanic crater", etc.

The cave descriptions (see Appendix I) show no particular geological insights. He remarks that they are "like all that I have seen, in a primitive or unstratified compact lime-stone... I think they arise from the rock, whatever that might be, giving way which supports them." On another page he writes that the individual chambers in the Baradla cave "have been formed by the falling in of the rock"; so probably he means no more than that caves are enlarged by roof breakdown.

When going into the Silica ice cave (Fig. 6), he is concerned to counter the common view, held by Bel (1739) and others, that ice caves are colder in summer than in winter and that it is therefore in summer that the ice is formed. Townson pointed out that the apparent cold of such caves in summer was due to the contrast with the warm air outside. When he visited the Silica cave on 16 July the air temperature inside was 0° C and,

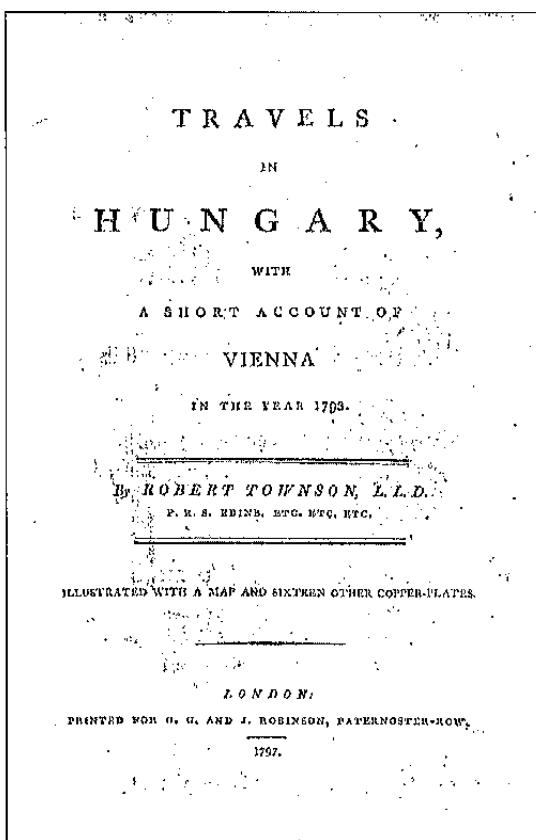


Fig. 5: The title page of the book describing Townson's tour in Hungary and Slovakia.



Fig. 6: The entrance of the Silica ice cave, opp. p. 319 of Townson's book of 1797.

although there were large masses of ice, they were wet and dripping as they very slowly melted. He believed that the ice is definitely formed in winter, though there is some delay before the low outside temperatures have an effect in the cave. Thus ice formation does not commence immediately with the beginning of winter, and the same slow reaction of the cave to external temperatures allows the ice to persist into the following summer. He held this common-sense and largely correct view fifty years before the theory of summer freezing was finally overcome. His idea had been put forward a century and a quarter earlier by Steno (1969) in 1671, but only in unpublished letters which Townson could not have seen.

It is the map, with "Petrography... added by the Author" (Fig. 7), which makes the book of wider significance than just a regional description. On the map are distinguished 13 kinds of rock types, including 'granit', volcanic tufa, stratified and unstratified sandstone, 'shistus', saline limestone, unstratified compact limestone, stratified limestone, and calcareous tufa. It appears to be the first such map published in England. The somewhat similar "Mineralogical

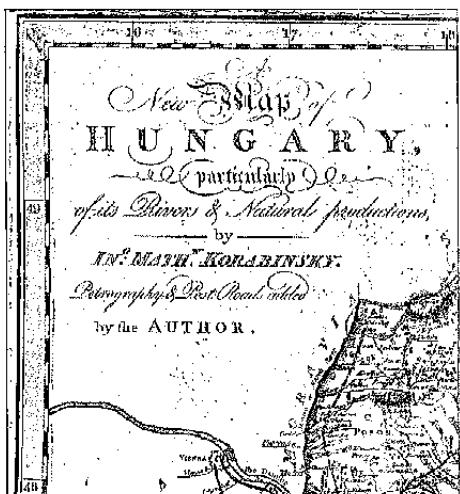


Fig. 7: The title block of the map in Townson's 1797 book.

When mineralogy and physical geography shall be more cultivated, which one day they certainly will, these maps will become common, and their union will give an easy and visible representation of the coating of our globe, that is, of its rocks and strata and their relative situations. (Townson 1797, p. xii)

He went on to say that this would be of practical use when particular minerals were recognized as occurring in certain strata.

The basic map from which Townson prepared his modified version and then added to it the geological information, was published by Johann Matthias Korabinsky in 1791. This original Korabinsky map showed the location of more caves than the one produced by Townson (Plihal 1992), who had presumably decided to simplify his in places so that it was able to receive his additional information without becoming overcrowded. His intention was evidently to produce a good 'petrographic' map from his observations throughout the tour, rather than a location map for the places he had visited. Thus, although the map in the 1797 book does have a cave symbol at "Szilitze", there is neither symbol nor name at Aggtelek.

The influence of Townson's Travels in Hungary..., which in English appeared only in a single edition, was greatly extended by its translation into French and Dutch. Editions in French were published in Paris in 1799 (*Voyage en Hongrie*, 3 vols.) and 1803, and at Leipzig in 1800; Dutch editions (*Reize in Hongarijen*) were issued in 1800 and 1801 at Den Haag (Darvas 1964). It was

map, of the western counties of England" was published later in the same year (Maton 1797) with the different rocks distinguished by cross-hatching instead of colour. In fact, Maton's whole book is rather similar to Townson's in that the text includes many geological observations made in the course of his journeys in south-west England in 1794 and 1796. Vallance & Torrens (1984) point out that an earlier German example of such a map occurs in a book by Charpentier (1778), which Townson had seen in 1792 in Göttingen.

The arrangement of rock types in the key does not show any particular stratigraphic order, but some indications of this are given in the text where certain rock types are described as occurring between two others. Presciently he wrote:

the French language editions which made the book known in Hungary where little English was then spoken (Hadobás 1992).

The description of the Baradla cave at Aggtelek, only, was translated into Hungarian and included in Almasi Balogh's (1820) study of the cave. It may have been from this that Imre Vass (1831a; b), who wrote an entire book about the cave, learned about Townson's visit.

Contemporary reviews of Travels in Hungary... do not add to our knowledge of the book. Certainly, as was their purpose, they made it known to potential readers. They assess it from the point of view of the general reader, and not that of a geologist, speleologist or historian of science. The lengthy review by Thomas Beddoes (1797) in *The Monthly Review* is mainly descriptive of the journey, with many quotations; and a single-paragraph review elsewhere (Anon. 1798) laments that although the book covers "ground untrodden by any of our late tourists", its author has "unclassical taste" and was presumably considered at fault for examining rocks rather than the classical architecture of the Grand Tour.

TOWNSON'S OTHER PUBLICATIONS

All Townson's publications, both before and after his Travels in Hungary..., reflect his interest in natural history and especially mineralogy and the wider subject of geology.

His lectures to the student Natural History Society at Edinburgh in 1790 were not printed until 1799, so his earliest publication was a botanical paper read to the Linnean Society in London in 1792 and printed in their Transactions two years later (Townson 1794). It was reprinted in his book of 1799, but otherwise his interest in botany diminished with time, though there was a botanical appendix of 18 pages in the Travels..., as well as a slightly longer one on entomology. These publications justified his inclusion in the book, *A Biographical Index of deceased British and Irish Botanists* (Britten & Boulger 1931), which led to the writing of the present paper.

Townson's papers on the physiology of amphibia, already mentioned as being written at Vienna and at Göttingen in 1793 and 1795 respectively, were published separately in Göttingen (Townson 1794, 1795). An English reviewer (Anon. 1796) comments that "These tracts contain, in a small bulk, a very interesting series of curious and accurate observations". Both were reprinted, in English, in Townson's book of 1799.

An extract from his 1797 Travels in Hungary, describing a method of bread-making at Debrecen, was published separately as a short paper in the same year (Townson 1797b).

The *Philosophy of Mineralogy* (Townson 1798) (Fig. 8) is a book of 233 pages overall and covers some aspects of what would now be called geology, as well as mineralogy. The 1790s were a particularly interesting time for anyone

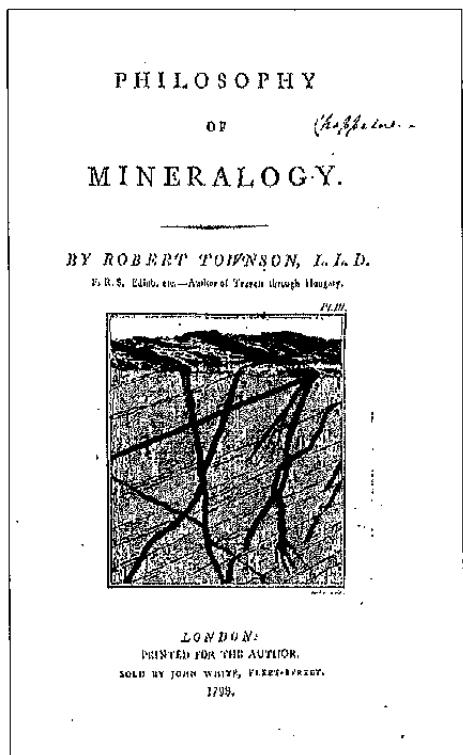


Fig. 8: Townson's 1798 book on mineralogy and geology.

to study and write about these subjects. There were two conflicting schools of thought about how rocks had originally been formed. The Neptunists accepted Werner's belief, published in 1787, that all rocks had been formed by deposition from the primaeval ocean. The Plutonists, on the other hand, followed Hutton (1795) in thinking that the earliest rocks were the result of volcanic action, and that only later were fragments eroded from these laid down as sedimentary rocks in the sea. Townson was mainly a Neptunist, though with some reservations.

The 1790s were also a period in which oxygen was being recognized and phlogiston rejected, and the significance of carbonic acid in dissolving limestone was being realised. Townson himself (1798, p. 114) wrote:

Chemistry of late years has made a most rapid progress, and every branch of human knowledge within its reach has been advanced by it. Mineralogy should be the first to speak its eulogium... Chemistry has done much for mineralogy: it has raised it from a frivolous amusement to a sublime science...

On page 26 of the same book he speaks of carbonic acid "being a constituent of limestones... and acidulous waters". He does not comment on its role in the formation of speleothems. In his Hungarian travels (1797) he was more concerned with description than explanation, and *The Philosophy of Mineralogy* is an outline of the subject rather than a treatise. A reviewer (Anon. 1799a) criticised it for just this, but its author explains (p. ix) that this was because there was insufficient support for the larger work, to be called "Elements of Mineralogy", that he had announced the year before (Townson 1797a, between pages 494 and 495). Stalactites are mentioned in *The Philosophy*... but only as examples of minerals of a particular colour (p. 122) and of one of the shapes in which minerals occur (p. 140).

Tracts and Observations in Natural History (Townson 1799) (Fig. 9) is a collection of papers of various lengths. The first two parts of his "Physiological Observations on the Amphibia", already published in Latin in 1794 and 1795,

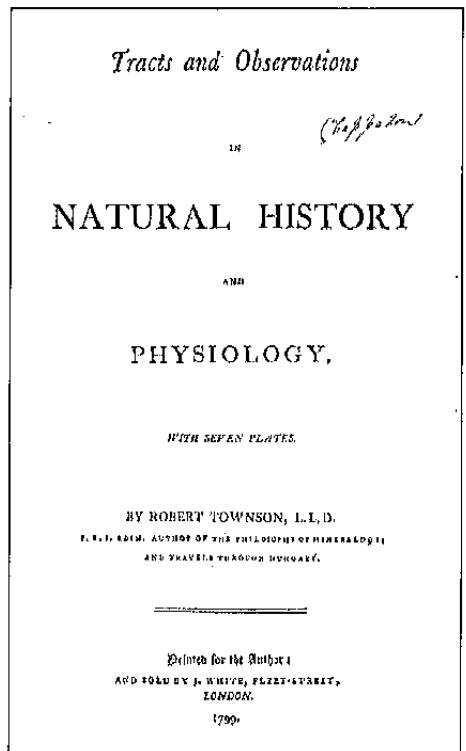


Fig. 9: Townson's 1799 book on natural history and geology, which includes his paper on *flos ferri*.

are printed here in English together with a third part, previously unpublished. "Memorandums on the rocks in the immediate vicinity of the City of Edinburgh" is based on the two papers he read to the student Natural History Society at Edinburgh in 1790. The Linnean Society paper on the growth of plants is also reprinted. Besides these, the book contains 21 original papers of which the most important is "A sketch of the Mineralogy of Shropshire". There is also the short "Remarks on the *Flos-ferri*", reprinted here as Appendix II, to make it available to karst researches. *Flos ferri* is normally a fine quill-like form of ant-hodite occurring in clusters, but Townson's description suggests that he is thinking of helictites. He is unable to explain their formation, though stalactites, he thinks, result from simple evaporation of water. A reviewer (Anon. 1799b) may have found most of the book too technical: the Shropshire mineralogy is appreciated, but the papers on amphibian respiration are considered too lengthy, and the rest is "unimportant matter".

