

Colorado Springs

Feb. 27/1912

D. G. V. Black  
Chicago Ill.

Dear Doctor Black.

Your manuscript was received today and I have just read it over and wish to present some additional data concerning the matter of spotted enamel which I trust will be of interest and value and will take up several points in the paper upon which I wish to make comment.

I will first report my findings on a week's trip in January to the cities of La Junta, Raton New Mexico, Trinidad, Wakeburg and Alamosa which had been suspected territory except Raton, of which we knew nothing, but which was examined because of its being on a different watershed which is crossed in going over Raton Pass on the main line of the Santa Fe Railroad. La Junta was the first town examined and

which I didn't find just what I expected,  
yet I did find a very curious state of affairs  
which I will relate after I have outlined in  
tabulated form the data secured.

### La Junta -

Number examined . . . . . 338

In this number I found 33 mottled cases.

(Note here that the term "mottled" includes  
all cases having lesions, whether mottled alone  
or mottled and stained for of course the two  
are inseparable).

Of these 33 mottled cases the following histories  
obtained.

Native to La Junta . . . . . 24

Chargeable to Colorado Springs . . . . . 2

" " " Rocky Ford (similar from La Junta) 4

Migratory in susceptible territory . . . . . 3

Total Natives 148 - 24 mottled - 16 normal enamel  
= 17% of natives mottled.

I found a considerable variety of waters used  
at La Junta as follows; Artesian water from various  
depths; city water from a well near the banks of  
the Arkansas River which flows through the city and  
which receives Fountain Creek with which you

are familiar, some forty or more miles above the city; Cistern water, and lastly I found that Colorado Springs water was shipped there, or had been, and was peddled through the streets and used by many families. Most curious of all was the following circumstance; The Santa Fe Railroad maintains a division headquarters there and it is at this point that the branch to Pueblo, Colorado Springs & Duran leaves the main line.

Locomotives from Duran take water at Colorado Springs on the trip to La Junta and being mostly a down hill run from there engines consume little water and so come into La Junta with tanks well filled with Colorado Springs water.

Knowing the reputation which our water has for purity the shop & round house men are in the habit of carrying home canteens filled with this water for drinking purposes and often the locomotive tanks are almost emptied in this way. This is done to avoid drinking the city water there because of its so-called alkalinity. So the water situation there is very complex and

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I found it hard to connect a given case of mottling with any particular water. In fact I observed that mottling seemed to exist regardless of what water had been used as I questioned several of these cases as to the kind of water used.

I left La Junta considerably at sea as to any possible value to my findings.

The next day I examined Raton with the following result.

Number Examined	432
Mottled cases found	7
with following histories:-	
Godfield Cal. (known susceptible territory)	1
Wabenburg " " " " " "	1
Migratory in known susceptible territory	1
Natives to Raton (all slightly marked)	3
Colondrias New Mexico	1
	<hr/>
	7

Raton is thus to all intents & purposes immune.

I came back into Colorado the next day and examined Trinidad which I had suspected

strongly of being susceptible territory with the following result

Trinidad -	
Number examined	238
Mottled cases	6
Historic -	
Cripple Creek (known susceptible territory)	4
Hakrubby " " "	1
Indefinite history	1
	<hr/>
	6

Trinidad is thus classed as immune.

Taking Alamosa next I found the following -

Number examined	328
Natives	71

Of these 38 had lesions which establishes the proportion that 50% + are afflicted.

Alamosa is the center of the great San Luis Valley which is the largest of the Colorado valleys and is 150 miles long by an average width of 40 miles making an area about the size of the State of Connecticut. The Rio Grande River flows through the valley and the water supply of this

city is from artesian wells of various depths, some of which are quite warm to the taste.

I saw one well which was a gusher and had been pouring out a large stream for 20 years continuously. The railroad crosses the La Veta Pass over a mountain range to get into this valley so I was in a different watershed from the other towns named.

I leave my account of the findings at and about Wakerburg which was visited just before Alamosa until the last because I feel that there I have come nearer to tracing the serpent to his lair than ever before and the account follows.

I had long wanted to visit this town because I had known for some time that it was afflicted and badly too, having seen pronounced cases that were grown there.

I examined during the forenoon 322 children and found 58 snottled cases of which 45 were chargeable to Wakerburg while the other 13 had been migratory in known susceptible territory.

During the forenoon I came across case after case of the most pronounced character which gave a

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history of having been born or raised at a place called Pictou until I made the remark to me of the teacher that if that was the best that Pictou could produce it ought to be dynamited off the map.

I had come across Pictou cases before in my work in the Pueblo Schools some two years ago but had been unable to locate it. Inquiring near I found it was a coal camp some few miles from Halseburg and I said to my escort Dr. Lishen that I must get out there that afternoon.

