

Colorado Springs Colo.
Nov. 17-1908

Dr. G. F. Black
% Northwestern Univ. Dental School
Dearborn & Lake Sts.
Chicago Ill.

My Dear Dr. Black -

I have been urged by the Officers of the Colorado State Dental Society that we press upon you our invitation that was extended some few weeks ago to meet with us as our guest at our coming meeting, and urge you earnestly to accept it.

There is at least one very particular reason why we wish you to come out here and that is because we need and must have your help.

You are already familiar through what Drs. Burton and Wilson have told you, with the nature of a problem that is pressing upon us here in this locality for solution. I refer of course to the brown stained enamel similar to the tooth that Dr. Wilson left with you.

There is a great deal that I wish personally

to write you regarding this condition particularly if you consent to come out here next Summer which I will not take space for in this letter, which I wish to devote to the matter of your coming principally.

I will however say that in the large proportion in which this stain occurs here, I am strongly convinced that it is a local problem; the reasons for this conclusion I can go into more fully later in our correspondence.

In order to determine the feeling on this matter of having you here a special meeting of the officers of the State Society was held last Saturday in Denver at which Dr. Gibson and myself presented the need of assistance from you and I am most happy to say that the plan we suggested was most heartily supported by these other gentlemen.

There has never been any doubt in my mind but that when you realized what sort of a problem we have here, you would be attracted enthusiastically to it because of your long years of study of enamel conditions and I was not disappointed by Dr. Gibson's report of his meeting.

with you in Chicago.

So far as I know the recent literature of Dentistry has no mention of any such condition as this stain, therefore we have a splendid field for an original essay, and of a most scientific nature.

As Dr. Wilson reported, the chief objection you had to coming here was that the date of the meeting would conflict with the close of the school year in Chicago.

If so, that is a matter we can arrange at this end, for it was agreed at our meeting that if you would consent to come, we would willingly and gladly change the date of the meeting to suit your convenience. And as an off hand plan it was suggested that we hold our meeting at dates one month later, that is about the third week in July.

It merely remains for you to tell us what time would be convenient for you and we will put the date accordingly.

Let me suggest the following plan: arrange if you can to be here by July 1st and spend the time up to the meeting (about three weeks).

in studying the evidence that we will have ready for you, and the conditions here that would seem to you to have a bearing on the subject. Your conclusions could then be given to us at the meeting.

Let us look also for a moment at the other side. We feel that you can do us a great deal of good by coming here and helping us in this matter, and we know also that we can do you a great deal of good.

Three weeks or so spent here will mean new life to you after the heat and smoke of Chicago. Our summer climate is delightful in that it affords an absolute freedom for humidity which means rest for the body.

I do not need to remind you of the beauties of nature which are at our very doors here in this locality, and which have made Colorado Springs famous the world over.

You shall be housed and cared for comfortably while you are here where you can rest and drink in these beauties and if there is anything that you need that has been overlooked, you have only to make your wants known and we will do

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all in our power to make you stay here pleasant
and comfortable.

In view of the fact that these preparations
are to be made there is considerable detail
work to be done which requires prompt action.
If possible then may I ask that you favor me
with a prompt reply that we may get to work
to prepare our evidence for you.

In closing let me again urge my Dear Doctor,
that you accept our invitation.

Most Cordially Yours
Frederick S. McKay

309 N. Tustin St.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Dec. 7, 1908.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor:-

Your letter of Nov. 17th reached me in due time. At the time I received it I could not quite make out how to reply, because of other things that seemed to come in the way, and I laid it aside for a day or two in order to make out the kind of a reply I should give you, and the time stretched out until it has been much longer than it should have been.

I think now that if you can place your meeting any time in July I can be with you. If it is after the first week in July, it will be easier for me. During June I am supposed to be lecturing here every day, or two or three times a week at least, and will complete that work about the end of June. I will be obliged to be absent for a short time during the month of June, a few days only, which I will try to make up. Besides this, June is generally a busy month with me, making out the reports of the year, and notifying all the students of their grades, arrearages, and everything of that nature; so that it is a very bad month for me to leave the work being done here.

I wish that among you, you would send me a number of teeth showing the marks of bad enamel that is so prevalent among you. You will certainly some of you have to extract teeth that are decayed, and yet a portion of the tooth will show this bad enamel very well. I would like very much to make a number of sections of

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Dec. 7, 1908.

Dr. F. S. M.

it before I visit you, so that I will know the ^{logical}historical characteristics of it in advance of going and seeing the cases. See if you cannot arrange that.

Please let me know if this kind of arrangement will meet with your approval.

Begging pardon for my delay, I am,

Very truly,

G.V. Black

G.V.B.

Colorado Springs
Dec. 19-1908

D. G. F. Black
Chicago Ill.

My Dear Doctor Black

Your acceptance to visit us during the Summer was received with gratification and it has been conveyed to the officers of the State Society who have put into effect the proper steps to change our dates for the meeting to July 15-16-17 which we trust will meet with your approval.

I will let you know definitely just as soon as these dates are established and I intend within the next few days to take up in detail with you the principal facts in connection with the stained enamel.

Yours Very Respectfully
Frederick J. McKay
309 N. Tejon St.

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CHICAGO, ILLINOIS.

Dec. 24, 1908.

Dr. Frederick S. McKay,
Colorado Springs, Colorado.

Dear Doctor:-

I received your two letters of Dec. 19th and 22nd today, and as I am going away this evening for a little vacation I can only write you hastily.

From what had been said to me I supposed this condition to be due entirely to the failure of the cementing substance between the enamel rods of which you speak, but there are several suggestions in your letter which cause me to think that there may be another condition that is acquired after the tooth is formed. Of course the failure of the enamel rods is a matter of development. This acquired condition, if it exists, might be from several causes, and in your examination of children I think it should be noted as to whether they have adenoids in such extent as to sleep with their mouths open. Indeed this inquiry as to sleeping with the mouth open is very important as to its relation to the acquired stain on the teeth. In making the examinations I should advise that you prepare slips with such arrangement of the matter that you can simply check the conditions found, as to age, sex and condition. This matter of sleeping with the mouth open I should take into very close consideration, for it may be an important factor. Of course the arrangement of this you can make for yourself with no difficulty.

I am very anxious, however, that I get some teeth showing the characters of the stain, that I may make histological studies

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Dec. 24, 1908.

Dr. F.S.McK #2

of it before I visit you, for I can determine the histological characters just as well here as there. Certainly some of you will extract some teeth that will answer this purpose.

Hoping to hear from you again, and hoping to have more time also to think about this matter after the holidays, I am,

Very truly,

G.V. Black

G.V.B.

P.S. Any teeth sent for histological examination should not be allowed to dry. Place them in a little water to which a little Formalin has been added

G.V.B.

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The Colorado State Dental Association

"EXECUTIVE COMMITTEE"

TWENTY-THIRD ANNUAL MEETING
COLORADO SPRINGS

JUNE 17, 18 AND 19, 1909.
July 12, 13 & 14 "

Colorado Spring
Jan. 27-1909

Dr. G. F. Black
Northwestern Dental School
Dearborn & Lake Sts.
Chicago Ill.

Dear Doctor Black -

I have pleasure in informing you that the State Society met and changed the date of the next meeting to July 12 - 13 - 14 to conform to our wishes in the matter.

The School Board of this City has also granted us permission to make an examination of a part of the school children to determine if possible what proportion of children are afflicted with the peculiar enamel.

I note your suggestion in your last letter that we inquire into the adenoïd phase of the matter which surprises me very much, as we have never considered that the stain or opacity was confined to mouth breathers.

When you write again could you in brief tell me why you regard this phase important and how it could act to produce an altered enamel.

Also any further suggestions to aid us in preparing our data.

I have not photographed the teeth yet on the color plates because of a juss of other matters, but will try to get to it soon.

Very Truly Yours

Fredrick S. McKay

2 Post Office Bld.

formerly at
309 N. Lyon St.

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY DENTAL SCHOOL
NORTHWESTERN UNIVERSITY BUILDING
CHICAGO, ILLINOIS.

Jan. 29, 1909.

Dr. Frederick S. McKay,
309 N. Tejon St.,
Colorado Springs, Colo.

Dear Doctor:-

I have just received your letter of the 27th inst and note the time fixed for the meeting is July 12, 13 and 14, and I shall try to work to it.

I am glad that you have made the arrangement for the examination of the school children. I have been reading very carefully Dr. Carl Rosa's examination of the school children in Germany, Sweden, and contiguous countries, and his plan of doing this, and one to which the officials controlling the public schools seemed willing to work, was that he called certain classes at certain hours and these children came as classes to a place designated, were examined, and then went back to their school. In this way there was no disturbance practically in the school itself at any time, excepting to the certain classes. With the teachers stating the time at which a class could go to some certain place or room to be examined on some certain day, very little disturbance to the school was created, making it a very different matter from a number of men going into the school to make examinations. Possibly this suggestion may help you some.

Now in regard to mouth breathing and discoloration of teeth. I have once in a while gotten myself into some difficulty because of this statement. Sometime ago I made the statement to a German lady residing in northern Germany that their people were, so many of them, mouth breathers because of adenoids, was the reason that they had so

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Jan. 29, 1909.

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much green stain upon their teeth. She resented it hotly and I told her to observe and inquire, and determine for herself. Sometime later she informed me that she found that I was correct in the matter. This came to my notice first a number of years ago, and by the way I have never written of it in anything published, by the discovery that stains were produced when certain of the micro-organisms habitually growing in the mouth were growing in conjunction with certain moulds, and the stain was free to spread in the gelatin upon which they grew, causing deep stains of the gelatin, while both of the organisms remained pure white. These moulds will grow in the mouth only in the night time when the mouth is open and air is freely admitted through it. They will not grow in closed receptacles, unless they are large, containing considerable amounts of air. Therefore for these stains to be produced there must generally be mouth breathing. This is my explanation in short, and why I asked this question.

These, however, you must remember are not the only stains found in the mouth. There are certain stains found that are purely developmental and some of the stains in these cases may be of that character.

Since writing you last, I have had one very marked case that seems similar to your description, come into the Infirmary to me. The child was just through shedding the temporary teeth; indeed there were two of them still hanging to the gums, which I obtained. The permanent teeth were mostly white enamel very nearly all over,

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Jan. 29, 1909.

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while the central incisors particularly were very deeply stained, and a good deal of wasting of the white enamel had occurred. The case looked very badly indeed. Of course I was not able to obtain any permanent teeth as the child was entirely too young to permit of cutting away the crowns of any of these ugly teeth for the purpose of putting on artificial crowns. Otherwise I might have obtained some specimens from it. I shall grind specimens from the deciduous teeth and see what they are like. *This child was born and has lived in Chicago* They are very white. If possible, get me some specimens to grind before I come out to see you.

Very truly,

G.V.B. Black

G.V.B.

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TWENTY-THIRD ANNUAL MEETING
COLORADO SPRINGS
JUNE 17, 18 AND 19, 1909.

The Colorado State Dental Association

"EXECUTIVE COMMITTEE"

Colorado Springs
Feb. 17-1909

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black:-

I have been holding the stained teeth hoping I might have a chance to experiment with photographing them, but pressure of other work has prevented and so I am mailing them to you today.

They have been in water constantly since their excision. No formalin in it. They will come to you in a bottle surrounded by wet cotton.

There are three crowns, one of which has split and there are also several small fragments which may be of some use to you.

Referring to your last letter, in which you speak of the relation of mouth-breathing to certain stains, I am reminded that some of the dentists here think that our brown stain is connected with mouth-breathing.

The real point in the matter it seems to me is

to rigidly separate superficial stains like the green stain from developmental stains as I think your stain will prove to be.

Considering it in this way was what led to my surprise at the mention of mouth breathing as a possible cause in one of your recent letters.

As your examination of these specimens I send proceeds, if you have further suggestions I will be very glad to receive them.

Dr. Hoyer is an expert in photographing and has done some of the color work. Could he not try to get something in that line from the specimens before they are ground.

Yours Very Truly
Frederick S. McKay

2 Post Office Bk.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Feb. 23, 1909.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor:-

Your letter of the 17th inst came a few days ago, and I waited a day or two for the box of teeth to come, which it did in good shape. I will grind these and see what histological fault there is in them, and I will report to you later. It may take me a little time to do this as there are other matters pushing me pretty hard just now. I want both photographs and photomicrographs, and I will have to arrange the work for a time when I can get the photographs made.

Regarding the stains, I doubt very much whether we can do much toward showing them by photography, though they seem to be so distinct. I will consult Dr. Noyes regarding that before I grind the specimens. I will then cut them and photograph them as opaque objects, and will then grind them thin enough for microscopic examination, and then make photomicrographs of them. I think I shall have no difficulty in separating the developmental stains from the acquired stains. I have seen enough already in examining the split teeth to show that there is considerable white enamel, or in other words, enamel that has not the cementing substance between the rods, and also that there are both developmental and acquired stains apparently.

Very truly,

G.V.B. Black

G.V.B.

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The Colorado State Dental Association

"EXECUTIVE COMMITTEE"

TWENTY-THIRD ANNUAL MEETING
COLORADO SPRINGS

~~JUNE 12-13 AND 15-19, 1909.~~

July 12-13-14

Colorado Springs
May 14-1909

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black:-

There has been nothing of particular interest that I have wished to write you about lately. We have almost completed our examination of the teeth of the public school children for the mottled marks and the brown stains.

We have been surprised to find that the enamel is marked in native born children in almost 90 % of cases. This is higher than we had thought. The actual cases of stain are much lower percentage.

When you are ready, let us know how you want these figures presented to you that is in what way will we arrange the data for your use.

We shall aim to have a multitude of children for your inspection if possible.

Now as to the date of your coming, we hope that you will get out here at the earliest possible date and I want to suggest that you get here by July 1st if you can.

I also want to make it clear that you are our guest from the moment you leave Chicago, and that that be as I have said, at the earliest date you can get away.

Arriving here July 1st will give you less than two weeks before the meeting comes, and as well as giving you time to rest away from the heat of Chicago, we have a great many things for you to see. Please let me know as soon as you can, and I can assist you as to best train service and hour of arrival etc. also route should you wish it.

Our meeting will be held at the Rutledge Hotel in the city. The question comes up as to whether you would prefer to remain there during your stay, or whether you would rather be out near the Canons and the mountains.

We have on the outskirts of the city the famous North & South Cheyenne Canons which are places

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TWENTY-THIRD ANNUAL MEETING
COLORADO SPRINGS
JUNE 17, 18 AND 19, 1909.

of great beauty and nearby are hotels and
boarding places where you could be made very
comfortable if you chose to be a little out of
the city.

