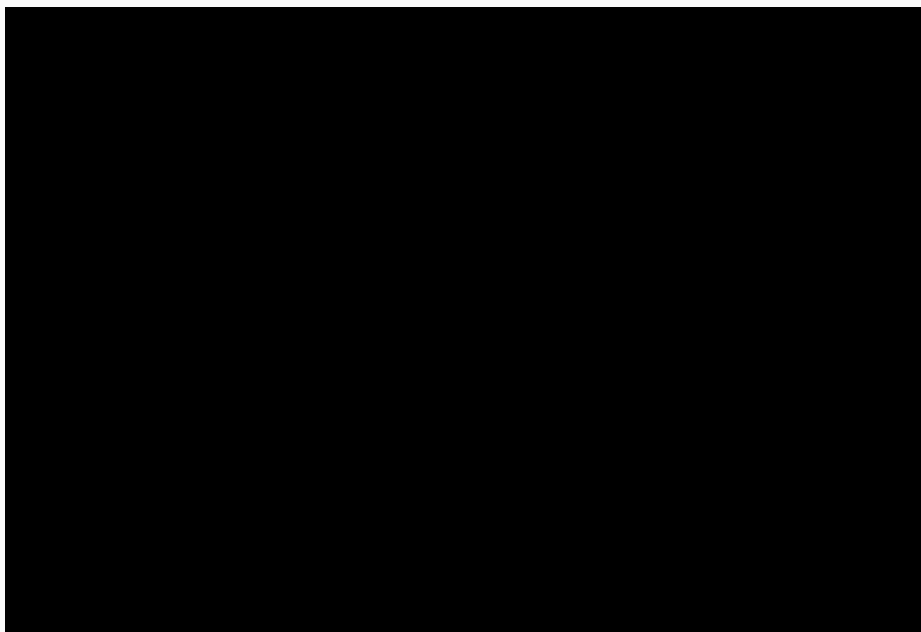


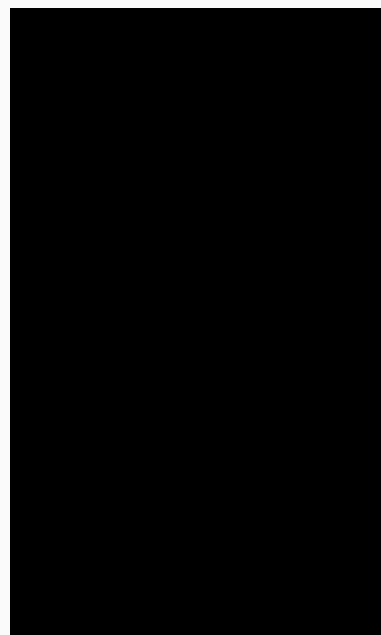
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## Hand Carved Quartz Crystal Skull

This particular project took approximately 250 hours, over a period of 2 ½ months from pattern to completed work.



### The Quartz Family



### Carving Projects

- ❖ Hand Carved Crystal Comical Viking Chess Set
- ❖ Hand Carved Smokey Quartz



This particular project took approximately 250 hours, over a period of 2 ½ months from pattern to completed work. Cut from a relatively clean block of natural Quartz rock crystal with a hardness of 7, and measuring about 8 to 8.5cm high, 6.5 cm across and a depth of 8.5cm with a weight of approx. .612349Kg or 1.35lb.

There were a few inclusions at the back which I hoped would disappear when cutting, but a couple on top I wasn't sure of their depth and hoped they would disappear through cutting. The overall shape of the piece was close to the hopefully finished project that I envisaged, so I decided that if the top inclusions were too deep, I would just have to live with it, because I was not going to sacrifice material just to cut them out.



The finished skull size is not quite half that of a human skull with dimensions of 8cm high front view from bottom of jaw to top of head, 5.5cm across 7.1cm depth and 16.579 ounces or just over 1lb in weight. The material lost to cutting was minimal as the original shape of the stone was close to the skull pattern. Many years ago, I read about and saw a picture of a crystal human size skull found in South America. This interested me and that's when the thought came that I wanted to carve a skull at some time in the future, along with all the other subjects I intend to carve, this meant I would have to live a few lifetimes.

