

THE SECRETS OF THE TRADE  
HOW I DO THAT  
ALL I KNOW ABOUT TOOLS, MATERIALS

**Sculpting tools**

**Structure=armature**

**Principals of the structure**

**Correlation between structure and mold/casting – wooden structure for the sand mold,  
metal structure for the lost wax.**

**Clays Waxes**

**Pre-foundry and after**

**Sculpting tools:**

The choice of modeling tool depends on the materials to be used for sculpting

Clay loves wood

Wax prefers metal

Oil-clay loves both.

Clay with grog or fiber doesn't like

the tool with teeth

and

doesn't like its surface to be touched twice,

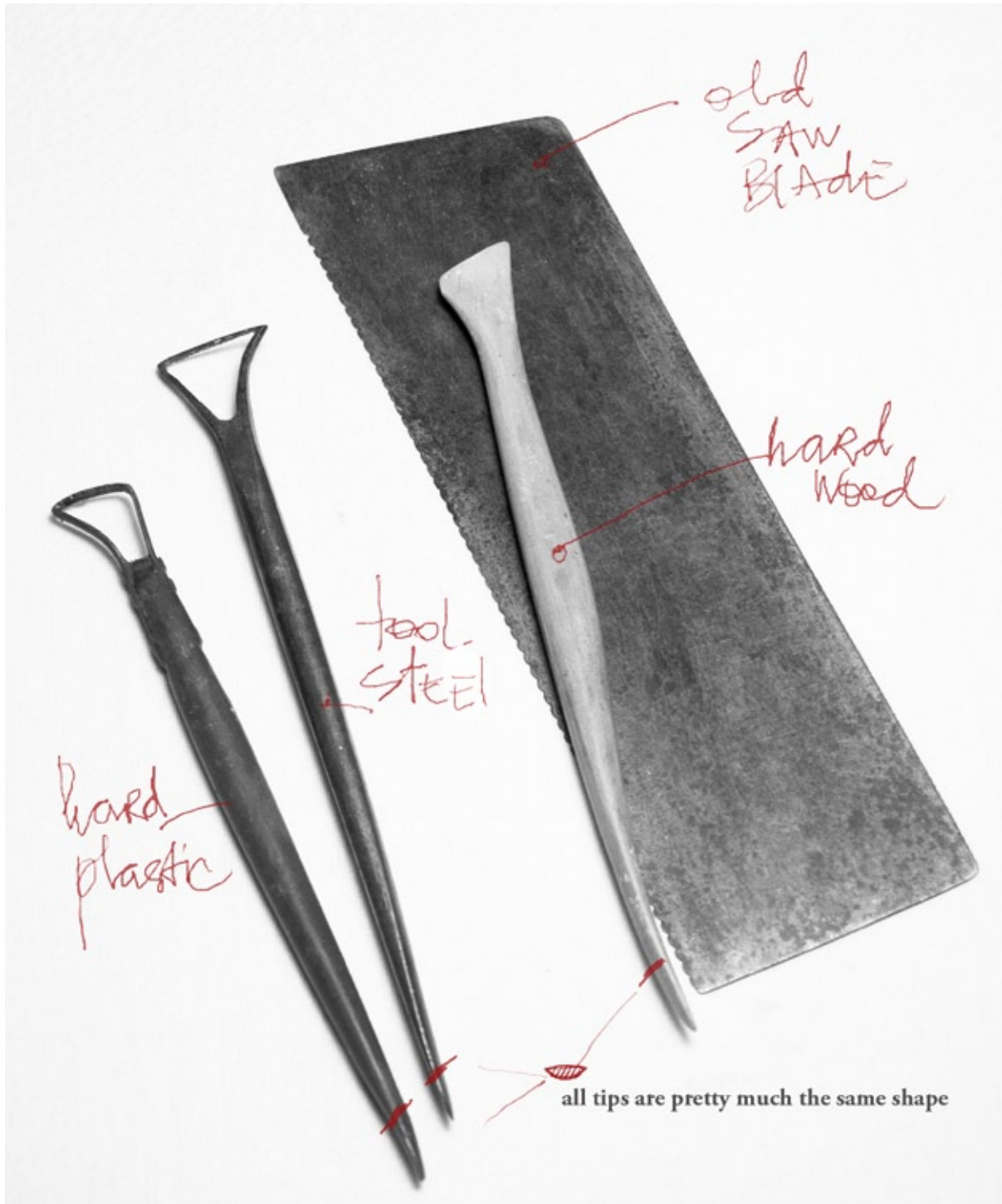
oil clay and wax do.

Hard wax loves sharp teeth.

Wood for the modeling tools

should be hard and

steel should be hardened.