There is frequent car service and the Canons
are within easy walking distance.

We want you to let us know what arrange-
ments we can make that will give you the most
comfort and enjoyment while you are here.

I am sending you some literature that
you may find of interest.

Yours Very Truly

Frederick S. McKay

2 P.O. Box.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

May 19, 1909.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor:-

I received your letter yesterday and have read it with some care. I suppose your term "mottled marks" upon the teeth means the variation of white and the ordinary tooth color mingled more or less, and that the brownish colors are the stains that you speak of. I am very much surprised at your report of about 90% of cases being mottled. While I expected that to be higher than the brown stains, I did not suppose the cases would reach such a large percentage. Of course that is the remarkable feature of the cases in your community - the number. Cases come in here to us occasionally, and whitish spots on the teeth are not very infrequent.

The examination I have made of the teeth you sent shows conclusively the nature of the trouble histologically. It consists in the failure of development of the cementing substance between the enamel rods. In most of the teeth that I have thus far seen, the enamel rods themselves are complete. In your examination of cases was there anything that would cause the segregation of the cases in which there were marks upon the teeth, rather than children with no marks? Was there anything that would cause those with marks to come to you in preference to those who had no marks? Unless great care is used there might be a grave error occur in that way. Children with marks and anxious to have something done, would more readily

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May 19, 1909.

Dr. F.S.McK #2

present themselves perhaps than those who have no marks on their teeth. I simply speak of this as a precaution in estimating the percentage.

As to how I want these figures reported to me, I will say that this is unimportant, so that the data is arranged in a way that I will understand, and some of this may be done after I arrive on the ground. Of course I will be very anxious to see a considerable number of these native-born children. I am not going to succeed very well in the photographing of these teeth in color. The efforts thus far have not been very satisfactory, but I would like to have a few more cases for the purpose of cutting histological slides.

As to the hotels, I think it would be very desirable for me to be in the hotel where the meeting occurs, during the meeting at any rate, and possibly if I have time before or after, I might be at some of the very fine places which you mention, but I suppose I could visit those even if I staid in the hotel in the city. I am not a person who needs very much to be done in the way of entertainment. I received the literature you sent with reference to the region, and I am sure I will find much delight in some of your surroundings.

As to the time I will leave here for your city, I cannot yet make out. The month of June is going to be a very busy month. I will be lecturing every day and shall have to make out my reports up to the first of July, and it will take me a little time - how

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May 19, 1909.

Dr. F.S.McK #3

much I cannot now tell. I shall make the endeavor to have everything ready to do it as rapidly as possible. I wish to thank you for the very kind words you have said as to the care you propose to take of me while I am with you.

Very truly,

G.V.B. Black

G.V.B.

I. C. BROWNIE, PRESIDENT,
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TWENTY-THIRD ANNUAL MEETING
COLORADO SPRINGS

~~JUNE 17, 18 AND 19, 1909.~~

July 2-13-14

Colorado Springs
May 20-1909

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black-

The Executive Committee
is almost ready to put the program on the
Press and we want to determine upon the
subject of the paper that you will present to
us.

So I write to ask if you will suggest a title
that will convey the most comprehensive idea
as to just what the paper will cover, and I
will be obliged if you can favor us with your
early reply.

We speak of that condition of the teeth known
as "the brown stain" and I should think it would
be well to incorporate that phrase into the
title if possible.

Yours Very Truly

Frederick S. McKay
2 P. O. Bld.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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CHICAGO, ILLINOIS.

May 24, 1909.

Dr. F. S. McKay,
2 P.O. Bldg.,
Colorado Springs, Colo.

Dear Doctor:-

I have just received yours of the 20th inst, and I think the following title will answer the purpose for anything I may want to say: "The Developmental Faults in Enamel and the Resulting Brown Stains." I will possibly not be able to give you much information upon the brown stain question, but the real fault in the development of the enamel in your cases is not new to me as a fault, but it is decidedly new to me in the proportion of cases discovered.

I am finding it exceedingly difficult to get anything like good photographs of the cases you have sent me, and if it is possible for you to send me some more I shall be glad.

Very truly,

G.V.B.

G.V.B.

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Colorado Springs
May 26 - 1909

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black.

Our use of the term "mottling" is just as you understand it, that is the white spotted appearance of the enamel. We have observed some teeth that were so much mottled, if I can use the term in that way that they were white all over. The defect in the enamel was uniform and there was no translucent enamel on such teeth at all.

Of course in some children the amount of mottling is very slight. So slight that it is hard to detect it. Many cases are mottled without being stained, but never stained without being mottled.

We have also found cases showing white spots which we considered of another character and differentiated sharply between such and our typical looking defect.

From your letter I judge that I failed to make clear just how we are conducting the examination. The children have not come to us. We have gone to them.

We have gone into the school rooms and from desk to desk taking the entire graded system of the city and all kinds of children just as we found them.

Our data taken in this way stands as follows. To date we have covered about 4000 children and of these positively from 87 to 90 % of native born have the failure of the cementing substance ^{in some degree} as you term the defect. I was quite sure that you would pronounce it such.

We have earnestly tried to ~~eliminate~~ eliminate all chance of error and have looked at each child just as though it were the only child being examined.

So, to answer your question I can say that there is nothing that would segregate those having the defect from those not having it, as you can see.

I presume that our data will fix an age limit, as to how old a child might be in coming here, before he could escape the defect and I presume we will find it to be somewhere about six or seven, which is of course only another way of saying that it depends upon the amount or progress of the development of the teeth of the individual. Now, can you tell me when you write where I can find any information or give it to me yourself briefly, regarding the nature of this cementing substance or its derivation? It is a structure not spoken of much in any dental literature with which I am familiar.

I have a call out for some more of the excised stained tooth crowns but have nothing in sight. We have even visited the Coroner to get him to help up if the circumstances came right.

I am going to urge again that you get away from Chicago at the earliest possible date.

Yours Very Truly

Frederick S. McKay

Colorado Springs
May 28-1909

Dr. G. V. Black
Chicago Ill.

Dear Doctor.

A fragment of an upper central which was fractured by a fall and which is almost uniformly lacking in the cementing substance also slightly stained has just been sent in to me.

It is a fairly fresh specimen but has been out of the mouth probably as much as four weeks.

I have just put it into water in which a little formaldehyde and mailed to you.

I hope that it will be of some use to you.
In the meantime I will try to get more.

Yours Truly

Frederick S. McKay

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO, ILLINOIS.

May 29, 1909.

Dr. Frederick S. McKay,

Colorado Springs, Colo.

Dear Doctor:-

I have read your letter of the 26th inst rather hurriedly, but while a good deal pressed with other matters, but I want to say this right now - that I am very much pleased with the manner in which you are doing your work. Your previous letter did not give me some points of information that you have given here regarding your plans, and they are certainly all right.

As to data regarding the cementing substance between the enamel rods, about all that is known about it will be found in my recent book; not all, for other men of course have written of it before, but not so extensively. In the articles on Atrophy and caries of enamel you will find an explanation of the cementing substance between the enamel rods, and of this whole matter of its occasional failure as it occurs sporadically, but occurring in such numbers of cases as you people have is an un-heard of thing, and it is that feature of it that beats me. I have cases here in the school where there are slight whitish markings, every week, and sometimes I have seen half a dozen in the clinic room at once, but they are so slight as generally to pass unnoticed. Only occasionally we see a coloration. We have in Chicago within my knowledge some half dozen such cases, and we are seeing from eight to twelve thousand people a year here in this school, so while I have seen this condition, it is the number of cases occurring

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May 29, 1909.

Dr. F.S.McK #2

that excites my curiosity.

As to the time I can get away, I will have to delay a little in the effort to fix it.

Very truly,

G.V. Black

G.V.B.

Colorado Springs
June 17-07

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black-

Can you tell yet what date you will be able to leave Chicago. If not, let me know just as soon as you can determine principally because of reserving hotel quarters for you. Things will be well filled here about that time.

Also as to route & service let me suggest leaving Chicago on the "Rocky Mountain Limited" via Rock Island landing you here early in the afternoon of the next day.

Also ticket yourself to Denver via Colorado Springs. This allows you to come direct here and also take in Denver which you will probably want to do on your return trip. Let me hear from you at your convenience.
Yours Truly
Frederick S. McKay

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CHICAGO, ILLINOIS.

July 3, 1909.

Dr. F. S. McKay,

Colorado Springs, Colo.

Dear Doctor:-

I have your letter of June 17th which has been on my table for some time because I did not know what to write you. I have been down to Pennsylvania for the Pennsylvania State Society meeting this week, and today am winding up the post-graduate course, and next week I will be hard at work preparing to go to Colorado. How soon I can get away is still uncertain. I have a good deal to do before I can leave here. I note what you say about ticketing to Denver via Colorado Springs, but I will write you again as to the route I take.

There is one thing that I would like for you men to do that I had not thought of proposing before, and that is, that you have some photographer take a number of negatives of the cases of bad looking teeth that are marked. I had hoped to be there in time to attend to that myself, but I am afraid I will not be. It is probable also that you will find somebody in Colorado Springs who understands the making of lantern slides and can put them in shape for use at the meeting. I enclose in this letter a picture from one of my patients here with conditions similar to those that you have, which will serve you as the type of picture that should be taken - a full size picture limited to the mouth and teeth. Of course more of the picture may appear on the negative, but in the

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CHICAGO, ILLINOIS.

July 3, 1909.

Dr. F.S.McK. #2

lantern slide it should be limited about as you see this. Many patients would object to having a picture taken if there would be enough of the face show for the recognition of the person; at least some of mine object quite strongly, and I have had quite a fight with one young lady to get a picture of her teeth and have been three years getting it, and only did so with the understanding that the picture used would be limited as in the one I send you. I think you will see at once the desirability of getting a number of such photographs and converting the photographs into lantern slides.

Very truly,

G.V.B.

G.V.B.

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CHICAGO, ILLINOIS.

July 8, 1909.

Dr. Frederick S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I am sorry that I could not reach Colorado Springs sooner, but I will not be able to leave here until ~~Sunday~~ ^{Saturday} morning at ten o'clock. On account of wash-outs on the southern route, I am advised that it will be best to reach Colorado Springs via Denver. This will bring me to Denver Sunday at noon, and I can get down to Colorado Springs sometime in the afternoon - about six o'clock I think. My ticket will be over the North Western & Union Pacific to Colorado Springs via Denver, and return.

I have had a good deal of difficulty in working up the material you sent me, but I am getting it in pretty good shape finally. The material doesn't make excellent photographs, but it will show what your difficulties are in the histological sense.

Hoping to find you all happy and ready for the best meeting of your Association, I am,

Very truly,

G.V.B.

G.V.B.

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CHICAGO, ILLINOIS.

Aug. 20, 1909.

Dr. F. S. McKay,
P.O. Building,
Colorado Springs, Colo.

Dear Doctor:-

I have been home over two weeks now and this is practically the first time I have been down at my desk. I was taken sick the morning I left Denver and was sick all the way home and confined to my house for ten days. This was simply one of the accidents that occasionally befall a fellow, for during my trip I was certainly very well otherwise than this misfortune.

I have been at work, however, over my notes, and will get them in shape now pretty rapidly I think. I have made out a scheme for a new card for examinations, as a suggestion, which I will send you in a day or two. I find that in writing up my notes I must write a good deal, and probably allow you to pick out from it that which you can use to the best advantage. I want to write it up now much as I would if I were going to publish it, because I think I had better have the whole of it together.

I found that hotel bill, and will enclose it to you in this. I have drawn a pencil mark across it as I think the amount you paid; the other few days and something else was added afterward, the bill having been made out a few days before our settlement. Dr. Brownlee paid for my sleeper ticket home, in Denver.

Remember me to the other fellows.

Very truly,

G.V.B.

G.V. Black

Colorado Springs
Aug. 26 - 1909

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black -

The expressman has just handed me the two volumes of your book; on the fly leaf of one is inscribed a message from you and your signature.

What am I to say that will convey to you my sincere appreciation and the pride I feel in accepting this mark of esteem from you? It is more than likely that you will be satisfied with a few words understanding that they are honest words and from the heart.

At least this is the way I read you during the few short weeks you were here and I don't think that I can be mistaken.

I shall prize and honor this token from you and it shall stand as a stimulus and greater incentive to follow further the work that has been begun here.

I had your letter a day or two ago and I was distressed to learn of your illness. I am positive that I kept you all night, so it must have been something those drunk boys did to you.

It shall be interested to receive the card you suggest for our further examinations and also your notes when you finish writing them. The appointment of that committee has not been completed for one reason and another: Dr. Slocum is in the East; the Chamber of Commerce Secretary has been away and also ill so I have been unable to reach him but with the coming of September, everyone will get down to business and I hope to report substantial progress before long.

It may be that the next important step will be the examination of the students at Colorado College after they have assembled. Also it might be wise to do that before asking for funds. It might outline just how much traveling we would have to do.

Your writing also will help us in putting the matter before the combined committee.

Yours with every good wish
Frederick S. McKay

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CHICAGO, ILLINOIS.

Sept. 2, 1909.

Dr. F. S. McKay,

Colorado Springs, Colo.

Dear Doctor:-

Your letter came yesterday, but I didn't get to answer it. Indeed, I am hardly ready yet to say what I wish. However, I wish to thank you for the very kind words contained in your letter, and hope that you will find some pleasure in the perusal of the books, and possibly some benefit.

I have been busy since I have been home, and have written up my notes, partially from a scientific standpoint, but from such a point of view as seemed to me the best under the circumstances. I have addressed this as a report to the Chamber of Commerce, Colorado Springs, to be presented through the active members of a committee appointed, I believe, as a local committee by the State Dental Association and as a committee on the examination of children's teeth, by the Colorado Springs Dental Association. You will notice that I have said in the letter of transmittal that it would be presented by yourself and Dr. Burton in person. I do this particularly to connect this work with the official action of both the State Dental Association of Colorado and the local Dental Association of Colorado Springs, showing that my action has been due to these Associations, and not assumed by me. I think this idea should be carried out and clearly explained. If there is anything about it that seems to you unfit, please let me know.

I shall enclose four copies of the report, one for the

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CHICAGO, ILLINOIS.

Sept. 2, 1909.

Dr. F.S.M.#2

President of the Chamber of Commerce, one for yourself, one for Dr. Burton and one for Dr. Slocum. Dr. Slocum seemed to take such an interest in the subject that I think he would like to have a copy of this report, and I think it might be of interest to him if either you or Dr. Burton would loan him a copy of the book, so that he can look up the references. You will understand what this means when you have read the report.