## CARVING THE PIECE.

Crystal African Queen

❖ Hand Carved Quartz Crystal Endless Knot

❖ Hand Carved Clear Quartz Crystal Sphinx

❖ Hand Carved Jelly Opal Pharaoh

❖ Hand Carved Petrified Wood and Opal Cross

❖ Hand Carved Clear Quartz Crystal Buddha

❖ Hand Carved Quartz Crystal Skull

❖ Hand Carved Smokey Quartz Crystal Cougar

❖ Hand Carved Chrysoprase Crystal Green Frog

❖ Hand Carved Crystal Carvings – Various

At the time the rough appeared, I had no thoughts and wasn't even looking for a piece of rough for the skull. But as soon as I saw it, I knew that would be the right size and shape so this became my next project. I was fortunate enough to buy a plastic put-together replica of a skull and this became my model. Pictures were not taken during the carving of this piece as I never had a digital camera. So you have to forgive the drawings and the subsequent colour of the pictures of these drawings. They were only done where I was trying to explain a particular part. So I hope you can follow the work progress.



As you can see from the pictures one side was ok but the other was not flat and had a number of depressions. The patterns that I transfer to stones are not always a perfect copy, and sometimes I'm the only one who can see what it is.

When you transfer a pattern it should be on a relatively flat surface. However, the surface onto which this drawing was copied was not as flat as desired, so a lot of thought and studying was involved before the work actually began. One side was not too bad but the other side there were some deep dips and I had to make sure the size I was working to was not affected by those hollows. The surface was also not easily drawn on as the pen marks were similar to marking on shiny glass. The rough also had a lot of in and out depressions all over the material and when this happens, you have to be aware of how deep these are in relation to the outline shape. If they are too deep, this in turn makes the overall carving smaller than anticipated. You also have to keep in mind any distortion effect which may occur if the design is stretched. A flat surface eliminates this bend or distortion of the subject.

It was not so prevalent in this piece because the subject was close to the rough shape. When I transferred the pattern to the stone, wherever I could, some connecting lines were missing, quite a lot of lines actually, but I didn't want to flatten the surface – this would have meant a reduction in the over-all size. The first pattern was of the side view and this should always be done first. There are usually more distinguishing features visible on a side view than the front and it's only the outline shape we do first, not what's contained within. An important point here is that when you cut the side view first you can then put in a balance line down the front and back, and work from this line to cut the front and back views. Looking at the front or back, most subjects are balanced the same on both halves of this line, but they are not if you put a centre line down the side view.

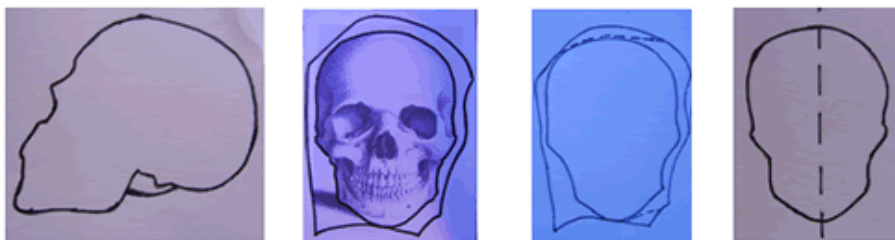


**Side view of waste material  
to be cut away and cut to  
outline with back section.**

So I began to cut to the side outline using the 6" silicon carbide grinders, leaving the part below the back of the skull until last. This area was rather bulky and once I cut this, the piece would not sit straight and I would have to hold it level to check lines etc. Once I cut this side view, other than the bulk behind the skull I could then evaluate the whole carving to make sure of the size. Being happy with the size and proportions,

I wanted now to cut away some of this back section before I went any further for 2 reasons. The first reason was that in this section there were a number of small flaws and although you could see into the material, I wasn't sure just how far they penetrated. And also this area had a couple of rather sharp edges that I wanted to remove before I had an accident. After only a short time working the piece it became quite heavy to hold and I was stopping to give my arms a rest every now and then. When the main grinding of this area was nearly finished I could not see if the flaws were completely removed. Putting a spot of oil on the cut section allowed a window into the stone and I could see that most of them were gone, just a few small ones which would eventually be cut away as they were just below my outline. As I proceeded to cut more of this back away, it began to have some kind of shape – at least to me.