old  
SAW  
BLADE

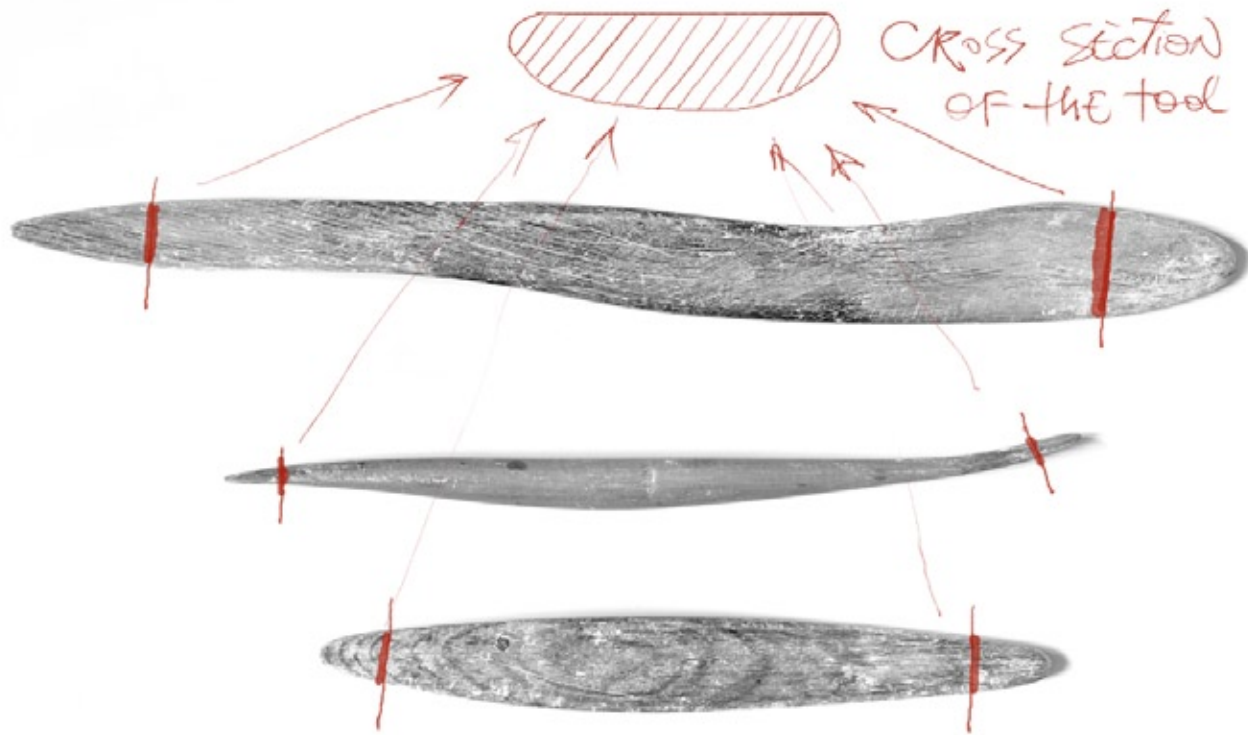
hard  
wood

tool  
STEEL

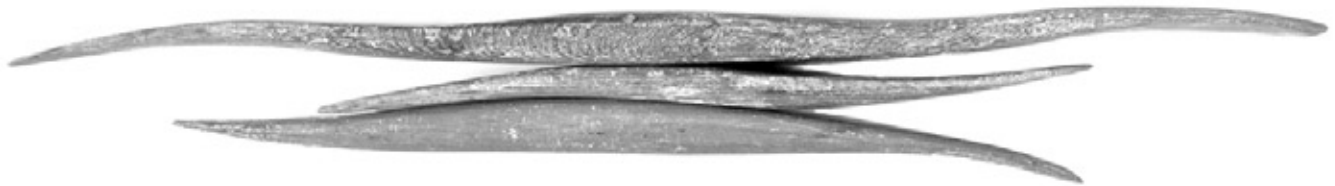
hard  
plastic

all tips are pretty much the same shape

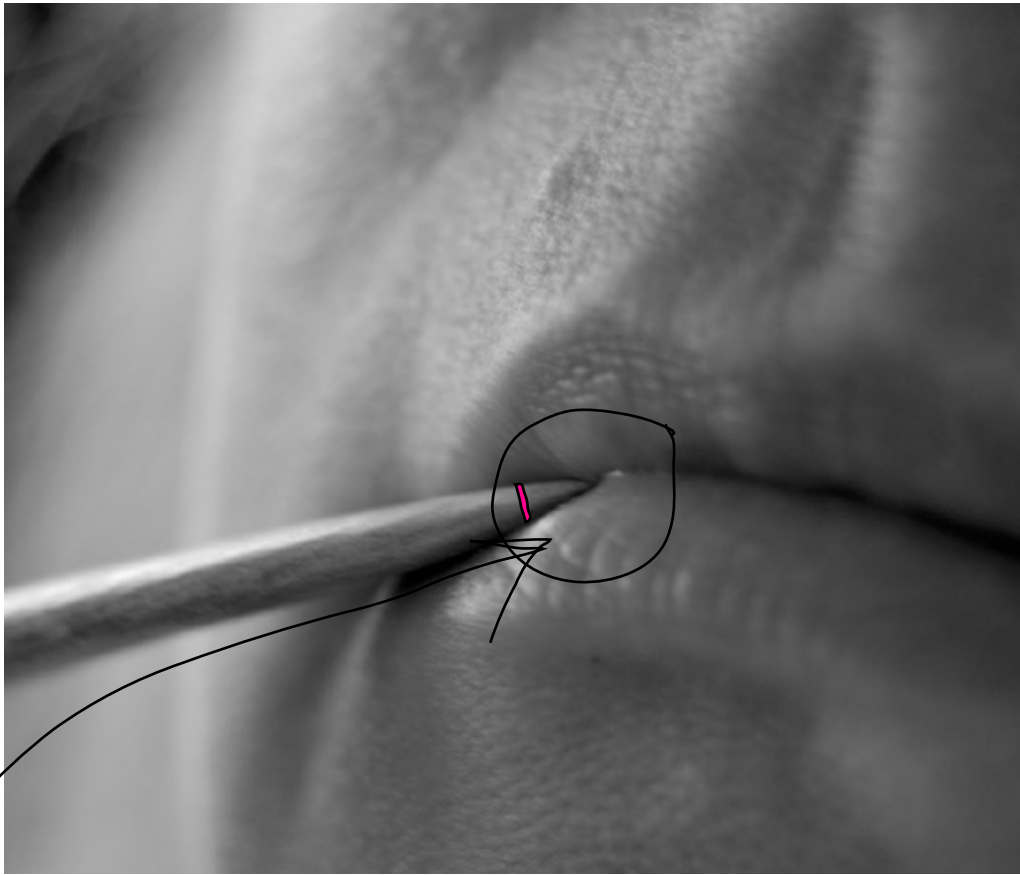
There is a little trick in having the tool just right,  
you can do it on a flat hard surface with a sand paper.  
It is very important, that one of the working sides of the tool  
is flat so there will be no digging on the surface of the sculpture  
it will actually behave as a planer when you'll pull it across the surface.



