

First Symposium on Salt

Cleveland, Ohio

May 1962

These papers that were presented at the "Symposium on Salt" sponsored by the Northern Ohio Geological Society at its May, 1962, meeting held in Cleveland, Ohio. The subject of this symposium was particularly timely in view of the significant recent advances that have been directed not only at developing and characterizing new processes, but also at a fundamental understanding of salt and salt deposits. This was the first symposium on salt ever held within the United States of America and differed markedly from other meetings in that it extended beyond the industrial and commercial areas. Five major areas of salt technology were embraced – geology of evaporates, mining, evaporated salt, solution mining, and underground storage. For the above reasons, this symposium developed into one of national interest and scope, and was attended by over 380 geologists, miners, briners, and other technical personnel, from 28 states, Mexico, England and four Provinces of Canada.

We thank NOGS, the editors -- A.C. Bersticker, K.E. Hoekstra and J.F. Hall -- and the other members of the Publication's Committee, Mr. D.R. Richner, Dr. J.A. Cain and Mr. T.H. Hawisher, for their enormous and successful efforts. Special appreciation, as well, is due the Ferro Corporation, Diamond Alkali Company, Western Reserve University, and Kent State University for their support in all phases of this work.

TABLE OF CONTENTS

SECTION I – GEOLOGY

Origin of Salt Deposits (pdf 341.50 kB) by K.K. Landes

Silurian Salt of New York State (pdf 294.52 kB) by Wm. Lynn Kreidler

Stratigraphy of Cayugan Series in Northwestern Pennsylvania (pdf 394.72 kB) by Addison S. Cate

Distribution of Salt in Ohio (pdf 140.38 kB) by John F. Hall

Evaporate Facies in Northwestern Ohio (pdf 498.60 kB) by F. G. Stehli, J.N. Namy and M.D. Aten

Clay Mineral Composition of the Evaporite Sequences (pdf 355.80 kB) by J. Droste

Deposition of Evaporites in the Michigan Basin (pdf 36.18 kB) by L.I. Briggs (Abstract only)

Clay Mineralogy of the Salina Formation, Detroit, Michigan (pdf 231.45 kB) by R. W. Lounsbury

Effects of Solution of Bedrock Salt in the Earth's Crust (pdf 477.87 kB) by Kenneth K. Landes

Environment and Mechanics of Deposition of the Permian Hutchinson Salt Member of the Wellington Shale (pdf 440.02 kB) by L. F. Dellwig

Chemistry of Brine Inclusions in Permian Salt from Hutchinson, Kansas (pdf 339.92 kB) by W.T. Holser

Fossil Content of Salt and Association Evaporites (pdf 311.75 kB) by Paul Tasch

Geology of Gulf Coast Salt Domes (pdf 38.40 kB) by G.E. Murray (Abstract only)

Structure of Salt in Gulf Coast Domes (pdf 788.72 kB) by D.H. Kupfer

Permian Salt Deposits of West Texas and Eastern New Mexico (pdf 251.12 kB) by John Emery Adams

Salt Anticlines of the Paradox Basin, Colorado and Utah (pdf 621.27 kB) by D.P. Elston and E.M. Shoemaker

Salt Deposits of the Williston Basin – United States Portion (pdf 666.49 kB) by H.E. Reed

Virgin Valley Salt Deposits, Clark County, Nevada (pdf 325.18 kB) by L.E. Mannion

Eocene Salt in the Green River Basin, Wyoming (pdf 585.88 kB) by D.L. Deardorff

Salt Deposits in Desert Basins of the Western United States (pdf 34.88 kB) by W. Smith (Abstract only)

Salt Deposits in Canada (pdf 1.51 MB) by W.J. Pearson

Geochemistry of Bromine in Some Salt Rocks of the Prairie Evaporite Formation of Saskatchewan (pdf 280.01 kB) by W. Schwerdtner and N.S. Wardlaw

Analysis of Small Amounts of Bromides in Presence of Large Amounts Of Chlorides (pdf 64.28 kB) by W. Schwerdtner

Petrofabric Analyses of Some Anhydrite Rocks (pdf 502.16 kB) by W. Schwerdtner

Salt Deposits of the Isthmus of Tehuantepec (pdf 586.94 kB) by Manuel Castillon and J.P. Larios

World Salt Resources (pdf 26.81 kB) by S.J. Lefond (Abstract only)

Some Early Geological and Production Problems in the Industry Beginning 100 Years Ago (pdf 234.70 kB) by Paul Weaver

SECTION II – MINING, EVAPORATED SALT

Use of Protective Coating in Salt Mine and Plant (pdf 300.07 kB) by Kenneth Tator