When cutting to the outline on a carving they must be cut straight. Continually I was checking that I was cutting parallel straight lines and not going off course, it's very easy to stray and go offline.



**Pattern of opposite side/on front/on front  
showing side cuts/front with center line.**

The glass like surface was now gone from around the skull's side view (the front and back of the skull), and a line was easily drawn on the surface right down the middle of the skull front and around to the back. The balance line is actually a centre line, I have always called it a balance line because that is what it's for – to balance the carving and I like to establish this position as soon as possible. The line started from the back continued over the top, front, then under and joined itself again at the back.

All other reference lines on a carving come from this main line, so it's very important to establish its' position within a carving as quickly as you can. I could have drawn the front outline on this surface and begin cutting but there wasn't room for error, I had to make sure that everything was correct. From this balance line I measured and marked the same distance either side, going as far out as I could, this was going to be the width, the widest part of the skull. I had to be careful from now on, making sure everything was in its correct position. At this time it was a bit difficult because I had to hold the material and draw or measure any positions, and if I made a mistake it would take a lot more work to compensate for the error.



**Balance line down  
centre of face and  
widest part from side  
to side.**

A 2B pencil was used for all markings on the skull, the only oil based pen lines were the outlines and balance line at this point. If you use an ink pen all the time, you'll end up with so many lines or parts of lines on the material you'll get lost. Pencil lines are easy to remove if you make a mistake – oil based pens lines are not. I then ground the sides down from the front view to these marks and then redrew the side view. Because it still wasn't completely flat I could only draw sections of one side view but it was enough for

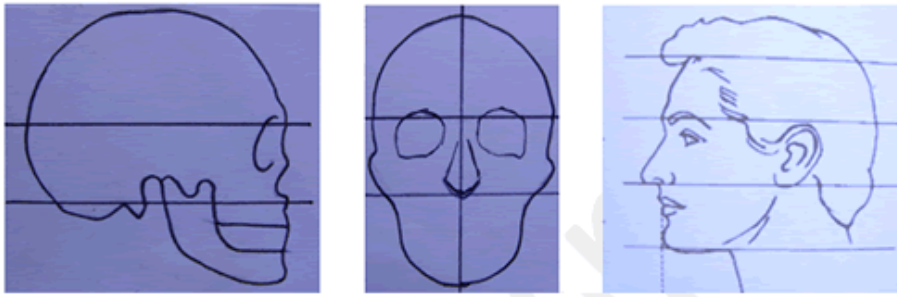
me to check where I was going. You can see from the drawing of the rough shape, there was not a lot to be cut away, a small section on top with the most around the jaw line and a bit on the sides. These outlines again had to be cut straight, so I had to lift the back section so the jaw sat on a straight surface.



**Front skull pattern showing material to be cut away.**

With the balance line in, I transferred the front view of the jaw onto the stone and cut from the widest part of the head to the widest part at the bottom of the jaw. From this width line, widest part of the skull, I roughly marked the position of the eye sockets and nose then I marked the position of the chin and again started to cut the rough away getting closer to the outline. The front side view (the face area) was redrawn many times and as I still had a bit of cutting to bring the stone even closer to the outline. I was still using the 6" grinders and not enjoying it one bit. Being extremely careful when putting in any lines at this point, because the piece did not have a straight base and I couldn't put it down and check. Holding it for drawing the lines and holding it for checking, just hoping they were straight. Any horizontal lines I had to make, I had to be sure they were accurate before I continued cutting, if I cut off too much, I couldn't put it back. Still working with the 6" grinders although they were getting smaller, I decided they now may be able to cut more from the side view under the jaw and back of the skull.

Playing with these grinders is no fun they are messy, dirty and quickly lose their shape. After a few times of truing the wheels, they no longer were 6" grinders but 4" wheels. The cutting I had achieved with the silicon carbide wheels showed they do cut hard material but it's at a price. But as these wheels became smaller they were able to reach into the smaller areas which I couldn't reach before. It must have been my complaining, but without going into a long story, I acquired a second-hand 6" diamond cutting unit. The diamond wheels are so much faster and cleaner and hold their shape, except – for the edges of mine. If I needed to cut into a certain area and the only thing that would get there were the edges of the wheels, that's what I used, otherwise the piece would still be sitting on a shelf. The size of the carving really called for the use of 8" wheels but I only had 6" so had to use what I had. I just might mention the edges of these grinders should not be used as I have, when cutting with any diamond tools the full area of cutting should be used. With the diamond grinders I was also able to round the back of the skull and the front of the jaw without too much trouble, now just keeping well away from the edges of the wheels.