After this, Townson planned to write a three-volume "County History of Yorkshire" (Anon. 1802). He worked at it until 1805, when it was seen that there was insufficient demand to cover the cost of publication (Vallance & Torrens 1984). By then, too, he was planning to emigrate. A few years later it was recorded as having been an "unsuccessful attempt" (Anon. 1809).

At the end of his mineralogy book Townson (1798, p. [220]) announced as 'preparing for the Press' a book to be called "Benevolence, considered as a source of happiness" but this too seems never to have appeared.

It has been stated (Vallance & Torrens 1984) that "The Poor Man's Moralist", which reached a 3rd edition in 1799, was written by Robert Townson. The British Museum General Catalogue of Printed Books firmly attributes this to the Rev. Thomas Townson (1715-1792), but in view of the previous paragraph it might be questioned whether its identification of the "Dr. T." of the title page is correct.

CONCLUSION

This paper provides information, not hitherto published in the field of karst studies, describing Robert Townson's life after he apparently "disappeared" from European view in 1799. He emigrated to Australia, became a successful vine-grower and farmer, and died in 1827. By drawing heavily on a paper published by Vallance & Torrens in 1984, together with other sources, it has been possible to provide more information about his earlier life in Europe, and to resolve some of the anomalies in the standard biographies.

Throughout the whole of his life up to his emigration in 1807, it will have been seen that Townson's main and continuing interest was in natural history and especially in mineralogy and geology:

- a) 1789-91. The friends who influenced him when he was studying at the University of Edinburgh included Joseph Black (Professor of Chemistry), James Hutton (geologist), Alexander Monro (Professor of Anatomy), Daniel Rutherford (Professor of Botany) and John Walker (Professor of Natural History). Later he came to know Sir Joseph Banks, for 45 years President of the Royal Society.
- b) 1790. The two papers he presented as a student at Edinburgh were on local geology.
- c) 1791. He was recommended for a post as naturalist in Canada.
- d) 1791-95. He studied in the Department of Natural History at Göttingen.
- e) 1793. Geological observations were an important part of his travels in Hungary.
- f) 1795. The studies he proposed to carry out in India were to be on its mineralogy, geology and physical geography.
- g) 1797. Publication of *Travels in Hungary...* with its petrographic map.
- h) 1798. Publication of *The Philosophy of Mineralogy*.
- j) 1799. Publication of his "Mineralogy of Shropshire", for which much of the research had been done some ten years earlier, with a collection of other natural history papers including "Remarks on the Flos-ferri".
- k) 1802. Intention to publish on the geology of Yorkshire.

The 1790s were a particularly active time in the development of geology, both because advances in chemistry were making it possible to understand more about rocks and minerals and because the fundamentally opposed ideas of the Neptunists (including Townson) and the Vulcanists explained their origin in totally different ways.

So it was an exciting time to be a naturalist and geologist. Whether or not his geological background made Townson any better an observer or recorder of caves is open to question. His view that caves "arise from the rock... giving way..." certainly did not advance knowledge of speleogenesis. On the other hand, he measured temperatures deep inside the cave at Agtelek "with a view

to a scertain the medium temperature of this part of Hungary". And in the Silica ice cave his observations and temperature measurements enabled him to refute Bel's (1739) statement, sent to the Royal Society, that the ice formed there during the summer.

Nevertheless his purpose in the Travels in Hungary... was mainly to describe these caves and not to conjecture how they had been formed. It was in his observation of the different kinds of rock in the country he visited, showing them on his žpetrographic' map and occasionally noting their relative positions, that his geological experience was of benefit.

At least the caves were seen by someone who was familiar with geological phenomena, and it may be that this was why he visited several during a relatively short visit. The shafts on the Alsó-hegy plateau would have been unlikely to attract the attention of a more conventional tourist.

ACKNOWLEDGEMENTS

I am particularly grateful to Dr Hugh Torrens of the University of Keele, who has been working on Townson's life for many years, for sending me copies of his publications. Kenneth and Virginia Pearson-Smith, the owners of Townson's land at Varroville, Sydney, shared some of their historical knowledge and allowed photographs to be taken; they also sent me prints from some old photographs. Ian Leister of Canberra located more historical material and made contact with the Pearson-Smiths, visiting Varroville and photographing it.

Biographical information came from Miss Broughton archivist of the Shropshire Record Office, Mrs Jo Currie of Edinburgh University Library, Dr Ulrich Hunger archivist of the Georg August University in Göttingen, and the staff of the Mitchell Library in Sydney who also arranged for the portrait of Townson to be copied. Chris Howes, FRPS, made the copy photographs for publication. I thank them all.

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ROBERT TOWNSON, POPOTNIK PO MADŽARSKEM LETA 1793 - NJEGOVO ŽIVLJENJE IN DELO

Povzetek

Robert Townson (rodil se je v bližini Londona leta 1762, umrl leta 1827 v Avstraliji) je študiral medicino, kemijo in naravoslovje na univerzah v Edinburgu, Parizu, Dunaju in Göttingenu. Čeprav ni dokončal študija na nobeni od univerz, so ga imenovali za častnega doktorja prava v Edinburgu leta 1796. Potoval je po Italiji in Skandinaviji, nato pa je odšel na petmesečno potovanje po Madžarski in Slovaški. Rezultat tega potovanja je leta 1797 objavljena knjiga *Travels in Hungary*. V tem delu opisuje jame pri Aggtelku, na Silicki planini ter brezno Alsó-hegy. Delu je dodana tudi geološka karta, sestavljena na podlagi Townsonovih lastnih opazovanj. Strani, ki vsebujejo njegove opise jam so ponatisnjene v dodatku. 1798 in 1799 je izdal še deli geološke in naravoslovne vsebine.

1807 se je izselil v Avstralijo, kjer je nameraval nadaljevati z znanstvenim delom. Zaradi nesporazuma z guvernerjem države New South Wales je to opustil, nato pa se je preselil v bližino Sydneys, kjer je kmetoval in se ukvarjal z vinogradništvom. V prispevku je tudi reprodukcija njegovega portreta iz šestdesetih let in ocena njegovih knjig.

APPENDIX I

THE CAVE DESCRIPTIONS IN TOWNSON (1797)

Saturday, July 14th, I left Csathos; but I again left the direct road to the Carpathian Alps, and struck off to the west. I was induced to this from hearing at Csathos, and not from the vulgar, but from learned doctors and professors, that at the distance of about a day's journey there were two great caverns; in one of which water froze during the summer, and ice thawed during the winter; whilst the other was so vast that one might wonder about it for a week without finding an end. Soon after leaving Csathos, I came to a quarry of the *Caveous Limestone* of Wallerius. At Cses, where I changed horses, the road began to draw nearer the hills, and the country became more pleasant: this is chiefly a corn country, Indian wheat was a good deal cultivated. Early in the evening I reached Madafin, the seat of Countess Gulyas. The hills here, which are very high, are of unstratified compact limestone, without any petrifications, but

it is full of holes; some of these are so deep, and at the same time so round, that they look as if they had been formed by apes. I passed the evening in a very dull manner; a rough gloomy priest was, come here to be ready to perform divine service the next day; and though he ate copiously himself, he allowed none of the family to do so; and the Countess, and her niece, who was a very nice girl, and spoke very good French, who were all that sat down to supper, fasted. I was a dreadful thorn in the side of this fellow, and vexed him grievously by eating a hearty supper, the whole of which he seemed to wish to poach.

Next morning I set out again for the caverns. I travelled at the foot of the same chain of hills; now and then some *Schistus* made its appearance, but in general the lately mentioned limestone prevailed. About half way I changed my horses for oxen; but as they were only to draw me, or rather my baggage, over a high hill, where horses could have gone no faster, I did not suffer as in the last horrid cattle expedition. About one o'clock I reached Asteleg, and I took up my quarters with the Calvinist parish minister: he knew not a word of German, much less French or English, only the Hungarian and the Latin. Though this was Sunday, and the villagers were Calvinists, they were dancing and making merry.

I procured a guide, and the same evening I entered the cave; but it was chiefly with a view to ascertain the medium temperature of this part of Hungary. The thermometer in the shade, in the open

air, stood at 15 above 0 of Reaumur, but in the cave, a good way from the mouth, immersed in a running stream in different places, it stood at seven degrees; yet out of the water by the side of the rock it stood at seven and an half. Shall we suppose that all, or part of this water, came from melting snow, which, hid in some deep hole or cavern, had now only begun to thaw? this would render every experiment fallacious; or shall we suppose that the rock, however thick, was nevertheless affected by the heat of the atmosphere? As I left my thermometer an hour, it certainly, as it had but a small bulb, had time to take the true temperature of the medium which it was in. The water in the wells in the village was eight degrees. The above observations, though rendered less decisive by this difference, agree pretty well with those made by Mr. Haquet on the medicinal waters of Barfeld: he says, "at six o'clock in the morning, the water was ten degrees of Reaumur colder than the atmosphere, which was then 16 degrees." This brings the temperature of the waters to six degrees, which is a degree colder than that of this cavern; but Barfeld is about half a degree of latitude further north, and in a more elevated situation.

In the morning I returned to the cavern, to see how far I could penetrate into it, and to repeat my experiment with the thermometer, but by accident this was left behind. The report here is, that this cavern extends several miles under the hills, and that it would require several days to see the whole of it. The mouth of it is at

the bottom of a precipice about 150 feet high, at the west end of a compact unstratified limestone hill, which runs east and west. This entrance is about two yards broad, but so low that I was obliged to bend considerably to get in. I descended rapidly for a short distance, and then I found myself in an immense cave, with a very lofty vault; this has in different parts communication with other caves and passages, and these again with others. Some of these caverns grove over one another; in some places I came to considerable streams of water; in one great cave my guide conducted me over a hill formed of great blocks of stone, which most probably had fallen down from the roof; in one place I had to get down a hole like the funnel of a chimney; then I was led into a cave where large stalactites, as thick as my body, hung pendulous from the roof; and I was shown others where the sides were ornamented in the manner of the most curious Gothic workmanship. In some the stalactites were so thick and close together, that we were in danger of losing one another if we separated but a few yards. Here aged stalactites, overloaded with their own weight, had fallen down, and lay prostrate; and there an embryo stalactite was just shooting into existence. The most curious cavern was one apparently of modern date; the soles, and particularly the roofs, seemed as if recently separated; and it was probably so, for I think most of these caverns have been formed by the filling in of the rocks; very white and slender stalactites were only found here.

After I had wandered about for three or four hours in this awful gloom, and had reached the end of the caverns in one direction, I thought it time to come out, and I desired my guide to return. After we had returned, as we thought, some way, we found no passage further; yet the guide was sure he was right. I thought I recognised the same rocks we had just left, and which had prevented our proceeding further, but the guide was positive he was in a right direction. Luckily for us I had written my name on the soft clay of the bottom of the cave, which had been the extent of our journey; on seeing this the guide was as thunderstruck, and ran this way and that way, and knew not where he was, nor what to do. I desired him not to be frightened, but to go as lively to work to extricate us from this labyrinth. As the wood which we burnt instead of lamps was nearly exhausted, and as I never adverted either to one of the guides whom we had left above, who by being charged with wood could not get down the funnel-like hole, being so near; nor to the people of the village being acquainted with our being in the cavern, who no doubt would have taken every possible means of coming to our assistance had we stayed much longer than usual, I was a good deal alarmed for our safety, and there was good reason; had our torches gone out, we should never have been able to find our way out; nor, had any accident have happened to our guide, could we by ourselves, though we had had lights, have had any hopes of extricating ourselves. After wandering about till all our wood was nearly exhausted, we found a great stalactite from which, on account

of its remarkable whiteness, I had been induced to knock off a specimen as I came by: I recollect how I did: when I struck it: this at once set us right; and after walking a little further we made ourselves heard to the other guide, from whom we got fresh torches, and we then continued our route homewards without further difficulty.

So complete a labyrinth as these caverns are in some places, is not I am sure to be found but in similar caverns: large open passages, proved *ad efacit*, whilst our road was over and under, through mud amongst proto-work of the most intricate nature. I firmly believe, that though a man should have lights and food enough to last him a month, he would not be able to find his way out.