Failing to get a conveyance because of a funeral which had used up all the City teams we boarded a shaky old mail stage which left the post office at noon and after a cold ride in the blustering wind were set down at the steps of the Pictou School and I want to say to you Dr. Black that neither yourself nor I had ever received an adequate conception of what the brown stain really is without seeing what greeted my eyes in that little school. Never since I commenced this investigation have I seen such a sight as I there saw. Child after child as I passed their desks revealed

such conditions as I would find it impossible to describe. Even the teacher herself who was a native there had a pronounced case.

They were all extreme cases, the teeth being unusually a deep brown almost black color and many so badly affected that the whole labial surfaces of the incisors were masses of softened decay. I could do nothing but marvel as I passed from one desk to another that the condition could be so bad.

Out of 50 children and individuals I found that day who had at some time in their lives been associated with Pictou only 2 escaped and I am unable to account for this. I questioned them closely but could find no clue to their immunity.

The physical conditions are these; here is a village situated in as barren a basin on the plain just over a ridge of low hills as could be imagined. There was positively no vegetation of any sort nor was there any indication of any gardening whatever which satisfied me that the food supply was all imported.



The industry there was the one coal mine called the Pictou and from this mine came all the water that was used in the camp. It is pumped out into a tank on the hill and supplies the town.

I tasted it at the school and noticed a strong taste of sulphur. In connection with this a remarkable circumstance came to my attention as follows. It seems that some years ago before Walsenburg had a water system they used to haul this mine water from Pictou for use at Walsenburg and the worst cases at Walsenburg were in the mouths of adults who had as children used the mine water from Pictou. This at least looks suspicious.

I heard rumors of other camps in that locality in which the stain is bad and saw some from these other places which satisfies me that there is probably a wide area there in which the lesion is bad.

Had it not been for the fact that I was due at Alamosa the next day and was going to lecture there that night in Oral Hygiene as the State Dental Society lectures for public instruction, which

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Lectures had been advertised I should have remained another day and visited these camps.

As soon as I returned home I took the matter up with the chief surgeon of the Colorado Fuel and Iron Co. with whom I am well acquainted, which company owns these mines, and through him the matter is now in the hands of the chemist of this great Corporation and I am waiting their report just now in reference to the analysis of the water from this Piton Mine.

So far as conditions in other parts of the State are concerned I am positive that there are areas where the lesion exists to a noticeably extent and I think it very important that these places be bounded, but I should be very much surprised if there is anywhere else where the record at Piton can be equalled.

I will enclose a map upon which I will encircle afflicted areas so far as known or suspected. The only point of similarity so far noticed is that some of these areas are in coal mining districts.

Probably the next place that I shall visit will be

a small coal camp called Chandler near Canon City from which I have had rumors concerning some prevalence of the lesion.

There is another coal camp which I believe to be afflicted situated near Boulder, and called Louisville: possibly also the small neighboring coal camp called Lafayette. On the other hand there is the Cripple Creek district which is metalliferous instead of coal bearing and we know that it is afflicted, but the water supply is from the same source as that of Colorado Springs.

The chief difficulty in my own actions is that it involves a severe financial drain in stopping all practice to visit these places even though my actual expenses are paid.

I have succeeded however in placing a part of the burden upon other parts of the State so that Colorado Springs is not the only offender and it may be that as this fact is known it will be harder to obtain financial aid here in

following the problem.

The State Board of Health has given us a promise

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that they will analyze some water for us which will help some in the effusion. Public officials are slow however in matters of this sort.

I feel fairly well satisfied with the work done thus far but become impatient at times that it cannot be taken rigorously in hand and pursued to some conclusion of some sort.

I will try to do all I can with the means at hand during the remainder of the school term in hope that I may collect enough data to induce you to visit us again this summer and perhaps visit some of these worst areas.

X Now as to your manuscript I have the following to offer.

The introductory paragraph should be altered so as to indicate that there are other well marked areas unless you wish it to stand as it now is indicating that at that time we thought there were no other such areas.

Under "General Description" it might do to say that the brown and black discolorations were almost never found on the ~~total~~<sup>lingual</sup> surfaces of the upper incisors and in only a very few of the cases so far seen were

the lower incisors stained brown or black either on the labial or lingual. Possibly a half dozen cases.

A frequent type of case is that in which the enamel of all the teeth is dotted with shallow pits. One of the most pronounced cases I have seen was entirely free from decay even under faulty oral hygiene and in the presence of orthodontic appliances over a period of at least two years. Still another type of case is that in which there are no well defined brown or black markings but the entire denture including the third molars was a dirty smoky color.

The cases at Picton largely fall into this class. On Page 2 in describing the thickness of the abnormal enamel I believe it entirely correct to say that in the average case the imperfect area is very superficial. I have had some experience lately in grinding this enamel and find that dressing down the entire tooth surface, removing only a very thin area brings me down to enamel that is almost normal, the exception being that a few white flecks are left which are scarcely noticeable when the tooth is wet.