**Balance Line down centre of face and facial thirds.**

Doing this work, I was continually drawing in lines as they were cut away but at last I had cut down to the side outline and now I had to mark in the positions the cheek, nose, and eyes on the face. I had to be as close to accurate as possible, if I cut them in the wrong position I would have to recut and reduce the whole skull to correct my error.

From the balance line down the front of the face I measured this into thirds,  $\frac{1}{3}$  from the bottom of the chin to the base of the nose the second  $\frac{1}{3}$  from the base of the nose to the nose bridge and a  $\frac{1}{3}$  from the nose bridge to the hairline. From the front these lines were extended to the side and thankfully they were in the correct position, and meet up with the side view of the nose, brow, and teeth. The side view was cut and showed the dips of the nose bridge, the base of the nose, teeth area and chin. The back of the skull under the jaw was also cut until I couldn't get any further. Throughout all this cutting, a close eye was kept on the balance of the piece as a whole. The front view was then cut as close to the outline as possible and everything looked fine and thankfully in the right positions and proportions. I again drew in the balance line and began to mark in positioning lines for the eye sockets, a circle to mark the nose location and a box type section where the teeth had to be placed. Within these frames I put a big X – these areas were not to be cut. At this stage I had managed to establish a resemblance to a skull.



**X marks the spots not to be cut away.**

**$\frac{1}{4}$  turn of skull.**

Having the subject facing me with all the facial positions marked, I turned it to the right  $\frac{1}{4}$  turn and was able to see what didn't belong. When you get to this point, you can see that there was too much material around the cheek, jaw and brow. I put striated lines on

these sections with a pen and then cut away the bottom section first, and repeated this on the other side always checking for balance. The same procedure was repeated with the top section then I did a ¼ turn to the left and did the same. This process was repeated on the back by ¼ turning it one way then the other. Slowly but surely the subject was becoming a skull and not just a nice lump of stone. At this stage the blockish appearance was beginning to disappear, I rounding the back of the skull and the front forehead section. This took quite a bit of time as I was constantly measuring and checking. The subject was now worked with a finer grade of diamond wheel and was checked for any flat spots. If any were found, these were corrected and when I was happy I moved to the next stage. When this was completed and after a bit more grinding on various other parts, the big grinders had finished their work and I had to reduce the tool size. The next tools I used were 1" (25mm) mizzey heatless wheels. These wheels are silicon carbide and I hated to retreat back from the diamond, but I had nothing that big in diamond. These come in rolls of 50 and have a hole in the centre to attach to screw mandrels. I could be wrong, but I don't believe they come in different grit sizes only different thicknesses. Working on material such as quartz they quickly lose their shape and wear down to smaller sizes. I have a vast number of these all different sizes.

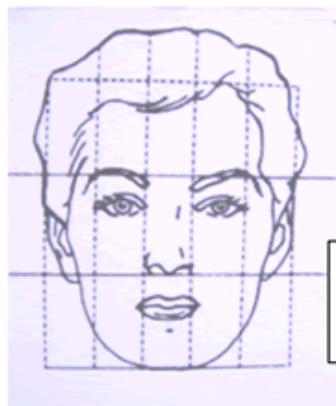
They are used with water mainly to reduce the dust, as they are marketed as heatless mizzey wheels. They are very messy – should have called them messy wheels.



**Mizzey wheels/A mixture of various sizes of mizzey wheels.**

Yet again I redrew all the lines on the surface of the subject and checked that everything was correct. Prepared my work space -a tray with water, a face mask, opti-visor, and began to work with the mizzey wheels. Back to the dirty mess these create I was pressing to finish with them and use diamond again. Eventually all that could be cut with these wheels came to an end and after cleaning the work area I was ready to start carving. Up to now all I had been doing was cutting not carving. Much like pre-forming a stone before faceting, doing the ground work enables the carving to start. CARVING: On the front of the face we have five vertical lines – facial 5ths, starting from the ears the face is divided into 5ths. The first is from the ears to the eye, the second eye to the nose, the third is the nose. Because I didn't have the ears I drew my third 5th in from either side of the nose base, then another 5th each side of that would become the width of the eyes. I drew roughly a large box with rounded edges for the eye sockets and when I was convinced these had been positioned correctly I continued.