I wrote to Prof. Strieby a few days ago, asking a number of questions, but as yet have had no reply. I suppose that he may be still out of the city, but as you say they will all be gathered together about the 1st, I suppose I will hear from him. I would like very much for Prof. Strieby to read what I have written, and to note any errors that I have made in regard to the conditions in the locality, particularly as to what I have said about limestone and hard water.

I also will look forward with great interest to the examination of the students of ^{Colorado} ~~the~~ college, and expect this to do something toward mapping out the area of liability to this tooth trouble. If the different parts of the state are pretty well represented, it ought to help some in this work, and point the way to the places to which you may have to go away from the city. I shall be glad to get your account of that examination as soon as it is ready.

Remember me particularly to Dr. Burton and to any of the other men.

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CHICAGO, ILLINOIS.

Sept. 2, 1909.

Dr. F.S.M.#3

I have what I have written copied, but must go over it to look up errors that may have crept in, and to mark all the copies alike. I will try to do this tonight, and maybe I will be able to send the package tomorrow. I will send it to you personally, either by mail or by express.

Very truly,

G.V.B. Black

G.V.B.

P.S. By the way, I have been trying to get some lantern slides ready to send you, but I haven't got them done yet. I will send them as soon as I can get them made and tested to see that they are all right. Among the lantern slides that you gave me, made from the pictures taken in Colorado Springs, some of them are very excellent; indeed one in particular I think is one of the best lantern slides taken from the teeth that I have ever seen. A few of them are out of focus and not first-rate pictures, but they are fair illustrations nevertheless.

G.V.B.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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CHICAGO, ILLINOIS.

Sept. 3, 1909.

Dr. F. S. McKay,
Post Office Bldg.,
Colorado Springs, Colo.

Dear Doctor:-

I send today the copies of the report which I have written, and with it I have included our plan of keeping records with the tables, or forms, that we use. You will see that all of our records of fillings are made on these forms, and they are described sufficiently, I think, on page (13) of the little book which I include with this.

You will see in the form for card which I have made out for you, that I have used only the figures representing the teeth of one side of the upper jaw. This seems to me to be entirely sufficient for your work, as you could not undertake to do much in the way of noting the particular teeth; only note the groups of teeth as I have outlined them. I have placed a line over the first group - incisors, cuspids and first molars - and a line under the second group - bicuspid and second molars - so that they will be easily caught by the eye. I have a notion that you would find it better to use a check mark for teeth that are normal, thus - ✓, rather than to leave them without marking, as I have written on the card. I have changed one of the cards, which I have marked #2 to identify it, to read in that way, you will notice. Of course all of these things are left to your discretion. I think, though, that I would print in very fine type this instruction for marking, whatever you make it, for in this way every one who takes it up will see at once what the markings mean. This makes four markings to be used, all told, unless

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Sept. 3, 1909.

Dr. F.S.M.#2

you find that there is something else that you think should be marked. I think, however that these four are as many as should be undertaken. It is easy to over-load such work and make it require too much time. You will not get far in the examinations until these markings become so familiar to you that you will make them almost without thought.

You will notice on the 12th page of the student's record in the little book, that we use these figures representing the teeth without the forms that we print, and may use them in any kind of a book, simply drawing a line to represent the side of the mouth and using the letter or figure, thus - /4) 5)/ - would represent a distal filling in the left upper first bicuspid, and a mesial filling in the right upper second bicuspid. The letters and figures may be used in the same way in writing should you wish to do it. This part of the scheme of record keeping, however, will not occur in the work that you are doing, unless you want to make some particular references to some case. That you could do under the space left for remarks. It is best to make this whole matter just as simple as possible.

I am mailing to you under separate cover the Northwestern Dental Journal for March, 1904, in which you will find an article beginning on page (15) on "The Keeping of Dental Records and Accounts," by my son, A. D. Black, that may be of interest to you in this connection. You will see there that large use is made of this system. Indeed a great many are making use of it, and all of our school work is done with it.

Very truly,

G.V.B.

G.V. Black

J. S. McKay

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DEAN'S OFFICE

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CHICAGO, ILLINOIS.

Sept. 3, 1909.

To the President of the Chamber of Commerce,
Colorado Springs, Colorado.

Dear Sir:-

The enclosed report has been prepared by me at the invitation of the State Dental Association of Colorado, as related in its first page. Following the usual custom in such matters, the Society should publish this report as a part of its proceedings. In discussing the matter with the local dentists and other members of the Association that were available, sometime after the adjournment of the meeting, and with you and other interested citizens, it was not deemed best to do this at present, but to with-hold it from publication until sufficient time has been given for a more complete investigation; and especially to give the city of Colorado Springs, or the citizens most interested in its welfare, the opportunity to learn the whole situation and take such part as they may see fit in the investigations yet to be made.

Therefore this report is primarily referred to you through the active members of the committee appointed to begin this work, by the Colorado State Dental Association, Drs. Isaac Burton and F. S. McKay, who will hand you this in person. In the meantime it will not be regarded as out of the way for professional men to discuss this matter freely, with-holding publications of it. Indeed this could not now be prevented.

Very respectfully submitted,

G.V.B.

W. Black

(4 copies sent)-

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NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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CHICAGO, ILLINOIS.

Sept. 4, 1909.

Dr. F. S. McKay,
Post Office Building,
Colorado Springs, Colo.

Dear Doctor:-

I notice in reading over the letter I wrote you yesterday, that there are a couple of items that I did not think of. One of the queer things is this: One of the cases that I had counted in making up my estimate of the percentage of cases of white enamel, while in Colorado, I have found since I came home was actually a Colorado boy, having been born and reared in the neighborhood of Colorado Springs. Of course I had to get that out of my list, which makes the average nearly one in 30,000, as stated in my paper. I did not get on to the fact that he was from near Colorado Springs until yesterday, though I had learned enough from my own notes to know that there was very considerable doubt about him, and had left it out in my writing, except to mention the case, and you will notice that I have interlined the fact that he was from Colorado Springs.

The other matter is an error in the table of examinations that I made out while in your city. In calculating the number of persons in the 40% of stains in cases of mottled teeth, I counted only the native-born in Colorado Springs, omitting to include the others. The correction of that makes it 642 persons instead of 365. Have Dr. Burton correct that in his copy. I have made copies of that table which you will find in the copy of the report marked #1, that you can make such use of as you think best. I thought possibly the Chamber of Commerce might want to have such a copy.

Now if there is anything in all of this stuff that doesn't seem to you right, let me know, and I will try to correct it.

Very truly,

G.V.B.

G.V.B.

Chicago Sept-6th 1907

Dr J S McKay

Colorado Springs Colo

Dear Doctor

Well I put five copies of that report in the package sent you. I had my own copy with the four to send and since they are gone I am unable to find my copy.

It was the first type writing and it is interlined much more than the other copies, by which you will recognize the particular one. Also the others are numbered from 1 to 4

I supposed I had put it in my portfolio. But when I looked for it - Saturday night - after going home it was not there. Then I supposed it was left in the Office at the school. Today - Monday - Labor day and a holiday - no one here - I am unable to find it. If it is in the package sent you will you make it into a roll and return it to me

G W Black

to know the report has been
my of same has been submitted
Colorado Springs Colo.
Sept. 18-1909

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black.

I received the package of reports this morning. Your letter inquiring if you had enclosed your first copy came yesterday and I hasten to reply that it was not in the package. I sent the four copies with the small books & other details.

I have of course not read the report yet, merely glanced through it and am struck at once by the amazing amount of detail.

I shall gladly place a copy of this report at once in the hands suggested in your letter.

Dr. Slocum is still East and a press report lately told of a sprained wrist while he was playing tennis in Virginia I think.

I will take no more time now except to thank you heartily for the report and your interest and I will write again as soon as I have examined the

report and thought about it.
In the meantime every good wish to you.

Very Respectfully
Frederick S. McKay

Dr. J. P. Black
Chicago Ill.

I received the package of reports
this morning. Your letter regarding it
reached me first and I was
glad to see that it was not
lost. I will write you again
about the other details.
I have not read the report yet, but
I will take as much time as I can
to read it and to make out
the amount of the report at once.
I shall place a copy of the report
in your hands and will send you
a copy of a printed report which
I will take as much time as I can
to read it and to make out the
amount of the report at once.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Sept. 14, 1909.

Dr. F. S. McKay,
Post Office Building,
Colorado Springs, Colo.

Dear Doctor:-

I have just this moment received your letter. About that extra copy - I had looked the office over and did not find it, but since I read your letter I told my secretary about it; she was away at the time I wrote you; and she unearthed it in very short meter. I supposed that I had looked everywhere. I am sorry I troubled you about the matter.

You speak of your surprise at the amount of detail in my report. I am conscious that there are some things there that some of the Colorado Springs people will think that they ought to know, but things to which I thought it best to call attention. The main facts that you wish to use I think you can easily pick out from the different headings, so as not to be confused by the variety of detail that I have written. You will not need to use very much of it in your talks with your citizens there, but I would advise you to make your selections as you think best, and stick to them in what you have to say to the people regarding this matter. Of course I have recorded facts there that I regard as important in the outcome of this whole matter, and there are studies yet to be made in them histologically, which I am pursuing. Dr. Noyes and I made eleven negatives last night, and each one will show some peculiar phase of the difficulty.

DEAN'S OFFICE

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CHICAGO, ILLINOIS.

Sept. 14, 1909.

Dr. F.S.M.#2

I am in some trouble for the want of teeth that are very badly stained, for the study of the deposit of coloring matter. I have some pretty fair showings of teeth that are lightly stained, but none of the very dark stains that I saw in the mouths of children while I was at your place. I would like to have some of them that I may grind excessively thin for the study of the deposit of coloring matter.

I made quite a large number of pictures since I saw you. I am getting all that is possible out of the scraps of eight teeth sent me first. I find that the coloring matter is deposited between the enamel rods, while the enamel rods are bright and clear, and deposited in a very patchy kind of a way in the specimens which I have, but I suppose it will be found to be practically solid in some of those very dark teeth. That I want to see. You will remember that I did not try to show the coloring matter in the enamel in the sections I had when I was at your place. I am slow getting out pictures, for I want to have them to show about everything that I have got, and I will have my lantern slides duplicated for you.

Very truly,

G.V.B.

G.V.B. Black

Colorado Springs
Sept. 20-1909

Dr. G. F. Black
Chicago Ill.
Dear Doctor:-

I am glad that you found the missing
ms. I have of course read your report and I must
say that it is very gratifying and without criticism
from me. It covers the matter in every detail so far as
we know.

I expect that you are impatient to learn of what has
been accomplished through the Committee and I am
impatient at the amount of progress made.

I delivered your report to Mr. Fisher Pres. of the Chamber
of Commerce in person. In him we have an "icicle" to
deal with. That is his reputation here. He frankly &
coolly told me that all he had intended to interest
himself in the matter was to the extent of getting the
Committee started on its work.

The School Board has its committee selected.
The College has just opened. Dr. Slocum has the report
and your books which I loaned him. He has been very
busy just lately as you can see and is a hard man to

catch which I have tried to do on the telephone. I will get at him soon however and urge him to serve on the Committee.

Two gentlemen, both wealthy & influential have been suggested for the members from the Chamber of Commerce and I hope they will serve although I wish that Mr. Gidding could be one of them. He has been ill lately I understand.

Dr. Hanford Pres. of the Medical Society has had my copy of your report and at my request will appoint himself on the Committee. He has been displaced as Health Officer by the new city administration. I suggested Dr. Hoagland as the other man ^{on the Committee.} He will make a good one and will aid us.

The Merchants Ass'n has not selected their men yet but I shall see the President soon and talk with him.

Just now, all our civic organizations are busy with preparations for Pres. Taft's coming next Wednesday the Chamber of Commerce in particular so all we can do till things calm again is to lay low.

I shall place my copy of your report in the hands of each of these Committee men & limit the loan to one day so as to force a prompt reading of it, and then pass it to the next and so on.

In this way I hope to make them all familiar with the

problem before the Committee meets.

You almost make me despair when you ask for some more of those deeply stained teeth. I am sure I don't know where to look unless I can induce Burton to rob some graveyard with me, he to do the shoveling. I will get them for you if possible but I have no idea when.

I am interested to know of your new slides and of Dr. Hoyer's work, and I will certainly be delighted to receive such duplicates as you may wish to send me.

I will keep you in touch with the very first developments and can only counsel patience!

Yours Very Truly

Fredrick S. McKay

P. S. - My kindest regards to Dr. Hoyer.

1
Colorado Springs

Oct. 26-1909

Dr. G. F. Black

Chicago Ill.

Dear Doctor Black

I enclose check for \$10.55 which seems to be the amount due you on your expense account at the Hotel here, as per the statement you enclosed in one of your last letters.

An old friend of yours, Dr. Adair of Atlanta Ga. dropped in on me a few days ago at your bidding to see the new "disease" we have here. He was under the impression that it was a condition of the gums. I had a case in the office for him to see, which gave him an idea of it. It was not a pronounced case but it cleared up his idea of it. I am practically at a standstill in that big committee although by considerable hustling I have managed to get all appointments made except from the Chamber of Commerce, just the one that ought to have been the first.

The entire School Board has had your report, excepting the lady member, who has been & is still seriously

ill.

The College Committee is Prof. Schneider the Biologist and I trible the Chemist. Neither of these has had the report yet.

Dr. Hocutt has accepted the committee appointment from the Chamber of Commerce & will act as the Chairman of the big committee when we get it together.

Attempts have been made to get certain men to serve on the Committee from the Chamber of Commerce but they have refused I suspect from pressure of other business.

Henderson the Secretary has just left for Billings Mont. to try with other gentlemen to land the next meeting of the Dry Farming Congress, now in session there, at Colorado Springs. When he returns we will go over the list of members and try to pick a man.

At the last meeting of the Medical Society Dr. Burt & myself attended. I read almost all of your report to them. We got up quite a discussion and the Society voted us its hearty endorsement, also a Committee to work with us. The Merchants Association appointed their good man one of whom now has your report.

As you can realize it is hard to work with such an unwieldy Committee but we will get things rounded up some day I hope even and get some action.

As to further examinations I have since I last wrote you taken the schoolhouses along the way from Pueblo to here. I did it by going to Pueblo early one morning & with Dr. Smith whose automobile happened to be there, making the return trip with him stopping at each school.

