# PROBLEMS FOR SUN READERS

## *HERE IS A HARDER PUZZLE FOR THE BRIDGE PLAYERS.*

### Two Solutions for W. McMartin's Bridge Problem—A Queer Situation in a Chess Game—Secret Sign of the Old Turks—A Study in Red and Green.

Bridge problem No. 104, printed two weeks ago, was composed by W. McMartin and is his first attempt at an original situation, although solvers of No. 43 may remember that he arranged Whitfeld's famous six carder with a round of trumps added to it, which instead of making the solution more difficult to find seemed to make it easier.

Although No. 104 has the usual beginner's defect of a double solution, it is curious that only two solvers point this out, all the others contenting themselves with the solution that they found, some getting the required number of tricks one way and some the other. Both methods are correct, with nothing to choose between them.

The author's solution and the one sent in by the majority is for Z to start with a high diamond, either ace or queen will do, Y discarding a spade. Z then leads the heart, and whatever A plays Y wins, Y leading the second round of hearts at once, Z discarding a spade.

The trick now is to get Z into the lead, so that he can put B in the lead, and the only way to do it is for Y to lead the king trumps and make Z overtake it with the ace. The small trump from Z forces B to win the trick, and Z's two diamonds are good for the next two tricks.

If Z does not win his partner's king the problem cannot be solved, although a number of correspondents sent in alleged solutions on that line of play. If Y is left with the lead, he must come with a spade, on which B discards a diamond. If Y trumps the adversaries separate their trumps for the last two tricks. If Z does not trump the spade A wins it and leads another spade, on which B puts the queen of trumps, forcing the ace, and A's seven wins the last trick.

Every one who started right got the correct solution. Those who failed did not begin with the diamond at all, but made Z lead a heart. It is curious that just about half the number that began with the heart got away with it, while the other half went astray at the fourth trick.

Several solvers, some of whom are expert enough to know better, got the required six tricks by starting with the heart, letting the king of clubs hold, and following it with the king of spades, upon which Z discarded a diamond. By making A lead a diamond, the rert is easy; but A would lead a spade, saving his own trump for the last trick.

In spite of this, the original heart lead is sound, and will solve the problem. It seems a pity that this problem could not be so arranged as to make only the diamond or the heart lead sound, instead of both. Then it would be a fine problem.

In his solution J. Warren Merrill bursts into song, the air suggested being that of "Life Is the Hour." Here is his solution:

Z leads the diamond high, 'tis plain
He wins the trick and leads again
Two rounds of hearts we now can play,
For Y holds tenace over A
Then king of trumps comes out from Y,
Won by his partner. We'll see why
The five of clubs, when led by Z,
Cannot be won, except by B.
And holding only diamonds, he
Must hand the last two tricks to Z
Poor A, you see, has never led,
And takes his ace of spades to bed.

