

Table of Contents

Foreword	V
Organization of the Congress	VI
<i>Keynote and Invited Papers</i>	
Overview of Ground Control Research for Underground Coal Mines in The United States <i>C. Mark</i>	3
Use of the Internet and Information Technology in Mining <i>T. Golosinski</i>	11
Development and Challenges in the Canadian Mining Industry <i>F. Hassan</i>	17
Recent Developments and Future <i>Outlook</i> for Clean Energy <i>from</i> Coal without Combustion <i>T.M. Yegülalp</i>	29
Modern Mining Technology and its Application within RAG Coa) International AG <i>K.F. Jakob</i>	39
Research and Innovations for Continuous Miner's Cutting Head, for Efficient Cutting Process of Rock/Coal <i>A.W. Khair</i>	45
Thin Spray-on Liners for Underground Rock Support <i>D.D. Tannant</i>	57
A Case Study on Safety Factor and Failure Probability of Rock Slopes <i>M.M. Ozbay</i>	69
Application of Remotely Sensed Data and GIS in Assessing the Impact of Mining Activities on the Environment <i>T. Woldai</i>	75
Cyanides in the Environment and Their Long-Term Fate <i>B. Yazar</i>	85
Engineering Education at a Crossroad: An Integrated Approach <i>T. Ertekin</i>	93

Rock Related Accidents, Investigations and Inquiries in South African Mines <i>K.S. Koldaş</i>	105
Open Pit Optimization - Strategies for Improving Economics of Mining Projects Through Mine Planning <i>K Dağdelen</i>	117
Stope Optimiser - A FORTRAN Program to Optimise Stope Boundaries <i>E. Y. Baafi & M Atae-pour</i>	123
Application of Advanced Technologies to Delineate Ground Hazards in Coal Mines <i>K. Banna, D. Conover & D. Neil</i>	133
New Approach to Study Load Transfer Mechanisms of Fully Grouted Bolts <i>N.I. Aza, A. Dey & B. Indraratna</i>	143
Application of Tunnel Boring Machines in Underground Mine Development <i>M. Cigla, S. Yagiz & L. Özdemir</i>	155
In Situ Measurements in a Paste Backfill: Backfill and Rock-Mass Response in the Context of Rock Burst <i>F. Hassam, J. Ouellet & S. Servant</i>	165
Management of Waste in the Mineral Processing In the Baia Mare Area <i>S. Arad, V. Arad, S. Irimie & D. Cosma</i>	177
Linking Long-Term Environmental Liability and Closure: A Necessary Development Towards Walk-Away Closure <i>E.C. Packee Jr. & S. Bandopadhyay</i>	181
Methodology for Estimating the Costs of Treatment of Mine Drainage <i>V. Rajaram, A. Glazer & G. Coghlan</i>	191
Microbial Treatment of Cyanide and Heavy Metals Containing Waste Water from Gold Mining <i>K. Bosecker & P. Blumenroth</i>	203
Mining Engineering Education Using the Internet <i>G.N. Panagiotou, E Tsiavos & T.N. Michalakopoulos</i>	209
Mining and Society: No Mining, No Future <i>P.N. Martens & L. Rattmann</i>	215
Safety and Welfare of Mine Employees in Australian Black Coal Mines <i>K.B. Cram & N.I. Aziz</i>	221
1 <i>Advanced Technology in Mining</i>	
Knowledge Discovery in Mining Truck Condition and Performance Databases <i>I.K. Ataman & T. Golosinski</i>	231
Performance of the Bigger, Faster and Smarter New Generation Electric Mining Shovels <i>L.B. Paterson & M. Özdoğan</i>	237
Assessing Spontaneous Combustion Risk in South African Coal Mines Using a GIS Tool <i>S. Uludağ, H.R. Phillips & H.N. Eroğlu</i>	243

