Sitar-making Today: Problems and Prospects of the Craft

SUVARNALATA RAO

Undoubtedly, the art of instrument-making is as important as the art of music itself. In almost every civilization, the origins of the earliest instruments have been connected with myths. For example, the sage Swati is supposed to have been inspired to make a percussion instrument after listening to the sound of raindrops falling on lotus leaves. Mercury is supposed to have devised the lyre upon finding the dry carcass of a tortoise on the banks of the Nile. These myths may simply represent attempts to accord a superhuman status to man-made artefacts like musical instruments. What seems certain, however, is that sounds in nature have been a source of inspiration in the creation of musical instruments; thus we find sound-producing mechanisms in nature being adapted in the making of musical instruments in diverse cultures.

In early times, the raw materials used for making instruments were naturally substances that man could easily find around himself. Primary natural material like bone, horn, willow bark, animal gut, hide, as well as simple artefacts such as the bow and arrow, clay pots, etc., were used to make musical instruments. Advances in technology were gradually reflected in the art of instrument-making; metals such as copper and iron, alloys like steel and bronze, chemical substances like gum, varnish, etc., came to be used extensively, and continue to be used today.

With reference to the music of the Indian subcontinent, evidences such as Bharata's *Natyashastra*, the sculptures of the Sunga period at Amaravati, the paintings of Ajanta, etc., suggest that the art of instrumental music and craftsmanship of instruments had reached very high levels by about 200 B.C.–A.D. 200. Both the arts have been discussed in great detail in the *Natyashastra* (Chapter XXXIII), and in the thirteenth-century treatise by Sharngadeva, the *Sangeeta-ratnakara* (Chapter VI). Someshvaradeva's *Manasollasa* provides details of craftsmanship of string instruments like the Ekatantri Veena (verses 586–613), Kinnari Veena (verses 666–701), and Mridanga, a percussion instrument (verses 687–701). The criteria to be adopted for the selection of raw materials — wood, hide, etc. — are discussed in the *Sangeeta-ratnakara* (Chapter VI, verses 1158–1163). Although most of these instruments are now extinct, there is no doubt that they were the predecessors of some of the instruments we use today.

Traditionally, Indian musical instruments have been entirely hand-made. Like the art of music, the art of making instruments has been passed on from one generation to the next. There are well-known families of instrument-makers located in different parts of the country who are primarily responsible for the preservation of this specialized art. Miraj, Calcutta, Lucknow, and Delhi are the main centres around which the makers of North Indian instruments have been living and practising their craft.

The information presented in this paper is largely based on an exhaustive survey of these

instrument-makers, in particular, makers of the Sitar. A part of the information comes from my collaboration with instrument-makers in Germany, Holland and Switzerland.

Some of the instrument-makers whose work is reported upon here have been engaged in the trade for several generations. Considering that the Sitar is about 250 to 300 years old, the families of some of these instrument-makers may have been involved in their profession over the last three centuries. During this period, a number of changes have occurred in the physical aspect of the Sitar, primarily influenced by the stylistic evolution of its music. It appears that, unlike today, instrumentalists in earlier times have worked in close collaboration with instrument-makers to bring about these changes and help in the process of development.

This paper aims at reviewing in brief the craft of Sitar-making as it is practised today, and is based on the survey earlier mentioned. However, the focus is not on the actual process of instrument-making but on certain issues associated with it, which have a direct influence on the process.

•

A. *Raw Materials and their Selection*

1. The raw materials used to make the Sitar are: wood (*toon* or teak for the body); deer-horn in place of ivory (for the bridge); German silver (for frets); gourd-shell (for the *tumba* — the resonator); *shisham*-wood (for the pegs); thread (China-*moonga* to tie the frets); beads (for fine tuning); for the tailpiece, synthetic gum and celluloid; for polish, lac and spirit; and for the strings, steel (of variable thickness) and bronze.

2. Except for strings and celluloid, which are imported from Germany and Japan respectively, no other raw material is imported. Although strings are locally available, they do not match the quality of the imported varieties.

3. The selection of raw materials is purely based on experience. The instrument-makers look for a hard, thick, and round gourd which is not too heavy. Gourds are classified on the basis of shape and size. In Maharashtra, instrument-makers classify them as having either the shape of a guava or a fig. Gourds of guava shape are used to make the Tanpura, while the fig variety is used for making the resonator of the Sitar, which is comparatively smaller and not so high. The curvature of the resonating plank is also a basis for this classification: in the Tanpura the gourd is more convex while in the Sitar it is relatively flat.

4. Most instrument-makers maintain that toon (Spanish cedar) is the best wood, quality-wise and money-wise. Woods are selected on the basis of their temper and softness. Wood with cracks or knots is avoided. The wood used for the sound-board has to have the required tonal quality, and the necessary strength and stability. It should lend itself to being finished or hand-polished with fresh shellac for protective and decorative purposes. According to some instrument-makers, the pattern of grains on the wood should not be straight. It should be circular, either convex or concave, especially for the resonating plank.

5. The colour of the deer-horn should be bluish grey, so that after filing it turns white. Instrument-makers prefer horn which has been removed from live deer (without hurting the deer), and not horn that has fallen off deer and left to deteriorate; such horn is often infested with insects.

6. Scarcity of deer-horn has forced some instrument-makers to use other material for the bridge of the Sitar. Many have also experimented with alternative materials for the gourd. Although these instrument-makers have expressed their dissatisfaction over the use of these materials, it would be worthwhile to know how musicians react to the changes brought about in the sound quality as a result of using non-conventional materials. Fibreglass, steel, aluminium, and wood-dust have been used for the tumba; for the bridge, fibreglass, plastic, metal, ebony, elephant bone, camel-bone and bones of other large animals. Burma teak and ebony have been substituted for toon.

7. Ebony, used for the Sitar-bridge, was found to produce a bigger sound but not a sustained sound. A Sitar-maker from Delhi also reports that African ebony is better than the Indian variety, found mostly in Mysore, which is quite porous and swells in humid conditions.

8. Almost all instrument-makers are willing to use non-conventional materials if these are made available to them and if they are found to result in a desirable sound quality approved by musicians. Therefore their experiments and suggestions need to be empirically verified in the laboratory so that we can understand the qualitative differences brought about by the use of new materials, and can explore the possibility of using non-conventional or synthetic materials for various components. This step would go a long way in achieving standardization of our instruments.

