

# Table of Contents

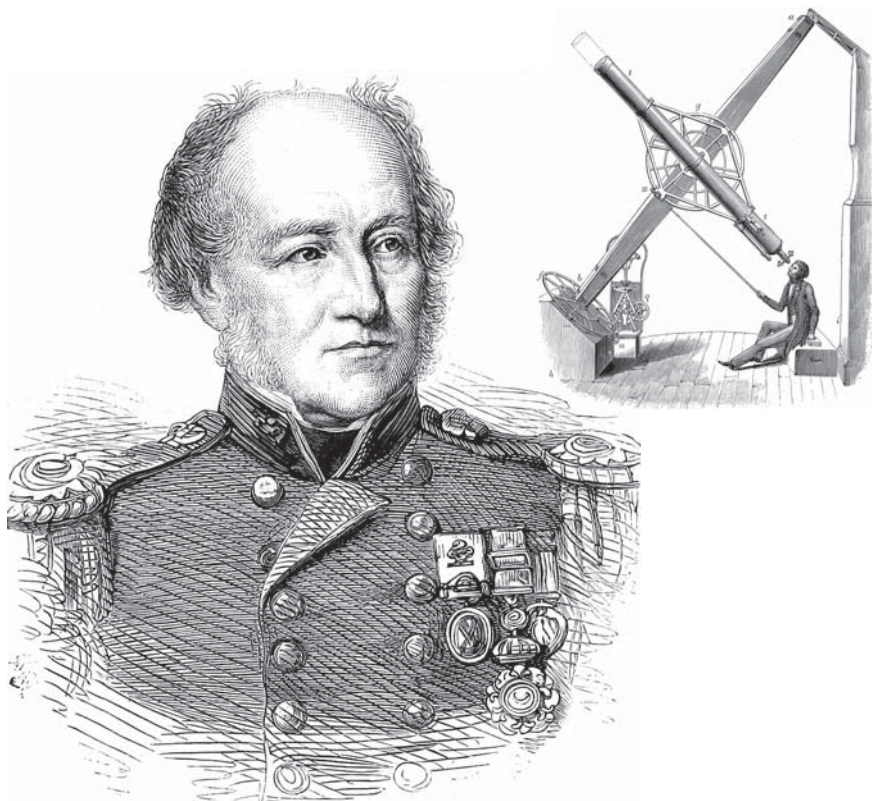
<b>Introduction</b> . . . . .	<b>vii</b>
<b>Acknowledgments</b> . . . . .	<b>xi</b>
<b>Centaurus</b> . . . . .	<b>1</b>
Notable Stars in Centaurus . . . . .	10
Rigil Kentaurus, Alpha ( $\alpha$ ) Centauri . . . . .	10
Observational History . . . . .	13
The Rigil Kentaurus (Alpha Centauri) System . . . . .	17
Motion toward the Sun . . . . .	22
The Purported Planet Orbiting Alpha Centauri B . . . . .	23
A Sample of Exoplanets in Centaurus . . . . .	26
The Not-so-purported Planet Orbiting Proxima Centauri . . . . .	27
Alpha Centauri's End Game . . . . .	29
A Neighboring Supernova . . . . .	30
Hadar, Beta ( $\beta$ ) Centauri . . . . .	30
Muhlifain, Gamma ( $\gamma$ ) Centauri . . . . .	34
Delta ( $\delta$ ) Centauri . . . . .	37
Epsilon ( $\epsilon$ ) Centauri . . . . .	39
Omega ( $\omega$ ) Centauri . . . . .	40
R Centauri . . . . .	40
T Centauri . . . . .	43
Galactic Objects . . . . .	47
Scorpius-Centaurus Association . . . . .	47
Sco OB2 Supernovae . . . . .	53
NGC 5367 . . . . .	57
NGC 3918 . . . . .	61
NGC 5617 (with Pismis 19, NGC 5662, and NGC 5460) . . . . .	65
NGC 5139 . . . . .	68
Overview of Observational History . . . . .	72
Omega Centauri's Anomalous Traits . . . . .	74
Evidence for and against a Central Black Hole . . . . .	77
The Orbit of Omega Centauri . . . . .	79
NGC 5286 . . . . .	81
Extragalactic Objects . . . . .	85
NGC 5253 . . . . .	85
Early Investigations . . . . .	89
A Starburst Galaxy in the Neighborhood . . . . .	93
NGC 5102 . . . . .	98
NGC 5128 . . . . .	106
Early Astronomical Observations . . . . .	111

