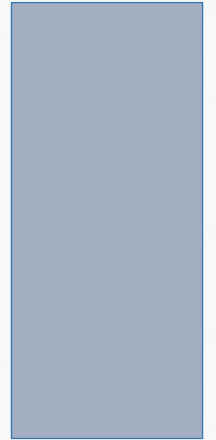# SYMBOLIC LOGIC

WASHBURN UNIVERSITY – PHILOSOPHY 220

## WHAT IS LOGICAL?

Most, when they think of logic, think of something devoid of emotion. When Spock held forth on what was and was not *logical*, he usually meant to say what was and was not *rational*.

# LOGIC:

- Logic, in the sense in which we will be interested, is <u>deductive</u> logic.

- Deductive logic is a formal (means it has set rules) system for determining and ensuring that our reasoning is truth-preserving.

- Put another way, we want to make sure that we don't start with things that are true and end up deriving things that are false from them.  When we know that some things are true, we want to make sure that we only derive other true things from those.

# DEDUCTION, MY DEAR WATSON!

Deduction is made famous by the character Sherlock Holmes, though he very rarely engaged in it. Most of his reasoning was really INDUCTIVE or ABDUCTIVE.
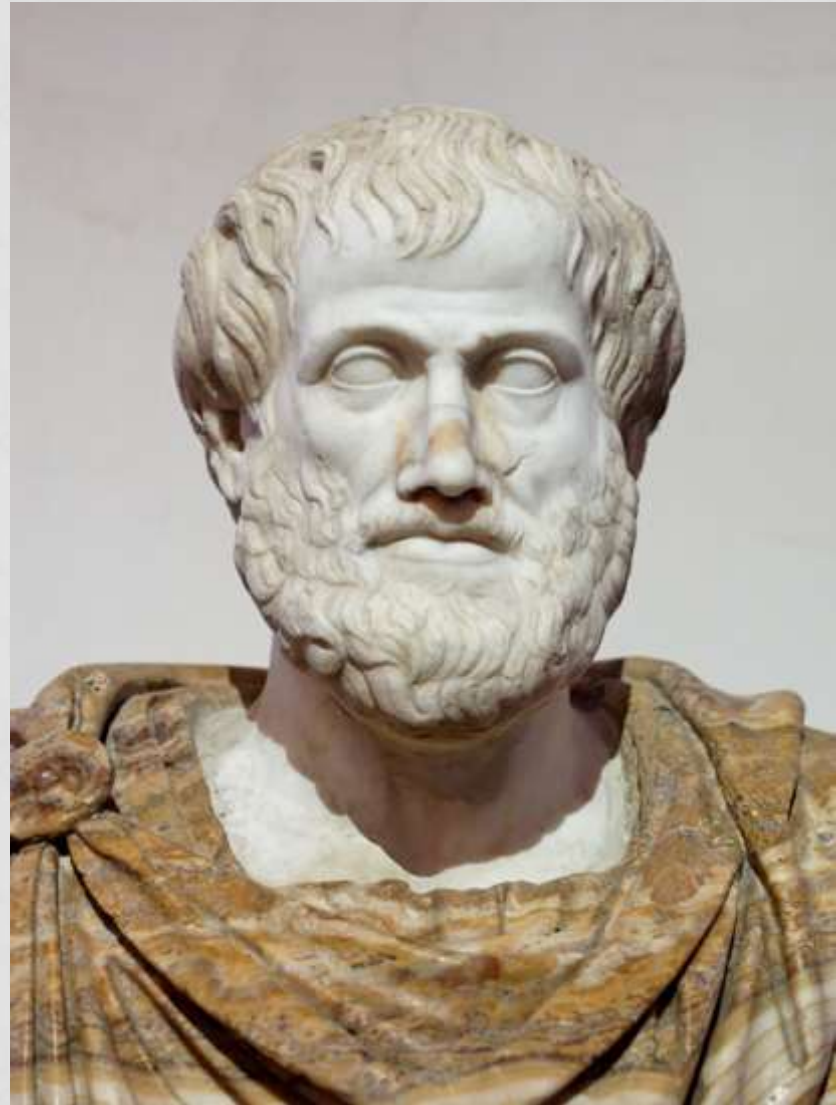
# THE REAL CELEBRITIES OF LOGIC
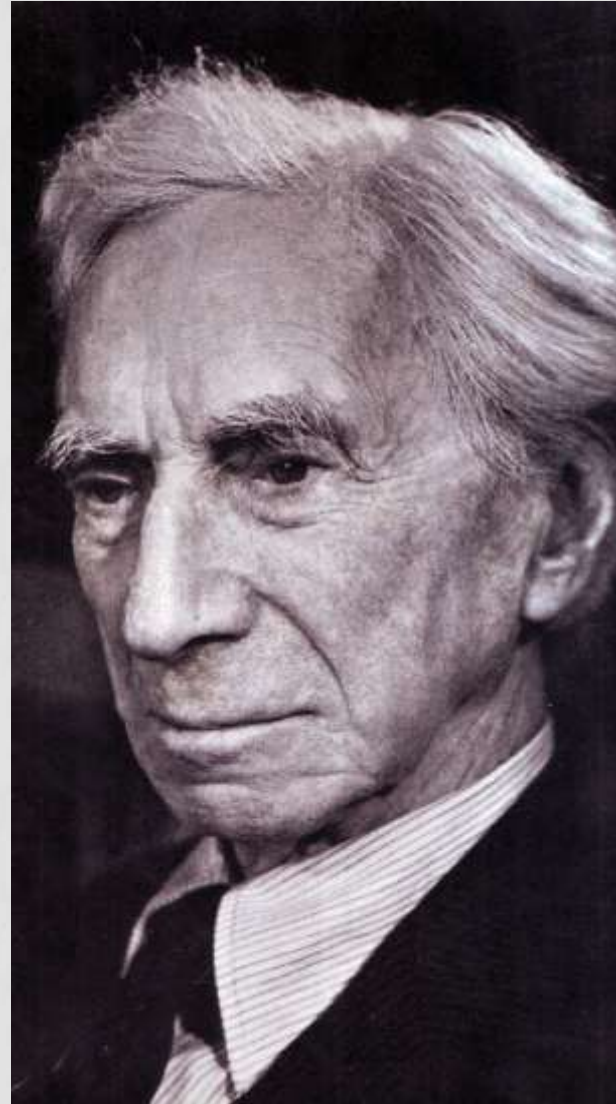
## ARISTOTLE, RUSSELL, WITTGENSTEIN

