Correspondence re: Well record display board. 1955

G. F. HANSON
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THE UNIVERSITY OF WISCONSIN

GEOLOGICAL AND NATURAL HISTORY
SURVEY

SCIENCE HALL

MADISON 6, WISCONSIN

July 20, 1955

Mr. A. P. Kuranz, Superintendent
Waukesha Water Utility
North Street
Waukesha, Wisconsin

Dear Mr. Kuranz:

I will be retiring before long and desire to write up my method of making display boards of well records. I have written the text but lack a photograph of a completed board. You have some and so do they at our city hall but I now have no camera larger than 35 m.m. with which to take a suitable photograph. I was wondering if you either have a photograph or can get one of one of yours to use with this short paper. Anything you could do to help prevent this becoming a "lost art" will be greatly appreciated.

Very truly yours,

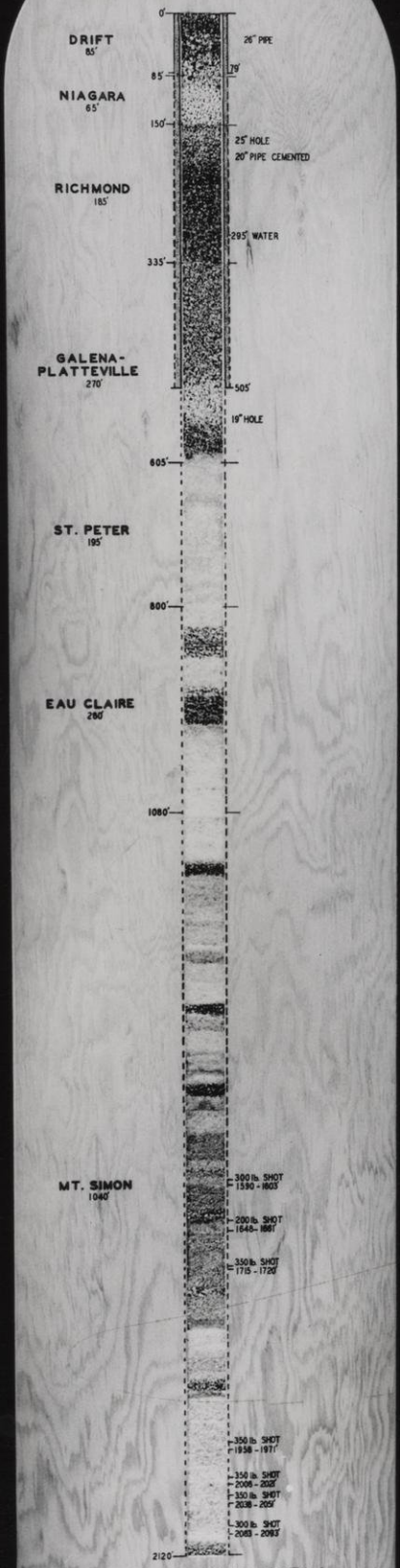
WISCONSIN GEOLOGICAL SURVEY

F. T. Thwaites

F. T. Thwaites, Geologist

FTT:N

Will have a photo made for you
an compliments.
A. P. Kuranz



EAST AVENUE WELL

WAUKESHA, WIS.

A. P. KURANZ, MANAGER, WATER UTILITY
MILLER WELL AND PUMP CO. CONTRACTORS
HOLLAND WELL SERVICE, CEMENTING
F. T. THWAITES, WISCONSIN GEOLOGICAL SURVEY

1954

Display Boards Showing Well Records

Ever since deep wells were first drilled many persons have desired to show the materials passed through for public display. Most of these used a glass tube up to an inch or more in diameter inside of which the cuttings were placed according to scale. The glass tube was then mounted on a board or in a glass case with appropriate description of the materials and their depths alongside. For many years the writer made such tubes only to discover to his sorrow their many shortcomings. In the first case the glass is not easy to see through. Moreover, no matter how carefully one tamps the cuttings in the tube they later sink with resulting mixture and inaccuracy of scale. This is because they form a "bridge" giving the impression that packing is tight when it is not. Later this bridge loosens and the cuttings settle, particularly if the tube has been subject to vibration in shipping. Another defect is liability to breakage no matter how well mounted. Some tubes hung above a steam radiator broke near the bottom within a short time, doubtless because of differential expansion. Considering these serious defects the writer sought a new method of construction. First, attempts were made to prevent settling by adding a liquid with the cuttings. Water, glycerine, and celluloid dissolved in acetone were all tried. The first two had little, if any effect. The third collects on the inside of the glass imparing its transparency. Difficulty is also encountered in getting the air out from below the wet portion. This was overcome by slowly withdrawing a small brass tube from the rear side of the glass tube but the defects mentioned above could not be overcome.