On the soil at the bottom of the cavern, my guides showed me imprecisions which, they said, were from the wheels of a carriage. I thought immediately to have detected the error by measuring the distance of the marks of the two wheels at different distances: but I was mistaken; the marks were throughout parallel. Whether these were really the marks of a carriage I cannot say: I only observed them in the first part of the cavern. On the soil at the bottom, at the mouth of the cave was taken away, I do not see any impossibility, through the assistance of men, to get such aching in thus far. It is known to have served as a hiding-place to the weak and unfortunate in time of war, and a better hiding-place there cannot be.

I thought it probable that I was the first English traveller who had examined this immense cavern; but Mr. Korabinsky says*, "that it is of such astonishing dimensions in length, that two members of the Royal Society of London, who were sent some years ago into Hungary by the Society, to examine this and other curiosities, after remaining in it three days, could never get to the end of it, nor find an opening."

After dining with the pastor, who seemed to possess but a small portion of the good things of this world, I set out for the other famous cavern near Szilize. I travelled by a bye road through a pleasant, hilly, and woody country, chiefly with pasture land. There I saw again my favourite little animal, the Karls Marmot, which I had not seen since I left the great plain. I reached Szilize early in the evening, and as before, I asked hospitality of the Calvinist minister, who likewise only knew his own language, the Hungarian, and the Latin. He seemed to be in more easy circumstances than the last, and to be a considerable farmer: all this district is inhabited by Calvinists. As the cavern is a mile from the village, I deferred seeing it till the next morning, when, my host, who had nothing of the four Calvinist about him, accompanied me.

* Title, immense vaults, and the glittering stalactites arranged in-

^{*} Lexicon von Ungarn, page 6..

Gothic style, of the last cavern, are not to be sought for here. This is only famed for possessing the remarkable nature of being *reddy* cold in summer than in winter; so that when the north east in winter blows, and the whole country is defaced with ice and snow, then the ice within this cavern begins to thaw; but when the parching heat of the écuâne reigns, then its dripping rocks begin to be adorned with pellucid icicles.

This is not the opinion of the vulgar alone, but, in this country, of the learned likewise; it has even reached our country, and found its way into our Philosophical Transactions. The celebrated Hungarian historian Matthew Bell sent the following account of it to the Royal Society, who have inserted it in the 42d volume: "Natura Aest id haret prouidit quod sum exire brenna hibernante rigore, tepido sit intus hinc; frigido contra, immo glaciali, cum sunt servitissim foliis. Minutum, sicut diligenteribus nivibus ver inter cepit, interior anti concameratio, quia ea meridiano sol dorno obicit, aquam liquidam et pulchram effundat: quia, interior frigoris vi, in pellucida glaciem concrefecens, striae efficit, ad ingenium dolerium molam oratia, ac pendulas, inque ramos abentes miris illustres speciebus." And further adds, "Glaciata istud specie ingens, totum cellinum est: quod ideo administrationis habet plurimum; angelis enim cum increcenti sole arcto, hibernus ille sepor cessat; mox, ubi id adolevit, intendi frigus occipit, tantis accessionibus, ut quo magis aer incandescat eo autrum frigescat ex-

quilibus. At ubi astas init, janque fervor canicula, in glaciam
brunam fatus absunt omnia."

This account agrees perfectly with the information I received at Cachan, and with what I heard on the spot likewise. Yet I know I shall have no difficulty to persuade Natural Philosophers of the present day, that there is a fallacy in the observations, and that this has arisen from depending too much on our feelings, and neglecting the only proper gage of heat and cold, the thermometer.

This cavern is about a hundred feet broad, a hundred and fifty deep or long, and twenty or thirty feet high at the mouth or entrance which faces the north: the descent is pretty rapid, the last third part of the bottom or floor was covered with ice; but this was so thin that I could see the rock under it. From the mouth the further end, which was here much lower than at the entrance, hung an immense icicle, or rather a congeries of icicles; and in a corner to the right, which was not only deprived of the influence of the sun, as the whole cavern is, but likewise of light, there was a great mass of ice. It was a fine forenoon when I visited this natural ice-house; and the air was heated by a July sun: as soon as I approached the mouth of the cave, I felt a chill, which increased the further I went in, and which rendered my continuance there to observe the state of the thermometer, very disagreeable.

Ice I truly found here in abundance, and it was near midsummer, but in a state of thaw: the bed of ice, which covered the floor of the cavern, was thinly covered with water, and the icicles dropped: every thing announced a thaw. I had no need to use my thermometer; however, I placed it in the ice, and it fell to 0° of Reaumur; I then wiped it and placed it in a niche in the rock, at the further part of the cavern, a yard above the ice, and here it remained near an hour: when I returned I found it at 0°. Thinking it might not have had time to take the real degree of heat of the medium in which it was in; I tried this by breathing upon it till it rose one degree above 0°; I then left it for a quarter of an hour only, and when I returned I found it again at 0°. Every thing here, therefore, ice, water, and the atmosphere in the neighbourhood of these, had the same temperature, and that was the temperature of melting ice, 0° of Reaumur.

When then is the ice which is found here, and in such quantities that this cavern serves the few opulent nobility in the neighbourhood as an ice-house, formed? Surely in winter, though not by the first frost, not so soon as ice is formed in the open air. No doubt, from the little communication this cavern has with the atmosphere, it will be but little and slowly affected by its changes. Should, therefore, Mr. Bell, or any of his friends, have come here to verify the common report at the commencement of a severe frost, when the whole country was covered with ice and snow, they might still have found here nothing but water, or the ice of the preceding winter in a state of thaw, and

the cavern relatively warm: and likewise, should they have visited it in a warm spring, which had succeeded to a severe winter, they might have found nothing here but frost and ice; and even the frost melted snow, percolating through the roof of this cavern, might again have been congealed to ice.—I observed frequently in Germany, in the severe winter of 1794-5, on a sudden thaw, that the walls of churches and other public buildings, on the outside were white, and covered with a hoar frost, and their windows on the same side covered with a line. I certainly should not have said so much on this subject, were not the opinion I have been combating so very general. This cavern is like all that I have seen, in a primitive or unstratified compact lime-stone; and it is curious to observe, that the most famous in the world are in this kind of rock. I think they arise from the rock, whatever that may be, giving way which supports them.

APPENDIX II

TOWNSON'S PAPER ON FLOS FERRI, FROM HIS 1799 BOOK

Remarks on the Flos-ferræ.

THE manner in which stalactites are formed, is, I believe, well understood. It is easy to conceive that by the gradual dissipation of a solvent the matter held in solution may be deposited, and assume all the various forms that the solution at one or different times had been in. Thus we can account for the form of any stalactite which has such a one as the dripping fluid can have existed in, either through its own natural gravitation or through the joint powers of gravitation and the attraction of some body in contact, but by no means of those forms in which we know a fluid body could not in any circumstances have been.

Reasoning thus, I am unable to account for the formation of that beautiful fossil the Flos-ferræ, found in its greatest perfection in the iron mines of Eisenärtz in Styria, which not only differs from all other stalactites in its forms but in its texture. In regard to its form it is generally branched, but whether simple or branched the parts are by no means straight but curved, and in the same specimen curved in very different directions. Where the branches shoot out, that is at the *axillæ*, it is

no thicker than in other parts, and frequently a simple undivided shoot, three inches long, is no thicker towards its base than towards its point. In the direction of its growth, the Flos-ferræ differs not less from the common stalactites, whose long cylindrical forms are never found in a horizontal situation, and in which direction we know they never can be formed. Yet in the great mine of spatois iron ore of Styria, I have seen both the sides of a vertical fissure covered with the flos-ferræ. The texture of this fossil likewise greatly differs from the common stalactites. It is not compact, nor is it composed of concentric cylindrical plates, but of obliquely divergent fibres.

These peculiarities lead me to think that it is formed in a different manner from common stalactites, and I offer these remarks to those who have an opportunity of observing this fossil in its birth-place, that they may investigate its formation.—It is not foreign to the present subject to mention that a few years ago I found on the side of a chalk rock on the turnpike road, somewhere between Portsmouth and Guildford, a fine white light body resembling very much in its structure, the *bryozoæ*; being in haste I put a small specimen between the alfs-skin leaves of my pocket book, which, when I went to examine, I found reduced to powder. It was insoluble in water, but soluble with effervescence in nitrous acid. It is probable that this singular production was of the nature of the flos-ferræ, and might be denominated *Inolithus-hysoides*, or *Stalactites-hysoides*. But these remarks are only offered as hints to future observers.

PUBLISHED IN 1796...**IZŠLO V LETU 1796...****KINGA SZÉKELY****Izvleček****Kinga Székely: Izšlo v letu 1796...**

UDC 551.44(439)(091)

1796 so izšle tri knjige v madžarskem jeziku, s pomembnimi podatki o jamah. Pred tem je bilo omenjenih le nekaj jam v latinsko ali nemško pisanih dokumentih. 1796 je Valyi izdal prvi del "Opisa Madžarske" in prevod Korabinskijeve "Geografske enciklopedije" (1786). Istega leta je izšel Telekijev popotni dnevnik, s prvo upodobitvijo 2 jam na Madžarskem. Tudi Szallerjeva "Geografija Madžarske" vsebuje opise jam.

Ključne besede: zgodovina speleologije, Madžarska, Slovaška, Romunija, Korabinsky, Szaller, Teleki, Valyi.

Abstract**Kinga Székely: Published in 1796...**

UDC 551.44(439)(091)

Three books containing information on caves, written in Hungarian language, were published in 1796. Before that only the existence of certain caves had been recorded in Latin or German. Valyi published the first volume of "Description of Hungary" and the translation of Korabinszky's (Korabinsky) Enciklopedia. Teleki produced travel book containing the earliest engraved views of two caves. Szaller's "Geography of Hungary" appeared in 1796 too, with descriptions of caves.

Key words: history of speleology, Hungary, Slovakia, Romania, Korabinsky, Szaller, Teleki, Valyi.

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Felolvasta Takácsné Bolner Katalin az ALCADI 96 on Postojnán 1996. május 24-én.
Fordította Székely Zsolt és Szabolcs, javította Takácsné.

From the earliest times until 1796 there are approximately 90 historical publications relating to the caves of Hungary. The first documents are charters in the Latin language, in which we can find geographical names referring to caves (*Odvaskő* 1037, *Ravaszlik, rókalyuk* 1055. *Likaskő*, 1355). The first cave name (*Deményfalva Cave/Demänovská jaskyňa, Slovakia*) can be found in a document of the Archiepiscopal Archives of Esztergom, which was written in Latin in 1299. From the middle of the 1500s, more and more cave descriptions were published in Latin or German in scientific publications. Most of the earliest publications in Hungarian are references only to the existence of caves (*Pozsonyi Magyar Hírmondó* 1781; *Benkő József*, 1784, 1786; *Losontzi István* 1788; *Zay Sámuel*, 1791; *Gyadányi József*, 1792).

Outstanding events in the early period of Hungarian speleology were the publication of some books in 1796 - exactly 200 years ago - which became the fundamentals in the Hungarian language speleological literature.

The "Description of Hungary" (*Magyarországnak leírása*) by VÁLYI K. András, Volume 1 (Fig. 1), was published in Buda and it was followed in 1799 by

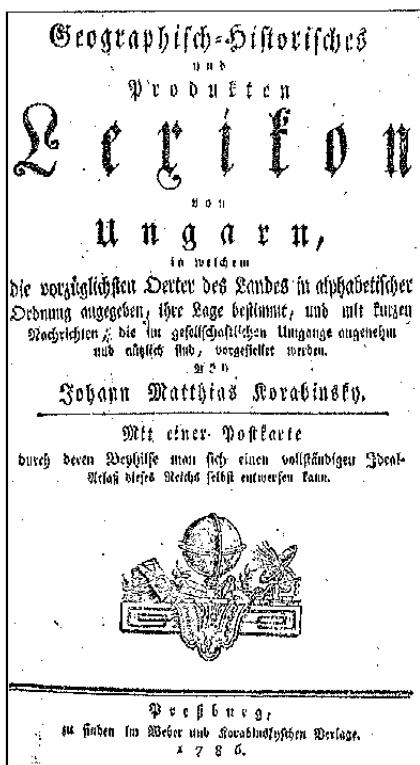
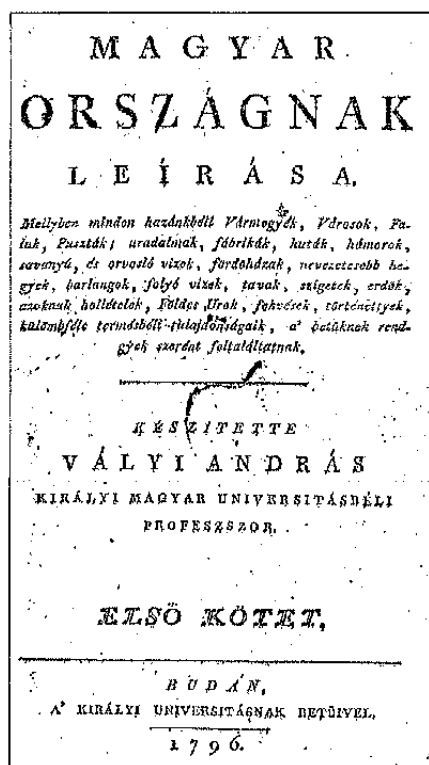


Fig. 1

Fig. 2

Volumes 2 and 3. As mentioned in its subtitle, one can find in alphabetical order the descriptions of all the counties, cities, villages, hamlets, mines, factories, smelting works, hot springs, bath houses, important mountains, rivers, lakes, islands and forests, as well as of some caves.