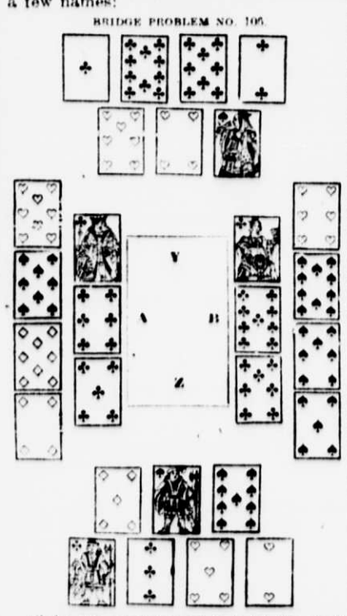
Correct solutions from the following: J. L. Scott, J. W. Cromwell, Jr., C. H. O'Connor, B. M. C., Theodore Reamer, J. G. Walsh, Martin B. Cohn, Tramp Travs, Ben Kard, Dr. George C. Bailey, S. C. Kinsey, Marie Thanhouser, H. K. Thaw, Arthur L. Brown, Jules R. Gimbernat, H. E. W., Ella C. Avery, D. C. Shanks, Pauline Newbold, Frank Roy, Lieut. R. J. Herman, H. C. Manheim, G. P. Coleman, J. R. C., J. Warren Merrill, Ralph Norton, E. Beebe, J. W. Wortz, James Steen, Miss Harman, Burton D. Blair, G. T. Jurgens, George B. Glover, William J. Ferris, M. J. McQuinn, F. G. T., Thomas C. Balcom, Milton C. Isbell, L. C. Hagen, F. J. J., Pemrose Angwin, Hewitt Warburton, Arthur B. Ettinger, Little John, Kirkman A Gurney, Algernon Bray, W. A. Conkling, Lieut. Carl C. Oakes, Frederic Pyle, Henry A. Horwood, Roscoe C. Harris, M. S. B., F. O'Byrne, G. H. Robinson, C. S. W., Charles M. Root, Richard F. Hall, A. I. Strasburger, Plainfield, W. J. Buehler, Henry Andresen, W. W. Dudley, B. B. W., Mrs. Steven B. Ayres, W. P. W., C. F. Johnson, Victor Du Pont, Jr., Herbert Riker, H. N. Ransom, W. Sterling Atwater, Constance Gardner, F. H. Ketchum, F. V. Macomber, W. O. Johnson, Vanderpoel, Charles M. Sager, C. W. Drummond, Edith T. Behrens, Bay State, Elizabeth T., W. A. Bulkley, Louis N. Ridenour and B. F. Knipe.

Charles M. Root in his solution points out the curious fact that it really does not matter what are trumps in this problem, as it fits all cases. If diamonds are trumps, the same play will give Y and Z six tricks, as B will be unable to use any of his three trumps. If hearts are trumps, the same line of play wins, as Y can exhaust the trumps either on the first two tricks or on the second and third, bringing about the same situation in the end as when clubs are trumps. Even if the problem were given as a no-trumper the solution would still be the same, as no one gets a chance to trump anything in any variation.

If spades were trumps, however, the opening would be the heart, and upon the second round of hearts Z would discard the club instead of the spade. Upon winning the king of clubs with the ace Z would lead a spade through A, and Y would make all the rest of the tricks after A had made his ace of trumps, which he must do on this trick or the next.

On looking over the lists of solvers for the past few weeks it must be admitted that they need trimming a bit. Perhaps the following proposition will eliminate a few names:

BRIDGE PROBLEM NO. 106.




Clubs are trumps and Z is in the lead. Y and Z want four of these seven tricks. How do they get them against any defence open to A and B?

Solvers who hope to be credited with correct solutions are expected to analyze the important lines of defence in order to show that they see the necessity of meeting each in turn. Many persons make the mistake of picking out one easy way of solving a problem and make no mention of the stronger defence that A and B have at their disposal.

A number of correspondents have been asking to have solutions credited that come to hand too late. Notice was given some months ago that this could not be done. All answers must arrive at the office of THE SUN on Thursday morning in order to be credited. That gives twelve days, and as it has always been enough for subscribers living in Colorado, Utah and Montana it should be ample for those living in New England. If letters are addressed to the Problem Department they will not go astray.

CHESS ENDINGS.

The solution of chess problem No. 104 depended on a person's ability to see the extent to which the quoted law could be stretched. When white plays PxR he asks for a black knight, which there is nothing in the rule to prevent, as it does not say that a player must ask for a piece of his own color.

This puts the white king in check, and as white cannot stay in check he must move out of it, even if it should be black's move. White therefore plays K—B5 and the next move is mate, no matter what black does.