A New Approach to Monitoring in the Advanced Dispatching System for Coal Mines <i>J. Wojciechowski</i>	251
Devices for Breaking and Haulage of Rocks on the Basis of Electromagnetic Motors <i>Ye.K. Yedygenov</i>	259
 2 Rock Engineering & Design	
Stability Analysis and Support Design of Glandroud Coal Mine Tunnel <i>K.G. Goshtasbi & S.F. Dehghan</i>	265
Some Considerations of Highwall Mining Systems in Coal Mines <i>K. Matsui, H Shimada, S. Kramadibraia & M.S. Rai</i>	269
The Stability Assessment of a Large Underground Opening at Great Depth <i>Ö Aydan & T. Kawamoto</i>	277
The Next Atlas Copco Generation of Tunnel-Rigs and Some Experience <i>G. Nord & J Appelgren</i>	289
Evolution of Blasting Practices at the Ekati™ Diamond Mine <i>D.D. Tannant & J. Peterson</i>	297
Evaluation and Analysis of Blasting Procedures for Removing Hard Formations at the South Field Lignite Mine, Ptolemais, Greece <i>Z. Agioutantis, S. Bozinis, G. Panagiotou & C. Kavouridis</i>	305
Increasing the Effectiveness of Blasting in Underground Mines <i>B.Ü. Raskildinov</i>	313
Timing Simulation for the Selection of Optimum Delay Time <i>G.G.U Aidas, H.A. Bilgin & S. Esen</i>	317
An Approach for Selection and Design of Rock Bolting Systems <i>N. Nikolaev, V. Paroushev & S. Nikolaev</i>	323
Temporary (Short-Term) Mining Working Stability <i>H. Sauku, A. Bakiu & V. Jorgji</i>	329
Backfill Practices at Çayeli Mine <i>M Yumlu</i>	333
Critical Dimension Concept in Pillar Stability <i>T. Ünlü</i>	341
Analytical Investigation of Overburden Rock Strata Movement During Monitoring of Rock Massif at Stage of Finishing of Ore Deposit Mining <i>Sh.M. Aitaliyev, T.M Yermekov, R.B. Yun & M.Zh Satov</i>	349
Estimation of Current Condition of Undermined Rock Massif by Deflection of the Earth's Surface <i>T.M, Yermekov, M.Zh. Bilimbayev, M.K. Alipbergenov & M.Zh. Satov</i>	353
The Geometrical and Geomechanical Characteristics of Sublevel Caving <i>V. Arad, S. Arad, G. Cioara & G. Cltpici</i>	357
Going Underground in Quarrying: Technical Perspectives for Marble in Portugal <i>M. Fornaro, C. Oggeri, P. Oreste & D. Valentino</i>	361

Mining and Technical Monitoring at Coal Mines <i>B.V. Vlasenko, VP. Potapov, V.A. Fedorin</i>	369
Impact of Blast Fragmentation on Truck Shovel Fleet Performance <i>M. Doktan</i>	375
Estimation of Current Condition of Undermined Rock Massif with Regard to Thickness of Mining <i>T.M. Yermekov, M.Zh. Bitimbayev, R.B. Yun & M.Th. Satov</i>	381
Drilling for Underground Excavation and Support in Sedimentary Rock <i>G. Nord</i>	387
Yielding Pillar Concept and its Design <i>H. Yavuz</i>	397
Investigation into Relationship Between Cutting Depth and Vibration in Cutting Process <i>Y. Özçelik, S. Kulaksız, I.C. Engin & A.S. Eyüboğlu</i>	405
The Effect of Specimen Volume and Temperature on Shore Hardness <i>R. Altındağ</i>	411
Failure and Failure Theories for Anisotropic Rocks <i>E. Yaşar</i>	417
An Analysis of the Effect of Discontinuity Surface Matching on Shear Strength by Image Processing <i>M. Ünal & B. Ünver</i>	425
Diversity of Electrical Conductivity in a Water-Bearing Rock Material <i>M.K. Gökay & I. Özkan</i>	431
Estimation of Lining Thickness Around Circular Shafts <i>H. Öztürk & E. Ünal</i>	437
New Anchorage Capacity Testing System and Pull-Out Applications in Yemceltek Coal Mine <i>E. Taşel, T.T. Ozan, E. Ünal & M. Bildik</i>	445
Studies in the Relationships between Hardgrove Grindability and Some Rock Index Tests on Cayirhan Coals <i>S. Tiryaki, K. Aiasoy, N.E. Yaştlı, A.S. Eyüboğlu & M.Z. Aydın</i>	451
 3 Mining & Environment	
Assessment of Open Pit Coal Mining Impacts Using Remote Sensing: A Case Study from Turkey <i>T. Tören & E. Ünal</i>	461
Rational Use and Environmental Impacts of Oil Shale Mining in Estonia <i>K. Erg, J. Kann & A. Raukas</i>	467
Soil Fertility in Coal Sterile Dump Assessment in Jiu Valley - Romania <i>M. Georgescu, E. Traista, A. Matei, M. Ionica & C. Temelie</i>	473
Underground Disposal of Hazardous Wastes in German Mines <i>A. Özarslan, P.N. Martens, T. Olbrich & M. Röhrlich</i>	479
Environmental Impacts of Mineral Resource Exploitation and Use <i>M. Kaya</i>	485

