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MODEL OF THE SURFACE DETAIL

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KOOTENAY BELLE GOLD MINES LTD.

Sheep Creek, B.C.

35  
30  
25

-by-

Harry P. Darley

Presentation

The reader found it  
hard to visualize all that was  
described. Presentation might have been  
a little ~~more~~ careful. 20% of 35 25/35  
Matter

interesting as being  
thought out and carried out  
by the author. R.W.

20/25

Matter 20 / 25

Presentation 25 / 35

English 26 / 40  

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Fig. 1. The model under construction.



Fig. 2. Looking down on the finished  
model.



Fig. 3. Front view showing position  
of the model in the case.

### HOW INSPIRED

The Kootenay Belle Gold Mine is situated in the bottom of the Sheep Creek valley and is protected by steep partly timbered slopes. While surveying on one of the slopes about a thousand feet above the Kootenay Belle camp, I was surprised to see that the property below resembled a miniature landscape. The winding row of camp buildings apparently squeezed between the creek and the road in the bottom of the valley, the vari-colored waste dumps on the slopes, and the tiny trestle which crosses the creek to pass in behind the mill, all appeared extremely small and unreal. I imagined that I was looking at a miniature valley built by man.

The idea of actually reproducing the valley in minute detail so fascinated me that I finally decided to try it. I wanted to include all of the Kootenay Belle's property and to reproduce in color all the surface detail. I planned to stay in Sheep Creek through the winter and felt that to work on the model would be a pleasant way to spend the long winter evenings.

## CONSTRUCTION

### Laying Out

In order to reproduce the true picture, both vertical and horizontal distances were measured to the same scale. As the volume to be modelled could be inclosed in a solid figure approximately 3500 feet long, 2400 feet wide, and 1200 feet deep, a scale of 1 inch to 100 feet was finally adopted.

The base, 36 inches long and 24 inches wide, was made of one-inch boards. A 2 by 2 inch strip was screwed to the bottom of the base along either end and cut off three inches beyond the edges. Ropes hung from the ceiling were attached to the extensions and were used to raise the model from the table. (When not in use the model was suspended close to the ceiling; the table upon which it had rested was then free to be used for other purposes.)

A map of the desired area was drawn from datum furnished by the Kootenay Belle Gold Mines Ltd. and the Sheep Creek Gold Mines Ltd. Points were located from co-ordinate lines drawn two inches apart. The map contained not only the plan of all essential features including roads, creeks, railroads, aerial tram lines, buildings, claim boundaries, and stations in survey loop but also contours of the entire area. After the map had been orientated in such a way that the main creek would lie parallel to the width and across the center of the

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base, it was redrawn on the base itself.

#### Sub-structure, How Raised and Covered

The creek, lowest feature in the landscape, was the first structure built. One-inch finishing nails, spaced about an inch apart, were driven down along the lines representing the edges of the creek, until their heads were at the height representing the elevation of the corresponding points on the real surface. Plaster of Paris, mixed with enough water to make it quite viscous, was poured into the trench of nails and smoothed out until it was just level with the tops of the nail-heads. On the surface of the plaster, now a part of an inclined plane containing the creek-bed, lines were drawn through consecutive nail-heads to mark the creek's outline.

The sub-structure of the slopes was raised to the desired height by layers of strips, three-eighths of an inch square in cross section, placed along the co-ordinate lines. The first layer of strips was laid along all the co-ordinate lines running in one direction; the second layer was laid across the first and along all the remaining lines. Alternate layers were bordered by a strip which helped to form the ends and sides of the model. The arrangement created a series of squares, the corners of which corresponded to the intersections of the co-ordinate lines on the map below. Any point located from its co-ordinates on the map, could now be located at any

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elevation from the edges of the strips which were now the new co-ordinates.

Both slopes were cut off horizontally, one at nine and the other at eleven inches above the base. Cutting one slope off at nine inches left enough flat space upon which to place a nicely balanced title plate; cutting the other slope off at eleven inches, balanced the area on the two sides of the creek and allowed all the important features on the property to be shown.

The leveled base represented an elevation of 3100 feet; therefore, all points together which were an inch above the base represented a plane with an elevation of 3200 feet. The creek-edge of the 3200-foot layer was trimmed along the 3200-foot contour, and similarly the edge of the layer whose top most nearly approached the level of the 3300-foot plane was trimmed along the 3300-foot contour on the base map. The edges of intermediate layers were trimmed off to form a graded slope between the successive contours.

As the tops of most of the layers were lower than the even 100-foot planes which they represented, nails were driven down along the edges of the layers to form contour lines lying directly above their respective plans on the map. The heads of these nails were points in the true contours which were now established both vertically and horizontally. Other nails placed on the surface



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of the structure directly above survey stations, corners of buildings, points on claim boundaries, railroads, and other important details, were driven down to the same elevation as that of the points which they were representing, and were used to identify these points after the framework was covered with plaster.

The camp-site and roads were built on the sub-structure. A row of nails was driven down about three-quarters of an inch apart along the outside edge of the road. The tops of the nail-heads represented the elevation of the corresponding points on the real road. A mound of plaster poured along the nails was graded down with a spatula until it was level with the tops the heads. The outside bank was trimmed to make it look as much as possible like a real road bank, bridge approaches were placed, and spaces were smoothed off for the road-side buildings.