Vályi András was born on the 30th of November, 1764 in Miskolc. He was the inspector of schools in the Kassa (*Košice, Slovakia*) educational district. Later, in 1792, he became the first professor of the Department of Hungarian Language and Literature at the University of Pest. His death was recorded in Pest on December 2nd, 1801.

Due to the public interest, Vályi translated from German to Hungarian the Encyclopaedia of Geography published by **Korabinszky János** (*Johan Matthias Korabinsky*) in 1786 (*Fig. 2*), which he supplemented with data collected by himself. With his work, he laid the foundation for the detailed Hungarian dictionary of geography, where the well-known Hungarian caves are described under individual entries.

Under the entry of Agtelek, Korabinszky described both the village and the cave (*Baradla*), but Vályi discusses them in two separate entries. The two cave descriptions are almost identical, except for the last sentence. Vályi does not include the information on utilisation of finely ground dripstones as a paint substitute; instead of that he provides an important fact in the history of the cave, namely, that it was discovered by János Farkas in 1794. If the historians had paid attention to this new information, we might know the original of the first map of the cave, as well as the first Hungarian language description of the cave by Farkas, which were lost without a trace.

Vályi's one-column description of the Cave of Benikova (*Jaskyňa Beníková, Slovakia*) gives the general location and size of the cave as well as mentioning the dripstones therein. He also goes into details regarding "the dragon bones", the healing power of the cave springs, and the fact that the cave had been surveyed by Buchholtz and its map published by Bél Mátyás (1723). In a much shorter description of Deményfalva Cave (*Demänovská jaskyňa, Slovakia*), the most important information revealed is that the cave was explored and surveyed by Buchholtz at the request of Bél's. This map also was published in *Prodromus*.

Under the entry for Fonátza or Funázai Cave (*Pestera de la Fânațe, Romania*), the only information was that it was surveyed for 4 hours by Nedeczky Elek in 1772. His observations were published in the same year in Vienna and a summary was published in Hungarian Geography by Windisch (1780). The detailed description of the cave can be found under the entry of Bihar County, together with the description of Esküllő Cave (*Romania*).

On numerous occasions when Vályi described counties, mountains, rivers, hamlets or forts; he also mentioned caves. In Borsod County, one can find three caves. First, he writes about Felete-lyuk (cave), which is one hundred steps long and sixteen steps wide - an ideal hiding place for the local popula-

tion during the Rákóczi revolution. This cave's name is unknown now, and most likely is a misspelling, but due to the given sizes it can be assumed to be Szeleta Cave. The other two caves, Kecske-lyuk Cave and Diósgyőr Cave, are still called by the same names today. At the Gerets Mountains, he describes a cave without a name. According to the location, size and historical data, this cave can be identified as Szelim Cave.

From among the settlement entries, at Borzova (*Silická Brezová, Slovakia*) the ice cave and at Csobánka the Kis-Kevély Cave are mentioned. At the Boi stream (*Romania*) the entrance to the Cave of Boli is described. At the Castle of Csesznek three caves are mentioned: the first is under the fort, the second one is on the opposite side, and the third one is further away and has water which smells like snake and tastes bad but is healthy for bathers.

It is interesting that some of the caves known at the time are not mentioned in the Encyclopaedia, namely the Abaliget Cave, Detrekő Cave (*Plaveská jaskyňa, Slovakia*), and Veterani Cave (*Pestera de la Pinza Curi, Romania*).

The second important literary work is **TELEKI Domokos**, travel book published in Vienna and describing four visits to Hungary between 1793 and 1795 (Fig. 3). Telcki Domokos, the son of Teleki Sámuel the Transylvanian Chancellor, was born in Transylvania on September 5, 1773. He was brought up in Marosvásárhely (*Tîrgu Mureş, Romania*) and Nagyszeben (*Sibiu, Romania*) and he later studied at the universities of Pest and Vienna. Due to his poor health, he sought relief through travels. He became acquainted with Hungary from north to south, and with Transylvania and Saxony. During his stay in Jena he was elected a member of the Scientific Society, and in 1798 he became the first chairman of the Mineralogical Society. He died at the age of 25 on September 16, 1798 in the town of Marosvásárhely.

During his Hungarian and Transylvanian travels he visited many caves such as Baradla Cave, Szilice Ice Cave (*Silická ladnica, Slovakia*) Szkleno Cave (*Jaskyňa Parenica, Slovakia*) and the Törja cavities (*Pestera Pucioasade la Turia, Romania*). Besides the detailed descrip-

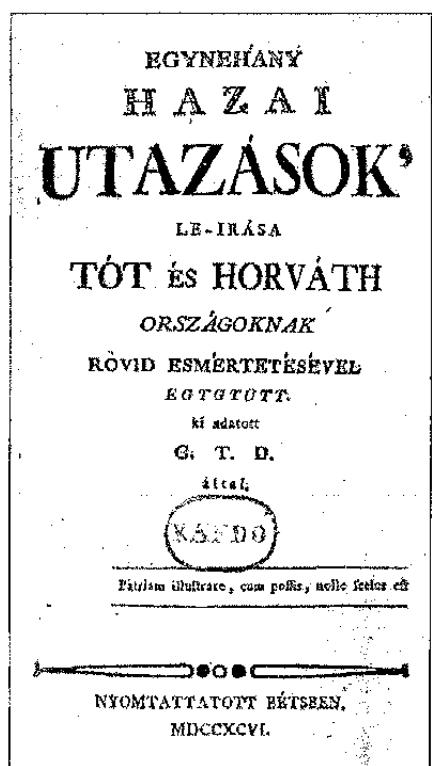


Fig. 3

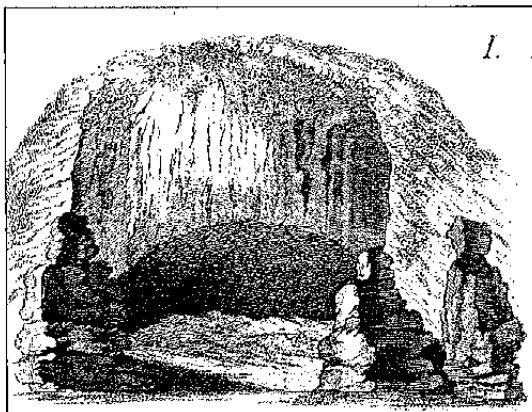


Fig. 4

In addition, in 1796 **SZALLER György** published the Geography of Hungary. The date and place of his birth is unknown; he died on October 30, 1807. The only other information about his life is found on the title page of his book. He was a surveyor in Pest and the Hungarian Language Instructor at the Pozsony College (*Bratislava, Slovakia*). Hungarian geographers honour him as the one of first persons to describe Hungary's geography in Hungarian, in which work he provided a map of the country, too. His work is a dry database listing of the counties and urban areas; it also reflects the country's people and economy. The first part of the 250-page book describes the natural environment of the country, where the ninth section discusses waterways and caves. The caves are mentioned by names such as the Okno Cave (*Demänovská jaskyňa Okno, Slovakia*), Szentivány Cave (*Stanisovská jaskyňa, Slovakia*), and the caves of Deményfalva (*Demänova, Slovakia*), the perennial icy cave of Szilice (*Silická ľadnica*, *Slovakia*).

tions of his visits to these caves, he also mentions the cave origin of the Columbács fly (*Romania*) in his book. In Teleki's 333-page book, we can find, beside maps, two engravings of Szilice Ice Cave (*Silická ľadnica, Slovakia*) and one of the entrance to Baradla Cave (Fig. 4-5). These engravings are the first pictures of the entrances of these caves. The book was also published in 1805 in Pest in German and it was used as a basis for the books of Sartori (*Vienna, 1807-1810*) and Engelhart (*Vienna, 1816*).

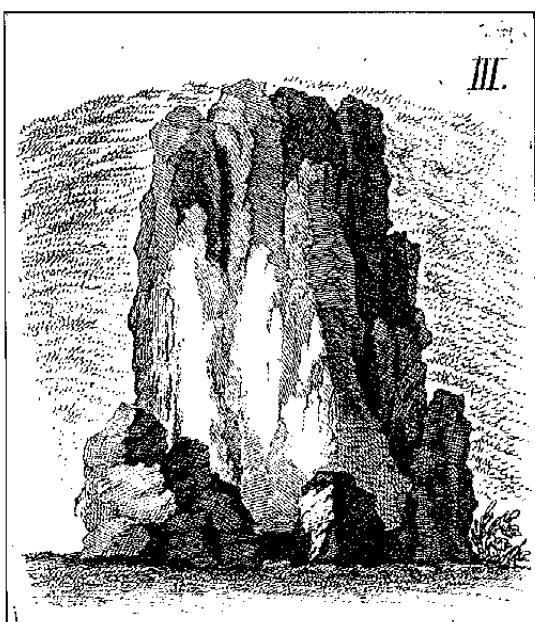


Fig. 5

Slovakia) and Fonácsa Cave (*Pestera de la Finaťe, Romania*) are discussed, and the presence of caves in Túrócz and Gömör Counties is mentioned. Under the counties one can read about the dragon bones of Deményfalva Cave in Liptóv county; the Mazarna and Dupna caves in Túrócz county (*Mažarná a Dúpna jaskyňa v Turci, Slovakia*); the cave on the hill at Dobšina and the bottomless Csörgőlyuk (*Zvonivá diera, Slovakia*) at Pelsőc in Gömör county; the Szádelő (*Zádielská jaskyňa, Slovakia*), and Szelice and Borzova caves (*Sílická ladnica a Brezovská jaskyňa, Slovakia*) in Torna county. It is interesting that Szaller does not mention Baradla, even though it was known to exist then. It is also interesting that the description of Dobšina rather fits that of Baradla. Here we can read the same as in the later Baradla descriptions: the water dripping down the walls and changing into stones, which were used for their clean white colour as paint and also as medicine for bovine.

In 1796 Hungarian language geographic studies and publications began to replace the previously prevailing Latin and German publications. This development provided new, previously unknown facts and information regarding caves in Hungary. These Hungarian publications were based not only on translations but also on new data and personal experiences.

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IZŠLO V LETU 1796...

Povzetek

1796 so izšle tri knjige v madžarskem jeziku, z zelo pomembnimi podatki o jamah na Madžarskem, Slovaškem in v Romuniji. Pred tem je bilo vsega skupaj omenjenih le nekaj jam v 90 rokopisih in knjigah, pisanih v latinskem ali nemškem jeziku, s prvo jamo, omenjeno leta 1037. 1796 je K. A. Valyi izdal prvega od treh delov svoje knjige "Opis Madžarske" ter prevod Korabinskyjeve "Geografske enciklopedije" (1786), dopolnjen z novimi podatki, kjer so tudi jamam namenjena posebna gesla. Istega leta je izdal D. Teleki svoj popotni dnevnik, kjer sta poleg opisov tudi gravuri dveh jam, to sta prvi upodobitvi znanih jam Baradle in Silicke lednice. Tudi "Geografija Madžarske" G. Szallerja, na 250 straneh, ki je izšla 1796, vsebuje opise številnih jam, ki so danes na Slovaškem in v Romuniji.

CAVES IN THE WORKS OF THE HUNGARIAN NOVELIST MÓR JÓKAI

JAME V DELIH MADŽARSKEGA PISATELJA MÓRA JÓKAIA

KATALIN BOLNER - TAKÁCS¹

Izvleček

UDK 821.511.141 Jókai M.
551.44(439):927 Jókai M.