Monitoring of Damaged Areas Affected by Mining Activity and Possibilities for Reclamation <i>V. Jorgji, S. Lipo & A. Bakiu</i>	493
Possible Ecological Consequences of Liquidation of Mines of Mirgalimsai Deposit <i>S.A. Kulumbetov, A.D. Bektybayev, B.B. Beisenov & A.A. Bektybayev</i>	497
Acid Mine Drainage at Sarcheshmeh Copper Open Pit Mine <i>5. Karimi Nasab, H. Sahraiee Parizi & M. Saadloo</i>	499
Waste Management Practices at Çayeli Bakır İşletmeleri A.Ş. <i>H. Kayhan, B. Şahin & S. Altunoluk</i>	507
Design Considerations of Heap Leaching at Sarcheshmeh Copper Open Pit Mine <i>5, Karimi Nasab, A. Alashpanjeh & M.R. Mollai Fard</i>	513
 4 Mining Engineering Education	
Upgrading Miners Knowledge through Website Learning on Mining Methods for Improved Safety and Productivity <i>N.I. Aziz, S. Chambers & A.S. Atkins</i>	519
Use of an Integrated Mining Software Package for the Training of Mining Technologists <i>/, Kapageridis & A. Triantafyllou</i>	527
Mining Engineering Postgraduate Education by Distance Learning through the Internet <i>E.C. Marcoulaki, F.A. Batzias, D.K. Sidiras & C.P. Roumpos</i>	533
 5 Natural Resource Management	
Technological and Economic Evolution of Diamond Wire Use in Granite or Similar Stone Quarries <i>R. Mancini, M. Cardu, M. Fornaro & E. Lovera</i>	543
Application of Pit Optimisation Algorithms Beyond Open Pit Limits <i>T. Dinger</i>	549
Present State of Hard Coal Underground Mining in the Czech Republic <i>J. Dvoracek</i>	557
Economic-Environmental Description of the Exploitation Method by Horizontal Slices and Ore Pass in Italian Surface Crushed Stone Quarries <i>M. Cardu, M. Fornaro & I. Sacerdote</i>	561
Evaluation of Single Slice and Twin Face Operations of Cayirhan Lignite Seams <i>Y. Aydın & Y. Kaygusuz</i>	567
Local Sustainable Development in Districts with Current Exploitation of Lignite Fields <i>F.A. Batzias & D.K. Sidiras</i>	575
Technical Efficiency Measurement and Occupational Safety Level. The Case of Greek Lignite Mining <i>I.E. Tsolas</i>	583
The U.K. Coal Industry since Privatisation in 1995 <i>D. W. Dixon-Hardy & I G Ediz</i>	589

Effect of Indicator Kriging on Recoverable Ore Reserves of EI-Gidida Iron Deposit <i>M.Â. Gouda & M.R. Moharam</i>	595
Amsotropy Problem in Geostatistical Simulation by Orthogonal Transformed Indicator Methods <i>Â.E. Tercan & T. Kaynak</i>	603
Geostatistical Simulation of a Quarry <i>M. Kumral</i>	609
Technical and Economic Possibilities of Using Low Temperature Geothermal Sources in Croatia <i>D.Rajkovic, M. Golub & S. Koscak-Kolm</i>	615
Regulation of the Mode of Mining Operations in Open Cast Mining of Steeply Dipping Fields <i>D.G. Bukeikhanov, B.M. Madiyev, S.Zh Galiyev & B.A. Utenbaiyev</i>	621
The History of the Evolution of Salt Working Methods in Romania, from Antiquity to the Present <i>L. Draganescu & S. Draganescu</i>	627
Salt in Turkey <i>M.E. Ertem, V.T. Engin & H.İ. Ertem</i>	635
 <i>6 Computer Applications in Mining & Processing</i>	
Mathematical Modeling of the Roadheader's Cutting Process <i>M. Dolipski, M. Jaszczuk, P.Cheluska & P. Sobota</i>	645
A New Computer Program for Cutting Head Design of Roadheaders and Drum Shearers <i>B. Tiryaki, M Ayhan & OZ Hekimoğlu</i>	655
The Effects of Operational Parameters on the Output Efficiency of the Bucket Wheel Excavator <i>S Ural</i>	663
Simulation of Optimal Control for Mining Drilling Robot <i>E. Pop, M Pop & M Leba</i>	671
Development of a Software Tool for the Prediction of Coal-Blending Efficiency <i>F Pavhudakis & Z Agioutantis</i>	675
Computer Modelling of Geomechanical Processes in Underground Working of Coal Seams <i>B.V. Vlasenko</i>	683
Improving Safety in Open Pit Mines Using RTK - Differential GPS <i>A. Nieto & K. Dağdelen</i>	691
Predicting Horizontal Movement for a Tunnel by Empirical and FE Methods <i>M. Karakuş</i>	697
Evaluation of Slope Stability by Numerical Methods <i>A. Kourdey, M. Alheib, J.-P. Piguet & T Kormi</i>	705
A Mathematical Model of Simple Flotation Circuits <i>L. Samoila, S. Arad & M Marcu</i>	711
Computer Simulation of Truck/Shovel System at Tuncbilek Coal Mine Using GPSS/H <i>N Çetin, K Erarslan & A. Okuducu</i>	715

