

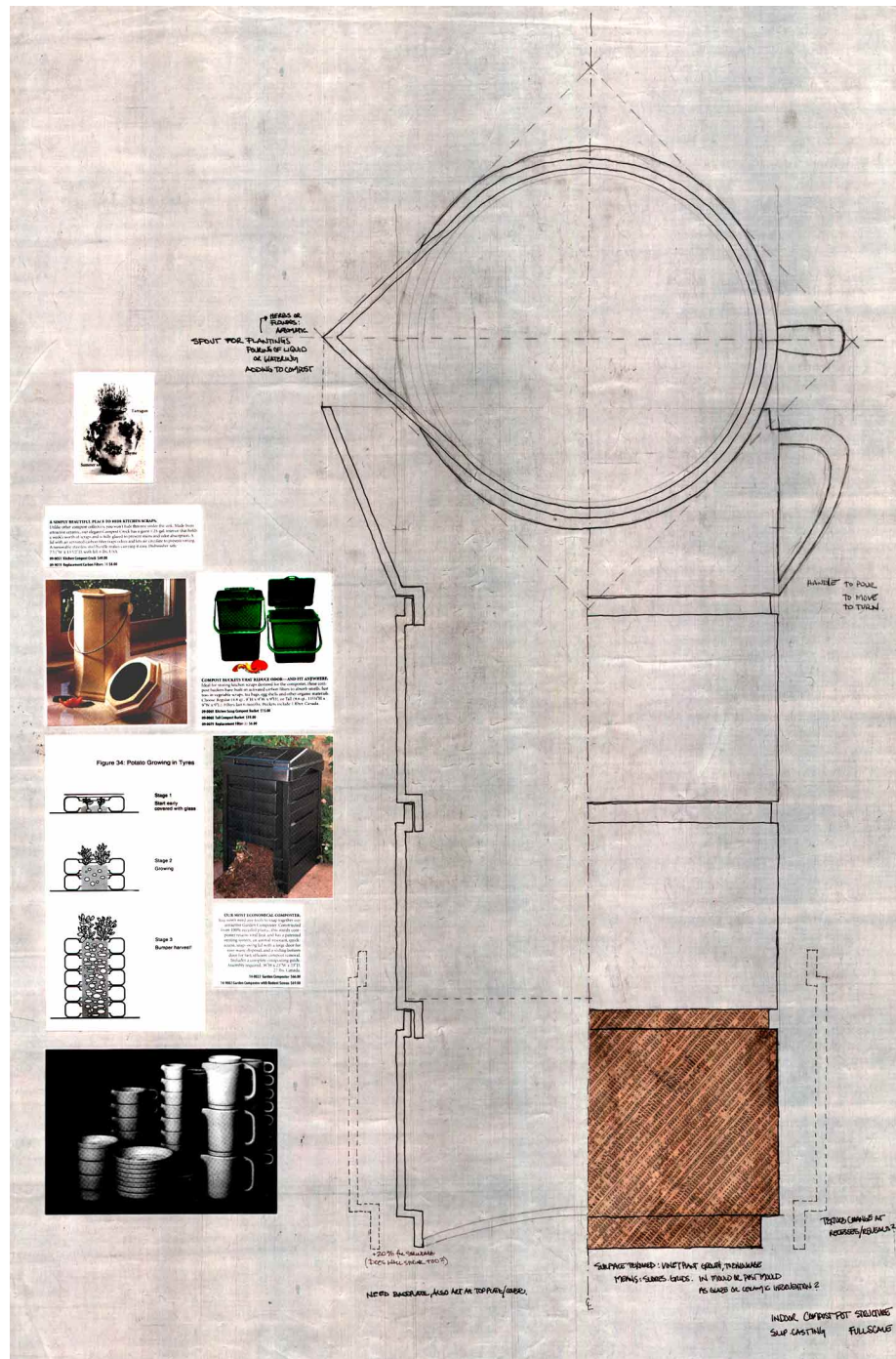


“VERMICOMPOST”: (20th cent.)
 (1) the process of using earthworms and microorganisms to convert organic waste into black, earthy-smelling, nutrient-rich humus (2) the castings (manure) of earthworms
 “VERMICULTURE”: the raising of earthworms under controlled conditions

ii. vermiculture tower

This product is an indoor composting system that uses vermiculture (the use of worms to break down organic waste into humus). The system is to be a touchless, sanitary modular indoor composter.

In 1997, a study was conducted in New York City to propose and test solutions to the city’s growing solid waste problem. Part of this study was to see the efficacy of backyard composting. The borough of Manhattan was discarded from the sample pool early in the study, as most residents were apartment dwellers, and unable to “backyard compost”. Participants in the other boroughs were provided with composting bins and instructions. Samples were collected and data extracted illustrating composting of organic waste as a feasible solution to waste stream reduction.¹³



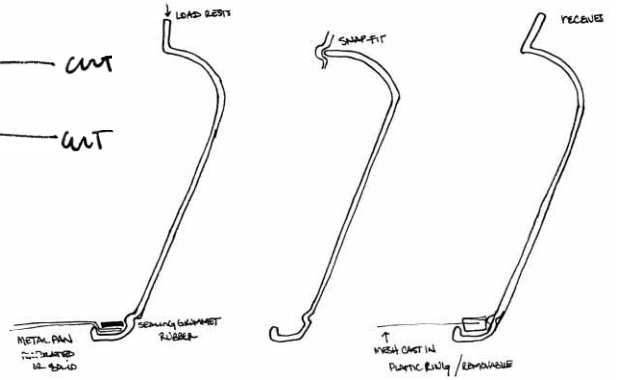
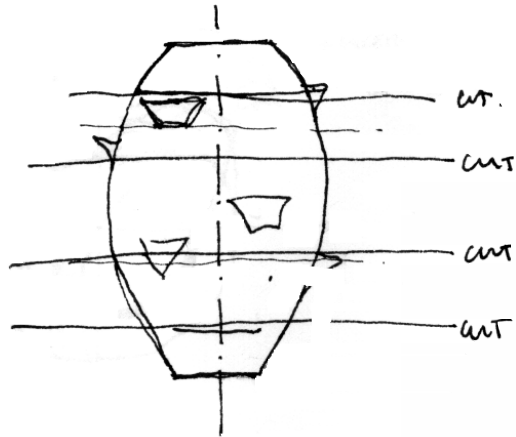
eisenia foetida and *lumbricus rubellus*

Composting worms. Jerry Minnich and Marjorie Hunt, *The Rodale Guide to Composting* (Emmaus: Rodale, 1979), p. 216.