# ARISTOTLE

This is a bust of what Aristotle probably looked very little like.

Aristotle developed a system of logic that was unrivaled for over 2000 years, and we will even discuss it for several minutes this semester.
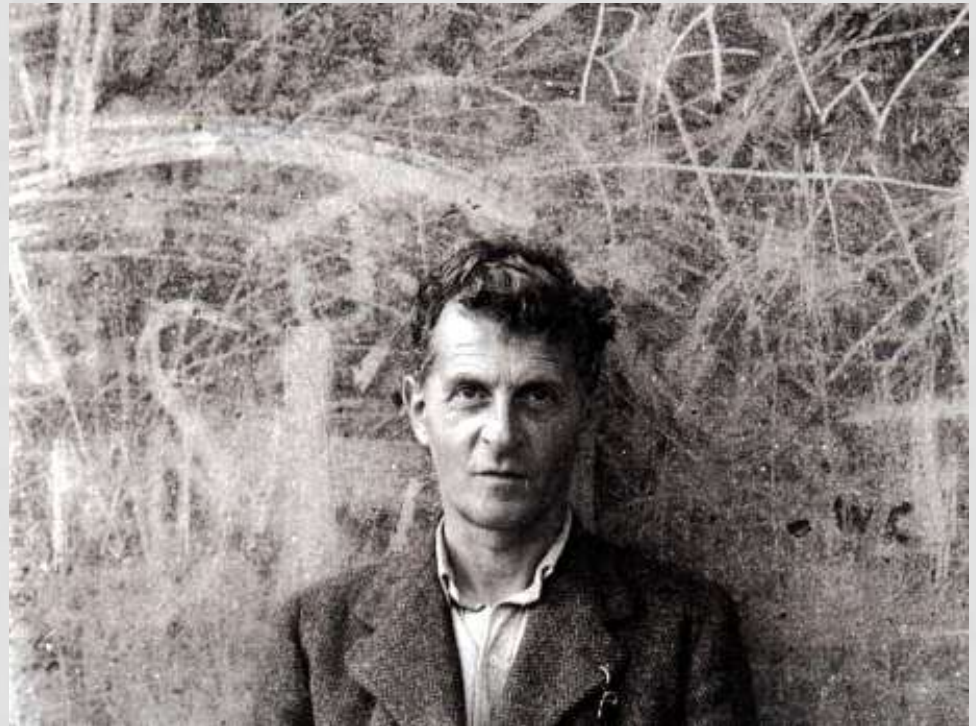
# BERTRAND RUSSELL

He and Alfred North Whitehead wrote *Principia Mathematica*. This book substantially contains the system of logic that we will learn and use.

## LUDWIG WITTGENSTEIN

Often credited with inventing truth tables, with which you shall become quite familiar.

# WHAT TO LOOK FORWARD TO:

- All human language has a structure that hides behind it (probably because human beings have a thought structure in common).

- Symbolic logic is an abstract language that has been developed to reveal that structure and help us to understand and analyze it.

- As we progress through the course we'll build up an artificial, symbolic language that allows us to determine whether our reasoning is truth-preserving.