SIDE VIEW - SAME TOOLS



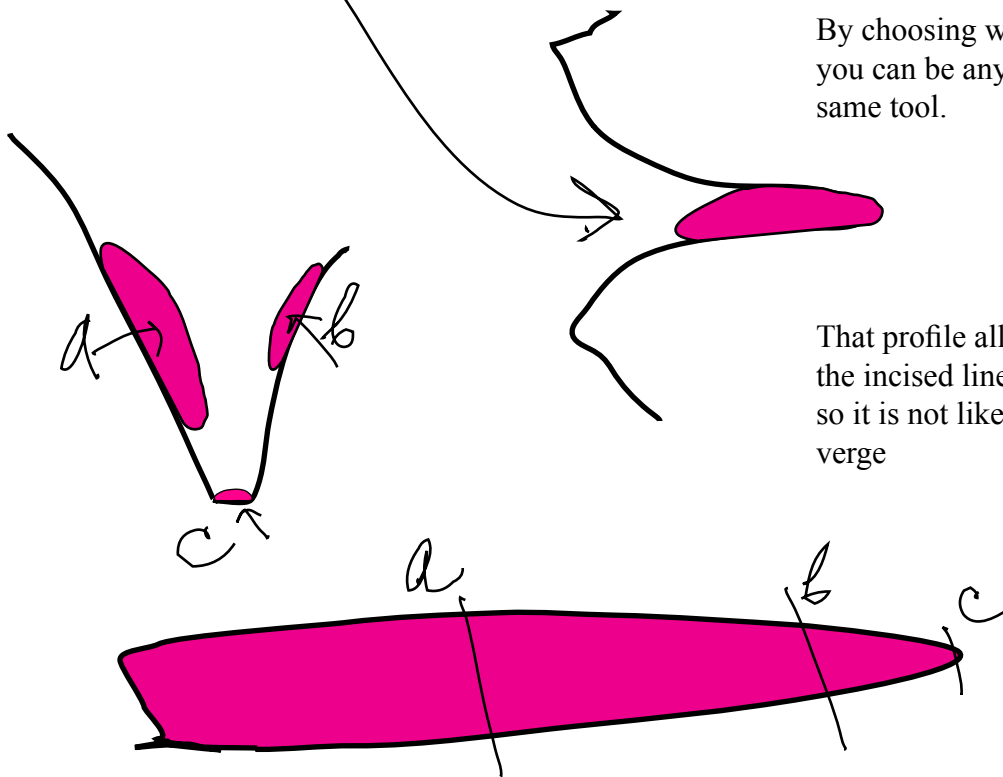
You can buy tools, customize= modify them if needed or make them yourself.



In cross section it should always look like a canyon with a river bed in between.

The "river bed" effect can be observed in any form or part of the form (nose meets face, corners of the eyes, or mouth, etc...) That little trick allows the light never to be trapped and no line will ever look like a deep painful cut on the surface of the sculpture.

By choosing which part of the tool to use - you can be anywhere on the form with the same tool.



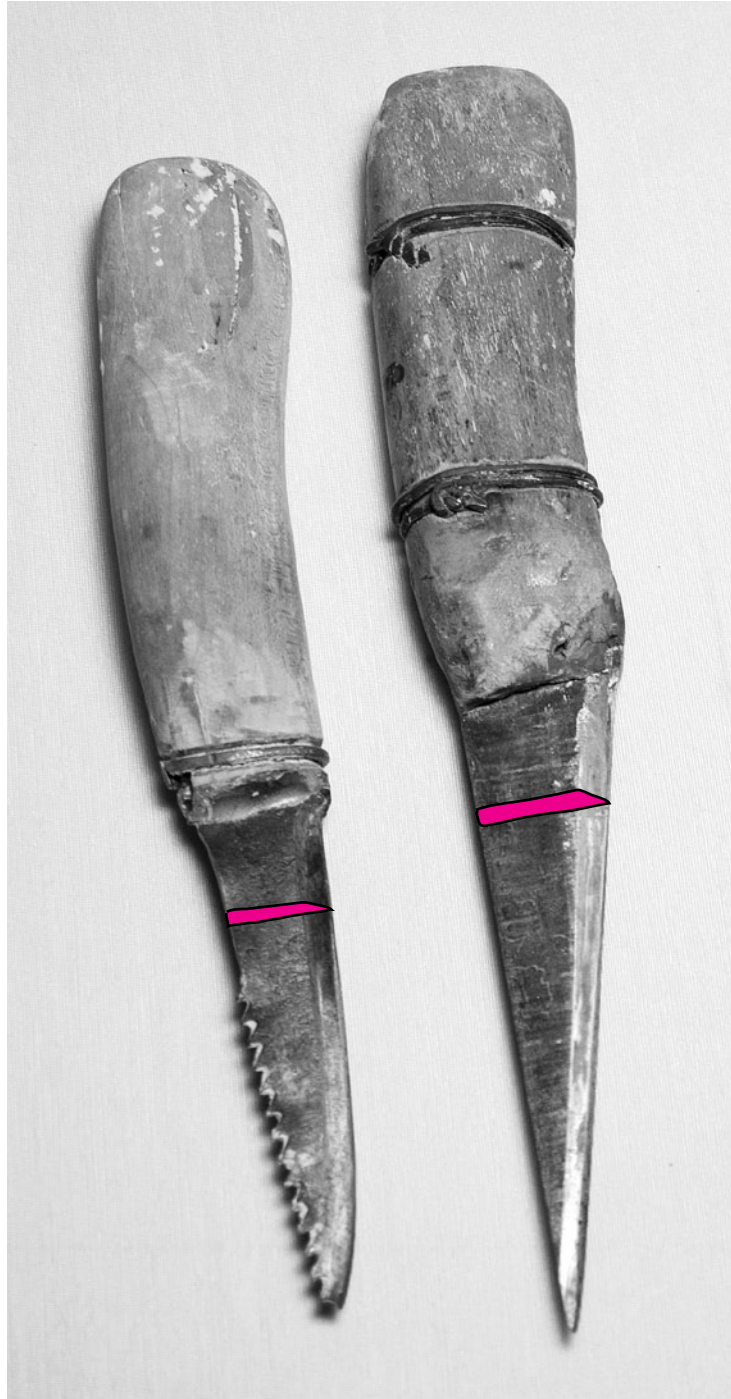
That profile allows to sculpt the bottom of the incised line so it is not like a cut but as two shapes converge



Sometimes tools are very simple: 2x4s have been planed and sanded – that's it

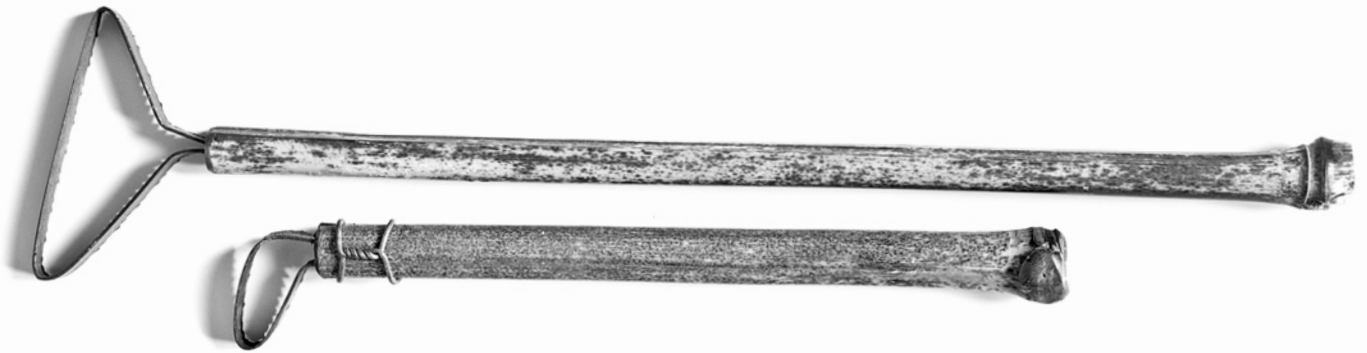
I have a weakness – knives.

