

Preface

This book is intended for my colleagues in the humanistic and natural sciences who share my interest in the search for extraterrestrial intelligence (SETI). It is about the role mathematics might play in this endeavor. Since I am writing for a wide audience, an audience of people with very diverse backgrounds, I have focused on ideas and avoided mathematical symbolism and technical jargon. No prior knowledge of mathematics is assumed and, since this subject may be new to many of my readers, I also present the history of, and the science behind, this search. My goal is to stimulate a discussion, among scientists interested in this area, of the ideas presented here.

Many contend that a great deal of our mathematics would be understandable, even familiar, to the members of any technologically sophisticated race—the only kind of society our current methods of searching will enable us to find. I examine this contention in detail. The astronomical environment of our planet, in particular our large moon, human evolutionary history, and our reliance on the sense of sight, have all influenced our mathematics. The subject is very much a part of our humanity, somewhat like our music and art. But mathematics has a way of becoming useful either as a model for some aspect of reality or in solving practical problems, and it can be more easily communicated to another, distant, society. I have tried to show that, in doing so, we say quite a lot about ourselves.

The early workers in SETI were concerned with the technical problems of sending and receiving radio signals across inter-stellar distances. Slowly, however, the deeper

questions inherent in this endeavor rose to prominence: questions about the possible nature of extraterrestrial intelligence, the nature of language, and the philosophical/psychological motivation for this search.

In recent years these questions have attracted scholars from a remarkably wide variety of disciplines. Several recent books¹ contain articles written by philosophers, psychologists, anthropologists, archaeologists, artists, and religious scholars. These scholars bring valuable insight into the many deep problems posed by SETI. As we broaden the scope of our discussions, however, it is important to remember the realities of this endeavor. Our method of searching, the radio telescope, restricts the kind of society we might contact to those capable of sending electro-magnetic signals over inter-stellar distances (yes, some search for optical signals, others for evidence of alien technology, but communication, if it occurs, will be by some form of electro-magnetic radiation). Thus the early insights of astronomers, physicists, and mathematicians are still relevant and provide a framework for ongoing research. In this book I try to bring the early work to the attention of those new to the field. Also, at the end of each chapter I have a section labeled “remark.” Here I present some aspect of mathematics that, I think, might illuminate the ongoing discussion.

Anyone who expresses an interest in SETI is, sooner or later, confronted by someone, sometimes a very belligerent someone, who claims the subject is inane and pointless. As “proof” such people will relate stories of UFO (unidentified flying object) sightings that, they claim, show that aliens exist and visit us often. This can be very disconcerting, especially if it happens when one is giving a public lecture. But some familiarity with the major incidents shows such people and anyone else listening that you are neither ignorant of, nor afraid to face, these “facts”—just not impressed by them.

Unfortunately, in the minds of many, SETI and UFOs are related. This is not so, and I think the best way to demonstrate this is to present some of the evidence for UFO visitation; this evidence is essentially just a collection of stories. The reader is invited to reach his or her own conclusions as to whether or not these stories are evidence of extra-terrestrial visitation. Personally I am a skeptic. More precisely, I don't believe that those who say UFOs are alien spaceships have proven their case. The reasons for my skepticism are presented throughout the book, most explicitly in Chapter 9.

At this time I would like to thank Dr. Harry Lataw, Jr. who read an early version of this book and made many helpful suggestions. I owe a great debt to Dr. Al Harrison who went over the manuscript chapter by chapter and gave me many insightful comments, and to Christina Carbone, of the computer support staff at the University of Arizona, who was always helpful in answering my technical questions. Finally, I must thank my wife Marilyn for her encouragement and patience during this rather lengthy and often arduous project.

Note

1. *Archaeology, Anthropology, and Interstellar Communication* will appear in the NASA history series. *Between Worlds*, which will be published by M.I.T. press. *Communication with Extraterrestrial Intelligence* was published by SUNY Press, and *Civilizations Beyond Earth* was published by Berghahn Books.