B. *Making the Instrument: Seasoning, Machines/Tools Used, Processing and Assembling*

1. At present, seasoning of wood as well as seasoning of partially made instruments is done by a completely natural process by some instrument-makers, i.e., by stacking them for months or years. No chemical treatment or other artificial means of seasoning is employed. Some instrument-makers report that a mixture of cowdung and gum is applied to the surface of the wood, so that it doesn't crack. Every instrument-maker is of the opinion that he has seasoned the wood, but the extent of seasoning remains a mystery. Humid weather does not help the process. Perhaps for this reason, places like Mumbai are not centres of instrument-making. The seasoning stage in instrument-making is supposed to be critical for the quality of instruments, but the length of time proper seasoning requires adds to the final cost: the longer the gestation, the smaller the output, and the higher the cost of the instrument. Here, as elsewhere, time is money. Storage facilities are often lacking with instrument-makers, adding to the problem.

2. Some instrument-makers are aware that it is possible, though not advisable, to season the wood rapidly by resorting to the kiln-drying technique.

3. Gourd-shells are supplied in a seasoned condition by planters. However, instrument-makers are aware of the advantages of further seasoning, and the necessity of disinfecting the gourds before actual use.

4. Lack of storage space seems to be a common problem, because of which raw materials cannot be procured in bulk. Given the overpopulated localities in which most instrument-makers' establishments are situated, there may not be an easy solution to this problem.

5. It is observed that at present instrument-making falls into two categories — for the wholesale market, and for specialized customers. Some instrument-makers make instruments only for the wholesale market, in which case the number of instruments made depends upon

the current demand in the market. Some others within the same category make and store half-made instruments and finish them according to specific orders as and when they are received. This method has several advantages over mass manufacture: the partially assembled instruments get further seasoned, and any defect if detected — craftsmen's errors like faulty joining, or natural defects such as wood cracking or warping — can be rectified before the final product takes shape. On the other hand, instrument-makers who make instruments only for specialized customers generally start and finish the entire process without any dormant period for the seasoning. Instrument-makers who have the necessary capital, and facilities such as storage, opt for the middle path (which seems the best) both to save time and ensure better instruments finished to specific orders.

6. The traditional instrument-makers at Miraj make instruments out of available gourds, whatever the dimensions, without giving much thought to standardization. An instrument-maker of Delhi, on the other hand, has certain standard measurements for instruments of specific sizes. He prefers to manipulate the tumba size to bring it closer to his standard measurements and then proceeds to make his instrument. This results in greater uniformity in the instruments made.

7. The time taken for seasoning and assembling instruments varies from fifteen days to two years. The minimum time required for making a Sitar varies between fifteen days to six months.

8. The tools employed to make instruments are rudimentary on the whole: screwdriver, chisel, pliers, cutters, files of different types, hammer, hand and electric drill, etc. There is scope for using sophisticated mechanical gadgets. At present, mechanization is restricted to the making of pegs and the brass tumba of the Sarod. It could be extended to more components. Further, there is a need to evolve standardized components such as frets, pegs, bridges, etc., which can be made available as 'spare parts'.

9. Almost all instrument-makers prefer to employ separate craftsmen for each kind of instrument, and also for the specific parts of each. The job-division is roughly as follows: woodwork; plastic-setting; engraving; polishing; fitting; *jowari* adjustment. The labour cost is minimal: most of the craftsmen are hired on daily-wage basis.

10. The practice of providing matching accessories such as strings, frets, bridges, pegs, *manka* (bead for fine tuning), packing cases, etc., along with the finished product does not exist at present. Even at extra cost, instrument-makers should be encouraged to supply these items.

C. *Marketing of the Finished Product, Government Policy, etc.*

1. Though variable, depending upon the instrument-maker, the demand is always more than the supply.

2. Although to some extent the price of the finished product may be based on the material used, the decoration and design, the tonal quality of the instrument, the time taken for delivery, and the demand in the market, in the ultimate analysis the pricing seems to be very subjective, making allowance for the instrument-maker's goodwill and the customer's negotiating ability.

3. A large number of instruments are sold from showrooms and shops. A significant

number of specialized custom-made instruments are also sold directly by instrument-makers, some of whom enjoy a good deal of patronage from musicians and teachers.

4. Most instrument-makers do not provide special packing while delivering their instruments, as mentioned earlier. This poses a problem particularly where out-of-town or overseas transportation is involved. In many cases, the customer has to accept the responsibility of transportation of the instrument, including packing. Only a few big instrument-makers take the responsibility of delivering instruments for export. They normally use cheap materials such as plywood, cardboard, thermocol boxes, wood shavings, straw and other packaging materials. They need to be encouraged to adopt better packing methods for safe transportation.

5. It is reported that four major instrument-makers of Calcutta are earning revenues between four and five lakh rupees a year (on average) from direct export of musical instruments. This shows the potential of this industry for earning foreign exchange. On this ground alone (if no other), the government should be persuaded to meet the demands of instrument-makers for:

(a) special facilities for inter-state transportation of raw materials as well as finished products;

(b) assistance in exporting instruments directly without the support of intermediaries;

(c) licenses for purchasing ivory, *barasingha* horn and white spirit (— it is reported by a well-known instrument-maker of Lucknow that the quality of spirit used by craftsmen at present tends to affect their fingers);

(d) licenses to import items like celluloid, strings, etc.

(e) recognizing the activity of instrument-making as handicraft, and granting the facility of low-interest loans admissible for this category of industry.

Other Non-conventional Materials and Innovative Approaches

1. An instrument-maker in Holland uses cedar wood to finish the top of the finger-board and a special synthetic material known as delring (polyacetyl) for the bridge. He also makes use of pegs that are normally used in the guitar for both the Tanpura and the Sitar. They are quite good for fine tuning and are also weather-proof (Fig. 1).

To make the Sitar-resonator, which is coupled with the finger-board (*dand* — the curved rear part of the stem) in his model, he uses a wooden mother mould. This is further used to make a silicon mould which is kept ready for repeated use. If any changes are required, the wooden mould can be altered. From the silicon mould, the actual body of the instrument is obtained by coating it with carbon-reinforced epoxy resin (Fig. 2). Upon drying, the new body is separated from the mould. In this way, the problems associated with joining three components (gourd, neck, and finger-board) in traditional Sitar-making are avoided (Figs. 3, 4). Interestingly, the acoustic quality is not affected. In fact, apart from being sturdy, such an instrument may prove to be more stable than the conventionally made instrument.

2. An instrument-maker in Germany uses spruce or mahogany for the body of his Sitar (Figs. 5, 6). He has made several experiments with the bridge material, using ebony for the Sitar, and wood known as lettern, snake-wood, etc., for the Tanpura. He has also experimented

by introducing a metallic upper bridge. His instruments have very good tonal quality.

This instrument-maker uses a ribbed bowl made from a typical mould to construct the resonator of the Tanpura, Sitar and Surbahar. The various Sitars made by him use locally available woods such as bubinga, mahogany and spruce for the resonator. The acoustic quality of these instruments is as good, if not better, than those with the traditional gourd.