¹³ “Backyard Composting Evaluated in New York City.” *Biocycle* October 1999: 47.



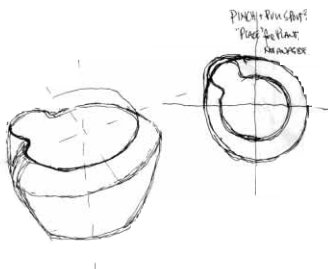
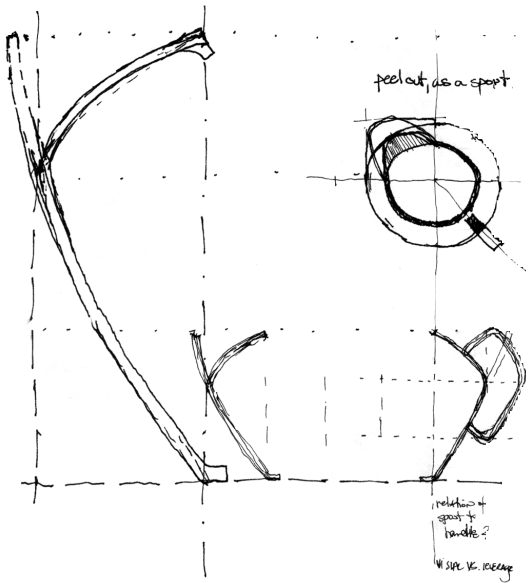
NESTING PIECES:



INVERSIONS OF SELF.

SAME CASTING, DIFFERENT PLACEMENT? TOP OR BOTTOM UP OR DOWN!

SPOUTS? ADDITIVE?



TERRACOTTA

properties:
 clay resource base
 cool touch
 heavy
 breakable

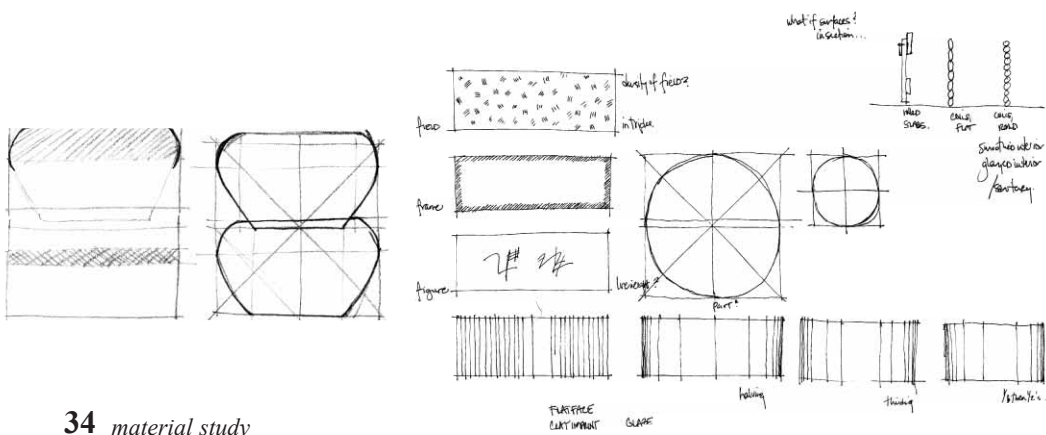
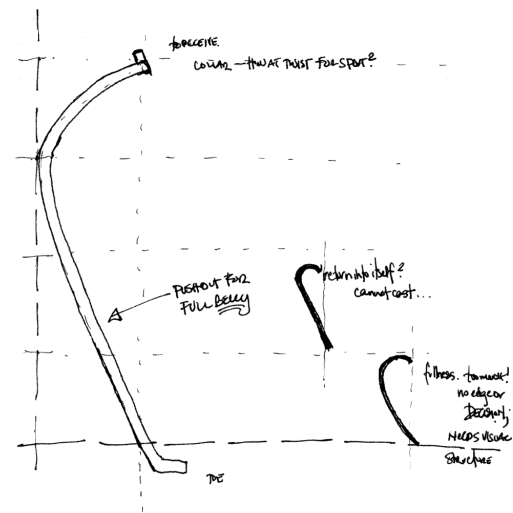
production:
 slip cast and fired
 color palette limited to glazes or natural

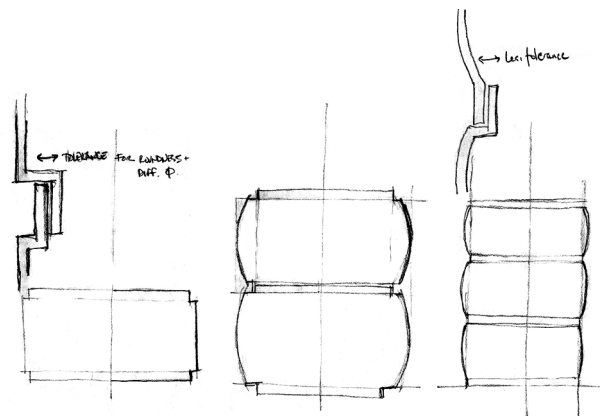
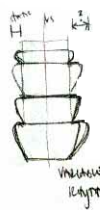
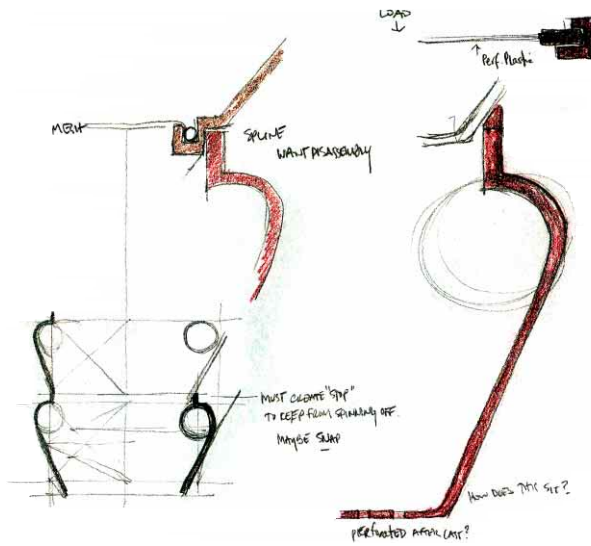
social:
 artisan required: maker's mark
 potential community revitalization
 local production: limited shipping

form:
 simple
 drafted angles for casting
 sculptural aesthetic
 texture variability / light quality

market:
 conservative adults
 all natural/homesteader's
 high-end nurseries
 specialty catalogs:
 organic/all natural, gardening

economy:
 expensive due to hand craft and fragile transport conditions





P O L Y P R O P Y L E N E

properties:

- petroleum resource base
- warm touch
- lightweight
- durable

production:

- rotational molded
- color palette limited to recycled or biodegradable (UV and H₂O sensitive)
- bulk: packaging for shipping

social:

- factory based production

form:

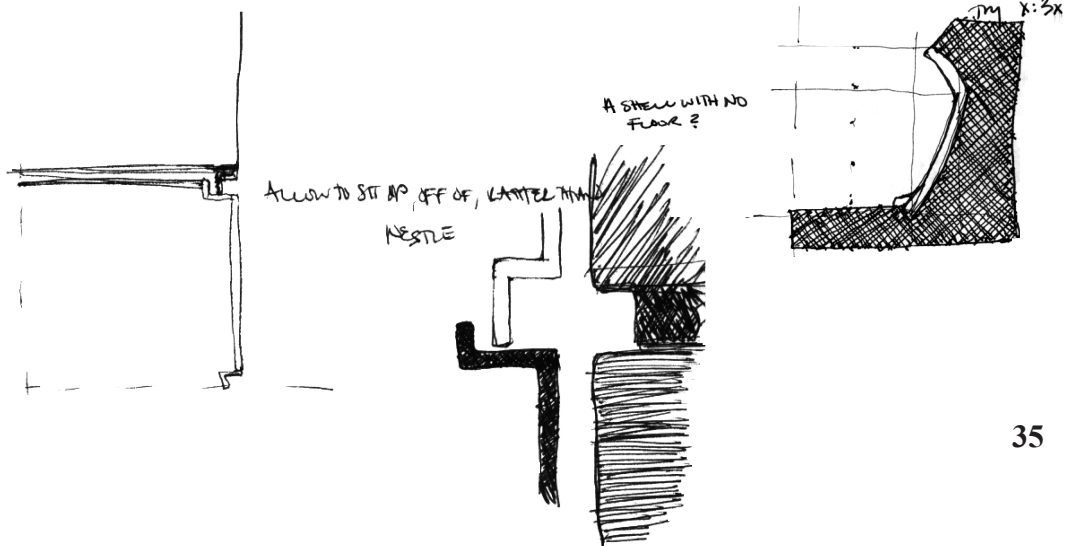
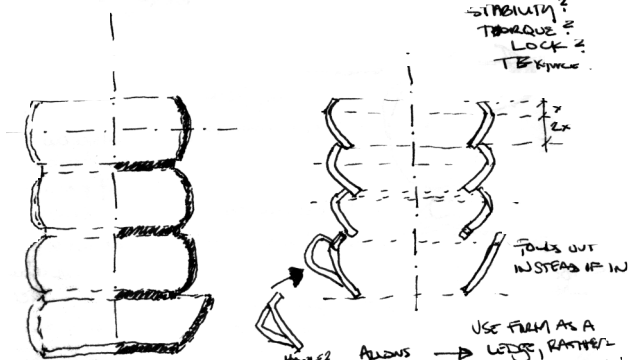
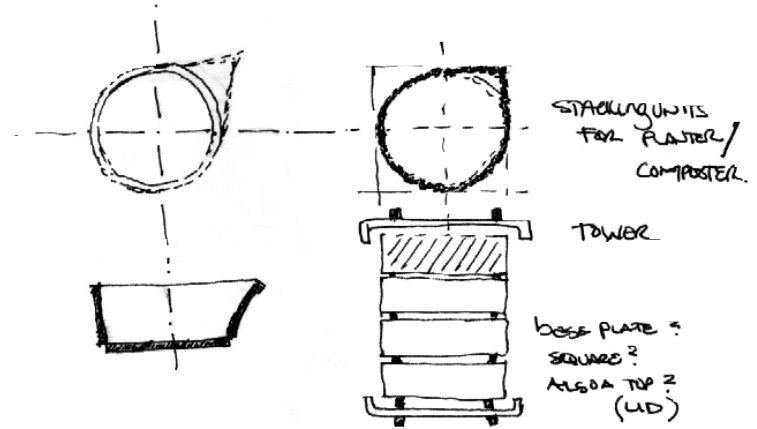
- complex
- drafted angles for molding
- playful aesthetic
- texture variability / light quality

market:

- young adults and families
- children / classroom
- elderly gardener's/fishermen
- home and garden retail centers
- hardware stores
- specialty catalogs: gardening, fishing, eco-living