This trip gave us some interesting data. The first one was Pinon (pronounced pin-yone) about 15 miles north of Pueblo and of course right in the Valley. 20 children were examined three of whom I saw born in Pinon. The histories of these 9 are as follows. 6 had the teeth generally mottled & stained and they were taken together as bad as any six cases I ever saw. They were very typical.

The ~~first~~ 7th child was born in Pinon & always lived there and yet no marks were found at the age of 12. I noted on his card that the water at his ranch was spring water & very clear & pure.

The 8th & 9th children were born in Pinon but went to California at the ages of 2 & 4 remaining away until the ages of 9 & 11 respectively. They are now

11 & 13 respectively. They both escaped the marks the enamel being normal. I forgot to state that they are brother & sister.

Of the six children first mentioned who were so badly marked, 4 were in one family & the other 2 in another family.

Of the remaining 11 children examined we will take out 2 who had no permanent teeth and another who was born 5 miles south of Pueblo who had at the age of 10 slight marks on lower second bicuspids & so considered doubtful. She came to Pinon at the age of 8. - Also take out 2 at ages of 8 & 9 who had only the incisors & 1st molars in the mouth. They were not marked, having been born in California & Kentucky respectively & come to Pinon at ages of 6 & 7 respectively.

The remaining 6 show as follows. -

- 1 - born in Eden Cal. (say 4 or 5 miles near Pueblo than Pinon) no school there - this would be the Pinon district - all teeth mottled & upper incisors stained.
- 2 - born Pueblo - couldn't get his history as to when he came to Pinon - all teeth mottled & upper centrals stained.
- 3 - born between Pueblo & Pinon - all teeth mottled & upper centrals stained.

These 3 in the same family (Beusch) &

4 in the badly stained group are in another family (De Lay.)

Following along in the same group next came to No. 5 - born Eastonville (which is on that Palmer Lake Divide off to the East beyond that timbered country through which you rode in the machine. It may be that you reached Eastonville that day.) Left Eastonville at age of 4 - came to Pinedale at age of 10 - we found no marks. All ~~teeth~~ ^{enamel} normal. No. 6 - born Greenland (the other side of Divide) but further to West than Eastonville. - left there aged 3 weeks - lived at Eastonville next until aged 3 years - then to Monument - then Pinedale - then Pinedale. These towns progressively nearer Colorado Springs in the valley of the Monument Creek which joins the Fountain there. at age of 12 we found all enamel normal. no marks. No. 6 - didn't know where born - been in Pinedale only 1 year - now 8 years old - came to Pinedale aged 7 - all ~~enamel~~ ^{enamel} ~~yet erupted~~ ^{erupted} normal. - all kept other 3

You will readily see that the blight falls pretty heavily on natives of the Pinedale district. The trouble runs close to 100 in reality.

The next school was W. ... because there were no natives. Only 4 or 5 children in the school.

The Buttes school came next & gave us very little that we did not know as you will see. 5 children examined.

No. 1 - Born Colorado Spring. Left at age of 1 year went to New York - came back to Buttes at 2. Now at the age of 9 the only permanent teeth in our the incisors & first molars and their enamel is normal. Later developments will be interesting.

No. 2 - Born New Hampshire - came to Colorado Spring aged 4 - came to Buttes soon after - at the age now of 14 we find incisors & 2d. molars mottled - all other teeth normal enamel - No stains.

No. 3 - Born New Hampshire - came to Colorado Spring aged 1 year - returned East aged 7 - came to Buttes aged $7\frac{1}{2}$ - Now at age 13 ~~all teeth mottled except first molars~~ first molars normal enamel. all other teeth mottled - upper & lower incisors stained. (Note that this is the first case found with lower incisors stained in the characteristic way)

No. 4 - born Colorado Spring - Came to Butte aged 6.
 Now at age 12 all teeth mottled & upper central stained.
 No. 5 - born Colorado Spring - came to Butte aged 9
 Now at age 16 all teeth mottled - upper central stained.

1-2+3 are same family (Kendall)
 4-5 " " " (Smith)

We passed Mountain having taken that before.
 School at Midfield (between P.S. & Mountain) not
 in session that day.

As you see the schools except Pinn had no children
 native to their respective localities so the data is not
 of value except to fasten the guilt more strongly
 on Colorado Spring as shown at Butte. It means
 that children spending what we may term the
 susceptible years in our peculiar environment (other things
 delightful) are marked for life no matter where they
 go afterwards.

It is curious to note that the blight runs so closely
 into Pueblo from the North & stops evidently at the
 city limits. More work must be done there. The schools
 lying farthest North must be seen. The school nurse
 there has filled out about 100 cards of cases that
 seemed to have these marks in other schools than the one

looked through and I shall look those cases over
at my first chance. I feel that Pueblo is not
entirely free from suspicion.

As to funds for further work a certain rich man
has said that he will be one of 20 to give \$100.00
toward it.

Our new building will be ready Monday & the
next week or two will find our in confusion.

Afterwards I will have better arrangements toward
leaving my office during the time I am away
"chasing the stain."

Allow me to hope that this letter may find you
in good health & spirits & that I may hear from you
at your convenience.

Very Truly Yours
Frederick M. Kay

720 Exchange Bank Bld.

after Nov 1st

Colorado Springs
Oct. 29-1909

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black.

A letter from Dr. Ketchum in
Denver this morning tells me that he has for you
an incised crown badly stained from a case
grown about 30 miles N. E. of Denver & obtained
by Dr. Waddell of Brighton Cole, a town 20 miles
north of Denver.

Dr. Waddell was at our State Meeting & said that
he had the stain in his locality. I am very anxious
to visit there when the opportunity comes right.

I am glad you are to get this specimen & will
be anxious to know what the histological verdict will
be: whether it differs from ours or not.

From the Experimental department of the State
Agricultural College at Fort Collins I learn that
the peculiarity of potato growth in our locality, wherein
the plant runs all to vines & no potatoes is a disease
(Rhizoctonia) & that it runs in certain localities

in the State. Pinon grows no potatoes, nor does
any locality so far as I can find, in the Mountain
Valley.

If I can ever get to Fort Collins I will see the
potato experts there & doubtless get some valuable
data.

Yours Truly
Frederick S. McKay.

720 Exchange Bank Bld.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Nov. 1, 1909.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I have received your letter of Sept. 20th and should have answered it, but I have expected every day or so that I would be able to send you the pictures and a further report covering the brown stain in the teeth of your children. I also have your letter of Oct. 29th regarding the teeth that Dr. Ketcham is to get for me. I have one of those teeth already, received it day before yesterday, and he promises me from three to five others from the same mouth, and thinks he will get them. That will help me a whole lot.

I have dissolved out the brown stain completely from one of the worst discolored teeth that I had, and was a little bit surprised at the result, and am somewhat encouraged to try further experimentation. The plan of doing it in this case would not do at all for use in the mouth, though the tooth itself is uninjured. I am very much interested in your report of the examinations in the lower valley of Fountain Creek, and your discoveries there seem to be very important, but how about the examination of the students in the college? I was expecting that to tell a whole lot.

By the way, I have a letter from Dr. H. H. Wilson of Phoenix, Arizona who tells me that he has the same difficulty in his neighborhood that you have in Colorado Springs. He proposed to send some Mexican boys, or one at least, to me here for me to

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Nov. 1, 1909.

Dr. F.S.M.#2

determine if it was the same thing or not; he said it could be done without costing more than his fare. I wrote back to him and told him that if there was any one with stained or white teeth who would be passing your place, for you to examine it would answer the same purpose. In the case which Dr. Ketcham sends, the discoloration is the same as that at Colorado Springs, but whether or not this is a sporadic case, and whether the teeth are all of the same character, showing the mottling we find in Colorado Springs, is another question entirely.

I find an occasional spot on teeth here, but the other teeth do not show the same injuries that are seen on the teeth at Colorado Springs, so that the fact that he has one case is not in itself significant or diagnostic, although that case shows the same condition as to stains as are found with you; so I think that ought to be investigated when the time comes. The further investigation of the brown stain has had some surprise for me that will be best explained when I send you the report and pictures.

I enclose two or three cards of the style that many of our men are using in their practice. They will help you a little perhaps as to the use of the letters and figures. You did not say in your letter what you thought of the little scheme that I sent when I sent you the report.

Hoping to hear further from you of any developments, and that you will remember me to Dr. Burton, Dr. Wilson, and others,
I am,

Very truly,

WV Black

Colorado Springs
Dec. 23-1909

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black-

Your report has at last been circulated among the members of the Committee. Dr. Gardiner the last one to have it returning my copy yesterday.

One cause of delay has been in the different ones keeping it beyond the allotted time & obliging me to go after it in order to give it to the next one.

Dr. Slocum has also been away for a large part of the time, in the East. He is also very actively engaged in the work of the Palmer Memorial which will be a statue of the late Gen. Palmer built from a popular subscription.

However, I called upon him a few days ago & his advice was not to attempt to call the Committee until about Jan. 15, after all the Holiday excitement has died out.

We also have decided that Colorado College is to be examined previous to the Committee meeting so that our findings can be laid before them.

On account of the Holidays, this cannot be done

until the students are back, about Jan 4th

No work could have been done in the outlying districts since October because of the condition of the roads. Snow has been on the ground constant ly since in November & the roads are bad.

We have had unusual weather for here so far this Winter but I am in hopes that we will be able to do some work by early Spring, although that is apt to be bad. You know that we have only two seasons here - Winter & August.

When the report went through Prof. Sturtevant's hands he made two corrections as follows. On page 15 - The water from the Mountain Lakes, which we drink has something more than one grain per gallon & the Creek & wells contain 25 or 30 grains of total solids to the gallon.

I received the diagram used at Missoula Mont. & both Burton & myself were favorably impressed. Such a form would come very near what we want with some little alteration. Thank you for sending it.

I notice in the Journals that the Chicago men are to show their esteem for you in the near future by a banquet. How I wish that I might be there but as this is impossible I will content myself by offering my felicitations in advance.

of the occasion also to wish you a happy New
Year & yet many long years of life.

I shall hope to have something more definite
to tell you before long.

Yours Most Cordially
Frederick S. McKay.

720 Exchange Bank Bld.
Colorado Springs

Colorado Springs
Dec. 26-1909

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black -

Since writing you a day or two ago a request has come from the Denver Dental Society that our Society here hold a joint meeting with them in February on the 13th. On account of the meeting of the A.D.A. in Denver next summer our State Society will have no meeting & this joint meeting I speak of will take the place of a State meeting.

They have requested that someone from here present the matter of our "brown stain" in the light of what we know of it a present. At first it was thought that it might be unwise for us to run any risk of publicity just now & this was suggested to the Denver Committee but they insisted that this subject

was their preference and that they would co-operate in excluding the Press from the meeting & otherwise preventing a report of the matter going into the Papers.

It will thus be in the nature of a discussion within the Profession which as you have said in your report cannot now be prevented.

Also the title as it will appear on the program should carry no tall talk announcement. I suggest something like this - "Dr. Black's Report Concerning a Certain Dystrophy of the Cranium," as what we present will of necessity be based on the report you sent us.

As for me I welcome an opportunity of getting those men interested so that they may have a better idea of what to look for & how to study this matter so that they may assist us by writing histories of the cases they may come across. To do that would be of benefit to our research in the time to come.

Now what I wanted to ask you is if you could assist me in the way of lantern slides for that meeting & also any further conclusions that you may have arrived at up to the time you send the slides.

To give the subject without slides would not impress it nor interest as we wish to.

In the meantime I will endeavor to do some more work in Pueblo that seems to be called for there & also some of our outlying districts.

Regarding Pueblo, it is impossible to get down there early enough in the day the way the trains from the East have been running lately due to snow & cold. That should straighten out again soon & the weather promises to be better.

Regarding the Schools at Monument & Palmer Lake, also Mte Pass (to the West) Dr. Smith has promised to take me to these in his machine but unfortunately it is in Denver & has been for some time, he being

unable to get it down here because of the
amount of snow along the way, particularly
between Palmer Lake & Durango.

Can you let me know soon as to what I may
expect in illustrating the talk.

Yours for a Happy New Year
Frederick S. McKay

720 Exchange Bank Bldg.
Colorado Springs

Chicago, Ill., Dec. 31, 1909.

COMPLIMENTS OF
FREDERICK S. MCKAY, D. D. S.

Drs. F. S. McKay and Isaac Burton,
Colorado Springs, Colo.

Dear Doctors:-

I am sending enclosed with this an account of further studies I have made of mottled teeth since sending the report to you some time ago. I am also sending under separate cover lantern slides covering most of the work done to date. I do this, not only that you may be fully posted regarding this part of the work to date, but also that you may have the means of fully illustrating it in your local Society work at home or elsewhere.

I think that when you have read what I have written regarding the solubility of the brown stain, you will be interested in that phase of the question, and among you I should expect that you would find some teeth which you could legitimately send me for further studies of that feature.

After a careful consideration of the matter, I am inclined to the opinion that the histological phenomena have been fairly developed in what has now been done, yet some further material for that work seems desirable for confirmatory work.

P.S. Jan. 17, 1910.

I am very sorry that the sending of the lantern slides and this copy has been so long delayed, but I have been at home ill for practically a week, and came down now on purpose to get this

out of my system and into yours. The delay has been caused by the difficulty of getting two lantern slides, and now they are not quite as I should like them, but they will do effective service with a good light, and are very good as pictures in the hand.

Dr. Slocum wrote me that he had a gentleman visiting him, a physician, who had become interested in this matter, and probably it would be well for both he and Dr. Slocum to see these additional photographs on the subject of the brown stain, and the text also which I give you. I am sending two copies of this in order that you may each have one. I suppose that a copy of this later work will not be necessary to the committee of citizens, though there is no objection to their having copies if you think they should. I note today that there is one page less, so that the first page is (2) instead of (1).

Hoping this will arrive in time for your meeting, of which you spoke in your last letter to me, I am,

Very truly,

G.V.B. Black

G.V.B.

Lantern Slides sent by express today.

COMPLIMENTS OF
FREDERICK S. MCKAY, D. D. S.

The lantern slides I am sending are divided into three groups, as follows:-

FIRST GROUP

185.1-----1,2,3,4,5 - 7,8 = 7

These are duplicates of the photographs by reflected light of the teeth cut centrally, showing the whitened areas of enamel, which I had with me last summer. ^{*This picture is a little too dark for the best effect.*} ^

SECOND GROUP - Photomicrographs

185.2-----1

White enamel in which the open spaces between the enamel rods are shown. This I had with me last summer. ^{*This copy is a little too dark for the best effect.*} ^ The rest are newly made since I came home.