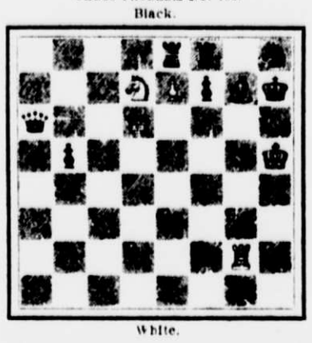
Correct solutions from:

G. T. Cunningham, Wm. M. de Visser, Henry A. Horwood, Mate Ho! B. F. Willcox, William J. Ferris, C. H. O'Connor, Wm. C. Van Antwerp and Walter Jennings.

It is said that a certain Colonel who was caught by the proposition shown in No. 104, and who had never imagined that a player could present a piece to his adversary in that manner, went home determined to study up something with which to get his money back and perhaps add a little to it. A week or two having passed he presented the following proposition to his fellow club members:

CHESS PROBLEM NO. 105.

Black.



White.

The men being set up he offered to bet that he could take the white pieces and mate in two. After covering all the money in sight he played PxR and demanded a black king, announcing double check. The men he was betting with smiled and winked at one another, but told him to go ahead. Of course K—Kt is forced, whereupon Kt—B6 is checkmate to both the black kings at once!

The secretary of the club being called upon to produce the laws of the game read out the one printed in this column two weeks ago, and the composer of this atrocity then discovered that he could not ask for a king, that piece being specifically barred. He is now studying up something with which to get even on both propositions. When he finds it THE SUN will publish it.

THAT TRANSPOSITION PUZZLE.

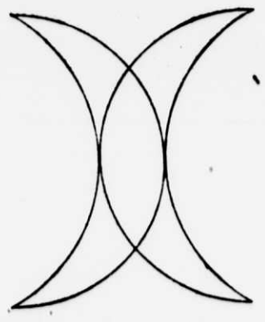
This problem is one of a class that cannot be solved by anything but experiment and one sometimes succeeds in finding the solution without being able to repeat it. The first line of letters shown in the following diagram is the original arrangement of the red and green cards, from which any two adjoining cards could be moved to the vacant spaces, the cards being reversed so that what was green and red should appear as red and green in their new position.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R | g | R | g | R | g | R | g | — | — |
| 2 | R | g | R | g | | | R | g | g | R |
| 3 | R | | | g | R | g | R | g | g | R |
| 4 | R | R | g | — | | g | R | g | g | R |
| 5 | R | R | g | g | g | g | R | — | g | R |
| 6 | | | g | g | g | g | R | R | R | R |

The only persons who solved this were C. H. O'Connor and W. E. Kaiser.

In answer to several requests for something more for the younger members of the family, here is a puzzle that will probably keep the little fingers busy for half an hour or so.

As you probably know, the emblem of Turkey is a crescent. The Young Turks, as they are called, have lately been making a good deal of trouble in Turkey, and the Old Turks determined to organize a secret society opposed to them. Instead of having any grips or passwords each member identifies himself to another member by proving his ability to draw the sign of the double crescent with one stroke of the pencil.



The pencil must not be lifted from the paper and no line must be gone over twice, but you may begin at any part of the figure you please.

## *STUDY OF AIR CURRENTS.*

### Tides in the Atmosphere Similar to Those on the Sea.

*From the Chicago Tribune.*

Until men began to navigate the air and study its currents and movements little attention was paid to the conditions of the upper atmosphere, and such matters as atmospheric tides and top currents completely encircling the earth were of seemingly little interest.

Since men have flown, and especially since men have flown and fallen, we have heard a great deal in a vague way of air currents. Recently Lawrence Hodges in a paper before an English scientific body gave some unique facts about air tides which are not generally known.

The moon, we know, causes the marine tides by its attraction. It draws the water on the surface of the earth toward it in a hump on the side that it exposed to the lunar influence, and draws the earth itself away from the water on the opposite side, leaving a corresponding hump of water.

The air, it seems, is affected in the same way. The layer of atmosphere about the earth rises, falls and flows more freely than water, because it is lighter, so the tide comes more quickly in the air at a given spot than the marine tide.