**Facial 5<sup>th</sup>  
drawn in.**

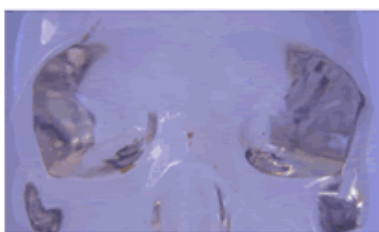
**The thirds of the  
face and the fifths.**



**Skull with eye sockets positioned.**

**Round diamond wheels and round  
cylinder heads.**

The first diamond wheel I began using was a ½“(about 12mm) round edge wheel. Because the eye sockets are large and take up a big portion of the face I wanted to have their position carved in and that would give me another reference for the rest of the face. The bottom of the eye socket should be about ½ -way down the length of the nose. Using the rounded diamond wheels to carve the sockets you have to be careful not to go over the outlines but just carve to them. The eye sockets are of course hollow but with a carving we carve them into the stone. Finding the center of the sockets I moved this centre slightly in towards the nose and repeated this procedure on the other socket. The off-centre for each socket had to be level and this was checked several times before I continued cutting. Doing this the sockets appear to move back into the skull and become closer together.



**The only pictures I have, are of the  
finished piece. You may be able to see  
what I mean with this picture – the  
sockets move back. If they were straight  
and not moved off center they would  
look odd.**

Moving the tool one way then the other and all the time checking that I didn't go over the outline socket, slowly the sockets began to deepen and widen. This center spot in each socket was marked and remarked when needed. These wheels can only go so deep and soon they became too big for this area, so I changed the tool for a large round head cylinder. This tool was used having the point of the tool on the off centre mark of the socket and leaning towards the outside socket lines, at no time was pressure exerted on the point, the tool was guided in a circular motion around this point using the cutting surface around the tool. As the socket became wider the circular motion was replaced with longer movements across the length and sides of the socket always keeping the center as the pivotal point. I moved from one socket to the other trying to keep the same action and depth for each, and also using the same tools. The centre points had to be checked all the time to ensure they were level.



If you are doing identical things, always take them to the same stage and use the same tools. If you use different tools for each, when carved they will not look identical. And never leave one done and the other not, do them together, you may forget the action you used on the first one and they won't look identical. Get to a point that each one is at the same stage of carving before you move onto something else. With a carving this size, if you get tired of doing a particular action or section of the carving, you can move to another part of the carving and your focus will return renewed. I did this frequently throughout the work.



**Straight edge wheels/inverted cones and cones.**

After changing to heavy duty straight edge wheels, I moved to carve the cheek bones, again checking their position and when sure began cutting them in. These bones are shaped along the side of the head, move up and form part of the eye sockets and skull

bone. Constantly I was evaluating various positions on the face and making sure before I cut anything that my markings were correct. When I wasn't sure about something, I would turn the carving upside down. Now this may seem strange but by doing this you have a whole new perspective of viewing and it's amazing what you can see is wrong, and then correct it.



### **Diamond straight edge wheels of various sizes.**

These wheels range in thickness and size and when needed these were changed to smaller or thinner ones, and when these became too big I used flat edge wheels always working from larger to smaller. The straight edged wheels and straight cylinders were also used in rounding the forehead, back and under the skull. Wherever there was a large enough area for these tools to work they were used. Care should be taken when using straight edge wheels, if concentration lapses and the tool held at an angle they tend to cut deeply. Next I moved to the bottom jaw showing where the lower teeth would protrude, the bone then going back and up into the skull under the cheek bones.



**Jaw and the teeth front view and side view.**

Then I began carving in the general shape and positioning of the teeth, both top and bottom separated by a straight line around and in the mouth. The teeth were also cut sloping out and from the gums.



