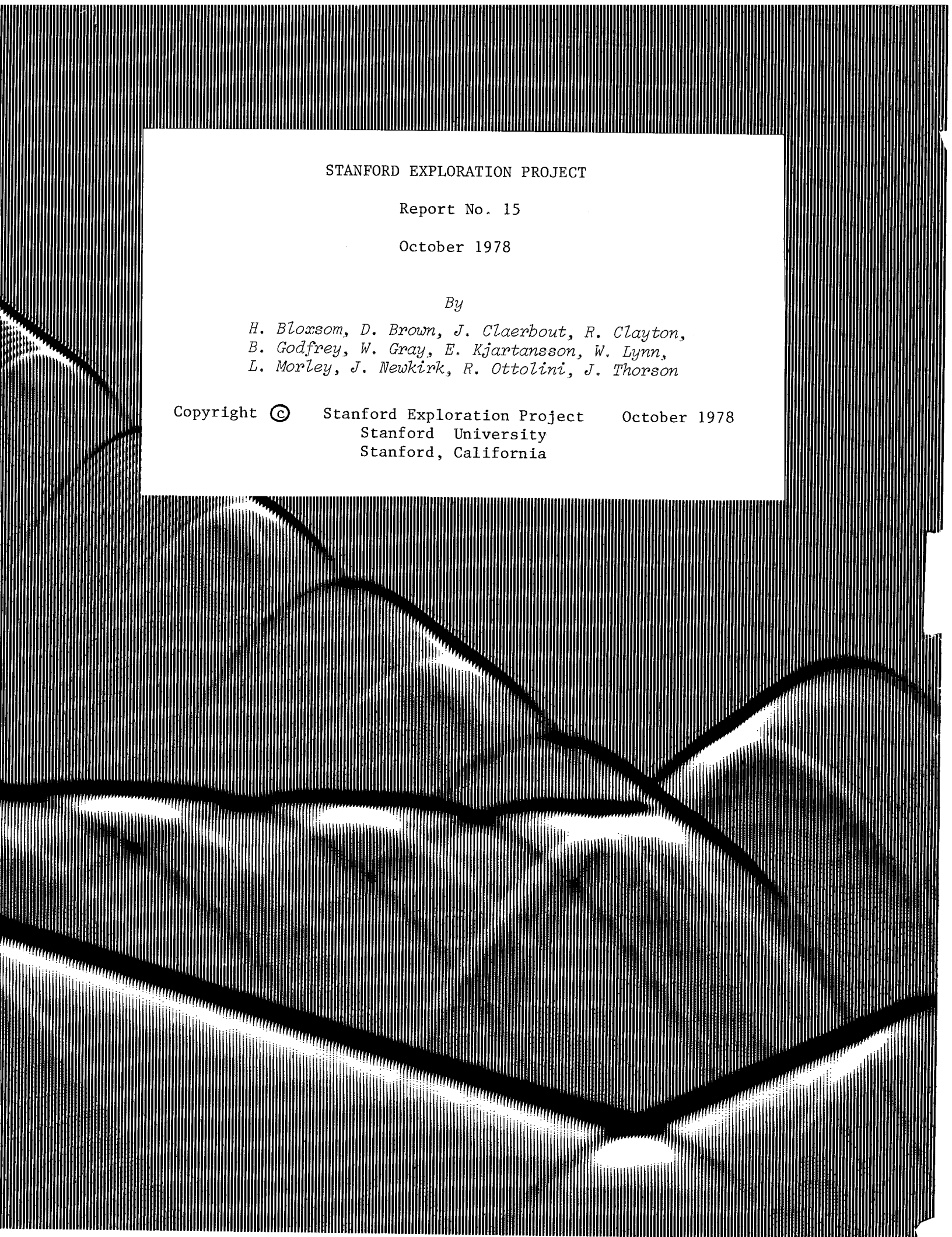

STANFORD EXPLORATION PROJECT

Report No. 15

October 1978

By

H. Bloxsom, D. Brown, J. Claerbout, R. Clayton,
B. Godfrey, W. Gray, E. Kjartansson, W. Lynn,
L. Morley, J. Newkirk, R. Ottolini, J. Thorson

Copyright © Stanford Exploration Project October 1978
Stanford University
Stanford, California

Copying permitted for all internal purposes
of the Sponsors of the Stanford Exploration Project

Produced by Jo Ann Heydron

CONTENTS

Migration and Lateral Velocity Variation — Page

KJARTANSSON, E., Modeling and Migration with the Monochromatic Wave Equation -- Variable Velocity and Attenuation..... 1

BLOXSOM, H. and E. KJARTANSSON, Steeply Faulted Regions, Artifacts, and Stability in the 45-Degree ω-Finite Difference Algorithm..... 21

LYNN, W., A Stable Lateral Velocity Estimation Scheme..... 39

Common Midpoint Data Analysis

CLAERBOUT, J. F., Snell Waves..... 57

CLAERBOUT, J. F., The Double Square Root Equation..... 73

CLAERBOUT, J. F., Short Review of Retarded Snell Midpoint Coordinates..... 81

CLAERBOUT, J. F., Slant Stack Migration and Velocity Analysis: Equations for Programs..... 89

OTTOLINI, R., Migration of Slant-Midpoint Stacks: Field Data Example..... 97

Deconvolution

CLAERBOUT, J. F., Minimum Information Deconvolution..... 109

GRAY, W., A Theory for Variable Norm Deconvolution..... 123

GODFREY, B., An Information Theory Approach to Deconvolution..... 157

GRAY, W., Variable Norm Exponential Gain Estimation..... 183

MORLEY, L. and J. F. CLAERBOUT, Wave Equation Deconvolved Time Sections... 191

Fundamental Theory

BROWN, D., Causal Positive Real Operators..... 203

BROWN, D., Splitting and Separation of Differential Equations with Applications to Three-Dimensional Migration and Lateral Velocity Variation..... 214

CLAYTON, R. and J. F. CLAERBOUT, An Exact Factorization of the Elastic Wave Equation..... 233

Applications

CLAYTON, R., Two-Dimensional Fourier Transforms without Transposing..... 247

BLOXSOM, H. and R. OTTOLINI, Applications and Comparisons of the Frequency Domain and the Finite Difference Migration Algorithms..... 251

DUT, JAN P., Subjective Comparison of Migration Methods..... 273

THORSON, J., A Complex Tridiagonal Matrix Solver..... 275

OTTOLINI, R. and J. NEWKIRK, An Array Processor Progress Report..... 283

Research Personnel..... 285

List of Sponsors, 1977-1978..... 288