A Brief Introduction to “Atomism”

Understanding Locke’s Distinction Between Primary and Second Qualities
Things Have Parts

• And those parts have parts . . . .
  – And those parts have parts . . .
    • And those parts have parts . . .
      – And those parts have parts . . .
        › And those parts have parts . . .
          » And those parts have parts . . .
            » . . . .
Does this repeat to infinity?

- Is it true that \textit{everything} is composed of smaller parts …
  - which are composed of smaller parts …
    - which are composed of smaller parts …
      - “all the way down?”
      » to \textit{infinity}?
Greek “Atomism”: NO!

- There are “smallest parts,” and these are called “atoms.”
  - In Greek, “atamos” mean “uncuttable.”
  - So, atoms are “uncuttable,” meaning they have no smaller parts.
Greek “Atomism”

• *Everything* in the natural world is composed of different collections of the *same* basic atoms.
  – So, paper, rocks, trees, human bodies, etc., are all composed of the same basic smallest pieces.
  – One individual atom can differ from another (i.e., it can have different properties), but they are fundamentally the same *kind* of things.
How Do Atoms Differ?

• What *qualities* do they have?
• For “Newtonian” science, they are:
  – Solid.
    • They can’t be further cut.
  – They *occupy space*.
    • And so have size and shape.
  – They *can move* through space.
  – They have *weight* (or “mass”).
Fundamental Properties

• Those (for Newton) are the fundamental properties of the basic parts out of which all natural objects are composed.
  – Later theories include different basic properties.

• So, a tree is different from a rock because it is a different “arrangement” of these same basic atoms, each with a specific size, shape, weight, and motion.
Are There Any *Other* Properties?

• If everything is composed of atoms,

• And the only properties atoms have are degrees of size, shape, weight and motion,
  – i.e., different degrees of these fundamental or “original” properties,

• Doesn’t that mean that *really* there are no other properties?
Are There Any “Non-Fundamental” Properties?

Yes and No!

- **Yes**: There are tables in the world, but no flying horses.
  - That means there is a property of “being a table,” but there isn’t any property of “being a flying horse.”
  - So, there are real “non-fundamental” properties.

- **No**: But a table is merely a collection of atoms, and the collection has the property of being a table only because of these fundamental properties of the atoms in that collection.
“Non-Fundamental” Properties

• Collections of atoms can (and do!) have properties other than solidity, size, shape, motion, and weight.
  – Examples: *being a table, being green*.

• But, whatever properties *collections* of atoms might have must ultimately be *explained* in terms of the fundamental properties of the atoms of which they are composed.
Reducibility

• Fundamental properties are the only “ultimate” (basic) properties.

• All other properties (lie being *a table*, or being *green*) are “reducible” to these fundamental properties.
  – So, something has the property of being a table because it is composed of atoms having a certain size, shape, etc.
  – Likewise with the property of being green.
Locke

• What Locke calls “Primary Qualities” are just these *fundamental properties of the basic particles out of which everything is composed.*
  – He also describes them as “original qualities.”
  – That is, he is accepting this whole “atomist” account that we have been describing.
    • This is the kind of account found in Newton.
Locke’s “Primary Qualities”

• “Solidity”
• “Extension” -- This just means “spread out” in space.
• “Size,” “shape,” “texture”
  -- These are different ways of “occupying” space.
• “Mobility”-- i.e., they can move through space
• “Weight”
• “Number”
  -- There is a quantity to how many there are.
Locke’s Secondary Qualities

• Locke lists: color, sound, taste, smell, feel, and warmth/coolness.

• These are (like the property of being a table) real properties that objects have.
  – They are “powers” in objects to produce ideas in us.

• But (like the property of being a table), they aren’t “ultimate.” The are reducible to the primary qualities of “insensible particles.”
One Difference

• **Primary qualities** are the ultimate properties of the basic particles out of which things are composed.

• **Secondary qualities** (like all real properties that aren’t fundamental) are “reducible to” the primary properties of these particles.
Its Not Easy Being Green

• So, being green (the secondary quality “green”) is a property an object has because it has the “power” to cause certain kinds of ideas in our minds.

  – It has this “power” because of the primary qualities of the particles out of which it is composed, and how these particles interact with our bodies in sense perception.
A Second Difference
See Section 17, p. 215

• Our ideas of primary qualities “are resemblances of them.”
  – i.e., an object’s primary qualities cause ideas in us that resemble those very qualities.

• But our ideas of secondary qualities are not.
  – i.e., an object’s secondary qualities cause ideas in us that do not resemble those qualities.
The Crucial Difference

• Our **ideas** of primary qualities (the sensations caused in us by “powers” in an object) **resemble** those qualities, but

• Our **ideas** of secondary qualities (the sensations caused in us by “powers” in an object) **do NOT resemble** those qualities.
So ....

• The important difference between primary and secondary qualities (which are both ultimately just collections of primary qualities) ...

• Is **not** in the *qualities in the object*, but

• Is in the *ideas they cause in our minds*.

• This is crucial!
Secondary Qualities

• Are NOT “in” the mind!
• They are powers in objects
  – Ultimately reducible to the primary qualities of “insensible particles”
• That cause ideas in our mind
• But where these ideas in our minds
• Do NOT resemble the qualities in the object.
"WHERE'S THE BLUE?"
Where did “Blue” go?

• Which is *blue*?
  – The sensation (idea) in our mind, or
  – The quality (power) in the object?

• *Blue* is a quality of objects.
  – Sensations aren’t *blue*, any more than they are *heavy*!
  – Sensations are *of* blue.
Ideas and Qualities (Again)

• “Whatsoever the mind perceives in itself, or is the immediate object of perception, thought, or understanding, that I call idea; and the power to produce any idea in our mind, I call quality of the subject [i.e., the thing—the object] wherein that power is."
Continued:

• “Thus a snowball having the power to produce in us the ideas of white, cold, and round—the power to produce those ideas in us, as they are in the snowball, I call qualities; and as they are sensations ... in our understanding, I call ideas; which ideas, if I speak sometimes as in the things themselves, I would be understood to mean those qualities in the objects which produce them in us.”
WTF?

• So, Locke makes a point to distinguish ideas, which are in minds, from qualities, which are in objects ....

• But then goes on to talk about qualities “as they are sensations,” and ideas “as in the things themselves.”

• That is, he makes a distinction, and then says he will sometimes use each term when he really means the other!
Look again

- “... white, cold, and round ..., as they are in the snowball, I call qualities; and as they are sensations ... in our understanding, I call ideas ....”
- It is words like “white,” “cold” and “round” that sometimes will be used to talk about qualities, and sometimes to talk about sensations.
This is just the way we all speak.

- We use words for secondary qualities (words for colors, sounds, tastes, temperatures, smells, etc.)
  - sometimes to talk about *qualities* in the object, and
  - sometimes to talk about *sensations* in our mind.
    - Sometimes when I say “blue” (or “color”) I am talking about an enduring *quality* of an object, but sometimes I am talking about a kind of *sensation*.

- *This can be confusing!*
  - even though *the distinction* between qualities and ideas is clear.
"WHERE'S THE BLUE?"
Confusion:

• This confusion between
  – “blue” as a quality in an external object, and
  – “blue” as a kind of sensation in our minds

• leads some (e.g., Berkeley) to think that Locke’s claim is that secondary qualities (colors, sounds, etc.) exist only in the mind.

• This is not Locke’s view. His view is only that our sensations of secondary qualities do not resemble those qualities.