185.2-----5

Brown enamel showing the coloring matter deposited between the enamel rods. ^{*also a little dark*} ^ The difference between this and 185.2-----1, you will find very striking.

185.2-----8

Floating Enamel Rods. You will remember that I spoke of the enamel rods getting away and floating in the balsam after mounting the first sections I made. This slide is a photomicrograph of some groups of these floating rods.

185.2-----9

A photomicrograph of the nearest normal enamel I have been able to find in the sections I have made from these teeth.

THIRD GROUP

185.3-----1

Distribution of the brown stain in the enamel tissue.

185.3-----2

The same from a portion of Number (1) made with a higher power.

185.3-----3 & 4

Shellac infiltration of white enamel.

185.3-----6

Infiltration of shellac, stained with Gentian violet, into the white portion of the enamel, while the normal, or nearly normal, portion resists the infiltration.

All of the slides of the second and third group are fully described in the additional text which I send, but I thought this brief list might be useful to you.

An Explanation.

The numbers of the slides I send you are the same as I place on the duplicate slides in my case. You will notice that it is a decimal numbering. That is, the whole number, as 185, represents a class. 185.1, 185.2, 185.3, etc., represent divisions of that class. The numbers on the righthand corners represent the individual slides in each of these divisions. In this way I am able to place new slides in any division of any class without disturbing the system in any degree. Of course you may change the numbering any time you may see fit.

My slides have become so numerous that I have been literally compelled to adopt such a system to be able to keep them in any reasonable order, or to return them to the case easily. 185 appears on the drawer front; when I find that on the guide card, I easily find any individual slide, or the place for it if returning them to the case.

Descriptions of Lantern Slides sent in this package.

Of these, those bearing the case number 185.1 are those shown while I was in Colorado Springs. There were eight of these, but I have placed but seven of them in the package because one of them seemed to me to be of no real value. They are photographs by reflected light from teeth split centrally, and the surfaces polished. They show the areas of white and brown enamel in its extension into the substance of the enamel. For the most part each of the two halves of the tooth are shown together in one slide. I had several pieces that had no mate, and these stand alone in the picture.

You will remember that I spoke of the case in which the enamel rods scattered in the balsam after I had mounted a section; slide 185.2-----8 is made from a group of these scattered enamel rods.

Other slides in the package will be described as I go on with the account of what I have done since I wrote the report which I sent you some time ago.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO, ILLINOIS.

Dec. 31, 1909.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I have received both of your letters and will now be in a position I think with my other work, to hurry up matters and get the pictures to you. I had bad luck with two pictures and have held the whole thing back on account of them. I have tried five or six times to get satisfactory duplicates and have failed each time. Then the school work came upon me and I have had almost no time until now during the Holidays I am pushing the matter out.

The copy of the further report that I wish to make is all written and ready, but I want to hold it until I can send the pictures, which will be my next task. I will try and get other trials tomorrow or the next day, but it may be several days yet before I can get them out.

There is certainly no objection to a discussion of the subject in Denver, under the conditions of which you speak in your letter, and I would like for you to have these pictures long enough beforehand to become thoroughly familiar with them.

You will hear from me again very soon.

Very truly,

G.V.B.

G.V.B.

Colorado Springs
Feb. 6-1900

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black-

The slides & the second report reached me in due season for which I most earnestly thank you. I laid the slides aside till I could look at them through a lantern which I did a few evenings ago with Burton.

They are of great value and assistance in depicting the lesions that we are interested and those showing the vacant spaces filled with chellae are certainly conclusive.

It was decided that it would be better not to present this matter at the Denver meeting of which I spoke because of the prominent character of that meeting, the Committee in Denver feared a leak, & could not guarantee that it could be kept out of the papers.

They suggested as an alternative that we take

the matter up at a quiet meeting later in the Spring.

One point of which I am not altogether sure regarding the specimens that were filled with shellac.

It surely could not be the whole tooth crown, uncut, that was so treated, but a ground section.

I raise this point to make sure on account of the doubt we feel as to whether the brown can become visible or not after eruption.

You know that in the many cases we saw where the upper centrals for example were from $\frac{1}{3}$ to $\frac{1}{2}$ way into the mouth we saw a large number of "white" teeth but I can recollect no case that showed brown. The question is raised as to whether some substance is already there in these empty spaces between the rods which becomes changed to brown in the mouth environment or action of light possibly or some other way unknown.

Given a normal Nasmyth's membrane do you conceive it possible that peristalsis can occur from the mouth into the spaces between the rods? Also - did the gasoline dissolve the coloring from

an uncut tooth crown, or was it from a cut section? I take it to be the latter.

As to our work here I can report some progress.

After diligently circulating the report among the men on the whole Committee we selected the "psychological moment" and called them to meet two weeks ago tomorrow (Monday).

I notified every one by postal card and twice by phone and the result was a meeting at which every one of the 15 members was present, a very gratifying showing. This included four of the best Physicians in the city.

Dr. Hocum presided & I was asked to make a brief statement of our position and necessities which I did. The enclosed form was circulated in the original among those present as a brief statement of the kind of action or endorsement we wanted and action was taken promptly, the matter going through without dissent. Among those present was our Mayor who was at once interested and the opinion of the Committee was that the matter be taken up with the City Council &

the County Commissioners the Mayor assuring us that he could control the newspaper men who attended the meetings of the Council & that the most of the discussion could be in executive session.

The enclosed form was adopted & the signatures of all members subscribed.

A working Committee was named by Dr. Slocum consisting of myself as Chairman, Dr. Gardiner a physician & a man who has done considerable research work, and who is considered one of our leading and best known physicians and Mr. John Lemmon a business man.

It was decided that the Report from you be circulated among the 4 members of the City Council (you know that we operate under the Commission form of government) & after they had read it, which all but one has now done, the working committee shall interview them in session as before stated. The same is to be done with the County Commissioners.

Dr. Gardiner has already visited a dog kennel in the city & is told by the keeper that dogs born here

have marks on the teeth. He was surprised to learn that native children had the same so his testimony has a unique value. He promised Dr. Gardiner two pups for research work which will be done by a pathologist here. I intend to visit these dogs & see for myself just what the lesion may be & if possible get some material for you.

Dr. Gardiner brought his dog to me because of his teeth (not professionally) & we found a peculiar condition which I can describe in no other way than erosion. Almost the entire denture was affected, some surfaces on some teeth and other surfaces on others, the lesions being extensive excavations showing brown like a smoker's stained denture.

The enamel was normal as to appearance over the unaffected areas of the teeth so I could not conclude that it was the mottled condition.

We may have a clue however in the dog condition I speak of & you may be sure that we will run it down.

Altogether the prospect looks promising and I shall hope to report developments soon.

I shall also report the details of the second Purbb examination made about three weeks ago as soon as Burton has made out the figures. We shall have to raise the percentage of mottling there to about 14%.

You will be kept in touch with every detail of future work as soon as we are able to undertake any.

Meanwhile, thanking you for the slide and further report I beg to be with kindest wishes

Very Truly

Frederick S. McKay

Feb. 9, 1910.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I am very glad to know from your letter which I received this morning, that you received the slides all right, and also that you are making some progress in the matter of getting started properly in the examination work, and I hope it may pan out in good shape.

I think probably you are right about not taking this subject to the Denver meeting. Public discussion of it had better be with-held until things are in more satisfactory shape in Colorado Springs. Of course private discussion of it is all right, but where there is danger of its being published, it had better be cut out.

Now a word as to the method of preparation of those specimens that have been infiltrated with shellac. I enclose a card on which I have made a rude picture of a incisor tooth with the root cut away, dividing it into two parts, (a) and (b), an explanation of which is written on the card. The cut surfaces where it is divided at (e) are ground smooth. Then it is placed in the shellac solution and left there sufficiently long, heating up to 140 or 150 degrees occasionally during the process, to facilitate the infiltration. The piece is then laid on a bit of paper and allowed to dry until the shellac is hard. Then the face where it is divided at (e) is ground on a stone until the shellac is removed from the surface. After this, this face made by a cut through at (e), is laid upon a disk, after placing balsam upon it, and forced down

Feb. 9, 1910.

Dr. F.S.McK #2

with a spring that will give about twenty-five pounds pressure, and is allowed to remain there for several hours at a temperature of 140 to 150 degrees F. It is then ^{when cold} in condition for grinding.

You will see from this that it is not a ground section that is infiltrated, but it is infiltrated from the side of practically one-half of the tooth. This is done especially in order that the enamel that we consider normal may have the same opportunity precisely to become infiltrated, as that which we regard as abnormal. I have not tried infiltration through the membrane covering the surface of the tooth. I have wanted to do that, but have not had material for it. The pieces of teeth that I now have do not seem to me suitable for this experiment. The person from whom they came was old enough so that the membrane is mostly worn off, and it would not make a fair test.

In dissolving out the color I have used pieces the same as those illustrated on the card, and of about similar thickness. They become a clear white. I put two of the best of these on the disk to grind, and had an accident with them and lost them. Accidents, you know, will occur in the best of families. I was very sorry, but it could not be helped.- the first grind in this series that I have lost. So that you will see that this dissolving out is practically done in a full one-half of the tooth, not a ground section. None of the infiltrations have been done in thin sec-

Feb. 9, 1910.

Dr. F.S.McK #3

tions, but always in the thick pieces illustrated on the card.

If there is any further explanation that I can make,
please write me.

Very truly,

G.V.B.

Colorado Springs
March 4-1910

Dr. G. V. Black
Chicago Ill.
Dear Doctor Black-

An sub committee of which I wrote you as having been appointed from the big committee to carry on the work of securing an appropriation met this afternoon with the City Council at a private called meeting. The full committee was present and the matter was presented after the Council had all read the first report you sent us.

Without exception the Commissioners received the matter favorably and have promised that action will be taken early next week.

The County Commissioners now have the report and we will try to get action from them soon, although it is likely that they will be much slower to give it attention because of pressure of other matters.

The agreement among us today was that in

were to ask for \$500.00 from the City and the same amount from the County.

It is very likely that the City will grant our request which they concede to be reasonable, at once or at least enough to give us a start in which case the pressure on the County officials need not call for undue haste.

Now while I don't want to "count my chickens before they are hatched," yet I feel that I want to get in touch with you as to suggestions as to just how to proceed so as to lose no more time as soon as funds are available.

Probably the first thing to do will be to devise a new form of examination card based upon the suggestions we have from you and have a lot printed for use in future examinations.

It is agreed that the area immediately surrounding us here should be gone over carefully to locate the boundaries.

(The Dental Review came to me today and I was delighted to see that it contained the account of the banquet at Chicago. I called Mrs. McKay's

attention to it & laid it on the table for her to read. She is now doing so as I write and has just interrupted me by being convulsed with laughter at the story therein told of the newsboy and the skeleton.)

In order that we may accomplish as much as possible when we visit a given locality and collect all data of value we ought to have clearly in mind just what we are to do and it is particularly along this line that suggestions from you will be very valuable.

I have the idea that probably a printed form of some sort which would be filled out for each locality would help us to classify things and expedite matters. Such a form could contain space for the writing in of observations and data obtained from analyses of the different samples taken.

For instance soil - surface water - drinking water - vegetation - milk - vegetables - crops - water sheds - geological formations and anything else that relates to the problem. - Also I presume the teeth of native animals should be looked at.

The sheets should be numbered in order to keep track of them & guard against loss or misplacement. If any other features that might assist us occur to you we would be very glad to know of them at your early convenience.

I have not yet read the Review for March but will do so with a great deal of interest.

Waiting your reply I am

Very Truly

Frederick S. McKay

720 Exchange Bank Bld.

Colorado Spring
March 25-1910

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black-

Our City Council has appropriated \$300.00 for our research fund as a start and to enable us to go ahead with our work.

We are planning to put in two days next week among Schools lying 30 to 50 miles to the East, probably Thursday & Friday.

Dr. Gardner is to go to Washington for maps showing timbered areas & soil analyses, as well as Geological areas which we can use to mark our findings on.

I will report to you later -

Yours Very Truly
Frederick S. McKay

March 31, 1910.

Dr. F. S. McKay,
720 Exchange Bank Bldg.,
Colorado Springs, Colorado.

Dear Doctor:-

Your kind letter of the 25th inst was laid on my table this morning. I believe a previous letter from you has remained unanswered. This has been because of my confinement to my room on account of a break-down of my vocal apparatus. Like Pol, the parrot, I have been talking too much, and am suffering the consequences. Otherwise I am in excellent health.

I am particularly glad that you are finally being put in a position to go on with your work, and hope for speedy results. The plan of getting the Government maps of your region is particularly good, and I hope you will succeed in this.

In the matter of the form of your cards, I would advise that you do not complicate them with too many items, and so render them cumbersome to fill out. It would be much better to file them by localities, and file the geological and chemical data on a card, heading each locality list, or group of locality lists, that may present the same or closely similar geological and chemical conditions. I feel a keen interest in these maps, for I feel that I may have been led into some errors in my report made from my judgment formed from my hasty look-round last summer. You on the ground, however, will now have a much better view of the matter than I can have at this distance, and must lead off much according to the way that may seem to you best.

Very truly,

G.V.B.

Colorado Spring
April 17-1910

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black-

Some more work has been done since I last wrote you. I believe that I did not give you the data that we collected along the 2 creeks between here & Palmer Lake. You will remember that Monument Creek comes out of the south end of Palmer Lake making its way down along the divide with the mountain range & joining with Fountain Creek which comes from Manitou and the West. The stream is there known as the Fountain until it joins the Arkansas just East of Pueblo.

The water from the north end of Palmer Lake goes down that side of that divide & finds its way into the P. R. R.

You will also remember that the divide upon which Palmer Lake sits extends out East &

is quite heavily timbered.

We stopped at two schisms on the way to Palmer Lake which gave us no data, because there were no natives, except however that we found two sisters who were raised, at least through the enamel growing years, in the town of Gillette which is one of the communities in the Custer Creek District. This of course only brought a new focus of suspected territory into view. We had felt here that the Custer Creek District was not much affected but these two cases were very typical both as to stain and mottling.

Coming next to Monument we found timber natives only two of which had the enamel defects. On other grounds ten natives out of twelve had escaped. This makes Monument essentially different from the rest of this territory so far examined. The only point we got was that the water there is taken from the timbered divide to the east. This timbered country you will remember having passed through in the machine with Burton & Wilson.

At Palmer Lake 10 natives were found, five of which had defects.

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The data of these different schools are made out in detail in an enclosed sheet.

The second trip of about ten days ago was to cover the schools lying in what is known as Ute Pass, which is the defile in the mountains through which the Ute Indians used to come to visit the mineral springs at Manitou and hunt on the Plains and incidentally to get their tails pinched by the Plains Indians.