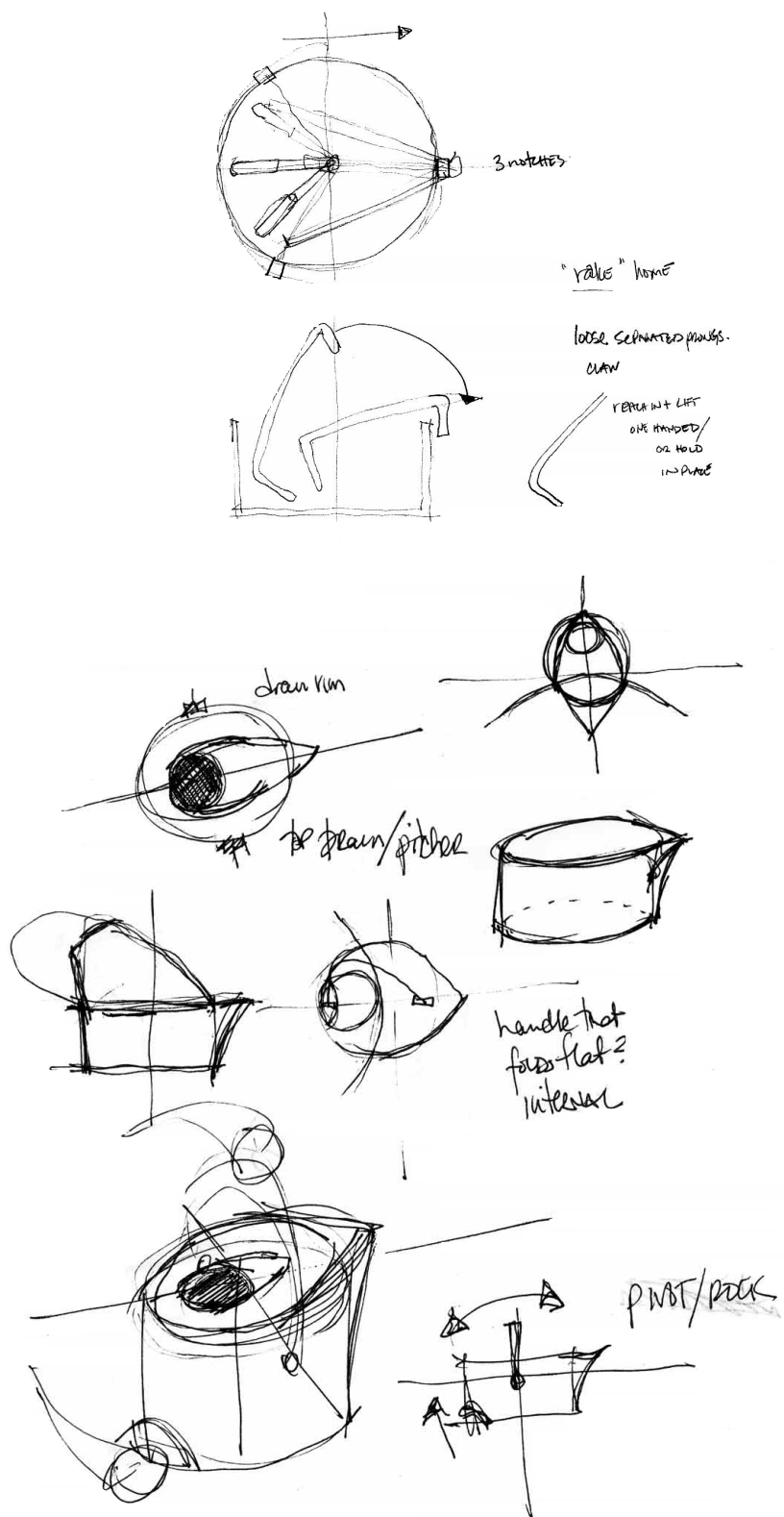
economy:

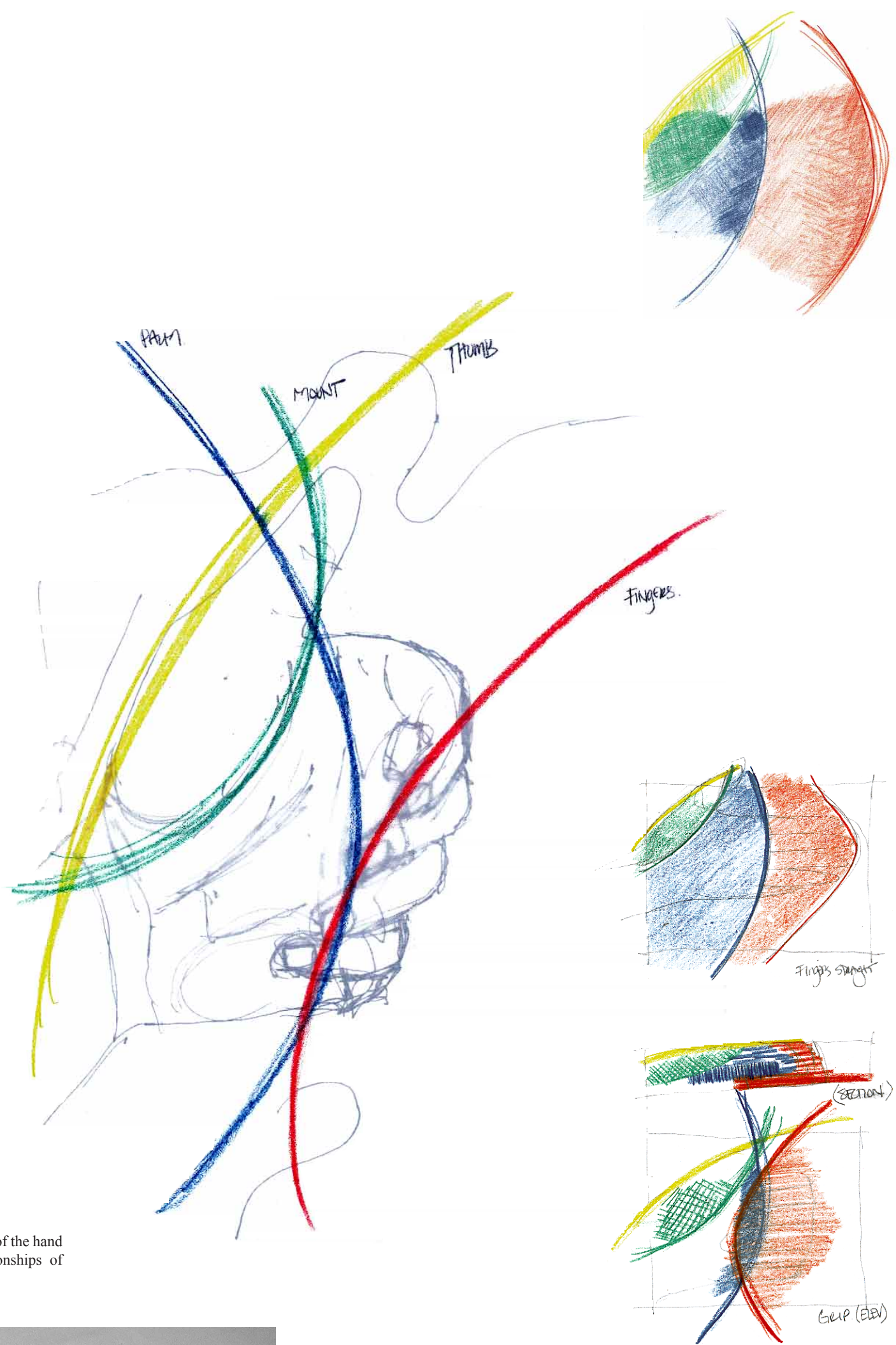
- inexpensive mass production and retail mass marketing