Katalin Bolner-Takács: Jame v delih madžarskega pisatelja Móra Jókaia

V delih M. Jókaia (1825-1904) se kaže njegovo poznavanje geologije (vključno krasa in jam), mineralov, rastlin, živali, itd. Njegovi romani se dogajajo v odmaknjениh delih zgodovinske Madžarske ali tujine. Prizori iz jam vključujejo podzemeljske reke, kapniške jame, ledene in termalne jame ter lavine cevi. Med njimi opisuje tudi resnične, npr. Veterani, Örvénykő, Szkerisora in Modra jama na Kapriju. Enega izmed njegovih romanov so navdihnilo Škocjanske jame. Jókai je 1853 obiskal jami Homoródalmás in Torja, 1876 in 1883 jamo Balika ter 1883 Dobšinsko ledeno jamo.

Ključne besede: jama v umetnosti, literatura, Madžarska, Jókai M.

Abstract

UDC821.511.141 Jókai M.
551.44(439):927 Jókai M.

Katalin Bolner-Takács: Caves in the works of the Hungarian novelist Mór Jókai

The books of the M. Jókai (1825-1904) incorporate scientific knowledge about geology (including karst and caves), minerals, plants, animals etc. The novels are set in remote parts of historical Hungary or abroad. The cave scenes involve underground rivers, stalactite caves, thermal caves and lava tubes. Real caves include those of Veterani, Örvénykő, Szkerisora and the Capri Grotta Azurra. Another book was inspired by Škocjanske jame. Jókai visited Homoródalmás and Torja caves in 1853, Balika cave in 1876 and 1883, Dobšina ice cave in 1883.

Key words: cave in art, literature, Hungary, Jókai M.

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Fig. 1: Mór Jókai (1825 - 1904).

his wide-ranging talent at an early age: his first poem was published at the age of 9, at the age of 15 he spoke German, English, French, and Italian, and had a talent for drawing and painting as well; in Kecskemét he staged plays and acted in them, and his first stories were written also at that time.

After the success of his first novel in 1846, he devoted his talent definitely to literature, and took an active part in public life, too. He participated in the 1848-49 revolution as a popular speaker, then as a journalist, and after its failure he had to live in exile for a few months. Returning to Pest in 1850 he published under a pseudonym, but soon was active again not only as a novelist, but as editor and also founder of almost a dozen newspapers and periodicals. He was a hard-working writer throughout his long lifetime: he got up at 5 o'clock in the morning every day, and by 10 o'clock he was ready with his work running to 1 or 2 printed sheets. With his life-work consisting of 64 novels, some 300 novellas and short stories, dozens of poems and dramatic works, and several hundred articles and speeches, Mór Jókai is also the most productive Hungarian writer. His most popular works have been translated into

Mór Jókai is one of the greatest personalities of Hungarian prose literature. Lasting already for one and a half century, his popularity is based upon his poetic personality, his rich imagination, idiom and humour, and, above all, his unequalled talent for story-telling. Besides these literary merits, his works also represent an extremely rich collection of knowledge on history, ethnography, botany, and zoology, as well as on geosciences - geography, astronomy, meteorology, hydrology, mineralogy, paleontology and, last but not least, karstology and speleology.

Mór Jókai was born in 1825 in Komárom, the prosperous commercial town on the Danube, as the third child of a noble family. He was educated in Komárom, Pozsony /Bratislava and Pápa; then he studied law in Kecskemét and after a two years apprenticeship in Komárom and Pest, he took his degree in law in 1846. He evinced

several languages: in his lifetime 137 of his novels and stories were published in German, 48 in Polish, 30 in Russian, 23 in English, 22 in Czech; and there are translations into Croatian, Danish, Estonian, Finnish, French, Italian, Rumanian, Serbian, Slovakian, Slovene, and Swedish languages, too.

Jókai had already gained exceptional recognition in his lifetime. The Hungarian Academy of Sciences elected him a corresponding member in 1858, an ordinary member in 1861, an honorary member in 1883 and a member of the board of directors in 1892. In 1861 he was elected Member of Parliament, and held this post for more than 30 years. On the occasion of the 50th anniversary of his literary activity in 1894, he was overwhelmed with honours: the freedom of the capital and other cities was presented to him, Budapest University conferred an honorary degree on him, and a hundred-volume special edition of his works was published. He died at the age of 80 in 1904; at his catafalque in the hall of the National Musem, representatives of the king, the government, the judiciary, as well as delegations of all social strata and all regions of the country payed tribute to him.

Jókai's art is a special mixture of romanticism and realism. Most of his works are historical novels, for which he took subjects from the most different centuries of the Hungarian and universal history; but his imagination was also inspired by legends, folk heroes and adventurers as well as by the national industrialization and the future of the country. Considerable merits of his novels and stories are the artistic and lively landscape descriptions, by which he guides the reader not only through the romantic scenes of historical Hungary, from Lake Fertő to the Great Hungarian Plain, from the Lower Danube to the Tatra Mountains; but to all the continents, from Italy to Siberia and China, from South America to the North Pole.

These descriptions involve a number of karst features: sinkings streams and resurgences [e.g. 7: in Vargyas Valley /Cheile Vîrghișului/; 17: in the Karst Mts.]; periodical springs [e.g. 4, 17: in the vicinity of Kolozsvár/Cluj]; travertine deposition [e.g. 11: in a tributary of the Maros]; limestone gorges [e.g. 9, 17: Torda Gorge /Cheile Turzii/]; dolines [e.g. 19: near Fiume/Rijeka]; karrenfelds [e.g. 17: at Trieste, 22: at Raguza/Dubrovnik]; and, of course, caves. Besides several unnamed and very probably imaginary caves and cavities mentioned when describing different sceneries in the ALCADI region, especially in Transylvania [e.g. 3] and in Dalmatia [e.g. 22], we find *Veterani Cave* /Peştera Veterani/ at the description of the Lower Danube [13], the *Blue Grotto* in a short paragraph concerning Capri [23], *Szkerisóra Ice Cave* /Ghețarul Scărișoara/ referred as the 'Gyetzár' among the sights of Transylvania [11, 15], as well as *Örvénykő Cave* in the Bükk Mts. [24], the caves of Székelykő Hill at Torockó/ Rimetea [17], and the rock bridge in Stratenská Valley [21].

But caves are not only elements of the landscape in Jókai's works. He frequently cites caves, cavities and rock niches as hiding places for various animals (bear, wolf, lion, hyena, snake, panther, dragon, etc.) as well as for

robbers, refugees, and hermits [e.g. 3, 4, 5, 17, 20, 22]. It is strange, but all the caves well known in the last century within the boundaries of modern Hungary, such as *Baradla Cave*, *Szelim-lyuk* and *Abaliget Cave* are mentioned in this way only [4]. Some other actual or legendary caves — such as *Szilice Ice Cave* /Silická ľadnica/ [17], the crystall-lined cavities of the Alps [16], or the biblical cave of Saint Anthony [19] — are cited as analogues; and he often uses the word 'cave' for fortress, blocks of flats, gambling-clubs or ornamented rooms, too [e.g. 14, 15, 17, 19].

In addition to this list, there are at least 24 novels and short stories, in which caves are scenes for more or less important events in the plot. These cave scenes involve a surprisingly great variety of caves: stream caves offering not only refuge but also water supply [4, 9, 17] or used to drain a marsh [27]; through caves, that serve as pathways for escape or attack [6, 11, 18, 22]; a multilevel system, where the heroes have to fight not only against offensive troops, but the evil dwarfs living in the deeper levels, too [7]; caves decorated with dripstones [1, 17, 19] or ice formations [21] as solemn sites of tragic events and secret meetings; a shaft used for prison by pirates [19]; a water-filled cavern endangering coal mining activity [12]; thermal caves with warm lakes or hot springs in them [2, 22]; glacier caves [2, 8, 16] carved partly by warm springs into ice; a coral grotto providing tomb for the victims of a shipwreck [15]; a lava tube, through which Chilean aborigines escape from Spanish conquerors [10]; other volcanic caves heated by solfatara-activity [26] or exhaling deadly sulphuric gas [20]; as well as crystal caves [25], or archaeological and paleontological sites [14, 16, 22]. Though most of these caves are suspected to be fictions in the given location, Jókai's imagination has usually translated literary-hearsay data or personal experiences to the scene of the plot. It is documented that the writer has visited at least four caves — it is not by chance that his most detailed and valuable cave descriptions concern these caves.

On the evidence of his travel notes, Jókai paid his first visit to a cave area in 1853, when he visited Homoródalmás Cave and Torja Cave during a three-weeks journey in Transylvania, and his experiences soon appeared in his books, too. *Homoródalmás Cave* (P. Mare de la Mereşti), referred by Jókai as 'the cave of Nagy Mál Hill' is the scene of his 1854 short story "The Hargita" [7] based on local legends, according to which the inhabitants of the nearby village were hidden here during the Tartar invasion. The story also recalls the discovery of the inner parts of the cave by following the bats that disappear in a narrow passage, where a blockage had to be removed to go on; and describes the purposes for which certain rooms were used by the refugees, citing the rooms by numbers — as it is shown on the 1836 map of István Fekete, who was Jókai's guide to the cave. In this story two more caves of the Vargyas Valley occur by name: *Ugron's Cave* and the *Horse-Barn* (P. Calului).

The gas-exhaling *Torja 'Stinking' Cave* (P. Pucioasa de la Turia) is mentioned in several stories [7, 9, 14]; and its detailed description is presented in Jókai's

1883. Junius 24.

Látogatók száma Zahl der Besucher		Kelet Datum	Név Name	Foglalkozás Stand	Lakhely Wohnort
Töltődésben Sitz der Anmeldung	Török Übung im laufenden Jahre	1883			
1883.	109.	24.	Jókai Mór	író	Budapest
58	110	"	Drausnitsky	"	Rosny
59	111.	"	Possány Dezső palganassza.	"	Balica
50	112.	"	Szontagh Károly	földművelő	"

Fig. 2: The writer's signature in the visitor's book of Dobšina Ice Cave.

1882 novel "The Castle of Idols" [20], that takes place in the 12th century. Here, the cave serves as an ideal background for the young hero to meet with an old woman who is thought to have a pact with the devil; whilst we get information on the surroundings of the cave, the sulphur deposition around its entrance, its length of ten yards, and the deadly effect of the sulphurous gas on animals in front of the cave, on the gas-level inside (defined as "not higher than ones head") so it can be visited on stilts and as far as the torch remains alight, and that the gas is believed to heal rheumatic diseases.

Jókai's experiences in Torda Gorge during his 1876 journey in Transylvania are used in his 1877 novel 'There is a God' [17]. In this book, the gorge with its famed *Balika Cave* (P. Mare a lui Balica) — that had already appeared in some early works [4, 5], too — provides a safe way with night shelter for the heroes to by-pass the enemy troops during the 1848-49 revolution. Besides describing the environs and the fortified entrance hall of the cave, and recalling a local legend about its last lord, a robber, the writer reports on its ground-plan and its ascending character; as well as on its counterpart (P. Mică a lui Balica) opening at the same level in the opposite wall of the gorge, and on the nearby dripstone-decorated *Porlik Cave*, where the stalactites — just like organ-pipes — are suitable to play melodies on.

Jókai's most artistic cave description concerns *Dobsina Ice Cave* (Dobšinská ľadová jaskyňa), that he visited in 1883. In his 1884 novel "The white lady of Lőcse" [21] Jókai devotes a whole chapter to this cave, referring it as the scene of a secret meeting during the Rákóczi war of liberty. The section title

itself is "The Ice Cave", where Jókai describes not only the different ice speleothems, comparing them to pillars, waterfalls, altars, mirrors, carpets, lacework and tents; but also mentions the cave's formation by carbonic acid and water; as well as the layered structure of the ice laid down year by year; and he describes the equipment by which one can climb the ice wall. He links the huge breakdown at the bottom of the cave with the collapse on the surface, and explains them by a thunderbolt; and his imagination creates another entrance to the cave from Hanneshöhe, which has been verified almost one hundred years later by the discovery of Stratenská Cave.

A further, similarly detailed cave description can be found in Jókai's 1886 novel "Three heads of marble" [22]. This novel takes place in the 12th century in Dalmatia, and comparing the former scenery with the modern landscape of karst, the writer stresses the role of human impact by timberfelling and the introduction of goats, which have resulted in deforestation, soil denudation and even change of local climate. The key scene of this novel is a river cave system, through which the hero gets from the inside of the country to a valley near the sea. The river, that reappears at the sea under another name, enters the cave after a short surface course and forms waterfalls at the entrance. The cave is accessible through a dripstone-decorated, dry higher passage; the hero finds stairs cut into the rock wall; and the path runs high above the thundering river that ends in a lake with no visible outlet. Though the site is placed in the Raguza (Dubrovnik) area, these elements give a strong hint that this scene has been inspired by Škocjanske Jame, that Jókai might have seen — or at least heard about it — on his 1876 journey via Trieste to Italy.