Both these instrument-makers use reamers to make pegs and peg-holes. The reamer is a simple sharpener-like device used for carving out pegs of desired diameter, and perfectly-matching peg-holes. With this gadget, one of the most nagging problems associated with Indian instruments has been overcome.

Conclusions

1. With the increasing popularity of Indian music, our instruments are not only in great demand at home but are also being exported in fairly large numbers. This has resulted in a situation where the demand exceeds the supply. It is interesting to note that a century ago the scene was just the reverse (*vide* Day, 1891, p.10). Hence, today, not only the quality but also the quantity of instruments made needs serious attention.

2. The music fraternity is concerned about : (a) the unpredictable quality of instruments; (b) non-standardized products of inferior quality; (c) short supply; (d) long waiting periods; (e) increasing costs; and (f) arbitrary pricing.

3. While there are many merits in the traditional system of instrument-making, it suffers from a lack of innovativeness; there is an in-built resistance within the trade against adopting new methods and materials. Our present-day instrument-makers seem to be unquestioningly using conventional materials and established manufacturing methods, rather than manipulating the individual components to create instruments of predetermined tonal quality.

In most cases, the sound quality cannot be predicted. Hence, at the buyer's end, there is no guarantee of an instrument of desired tonal quality even when the instrument is specially ordered. Thus there is a need for developing new methods of instrument-making conducing to more predictable results. Also, in order to support this traditional craft through scientific methods, some practical difficulties relating to the industry need to be solved by the concerned government authorities.

4. Even the tools used by our instrument-makers are the same as those employed by their predecessors. Instrument-makers show a great deal of resistance to any kind of mechanization. Hence they have not been able to take advantage of modern technical advances in any way. As a result, their art seems to be lagging far behind the requirements of our times.

5. Furthermore, the apprehensions expressed by some of the leading Indian craftsmen about the survival of their art indicate that it may well be a dying art. Unless some steps are taken in right earnest, instrument-making might indeed not survive in India. During the survey referred to earlier, no information could be obtained about Surbahar-making. Craftsmen lamented not having the chance to make a Surbahar because of its dwindling popularity. Interestingly, the instrument-maker from Germany (mentioned earlier) has successfully made Surbahars of excellent tonal quality, using non-conventional materials and methods (Figs. 7, 8). The process is summarized in Fig. 7.

6. The results of isolated efforts reported by instrument-makers regarding the use of

Fig. 1. A Sitar made by Paul van den Hout of Rotterdam, Holland. The instrument uses polyacetyl for the bridge, and pegs that are normally used in the guitar (mounted on a board affixed to the stem), as shown enlarged in the insets in the picture.

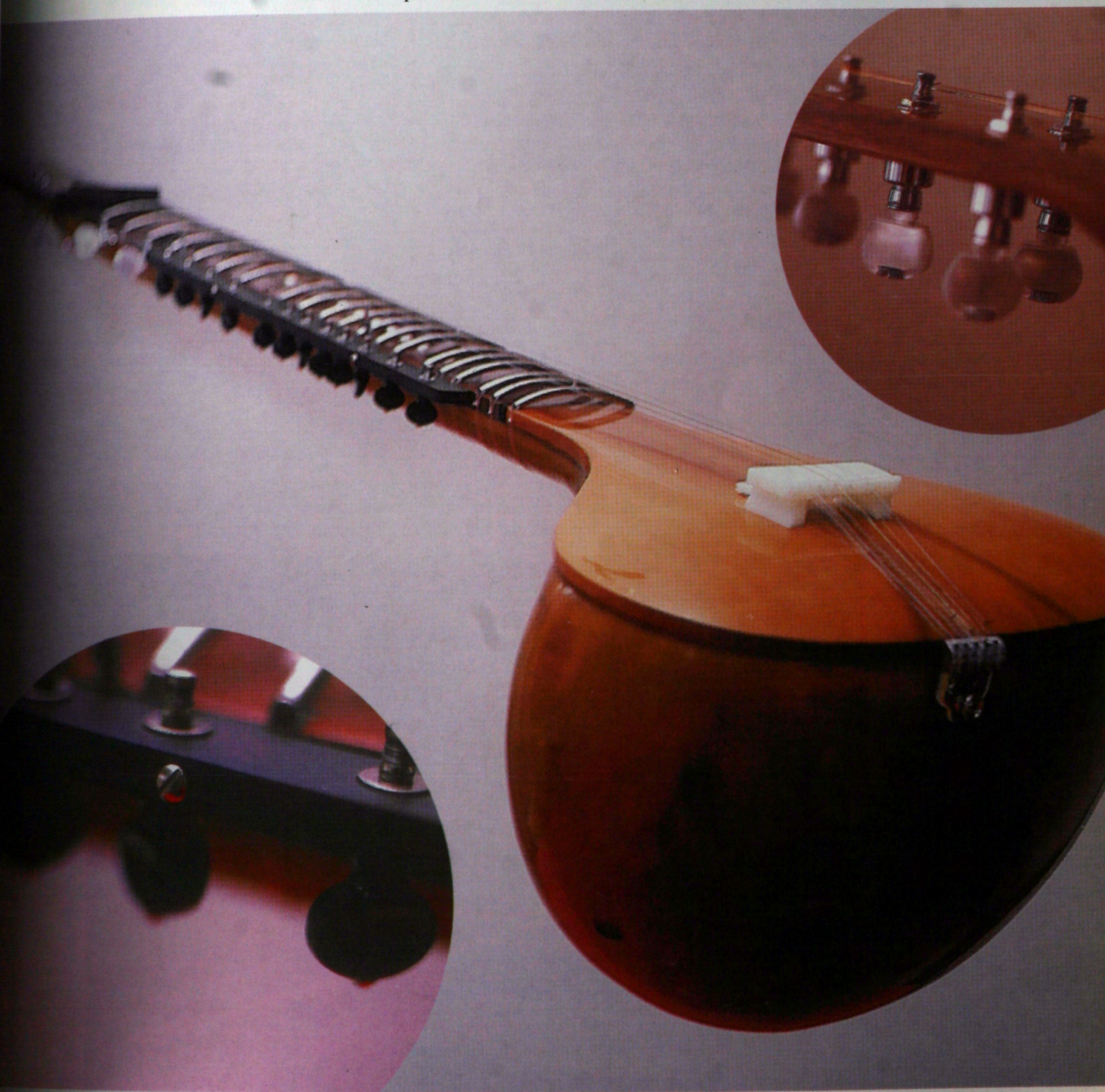


Fig. 2 (*above*): Paul van den Hout's one-piece Sitar body, combining resonator and stem, resting on the silicon mould from which it has been obtained. Fig. 3 (*below*): How van den Hout joins the *tabli*, neck heel, and finger-board to the one-piece resonator and stem of his Sitar.