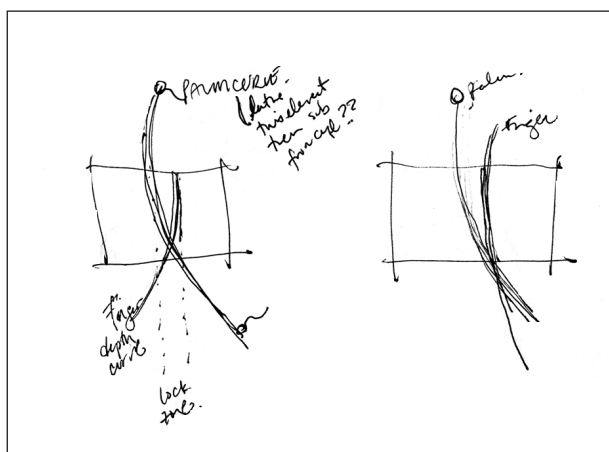
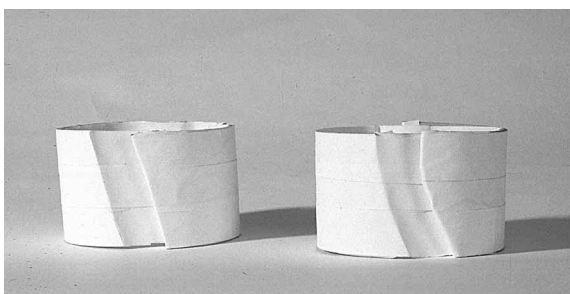


The base unit is multifunctional. It needs to catch water runoff, called "compost tea", which can be used as a natural fertilizer for plants. The base is therefore designed as a watering can as well as a storage reservoir. To simplify production and use, the base unit is also used as a top for the tower. The top is a convenient storage place for a claw tool which is used to bury household waste without soiling the hands.



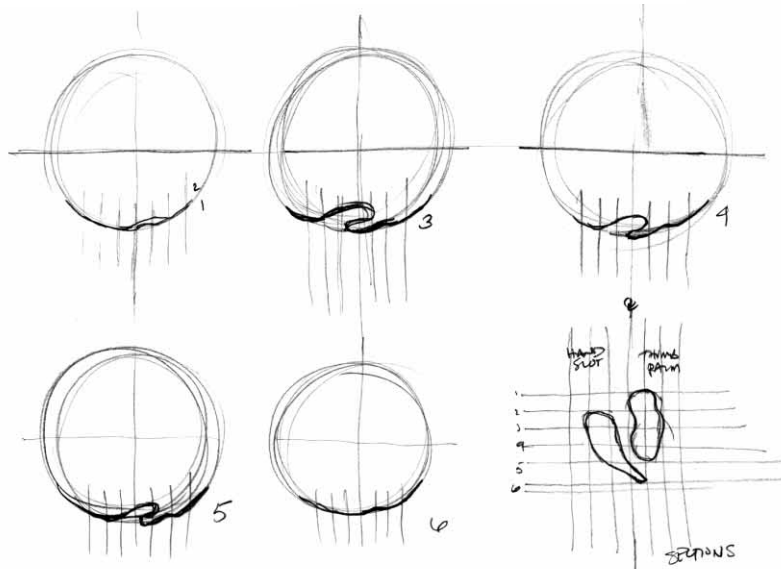
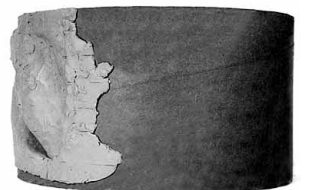
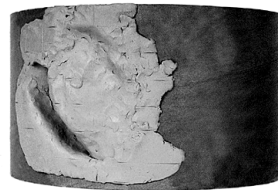
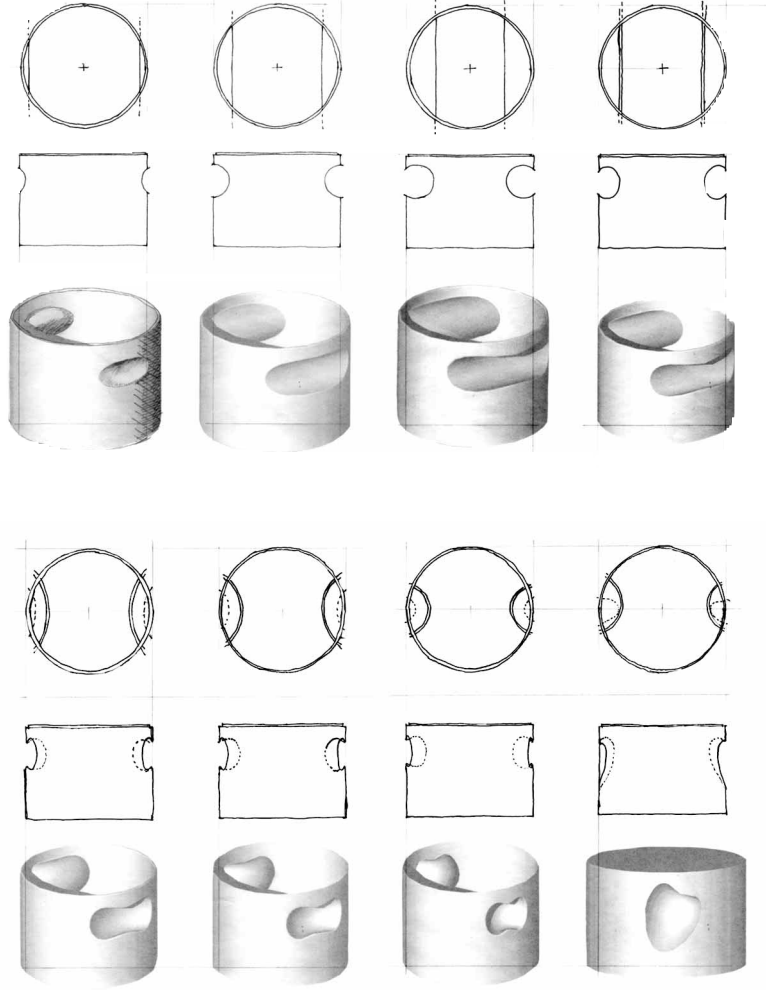
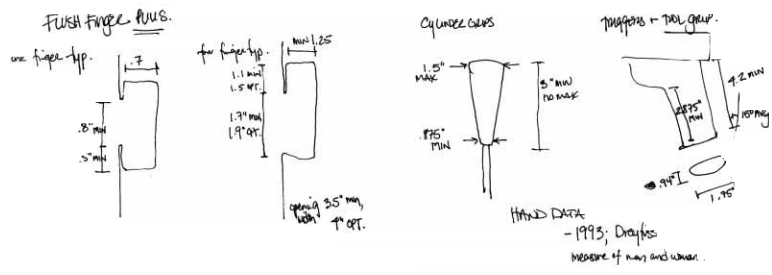


