

A VERTICAL MAGNETOMETER SURVEY
IN A SEISMIC ZONE

By

Feng-Keng Chang, B. Sc.

A Thesis Presented to the Faculty of the Graduate School
of Saint Louis University in Partial Fulfillment
of the Requirements for the Degree of
Master of Science (Research)

1957

TABLE OF CONTENTS

	<i>Page</i>
LIST OF TABLES	iv
LIST OF ILLUSTRATIONS	v
Chapter	
I. INTRODUCTION	1
Background of the Problem	1
Statement of the Problem	5
Location and Description of the Area	7
Method of Attack	7
Acknowledgments	9
II. GENERAL GEOLOGY OF THE AREA	10
Surface Geology	10
Structural Geology	12
1. Waterloo Anticline	12
2. Columbia Syncline	14
3. Valmeyer Anticline	14
4. Maeystown Syncline	15
5. Anticlinal Areas near Renault	15
Stratigraphy	17
Seismicity Aspects	24
III. THE MAGNETIC SURVEY	26
The Magnetic Instrument	26
Sensitivity of the Instrument	29
Magnetometer Corrections	32
Base Stations	36
Field Procedure	37
Reduction of Data	39
IV. THE TECHNIQUES OF INTERPRETATION	46
Qualitative Analysis	46
Quantitative Analysis	47
1. The Buried Magnetic Bodies as Simple Poles	48
2. Extended Sources	49
3. Second Derivative Method	50