Volume 2, Chapter 6: Rubbing the Powder on Smooth[1]

When the two halves of the ch'in, the top and bottom, and also the area within the belly (that is, the sound chamber) have all been perfected, wait before putting it together. *[Both halves, top and bottom, unite and make one. When they have not yet been put together and are still in two parts, then dig out the chest, test the sound and afterwards put the halves together.]* It is necessary to put on the powder and lacquer so that the ch'in can stand up to the fingering. *[If the lacquer powder mixture is not used, then after a great period of time, the wood will be damaged.]* Whenever others put on the powder and lacquer they use a cattle horn comb[2] and dab on (the lacquer-powder mixture) so that the defect of overly-thick-and-thin-places occurs, and these places are hard to make even. My idea is to use a brush so that then it can be made even. This is really a good method.

The powder; that is, deer horn shuang[3] (霜) (crystallite), (3) *[deer horn that has been distilled down to a paste.]* should be ground fine so that it has "flying clarity"[4] (4) like flour. Mix it with genuine raw lacquer that has been strained. Adulterate this with water, blending the parts together, so that it is like a paste. *[Mix it so that it is like a paste, then use a brush.]* Use a flat brush made of pig bristles, which should be (in the length of its bristles) 4-5/100's of an inch. Dip it into the mixture and paint it on the whole ch'in, top and bottom, so that it is about 15/100's of an inch thick. *[When it has been rubbed down, it should be approximately 10/100's of an inch thick. If it is too thin, then it will not stand up to the fingering, but if it is too thick then the sound will be blocked and unclear. Consider this in light of what is suitable.]* Using the horizontal, crosswise, and oblique strokes, then cover the whole ch'in, brushing it on evenly. What is desirable is to not have excessively thick or thin places. When the lacquer-powder mixture has been put on, wait for it to dry through. *[Let it dry for three to five days.]* Now take the ch'in and set it face up on a long, short table. Use a long stone with a flat surface,[5] and grasping its center with the right hand, then move the stone straight along the ch'in lengthwise. Do this naturally without exerting undue pressure. When rubbing down, it is necessary to use water; *[if water is not used, it is hard to rub smooth and there will be resistance. Always use water.]* rubbing, and at the same time using a cloth to wipe up and afterwards inspect the results. It is necessary to rub the whole surface so that it is level, but do not rub too long on one spot. Now from the center of the ch'in's face, rub out to the sides, starting from the tail and pushing (the stone) straight back to the first hui. Rub it all over again in successive strips in order to insure uniformity and that there are no striking

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[1] "Powder" refers to deer horn powder (or some other material, possibly ground stone), which is ground fine and mixed with lacquer making a very hard cement-like material when dry. The surface of the ch'in is coated with several layers which provide protection for the wood from the constant rubbing of the fingers of the player. Non-playing areas on the ch'in surface are not covered with this material.

[2] This comb has very fine teeth.

[3] The powder is ground, mixed with water and distilled, and then in the distillation process, separates into two parts, glue and shuang, mentioned in the text. These are then ground into powder.

[4] This is apparently a technical term. The powder should be so light that it "flies" and it should also be clear.

[5] Coarse and smooth sharpening stones can be used.

noises[6]. Once again now, running from the first hui to the bridge, rub it down according to the set method.

It will be necessary here to put on strings and test it. If any string, up or down, should have striking noises, take out the long stone again, and rub it down, pushing the stone in straight lines, thereby gradually making the string path level and straight. The striking noises should naturally disappear. Whatever happens, do not use a short stone and apply it to a striking area, then one will experience the misfortune of "paying special attention to one thing, thus losing track of another". *[At this point, smooth all the places with striking noises.]* One should use a long stone and push it straight. This is an excellent method. The quality of the surface certainly depends on the complete lack of the striking defect, so the whole surface needs to be uniformly even. *[A completely smooth surface, after the final shining up, will be without any cavities, which break up the reflected light.]* This way one can perfect it. The ch'in's underside should also be rubbed in the same straight fashion. This is easily done in so much as there is no need to check for the striking defect.

