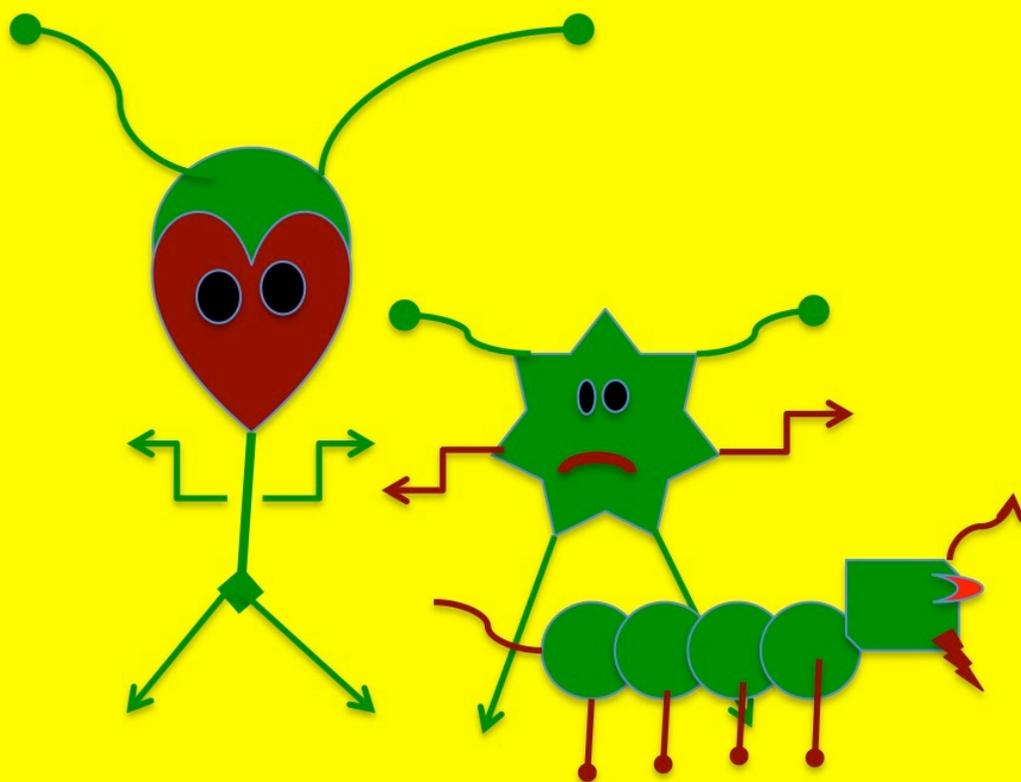
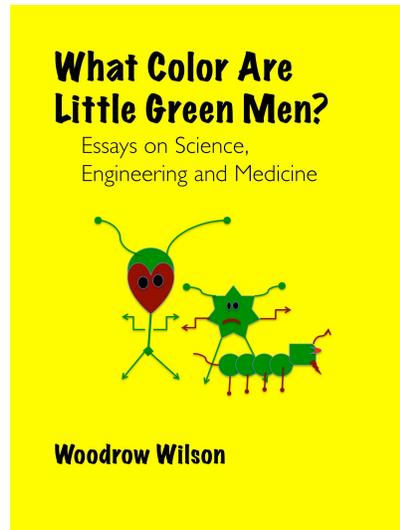


What Color Are Little Green Men?

Essays on Science,
Engineering and Medicine



Woodrow Wilson



The sky is teeming with life. Why hasn't anyone visited earth yet? What will they look like if they do come? How will we communicate with them?

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Reflections of a rocket scientist. Essays on science, engineering and medicine—accessible to young adults, but meant for everyone.

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ALSO BY WOODROW WILSON

THE CHAMPAGNE TASTE/BEER BUDGET COOKBOOK

DEAD ASTRONAUTS

THE UTAH FLU

CHAMPAGNE BRUNCH

FISH STORY

This book is dedicated to my sister
Donna Shammass
She urged me to write for her grandchildren.
I took so long they grew into this.

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GLOSSARY

About the Author

Woodrow Wilson is retired rocket scientist, a retired Toastmaster executive and a relapsed workaholic. His interests are eclectic. He has addressed scientific meetings in Russia, in Germany, and throughout North America. As a Distinguished Toastmaster, he addresses general audiences on technical and historical topics. His professional experience creates credible bases for his science fact as well as his science fiction writing.

Wilson is a Caltech PhD with more than thirty years experience in research and development for the military and intelligence communities. He has explored space and other exotic environments in the laboratory and in the computer. He contributed to the design and testing of space-based and ground-based anti-ballistic missile defenses. He has studied chemistry at 10,000°F, 30,000 mph collisions, plus fires and explosions in zero gravity. Wilson's work in military applications of space put the science in his hard science fiction work **Dead Astronauts**

He has contributed to US government agency programs for the detection and destruction of weapons of mass destruction. His work included consulting to the Army and Air Force Medical Research Commands on medical defense against chemical and biological warfare agents. That work put the science in his medical mystery **The Utah Flu**

Wilson has carried his wide-ranging curiosity about science and medicine into retirement. His vivid imagination and his interest in the ocean led to **Fish Story**, a science fiction novel about people kept by dolphins. His weekly Mad Scientist eZine <http://www.woodrow-wilson.com/MS.htm> spans topics of interest to him. Many of his articles from that publication are presented in this collection.

He is also an experienced cook and the author of two cookbooks plus a weekly food column. He brings his creativity out of the lab and into the kitchen. There he reverse engineers traditional dishes and creates new taste sensations. His **The Champagne Taste/Beer Budget Cookbook** offers restaurant quality meals without quality restaurant prices. His **Champagne Brunch** eBook is available free to subscribers to his Food 4 Thought eZine <http://www.woodrow-wilson.com/F4T.htm>.