Radio Lobes, Jet, and Active Nucleus . . . . .	117
The Return of the Merger Scenario . . . . .	123
Globular Cluster Population . . . . .	125
NGC 5128/Centaurus A Today: An Overview . . . . .	133
NGC 4945 . . . . .	139
The Centaurus Cluster of Galaxies . . . . .	146
NGC 4696 . . . . .	146
Looking toward Centaurus through the Milky Way . . . . .	151
Looking through Centaurus: The Extragalactic View . . . . .	152
<b>Cepheus . . . . .</b>	<b>155</b>
Notable Stars in Cepheus . . . . .	159
Alderamin, Alpha ( $\alpha$ ) Cephei . . . . .	159
Alfirk, Beta ( $\beta$ ) Cephei . . . . .	162
Errai, Gamma ( $\gamma$ ) Cephei . . . . .	163
Delta ( $\delta$ ) Cephei . . . . .	165
Epsilon ( $\epsilon$ ) Cephei . . . . .	176
Mu ( $\mu$ ) Cephei . . . . .	179
The Purkinje Effect: Seeing Red . . . . .	189
Xi ( $\xi$ ) Cephei . . . . .	191
Krüger 60AB . . . . .	192
S Cephei . . . . .	195
U Cephei . . . . .	200
EE Cephei . . . . .	205
VV Cephei . . . . .	209
$\Sigma$ 2816 . . . . .	212
Galactic Objects . . . . .	212
NGC 7023 . . . . .	212
NGC 7160 . . . . .	221
IC 1396 . . . . .	224
NGC 7380, Sh 2-155, and NGC 7822 . . . . .	236
NGC 7538 and NGC 7510 . . . . .	242
NGC 188 . . . . .	244
NGC 40 . . . . .	251
Extragalactic Objects . . . . .	257
NGC 6951 . . . . .	257
NGC 2300 and NGC 2276 . . . . .	263
NGC 6946 . . . . .	268
Looking toward Cepheus through the Milky Way . . . . .	278
Looking through Cepheus: The Extragalactic View . . . . .	279
<b>Cetus . . . . .</b>	<b>281</b>
Notable Stars in Cetus . . . . .	288
Menkar, Alpha ( $\alpha$ ) Ceti . . . . .	288
Deneb Kaitos, Beta ( $\beta$ ) Ceti . . . . .	291

*TABLE OF CONTENTS*

v

Gamma ( $\gamma$ ) Ceti .....	293
Mira, Omicron ( $\omicron$ ) Ceti .....	295
Discovery .....	297
Mira Stars in General .....	302
Mira in Particular .....	303
Mira's Environment .....	305
The Companion .....	308
Tau ( $\tau$ ) Ceti .....	310
Reflections on Project Ozma .....	316
Luyten 726-8 .....	327
A Sample of Exoplanets in Cetus .....	330
Galactic Objects .....	332
NGC 246 .....	332
NGC 7826 .....	338
Extragalactic Objects .....	339
IC 1613 .....	339
NGC 247 .....	342
NGC 45 .....	347
NGC 1055 .....	353
M77 .....	355
Isaac Roberts and the Dawn of Modern Astrophotography .....	367
NGC 908 .....	376
NGC 157 .....	378
<b>Figure Acknowledgments .....</b>	<b>387</b>
<b>Index .....</b>	<b>395</b>



**Dedicated to Admiral William Henry Smyth (1788–1865).** He pursued a long career with the Royal Navy, earning the rank of Vice Admiral after his retirement in 1846. In 1825, he established a private observatory in Bedford, England, equipped with a 5.9-inch refractor (upper right), where he vigorously made astronomical observations for the next 14 years. He published his observing notes in 1844 in *Cycle of Celestial Objects* and its most famous second volume, *The Bedford Catalogue*. In addition to his astronomical work, Smyth studied, translated, and published works on diverse topics including naval history, antiquarian artifacts, numismatics, geography, and travel. His obituary in the *Monthly Notices of the Royal Astronomical Society* observed: “As President of the Astronomical Club, he was always genial & courteous, ever keeping things in happy order, and by his ready wit and flow of humour compelling the maintenance of good fellowship.” Portrait credit Smyth’s obituary in the *Illustrated London News*, 1865; telescope image is from *A Handbook of Descriptive and Practical Astronomy Volume 2* (1892), by George Chambers.