After the top and bottom have been rubbed down, then fit them together. On the seam running around the ch'in's side, paste on some soft paper, so as to prevent air leakage. Afterwards put on the strings and play them to check the sound. If within the cavity there is the need to do any work, this (putting on the paper) makes it easy to tear open. If there is no need to fix it, then remove the paper around the seam. Now use bamboo studs, nailing them through by the sides of the bottom. *[The bamboo studs should be about 1/10th of an inch thick, 3/10's of an inch wide, and 7/10's of an inch long. One end should be sharp and the other should be flat. Now use a 2/10's by 1/10th of an inch flat drill bit and lightly bore the holes, then hammer in the bamboo studs. On the sides there should be about two inches or more between each of the studs. When they have all been hammered in, then the heads of the studs should be underneath the lacquer coat, so use the lacquer-powder mixture and lacquer over them, then make the surface smooth.]* In order to make it closed tightly, one should take fine silk strips, put them on the sides, and then lacquer over them, thus sealing it up tight. If there is any worry over the possibility of a crack appearing, then take a rope and tie the top and bottom up tight. Wait for the lacquer-powder to dry, then paint over it again. Wait for it to dry, and then use a short stone on the sides and also on the rims of top and bottom. Rub these places smooth. Leave no marks. With this then the work of rubbing is finished.

The method for "flying clearness": Take the deer horn shuang and grind it extremely fine, enough so that it fills up half of a big bowl. Take water and pour it in so that the bowl is full. Use your hand and swirl the water around, and then take the dirty water and pour it into another bowl. Again pour water into the original bowl and swirl it around, pouring the dirty water into the other bowl. In this manner, one can cause the finer particles of the deer horn shuang to be blended into the water and thus poured off into the container. These particles are clear and fine like soft powder. Then dehydrate it by putting the bowl in sunlight. The coarser particles, although stirred up at first, sink back to the bottom and do not get blended in. (Take these) and grind them fine. They also can

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[6] The translator suggests that one might put on the bridge and nut before carrying out this chapter. See chapter 2.7.

then be removed with the above process. Brick and crockery powder can also be obtained in the same manner.

The method for mixing the lacquer and powder: Take an ounce of horn powder, *[that is, deer horn shuang that has already undergone the flying process.]* and mix it with three or four tenth's of an ounce of water. Blend the powder so that there are no lumps. Now add seven tenth's of an ounce of raw lacquer. Blend these three things together evenly, so that the mixture resembles paste. It is best if it is not too thin and not too thick. If there is more lacquer than powder, and too little water, then it will be too dry and (the surface) will wrinkle. If there is more powder than lacquer, and there is too much water, then it may dry, but it will not stick to the ch'in. If there is less water than lacquer and powder, then the mixture will be dense and hard to brush on. If water is not used, then the mixture will be too thick and will not dry.[7] Everything will be as it should be if this method is followed. *[For the lacquering of every ch'in, one should use four and a half ounces of horn powder, three and one fifth ounces of clear raw lacquer, and one and four to five tenth's ounces of clean water. According to the weather, whether summer or winter, increase or decrease it.]*

The method for distinguishing genuine raw lacquer and the method of straining: Raw lacquer is produced in Shenhsi, Kuangtung, and Chekiang. If it is genuine and one drips it on paper, the (the paper) will dissolve. It is very smelly. Stir it and it is white, then after awhile it will turn black. Thinly paint it on bamboo and it will be dry in half a day. As for the false lacquer, it is mixed with t'ung oil[8] and can be distinguished through inspection. The straining method involves taking Chinese linen *[not too coarse or too sheer.]* and wrapping up the lacquer in it, twisting it in a frame so that the clean lacquer comes out. The coarse part stays within the cloth. Get rid of it. Take cotton or silk and cotton and spread it over the Chinese linen. Now wrap it up and squeeze it again, so the lacquer will be even cleaner.[9]

The method for finding striking defects which involves putting on the strings and testing the sound: It does not matter whether one uses the first or second string. *[Use thicker strings in order to make the striking sound defect more apparent.]* Tie the head of the string up on a small inch-long pen case. Take the tail (of the string) and pull it up through from the fourth eye of the peg pool. Pass it through the ch'eng-lu and pull it up over the bridge. Put it through on the middle of the nut and pull it tight so that it sounds, but not too tight. *[If it is too tight, the smaller striking noises may not appear.]* Divide it up into small positions, plucking it to test whether the sound is empty or full, loud or blocked. Also test for striking places. Here we are only examining the positions for the fourth string. If one wants to test all the strings, use a bamboo slip *[a metal slip is even better.]* that is as big around as a string eye and five inches in length. Take the string and

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7 Turpentine is used for the solvent now. The difference lies in the fact that processed lacquer is used now; while unprocessed lacquer ("raw lacquer") which the user had to prepare himself, was used in the author's time.

8 Tung oil is used in varnishes and paints as a drying and waterproofing agent. It is made from the seeds of the t'ung tree.

9 See Volume 2, Chapter 13 "Good Work Requires Sharp Tools" on tools, for a better explanation of this process.

wind it around the slip. The string will follow its movements. Stick it in the string eye and pull it tight like before. Pluck it. And thus all the positions for all the strings can be investigated. There is no need to put all seven strings on at the same time. This is a convenient shortcut.