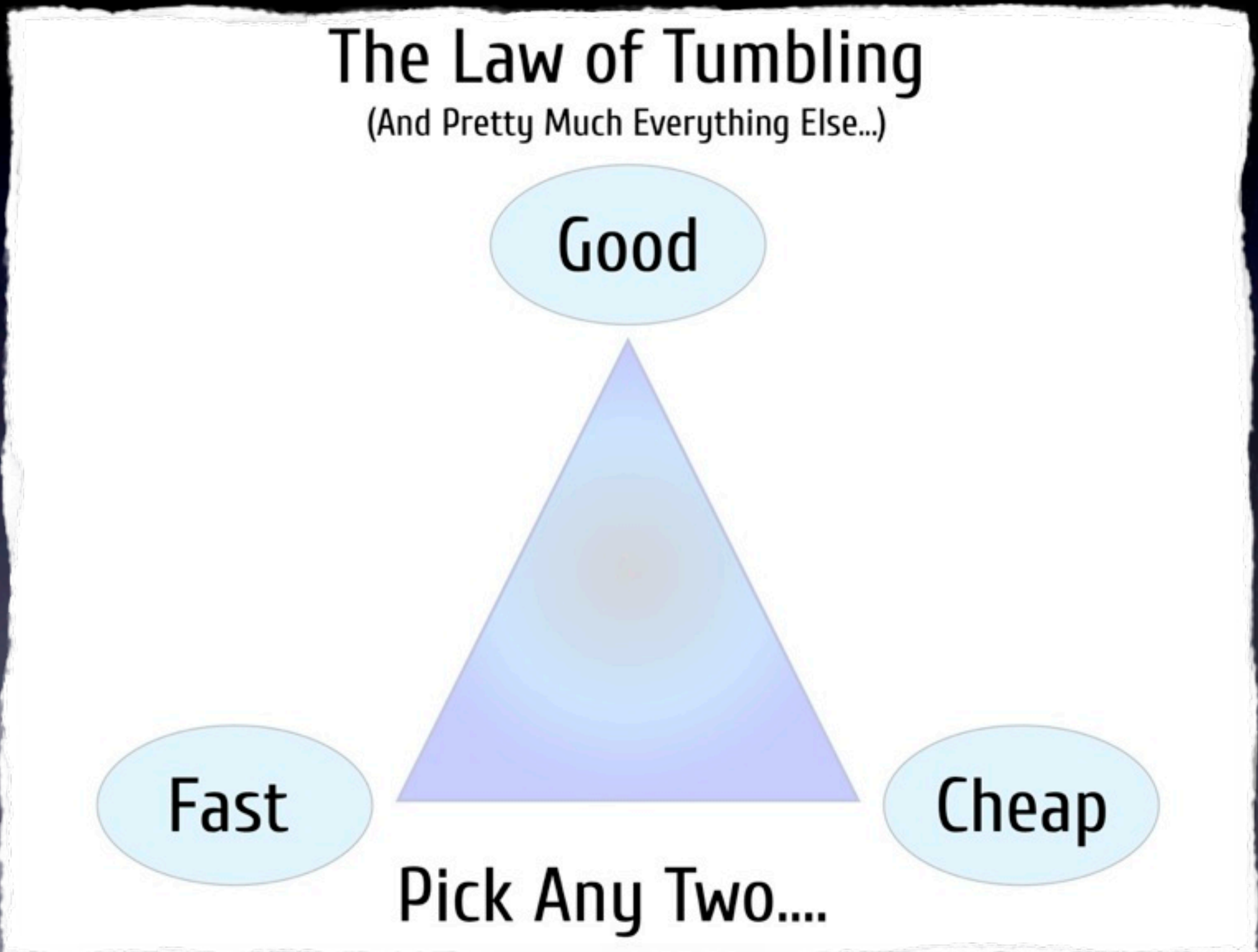
Tumbling: Good/Fast/Cheap



Not This Kind of Tumbling!