The surface of the broad slopes was fabricated over a mat of shavings and small short sticks placed between the "contour-nails" and stuck into the framework. The plaster was poured to a depth of about an inch and smoothed out until the nail heads were visible. Although the mat was soaked with water to prevent its drawing the water from the plaster, the plaster set in a few minutes and only small sections were poured at a time.

## CONSTRUCTION

### Surface Detail

The surface detail was scaled to 1 inch to 100 feet. Nail-heads showing through the plaster directly above important points on the map were used to locate the detail on the surface of the model. Since the landscape was to be restored in color, the whole surface was painted a grayish-green to hide the snow-white plaster which could not be hidden by trees, dumps, rocks, and similar objects.

One of the outstanding features of relief, a high reddish-black bluff jutting out above the camp, was reproduced with small reddish-black rocks taken from the real bluff. After being orientated to strike in the same direction as the real rocks, the pieces were set in plaster. (See fig.1.) Other pieces were glued on to give the appearance of a solid mass of rock.

Rock taken from a real slide, below and to the left of the bluff, was crushed, screened to the proper size, and poured over wet glue spread over the slide area. The rock which stuck was left in place, but the remainder was swept away. After scattering a few large "boulders" over the slide, it looked surprisingly real.

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Waste dumps, made in much the same way as the slide, were correctly colored duplicates of the real dumps. Several layers of glue and crushed rock were applied to give a

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piled-up effect. By pouring the "dump-rock" over the glue the sizes were graded laterally; the fine-stuff stayed near the top of the dump, while the heavier coarse material rolled down and out to the edges. All rock which did not stick to the dump was swept off.

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A big washout nearly two hundred feet long on the real landscape was cut out to scale on the plaster. Fine sand was poured over the wet glue spread into the cut, and a striking resemblance to the real washout was obtained.

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Roads were "gravelled" by sprinkling over their freshly painted surfaces a finely ground light-gray quartzite. Trails were scratched in the plaster along the lines joining certain nail-heads and were dusted with an earthy-brown pulverised rock.

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Miniature railroad tracks, made of fine black silk thread, were laid on the tops of the two lower dumps.

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All buildings were made of wood and were glued to the plaster. The important over-all dimensions were measured with a rule, but many of the small details were carved free-hand. Special care was taken with the mill, largest building on the property, in order to get an accurate reproduction. The wrecked remains of an old stampmill were

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## CONSTRUCTION

also carefully duplicated. The buildings were painted the same color as the buildings which they represented. Most of the roofs were covered with a silver paint to resemble the silver color of the galvanised iron on the real roofs.

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A high trestle, used to carry ore across the creek from the mine to the mill, was reproduced in minute detail. The part containing the track was carved from a thin sheet of pine; the long poles supporting the structure were taken from exposed roots, the bark of which had weathered away and left very fine round "strings" of wood. Cribbing, placed along the creek to hold up some of the lower dumps, was also cut from the "strings".

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The creek-bed was partly filled with miniature boulders and gravel, glued in place to give the effect of eddies and rapids. A transparent mucilage which retained a shiny surface when dry was used to represent the water. The mucilage was poured down the creek-bed, worked into the eddies, and piled up against miniature log-jams and other obstructions to give an amazingly realistic picture of the real creek.

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Three small bridges made of paper-thin strips of wood were laid across the creek and rested on cribbed-up approaches. On the large bridge the super structure was also reproduced.

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### CONSTRUCTION

The slopes on both sides of the creek were partly covered by bushes and trees taken from a peculiar type of fern-like moss which grew in damp protected places in the Sheep Creek valley. When cut to the proper lengths, these pieces of fern looked exactly like miniature evergreens. If cut from the ends of the fern, the trees tapered off to form long dead spines; if cut from dead bleached ferns, the trees made wonderful duplicates of the dead trees which were very numerous on the real landscape. Trees, bushes, stumps, and windfalls were all stuck to the surface by tiny drops of glue. It was extremely helpful to find that the green trees retained their green color even after they had dried for nearly a year in a warm room.

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Two aerial tramlines were installed between the mill and the portals of two of the tunnels. The "wires" in the lines were made of fine silk thread and sagged a little between the supports to give a more realistic appearance. To duplicate the real tram, a tower built of thinner poles than those used in the trestle, was erected in the center of the line.

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The whole structure was inclosed in a cedar case, the front of which was cut out as shown in fig. 3. An extra four-inch border was fastened around the bottom to hide three 2 by 2 inch supports. A groove cut about a quarter

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of an inch down from the top on the inside of the back and sides served to hold the large plate-glass cover, and a sheet of thin glass replaced the wood cut out of the front. The sections of the case which showed under the glass were painted white, and the outside was treated with two coats of clear varnish.

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After looking over the finished model, I felt that it reflected the work of a beginner. However, the many hours spent in its construction were pleasantly spent, and with the aid of experience gained from making this model I plan to do a much better job on the next one.

### NOTE OF THANKS

I wish to express my thanks to Mr. H.C. Hughes, Inspector of Mines, Nelson, B.C., for so kindly offering to care for the model, and for having it put on display in his office; also to the Kootenay Belle Gold Mines Ltd. and the Sheep Creek Gold Mines Ltd., both of Sheep Creek, B.C., for the material which they so willingly furnished.