The investigation of Jókai's life-work from a speleological point of view is far from being completed, but the data obtained so far seem already to prove the potential speleohistorical importance of literary works. Jókai's novels and short stories are significant not only because of his artistic cave descriptions: considering the fact that almost all the well-known caves of his age are presented in his works, either directly or indirectly, and are enhanced by a wide range of information comprising almost all branches of speleology, his life-work can also be regarded as giving a summary of the speleological knowledge available in Hungary in the second part of the last century.

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- [2] Erdély aranykora — 1852, Pest (1851, *Pesti Napló*);
Die goldene Zeit in Siebenbürgen — 1874, Leipzig;
Midst the wild Carpathians — 1894, London;
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- [3] A kétszarvú ember — 1852, Pest (1851, *Pesti Napló*);
Der Mann mit den zwei Hörnern — 1886, Berlin.

- [4] Török világ Magyarországon — 1853, Pest;
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Slaves of the Padishah — 1902, London.
- [5] A nagyenyedi két fűzfa — 1853, *Délibáb*
- [6] Janicsárok végnapjai — 1854, Pest;
Die letzten Tage der Janitscharen — 1854, Leipzig;
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(3. ed. 1897)
- [7] A Hargita — 1854, *Jókai Országos Nagy Naptára*
- [8] A láthatatlan csillag — 1851, *Losonczi Phónix*; In: Délvirágok — 1856, Pest
- [9] Istenhegyi székely leány — 1857, *Vasárnapi Újság*;
Die Széklermaid von Gottesberg — 1890 (?), Dresden.
- [10] Valdivia — 1857, *Nővilág*;
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New York
- [11] Szegény gazdagok — 1860, Pest;
Die armen Reichen — 1873, Berlin (1872, *Berliner Roman-Zeitung*);
The poor plutocrats — 1874, New York; 1899, London.
- [12] Fekete gyémántok — 1870, Pest;
Schwarze Diamanten — 1871, Pest; 1877, Berlin;
Black diamonds — 1894, London.
- [13] Az arany ember — 1873, Pest (1872, *A Hon*);
Ein Goldmensch — 1873, Berlin;
Modern Midas — 1884, New York;
Timar's two worlds — 1888, London.
- [14] A jövő század regénye — 1872-74, Pest;
Der Roman des künftigen Jahrhunderts — 1879, Pressburg (1873, *Pester Lloyd*)
- [15] Enyim, tied, övé — 1875, Budapest;
Mein, Dein, Sein — 1875, Berlin.
- [16] Egész az északi pólusig! vagy: mi lett tovább a Tegethoffal? — 1876,
Budapest (1875, *Üstökös*);
20.000 Jahre unter dem Eise — 1891, Berlin;
Bis zum Nordpol, oder was geschah weiter mit dem Tegetthoff? — 1909,
Berlin (1875, *Pester Lloyd*).
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Die nur einmal lieben — 1878, Berlin;
The Christian in Hungarian romance. There is a God, or the people
who love but once — 1901, London;
Manasseh — 1901, London.
- [18] Egy hirhedett kalandor a XVII. századból—1879, Budapest (1878, *A Hon*);
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Told by the death's head — 1902, New York; 1903, London.

- [19] Egy játékos, aki nyer — 1882, Budapest;
 Ein Spieler der gewinnt — 1883, Budapest.
- [20] A bálványos vár — 1883, Budapest (1882, *Nemzet*);
 Die Götterburg — 1884, Berlin.
- [21] A lőcsei fehér asszony — 1885, Budapest (1884, *Nemzet*);
 Die weisse Frau von Leutschau — 1885, Budapest.
- [22] Hárrom márványfcj — 1887, Budapest (1886, *Nemzet*).
- [23] A lélekdomár — 1889, Budapest (1888, *Nemzet*);
 Der Seelenbändiger — 1892, Berlin.
- [24] A tengerszemű hölgy — 1890, Budapest (1888, *Nemzet*);
 Die Dame mit den Meeraugen — 1890, Lcipzig;
 Eyes like the sea — 1893, London
- [25] Álmodád — 1891, *Pesti Hirlap*.
- [26] Rákóczi fia — 1892, Budapest (1891, *Nemzet*);
 Fürstenblut — 1893, Stuttgart.
- [27] Ahol a pénz nem isten — 1904, Budapest

JAME V DELIH MADŽARSKEGA ROMANOPISCA M. JÓKAIA

Povzetek

Dela Móra Jókaia (1825-1904), največjega madžarskega romanopisca, temelje tudi na njegovem poznavanju zgodovine, etnografije in tudi geologije (vključno krasa in jam), mineralov, rastlin, živali, itd. Njegovi romani in novele se dogajajo v skrajnih in odmagnjenih delih zgodovinske Madžarske (Transilvanija, Višavje, Velika madžarska ravnina) ali eksotičnih celin: Daljni Vzhod, Južna Amerika, itd. Njegova najbolj znana dela so bila prevedena v tuje jezike, toda večji del njegovega opusa, ki vključuje 54 romanov, okoli 300 novel in stotine člankov, je dostopen le v madžarščini.

Prizori njegovih del vključujejo jame kot skrivališča, puščavniška zavetišča in bivališča raznih živali. V opise pokrajin vključuje kraške oblike in pojave, kot so intermitentni izviri, lehnjak, vrtače, škraplje, itd., kot tudi izmišljenc in prave jame (Veterani, Örvénykő, ledenica Szkerisora, Stratenska kamcnita vrata in Modra jama na Kapriju). V okoli 20 njegovih del so prizori iz jam, včasih je jama tudi vodilno prizorišče. V jamskih prizorih so opisane najrazličnejše jame: kapniške in vodne jame, jame v nadstropijah, ponorne, izvirne, ledene in termalne jame ter jame s strupenimi plini.

Kot dokazujejo njegovi zapiski, je Jókai 1853 obiskal jami Homoródalmás in Torja, 1876 jamo Balíka in sotesko Torda, 1883 pa Dobšinsko ledeno jamo. Opirajoč se na podrobne opise v enem izmed njegovih zadnjih romanov, ki se dogaja v Dalmaciji (in razpravlja o antropogenih vplivih na kraško denudacijo), je zelo verjetno, da ga je navdihnil obisk Škocjanskih jam, kar bi se lahko zgodilo med njegovim obiskom Italije 1876 ali 1887.

FEDERICO DE COMELLI: GLI STUDI IN MERITO ALL'APPROVIGIONAMENTO D'ACQUA POTABILE PER LA CITTÀ DI GORIZIA

FEDERICO DE COMELLI IN NJEGOVA ŠTUDIJA O OSKRBI GORICE S PITNO VODO

DI MAURIZIO TAVAGNUTTI¹

Izvleček

UDK 556.3(450.36)“18”

Di Maurizio Tavagnutti: Federico De Comelli in njegova študija o oskrbi Gorice s pitno vodo

V prejšnjem stoletju so v Gorici sklenili rešiti vprašanje pitne vode. Pripravljalnih raziskav se je lotil F. De Comelli (1826-1892). V zvezi z izkoriščanjem izvira Mrzlek je raziskoval lame v okolici Grgarja. Zaradi tega ga štejejo za pionirja tamkajšnje speleologije. 1887 je končal študijo, ki je bila tudi kasneje vedno upoštevana (Taramelli 1903). Njegov projekt "Mrzlek" (to je danes najpomembnejši vodni vir v vsej regiji) ni bil odklonjen zaradi pomanjkljivosti, kot piše Boegan, ampak ker so ga šteli za predragega.

Ključne besede: hidrologija krasa, zgodovina speleologije, Italija, Slovenija, Goriško, Mrzlek, De Comelli F.

Abstract

UDC 556.3(450.36)“18”

Di Maurizio Tavagnutti: Federico De Comelli and his study of water supply of Gorizia

In the 19th century the decision to settle the water supply problem was accepted. F. De Comelli (1826-1892) started the investigations. He proposed to use the Mrzlek spring and therefore he explored caves in the surroundings of the Grgar village. That is why he is considered the pioneer of the speleology of this region. In 1887 he finished his study which was also later considered as a basic one. According to Boegan the project "Mrzlek" (this is the most important spring of the whole region) was not rejected because of imperfection but it was too expensive.

Key words: karst hydrology, history of speleology, Italy, Slovenia, Nova Gorica region, Mrzlek, De Comelli F.

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LA VITA E LE SUE RICERCHE

La ricerca di fiumi e acque sotterranee in genere, è sempre stata una delle attività principali dei gruppi speleologici.

Il Friuli Venezia Giulia, tra l'altro, vanta antiche tradizioni in questo campo: troviamo infatti già nella seconda metà del 1800 studiosi ed appassionati che si dedicano attivamente a questa nuova scienza per la quale viene coniato il nuovo termine "speleologia".

E' proprio dal nostro Carso che deriva, inoltre, il termine "carsico" universalmente impiegato per indicare il tipico paesaggio calcareo traforato da doline e grotte, mentre con il termine carsismo viene definita quella scienza che studia l'instaurarsi di tale fenomeno.

Stimolato da tali premesse e grazie all'aiuto del Centro Ricerche Carsiche "C. Seppenhofer" di Gorizia per le ricerche storiche, ho riesumato una vicenda legata all'ambiente isontino del 1887 in cui spicca una singolare figura, quella dell'ingegnere gradiscano Federico de Comelli.

Verso la fine dello scorso secolo, Gorizia era alle prese con un problema di vitale importanza: quello della ricerca d'una fonte d'acqua potabile capace di soddisfare le esigenze della sua sempre crescente popolazione. E' vero che la città disponeva di un numero di pozzi artesiani pubblici sufficienti a garantire i bisogni igienici e alimentari della popolazione, ma i goriziani dell'epoca cominciavano a sentire in modo sempre più insistente la necessità di un vero acquedotto.

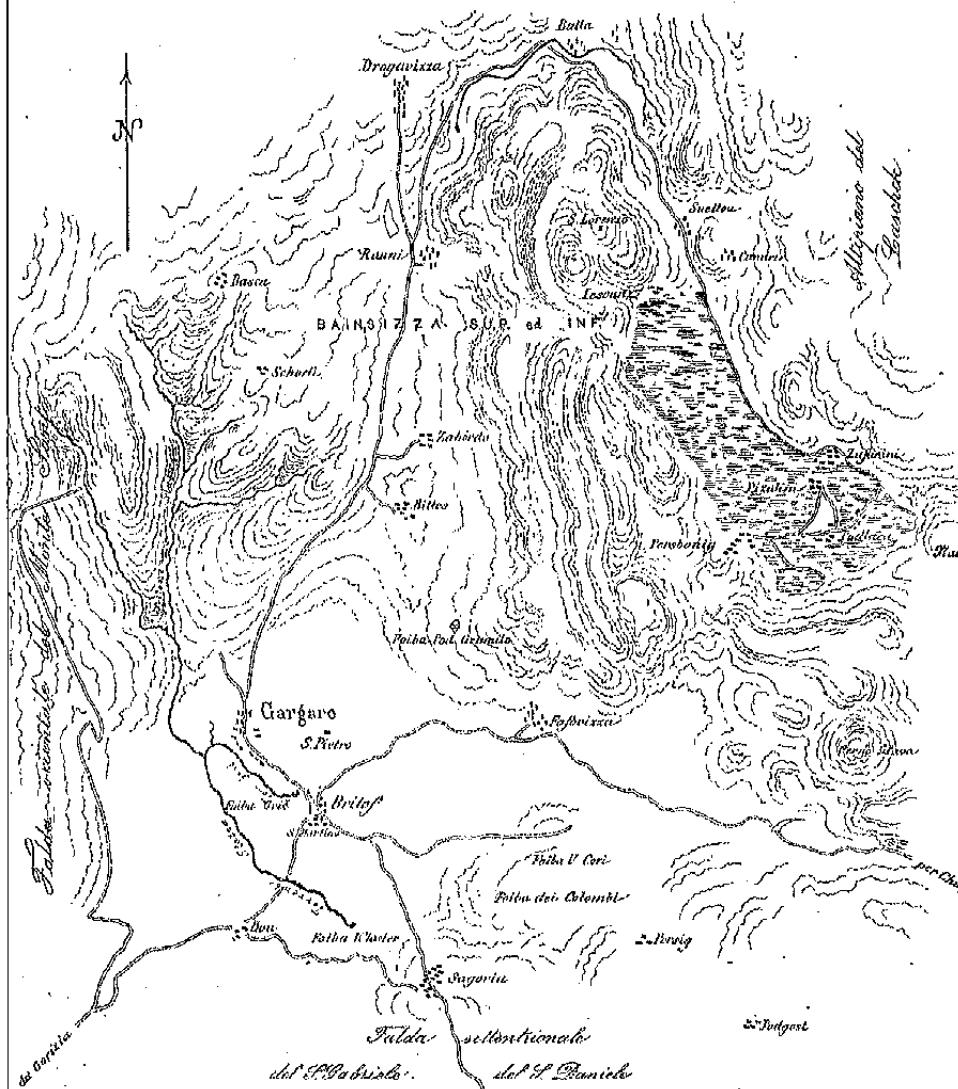
E' proprio in quegli anni che molti studiosi o addirittura semplici letterati, si occuparono di questo problema a dimostrazione che i disagi di doversi rifornire alle pubbliche fontane, anche per le piccole esigenze, dovevano farsi particolarmente sentire a tutti i livelli sociali. Una vicenda storica questa che ho voluto approfondire, in quanto avevo casualmente scoperto essere legata a dei risvolti della storia speleologica della nostra città, mettendo in luce, tra l'altro, l'opera di un ingegnere gradiscano che per gli studi di idrologia sotterranea eseguiti in quel periodo, deve essere senz'altro rivalutato e considerato, oserei dire, tra i più grandi precursori della speleologia moderna.

