trade and to which they have devoted their entire energies.

To point out an evil is easy; to show an effectual remedy is another matter. There is one thing the retail jewelers throughout the province should do and can do and rightly considered will find it to their interest to do. Support and buy only from the legitimate trader and to remember that in buying from a firm who will sell a twelfth dozen watches or chains to any peddler or merchant and his clerks, and his sisters, and cousins, and aunts and their friends, they are really supporting a formidable competitor to their own local trade.

In my own town (and I know that my experience is not exceptional) within a stone's throw I have dry goods men, grocers, hardware dealers, druggists who buy everything they want in watches or jewelry not for their own use only but frequently for sale in their stores, where they buy their own trade goods. Nor is this all, their clerks and their friends (and who has not a friend) make use of this same connection and they will supply a watch for a customer of theirs at any time if they get a chance.

Respectfully,

G. W. BEALL,
Watchmaker and jeweler.

Lindsay, 20th August, 1885.

Selected Matter.

THE USES AND METHODS OF WORKING GOLD AND SILVER AND THEIR ALLOYS.

Abstract of a Paper read at the London (Eng.) Horological Institute on Wednesday, March 18, 1885.]

The well-known alloys of copper and silver for gold, and the copper alloy for silver, are so familiar to us, that I shall dwell more upon an alloy not generally used in the high standards of gold, but frequently employed in low standards, viz., zinc.

Gold of a very low standard alloyed with zinc, when polished, presents the appearance of gold of a much higher standard. A curious fact presented itself to me a short time ago, whilst operating upon a portion of a gold Geneva watch-case. To all appearance it was gold of about twelve carat, worth something like 40s. per ounce. Wetted with nitric acid, the usual green was not noticeable; after the acid was wiped away, I found spots of an unusually deep red color. was not my province to value gold, but to repair the case, I proceeded to anneal, preparatory to soldering. The flame of gas no sooner touched the metal than an explosion occurred, splitting and shattering my portion of watch-case to pieces. When it was cold, I dipped a piece in a weak solution of vitriol; it then presented its true character, viz., an alloy of silver, small portion of copper, zinc, and gold, and reported by an assay to be gold of six carat, worth 21s. per ounce. I may add, this gold or zinc alloy, after being annealed, has become as brittle as thin sheet glass. This caused me to inquire what effect is produced by the addition of zinc to an alloy of gold or silver. I therefore prepared and melted a similar alloy, which proved to be malleable, but not so malleable as gold alloyed with silver and copper, and decidedly harder than gold containing the two latter alloys. Annealing has the desired effect of softening the metal. In process of plating, and when polished, it presented a good color, and I was curious to know how long, or under what circumstances, the elements in the zinc would produce these mischievous results. I was satisfied that a galvanic or electric action would have to be produced. I had flatted a piece of this gold and zinc alloy exceedingly thin, which, when annealed, showed no signs of cracking upon being bent. For the present I was not satisfied, and having cut the sheet of metal into small pieces, I laid them aside. Some few days after, taking a piece in my hand without any positive motive, I placed it in my mouth, and after a second or so, between my teeth I noticed a cracking sound. I was now persuaded that the gases or acids of the mouth were producing the galvanic action I was seeking, and taking another piece I breathed heavily and repeatedly upon it. In about half an hour the piece so breathed upon became as brittle as my portion of watch-case, and thoroughly useless for any mechanical purpose. This accidental and imperfect experiment demonstrated the fact that zinc is both a dangerous and mischievous alloy; as articles of gold jewelry so alloyed must, upon coming in contact with oxygen, lose most of their physical properties by galvanism and oxidation. The knowledge of this may deter operators upon low standard gold from using zinc as an alloy, of which the most that can be said is that it produces a good color and is apt to deceive the uninitiated of its true standard. Brass, an alloy which I know is used in the ridiculously low standard sold as gold, produces similar results to that of zinc.

Hellot, a writer upon metallurgy, states that gold highly alloyed with zinc becomes wholly volatile when heated. Pure gold has a very feeble affinity for oxygen, but is an excellent conductor of heat and electricity, and with some presumption I say gold is an element capable of being placed and replaced. I have not been fortunate enough to find any metallurgist whose writings would bear me out, but most have come so near as to hesitate in their decision. Napier, a metallurgist whose writings I often turn to with profit and interest, gives his experience, that melting 80 lbs. weight of pure gold, he found a loss of 4½ grains, which he eventually collected from the vapor escaped in the process of melting. The same writer, in a paper read before the Chemical Society, shows that gold alloyed with silver or any other metal, when melted or cupelled together, becomes exceedingly volatile, but more so if the metal employed be lead; and Makins still further corroborates this fact by experiments he made, and deposits obtained from a flue attached to a muffle furnace. Therefore, although we may say gold and silver are indestructible by heat, yet they do escape us in what I may call metallic vapors. The strong acids employed in the wet process of liquefying gold and silver volatilize these metals; therefore we may say the air we breathe in Clerkenwell is, to some extent, charged with precious metallic vapors.

Now a word upon assaying. Assays are generally made with reference to standard, as so much better or worse. In endeavoring to show how assays are made, the process may appear very simple, and may be so if you keep your calculations correct, and use a proper balance or scales. Should an assayer be present, I hope he will take it that I am giving but an outline of how assays may be made. The experiment I made in assaying was under the most unfavorable circumstances, but the results were sufficient to encourage me in the hope that with more adapted appliances I may succeed in making a faithful report. The metal I operated upon was obtained from the sediment of the water we call in the trade "wash-hands." Upon being reduced, it appeared to me exceedingly base. I therefore melted and remelted it