Photographs: courtesy Paul van den Hout

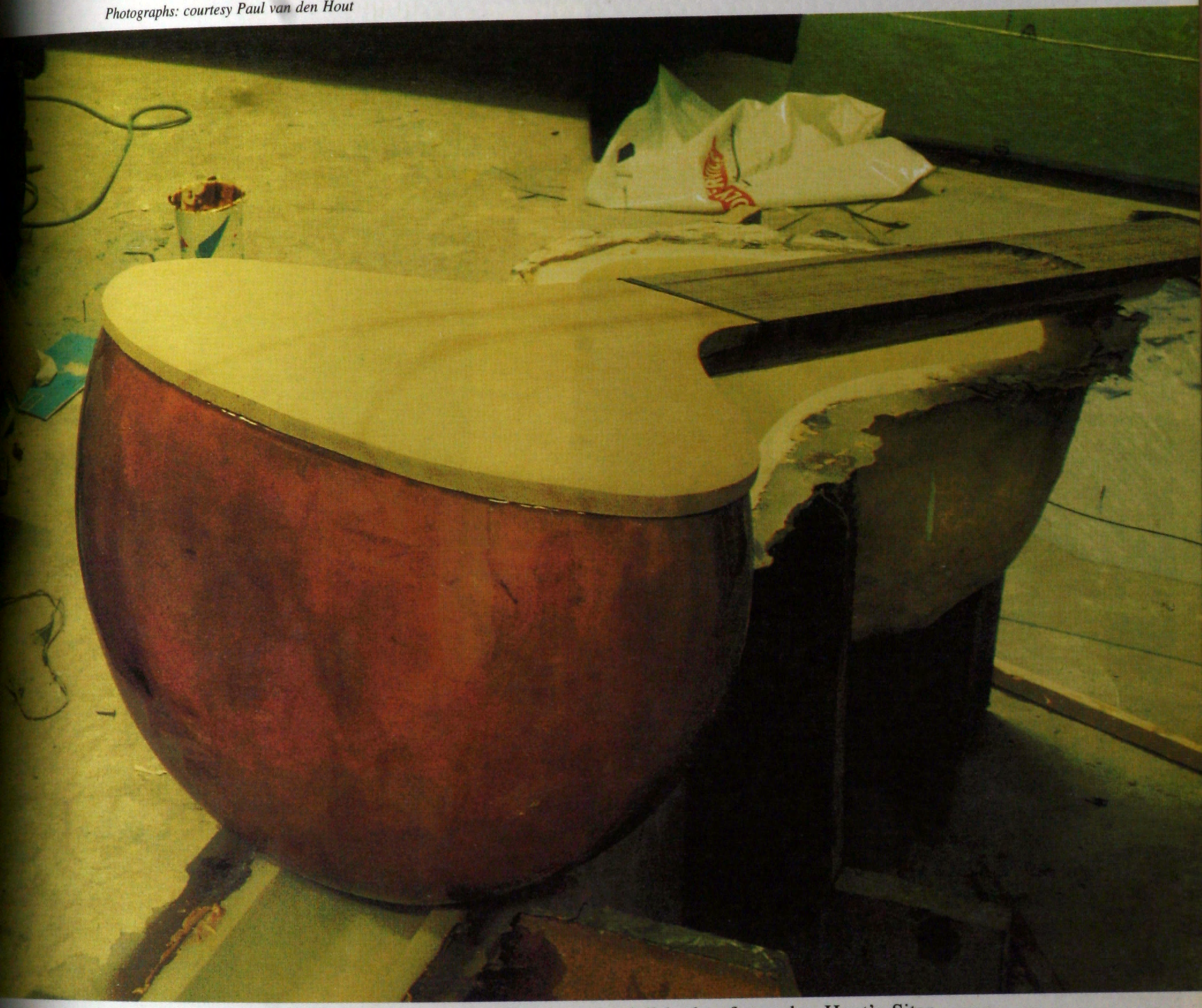


Fig. 4. After the wraps are removed — the full body of van den Hout's Sitar.

Fig. 5 (*left*): A Sitar made by Dieter Zarnitz of Kaarst, Germany. This model uses spruce and maple.
Fig. 6 (*below*): Zarnitz's Sitar made of mahogany.

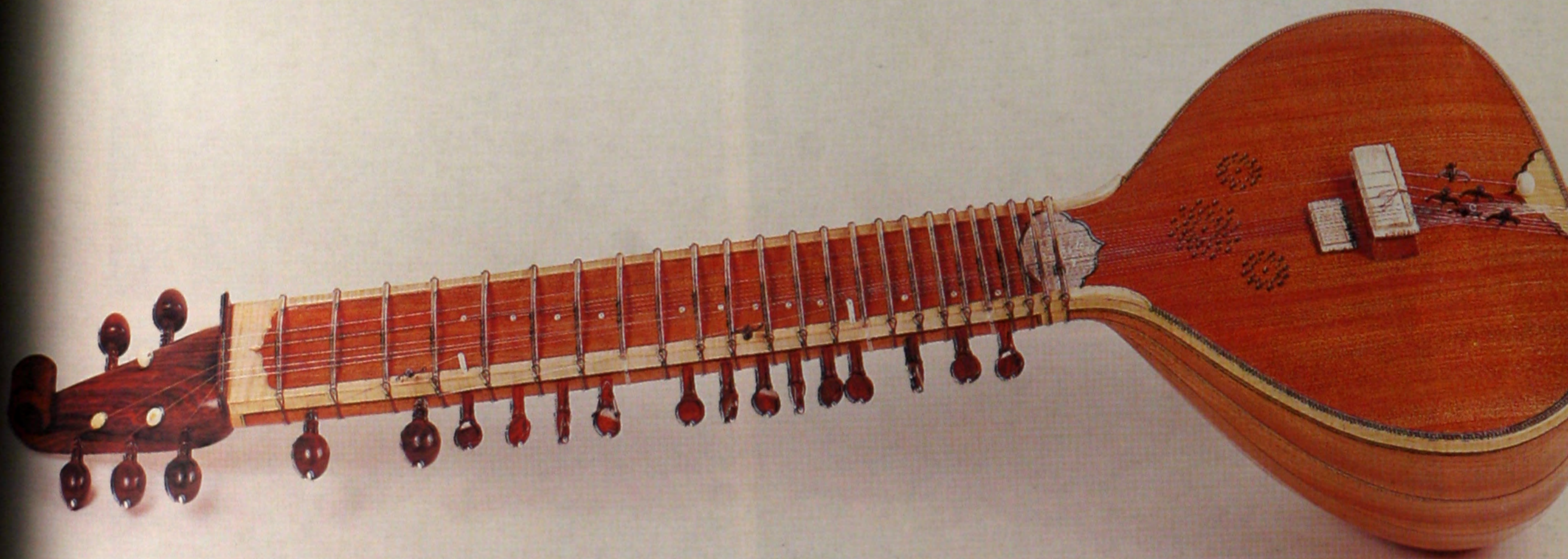


Fig. 7. The making of Zarnitz's Surbahar:

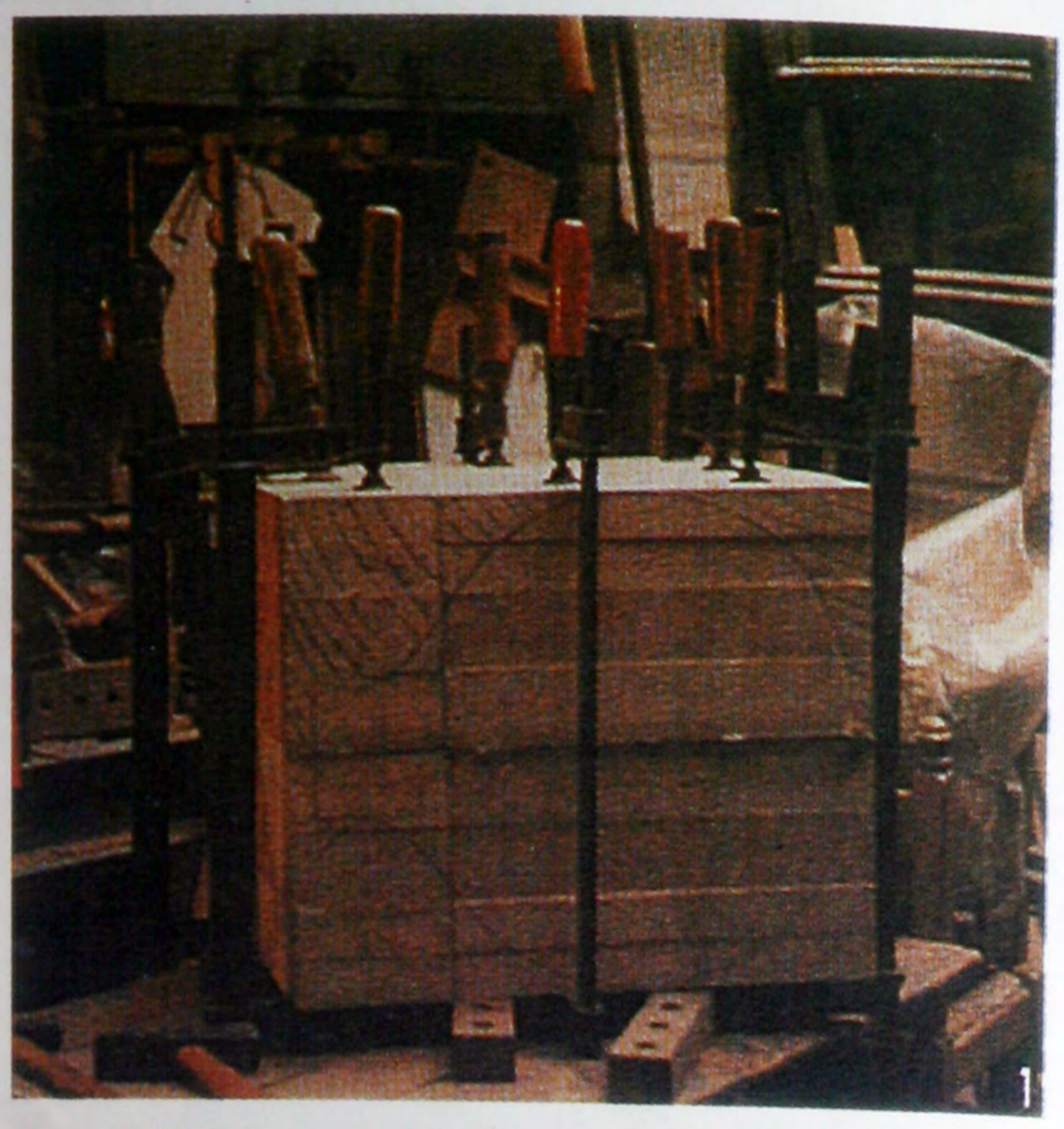
1. A big 'block' of wood is assembled by putting several layers of smaller wooden blocks on top of each other.

2. The pile of blocks is put under a lathe machine for compression.

3. Thus a rounded block of wood is obtained.

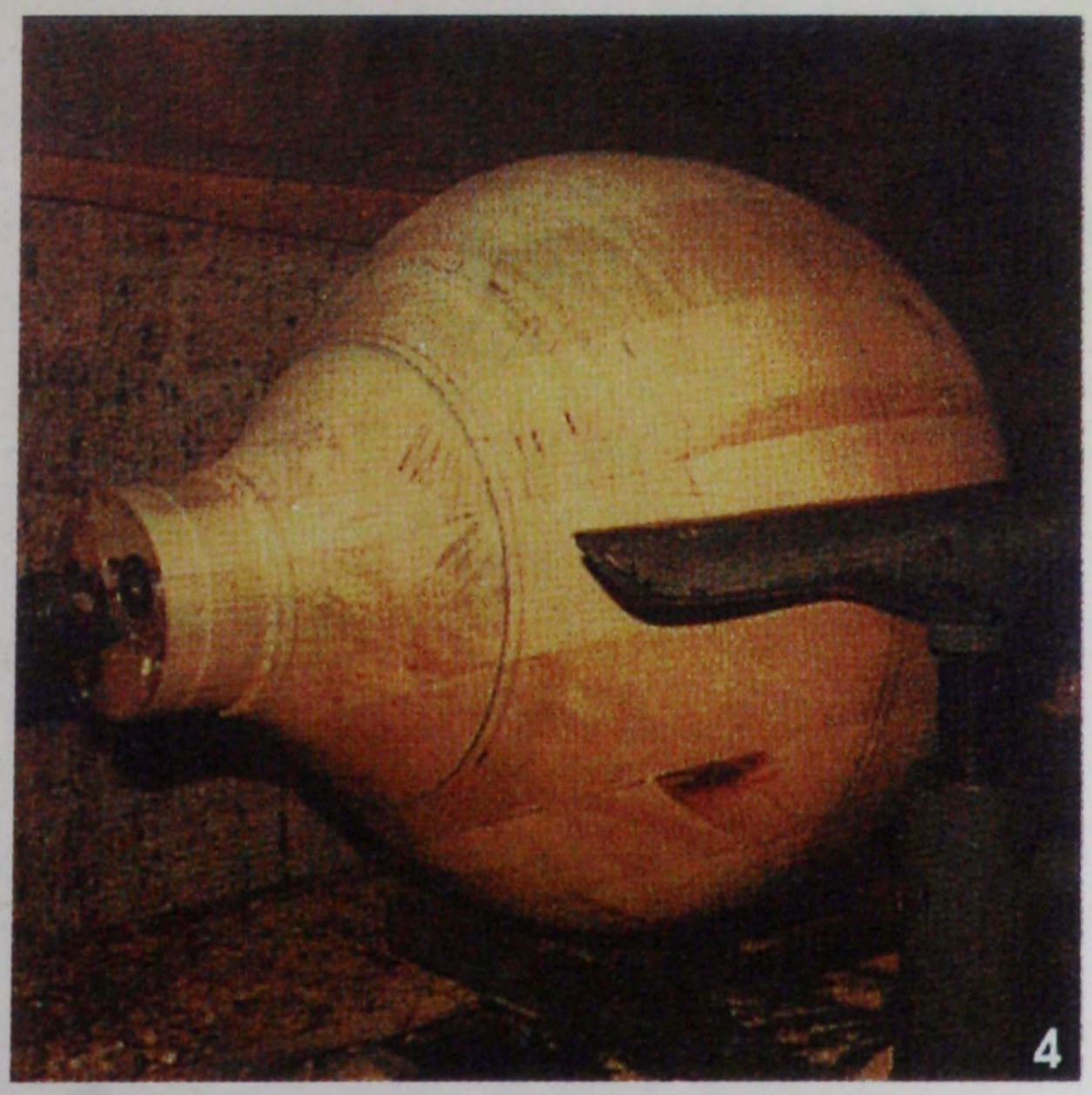
4. The block is chiselled to give an almost finished rounded structure.