This line was cut in by a small diamond saw being very careful not to go off line. To cut a straight line of this size and keeping it straight is difficult. I first drew the separating line with a pencil and when sure it was right, using an inverted cone began to cut moving along this line. Moving slowly and not cutting to any great depth maybe to 2mm I eventually finished and the line looked straight. Then using a small saw I went over this groove and deepened the line to maybe 4mm. I didn't want to cut too deep but deep enough to show the separation from the top and bottom teeth. If the initial depth line is straight the saw blade will have no trouble, if it's not, the blade will catch.



The saw and flat wheels were also used in other areas throughout the carving. As were a number of different tools that played their part, cylinders with flat heads and rounded heads, cones, flames, points whatever tool would do the job was used and always with water. The balance line which ran down the face separated the 2 front teeth. There are 32 teeth and they each had to be carved in and in the right position. I divided the teeth section into 4 areas - 2 on the top, one either side of the balance line and 2 on the bottom, either side and each section having 8 divisions, the teeth. Every tooth had to be even from one side to the other, the 2 front upper teeth were first drawn in and the rest were penciled in until I had all 16 in the upper and 16 in the lower jaw then I numbered them, and of course they each had a center line.



The teeth had to appear to come from the jaws, so gum (jaw) lines were cut in and the drawing for each tooth from that line down on the upper set and from the bottom up on the lower set but never going past these jaw lines. Concentrating solely on the teeth for the next 6 days, each tooth was cut and carved, first using the inverted cones for original placement then points and straight cylinders for the detail work. Each tooth

was cut in roughly at first then when satisfied everything was right, the finer detail was carved in by rounding each tooth from the sides towards the front center line. This was unusual for me to spend this amount of time in one area of the carving but for days I just worked on the teeth. The chin was rounded off and the nose bone roughly carved. A lot of time was spent continually balancing the skull, making sure each side was the same or at least close to each other in dimensions and all this measuring was done with a ruler. Moving back to work on the eye sockets the final outline was drawn in and making sure of position and size in relation to the rest of the face was ok, began to carve to this final outline, again working from the off centre point out. Next I worked on the nose area using rounded edged wheels to create the curved section deep at the base of the nose and becoming shallower as it goes up. When the area became too small for the size wheel I was using I changed to a smaller size. Using whatever tools would do the job I went over the whole carving and looked for flat spots or areas I had managed to miss. Any edges were rounded off, like around the eye sockets and any other areas that needed work had my attention. When I was content that I had not missed anything the carving was cleaned and rinsed in running water, hands washed, and the work area was cleaned and prepared for the sanding process.

## Sanding:

I should mention that sanding is not quick you have to take your time and get into every area that was carved, this takes time and patience. If you take 10 hours to carve a subject you should take another 10 + to sand it. The sanding process is time consuming but I cannot stress enough, that the time you spend on the early sanding grades will quicken the later sanding stages. At this time, I was using wet and dry and not diamond paste, so I knew I would have to be careful with contamination, especially on a carving this size and being rock crystal any mark would show up like a sore thumb. Starting with 180grit I began by hand sanding dry the top and back of the skull moving it backwards and forwards and in a circular motion in my hands. Then went around all the large areas, then smaller and smaller and anywhere I could get my fingers and sanded as much as possible. When I couldn't get any further by hand, I used small sanding discs. The edges of these small discs are brilliant for getting into tiny areas and doing areas like the teeth but you have to be methodical. Because this rough paper is fairly stiff it can't be used in a split mandrel, but are great as sanding discs.



I use about 4 at a time on a screw mandrel, 2 facing towards the screw and 2 facing