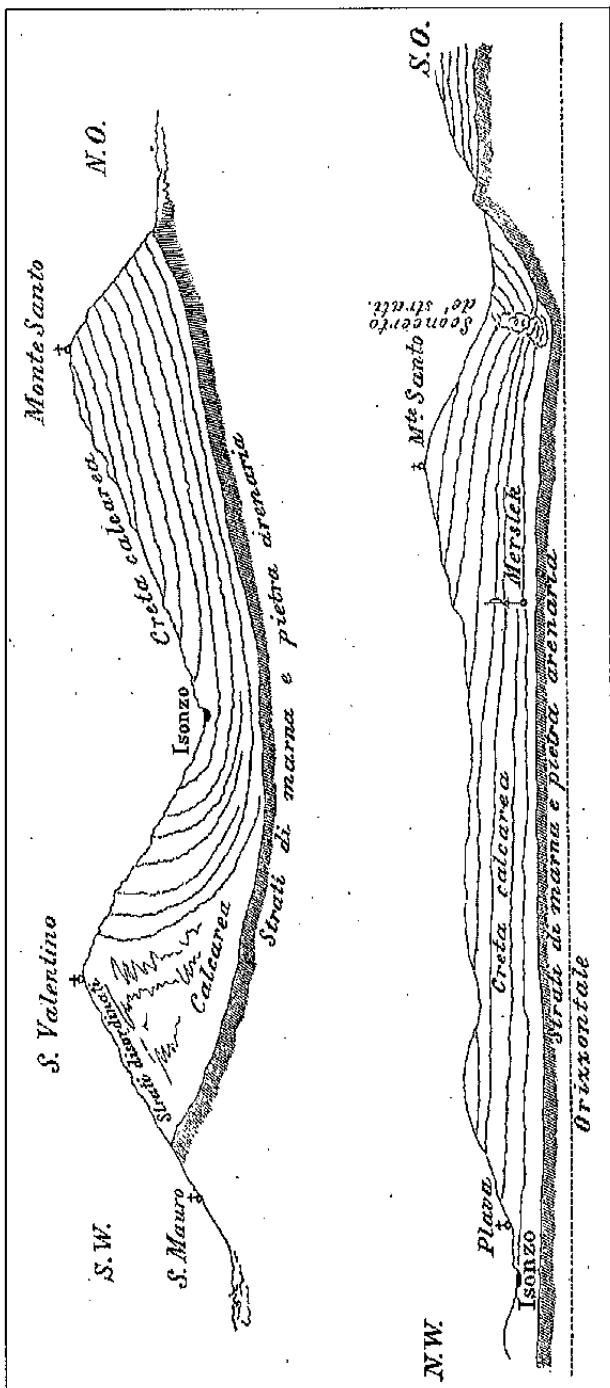
Così, sotto quest'ottica, dopo un'accurata ricerca sono riuscito a raccogliere una serie di dati che, seppur frammentari, sono sufficienti a comporre parte della storia riguardante la travagliata vicenda della ricerca d'acqua potabile a Gorizia e soprattutto è venuta alla luce la storia di un personaggio affascinante e dalla cultura veramente poliedrica: Federico de Comelli.

Federico de Comelli von Stuckenfeld nacque a Gradisca da nobile famiglia nel 1826 e vi morì nel 1892; suo padre Giuseppe fu ricco possidente terriero. Sposò Anna Galvagni da cui ebbe tre figli e tre figlie.

Tra questi Attilio fu pittore di fama e lavorò soprattutto a Londra ove morì nel 1929. I de Comelli abitavano a Gradisca dove un magnifico palazzo che porta ancora il loro nome, rimane a testimoniare la loro presenza in questa

Idrografia del bacino di Gargaro
tratta dai rilievi di
Leonardo da Montel





cittadina, Federico studiò e si laureò in ingegneria a Vienna ed inoltre fu uno scrittore di notevole pregio; dopo il 1848 capeggiò col Favetti il movimento patriottico goriziano, esprimendo così tutta la sua vocazione irredentista al punto che dovette abbandonare il Friuli perché perseguitato dall'Austria. In giovane età lo troviamo in qualità di redattore dell' "Eco dell'Isonzo", un giornale la cui stampa viene effettuata dalla Tipografia Seitz a Gorizia, ma la cui redazione si trova a Gradisca in Casa Comelli.

Nelle mani di Federico la pubblicazione diventa ben presto un'arma per diffondere il proprio patriottismo. Con gli stessi intenti pubblica la strenna per il 1855, intitolata "il mè pais", scritta quasi interamente da lui. Come scrittore ebbe in prosa uno stile sostanzioso, solido e ricco di pensiero; alcuni suoi articoli comparvero anche sul "Politecnico" diretto in quegli anni dal Cattaneo. La sua fama di poeta inoltre ci viene tramandata da quattro poesie pubblicate su "il mè pais": Buona sera, Il varda-fuc, Il ciant dell'armentar e Il ciazzador.

Ebbe la stima e l'amicizia di noti letterati e studiosi dell'epoca quali il Cattaneo, il Prati, il Fusinato, il Crispi, il Correnti, il Martini, il De Gubernatis, il Dall'Ongaro, il Duprè ed altri. In esilio diresse i lavori della ferrovia umbra, ed inoltre elaborò numerosi altri progetti, ma a noi piace ricordarlo soprattutto per la pubblicazione di uno studio riguardante l'approvvigionamento d'acqua potabile per la città di Gorizia, opera che, dopo la sua morte, meritò il plauso da parte dello stesso Torquato Taramelli impegnato anch'egli a risolvere l'analogo e spinoso problema. Dopo trenta anni di esilio Federico ritorna finalmente nella sua cittadina natale. Ad un primo esame ci sorprende che una mente abituata al calcolo ed al pensiero razionale come quella di un ingegnere, possa conciliarsi con l'attività di scrittore, poeta e non da ultimo ricercatore d'acque sotterranee.

Ma se facciamo un'attenta analisi della vita di questo illustre personaggio, possiamo constatare come, nel corso di tutta la sua frenetica attività, la parte emotiva emerge quasi sempre su quella raziocinante dell'ingegnere. Possiamo infatti notare proprio nel suo lavoro, sullo studio delle acque sotterranee del Merzlek (Mrzlek), come egli si sia dedicato con vero e proprio entusiasmo al problema dell'approvvigionamento d'acqua potabile per la città di Gorizia; dagli studi eseguiti risulta evidente che egli va ben oltre il proprio compito professionale. Si trasforma perciò in uno speleologo e con pochi amici esplora sistematicamente numerose cavità nei pressi di Gargaro (Grgar) (ora in Slovenia).

Purtroppo non ci sono molti dati che documentino l'attività di Federico Comelli nel campo speleologico ma presumiamo che sia stata notevole. A tal proposito ricordiamo una dettagliata relazione sull'esplorazione della Grotta di Gargaro, esplorazione che egli compie in merito agli studi sulle acque sotterranee del Merzlek e che pubblicherà nella sua pregevole opera, presentata all'Amministrazione Civica di Gorizia, riguardante il provvedimento d'acqua per la città.

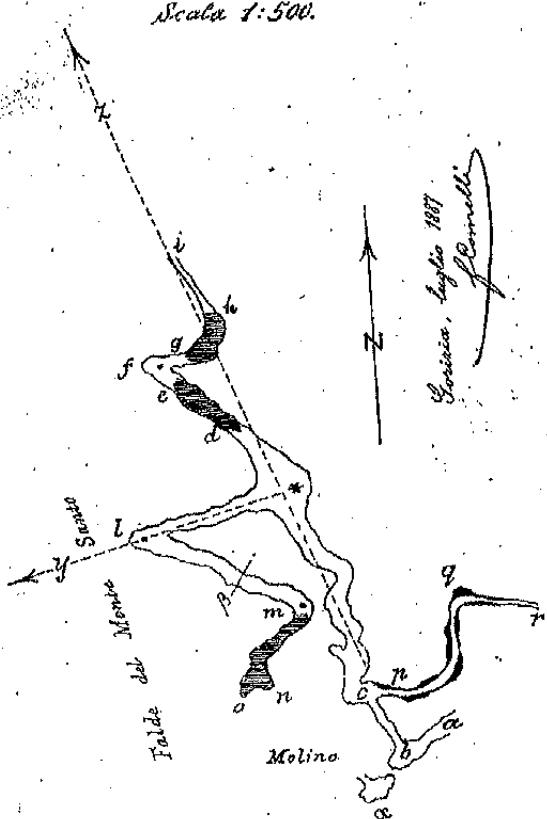
Questa relazione a mio avviso è un raro esempio di studio speleologico condotto con cognizione, scrupolo e metodi professionali, ben difficilmente riscontrabili in altri analoghi lavori apparsi in quell'epoca. La pubblicazione di questo lavoro, infatti, sarà presa per molti anni come punto di riferimento da numerosi autori, che, come il Comelli, hanno cercato di risolvere l'annoso problema dell'acqua potabile a Gorizia. Tutti però confermano le ipotesi che da tempo l'ingegnere gradiscano aveva formulato nel suo lavoro, e cioè della non convenienza finanziaria e impossibilità pratica a realizzare tale impresa.

Pertanto il progetto di alimentare l'acquedotto goriziano con le acque sotterranee del Merzlek fu definitivamente abbandonato per ragioni pratiche e non perché gli studi fossero stati eseguiti poco correttamente come sosteneva il triestino Boegan. Infatti, tra gli autori che si occuparono del problema, il più autorevole, Torquato Taramelli, in un suo lavoro (1903) riferendosi allo studio eseguito dal Comelli sul Merzlek afferma: - *Devo però osservare che allora*

Pianta dei sotterranei di Gargaro.

Spiegazione della pianta e dei rispettivi sotterranei.

Scala 1:500.



o Breve portugio di uscita della nequa. Il 1917 lambito dalla nequa fino alla soglia. Oltre il portugio cedono una piccola grotta risultante. Passaggio impossibile.

p — q — r Terza diramazione del sotterraneo, alla volta (sembra) di Chianovano: ingombra parzialmente di depositi di fungo argilloso, avvicinandosi sui fianchi; inclinazione spezzata da **q** a **r** da **q** a **r**.

r Estremità del sotterraneo, senza continuazione visibile.

y Direzione verso il Monte Santo,
alla cima del monte Koblik (Vogna) la carta militare).

Le punteggiate segnano la direzioni riferite soprattutto.

Rilievo:	Ramo principale q — i , lunghezza sottoposta sull'asse	m. 64,00
	Ramo laterale q — o , sviluppo o. s.	m. 42,00
	Ramo o — r , " "	m. 86,00

Riassunto delle altezze barometriche:

al piano di campagna	m. 278,00
principio del punto di discesa (b , altezza rilevata)	" 269,70
punto a	" 250,80
" g	" 252,00
" m	" 245,00
" o	" 255,00

Temperature sotterraneo: punto	0	10° d. R.	carlo
"	0	0° 0'	"
"	1	8° 2'	" acqua
"	2	10° 2'	" aria
"	m — o	12° 2'	" acqua
"	"	13° 2'	" aria

mancava uno studio diligente della Merzlek; e questo fu eseguito ed esposto nel miglior modo dal compianto ingegnere Federico Comelli, autore di una relazione molto pregevole, pubblicata nel 1887, sulla quale è indispensabile che richiami l'attenzione della spettabile Amministrazione Civica, poiché, non avendo potuto trattenermi a lungo nella regione, debbo far tesoro delle osservazioni e delle considerazioni di questo Autore, che ben a ragione dichiara di "aver studiato con passione e giudicato senza passione" e che ha considerato l'argomento della provvista d'acqua per Gorizia con larghezza di concetti, estendendo le sue ricerche a molte altre fonti... -.