5. Then it is cut along with the upper part.

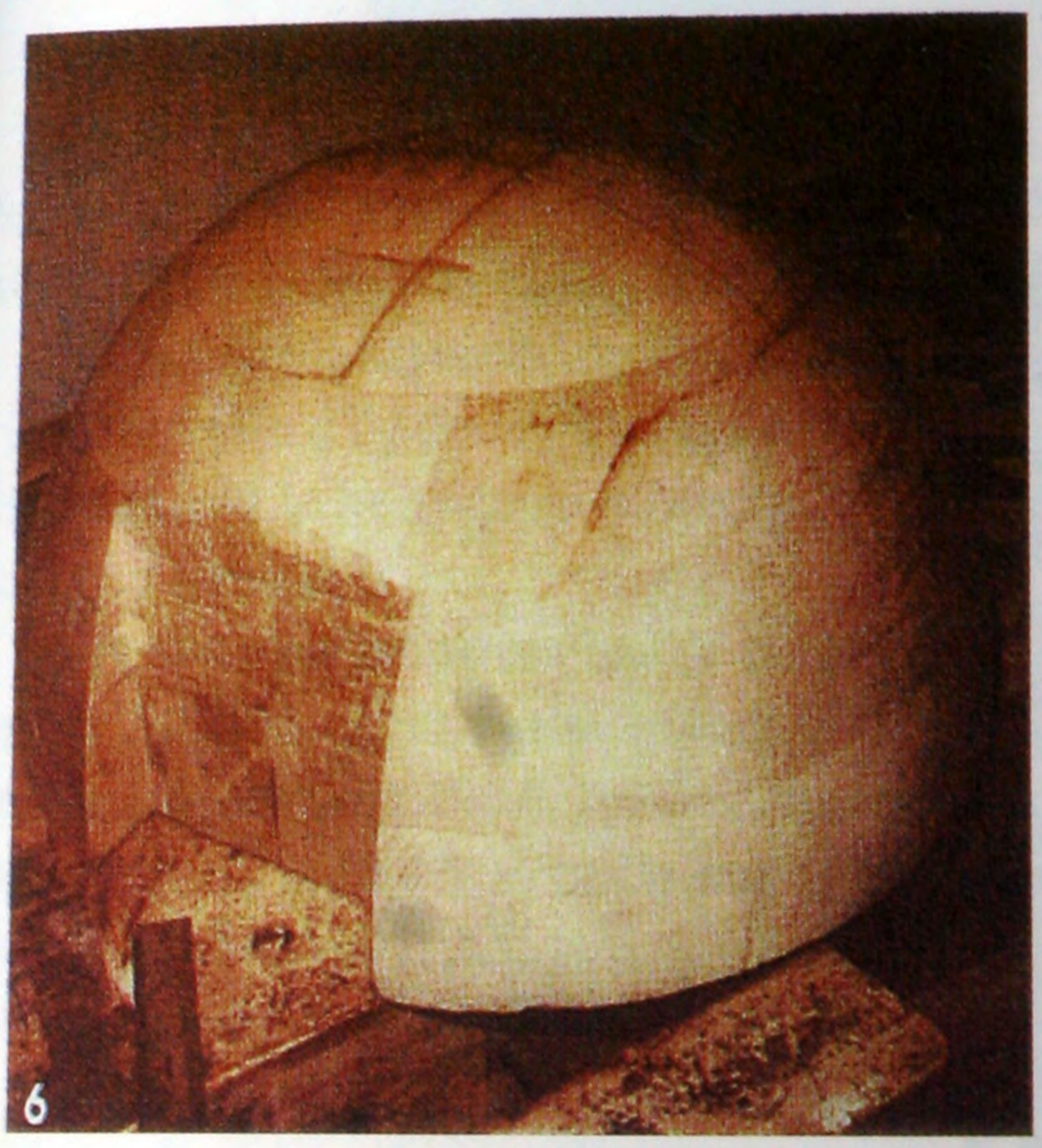

1


2


3


4


5



6

6. The divided belly is fixed with a wedge at the lower end.

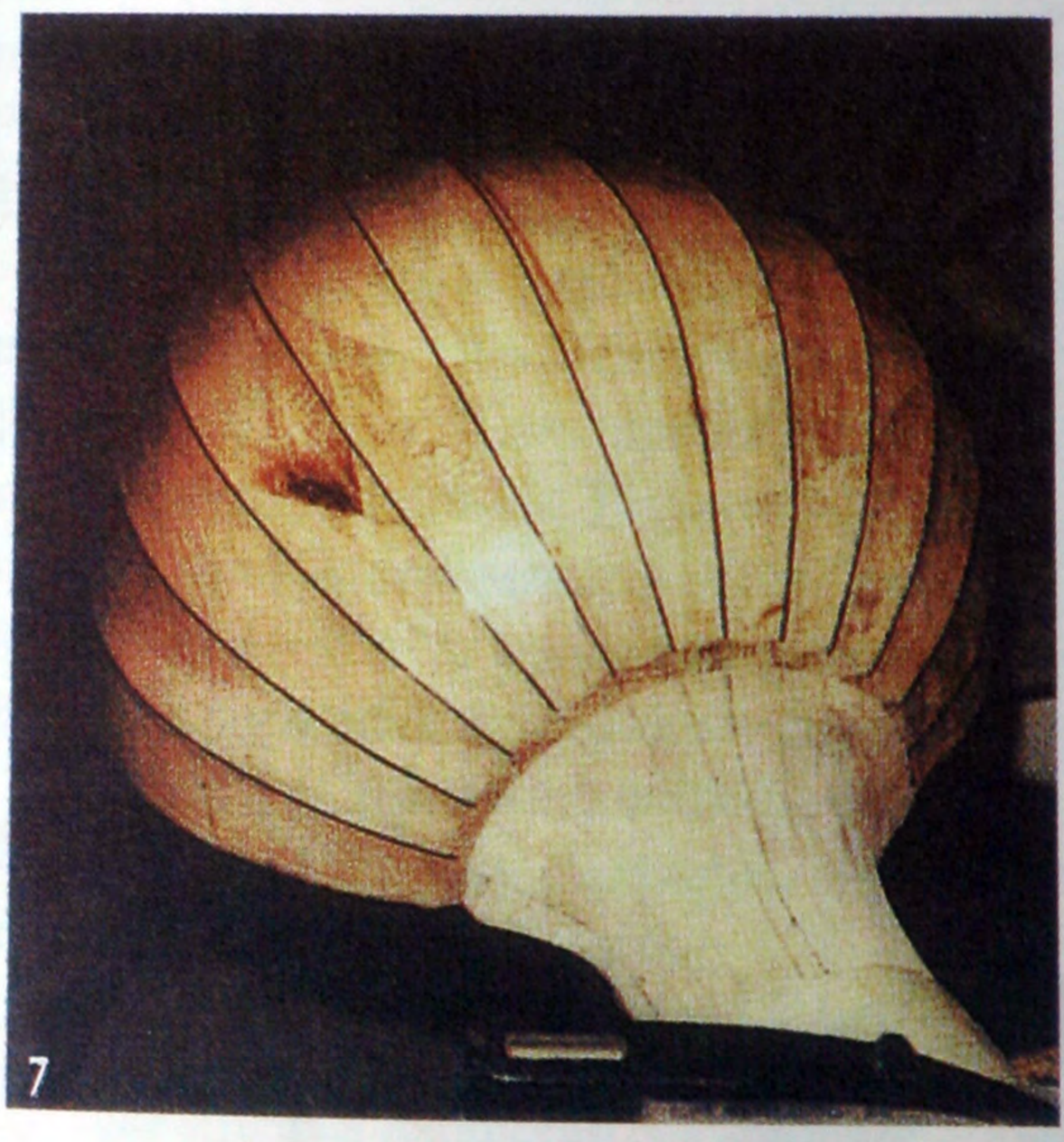
7. Indentations are made on the rounded body. This structure is used as a mould for shaping the resonators.