The brown color also can generally be ground out without going too deep and I have been very much gratified by the improvement in appearance that can be brought about in these cases.

The extreme cases of course are questionably under this method but I believe that the worst discoloration lies superficially and I am satisfied that even the appearance of these can be immensely improved. The grinding of course is followed by sandpaper & cuttle fish discs well lubricated and these by pumice & chalk or oxide of tin and finally rouge until the enamel surface is like flat glass and without a scratch remaining.

The time to do this is in many cases prohibitive as an operator is doing well to complete an incisor tooth in  $1\frac{1}{2}$  hours.

The mottling of the first & second molars is usually very superficial and a slight thinning of the enamel brings one to normal enamel. I have seen some of these white teeth converted into very beautiful teeth with the high polish I have spoken of.

This statement may throw some light upon the distribution of the imperfect enamel.

The description of the histological technique I will pass.

On Page 11 it is likely that our observations during the last two years may have modified the statement as you have put it down.

In stating that the stain is "not superficial" in the first paragraph a distinction might be drawn as to whether superficiality meant outside the enamel (like green stain etc) or superficial as related to the depth of the stain in the enamel.

I am satisfied as I have just been stating that the most of the stain lies in the outer layers of the enamel but there are places where the lesion dips down into the deeper parts of the enamel and cannot be removed by grinding.

Also in the latter part of the same paragraph in speaking of the teeth coming through the gums stained we are satisfied now by watching some young cases that the stain is not usually visible when the teeth are erupting.

It has been my observation that newly erupted teeth (if injured at all) are paper white when first seen but that during the next year or two or longer the brown becomes visible (if it ever appears) I have seen cases where I am positive that certain

teeth are progressively becoming brown that were not brown before. This means to me as I have before stated to you that some extraneous substance that had gained entrance into these empty spaces between the enamel rods was undergoing a slow chemical change with the accompanying phenomenon of a change of color. This substance had been there all the time but was slowly becoming visible.

The case at Pictou offered a noticeable exception to this idea in that newly erupted teeth were apparently discolored just as soon as they had emerged from the gums as were already stained and actually erupted with the color visible. This is decidedly the exception.

On the same page concerning removal of the stain the grinding as I have described it has the advantage of removing the white enamel also with the disadvantage of course of making the enamel thinner and so liable to be sensitive to thermal changes which we have observed soon wear away.

There are two or three men practicing here who have a secret remedy or method of chemically removing the stain but of course the white spots remain.



Some preparation of iodine I think is used and some acid has a part in it and I am told that the glazed surface of the tooth has not been injured. There seems to be no way now to get this secret as these men are outside our Society.

On page 17 speaking of sporadic cases I saw a young man within two months in Colorado Springs who presented this typical lesion in the two upper incisors, namely a broad belt of brown across the middle third of the labial surfaces who had been reared in Michigan and of several children in the family he was the only one afflicted.

The only departure from typicality that I could detect was that the other teeth of the mouth did not have the same mottled appearance that is usually associated with stained incisors.

I have photographed this case but not yet developed and will send you a print if they are good.

On page 19 I fully agree with the statement in paragraph two. The time of coming into and departure from an endemic area will show upon the then forming enamel with absolute mathematical accuracy. I have seen this phase

work out so uniformly in my examinations of  
to date about 700 children that I have no hesitation  
in making this statement.

I would only add that removal from an endemic  
area for a part of each year during the growth of  
enamel of a given group of teeth seems to lessen or  
prevent the injury which a continuous residence  
would be expected to bring about. I say "seems"  
because it is by no means proved but enough  
cases have been noticed that have worked out  
this way to justify us in saying that we believe  
this to be the case and in our so advising parents.

I believe that the scope of the paper is as far  
as it can be taken at the present time and  
I am in hope that as new information is  
gained later phases can be written and published.  
I almost forgot to say that I have a rumor  
from Amarillo Texas which seems well founded  
in leading us to believe that the same lesion  
exists there. I shall investigate it as soon as  
possible and possibly can secure some teeth.  
There is no more news that occurs to me except  
to say that there seems to be about the same percent -

age of damage among natives in places that are not markedly afflicted as for instance Denver & Pueblo with about 15% - La Junta 17%. The percentage jumps then to 50 at Alamosa and from that to the pronounced areas of

Endemic running from 90 to 100%. <sup>sweet potato give</sup> This seems curious. <sup>percentages</sup> Was ~~not~~ either low or high. There seems to be no middle ground.

Hoping for something definite soon and appreciating your efforts I am

Sincerely yours  
F. Frederick S. McKay.

P.S. - I assume that the manuscript is to be returned to you so enclose it.