Disclaimer

- I am not an expert!
- There's a very great many approaches/tools/materials, so...
- Your mileage may vary!

What is Tumbling?

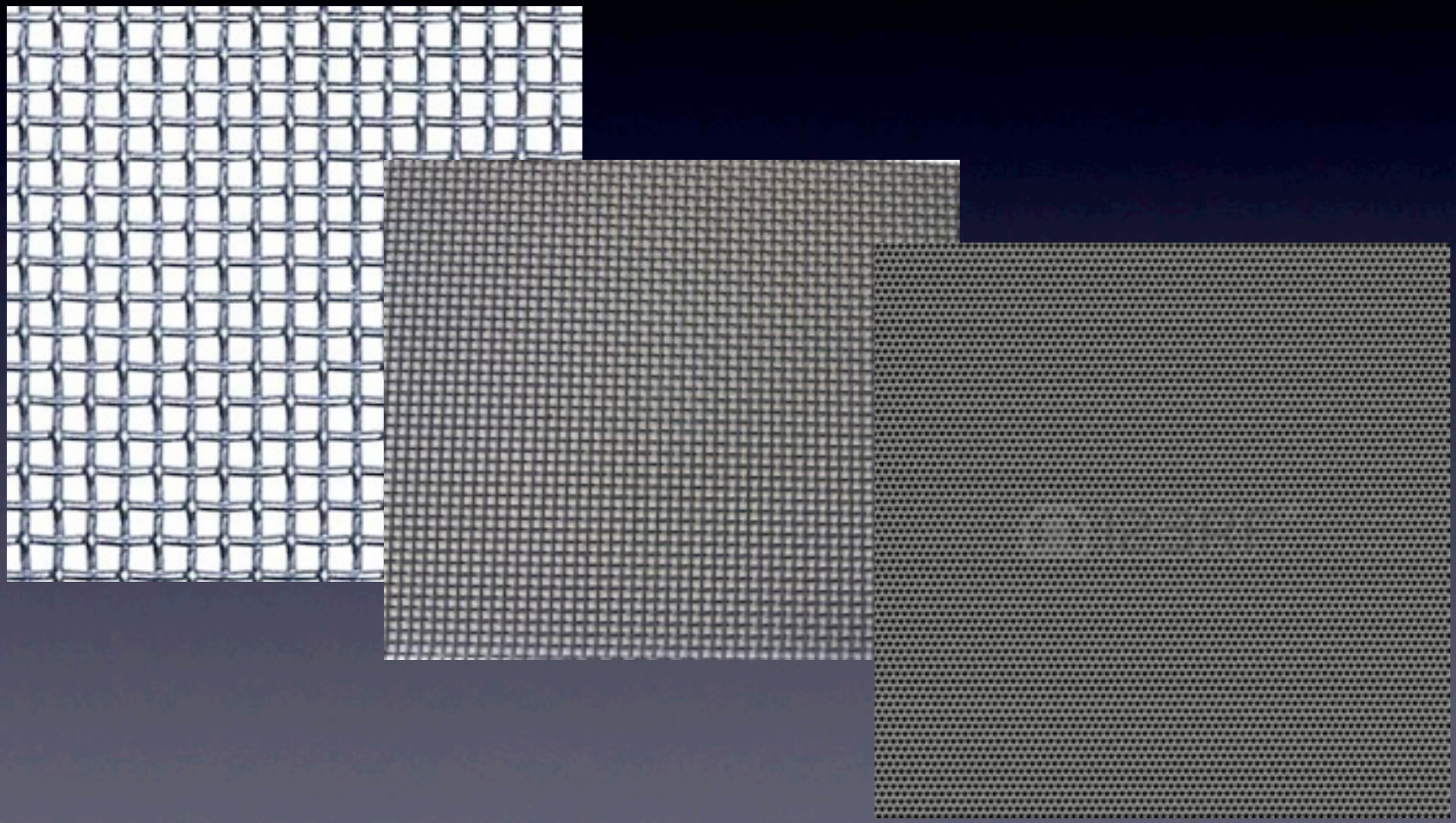
Mother Nature's Version...

