CONTENTS

- 1 ON CLIMATE AND LIFE. Harlow Shapley, Harvard University 1
- 2 CLIMATE AND RACE. Carleton S. Coon, University of Pennsylvania 13
- 3 CLIMATE AND CIVILIZATION. Paul B. Sears, Yale University 35
- 4 ATMOSPHERIC AND OCEANIC CIRCULATION AS FACTORS IN GLACIAL-INTERGLACIAL CHANGES OF CLIMATE. Hurd C. Willett, Massachusetts Institute of Technology 51
- 5 RADIATION BALANCE OF THE EARTH AS A FACTOR IN CLI-MATIC CHANGE. H. Wexler, U. S. Weather Bureau, Washington, D. C. 73
- 6 THE INSUFFICIENCY OF GEOGRAPHICAL CAUSES OF CLI-MATIC CHANGE. John Wolbach, Harvard University 107
- 7 ON THE CAUSES OF THE ICE AGES. Donald H. Menzel, Harvard University 117
- 8 SOLAR VARIATION AS AN EXPLANATION OF CLIMATE CHANGE. Barbara Bell. Harvard University 123
- 9 INTERNAL CONSTITUTION OF THE SUN AND CLIMATIC CHANGES. P. L. Bhatnagar, Harvard University 137
- 10 INTERSTELLAR MATTER AND THE SOLAR CONSTANT. Max Krook, Harvard University 143
- 11 THE ASTRONOMICAL THEORY OF CLIMATE CHANGES. A. J. J. van Woerkom, Yale University 147
- 12 THE POLAR MOTION AND CHANGES IN THE EARTH'S ORBIT.

 Dirk Brouwer, Yale University 159

xii CONTENTS

13 EVIDENCE FROM GLACIAL GEOLOGY AS TO CLIMATIC VARIATIONS. Richard Foster Flint, Yale University 165

- 14 GEOLOGIC EVIDENCE OF LATE PLEISTOCENE CLIMATES.

 A Review of a Paper by Büdel on the Climate of Europe during the Würm Stage. John T. Hack, United States Geological Survey 179
- 15 PEDOGENIC CRITERIA OF CLIMATIC CHANGES. C. C. Nikiforoff, U. S. Department of Agriculture 189
- 16 CLIMATIC CHANGES AND RADIOISOTOPE DATING. J. Laurence Kulp, Lamont Geological Observatory 201
- 17 TREE-RING EVIDENCE FOR CLIMATIC CHANGES. Edmund Schulman, University of Arizona 209
- 18 CLIMATIC CHANGES AS INTERPRETED FROM METEORO-LOGICAL DATA. John H. Conover, Harvard University 221
- 19 CLIMATIC CHANGES OR CYCLES? Victor Conrad, Harvard University 231
- 20 EVIDENCE OF CLIMATIC CHANGE IN THE GEOLOGIC RECORD OF PLANT LIFE. Elso S. Barghoorn, Harvard University 235
- 21 THE RECORD OF CLIMATIC CHANGES AS REVEALED BY VERTEBRATE PALEONTOLOGY. Edwin H. Colbert, The American Museum of Natural History and Columbia University 249
- 22 PALEOLIMNOLOGY AND CLIMATE. Edward S. Deevey, Jr., Yale University 273

CLIMATIC CHANGE