Ute Pass leads up to the West from Manitou and is traversed its entire length by the Colorado Midland R.R. The grade is very steep for the first four miles from Manitou to Cascade Canon, from which place the valley widens out but still ascends until the town of Divide, altitude 9200 feet & distance 30 miles from Colorado Spring is reached. From here the railroad throws out a branch which circles around the north & west side of Pikes Peak, into the Cripple Creek District and it is on this branch that the town of Gillette is located.

Divide, as the name implies is a water shed, the waters running down Ute Pass into the Mountain, and down the other slope into the Platte.

This was our terminus and in the school there we found the data which is outlined on another sheet. The further fact was brought out here that there were grown to the West in an immense area something like that of the State of Connecticut rolling, surrounded by high mountain chains, but timberless known as South Park, had developed no defects. Two were from the town of Jefferson which sits right out in the open park and one from Fairplay which is close up against the mountains. Of course this is not conclusive but merely a hint. The country about Divide is hard to describe. It is barren & bleak looking, rolling & generally timberless. The principal agriculture of that region is growing potatoes, which are of splendid variety and size, and fair yields of the famous Greys. No irrigation is practiced the rainfall being abundant.

I have not the figures before me, but my memory is that of ten natives at Divide & had defects which is not what I was expecting to find in that region of potato culture.

A small school at Edmore on our return down the Pass had no natives so no data.

The next town was Woodland Park which had

a fair sized school for this country & here you will see the heretage having enamel defects, (among natives) was large. This was contrary to my expectations because I had been learning to associate the enamel defects with mountainous & timbered areas, and Woodland Park as the name might imply has a generous sprinkling of pine & evergreen trees. Green Mountain Falls was next and this school took the record - 100%. 10 children were in the school every one of them were natives there and defects were present in all. This town sits right in a narrow part of the Pass in fact the school house is built quite a distance up on the slope of the mountain and rivers are numerous.

So the Pass shattered all my preconceived notions and left me hanging high & dry again.

However I have allowed myself to hope that the data secured at Monument has given us a clue and my next investigation will be at Eastonville to which place you went in the machine.

It is either just on the Palmer Lake Divide or just over it and I am trying to arrange to run out there someday this week on the train.

At our present point in this investigation it is a matter of some confusion to properly

Classify the data found in a given locality for the reason that we have mapped out areas which we know to be susceptible, therefore we must separate cases grown in areas of known susceptibility and having no bearing upon the district in which they are in at a given time.

Bearing in mind the ages of enamel growth, we must be particular to change the defects when found against the home locality and also to separate those children who have few or no permanent teeth in the mouth from the general data of each school. I generally mark such as negative because we don't know what may be the condition of the unerupted teeth and it would not be fair to prejudice our data by admitting such to the count.

Therefore it seems to me that the value of the data collected in any given place is in what we find in the native who have left that community as a continuous residence.

Of course existing defects of enamel may be valuable as outlining other susceptible areas so far unknown. That would simply widen the horizon.

As the matter looks now I have a strong feeling that this question is ultimately going to land in Geology but as yet I can't see the connection unless after all it should prove to be the drinking or cooking water.

As to the milk, I am told that one of our largest dairies, the Sinton Dairy, which you visited receives large shipments daily from the Territory about Monument & Eastonville which we will consider for the present as area of suspected insusceptibility.

I will let you know of course what I find when I go to other territories.

Now for a question or two: - I find a general conception that having this membrane is a structure that is present in the teeth only temporarily or for a limited time, and that it soon disappears.

On the other hand is not having this membrane a permanent fixture and is it not the hard glazed covering of the enamel that remains through life?


Will you please answer this for me in a way more or less dogmatic so that I may quote in case of dispute. I seem to be unable to find much written about this structure.

Another thing; in your study thus far, are you able yet to determine whether, given a area of unincorporated enamel is it possible or likely that

a substance which we call the "Brown Stain" can actually penetrate a normal nasmyth's Membrane & enter the empty spaces between the enamel rods from the outside?

Again and again this question comes up the claim being made that having these empty spaces between the rods, the coloring material comes through from the outside.

If so then why are not all mottled teeth stained? I know they are not. In fact I believe the percent-
age of mottled teeth that are stained is small.
You know in rarest find stain except on the Central & laterals, and usually it is confined to the labial surface and I have never seen but one case where the lower incisors were stained and that was confined to the labial surface.

Another thing - the fact that the stain is often found something like this  (I am like Com Bill Barrett; I never could draw anything except with a corkscrew) indicates to me that the case is a mouth breather and the curved line of the stain follows the lip line. Is this not developmental in itself.

It has positively not been my experience that stained cases are mouth breathers.

Some Suspicious hold their mouth breathing through
quite tenaciously and it is hard to argue them
out of it.

I didn't mean to tire you with so long a letter
but you must expect an infliction like this every
once in a while as my system gets filled up.

I am already beginning to look forward to
seeing you in Denver in July at the National
meeting and am hoping that you can stay at
the Springs again for a time.

With kindest regards

Fredrick S. H. Kay

720 Exchange Bank Bld.
Colorado Springs

May 5, 1910.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I received your letter of April 17th, how long ago I do not know. It seems that I stuck it in my pocket at some time, and by some change of my clothing it got away from me. I just opened it last night.

It seems that your investigations show a considerable scattering of the mottled teeth, and that is quite a wonderful thing, and the ferreting of it out is no child's play. But when you are through with it, we will know more about it. It is hardly worth while for me at this distance to discuss that part of the question very much, but I want to say a word in regard to your questions, and I may best do it in a somewhat dogmatic form, perhaps.

Nasmyth's membrane is on all teeth that are properly completed in their development, and if not worn away remains on them during life. It is worn away somewhat quickly, however, over the incisal edges of incisors and the cusps of other teeth. On the proximal surfaces it usually remains for a long time, or permanently. It is only the portions of the teeth that are worn by friction that lose this membrane. It is apparently as hard and firm as the enamel, but it is of a different structure, and re-acts differently toward acids.

As to your question regarding the enamel that is incomplete as to the cementing of the enamel rods together (is what I suppose you mean by uncemented enamel) I should not think that the

May 5, 1910.

Dr. F.S.McK. #2

stain we find between the uncemented rods has been deposited from the outside. I find quite a little of it deep in the tissue with open spaces between that and the surface, and the whole appearance of it convinces me that this deposit occurs during the development of the enamel - not afterward; yet as I stated in some of my letters to you, the fact that we can dissolve it out, makes it possible that it might be deposited after the teeth were developed, but I do not believe it is. If it is, you people certainly ought to be able to find teeth coming through the gums white, and afterward becoming black. It would require testimony of that kind of no uncertain character to convince me that these teeth become dark after they are erupted, but of course I am ready to receive evidence any time. I would require those who are making this claim that the coloring matter is deposited from the outside after the enamel is formed, to present actual cases where teeth come through white and are afterward colored. This you will find - that when the incisal edges of the teeth come through, they will be white, nearly all of them; even those most deeply colored have a white incisal edge; but when the other part of the tissues comes along, see whether or not that is not colored as it comes out from the gums.

The question as to why some teeth that are mottled are stained, and some are not, is an ugly one to tackle, and I had best say that I do not know. It is also true that some teeth that are atrophied are stained, and some are not. The majority of them are not stained, but a very large minority of them are stained. I should

May 5, 1910.

Dr. F.S.McK. #3

think that you in your work would have a very considerable opportunity to notice the little fellows whose teeth are coming through, and would be able to spot those that come through and become stained later. Of course that would settle the matter definitely, and it is the only thing that will.

As to why the stain selects a particular locality - the labial surface of the upper incisors - I have no data whatever. It is entirely different from the stain that we see on the teeth of mouth breathers; neither the same in substance, nor in the locality in which it is found. The green stain, as we call that seen in mouth breathers, is on and in Nasmyth's membrane. The stain in mottled teeth is not in Nasmyth's membrane, nor is it on the teeth, but it is in the teeth and within the enamel. When you say that it is positively not in your evidence that stained cases are mouth breathers, I have no doubt that you are correct. If I am right in my thought of the matter, mouth breathing would have no reference whatever to these stains. I wish you would write me how this statement is tallying with your observations.

Very truly,

G.V.B.

July 14, 1910.

Dr. F. S. McKay,

Colorado Springs, Colo.

Dear Doctor:-

I want to say to you that I had intended to go to Denver and to visit Colorado Springs again this summer, but my voice has given me so much trouble that I am advised that I should not go any place where I would have much talking to do, even in a private way. I am trying very hard to get in shape for lecturing again this coming year, and my physicians think that I should take my vacation in a locality where I will not see people much and not be forced to talk. My voice is improving very rapidly now. It has regained its tone, but tires out quickly, and I often have a good deal of pain at night if I have talked much during the day.

I am sorry for this, because I wanted to look over what you have been doing, and see Dr. Burton and others and talk this whole matter over again about the mottled teeth, but I will have to let it go for this time. Please say to anyone who inquires for me at Denver, that I wanted to go very much, but did not think it judicious on account of the difficulty with my voice.

In the meantime I have received several letters about the mottled teeth, and one from Dr. John Steele of Denver, Colorado, in which he details some cases occurring near him that come to his office. I think it would be well for you to write him now for a bill of particulars, or maybe you may be able to see him at Denver

July 14, 1910.

Dr. F.S.M.#2

and have a talk with him. I suppose both you and Dr. Burton will be there, and between you you will be able to gather considerable information that will help you with your work. I regret that I cannot go to Denver and Colorado Springs this year. I shall take to the woods tomorrow.

Very truly,

G.V.B.

Colorado Springs
July 31/1910

Dr. G. V. Black
Chicago Ill.

Dear Doctor Black -

I received your letter saying that you could not come to Denver just a day or two before the meeting, and was disappointed, as I had hoped to see you again this summer & compare notes.

I tried to get in touch with Dr. Koch in Denver but couldn't locate him. He evidently left Denver before the meeting was over & came to Colorado Springs. I was very sorry to have missed meeting him & showing him some of the mottled enamel.

There were several men whom I wanted to see in Denver regarding this condition but none of them were there except J. Leon Williams, of whom more anon.

I had a very typical case show during one of the clinic days, that was grown in Cripple Creek and we had some very interesting discussions.

We had some of the "big ones" looking it over & it was
fun to take the wind out of their sails.

Dr. Brophy had said some few things regarding
the condition before he had seen it. But when he
saw it he was a good deal like a little boy I heard
of "who didn't have a word to say". He merely looked
at it & went away.

We also had kick on it & he expounded very learnedly
about carbo-hydrate mouths & other salivary conditions
which are very interesting in their place but which
have about as much to do with our condition as
"Bath House John" has with a Methodist Sunday
School Picnic.

Mike's visit was quite brief owing I suppose to some
pressing engagement elsewhere & he shed no light
on the situation.

The star performance however was with one
Meyer L. Rhein of New York who started in in his
cock sure fashion to tell us all about it &
he & I had it hot & heavy for about half an hour
much to the edification of some of the Spring boys
such as Gibson & J. Allen Smith who were standing
about the chair.

Rhino's first break was that he observed the same condition in New York very frequently & that it was not at all new to him. Also that it could be removed by prophylactic treatment

The discussion went on until he commenced talking about "the nutritional circulation within the cementing substance". He took me up on the statement that the enamel is put into the mouth a completed structure & never undergoes any change which I said was my understanding of your views on enamel. He said that you did not teach this & I said I was going to find out direct from you. He agreed that the enamel rods did not change but maintained that the cement substance did undergo a constant change.

These are only samples of the "tongue rot" that he spouted there and it certainly was the most brilliant example of "hot air" that I have listened to for a long time.

He was attempting to argue a subject the fundamentals of which he knew nothing.

With J. Leon Williams however I had a very different experience. Dr. Chambers & I took the patient

to Dr. Williams hotel & we had a very interesting chat with him for an hour or so. His grasp of the situation was very complete because of his having gone over it with you in Philadelphia. The tendency though even in his case was to get back into embryology which I cannot see the usefulness of. This was however during the early part of our talk & before some of the points had been brought out.

In the main he upheld all of our ideas in regard to the matter which was very gratifying to me & so coming right from him that same morning I was loaded for Rhein.

He suggested our importing some water for some test children & not allowing them to have a bit of our own water during enamel formation. This might be a difficult thing to do.

I have recently seen a case grown in Wabernburg, some 60 miles south of Pueblo which was very typical & was told that it was very common there: almost universal. This is a no potato country.

The last work I did just before the school closed was at Eastonville which is a town that you

visited on an auto trip with Dr. Burton. I haven't the cards here just now so I can't give you the exact figures but in the school of about 25 children of whom a large number were natives I failed to find even a trace of mottled enamel.

This is the first town within the radius of 30 miles that has showed a negative result. Monument you will remember showed that only 2 out of 12 natives were afflicted. This establishes a connection between Monument & Eastonville, which lie in a direct line east & west with the latter place 24 miles to the East. I was told that the water there was very hard.

Just as soon as the school opens this fall I am planning a trip to take in Eastonville again & then over the stretch of 24 miles through the timber on the Divide to Monument.

That intervening country has one school & there are several families of settlers who have raised families there & we shall go over that strip with a fine toothed comb to see if we can't get some interesting data.

I feel almost positive that we will find some

difference of some sort then to account for the disappearance of the mottling.

The next territory after that will be that lying between Palmer Lake & Denver in which there are one or two fair sized places.

In the fall I expect to do some work in the Dental School in Denver with clinical orthodontia and that will put me in line for some more evidence regarding the prevalence of the lesion in Denver and I think I can inaugurate a plan whereby records can be kept even during my absence.

I am satisfied that the condition is more widely spread through the State than at first thought and by no means confined to Colorado Springs.

Now I would a two as to a theory accounting for the brown on which I want your opinion.

Given an area of forming enamel, in which ~~for~~ ~~some~~ because of some nutritional deficiency the enamel organ is deprived of some material it should have, a certain area is lacking in the cement substance & empty spaces are left between the enamel rods.

Next assume that something happens in a

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given case which allows an escape of blood into the area, and a deposit of haematin is laid into these empty spaces.

Afterward the tooth erupts & the laid in haematin or other substance undergoes a slow chemical change due perhaps to the action of light upon it and the brown stain gradually makes its appearance.

I say the action of light as a possible way of accounting for the stain on the labial surface & not on the lingual and yet this does not quite account for the brown not coming on the lower incisors, which as you know it rarely does.