These knives are for work with plaster. They have thick blades, very sharp cutting edge and they stay sharp. Both are made from old heavy saw blades. One side of the blade is flat.

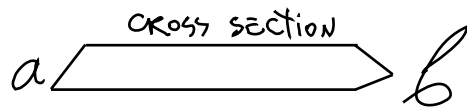


These are for wax and clay,  
they have thick, not flexible, stiff blades

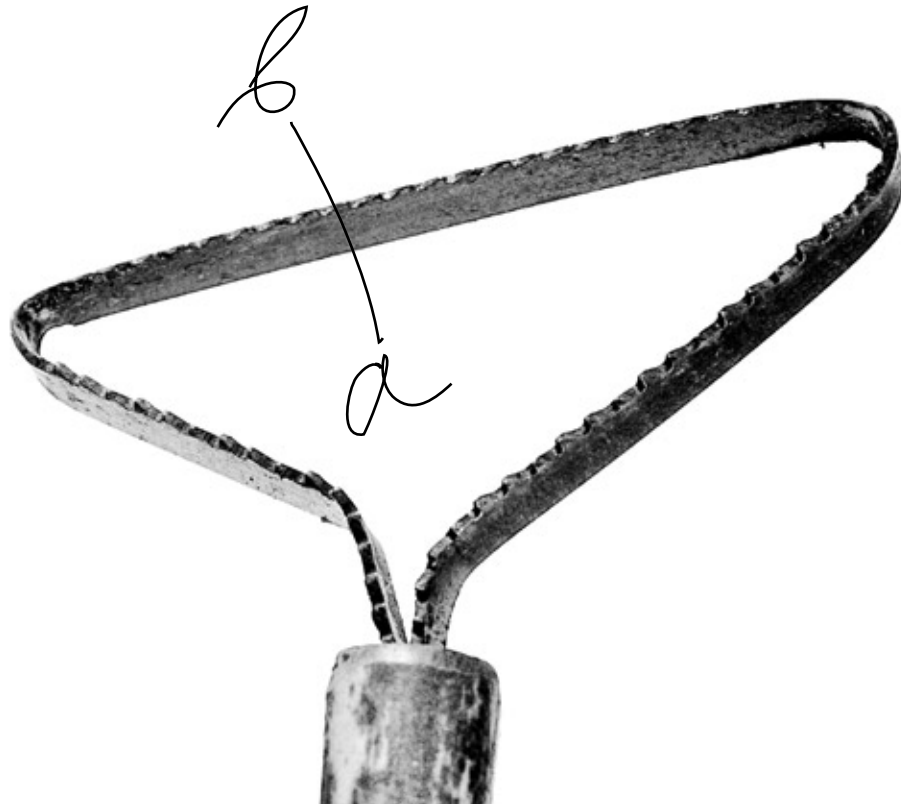




**Sculpting loops** – are made from the bend saw blade



“a” is absolutely flat edge, I sharpen it so it cuts better the uneven surfaces; becomes like a wood planer  
“b” is original tooth of the blade which I sharpen from both sides to make it feisty.



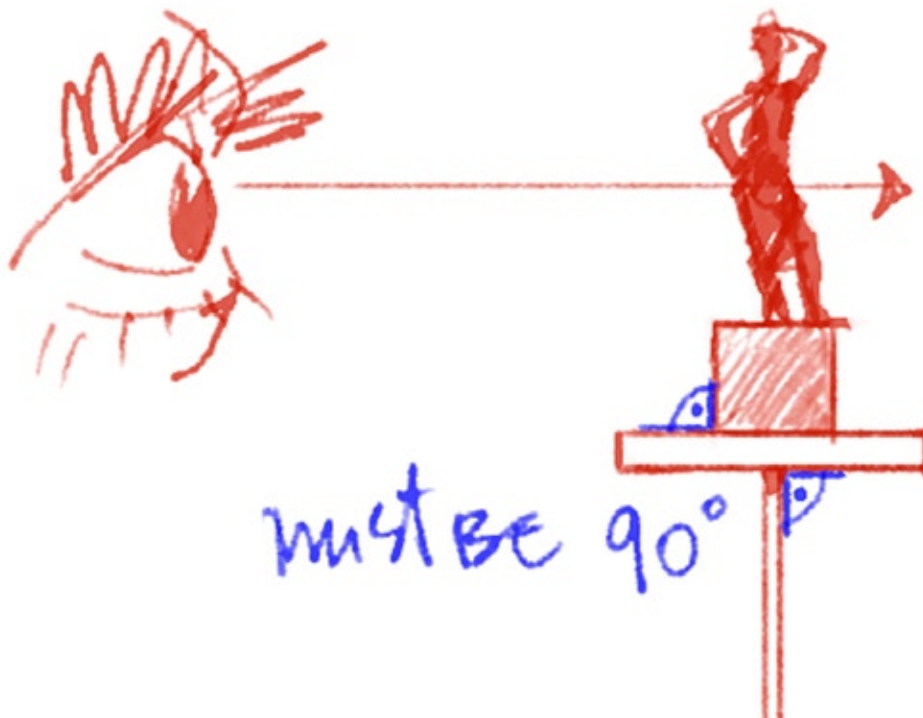


## Modeling stand

- must have a free revolving top. If it does not, then “lazy Susan” is the easy way out.



The bottom of the sculpture base and the top of the modeling stand must be absolutely at level. Any deviations from zero and you are bound to fail the sculpture.



In monumental size  
The bigger the sculpture the greater is the danger of being hurt.

**Structure=armature**

**Principals of the structure**

**Correlation between structure and mold/casting - wooden structure for the sand mold, metal structure for the lost wax.**

When designing your armature  
Flexibility, openness of your mind,  
simplicity of the obvious – are the keys!

Sculpture is a structure and should be approached as one.