8. Thin strips of wood are placed on this mould, which is later hollowed out to yield a ribbed bowl. A neck is fitted onto this.

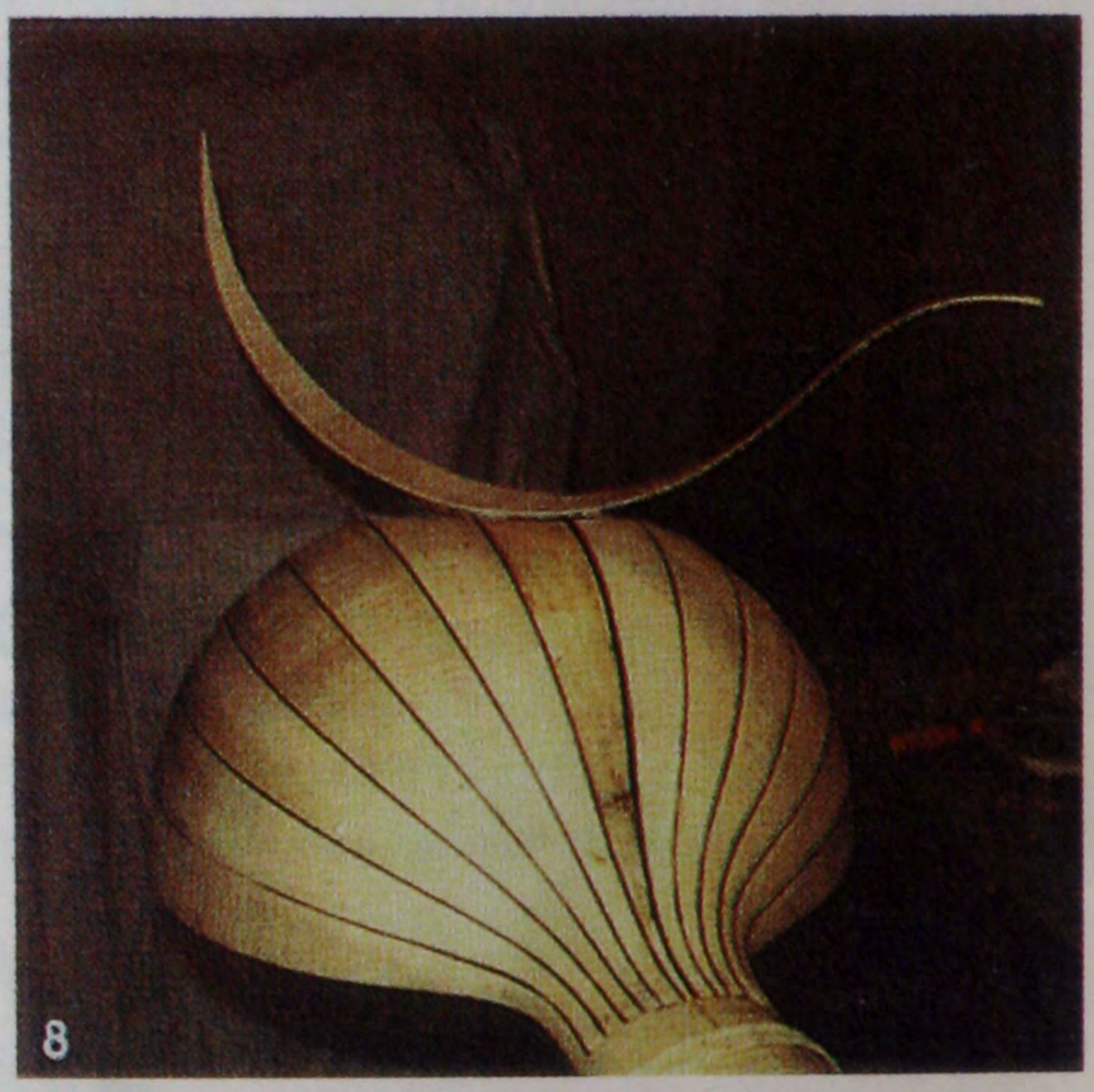
9. The lower portion of the finger-board is fixed through the neck.