Introduction

Knowledge spreads faster than light. Five hundred years ago, planets and stars were just dots in the sky. The Milky Way was a diffuse cloud a hundred thousand light years away. Today, our telescopes look thirteen billion light years beyond—back almost to the beginning of time. Five hundred years ago, our planet was the center of the universe. Today, earth is just one of billions of planets. We're in an out of the way corner of one of billions of galaxies.

Information is exploding all around us. Five hundred years ago, there were earth, air, fire and water. Today, there are atoms and molecules. Five hundred years ago, we had curses and evil spirits. Today, we have bacteria and viruses. Five hundred years ago, we had charlatans and exorcists. Today, we have antibiotics and vaccines.

It's an exciting world we live in. Yesterday's science fiction is today's commonplace. People live and work in space. Men have walked on the moon. Probes have visited the planets and their moons. Robots have toured alien worlds and gone to the bottom of the ocean. We've smashed the atom and mapped the human genome.

Progress is accelerating. Nine out ten scientists who ever lived are alive today. New discoveries fuel an ever-improving standard of living. New technology spawns new careers. Computer capacities double every eighteen months—that's a hundred times better every decade. A well-equipped baby's crib has more computing power than NASA used to reach the moon.

It's only just begun. Everywhere you look there's something new and fascinating happening. Information bombards us from the press, the media, and the Internet. Savor whatever catches your fancy, but consider the source. Just because a rock star, a sports star or a politician says something doesn't make it true.

This book presents the musings of a retired rocket scientist on a few interesting topics. I submit that my years of research in anti-ballistic missile technology, medicine, and atmospheric chemistry make these thoughts worth considering. If these essays stimulate your independent thinking, this book will have accomplished its objective.

Astronomy



Galileo's telescope opened a whole new world. Five hundred years ago, the earth was the center of the universe. Heretics who dared nominate the sun as the center got life in prison. The less daring ones published posthumously. Infidels who suggested stars might be other suns—like our own—were tortured and executed.

We've just begun discovering the wonders of our Universe. The more we learn about it, the more fascinating it becomes. Everywhere we look, we find

something new and exciting. The slightest perturbations in the paths of known planets tell us where to look for new planets. The sun hosts more invisible planets, dwarf planets and "objects" than ones the naked eye can see. Oscillations in the red shift of nearby stars confirm the existence of exoplanets out there. The first one detected was a super giant planet rocking its host star. Since that time, spectral studies and direct observation have found over two thousand planets of nearby stars. Planetary systems surround stars of every description from tiny borderline infrared bodies to super giants. Advances in observation technology allow detection of small planets like our earth. Some resemble earth. They are about the same size. They orbit at a distance where liquid water could exist. Life could have evolved under the conditions there.

The technology to find planets is still in its infancy. It's growing by leaps and bounds, but is still limited to detecting planets in our neighborhood. The growing census of exo-planets suggests an extraordinary number of planets are out there. There are an estimated ten billion sun-like stars in the Milky Way Galaxy. There are many times that many other kinds of stars out there. We're detecting multiple planets around all the different kinds of stars. The Milky Way planets must number in the billions. There are billions of galaxies like the Milky Way out there. The number of planets possible is mind-boggling.

Exploring the universe has just begun. Powerful telescopes stare into the distance. Pick a direction—any direction—and you find something new out beyond our reach. Only one man-made object has ever escaped the solar system. A score of robots and probes are exploring the planets, asteroids and "objects" within the solar system. A dozen men have ventured a quarter million miles to the moon; a few hundred astronauts have orbited a few hundred miles above the earth. The final frontier awaits.

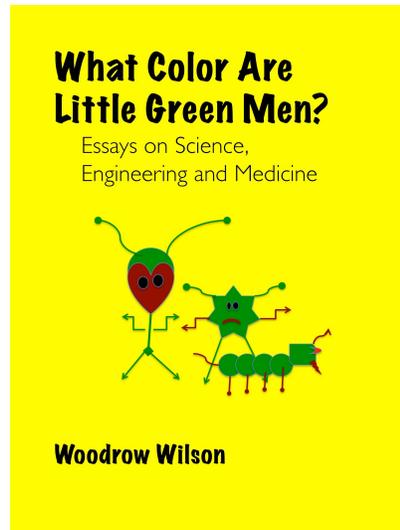
The Devil in New England

Clearly the handiwork of the devil, lunar eclipses terrified our ancestors. Eclipses were omens scary enough to alter history. A total lunar eclipse almost ended English colonization of America in 1635.

New England was cursed. The devil was working his evil magic everywhere there. The young colony was struggling. Colonists were freezing. Colonists were starving. Colonists were dying. A storm beyond their wildest nightmares struck on August 16, 1635. Class 3 hurricane winds toppled trees and drove twenty-foot surf ashore. People were dragged out to sea. Heavy rains compounded the flooding. Crops were ruined. Ships in port were dashed against the shore and shattered with nearly total loss of their crews. The colony reported forty-six killed. (The actual number was probably higher—women, children, sailors, servants and Native Americans weren't necessarily counted as people then.)

Eleven days later, the devil attacked the little settlement again. The storm survivors watched the moon rise and then disappear. A shadow spread across the moon. The moon vanished for hours before slowly reemerging in the sky. This was the work of the devil. The colony was cursed.

New England was the devil's playground. Many colonists wanted to return to England. If they had, the local geography and history would be different today. Instead, they stayed and spent the next fifty-eight years purging New England of the devil's disciples. He had spawned many witches and warlocks in that tiny outpost. Their zealous persecution forestalled further evil events like lunar eclipses.



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