This rise and fall, however, means just as much to the navigator of the air as the tide in the sea does to the sailor, and has to be accounted for. The most remarkable current, however, is one constant stream in the atmosphere running from west to east completely around the earth in the upper atmosphere.

This was first brought to public attention when the volcano Krakatao blew a cubic mile of matter into the upper atmosphere in the '80s. The lighter particles were seen to make a complete circuit of the earth seven times in this circumglobular current before they finally disappeared.

# BETTER THAN GUNS IS POKER

## To It Is Due the Fact That the Census in Arkansas City Does Not Show a Loss of Two.

As a general rule the citizens of Arkansas City were on reasonably good terms one with another. It would perhaps be an overstatement to say that the policy of the community was shaped in conformity with any fixed principle, but the prevailing thought was in accordance with old man Greenlaw's utterance on the subject.

"Th' ain't no use wastin' any o' the poppylation of a place like Arkansas City. 'Pears like th' ain't no hellroarin' too strong desire into nobody's mind fo' to rush in here an' reside permanent.

"Mostly them that comes goes, an' bein' 's th' ain't no prospect o' the town growin' no bigger stands to reason there 'd oughter be some care took fo' to keep it f'm growin' smaller. Them that's here oughter stand together 'stead o' shootin' p'misc'ous case o' friv'lous quar'ls. A citizen on the hoof is wuth two in the grave, even if he ain't none too desirable."

Nevertheless there were times and occasions on which bad blood would be manifested between fellow residents of the place, and in extreme cases there would be at least a danger that two or more belligerents would ignore the unwritten law the old man expounded so clearly.

Such an occasion arose one day when one Billings, a planter of substance whose land lay partly within the town limits, had words with the principal storekeeper of the community, a man named Glover. Billings had asserted with much heat that he would do Glover the first time he should encounter him outside of his own premises. To this Glover had retorted that he would not only be prepared but would welcome the occasion. Beyond that there was no step known in the negotiation of a personal difference of opinion excepting an appeal to the law governing personal encounters.

That law as it was locally understood and practised was to shoot first and shoot straight, and as both men were considered more than ordinarily expert in the handling of weapons there was an uneasy feeling that the next census return from Arkansas City would show a deficit of two in the total population.

"Mo' 'n likely there won't neither on 'em miss when it comes to a showdown," was old man Greenlaw's comment when he heard a detailed account of the affair as it stood, "an' that sho' is some ser'ous.

"O' co'se it's consid'able of a c'lamity when there's on'y one citizen removed f'm outen we uns midst, but that's to be looked fo' in the reg'lar run o' things f'm time to time. 'Pears like Providence done ordained what there has to be shootin' scrapes occasional, an' th' ain't no sense in lookin' fo' things not to happen 'cordin' to natur'.

"But when the grim Angel o' Death, as the Good Book calls him, stands ready to poke his sickle in an' p'poses fo' to remove two o' the leadin' citizens to oncet f'm outen their sp'ere o' usefulness it sho' is time fo' somepin' to be did. Joe Bassett, yo' all is Sheriff. I reckon it's up to yo' fo' to take steps."

"I reckon I'll take steps quick enough," said Bassett, looking somewhat puzzled, "when the shootin' begins, if I'm anywheres in the neighborhood. I gen'ly reckons to be on hand case of anythin' diddin' in the way o' shootin'.

"But these two ain't no new beginners. If they draws 'tain't likely 't nobody's goin' to do no good a-buttin' in. An' th' ain't no law, 's fur's I know, what says a man sha'n't draw a gun when he sees the man what's goin' to shoot at him."

"Co'se th' ain't," said the old man. "What's to be did is to keep him from seein' on him."

"Well, of all the blingtwisted, dodrotted things I ever heer'd!" exclaimed the Sheriff. "Be yo' all reck'nin' I'd let one man get the best of another thataway, mo' special when it 'd break up the prettiest fight we uns is likely fo' to see fo' a long time?"