A **structure** must exhibit three qualities :

firmitas, utilitas, venustas — that is,

**durable, functional, beautiful.**

Vitruvius

(Marcus Vitruvius Pollio. fl. first century b.c. Roman architect and writer.

His De Architectura is the only surviving text on ancient architectural theory)

You don't start the house from the roof, do you?

Sculpture starts with the foundation too.

You have to understand (have a clear picture in your mind) and talk to the foundry about the preparations of the work for casting, especially the big one. The internal structure-armature depends on the approach you will take in molding and preparation for casting.

The way you will mold and cast – rubber mold, wax or sand mold – dictates the plastic of your sculpting.

Sculpting for rubber mold and sculpting for sand mold are very different.

If you will mold in rubber you don't have to worry about the original, and you can use steel for the structure.

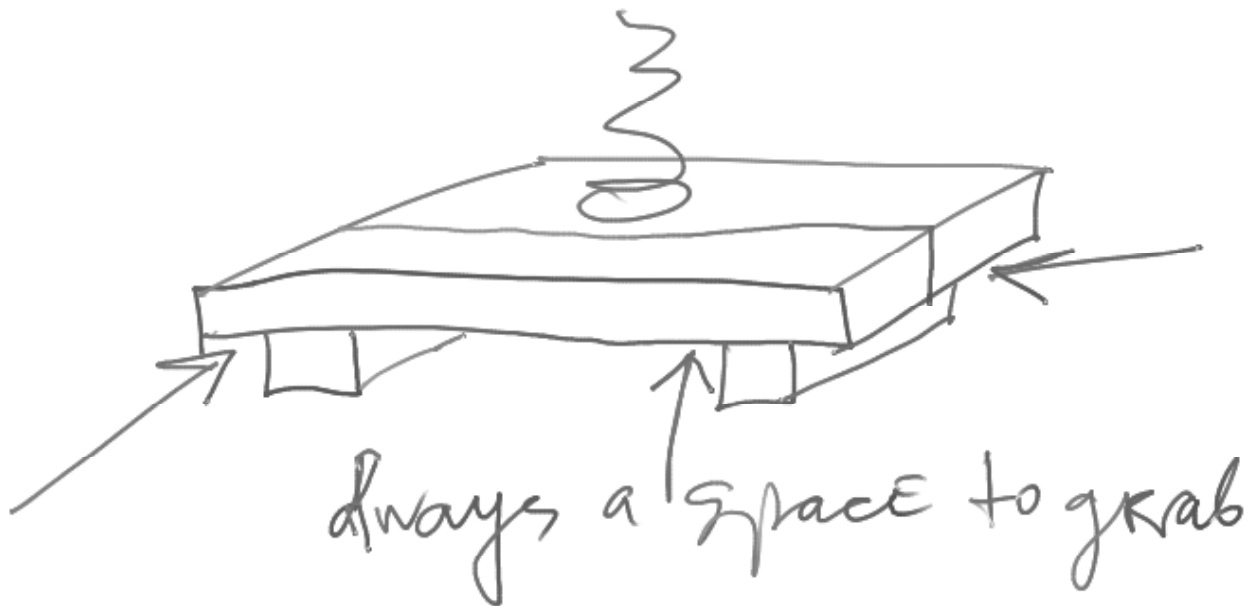
If it will be the sand mold, you should consider the type of clay/wax for sculpting and the wooden armature instead of steel, because most likely you will have to cut the original in order to mold it in sand.

## Base

I like things simple,  
easy to make  
and of pleasant proportions of their own.  
It can be wood, plaster, metal or any other material of substance,  
able to carry the forces of weight, height and sculpting.

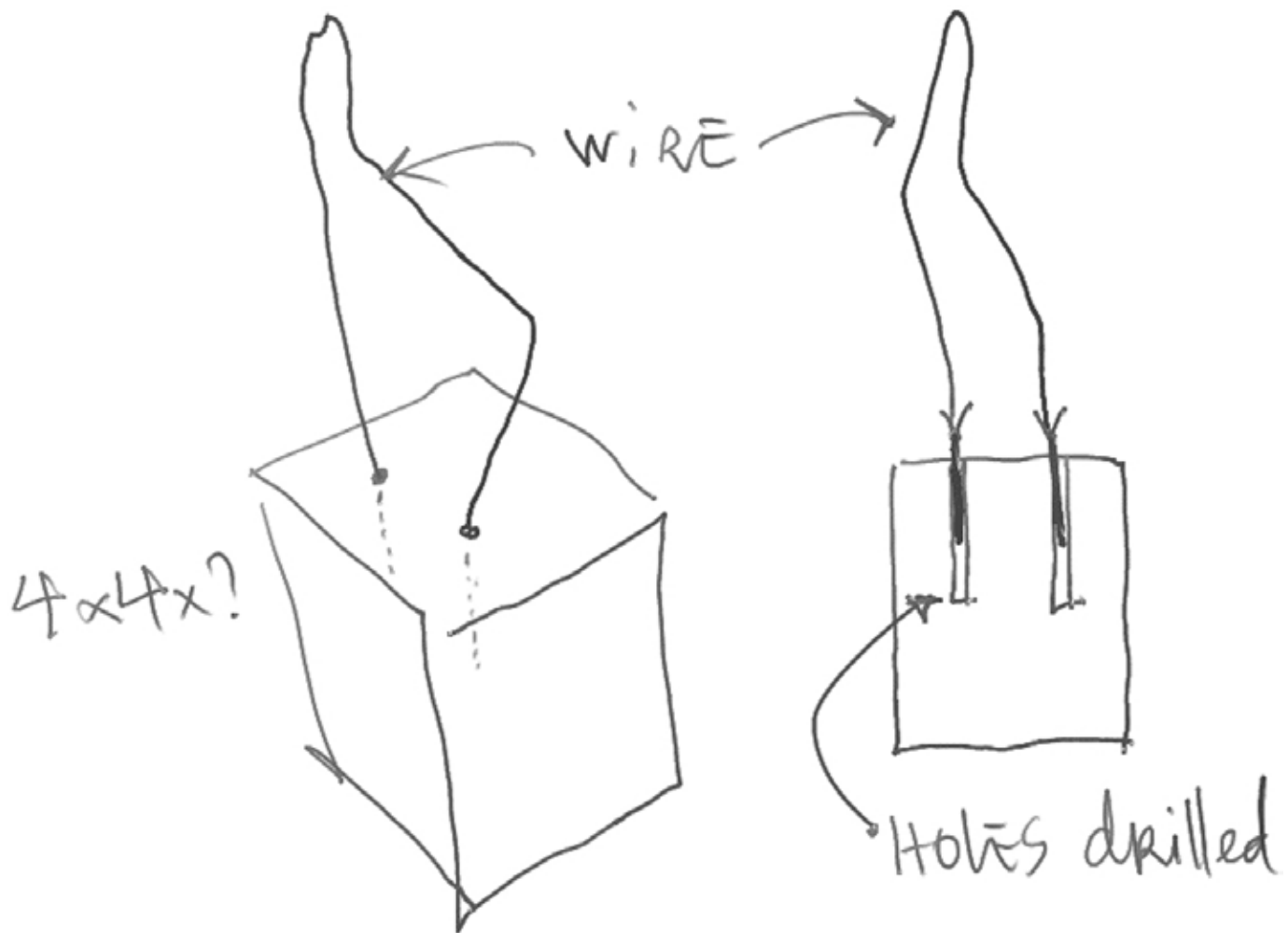
Remember,  
you will  
have to move it,  
which means  
you must have access to it,  
to grab, pool, push, turn, lift, roll ...