10. The upper plate of the finger-board is placed in position.

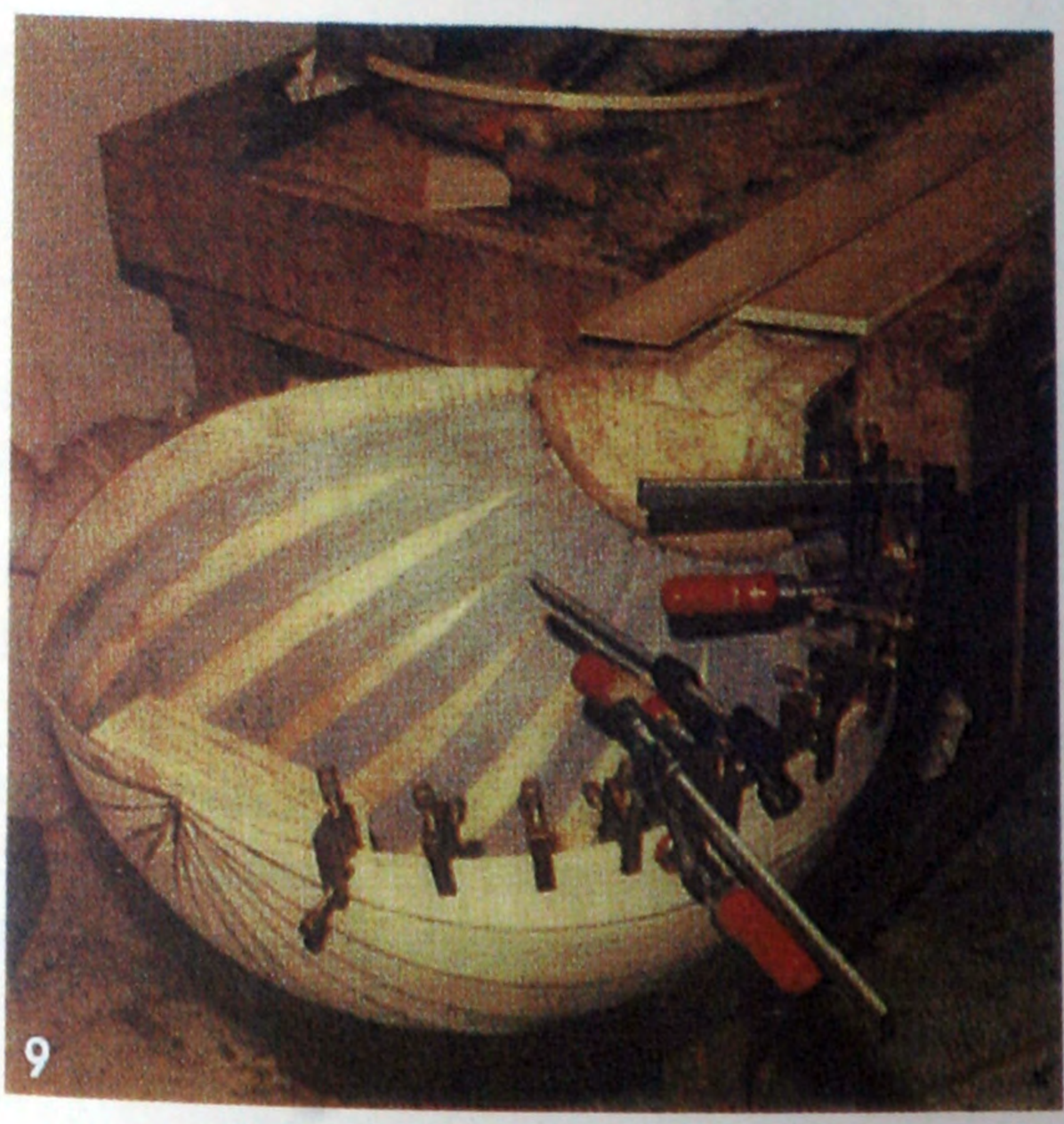
The rest of the components — decorations, pegs, frets, strings, etc. — are then affixed to complete the instrument, shown overleaf.



7



8



9

10

Photographs: courtesy Dieter Zarnitz

Fig. 8. The finished Surbahar by Dieter Zarnitz.

various alternative materials for the resonator and the bridge have to be tested, and instruments standardized to meet the approval of practising musicians.

7. The non-conventional methods reported here for assembling various parts (such as the ribbed bowl used by the instrument-maker of Germany, or the moulded body developed in Holland) have to be evolved further to overcome limitations such as excess weight, or time taken for assembly.

8. Partial mechanization has to be encouraged among instrument-makers to save time, energy and cost, as well as to ensure production of good instruments. Reamers for making pegs can be developed with indigenous technology, adapted for specific instruments. These could be made available to craftsmen at a reasonable price, and would no doubt improve the quality of Indian pegs. Certain devices like the electric saw can be used to pare resonating planks.

9. An effort could be made to establish a well-structured school for teaching instrument-making. Reports of several such schools established elsewhere in the world are very encouraging. This may be one of the solutions to the current crisis of lack of skilled manpower. Furthermore, a systematic approach to instrument-making is necessary to lend a new lease of life to this specialized craft.

10. The efforts made by craftsmen in Tanjavur, who have formed a co-operative society, are worth emulating. This society was organized to provide employment and thereby improve the economic status of artisans engaged in manufacturing the Veena and other musical instruments in and around Tanjavur. At present, it has forty-five members, and functions under the administrative control of the Department of Industries and Commerce, Government of Tamil Nadu. Similar societies can be organized at centres like Calcutta and Miraj, where there are a large number of artisans engaged in instrument-making.

11. Making of instruments could be classified by the government and industry, by common consent, in the following categories, so that quality standards can be maintained, and costs and time reduced where possible:

(a) The making of top-class, custom-made, professional-quality instruments could be classified as handicraft.

(b) The making of medium-quality instruments for non-professionals and students could be considered mainstream industry. These instruments would also have to be of a standard quality, and be available at a reasonable price. This variety can involve mechanization, and even assembly-line mass production of set designs. If well-produced and delivered on time, this category of instruments can change the economics of the whole trade for the better. This kind of distinction is being made in the West in order to meet the demands of time and quality, as well as to make the profession economically viable.

To sum up, there is dire need as well as plenty of scope to improve the quality of Indian musical instruments. The technology available in the country is more than adequate to achieve this goal. It is up to musicians to realize the gravity of the situation and mobilize necessary action in their own interest.

Acknowledgements
I am indebted to numerous instrument-makers for sharing their experiences with me, especially Paul van den Hout of Holland and Dieter Zarnitz of Germany. Thanks are also due to the Sangeet Research Academy, Calcutta, for help in collecting some of the data. I am grateful to the Homi Bhabha Fellowship Foundation for its generous financial support for my survey. — S.R.