What is Tumbling?
...The Lapidary Version

- Continual mechanical abrasion of stones to produce a polished surface on the stones

How Does It Work?

Imagine these to be the surfaces of a stone...



Tumbling Might Not Be For You If...

- Washing dishes bums you out
- You have "Destinesia" -
  - I.e., Destination Amnesia
    - Can't remember what you walked into a room for
    - (Pre-cursor to "CRS Syndrome")
- Instant gratification is your life's purpose
  - Not gonna happen with this pursuit

Why Tumble Rocks?

- Make rocks pretty!
- Prepare “cabs” for projects w/o having a cabbing machine
- Test new materials for ‘polish-ability’
- Make scraps from other projects useful
- Introduction to lapidary techniques
- Practical application of mineralogy

Tumbling Processes

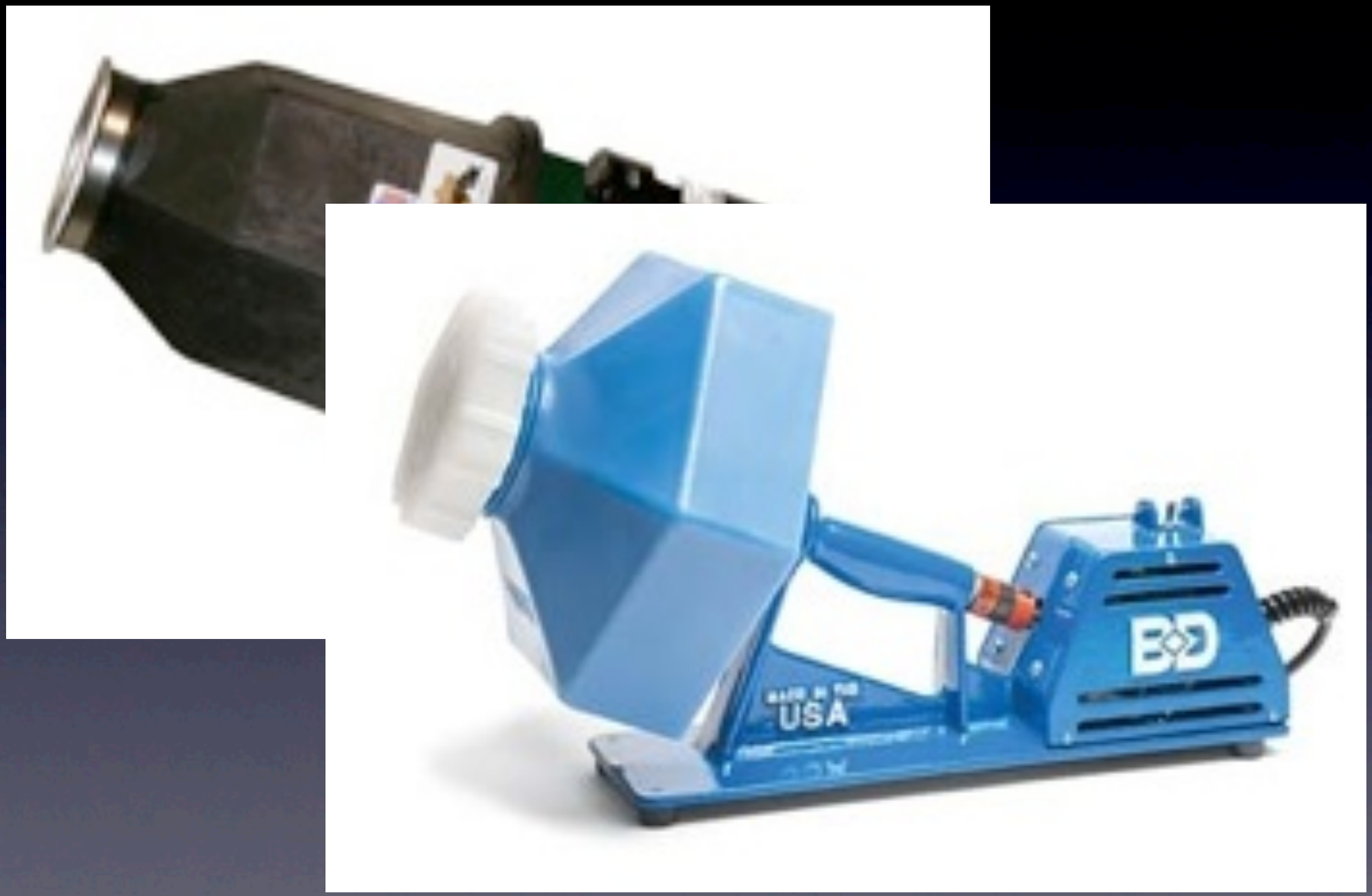
- Wet
  - The abrasive is in a medium such as water
- Dry
  - The abrasive is in a medium such as ground walnut shells