It is a good idea to have heavy-duty wheels under working tables,  
It will become very heavy, very fast.

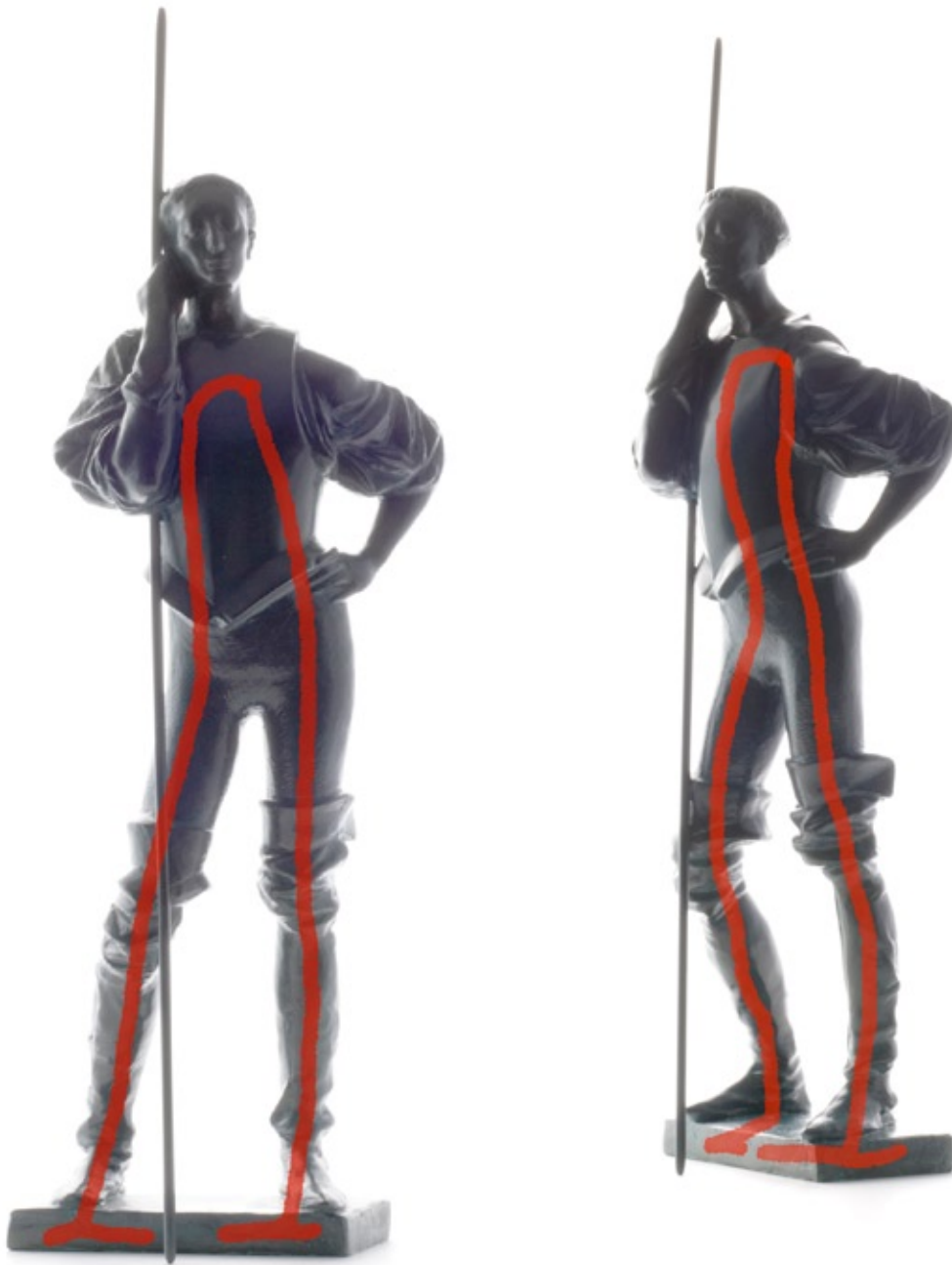


## Armature:

Steel, brass or bronze rods from 1/16 "in diameter (is good for up to 12" high) to a thick wall structural steel pipe, has to be properly attached to the base, which should be accordingly chosen for the mass of the future sculpture.