A common practice among geologists is to divide a strip of cardboard according to scale, varnish the divided section, and then sprinkle dry cuttings in their appropriate spaces. The surfaces of such particles are unobscured but form a rough surface of uncertain durability which is hard

to keep clean if hung in a dusty place. It seemed better to cement the cuttings into a groove cut in a board. At first white shellac was used for a cement but later clear lacquer was substituted. Clear varnish might also be used, although the writer has not tried it.

Making a suitable groove in a board is not easy. Some were made with a tool called a "router" which involves passing the board accurately under the cutter on a slide. Later 3/4 inch plywood was used. A cut with a circular saw is then made on each side of the groove and either one or two layers of plywood removed with a chisel. Plywood boards do not warp much so this material was finally adopted. The writer has used boards 48 inches long with a groove in the center an inch wide. The sides of the groove, which is 40 inches long, are slightly undercut so that if the filling of cuttings should break it would not fall out. The top end of the board may be either cut into a half round or have the corners cut off. When the groove has been prepared a slide rule was used to establish the proportion between well depths in feet and length of groove from the top in inches. Dimensions were computed to hundreths of inches although it is difficult to place material that accurately. The board, including the groove is shellacked before any cuttings are placed. When measured to each change of formation as shown in the geologists log of the well the cuttings were put in place. Cuttings from firm rocks such as limestone or dolomite were screened so that only particles which will pass a No. 10 screen and be retained on a No. 20 are used. Sandstone, unless very coarse, should be confined to the material which will pass 20 mesh screen and be retained on a 50. No material which will pass a 50 mesh screen should be placed in the groove for it hinders entrance of the lacquer. Shales were long a problem in grooves. The matter was finally arranged by taking lumps of cuttings and breaking them until they pass the 20 mesh and are retained on the 50

mesh screen. These are put in place with a small spatula with the board flat. A start is made at the top of the well and the lower side of each kind of material is made straight across the groove at the top. The lower part slants outward. As soon as a section several inches long is placed it is cemented with the lacquer which can be dropped either with a section of glass tubing drawn out to a dropper, with a medicine dropper, or with a small spoon. If there are any defects they are smoothed out with the spatula before the lacquer hardens. Marks showing depth must be placed on the edges of the groove using a soft pencil which can readily be erased.

When all material is in place the laccuer is allowed to dry thoroughly and all pencil marks except those necessary to show the divisions which are to be explained in the legend are erased carefully. Care must be taken that the pencil did not leave any grooves in the wood after erasure of the pencil. The legend, which should give the names and thicknesses of the different geological formations penetrated, is then done in India ink. The hole sizes, pipe sizes, and cement grout are also shown with appropriate symbols alongside the two sides of the groove. Static water level may also be indicated. The names of formations with depths of contacts and thicknesses are lettered in neatly with the aid of lettering guides of any kind. If too much shellac prevents ink marks on the board the surface may be roughened with fine sandpaper. Erasures of mistakes are made by sanding down the erroneous area reshellacing, and doing over on the new surface. When done and checked the legend is preserved by spraying transparent plastic from a pressurized spray can neatly over the whole including also the groove. The lacquer and plastic brighten the colors of the cuttings and make the geological succession stand out clearly. The most spectacular results are obtained with wells which penetrated some red rocks. Rocks all of the same color may be somewhat

diversified by changing the size of the cuttings in different layers. The name of well, location of well, names of engineer and drilling contractor, and date of drilling are placed at the bottom of the board in larger letters.

A board makes a well record valuable not only for wall display but one which is not easily lost. It is said that the first boards made in this way more than 20 years ago are still perfect.

F. T. Thwaites