

# PREFACE

These algebras determine, by the Wedderburn Theorem, the semi-simple finite dimensional algebras over a field. They lead to the definition of the Brauer group and to certain geometric objects, the Brauer-Severi varieties.

We shall be interested in these algebras which have an involution. Algebras with involution arose first in the study of the so-called “multiplication algebras of Riemann matrices”. Albert undertook their study at the behest of Lefschetz. He solved the problem of determining these algebras. The problem has an algebraic part and an arithmetic part which can be solved only by determining the finite dimensional simple algebras over an algebraic number field. We are not going to consider the arithmetic part but will be interested only in the algebraic part. In Albert’s classical book (1939), both parts are treated. A quick survey of our Table of Contents will indicate the scope of the present volume.

The largest part of our book is the fifth chapter which deals with involutorial simple algebras of finite dimension over a field.

Of particular interest are the Jordan algebras determined by these algebras with involution. Their structure is determined and two important concepts of these algebras with involution are the universal enveloping algebras and the reduced norm. Of great importance is the concept of isotopy. There are numerous applications of these concepts, some of which are quite old.

In preparing this volume we have been assisted by our friends, notably Jean-Pierre Tignol and John Faulkner. Also, I am greatly indebted to my secretary, Donna Belli, and to my wife, Florie. I wish to thank all of them for their help.



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