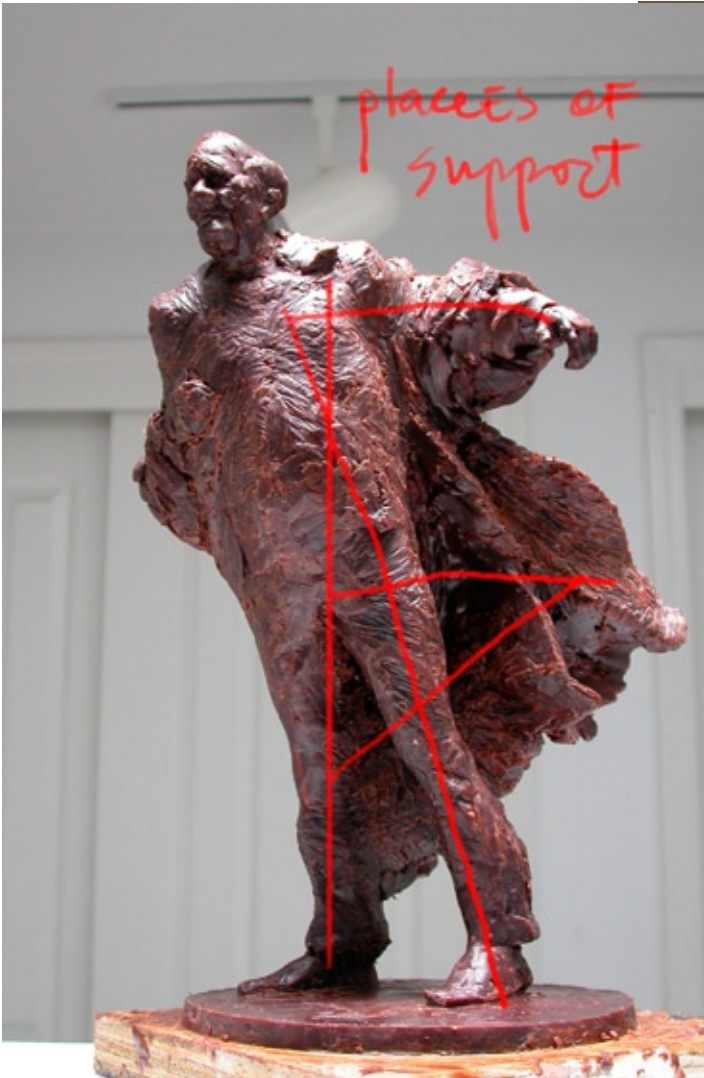
Here is an example of how I make a structure for a sculpture up to 20" high, using a wire - steel rod from 1/16 to 3/16 in diameter.



Red represents the simple 3/16 steel rod for the 20" high sculpture imbedded in to the plaster base.

## Wood

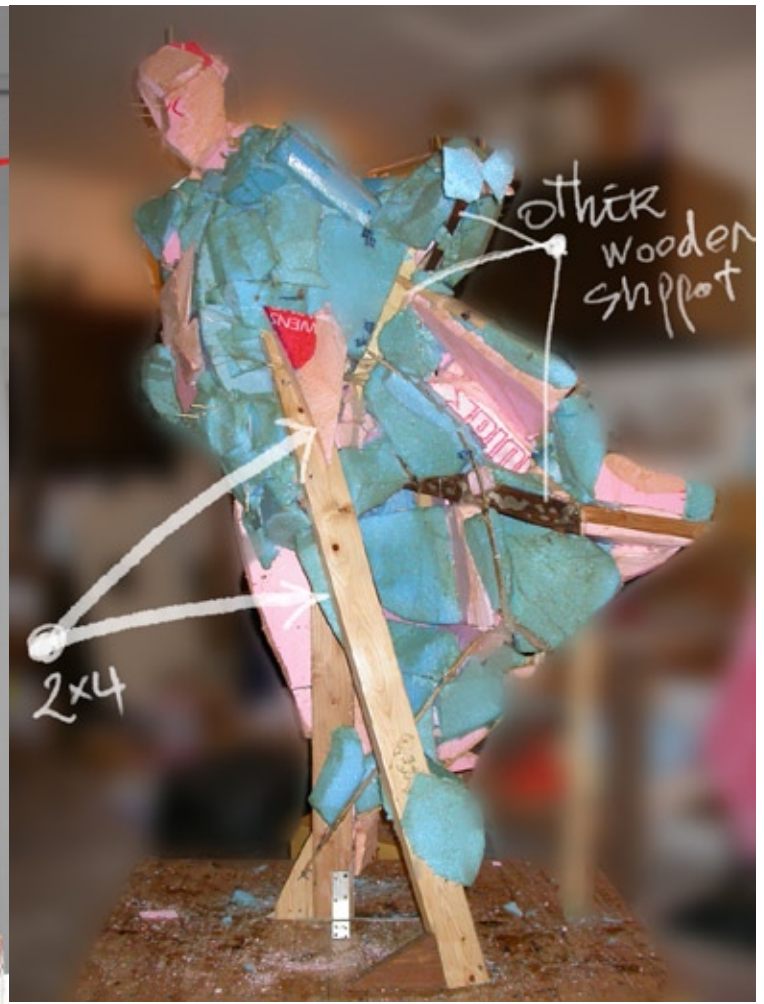
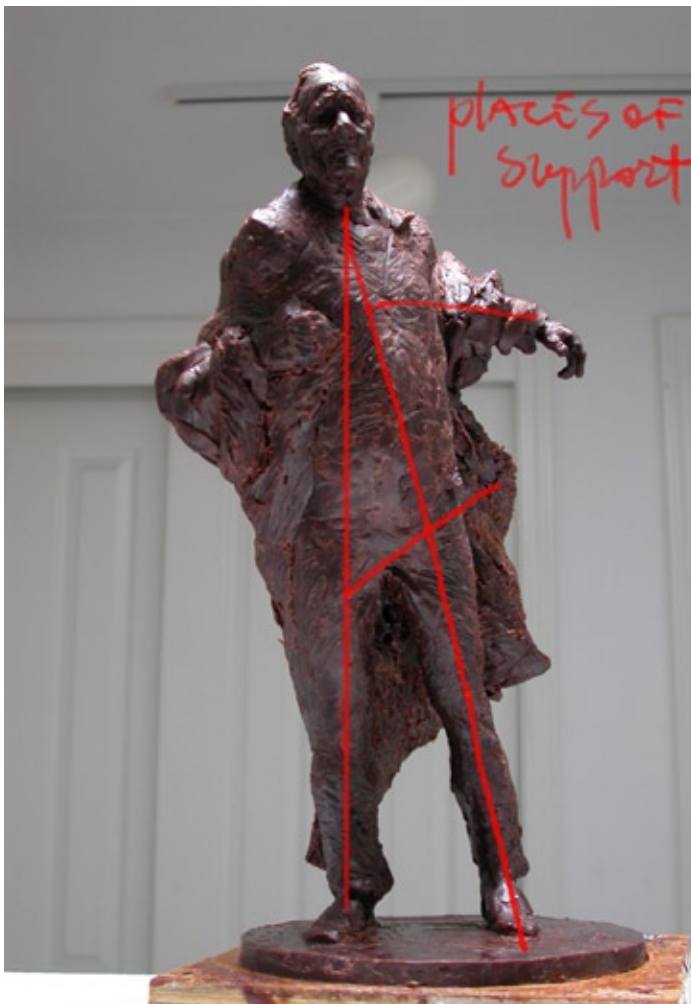
2x4 or any other structurally proportioned studs attached to the base in a construction manner



this is 9" tall model



this is 7,5 foot tall monument to be



Visualizing position of the carrying structural vertical is crucial, but usually obvious, the common sense is a good adviser.