I think I have pointed out to you that of scores of erupting incisors, some in $\frac{1}{2}$ to $\frac{3}{4}$ we have almost invariably found them white, but never carrying the brown stain in this stage.

Consequently we are coming to believe that the brown gradually makes its appearance after eruption & it is due to the gradual change of some substance that has been laid into these empty spaces between the rods, & which has been there all the time but only gradually become visible.

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The fact that only a percentage of mottled teeth are stained makes this latter appear to me in the nature of an accident which happens to the child at some time during the enamel growth and if this brown deposit is not a blood deposit I can't see what it can be.

I think that we must absolutely abandon any theory that would account for this brown by the penetration of a normal passing the membrane from the outside after the eruption of the tooth.

I will be very glad to have you think this theory over & let me have your ideas of it.

I am very sorry to hear that your voice has been giving trouble & hope that your rest will fit you for work again soon.

I hope that you will find an opportunity to write me ere long & I will report to you again as soon as I have anything of interest.

Very Truly Yours

Frederick S. McKay

700 Exchange Bank Bldg.
Colorado Springs.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO ILLINOIS

Oct. 19, 1910.

Dr. T. S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colo.

Dear Doctor:-

I suppose your letter of July 21st came before I returned from my vacation, and when I came upon it in answering the accumulation of mail that was here, I evidently stuck it in my pocket to read at home, then changed my clothes and lost sight of it. At least I came upon it yesterday and read it.

I was particularly sorry not to go to Denver and to Colorado Springs this summer, but with the condition of my throat it would seem almost like suicide to do so and do even the private talking that would be necessary, so I took to the woods, and shunned the people that talked, pretty generally. The result is that my throat is so much better than I am doing my work very comfortably, and am in a better physical condition than usual. I was greatly interested in reading your experiences at the meeting at Denver. A great many people say they have seen these things, but when they come to count cases against them and show its prevalence in your part of the country, they generally come to the conclusion that they have never seen it and don't know what it is. We have one very typical case here with us this year - a student. He came from your city, and we are able to show it to every one, but when we give the figures of the percentage of such cases in your city, it staggers our people here. A few cases that have been seen occurring elsewhere have been regarded as freaks and no particular account taken of them.

I particularly enjoyed your account of our beloved brother, M. L. Rhein and some of the others. Nobody will realize what this

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Oct. 19, 1910.

Dr. F.S.M.#2

thing is without a good deal of careful study of it. A few cases don't count, but when they go into Colorado Springs and see it by the wholesale, it is different.

I am greatly pleased also with the way you are getting along with the work. You and Dr. Burton and the rest of you are doing a noble thing in this work, and it will take a good deal of time to work it out, but I am satisfied that you will get there. Of course lately I have done nothing with it. I want sometime to make a few more sections, but that part of it is pretty well worked out I think. We know what it is. The point that I am least satisfied with is that which you mention, regarding the time of the deposit of the coloring matter. Since I found that I could dissolve it out and replace it with shellac that had been colored, it has seemed to me quite possible that it might occur after the teeth come through, and I am particularly anxious that this be well observed in children who are cutting their teeth and as their teeth come through. You can certainly after a little, fix it with certainty as to whether that coloration occurs after the teeth are through or not.

The point that made me so certain at first that the discoloration came before the teeth were through, was the fact that so many atrophied cases are colored in the same way, and these I have always supposed occurred during the development of the enamel, and not afterward. Further observation of these may change my whole notion regarding these things. I have never tried to dissolve out

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Oct. 19, 1910.

Dr. F.S.M.#3

the coloring matter from atrophied teeth.

What you say about the coloring matter of the blood is probably the explanation of it if it occurs before the eruption of the teeth, but the discoloration in that case might occur after the eruption of the teeth, even though the material for the coloring matter was present. When the blood globules are broken up from any cause, and the coloring matter dissolved in the tissues, it causes discoloration. It is this that causes the blue color or dark color in contusions, bruises and the like, and you will see that according to your notions expressed in this letter, this is the same variety of coloring matter apparently, lending a strong supposition to the idea that this may be the correct solution of that part of the problem. I have found also in some cases that I have traced through, that when very severe abscesses at the roots of the temporary molars have destroyed the enamel organ of a bicuspid before the enamel is completed, these cases have a discolored enamel in every case that I have been able to note and to watch through until they have erupted.

I am writing now in some haste. I hope to hear more from you on this point, and especially as to the observations of children's teeth during the eruption of them. Please keep me posted as to what is going on. I have had a number of cases reported directly to me from regions round about, but some distance from, Colorado Springs. Some of these seem to be isolated cases observed by

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Oct. 19, 1910.

Dr. F.S.M.#4

parties who have not seen the cases at Colorado springs. The observations are probably correct, however. These cases you will find as you go around from place to place. The observations at Eastonville are especially interesting, and I shall be interested in what you find later in that place.

Remember me to the boys and tell them that I have not lost interest by any means in the work you are doing. I should like especially that Dr. Burton read this letter, as I cannot consider you two men separately very easily.

Very truly,

G.V.B. Black

G.V.B.

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Nov. 3, 1910.

Dr. Frederick S. McKay,

Colorado Springs, Colorado.

Dear doctor:-

I am sending you with this a communication from Dr. Steele of Denver that may be of interest to you in the work that you and Dr. Burton are doing on mottled teeth. It gives a case a little out of the field in which you have worked thus far, and may do something to direct you to new fields.

Very truly,

G.V.B.

G.V.B.
Enc.

I

Colorado Spring
Jan. 8-1911

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black-

Since I last wrote you we have been doing some work toward outlining more clearly the geographical boundaries of the mottled enamel. We have come to use the terms "Areas of susceptibility" and "immunity" in talking about this matter.

When I last wrote you we had run onto the first immune area in our vicinity, that being Eastonville which you will remember is out to the East & North about 30 miles. Not only right at this town but in other places we have seen native persons (native to Eastonville) & not once have we found mottled enamel.

This fact together with the fact that Monument, which is in the same geological formation, which we speak of as the Palmer Lake Divide, just 25 miles due west of Eastonville, showed not exactly

immunity but a very low percentage of mottling, led us to an examination of the intervening area a few weeks ago.

Between these two towns the road follows along near the summit of the ridge (the Divide) but lies on the north or Platte River slope. You will remember that on side of the slope is the Arkansas River or south slope.

We stopped at every ranch house & school house & found pretty nearly every native on the Divide, and we failed to find a trace of what we were looking for.

At the ranch of John Cummings we found two children and the mother who had been raised right there & their enamel was normal. We thought this was a good place from which to take a sample of well water for analysis, so we dipped out 3 gallons into a large bottle we had with us. We had another empty bottle which we were going to fill in case we came onto a ranch where the children had the mottled enamel, but we found no such.

I received the analysis of this water a few

days ago from Prof. Sturtevant's laboratory and I
 write herewith a copy. —

Constituents as
 Determined

Potassium

Sodium

Calcium

Magnesium

Iron

Alumina

Silica

Sulfuric acid (SO_4)

Chlorine

Bicarbonic acid (HCO_3)

Organic & Volatile Matter

Parts per
 Million

2.67

4.92

10.58

2.34

1.84

4.30

36.80

4.85

2.40

52.86

14.98

136.78

(m)

| Compounds as they probably exist in solution in the Water | | Parts per million |
|--|--|----------------------|
| Potassium Sulphate | | 5.94 |
| Sodium Sulphate | | 2.33 |
| Sodium Chloride | | 3.96 |
| Sodium Bicarbonate | | 9.31 |
| Calcium Bicarbonate | | 42.44 |
| Magnesium Bicarbonate | | 14.09 |
| Iron Bicarbonate | | |
| Alumina | | 3.31 |
| Silica | | 4.30 |
| Organic & Volatile Matter | | 36.00 |
| | | 14.90 |
| | | 136.78 |

Solids by Evaporation - $\frac{100}{100} \times 136.78 = 136.78$

Note - The solids by evaporation
Expressed in Grains per U. S.
Gallon are 3.65

If you can get a similar analysis of the Chicago water from the City Chemist it would be of interest to put it side by side with the enclosed copy & see what the difference is.

As time goes on we shall aim to collect similar water analyses from the various areas of known susceptibility and immunity with the hope of finding something common to or differing from each, although Prof. Sturby says that he doesn't think the waters will show anything.

Just now we are delaying to find out if our city Chemist can make these analyses & so save the money on our appropriation that it will cost if it has to be done in Sturby's laboratory.

Before this work was done on the Divide I dropped off the train at Castle Rock which is the principal town between here & Denver & examined the school there. I failed to find a trace of mottled enamel & the school was one having three good sized rooms full of children, most of whom were natives of that locality.

I took a sample of water but not knowing how much was required for analysis I didn't get enough.

I find that an analysis takes about three gallons. Since the beginning of the school year I have been doing the work in teaching Orthodontia at the Dental School in Denver & am gradually accumulating some evidence relative to the problem around Denver. I am finding that there is more of it there than we had thought. I have seen some very typical cases grown in Denver.

Next month I am to discuss this problem before the City Dental Society in Denver & before then I shall finish writing the history of the investigation up to date & also arrange a day to examine one of the large grade schools in Denver if I can get permission.

I am anxious to fasten the curse onto Denver's shoulders if I can so that they cannot point their fingers at Colorado Springs quite so hard.

There is no question but that the problem exists there but to determine in what proportion is the question.

So far as we can see now, our work is done as to school examinations in this immediate locality with possibly two or three exceptions which are not

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pressing just now. Localizing other susceptible areas at a distance from here ought to be done and much as we have tried to get away from the water idea, yet we keep coming back to it in hopes that it will show us something. At least we must be in a position to meet arguments along that line as they so frequently appear.

I think at least we ought to have water samples from all afflicted areas to compare side by side with a sample from an immune area.

Now as to the question of the time of appearance of the brown stain we are coming more & more to the opinion that the color does appear after eruption and probably some little time afterward.

I am seeing a few cases where there is a slight coloration present which according to the parents testimony was not previously there and the parents are alive to the situation & are watching it closely.

I feel that it will not be long before we will be able to state pretty positively our way or the other in regard to this phase of the matter and I feel that it is an important one.

I know that one of our dentists is now at work on a

1

case that is badly disfigured, cutting off four of the
anterior teeth and he has promised that he will
let you have some of the teeth for sectioning.

Hoping that you are well I am

Very Truly

Fredrick S. McKay

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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DEAN'S OFFICE

CHICAGO ILLINOIS

Jan. 21, 1911.

Dr. F. S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colorado.

Dear Doctor:-

I received your letter of the 8th inst in due time, and have read it with a great deal of interest. I have been so busy of late that I have hardly known which way to turn. I have been doing a lot of experimental work on the formation of calculus and have been finding out some things not known before, and the work has held me very closely. I have just been down to New York and have said something about it there in a paper on the beginnings of pyorrhea alveolaris, so-called.

I have been very anxious to visit you again and look over the field there under the new conditions that may have developed. What you say of the outlining of the area of susceptibility to mottling of the enamel is both strange and interesting. I think the city government of Colorado Springs would do well to have a very thorough analysis of the water made in the different localities, and particularly in the localities near, in which the mottling does not occur. That matter of the freedom of the little town Eastonville and the schools at Castle Rock, is certainly interesting data, and shows plainly that there is some influence at Colorado Springs that is ^{not} operative at those points where you find immunity, and certainly we ought to get at something as to these differences, in some way. The only way to do is to try everything we can think of and eliminate the things we have sufficiently tried, until we narrow the

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DEAN'S OFFICE

Jan. 21, 1911.

Dr. F.S.McK. #2

thing down to the right thing. It will certainly come if the investigation is continued.

I will try to get an analysis of the Chicago water to compare with this that you have sent me. This analysis contains some very decided surprises. The amount of silica was rather unexpected by me particularly, but I will try to look that matter up. There are analyses of the water here made occasionally by the city chemist, and I will be able to find it in the reports.

I am glad you have got some people at work watching the coming of the permanent incisors. I don't know but I feel just about as anxious over that matter as about any one item of the whole business.

From the reports that have come to me from regions about Denver, I suspect that there are some spots about there that are susceptible to the mottling, which may be found by questioning closely as to where the persons that show mottled teeth have lived as children. It is sometimes difficult to find out those things. I know I had a case here in which our examiner found that the boy had been born and raised in Chicago. I finally got hold of the mother and questioned her carefully about it, and found that he had spent his first seven years actually in Colorado Springs. Some people seem to forget where they were born. They were there perhaps, but don't remember it, and unless you are very cautious you will be deceived in spite of yourself. Of course we expect that, but the

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Jan. 21, 1911.

Dr. F.S.McK.#2

point is to eliminate these deceptions as far as possible.

Don't forget me because I am a little slow sometimes in answering. I am glad always to get your letters, and am very anxious over the matter. I have no more interesting thing on the tapes.

Very truly,

G.V. Slack

G.V.B.

The Colorado State Dental Association

ORAL HYGIENE COMMITTEE
OFFICE OF F. S. MCKAY, CHAIRMAN
700 EXCHANGE BANK BUILDING

Colorado Springs, Colo.

Sept. 21-1911

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D. G. Black
Chicago Ill.

Dear Doctor Black-

Not having heard anything from us for so long a time I presume that you are thinking that we have "lain down" on the problem we were trying to work out.

There has been practically nothing done since I last wrote to you for the reason that I found that our City Council drew back the money and portion of the appropriation which they made for the expense of the investigation saying that they didn't feel like putting any more money into it.

In all we had used something like \$25.00 which was not quite half of what we had expected to be allowed to use.

I wrote a letter of protest but all to no avail so I decided to let it drop and

find some other way of getting help. Last year I was honored by being given the Presidency of the State Dental

Committee on Investigation
of Enamel Lesions
F. S. McKay Chairman
Colorado Springs

Association and in talking with some of the members in Denver decided it was feasible to ask for an appropriation from the treasury to carry on the work.

I could do nothing of course until the meeting in June so in my President's Address I laid forth the matter and asked for \$50.00 to be used by a Committee of not more than two. They considered that one man was enough to work on it for now and put me in the Committee and gave me the appropriation without hesitation. No further work was possible until the school had opened and instead of giving the problem up I am planning on several trips into suspected territory in the course of the Fall and Winter and I am assured that the work is going to be carried on with renewed vigor.

I have also the Chairmanship of the State Committee on Oral Hygiene and I am planning to send a lecturer on several into various parts of the State and it is likely that the two lines of work can be carried on together.

I am pretty well satisfied now as to the extent of the trouble in this immediate vicinity by the work that has heretofore been done and I have

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gradually been adding suspected communities to the list of places that I wish to visit.