Optimum Blending of Coal by Linear Programming for the Power Plant at SeyitÖmer Coal Mine <i>K. Erarlan, H. Aykul, H. Akçakoca & N. Çetin</i>	719
7 Process Engineering	
Study of the Flotation Process by Simulation <i>S. Arad, L. Samoila & M. Marcu</i>	725
Perspective Trends in Fine Coal Slimes Flotation <i>Yu.B. Rubinstein, B.I. Linev & E.K. Samoylova</i>	729
Complex Coal Processing of Kazakhstan Deposits <i>N. Zhalgassufy, M.T. Toktamyssov, V.I. Galits, B.M. Mukushev & Z.U. Ergusaev</i>	735
Application of Aeration to Complex Sulphide Ore and its Effects on Circuit Metallurgy <i>B. Aksam & M.N. Mian</i>	737
New Filter Selection, Installation, Commissioning and Operation at CBI Concentrator <i>V. Gökäere & M. Naseem Mian</i>	741
Interaction of Original and Heat-Treated Sepiolites with Quaternary Amines <i>E. Sabah & M.S. Çelik</i>	747
The Application of Colemanite Addition to Floor Tile Glazes <i>A. Yamık, İ. Bentii, C. Karagüzel, M. Çınar & B. Cengiz</i>	753
Productivity of Brown Coal for Briquette Production <i>N. Zhalgassufy, M.T. Toktamyssov, V.I. Galits, B.M. Mukushev & Z.U. Ergusaev</i>	757
A New Microscale Flotation Cell: Combination of Canadian Column and Partridge-Smith Cell <i>A. Özkan & M. Yekeler</i>	759
Concentration Studies on Chromite Tailings by Multi Gravity Separator <i>Ş.G. Özkan & B. İpekoğlu</i>	765
Influence of Coal Face Mechanization on the Properties of Çayırhan Lignite <i>A. Özder & G. Özbayoğlu</i>	769
Application of the Dry Processen Concentration of Boron Ores <i>A. Akçıl & A. Akar</i>	775
8 Health & Safety	
An Outline of a Hybrid Intelligent System for Mine Safety Analysis <i>N.M. Lilic, I.M. Obraclovic & F. Vukovic</i>	781
New Acoustic Anemometers for the Mining Industry <i>S.Z. Shkundin & V. V. Stuchilin</i>	787
Opportunities of Improving the Microclimate in Underground Mines by Heat- and Hydro-Isolation <i>V. Bojilov, K. Petrov & T. Slaikovski</i>	793
Managing the Impact of HIV/AIDS on African Mining <i>R.T. Elias</i>	799

Development of a Portable Coal Seam Gas Analyser <i>M.S. Kizii, A.D.S. Gillies & H.W.Wu</i>	807
9 <i>Practical Solutions to Mining Problems</i>	
Designing a Fullback Dragline Panel for Dipping Coal Seam Conditions <i>Z. Duran & B. Erdem</i>	817
Visual Aspect of Mine Valuation; A Case Study <i>K. Erarslari</i>	825
Draw Control Optimisation in the Context of Production Scheduling <i>M.L. Smith & D. Rahal</i>	831
High Technologies of the Underground Extraction of Kazakhstan Fields <i>A.Sh. Altayev, ht.Zh. Bitimbayev & E.I. Zhumabayev</i>	839
The Assessment of Salt Production Drilling <i>A Ersoy & TY Yünsel</i>	843
Ore Deposits Mining with Goaf Stowing in Kazakhstan <i>V Muzgina</i>	851
The Effect of Design Peculiarities of Elastic Liner on Durability of Rope and Liner <i>KP. Franchuk & V. V. Franchuk</i>	855
Technique of No-Pillar Production and Repeated Development of Mineral Deposits with Ice-Rock Laying of Worked-Out Space <i>N Zhalgassuly, M. T Toktamysov, V.I. Gahts, B M. Mukushev & ZV. Ergusaev</i>	859
Çayeli Underground Cu-Zn Mine <i>M Yumlu</i>	861
A Mine-Site Laboratory from Exploration to Closure: A Case Study <i>H. Babacan</i>	869
Author Index	875