"There mustn't be no fight," declared the old man earnestly. "Mo 'n that, there ain't goin' to be neither on 'em shootin' at t'other. This here is a case where the c'munity is got to stand together an' do its dooty."

"How is it goin' to be did?" asked Jake Winterbottom, with considerable curiosity. "I reckon it'll be some hard to keep them two apart."

"The Good Book says, 'Mo' things is did by prayer than this world dreams of,'" replied the old man. "But I reckon if it was wrote nowadays 'stead o' back in the Middle Ages it'd be wrote poker 'stead o' prayer. There's mo' c'n be did with a game o' poker, if it's did skilful, 'n 'pears to be likely."

"Yo' all ain't reck'nin' on gettin' them two to play together, not 'fo' they meets up with guns, be yo'?" said Jim Blaisdell with some surprise.

"No, I hain't," retorted the old man tartly, "but I reckon 'twon't be no meracle if one on 'em c'd be brung into a game in the back room. An' if there's anythin' into the p'vailin' notion o' Providence bein' beneficial mebbe t'other one mought happen in fo' a drink afo' the game was over."

"Likely that c'd be did" observed the Sheriff, "but looks to me like that was on'y a means o' gettin' 'em to fight here 'stead of outdo's. I thought yo' all was some sot agin havin' any shootin' on the premises."

"There won't be no shootin' on my premises, not 's long 's I makes the house rules an' has a bung starter fo' to enfo'ce 'em th' won't," declared the old man with emphasis. "An' mo 'n that there won't be no shootin' nowhere else, not by them two there won't, not if yo' uns'il do what I tells yo'."

And he unfolded the details of a crafty scheme to his cronies, who agreed after some argument to assist him in carrying it out, though they were not as sanguine as he concerning its success.

"'Twon't do no harm," said Bassett, though he showed no faith in the idea. "An' if it won't work it'll bring the fight off when we uns c'n see it." And this consideration had its weight in inducing the others to agree.

Having once agreed, however, they played their several parts willingly enough, and in consequence when Mr. Billings rode into town the next day in search of his enemy he was met by a committee of two from old man Greenlaw's saloon. Moreover he was greeted in such friendly fashion that he was readily enough induced to visit the saloon in search of the stimulant which he may or may not have felt to be desirable under the circumstances.

Once there he found the atmosphere so congenial and hospitable that it was a matter of no great difficulty to persuade him to partake several times of old man Greenlaw's best liquor. It cannot be said that he was brought to forgo his purpose, but in the course of the evening he began to realize that it might be as well to postpone action until the following day, and being a man of strong sporting tendencies he listened favorably to the proposition of a game of poker, and he was soon engaged in a contest with Winterbottom, Blaisdell and Pearsall.

The working out of the old man's plan had been carefully arranged with reference to the exact time at which certain things were to happen, and possibly it was on this account that Mr. Billings won rather steadily for the first hour of the play.

Then when he had convinced himself thoroughly of the likelihood of his quitting greatly ahead of the game there came a hand which roused his hopes to a great height, the more especially as he found before the draw that there were two hands against him which the holders were prepared to back heavily.

Blaisdell had dealt the cards, and when Billings picked up his he found a straight flush, pat, queen high. He was not wholly unsuspicious, nor was he unacquainted with Blaisdell's reputation, but that player assumed such an expression of evident disappointment when he picked up his own hand that he was fully convinced that the brilliant dealer had for once made an error.

This conviction deepened when, after Winterbottom had come in and Pearsall had trailed, Blaisdell threw his hand down with a muttered oath which he seemed to be trying to suppress.

Billings therefore raised as much as he thought he could safely do without driving out the others, and he was particularly pleased when Winterbottom saw the raise and Pearsall raised back. With this promising start he pushed the game until he had not only all his chips but all the money he had with him in the pot. And again Pearsall raised it, $500 this time, and Bilings's greed inspired him with a strong desire to go further.

