Colorado Springs.
Dec. 22-1908

Dr. G. V. Black
Northwestern Univ. Dental School
Chicago Ill.

Dear Doctor Black.-

Since it seems to be settled that you are to visit us in July, I hope so at least, there arises a multitude of detail which it seems to me the time between now and then is all too short in which to arrange and classify what we have undertaken.

There can be no doubt but with your aid we can perhaps solve this problem of the stained enamel, at any rate we can come much closer to its cause than ever before, and in order to give you all the information we have we have here taken steps in our local society to collect data previous to your coming.

A Committee of which I am a member has made application to the School Board for permission to make an examination of school children to find what percentage of children have these stains. In such an examination we shall try principally to learn the birthplace of the child and at what age it came to Colorado Springs (if born

elsewhere. The School Board objects to taking much time from each pupil so we cannot undertake anything more than a hasty examination. If you can suggest anything to us in this regard we will try and put it into effect. We aim to make this examination as soon after Jan. 1st. as the Board allows.

This would help to determine one of the important features namely; how many (what proportion) of our children are afflicted and of these showing the stains what proportion were born here or spent their infancy here which I believe amounts to the same thing.

The other great point is, does this stain, which is often spoken of as the "Colorado Stain" occur in any large proportion in other places throughout the State and if so where This it seems to me to be a most important point, in that it would allow us to compare the natural conditions in those places where the stain exists.

To do this we contemplate having colored half tones made from hand colored enlarged photographs of excised crowns of stained teeth. These we propose to send with a circular letter into every community in the State that has a dentist. These half tones would make a fairly accurate representation of the condition as it exists and seems necessary because it is very hard to describe the stain to any one who has not seen

it. Other stains would be confused with this one unless we found a picture and even then there is danger.

Now if you can suggest anything along this line either as to procedure or as to the best way to get a pictorial reproduction of such teeth we will be very grateful.

I am experimenting some with the color plates, photographing the teeth in the mouth but have not seen the result yet. If we get anything you may depend upon getting the very best that we get.

My own opinion however is that this stain does not occur in any other community in the State except perhaps in scattering instances. My reasons are as follows: Never has such a condition been mentioned at any State Dental Society meeting by anyone practicing in any other community, neither in private conversation; no one has ever mentioned in the literature that I know of; the dentists of Denver (75 miles north) seem to be almost wholly unacquainted with it and express surprise when told of our local condition. The same with Pueblo (45 miles south). In a series of letters some seven years ago I found it unknown in other sections of the State.

My practice here is Orthodontic dealing almost wholly with children. I rarely fail to find that those having the stains are native born or have come here in infancy.

I find also that those children who have not come here to reside until they were say five or six or past do not present the stains. This is almost the universal rule.

The three years previous to a year ago now I spent in St. Louis also in Orthodontia. In my private practice with children I never once observed a case of stain. Also in the three annual sessions of Dr. Angle's School of Orthodontia of which I was Superintendent during that time selecting the clinical material and caring for the cases between sessions I never saw it, and I surely would have recognized it because I had been in general practice in Colorado Springs for the four years previous. In fact I almost forgot about it while in St. Louis.

A threatened failure of my health obliged me a year ago to abandon the St. Louis work and return here, where the stain problem again struck me with more force than ever.

For these reasons it seems certain that we have a condition here that exists no where else at least in the same proportion or anything like it.

Now when we refer to this locality it is very likely that we will find that we must include a surrounding area of perhaps 30 miles radius. This would include no towns of any size except possibly the Cripple Creek

mining district although I have never heard of the stain there.

I have spoken of it in children's teeth. This requires a little explanation. It is limited here almost to children for the reason that the town is not much over 30 years old, and there are comparatively few adults who were born here and have lived here continuously. Most adults were born elsewhere but we do find a considerable number of persons who were born here and are now say past 20 or almost 30 whose teeth are severely stained.

Another important fact is that the stain is never found in the temporary teeth; at least no one has ever reported a case.

Another thing: the dental profession seems to be generally agreed that this problem is divided into two phases. The brown discoloration itself and a mottled or streaked chalky appearance of the enamel.

The average run of cases is something like this – the upper central incisors will be stained brown in certain areas varying with different cases, and sometimes the upper laterals also: never the laterals without the centrals: the lower incisors almost never stained. The rest of the permanent teeth in the mouth will be mottled as described: the cuspids perhaps less than the other teeth and the second

molars less than the first, but I know of one case that the entire denture including 3d molars are deeply stained.