Field Application of Protective Coating Systems (pdf 192.77 kB) by Charles M. Simpson

Materials of Construction for Salt Mine and Plant (pdf 312.16 kB) by W.Z. Friend

Corrosion-Resistant Aluminum for the Salt Industry (pdf 465.29 kB) by Thomas A. Lowe

Underground Electrical Distribution at Morton's Fairport Mine (pdf 491.96 kB) by Fred Geisheimer

Rotary Drilling of Large Diameter Vertical Holes (pdf 389.36 kB) by J.W. Bawcom

Development of Continuous Boring Machines for Salt and Potash Underground Mining (pdf 305.85 kB) by C.E. McWhorter

Koepe Versus Drum Hoisting (pdf 207.13 kB) by James R. Gronseth

Exploration by Horizontal Drilling at Avery Island, Louisiana (pdf 345.22 kB) by Wm. Walden and C.H. Jacoby

Electrical Resistivity Surveys in Salt Mines (pdf 354.50 kB) by LeRoy Scharon

Dome Mining: Floor vs. Roof Extraction (pdf 287.66 kB) by Nicholas J. Nicola

Bagging Salt at the Fairport Mine (pdf 47.27 kB) by Robert R. Ryland (Abstract only)

Compaction of Fine Salts and Chemicals (pdf 29.52 kB) by G.J. Jennrich (Abstract only)

Developing Ammonium Nitrate-Fuel Oil Blasting at International Salt Company (pdf 181.20 kB) by L.P. Bush

Ammonium Nitrate and its Application Underground (pdf 249.05 kB) by R.H. Hopler and R. J. Shiel

Storage of Radioactive Waste in Mine Cavities (pdf 37.39 kB) by E. G. Struxness (Abstract only)

Storage Operations in a Salt Mine (pdf 189.56 kB) by J.H. Schul

The International Recrystallizer Process (pdf 360.25 kB) by Laurence J. Theilgard

Fluidized Drying and Cooling of Granulated Salt (pdf 257.24 kB) by P.V. Imes and C.W. Jobes

Automation of Vacuum Pans and Filters (pdf 178.24 kB) by E.H. Atkins

Compaction and Flow of Evaporated Salt from Bins and Hoppers (pdf 498.13 kB) by B.F. Dentel

Washing of Strip-Mined Rock and Solar Salt (pdf 747.49 kB) by A. Woodhill

SECTION III - - SOLUTION MINING, UNDERGROUND STORAGE

Significant Uncertainties in Current Salt Solution Extraction Operations (pdf 741.43 kB) by C.A. Bays

Dow Canada Brine Field at Sarnia, Ontario (pdf 393.08 kB) by J.F. Gilbert

The Canadian Brine Limited Brine Field at Windsor (pdf 327.20 kB) , Ontario by J.D. Mair

International Salt Brine Field at Watkins Glen, New York (pdf 403.15 kB) by Charles H. Jacoby

Offset Brine Wells by Directional Drilling (pdf 637.61 kB) by G.B. French

Salt Solution Mining by Pittsburgh Plate Glass Company at Natrium, W. VA (pdf 253.82 kB) by C.A. Giese

Diamond Alkali Brine Field at Mont Belvieu, Texas (pdf 273.88 kB) by M.L. Moore

Sonar Measurements of Brine Cavity Shapes (pdf 326.33 kB) by A.J. Myers

Well Construction; Possible Causes of Failure and Remedial Measures (pdf 341.96 kB) by J.K. Henderson

Cathodic Protection of Well Casing (pdf 705.85 kB) by Y.W. Titterington (Abstract only)

Use of Salt Solution Cavities for Underground Storage (pdf 686.42 kB) by C.A. Bays

Ethylene Storage Near Midland, Michigan (pdf 534.97 kB) by C.W. Querio and R.R. Hultin

Southeastern Michigan Gas Company's High Pressure Gas Holder in a Salt Strata (pdf 235.82 kB) by T.B. Vance

Storage of High Pressure Natural Gas in Underground Salt or Rock Caverns (pdf 179.17 kB) by H.L. Gentry

Operation and Maintenance of Underground Storage (pdf 217.10 kB) by S.G. Branyan

Salt Cavern Storage of LPG at Lowell, Michigan, and Hutchinson, Kansas (pdf 226.26 kB) by Richard D. Crow

Solution Cavern LPG Storage – Instrumentation for Remote Operation and Supervision (pdf 535.07 kB) by S. Kurtis

Design Development of Underground Storage Caverns at Texas Eastern's Mont Belvieu, Texas, Terminal (pdf 924.01 kB) by D.J. Cozad