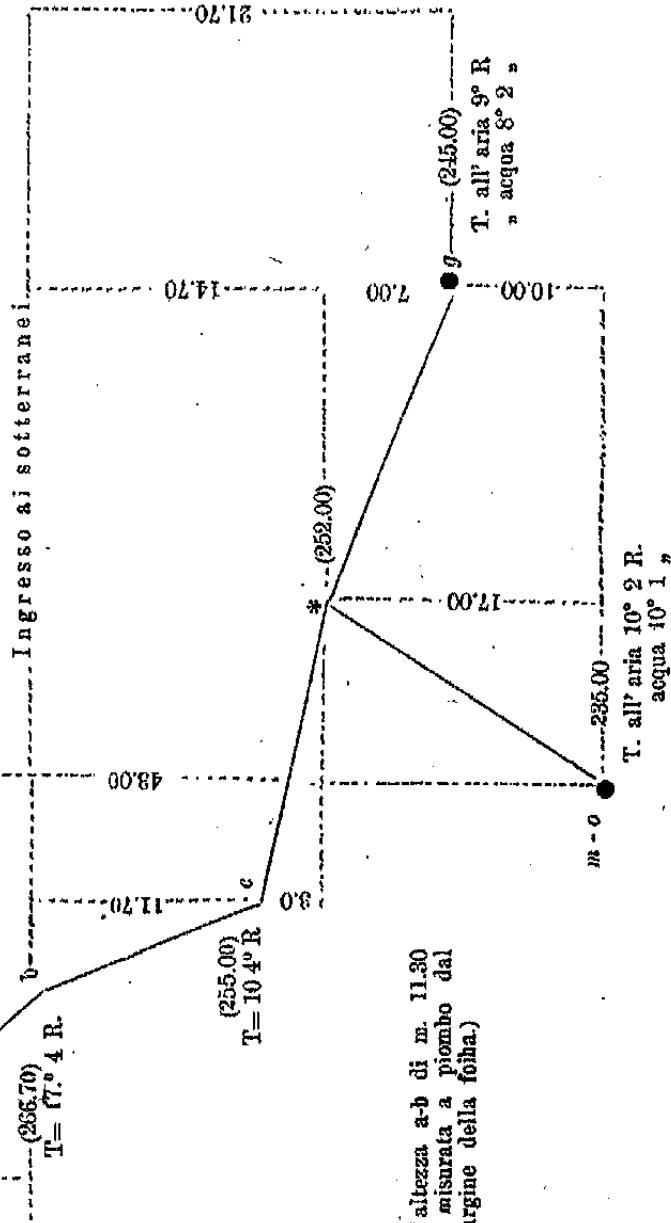
Lo stesso Autore, sempre nella sua relazione presentata all'Amministrazione Civica di Gorizia, nel precisare i rapporti stratigrafici tra il Monte Santo e l'opposto Monte S. Valentino, cita nuovamente il Comelli avendo quest'ultimo affermato: - ... *le condizioni idrografiche interne della Merzlek non mi sembrano tali da potersi con asservanza assicurare la riuscita d'un lavoro, nel quale siano i mezzi meccanici eliminati.* - E poi aggiunge: - *Sebbene non abbia a lamentare di aver incoraggiato la ricerca della fonte ad altezze tali da non richiedere l'innalzamento meccanico, tuttavia, se avessi allora avuto in mente il concetto che mi sono fatto dappoi dell'andamento delle acque sotterranee nei terreni permeabili e particolarmente nei calcari, non mi sarei nemmeno azzardato a proporre lo scavo del breve cunicolo di presa allo scopo di tentare un leggero sollevamento di una parte dell'acqua della fonte.*-.

Il Taramelli, nel corso di tutto il suo lavoro, cita continuamente il Comelli dimostrando l'estrema validità dell'opera di quest'ultimo. Bisogna inoltre ricordare che Federico Comelli, pur non essendo stato uno speleologo nel senso stretto della parola, si dedicò attivamente alla esplorazione delle cavità circostanti il paese di Gargaro. Sebbene queste esplorazioni siano strettamente collegate con lo studio del percorso sotterraneo del Merzlek, dimostrano come quest'uomo, oltre ad essersi dedicato con vero amore a questo tipo di ricerche, abbia precorso i tempi, impegnandosi con criteri rigorosamente scientifici in una disciplina nuova per l'ambiente isontino dell'epoca, anche se per la verità il goriziano Carlo Seppenhofer, suo contemporaneo, aveva già esplorato alcune cavità vicino alla nostra città ed aveva cominciato un'attenta opera di sensibilizzazione presso la cittadinanza.

Ritornando allo studio del Merzlek, il Taramelli aggiunge: - *Secondo ogni probabilità le acque che si perdono nelle fratture del calcare, entrando nella massa di questo a preferenza per quelle numerosissime foibe che appunto si osservano nell'altopiano di Laschik, nel raccogliersi per originare la Merzlek e le fonti che la fronteggiano, si abbassano rapidamente in corrispondenza allo stesso altipiano; epperò il Comelli giudica che "l'andare sottoterra alla ricerca di quelle acque sarebbe uno sprecare tempo, lavoro e quattrini"* (pag. 22). L'autore (il Comelli, n.d.a.) non omise di studiare accuratamente le foibe della valle del Gargaro, così nella loro topografia come per la temperatura delle acque; traendone sicura dimostrazione che da quelle foibe non può essere alimentata la Merzlek, dicui le

Altezze aneroidali e temperature trovate ne' sotterranei di Gargaro.

Piano di campagna.
M. 278 T = 20° R.



O.N.B. L'altezza a-b di m. 11,20 fu misurata a piombo dal margine della foiba.)

acque, sprofondandosi direttamente sotto l'altopiano più a nord-est, non devono però abbassarsi di tanto da raggiungere quell'ambiente di calore che troppo scemerebbe la loro freschezza originaria. - Ed aggiunge: - Ciò non toglie che le osservazioni dell'ingegner Comelli sulla temperatura dell'aria e dell'acqua nelle grotte di Gargaro costituiscono un materiale assai prezioso per la speleologia e per l'idrografia sotterranea e convalidino l'opinione che la Merzlek abbia origini lontane ... -

Tuttavia a Gorizia il pressante problema dell'approvvigionamento d'acqua era particolarmente sentito e lo si riscontra anche in altri scritti di autori vari. Tra questi spicca la singolare figura di un ispettore montanista che propone alcune soluzioni per la cattura delle acque sotterranee del Merzlek, soluzioni giudicate dal Taramelli con scetticismo al punto da dichiarare, sempre interponendo lo studio del Comelli: - ... Tuttavia il parere di una persona (il Comelli, n.d.a.), che aveva studiato con amore e con molta perspicacia la questione dell'approvvigionamento d'acqua per la città di Gorizia, doveva rendere più guardingo il signor Ispettore Montanista Tchebull, che in uno dei suoi rapporti dichiara di conoscere il libro del Comelli, nelle sue assicurazioni all'Amministrazione Civica, la quale desiderosa com'essa è di non tralasciare tentativo per riuscire nella importante impresa, era naturalmente disposta a prestar fede ad una così asservante promessa di trovare, di seguire e di raccogliere l'acqua della Merzlek alla desiderata altitudine. Anche il Comelli, in teoria, ammetteva la possibilità di rintracciare il corso della fonte anche oltre il Gargaro; ma soggiungeva: "Intanto chi vorrebbe arrischiare un tempo ed una somma considerevole dietro tale ricerca? E trovato il Merzlek, nelle sue profondità misteriose, sarà possibile (e con che spesa?) portarlo sopraterra per condurlo in città? (pag. 103)." -

Infine sempre il Taramelli aggiunge, quasi ad eliminare ogni dubbio: - ... Per le ragioni, che verrò esponendo, io poi dubito che esiste in realtà un corso sotterraneo individuato in uno o due rami e che quindi le opere di ricerca, di inseguimento e di cattura proposte dal signor Tchebull siano in opposizione alla più probabile struttura dell'apparato acquifero sotterraneo. -

Nel 1903, un altro goriziano, Giuseppe Bramo riprende l'argomento e pubblica un fascicolo riguardante l'importante problema. Nel suo lavoro l'Autore elenca, tra l'altro, le possibili fonti d'approvvigionamento d'acqua esistenti nel territorio goriziano. È curioso osservare che anch'egli spesso deve rifarsi agli studi eseguiti da Federico Comelli di cui cita, proprio in questa pubblicazione, alcune osservazioni e dati inediti che non sono riuscito a rintracciare da nessun'altra fonte. La cosa è molto evidente nell'elenco delle riserve d'acqua, a disposizione di Gorizia, che Bramo riporta dettagliatamente e che io riassumo brevemente qui di seguito.

LE RISERVE ACQUEE A DISPOSIZIONE DI GORIZIA.

- ... 3. *Acqua del sottosuolo* (qui l'Autore suddivide diversi casi)... Se le circostanze imponessero di dovervi ricorrere ad ogni costo, tenendo conto delle fatte enunciazioni, converrebbe pensare ad un impianto di sottosuolo sito sulla *plaga compresa tra Vipacco e l'Isonzo*, al di là di S. Andrea, mentre un impianto a monte della città arrischierebbe cogliere acque della sottogiacente formazione eocenica, cui allude il Professor Taramelli a pag. 38 del suo opuscolo "Risposte ad alcuni quesiti..." e che suole contenere acqua meno buona per l'uso potabile.
4. *Ad oriente di Gorizia, distanti 20 Km circa, abbiamo le sorgenti di San Paolo, rappresentate da sette polle di varia portata. La principale diede al Sig. Streiz il 16 agosto 1887, 1018 m.c., all'Ing. Comelli il 14 settembre 1887, 2186 m.c. il Signor Streiz ne aveva misurato solo 1578.*
Considerando che l'anno 1887 era d'una siccità eccezionale, mai riscontrata da prima per 53 anni, l'Ingegner Comelli inclinava a ritenere che la portata media delle sorgenti sul finire dell'estate degli anni normali, potrebbe calcolarsi in 2200 m.c. ...
7. *Le sorgenti di Chiapovano. Le polle che scaturiscono a nord di Chiapovano costituiscono le omonime sorgenti. L'Ing. Comelli, che ne misurò la portata, constatò il 27 luglio 1887, 2000 m.c., e fu subito indotto ad esclamare: "la portata non franca la spesa d'una condutture", visto il numero degli abitanti ed i bisogni della città di Gorizia.*
8. *Le sorgenti della valle di Tribussa. L'Ing. Comelli, a pag. 66 e seg. della sua bella ed istruttiva relazione ne enumera 4 di principali, di rendimento incostante, variabile tra 300 e 1600 m.c. giornalieri. ... -*

Sul problema dell'acqua potabile a Gorizia si soffermarono in seguito altri Autori ma sempre con minore incisività, visto che tra l'altro, con l'avvento di nuove metodologie e diverse tecnologie, l'acquedotto venne ugualmente costruito. Resta comunque la validità del lavoro svolto dai primi pionieri dello studio e della ricerca delle acque sotterranee.

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FEDERICO DE COMELLI IN NJEGOVA ŠTUDIJA O OSKRBI GORICE S PITNO VODO

Povzetek

V prejšnjem stoletju so v Gorici sklenili rešiti vprašanje pitne vode s pomočjo vodovoda. Do takrat so dobivali vodo iz številnih vodnjakov, ki pa niso več zadoščali. Pripravljalnih raziskav se je lotil F. De Comelli (1826-1892). Doma je bil iz Gradišca d'Isonzo (Gradišče ob Soči). Po študiju na Dunaju, kjer je dosegel stopnjo inženirja, se je vrnil domov. Priključil se je gibanju za zedinjenje Italije in bil nekaj časa urednik časopisa "Eco dell'Isonzo". V zvezi z izkoriščanjem izvira Mrzlek je raziskoval jame v okolici Grgarja. Kot je razbrati iz študije, je jame raziskoval zelo podrobno. Prav zaradi tega ga štejemo za pionirja speleologije na Goriškem. 1887 je končal študijo, ki je bila tudi kasneje vedno upoštevana (Taramelli 1903). Prišel je do enakih zaključkov, kot tudi številni njegovi nasledniki: zajetje podzemeljske vode iz Mrzleka bi bilo tehnično zahtevno in drago delo. Njegov projekt "Mrzlek" (ta izvir je danes najpomembnejši vir za oskrbo s pitno vodo cele regije) ni bil odklonjen zaradi pomanjkljivih in nepopolnih raziskav, kot piše Boegan, ampak ker so ga šteli za predragega.

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