Tumbling Technologies

- Rotational
  - Single axis
  - Dual axis
- Mechanical vibratory
- Electro-magnetic vibratory

Rotary Tumblers - Single Axis

Rotary Tumblers - Dual Axis



Rotary Tumblers - Dual Axis

Vibratory Tumblers

E/M Vibratory Tumblers

Tumbling Technologies

- Rotational
  - Shapes stones best
  - Less costly in general
  - Slowest
- Mechanical vibratory
  - Shapes stones less
  - Faster
- Electro-magnetic vibratory
  - Speed!

Tumbling Requirements

- Rocks
- Abrasives
- Medium
- Patience
- More patience

What Can You Tumble?

- Rocks - Glass
- Flats
- Rounds
- Possible sizes a function of tumbler dimensions
- For best results, materials of similar hardness are best
- For best results, a mix of sizes is best

Things That Matter

- Cleanliness
- Attention to detail
- Consistency
- Did I mention patience?

Factors To Consider

- How hard is the material?
- How similar in hardness are the individual pieces of the material?
- How “brittle” is the material?
- What’s (chemically) in the material?
  - Example: Bumble Bee Jasper = Arsenic!

Tumbling - Other Necessities

- Location where noise isn't an issue
- Access to used grit disposal area
- Ceramic pellets
- Plastic beads
- Burnishing compounds
- Dishwashing soap
- Strainers
- Brushes for scrubbing

The Process - Overview

- Shaping
- Grinding
- Polishing
- Burnishing

The Process - Shaping Gen'l

- Best accomplished with a rotary tumbler & wet process
- Select materials & abrasives
- Prepare equipment
- Make notes
- Combine materials/abrasives/water
- Energize!
- Monitor & inspect

The Process - Shaping

- Clean materials
- Add to tumbler
- Add abrasive
  - Coarse grade (46 - 60- 80 - 100)
- Add water
- Add ceramic pellets
- Add a LITTLE dishwashing soap
- Go

The Process - Shaping Cont'd

- Check on process daily
- One week passes...
  - Clean materials
  - Add back to tumbler
  - Add fresh abrasive
    - Coarse (46 - 60 - 80 - 100)
  - Add water
  - Add a LITTLE dishwashing soap
- Continue 2 - 3 - 4 - 5 - 6 weeks...

The Process - Grinding Gen'l

- Best accomplished with rotary or vibratory tumbler & wet process
- Select materials & abrasives
- Prepare equipment
- Make notes
- Combine materials/abrasives/water
- Energize!
- Monitor & inspect

The Process - Grinding

- Clean materials
- Add to tumbler
- Add abrasive
  - Medium (220 - 400 - 600)
- Add water
- Add addt'l ceramic pellets (if needed)
- Add a LITTLE dishwashing soap
- Go

The Process - Grinding Cont'd

- Check on process daily
- Up to one week passes...
  - Clean materials
  - Add back to tumbler
  - Add fresh abrasive
    - Medium (220 - 400 - 600)
  - Add water
  - Add a LITTLE dishwashing soap
- Continue 2 - 3 - 4 weeks...