First he tried to put in an I O U, but the others told him regretfully that the house rules forbade that. Then he bethought himself of his watch and put that in for $100, declaring that he was sorry he could not go further.

Pearsall then said that he was willing to go to any length and inquired if the other had anything else of value with him. He would take it at Billings's own valuation. And Billings remembered his gun.

"I paid $30 for that," he said, producing it, "an' I wouldn't put it up fo' $50 if I wa'n't sho' o' winnin'."

"Put it in fo' $50," suggested Pearsall indifferently, and doing that Billings called.

A moment later Winterbottom dropped a whiskey glass on the floor. It might have been that he started in surprise when Pearsall showed a king high straight flush.

A few moments before that, while the players were engrossed in their game, Joe Bassett had entered the front room in company with Mr. Glover, and the two had been greeted warmly by old man Greenlaw. A pleasant conversation followed, during the course of which each of the three observed the usual ceremony of good fellowship, and it was while the third round was being consumed that the tinkling sound of breaking glass came from the back room.

"I heer'd yo' all had some sort of a difficulty with Ham Billings," observed the old man, as he wiped his mouth. "I reckon 'twa'n't nothin' serious though. Billings is some hasty, they tell me, but he's a val'able citizen, an' yo' an' him hadn't oughter have no gre't trouble."

Mr. Glover's reply would not look well in print.

"Well, well," said the old man. "If yo' all is reely wishful fo' to meet up with Billings I reckon yo' mought do it right now, but Billings ain't got no gun. Yo' wouldn't shoot a onarmed man, would yo'?"

"'Tain't likely," said Mr. Glover, who was well acquainted with the etiquette governing such matters.

"I thought not. B'sides there's a house rule ag'in shootin' on the premises. Billings is in the back room, but, as I was savin', he ain't armed. Now, what was yo' trouble with him?"

Mr. Glover replied at great length, but the gist of his statement appeared to be that there had been a disputed account of $100 between the two men, and that both losing their temper inexcusable words had been used.

"I thought likely," said the old man. "Now, Billings ain't got no money with him, but s'posin' I sh'd loan him $200, an' yo' an' him sh'd play a freezeout. Ain't that better 'n wastin' two val'able lives into a quar'l over a measly hundred? The winner c'n pay t'other the hundred an' still be ahead, an' the loser won't be on'y $100 out, an' he'd be that anyway if yo' all was to shoot each other up."

It took time and argument to convince Mr. Glover of this, and even more time and closer argument to convince Mr. Billings when the old man brought them together, but it was finally accomplished and the freezeout was played on the understanding the old man had outlined.

"This here joyful occasion 'pears to bristle with morals," said he when the final settlement was made, "but the principal one 'pears to be how draw poker is better 'n the co'ts an' even better 'n guns when it comes to the cl'arin' up o' trouble."

### Electric Ants.

*From the Atlantic Monthly.*

When you happen to sit down to rest or take notes near a colony of electric ants some wandering hunter is sure to find you and come cautiously forward to discover the nature of the intruder and what ought to be done.

If you are not too near the town and keep perfectly still he may run across your feet a few times, over your legs and hands and face, up your trousers, as if taking your measure and getting comprehensive views, then go in peace without raising an alarm.

If, however, a tempting spot is offered or some suspicious movement excites him a bite follows, and such a bite! I fancy that a bear or wolf bite is not to be compared with it.

A quick electric flame of pain flashes along the outraged nerves, and you discover for the first time how great is the capacity for sensation you are possessed of. A shriek, a grab for the animal, and a bewildered stare follow this bite of bites as one comes back to consciousness from sudden eclipse. Fortunately if careful one need not be bitten oftener than once or twice in a lifetime.

### The Wedding Cake Pagoda.

*From the Wide World.*

At Mingun, on the right bank of the Irrawaddy River, about five miles from Mandalay, in Burma, there stands a peculiar pagoda known as the Wedding Cake Pagoda because it looks like a marvellously magnified bridal cake.