For the **Life size** sculpture and over life size, have an engineer make a calculation for the necessary structure and foundation - **it is liability.**

**Clays, waxes, plasters, wood, stone - strength, plasticity, brittleness, purpose, size of the project, juice of the idea, tightness of sculpting...**

**The color of the clay-** it is important to understand that the color and tonality of the modeling material impacts the perception of the size and volume of the sculpture.

Lighter clays inflate existing volume.

You will be surprised when you see it in the wax,  
even more in bronze.

It will look much smaller.

The darker color clays,

from grey to brown to black

are more like bronze in tonal appearance,

still

bronze will look smaller... I think it's the density of the bronze.

If the final material for your work will not to be bronze,

think about the consistence of the appearance from the very beginning.

**Plaster** - is one remarkable material, you can pour it in to the mold, you can sculpt directly with it.

You can use all kinds of tools

I mean all!

...from hand to spatula to rasp to axe.

It allows you to reach a surface tension and tightness of the form which is still breathing, even when it is absolutely polished.

It is pores but brilliant,

it reflects light and carries it in itself.

You can sculpt small and very big with it. Great!

Some works can be only in plaster.

There is something alive and holy in the white breath of the plaster.



**Water clays** – are the most sensual material, have the most soul, character and mood. There are multitudes of kinds and varieties. Water clay for me is only a raw material to sculpt with, not to turn the sculpture into a ceramic. You have to try a lot and have an arsenal of them for the different applications.

For example:

the portrait of a young lady - not for a groggy clay,  
but an old sailor with the seabeaten face – might be.

The **viscosity** of the clay is in the origin of the clay's body plus water,  
it can go from a soup to a dough,  
to an old bread.

You pick,  
match to the idea  
some are build of rocks some of dandelions.

If  
you want to sculpt slow,  
a tight portrait,  
you will need the clay which holds the water well,  
doesn't get tired fast,  
has a nice tack  
or  
you might consider switching to the oil clay (plasticine).

If  
it has to be a fast expressive work  
you pick the clay  
with a kissing touch,  
not intended to be touched again,  
leaving the experience of sculpting  
as a witness of your passion,  
exposed.

For some reason people are hesitant to leave the work fresh  
as it is,  
want to run and hide the tracks of hard intimate work.  
Instead,  
they sweat slick "clean, appropriate" finish  
to imitate the look of ...what?  
reality?

what a waste!

Water clays I like and use, are "Little John", "Akio" made by Clay Art Center in Tacoma WA,  
very knowledgeable staff, always open to help. [www.clayartcenter.net](http://www.clayartcenter.net) 1-800-952-8030

## **Wax**

Sculpting in wax delivers a certain level of crisp density which is not attainable other ways.  
There are multitudes of waxes out there.

I buy at

<http://www.arizonasculpture.com/>

hard Microcrystalline Wax 2-AB150 and soft Microcrystallines Wax Amber,  
mix them in a slow cooker - different hardness and plasticity for the different projects.

My mix is very hard when it cools. That allows working it hard with harsh rasps and files, which are usually used on wood and plaster.

I just came across the coveted wax, which I have not seen forever – it is made now by “Remet”  
[www.remet.com](http://www.remet.com) - named “Optimus 3.0 Microcrystalline Wax”- dark, juicy, sticky enough not to gum fingers.

## **Oil Clay**

I use J.F.McCaughin 2-AB210 – it is buttery, dark brown, firm, hard clay, great for challenging complex compositions spread throughout the space,  
heats easily in hot water or microwave, stays warm for a while.

### **Caution**

**heat small** portions in seconds

DO NOT make it too hot

it will burn you!

## **Mold**

Mold making is the profession on its own.  
It requires understanding of the form and mold as one -  
that is experience.

It is NOT hard to apply the mold,  
it is hard to take it down,  
it is even harder to pull the wax out.

If you are not sculpting for a living –  
leave it to the mold makers.

## **Pre - foundry and after**

### **Understanding the losses of having the work cast in bronze:**

it becomes a different work

a different entity

it is not an original you had:

in clay, wax, plaster, wood, stone...

not anymore.

It is bronze now,

different color,

different size,

different volume,

different density,

different presence.

That is the nature of the process,

there is nothing you can do,

adjust,

move on.

Shrinkage is unpredictable.

Edition means all are different.

### **Base or plinth**

- as a finishing touch? – Careful!

It is not a prop.

Do not worry about their's furniture-

Composition is more important.

In my humble opinion, the base should be the part of designing process from the very beginning.

It will influence the development of your composition you like it or not.

Better pay attention to it right away or you'll miss the ship.

## **When looking at the wax of your work before it goes to casting be aware:**

The **weight** – you'll be charged per pound, be sure the wax is reasonably thin, around 0.25” multiply the weight of wax by 10 – that is your future bronze.

The **shrinkage** – so it does not distort too much your original design.

If you have a box or a flat surface as part of design, it (box) will have concave sides – fix it by warming the wax and pushing the sunken side from inside out.

**All the angles**, tilt, turn, torque should be compared to the original design or the photos of it. It will be too late in bronze and it will be your fault, not the foundry!

I recommend **chasing the wax** yourself – nobody can do that better than you and do not cry when you receive the bronze and you did not chase the wax.

Talk to the foundry about **chasing** your work in **bronze**. Be very specific!

When **shipping** the **wax** use **3** layers of packing bubbles for your wax before you put in the box full of styrofoam “peanuts”. Do not pack “peanuts” hard, just shake it well and have the box fool.

**Patina** – is a bitch! It will change - give it up! Everybody ages. There is a saying, that the best patina is time.

I use the “TREWAX” for **sealing** my **patina** and “**stopping**” (you can not stop! just slow it down) **the patination process**, if I do. Sometimes, I like to let the patina live, it changes and it is beautiful to observe. Every foundry has their “patina man” and procedures. Unless you want to do it yourself, give the foundry a break. Tell them what you want and let them do it. Just be very specific.

There are colored waxes which used in patination and restoration . They are called “gilders paste” [www.gilderspaste.com](http://www.gilderspaste.com).

Lately become popular to use acrylic, silicon and other types of sealers (incralac, permalac) – I do not use them.