XXXI.—*On a Cement for stopping the cavities of Teeth.*

BY T. J. HERAPATH, F.C.S.

A good cement for stopping the cavities of carious teeth has long been a great desideratum to dentists, because, unfortunately, almost all those now known possess some disadvantage or other. Even the copper-amalgam, hitherto the one most preferred by the members of this profession, and of which the analysis and mode of preparation have been recently described by M. Pettenkofer,* is apt to communicate a very unpleasant metallic taste to the food, and soon becomes discoloured, in consequence of the formation of a thin film of black sulphuret of copper. But in the course of the last few months, another succedaneum, the invention of an American gentleman, has been brought into notice; and this would appear to

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possess every requisite that could be desired. The substance referred to is an alloy of tin and cadmium. When combined with a small quantity of mercury, it becomes soft and semi-fluid, and may then be easily pressed into the cavity of the decayed tooth, where it soon solidifies into a hard, tenacious, crystalline amalgam, thus preventing the access of air to the interior of the tooth and rendering the organ fit for the purposes of mastication. Being at the same time of a dull white colour, similar in appearance to frosted silver, and not liable to become tarnished, close scrutiny is required in order to detect its presence. The great advantage of this latter property need not be pointed out.

When about to be employed, the alloy in fine powder is mixed up by the operator in the palm of his hand, with from two and a half to three times its weight of mercury, or such a quantity as will suffice to render it perfectly soft, when it is immediately pressed into the cavity in the enamel, the latter having been previously cleansed and dried by the ordinary method.

The alloy above-described, as may be naturally supposed, is readily acted upon by acids, even by the diluted vegetable acids, which gradually dissolve out the cadmium. But as the salts of cadmium do not appear to produce any injurious action upon the system, unless taken in large quantity, of course no ill effects need be expected to result from this circumstance.

This metallic combination of tin and cadmium presents us with another interesting example of the effects of crystallization and amorphism on the physical properties of bodies. As in the case of the copper-amalgam before adverted to, the specific gravity does not appear to vary in the transition from the amorphous to the crystallized condition, as the amalgam, when hard, occupies very nearly, if not exactly, the same space that it does when soft and fluid.

In conclusion I may observe, it has been found that, the proportion of the cadmium may be considerably reduced without altering the physical properties of the compound. A mixture of 5 parts of cadmium and 7 to 8 of tin is the best, and has been found to answer remarkably well.

A quantity of the cement in question was placed in my hands some time since by a friend who wished to learn the nature of its components. Upon subjecting it to analysis, it was found to consist of tin and cadmium in the following proportions:

8.90	grs.	gave	3.962	grs.	of SnO^2	and	6.629	grs.	of CdO .
10.00	"	"	4.460	"	of SnO^2	"	7.429	"	of CdO .
10.00	"	"	4.630	"	of SnO^2	"	7.422	"	of CdO .

It would therefore appear to be composed of:

	I.	II.	III.	Mean.
Tin . . .	34·899	34·960	34·980	34·946
Cadmium .	65·061	65·010	64·950	65·007

and must therefore be considered as an alloy of these two metals in the proportion of one atom of the former to two of the latter.

The best mode of preparing it, I find to be as follows:—Melt a quantity of bees'-wax in a pipkin over the fire, and then throw in the cadmium; by these means, the loss of cadmium which would otherwise result from oxidation is avoided. So soon as the metal is completely fused, add the tin in small pieces till a perfectly homogeneous alloy is formed. This can be afterwards granulated in the usual manner, or by introducing it into a wooden or iron box, and shaking it up rapidly while it still remains in the fluid state.

Since the above was written, I have analysed another and somewhat similar cement, which was stated by the inventor to be composed of platinum and tin. A quantitative examination, however, proved it to possess the following composition in 100 parts:

Silver	73·188
Tin	21·127
Zinc	slight traces
Platinum with very slight traces of gold .	5·685
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	100·000