It was built in the early part of the nineteenth century and is in thoroughly good preservation, only a few of the images inside having been broken. The extreme height to the top of the minaret is eighty feet and the circumference about 600 feet. The pagoda stands back from the river some 300 feet and is hidden from it by a grove of teak trees. Close to it is the famous Mingun bell.

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## *CHINESE LACQUER WARE.*

### Some of the Finest Specimens May Be [illegible] Years in the Making.

The manufacture of the lacquer ware, known to the Chinese as the "No. 1 Foochow lacquer," can hardly be called an art; it is rather a craft; the result of infinite labor and patience, since the laying on of the coat or color requires no more skill than the simplest form of painting.

This lacquer, although very popular and greatly sought by the Chinese, is little known in America, doubtless owing to a lack of appreciation or to the cost, since the market is flooded with a cheap form of lacquer that seems to answer all requirements.

The superiority of the No. 1 Foochow lacquer over all other forms is due to its durability and beauty; it takes more time to prepare (in some cases several years) and possesses a finish and depth of color unlike any other products of the same nature. The extreme care taken to refine the pure lacquer, the number of coats given, and according to the *Consular and Trade Reports* the great quantity of gold and silver leaf usually used in the last coat are the cause of this.

Concerning the gold and silver leaf used one imparts to the lacquer a dull gold color, in whose depth a fine gold powder may be discerned, and the other gives a silver green effect. Sometimes a little coloring matter is added, but the result is supposed to be better without it. The quantity of gold mixed with the lac is about one-third the selling price for these articles, which usually ranges from $2 to $3,000.

The earliest record of lacquer is from the Sung dynasty, although it probably existed long before that date, but in a more crude form. It was introduced into Japan in the third century from Corea, at the time of the conquest of that country by the Empress Jingo. The seventeenth century marked great progress in the industry in Japan, and the gold lacquer became very popular, but from that time its popularity decreased and the demand did not revive until the last few years. Last year the export from Japan was 219,525 yen, or about half as many dollars. The export of No. 1 Foochow lacquer, though a far superior article, is so small as to be classified in the customs returns under the head of furniture.

The lac is not a manufactured product, but the sap of the Rhus vernicifera, or Ch'i shu of the Chinese. The tree is tapped at night during the summer season and the lac sold to the consumer as a dried cake or in a semi-fluid state. It is first placed in a rectangular pan, where it is continually stirred with a spatula for about two days, then pressed by twisting the lac through a sack made of fine grass cloth and lined with a thick layer of cotton. The refined lac is put into the pan again for a day and the same process is repeated. So prepared the lac will answer for the first coats given the articles, but for the final or color coat the lac used undergoes this process four times.

The invention of the No. 1 lacquer is said to belong to the Shen Shao An family, in whose hands the manufacture still is. To this same family is also accredited the invention of silk lacquer. The term lacquer ware applies only to the thing which has undergone certain preparations before receiving several coats of lac. Ordinary woodwork covered with Ningpo varnish, or even with lac, is not included. The proper lacquer ware may be chiefly divided into two kinds, the ordinary and the silk.

The ordinary lacquer is applicable to almost every kind of furniture and to ornamental articles for the houses, but is commonly applied to woodwork. Only very old wood, usually cedar which will neither warp nor crack, is used for this purpose. Articles and ornaments of the most delicate carving are treated in this fashion.

To prepare the woodwork, such as furniture, for lacquer a lacquerer scrapes the wood one or two inches wide along any crack or joint or opening that may exist; it is then filled up with lac and two or three coats of linen cloth, which will not only cover the depth but also serve to keep the parts together. After a fortnight or longer, when the lac on the linen is perfectly dry, the woodwork is covered with a thin coat of black lac mixed with a little ching-chu, a kind of clay the preparation of which will later be described.

Ten days later a process of general polishing is applied to the article with fine pumice stone of various shapes and sizes. About every ten days a new thin coat of the lac mixture is put on. The article is always polished before receiving a new coat. After the ninth or tenth coat of this black lac mixture the article is thoroughly polished so as to receive the color coat.