The Process - Polishing Gen'l

- Best accomplished w/ vibratory or E/M tumbler & dry process
- Select materials & pre-polish or polish
- Prepare equipment
  - Recommend separate vessel for polish!
- Make notes
- Combine materials + abrasives
- Energize!

The Process - Polishing

- Check on process daily
- Up to one week passes...
  - Clean materials
  - Add to tumbler
    - Add fresh abrasive
      - Pre-polish (1200)
    - Add water
    - Add a LITTLE dishwashing soap
- Continue 1 - 2 weeks...

The Process - Polishing Cont'd

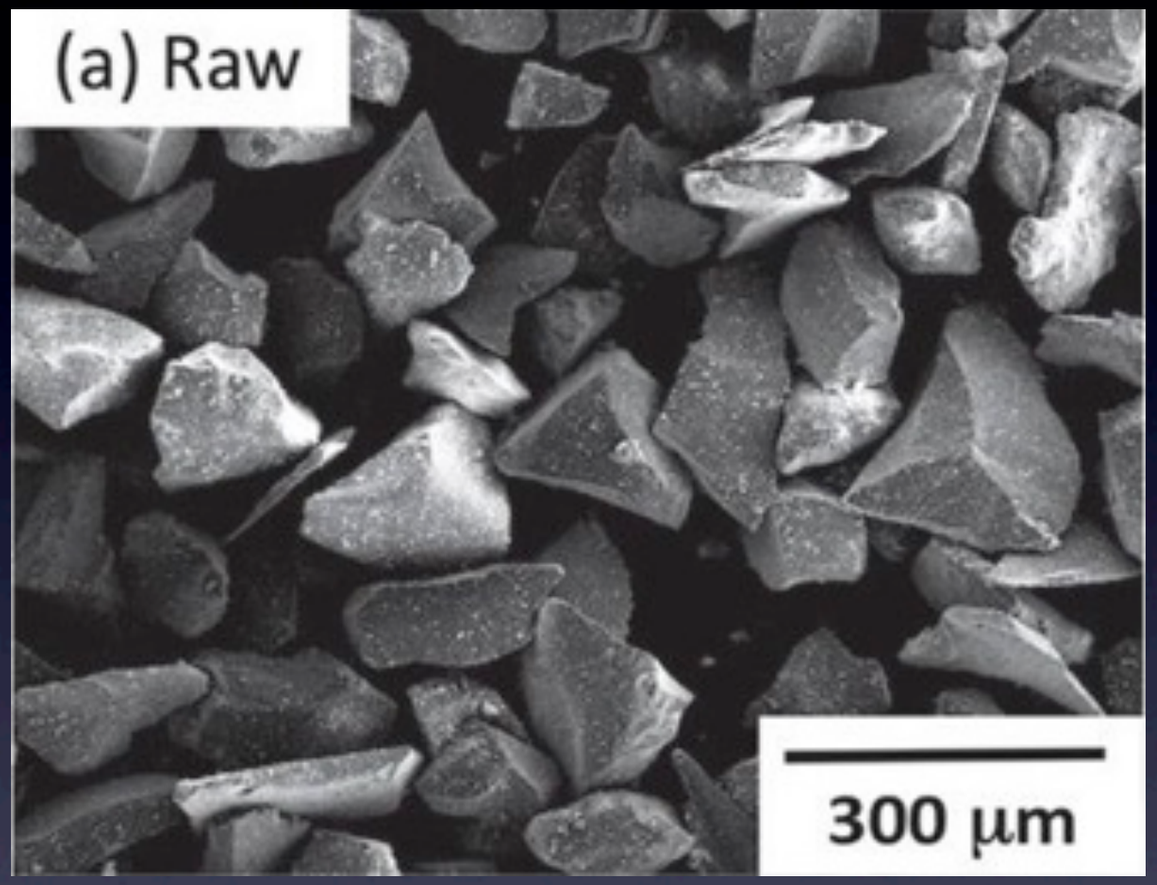
- Check on process daily
- Up to one week passes...
  - Clean materials
  - Add to tumbler
    - Add fresh abrasive
      - Polish (Aluminum Oxide or others)
    - Add water
    - Add a LITTLE dishwashing soap
- Continue 1 - 2 weeks...