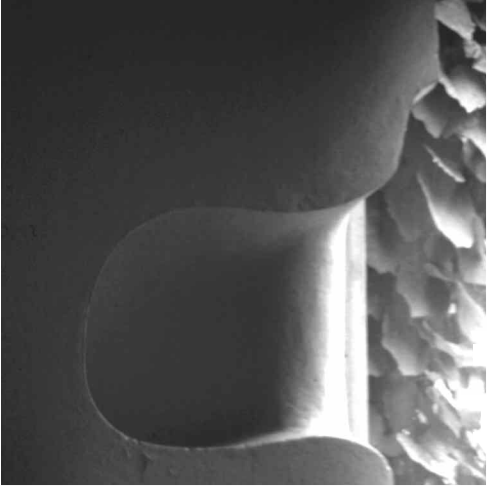
studies of the natural contours of the hand revealed the geometric relationships of opposing curves



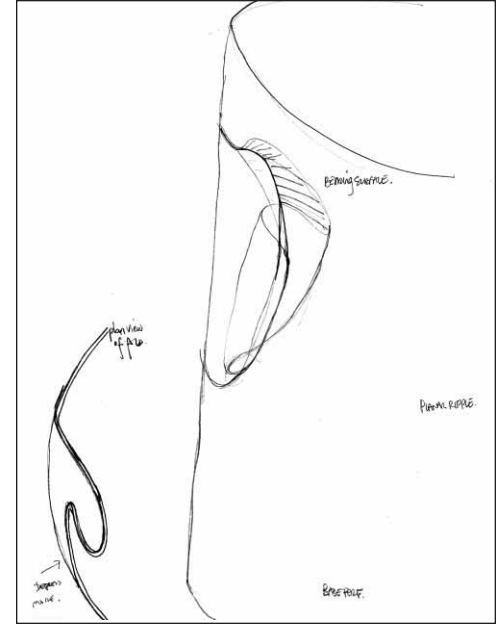
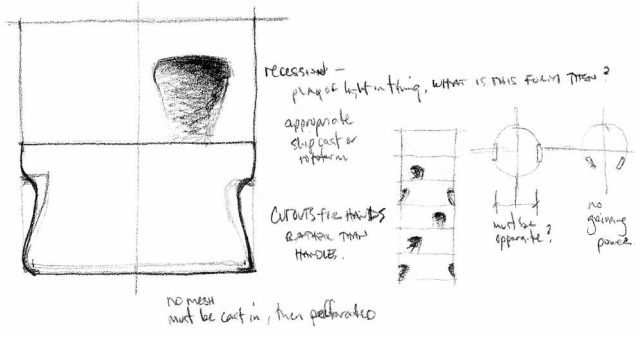
Intersecting Platonic Solids Study:

to provide a base of knowledge for the development of an organic handle.