For the preparation of the final coat a small portion of lacquer that has undergone the refining process four times is mixed by a pallet knife on a stone surface with the gold or gold and silver leaf. When thoroughly mixed it is placed in the centre of a thin sheet of cotton paper. The paper is then rolled together with the lacquer inside, the ends being twisted in opposite directions, until the lac oozes through.

This is repeated three times. There is great waste by this process, which may also account for the price charged for some of these articles. There is but one coating made of this lacquer. Sometimes a flat surface is decorated by adding flowers or birds with ordinary paint, but this is not very popular, since the color and quality of the lacquer itself are deemed sufficient decoration.

The silk lacquer is generally applied to small articles for practical use or for ornamental purposes, such as vases, card cases and images. The art is so far advanced that images of almost every description can be made under this system with accuracy and clearness.

The process commences by pasting a coat of native printing paper with rice glue mixed with ching-chu powder on a well modelled clay image, care being taken to cut the paper into proper sizes to suit the different parts where it is pasted and to paste it so neatly that every wrinkle of the face or fold of the material, should there be any, will remain clear cut. After the pasting the figure is thouroghly washed with this thin mixture and left to dry for two or three days.

On top of the paper is then pasted the silk with a plaster of black lac and pulverized ching-chu, with still greater care as to the overlaps and folds than is required in the paper coating. Ten days later another coating of silk is added after the necessary polishing has been applied.

For small articles only two coats of silk are sufficient, but in the case of larger ones one or two more coats may be added. When the silk moulding is dry and carefully finished subsequent coatings of black lac mixture are applied thereto at an interval of about every ten days in the same manner as to the wood, only greater care is exercised and longer time spent in the polishing.

Before receiving the color coat the image is immersed in water for such a length of time that the clay inside will dissolve and can be taken out through a hole left at the bottom of the figure for that purpose. After the removal of the clay the opening is sealed and a fortnight later the hollow and exceedingly light article is ready to receive its decoration.

On silk as well as woodwork the color coat is applied but once. The lac, though black itself, can be made almost into every color existing and of various shades by mixing it with other ingredients. The most costly colors are those which contain the greatest quantity of gold dust and the colors in most common use are bronze or ochre green of various shades and liver purple or dark maroon gold.

The term gold lacquer is easily misinterpreted to mean lacquer ware sprinkled with gold dust or fragments of gold foil or inlaid with gold thread, &c. In gold lacquer the gold or silver has been pulverized so fine that it appears no more a sprinkled dust, but its richness is blended with the other coloring matter and the refined lac, giving a lustrous and lovely tint of uniform shade.

The lac in the ching-chu mixture used for the primary coating has passed the refining process only twice instead of four times, as is described in the foregoing for that of the last coat. A little water is added to the lac when it is being mixed with the pulverized ching-chu.

Ching-chu is a refined red clay. It is dissolved in water and after the impurities, such as sand, have been removed the muddy water is filtered through certain layers of paper and porous tiles. The fine clay found on the top of the paper is dried into tablets or bricks, in which form it is sold at the market. This pulverized clay mixed with the lac will form a crisp coating on the woodwork or harden the silk in the silk lacquer.

A genuine No. 1 Foochow lacquer will stand any climate and any amount of washing, even with boiling water. In the common form of lacquer unrefined lac is used for the primary coating and that for the color coat has not been refined more than twice. Instead of ching-chu, which is comparatively expensive, the powder of broken bricks and tiles is freely used.

The color lac is very seldom or never enriched with pulverized gold and silver. Linen is substituted for silk. Very little or no polishing is done in each and every interval between the coatings until before the last coat. Owing to cheapness there is much greater demand for the imitations than the genuine. Ordinary lacquer ware will receive on an average but five coats, whereas No. 1 never less than nine and sometimes as many as twenty.

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