The Process - Burnishing

- Considered optional by some
- Puts final "shine" on materials
- Softer abrasive "buffs" the material
- Method depends on tumbler used
  - Ivory soap flakes
  - Borax
  - "Home-made" Vibra-Dry

Abrasives

- Silicon Carbide
  - SiC
  - = Carborundum
  - = Moissanite
  - Mohs hardness: 9 - 9.5



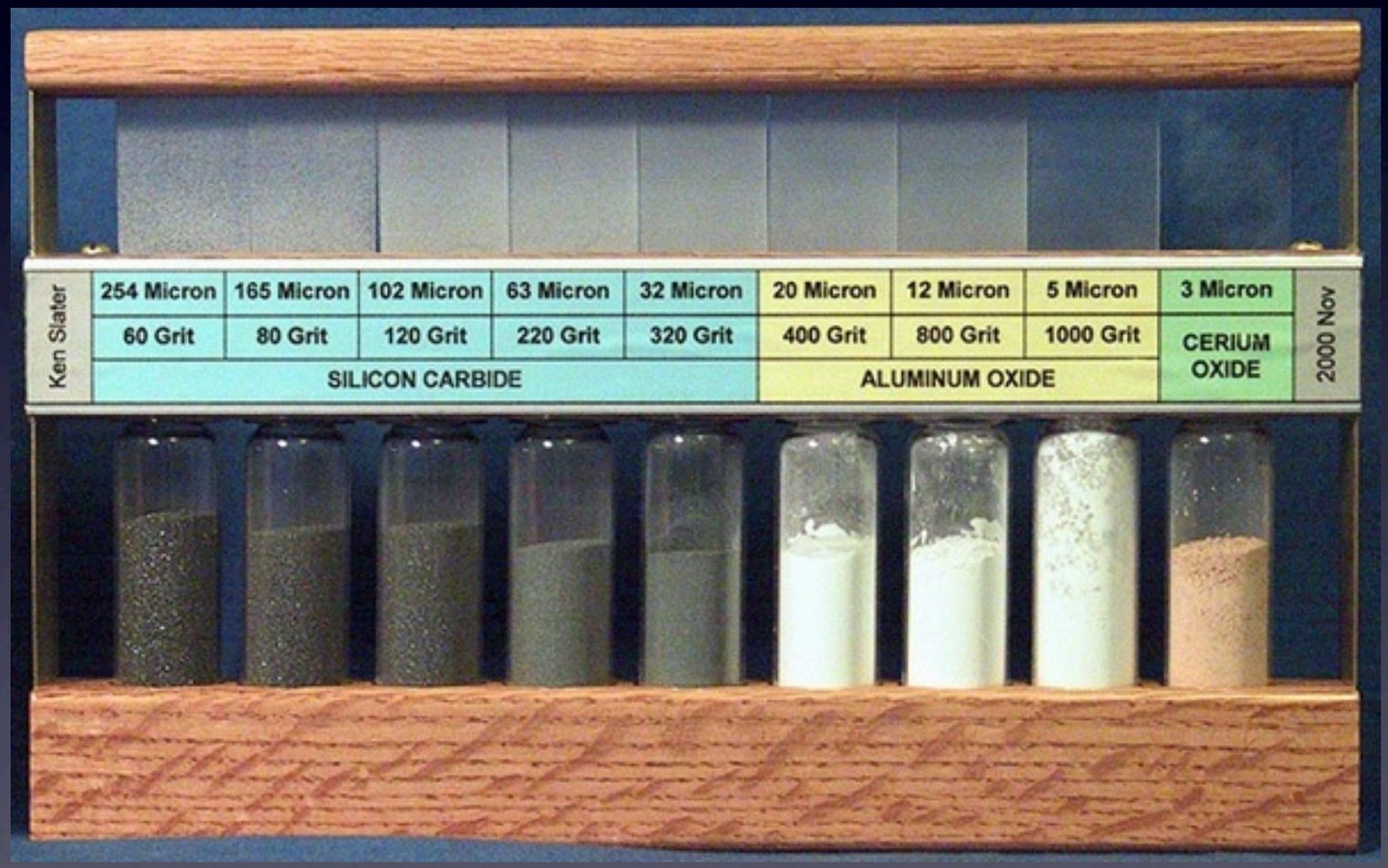
  - Silicon carbide is sharper and harder than standard forms of aluminum oxide.
  - It has needle-like grains that resemble shards of broken glass