Other cases, and probably the largest number, will present a general mottling but an absence of the stain or a very slight stain.

I should have said that our School examination will include the mottling.

I think we must consider the stain and the mottling as the same problem and I believe that Dr. Wilson who saw you last Fall told me that you believed so.

In order that you may see the problem through our eyes I will try and cover the local theories among the dentists concerning it.

Probably the principal theory is that our water supply is accountable for it and the reasons that are given are that our water is so pure ("too pure" as it is stated) that it holds no earthy material, meaning lime principally and for this reason the teeth are not properly calcified.

Our water, in fact, is practically absolutely pure. It has a national reputation and from its journey in the mountains to our pipes flows on nothing but granite.

I find that this theory is pretty general and some men have put children & pregnant women on lime-

water as a measure of overcoming the evil. I know of no results however from such treatment nor would I expect any from such empiricism.

Referring back to the matter of calafication I know it will make you smile, because I know your views & findings upon this matter.

One gentleman reports having found a similar condition in a family who used cistern water, meaning I suppose that the water like ours was free from lime.

Some other theories which lay this problem to the use of certain foods probably come no nearer the truth.

Let me put the matter now from a personal standpoint. Is it a matter of calafication? I think not. The nearest I have ever seen the condition explained is in your book which if I have read it aright describes the condition (I am speaking now of the mottling) as a failure of the cementing substance between the enamel rods. You somewhere state that scrapings put under the microscope show that the calafication of the enamel rods is perfect but that they are floating unattached to each other. From this I conclude that there is abundant lime, but a lack of the cementing substance.

This I believe to be the heart of the problem.

That such an area could be infiltrated by, or could

"soak up" pigmented matter when normal enamel would do would seem natural to me. The close proximity of the capillary loops to the forming enamel might under certain adverse conditions allow a leakage of blood, with hematin deposited there as a permanent stain, seems to my mind to offer a possible solution.

But why ~~it~~ such a process should so often confine itself to the upper centrals and why it should occur so often in Colorado Springs and no where else I must admit baffles me completely.

A little more about this water theory. I cannot believe that the explanation lies there because, in the first place, supposing the water doesn't hold any lime. What difference does that make? We surely do not depend upon what lime we drink from drinking water for the calcification of our teeth. Do we not rather drink it from other sources such as milk and other foods.?

In the second place how much lime can water be made to hold. Very little I think and surely no community has pure lime water as a regular supply in order that their teeth may be properly calcified.

Then again the stain is often confined to the cutting edges of the centrals which portion of the tooth begins to calcify at about one year after birth according to

current authority. At that age how much water per day does the average infant drink?

I may be wrong but the more I think of it the less I can ascribe it to the water supply.

Frequently the question arises as to whether this stain is a matter of development or whether it comes on after the teeth erupt and some of our profession here maintain the latter. Even Dr. Andrews of Cambridge Mass. told me in a letter that it was something that came on after eruption. Parents frequently will say this but we can understand the error on their part.

I hesitate of course to question Dr. Andrews, but I cannot understand how he arrives at such a conclusion.

In its very nature I do not understand how a tissue like enamel if its surface be perfect, can absorb a stain. If it could, and there were something in our atmosphere or water here that could stain, it would all have stained teeth, instead of natives only.

To make the deduction more absurd, we notice that the enamel surface is perfect as to glaze, otherwise what pits caries would run. We find that these stained teeth are not more likely to decay than others. Neither are the mottled teeth.

In thus drawing the thing down I may have gone to

an unnecessary length, but I felt that a full statement was due you, partly to aid if possible, and also to get rid of error.

You asked for more teeth to section and study. They are very hard to get because as stated the staining is confined to the incisors so frequently and they of course cannot be lost. Few are old enough, who have therestains, to have pyorrhea bad enough to lose the teeth.

I have scoured the city and can get no extracted teeth that have even the mottling. I have however three excised crowns of incisors, the mates to the one you had from Dr. Wilson which I will send to you before long, after they have been used to paint prints from.

If there are any ways that our committee can assist you in preparation for your coming, please give us your full suggestions.

With very great respect I am

Truly Yours

Frederick S. McKay

309 N. Tejon St.