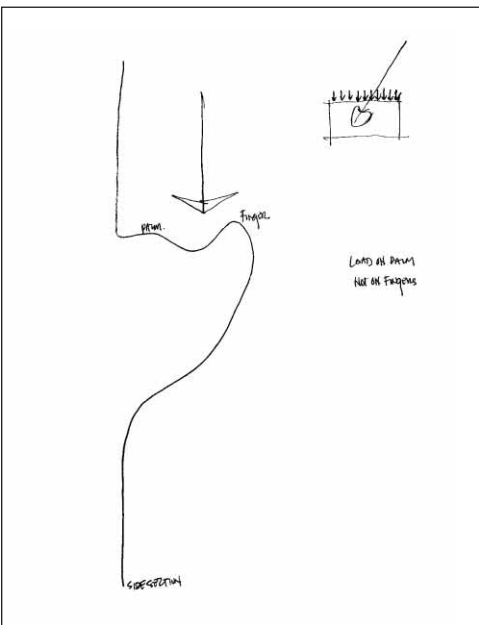
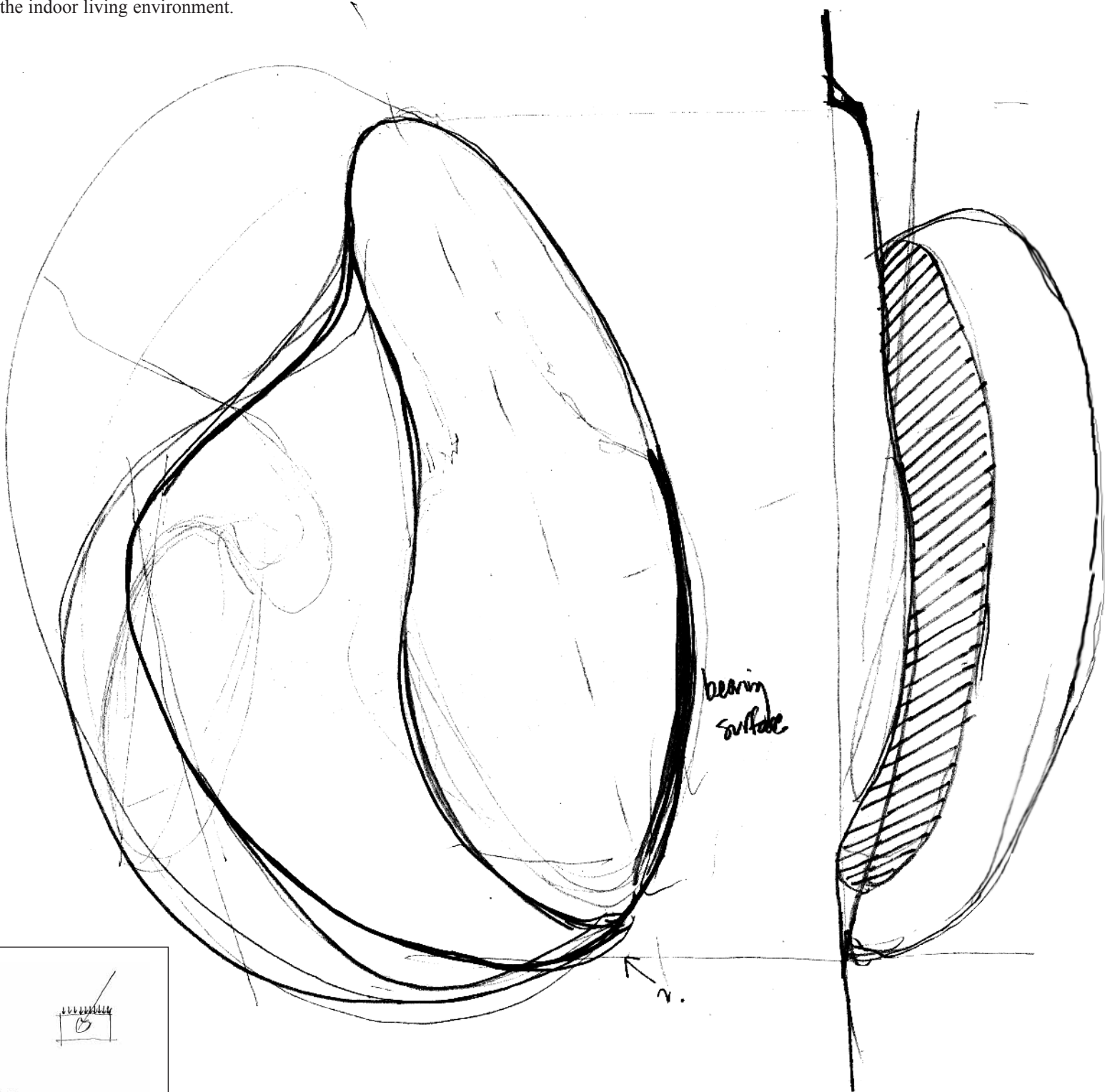




aalto villa mairea



The handle is an opportunity for the tower to become a sculptural element in the indoor living environment.



The VermiTower works as a composter using a simple shuffling of modules. The quantity of waste production determines the number of modules necessary, as shown in the product instruction sheet.

VermiTower Use

what you can put in your VermiTower:

- trimmings from vegetables and fruits
- baked products (limit bread)
- coffee grounds and tea leaves
- cut flowers and foliage
- egg shells
- cheese

Determine your waste production:

apprx 3.5 lb/wk (VermiTower starter kit, 3 bins)
2 non-vegetarians, eating dinners and weekends at home

apprx 7 lb/wk (VermiTower family kit, 5 bins)
4-6 person household, eating most meals at home


Getting started:

- vermitower kit
- bedding (shredded newspaper, office paper or torn corrugated cardboard)
- worms (coupon for redworms provided in kit)
- a handful of soil, preferably slightly sandy soil
- organic waste (see chart at left)
- a warm climate controlled environment, like your kitchen !!

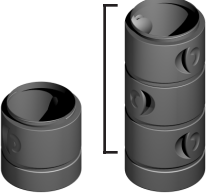
Instructions:

- (1) Assemble tower, filling each bin with shredded paper.
- (2) In the top bin only,
 - A. Mist the newsprint with water until damp to the touch.
 - B. Bury about a cup of organic waste in the bedding.
 - C. Sprinkle in a handful of soil.
 - D. Slowly add the worms; they should wiggle down into the bedding, away from the light. (Worms don't like light.)
- (3) Cover the top bin with the top/base piece.
 Keeping the unit closed will keep flies out and maintain a steady temperature within the tower.
- (4) Every few days, bury more organic waste in the bedding.
- (5) About every 10 days, depending on your waste production, you will need to "turn" the composter. (See illustrations)
 - A. Remove the "top" and rinse if dirty.
Place piece on floor. This will now be the "base."
 - B. Transfer all bins, as a stack, except the bottom bin to new "base."
(The bin containing the worms should still be on top at this point.)
 - C. Place the remaining bin on the new tower.
Bury about a cup of organic waste in the bedding.
The worms will migrate to the new food.
Use the runoff water in the "base" to fertilize houseplants.
(This organic fertilizer will not "burn" even the most fragile plants.)
 - D. Rinse the "base" and use now as a "top" to cover the tower.
- (6) Repeat step 5, shifting the tower, until it is full; (apprx. 3-4 months)
You may shift through all of the bins many times before it is full.
- (7) As castings are produced, gently shift the bin side to side to sift out the fresh soil.
Or wait until the tower is full to shift out the soil.
Use the soil for top dressing your houseplants or garden (as solid fertilizer) or mix with sand or vermiculite to make a fresh potting soil.