Abrasives

- Aluminum Oxide
  - Al_2O_3
  - = Corundum
  - = Linde A & B
  - Mohs hardness: 9.0
  - It tends to wear down until it becomes too dull to cut efficiently

Abrasive "Sizes"

- Grit = Mesh = Microns
- Smaller Mesh = Bigger (coarser) particles
- Coarse: ≤ 100
- Medium: ≤ 400
- Fine: ≤ 600
- Pre-Polish: 1200
- Polish: ≥ 1200

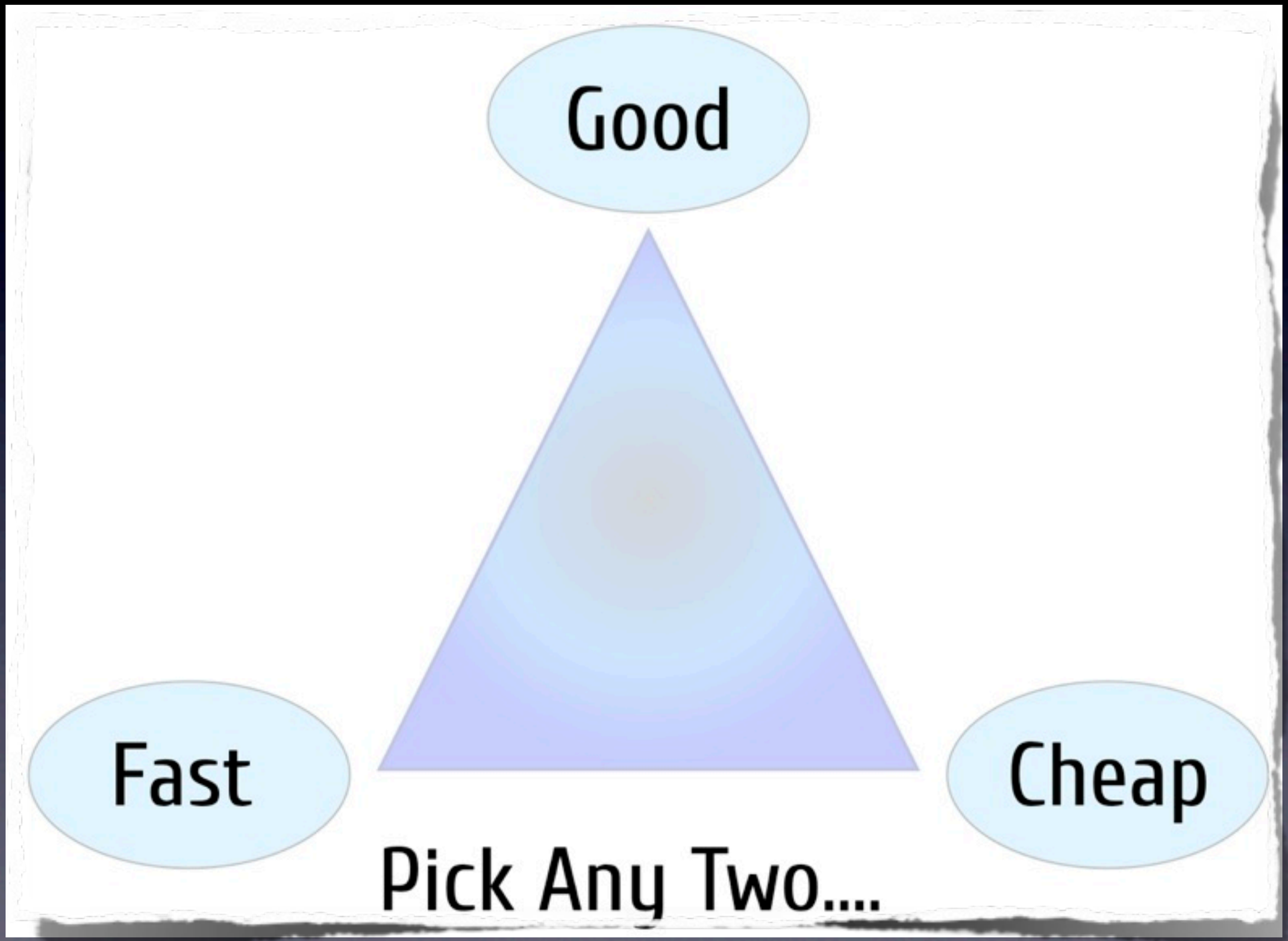


Lessons Learned

- Grit grinds everything
- Weight + wet + continuous motion = Death to things mechanical
- Quality of materials directly impacts degree of success
- Attention to detail - ditto
- Watch the weather forecast

Things I Wouldn't Do Again

Back to the Original Premise...



Tumbling Solutions Fast + Cheap

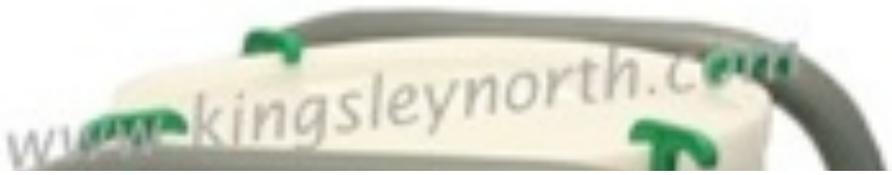
- ✓Buy prefab
- ✓Buy partially tumbled
- ✓Collect from natural sources

Tumbling Solutions Good + Cheap

- ✓DIY equipment
- ✓Limited equipment investments
- ✓Buy abrasives in bulk
- ✓Meet someone with quality scraps

Tumbling Solutions Good + Fast

- Multiple methods
- Equipment investments w/ an eye to steady production
- Buy materials in bulk
- Make quality scraps



Demo's

- Recharging abrasive for second week of shaping in rotary tumbler
- Moving to 50,000 polish in eletro-magnetic vibratory tumbler
- Final results to be revealed at subsequent meeting(s)

Now What?

- So you've got a pile of tumbled stones...
  - Bring to rock shop and turn into "cabs"
  - Build a collection
    - Including 'before' & 'after' samples
  - Give as gifts
  - Turn into craft projects

Some Suggestions...

Recommendations For Getting Started

- Decide your level of interest/ involvement
- Acquire equipment consistent w/ that
- More time spent = less money spent
- More money spent = less time spent
- Make sure this will be fun!

Resources

- DIY
  - Kreigh's: http://tomaszewski.net/Kreigh/Minerals/Homemade.shtml
- Community forums
  - RTH: http://andy321.proboards.com/
- Commercial suppliers
  - JS Gems: http://www.jsgemslapidary.com/
  - The Rock Shed: http://therockshed.com/
  - Kingsley North: http://www.kingsleynorth.com/
  - Jesco: http://www.jescoproducts.com/

Questions?

(Related to rock tumbling, that is...)

Door Prizes

Parcel of tumbled stones

Wire-wrapped tumbled stone

Tumbling “Starter Kit” (As Is!)

Thanks!

(Presentation will be published on club web site in the near future)