down the shank of the mandrel. This is very firm and I can use the tool both ways and it also has good flexibility. I cut the discs with a whole punch which also has a centre hole for the screw. I made small files using ice cream sticks and larger ones using flat pieces of wood about 30cm long and sticking wet and dry to them. Both these came in handy for various parts of the carving. Small points were made from bamboo skewers and I used these with 180 grit powder to reach and sand the really small areas. The skull fitted nicely into the palm of my hand so I placed a large piece of 180grit paper in my hand and this is how I sanded the back and any large areas. To sand the eye sockets, I used my finger wrapped in wet and dry paper and moved around the sockets in a circular motion first one then the other using the same action. Then used sanding discs and split mandrels where they would fit. The trick with sanding is to take your time and do each grade thoroughly. When I had gone over the whole carving, I repeated the process twice more. Continually checking my work until I was confident I had sanded every area before I even thought about the next grade. After this first sanding or any grade, I always clean the material wash my hands, clean the work space, and examine for flats or any marks that should not be there. No matter how hard you try there will always be flat spots or small areas missed. Back to the diamond tools to correct these mistakes, sometimes these small flat spots do not become visible until you start sanding. When I work with crystal, I always dry the material when I have washed it, because it is extremely hard to see any marks when wet. Making a final check over every part of the carving to ensure no areas had been missed only then was I ready for the next grade. Because the carving is large compared to what I normally do, I decided to just work on certain areas at a time, this would ensure that I wouldn't miss anything. So, I divided the carving into 8 sections 4 on the front and 4 on the back and work a quarter of the carving at a time. The next grade used was 240 grit, the process of working each section worked well, first the hand sanding then the files, small discs and split mandrels. When I finished this grade, everything was cleaned in preparation for the next 360. With the 360 sanding I went to the big sanding disc on my machine for the back of the head and the forehead. I didn't want to use the big machine for sanding with the 180 or 240, because I thought it would be too aggressive and also holding it to the wheel, there was a chance that it would grip and come out of my hands or create large flat spots. Working with the 360 grit, a finer grade was a more pleasant experience. So the initial sanding on the 6" machine was with 360 and using this disc I still had to be constantly moving the subject so that no flat spots would develop. Then I went back to hand sanding and the small sanding discs and files. After the 360 sanding the subject started to take on a slight polish. The first 3 grades of sanding are critical in any carving, and errors will show up in one of these grades, usually the first or second. If the sanding of these grades is done correctly, the remaining sanding and polishing will take less time. If they are not, and you ignore marks that should have been removed, eventually you will have to go back and fix them and this is very frustrating and causes a lot more trouble. Hand sanding was then repeated with the next grades 500 then 800 and finally 1,000. Depending of the material and the polish you want further grades can be worked, but on this particular piece I only sanded to 1,000 and I had quite a decent polish. With the sanding process completed, I prepared for the polishing. Having the subject divided into these sections was good, because you look only at that section and not at the whole carving. The small buffs and wheels I have can do these small areas but if I looked at it as a whole, it would have seemed hopeless with these small buffs. The large areas around the back of the skull and the forehead were primarily polished on a 6" felt buff

on the big machine, then I went back to the sectioned areas and concentrated on them with the smaller cotton and felt buffs using tin oxide. With each grade I also used bamboo skewers cut to about 3cm long and sharpened to a point. Using the bamboo against a grit, this becomes impregnated into the bamboo and is a very useful and cheap tool for reaching small and hard areas.



At this time I never had any diamond paste, so all the sanding was done with the wet and dry papers and various diamond grit on bamboo. With the powered tin oxide made into a paste and this paste applied to the buff, the rotation of the tool flings some of the paste off. When you begin to polish everything around gets covered in little spots of white. Initially when I start polishing with this, I hold the subject in front of the buff and cup my hand around the buff and subject and let the paste land wherever. Most of the paste flung off will land on the carving but, you also get covered in spots. The polishing took a lot of hours as my buffs were small and the area large but eventually the time had come to wash and examine the subject. A few areas I had to go over with polish as they never came up as other sections had, but on the whole I was extremely happy with the final result. The finished project never lost a lot of weight from the original piece which is always a blessing, I hate wasting what nature has taken millions of years to create.







You can see a flaw in the stone above the right eye socket. If I had removed this the size would have been extremely smaller. There are a few small inclusions on one side but this does not detract from the finished work. The base was made from sterling silver into a skeletal frame for this to sit on. When I made it, I had only been doing a few odd things in silver and I can think of better ways to do it now, but the carving is not mine anymore. Again, I would like to apologize for the photographic work, as you can see I'm not a photographer and with it being highly reflective I was learning as I went. I would also like to apologize for the number of photos of this skull. I don't have it anymore, so I took as many pics as I could when in my possession.

Thank you for listening.

KCarving.



**Please Note: This exquisite piece has now been sold and is in a private collection**

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Brisbane, Australia

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