(5A)




(5B)

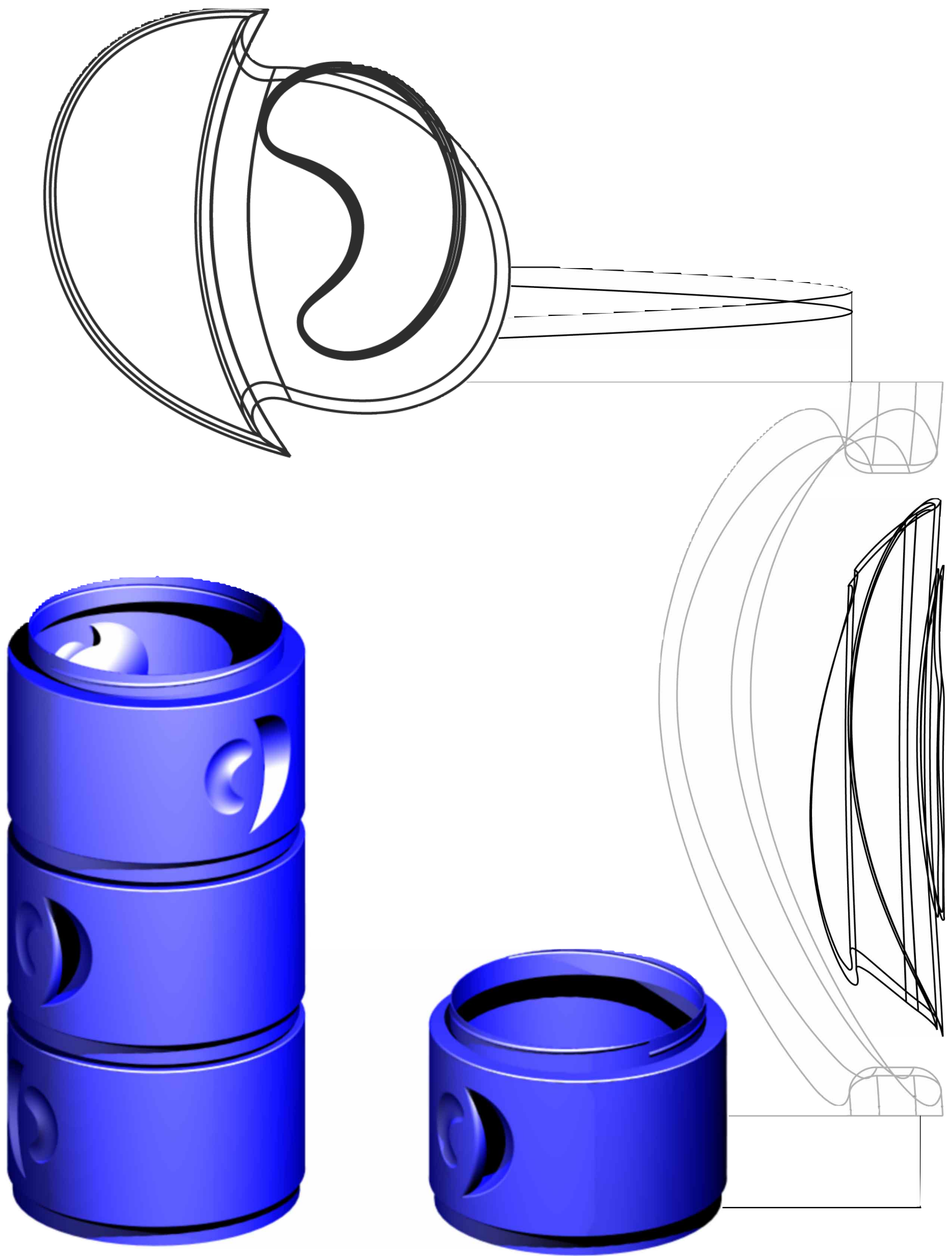


(5C)



(5D)



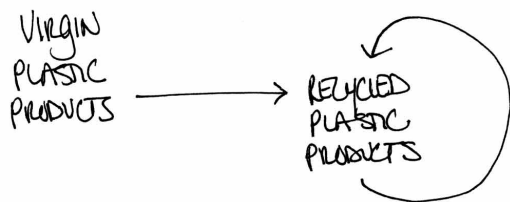


“EARTHWORM CASTINGS”: (20th cent.)
 (1) the finest form of humus known (2) when compared to topsoil: 5x nitrogen, 7x phosphate, 11x potash, 3x magnesium (R. Rodale)

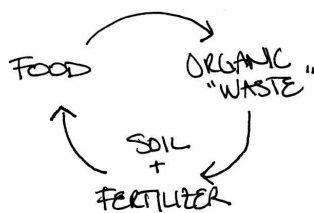


evaluation of the product

LIFECYCLE OF PRODUCT



USE OF PRODUCT



The VermiTower demonstrates that product design can support sustainability issues. The product follows a cyclic model, both in its resource base (recycled plastic) and in its productive life (the conversion of solid organic waste into humus and “compost tea” fertilizer). Economically, the product is affordable, attractive and easy to use and maintain. The product opens a new market for apartment dwelling individuals concerned with gardening or environmental impact. The system is a touchless and sanitary system. It is modular and therefore expandable to meet future needs (or shrinkable). The scale and weight of the modular bins, even when full, is ergonomically successful, as are the molded in handles. If a consumer tires of their pet worms, the bin can simply be recycled back into the plastics stream.

There is the potential for the VermiTower to be redesigned to allow for package-free shipping. The VermiTower would then be “sold” on a lifetime lease, making the manufacturer the true owner of the product. Potential consumers might be persuaded to purchase by the returnable, “money-back” guarantee that the design allows for and encourages.

The VermiTower as a commercial product still needs field testing. The quantity of soil produced by the system is unknown. Future full-scale demonstration and testing would reveal yields. The quality of the humus depends primarily on the waste put into the system, although all humus is excellent organic fertilizer for any plant. (It will not “burn” as synthetic fertilizers often do.) A bag of commercially marketed worm castings costs \$3/lb; synthetic fertilizers cost \$8/lb and harm natural water and soil systems. Odor is also an unknown factor. Most research shows that a ventilated and properly cared for vermiculture environment will not smell.

As a first attempt at a design that satisfies a demanding sustainability program and ethic, the VermiTower production process does not satisfy certain social issues. The tower is made from recycled plastic, rotationally molded in a factory far from the point of purchase and use. The terra cotta model satisfies this criteria more successfully, although increases cost and limits marketability.

The VermiTower successfully marks the first point of an industrial designer’s challenge to work within an ethic that aims to support sustainable ways of living.



CONCLUSION



(decay)