Just when I shall be able to start out I can not say just now but I hope it will be soon.

I have written the history of the investigation practically up to date and intend to add to it just as fast as new developments arise.

I wish that we might go over it together.

I read with interest an account of your birthday celebration at Salt Lake as a part of your trip to Alaska and I am sure that you must have had a very enjoyable and interesting vacation.

I managed to get away for two weeks and one during the summer, one week of which I was at Camp Pueblo on the Gunnison with Dr. Farley. Needless to say I enjoyed it hugely although the water was very high and the fishing consequently

not at its best.

The second week was spent with Dr. Ketchum of Denver in his machine in North Park which is an unfrequented area in the northern central part of the State and here we had splendid sport both in trout fishing and sage hen shooting.

I found a school in session there in August because of the dry snow in the winter and we stopped long enough to allow me to look over the children. Several of whom were natives of that locality but I found nothing but normal enamel. I am positive that after I have been to several places I have in mind I will have a much better idea of the area covered by the lesion than I now have.

I have been collecting material for you for investigation and I now have several fused crowns of badly mottled teeth that I am going to send to you in the next few days.

Some of these are the worst I have ever seen and I know that you will be interested and perhaps you may be able to throw additional light on the problem.

With my kindest regards for your continued good health I am
Very Truly Yours
Frederick S. Key

FREDERICK S. MCKAY, D. D. S.
700 EXCHANGE
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COLORADO SPRINGS, COLORADO
—
PRACTICE LIMITED TO ORTHODONTIA
AND ORAL PROPHYLAXIS

Sept. 22, 1911.

Dr. G.V. Black.

Chicago, Ill.

Dear Dr. Black:-

I am mailing you under separate cover the teeth of which I spoke in my letter yesterday. The two darkest cuspids were handed me by Dr. DeBerry, and I may say about this case that it is the worst I ever saw. The entire mouth including the third molars is just like the teeth which you have.

At different times the upper six front teeth have been cut off and crowns placed. Needless to say the person is a native. The rest of those which I send were given me by Dr. Kennedy, and were from a child of about fifteen, a native of a territory that we long have been suspicious of, namely Walsenburg and one the places I intend to visit this fall. This is one of the cases that shows pits, and you can see that these pits have been so imperfect that decay has occurred which was the means of deciding to cut the teeth off.

In those real dark teeth it looks as though the dentine was discolored, and I hope you may be able to determine whether the dentin is imperfect.

I have been intending to write you ever since your article was published in Items of Interest, dealing with beginnings of tartar formation. It made me feel very comfortable because I have found myself thinking pretty much the same way along that line for some time

FREDERICK S. MCKAY, D. D. S.
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past.

Needless to say I will be very glad to learn of your conclusions. In one of your previous letters you spoke of getting an analysis of the Chicago water, and if it is possible to get this in such form that we can arrange it parallel with the analysis I sent you it will be very valuable.

Hoping that I may hear from you at your early convenience, I am,

Very Sincerely Yours,

FSM-M

Frederick S. McKay

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

NORTHWESTERN UNIVERSITY BUILDING

DEAN'S OFFICE

CHICAGO ILLINOIS

Sept. 27, 1911.

Dr. Frederick S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colo.

Dear Doctor:-

I have just been through your two letters of September 21st and 22nd, and I have the teeth and have looked at them. They are great specimens.

I had intended to visit you this summer - indeed I had expected to make that my vacation, until this matter of going to Alaska came up and it was rather insisted that I make that trip. At first the arrangement was that I should go to Colorado Springs and spend a week or two, and the other fellows come along after me, and for me to board the train as they passed, but I didn't get ready in time and couldn't do it, and when the time came to go to Alaska there was no time left. So I couldn't do anything else but just ride right through Colorado Springs and never say "turkey" to anybody. I looked out to see if I could see you anywhere on the trains or anything of that kind, to have a little chat with you, but I did not.

I am surprised at your people there in Colorado Springs withdrawing that appropriation. What is the matter with them anyway? Certainly they ought to do that much. I get out of patience. But the dentists of the state will see you through I haven't the least doubt. If the dentists of your state can't do it, I think the dentists of other states will take some interest in it. It is an important problem simply from the scientific standpoint, and from that standpoint alone there is sufficient reason to appropriate some

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Sept. 27, 1911.

Dr. F.S.McKay #2

money to work the thing through. It is no use for a community to throw all the burden of such an investigation upon a few persons, and they should not do it. I was very sorry not to spend some time with you this summer, but it fell out so that I could not, as I have said.

Now these teeth I will examine more carefully and see what I can do with them to the best advantage. It is rather my opinion that I had better take some of the blackest of them and try some processes of bleaching and see what can be done at that, and make sections of some of them, and so on. I will try to make the best use of them possible, to throw some light on the subject.

Now, doctor, the paper that I wrote just after I was out to see you, has never been printed. What do you think to be the consensus of opinion in your Society about printing that as I would prepare it for publication in the Society's Proceedings, with this last year's proceedings? It ought to see the light some how. I could temper it some as far as Colorado Springs is concerned, but it seems to me that we have waited long enough, and Colorado Springs has not done enough in this matter. You know what I mean. Of course we should have every courtesy shown to the dentists of Colorado Springs and vicinity, in any matter that is printed, and I should publish nothing not approved by you and the dentists of Colorado Springs. In preparing the paper for publication, a great amount of material would be left out, for much was written

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Sept. 27, 1911.

Dr. F.S.McKay #3

there simply to try to influence the Colorado Springs people.
In preparing it for publication I should devote myself exclusively to the scientific aspects of the case, leaving out everything else. Now tell me what you think about it.

Very truly,

G.V.B. Black

G.V.B.

The Colorado State Dental Association

ORAL HYGIENE COMMITTEE
OFFICE OF F. S. MCKAY, CHAIRMAN
700 EXCHANGE BANK BUILDING

Colorado Springs, Colo.

Oct. 10, 1911.

Dr. G.V. Black.

Chicago, Ill.

My Dear Dr. Black:-

Yours of September 27 came duly to hand and was read with much interest.

It so happened that our local Dental Society had its first meeting of the season last night, and I was enabled to bring the matter of publishing your research on mottled enamel before them.

It was agreed that the matter ought to be published, and there was no opposition made to your doing so, except of course including anything which would lay the crime at our doors and we are assured that you would give this phase of it your most careful attention

We would be very glad also if you would do us the favor to submit the material to us before it is printed. I am sure that you realize that we must be extremely careful not to do anything that will make it seem as though we had been careless in exposing this matter to any publicity, because we may find it necessary before we are through with this to appeal again to

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COMMITTEE OF RESEARCH
ON ENAMEL LESIONS.
F. S. MCKAY,
COLORADO SPRINGS.

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public sources for funds.

Of course the matter is properly one coming before the State Society, hence I will have to consult with the present officers regarding it, but I feel satisfied that they will put the matter up to us here at Colorado Springs, and that is already settled.

I feel certain in saying therefore that there is no reason why you should not proceed at your own convenience in the preparation of the article.

I am not able yet to say what Journal is to publish this year's proceedings but will let you know definitely later.

With best wishes, I am,

Very Sincerely Yours,

Fredrick S. McKay

FSM-M

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NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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DEAN'S OFFICE

Oct. 14, 1911.

Dr. F. S. McKay,

Colorado Springs, Colo.

Dear Doctor:-

I have your letter of the 10th inst, and wish to say in reply that what you have done toward the publication of what I shall write - rather than what I have written - is about as I think it ought to be placed. I don't know just how soon I can make the changes in the article that are necessary, and get it together for publication. Many things are to be left out, and it is a question as to how much writing it will take to connect everything up properly.

What I shall write will be, as nearly as I can do it, upon the scientific features of the subject. My impression is that the right thing would be to say that it is in the Valley of the Monument & Fountain Creeks, state of Colorado, without mentioning any cities whatever, simply stating that this Valley has a number of cities and villages and let it go in that way as to locality. What do you think about that, or should the state also be left out of mention, and simply state the name of the Valley. I want to be careful to avoid, as far as possible, any wounds. I would like to know a little more particularly your thought, and the thought of your men, along that line. If I can say that it is in the Valley of the Monument ^{Fountain} and / Creeks, I will about cover the field, and particularly it will be locatable if I use the name of the state, but will not bring it so baldly before the reader as to mention Colorado Springs.

Very truly,

W. H. Black

Oct. 27-1911

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black. In answer to your last letter dated the 4th inst I may say in general that the less specific your article on bottled enamel is as to locality the better pleased will be all who are residents here.

It might do to lean out the State for the reason that those who read it might infer that the whole State could be afflicted if a fault was and so harm might be done.

I am trying to plan a trip into several towns in the southern part of the State soon and it might be a good plan to include these later findings in your article. I shall be very glad to give you the data as soon as I have collected it and thereby add a feature that might be of added scientific interest.

I don't find it at all easy to drop everything and go to these towns just when I would like it having as much on hand as I have at present.

I am gradually eliminating Puerblo from my practice but as you may remember I have a day and a half each week in Denver where I have again this year the teaching of Orthodontia at the Dental School of Denver University and I find it will require careful planning to arrange a trip of investigation so as not to conflict with my work.

I hope to get to Hahobung, Alamosa, Monte Vista, La Junta, Trinidad and Raton New Mexico which will take about a week. This is all suspected territory and in the same general region although Alamosa and Monte Vista are in the San Luis Valley which is drained by the Rio Grande River and Raton is across a range of mountains west of Trinidad.

I am positive that there is an extensive area of susceptibility in the valley of the South Platte extending north east of Denver, because I have heard of cases from there and even others that are just as typical as any that we have. I shall go into this territory later.

FREDERICK S. MCKAY, D. D. S.

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PRACTICE LIMITED TO ORTHODONTIA
AND ORAL PROPHYLAXIS

I am almost persuading myself that I shall take a run to Chicago to see you perhaps during the late winter after I have secured the data that I want but it is far from settled just now.

It is likely that in writing of this matter you might find it sufficient to designate these areas solely by the creek or river valleys in which they occur leaving out the State.

With my kindest regards I am

Very Truly

Frederick S. McKay

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

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CHICAGO ILLINOIS

DEAN'S OFFICE

Nov. 16, 1911.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor:-

I received your kind letter of October 22nd some days ago, and have been thinking over what to say in reply.

I would suggest in the first place, that you write that portion of the report that deals with the locality, in your own way, and then let me see how I could handle it in connection with what I may write as to the scientific features of the difficulty. This would place that matter in the hands of you people in Colorado Springs, and you could so handle it, perhaps, as to meet the difficulties. Then for my part of it I would not bother much with that feature of the case. In fact I did not intend to do so any way. It seems to me impossible, however, that we can write of the area affected with anything like reasonable definiteness, without locating it. Of course in using your suggestion, we would not really locate it. Try and see what you can do with that feature of it.

I hope you will find it convenient to come out and see us, and we can talk that whole matter over. It looks now as though it would be a bit late in the season before I can get at the writing of the article. I haven't looked it over yet to see how much of it will need re-writing. Perhaps no great amount of it, or maybe it will need re-constructing. We will arrange that, however, in some way.

I would suggest that you come out to the Pedagogic meeting

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DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO ILLINOIS

Nov. 16, 1911.

Dr. F.S.McK.#2

that occurs here in January. The meeting will be held in our building in part, and in the other schools in part, and you can see pretty much everything that is going on. Some of the boys are insisting on making demonstrations of our plans of teaching, each school arranging its own demonstrations, and having its own time in which to make them. I think you would find it a very interesting meeting to attend. There will be men here from all over the United States, and if you are a teacher, as you say, in the Denver school, you have a right to attendance, the same as anyone else. Please let me know how this fits in with your views.

Very truly,

G.V.B.

G.V.B.

Jan. 14-1912

Dr. G. F. Black
Chicago, Ill.

Dear Doctor Black - I am leaving Colorado Springs tonight for a weeks trip through suspected susceptible territory for examination of the children in the public schools. I shall take La Junta Monday, Raton New Mexico Tuesday, Trinidad Colo Wednesday, Wakenburg Thursday, Alamosa Friday, and be home Saturday night or Sunday morning, and you may expect an interesting report from me when I return.

I have wanted to make such a trip as this for a long time and have had to put off the actual going longer than I wanted to but now I am at last about to start and am anticipating a strenuous but interesting week.

With kindest regards.

Frederick S. McKay

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CHICAGO ILLINOIS

Jan. 18, 1912.

Dr. Frederick S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I have just received yours of the 14th inst, and I am very glad that you have found an opportunity to visit the places you mention, and shall be particularly interested in the report of what you find.

I have done nothing with the report of what I saw during my visit to Colorado Springs, and the work I have done since. In fact I have been laid up now for nearly two months, and have been doing nothing. I will be at work again before long, if things go well with me, and I hope to get that right out. I can do nothing until after the meeting of the Pedagogic Association which occurs here next week, and maybe for some little time afterward. I am glad to know that your work is progressing, and that I will hear from you soon.

Very truly,

G.V.B.

G.V.B.

Colorado Springs

Feb. 27/1912

D. G. K. 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 mottled 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 or corner. 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 (some from La Junta) 4

Migratory in susceptible territory 3

Total Natives 148 - 24 mottled - 1/6 normal examined
= 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 families, 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 fedded 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 bring mostly a down hill run from there engines consuming 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 containers 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

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 | <u>7</u> |
| with following histories:- | |
| Goodfield Cal. (known susceptible territory) | 1 |
| Wabersburg " " " " | 1 |
| Migratory in known susceptible territory | 1 |
| Natives to Raton (all slightly marked) | 3 |
| Goldfields New Mexico | <u>1</u> |
| | 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 |
| Natives | |
| Croft's Creek (known susceptible territory) | 4 |
| Hakrumburg | 1 |
| Indefinite history | 1 |
| | <hr/> 6 |

Trinidad is thus cleared as minimum.

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 Walsenburg 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 mottled cases of which 45 were chargeable to Walsenburg 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

1

history of having been born or raised at a place called Pictou until I made the remark to one of the teachers 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 now I found it was a coal camp some few miles from Halesburg and I said to my escort Dr. Leshen 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 himself who was a native there had a pronounced case.

They were all extreme cases, the teeth being universally a dry 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 only two 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 a barren a basin on the plains 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 Alameda the next day and was going to lecture there that night on Oral Hygiene to the State Dental Society lecture for public instruction, which

lecture 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 engineer 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 furnance 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 there in

following the problem.

The State Board of Health has given us a promise

X

that they will analyze some water for us which will help some in the analyses. 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 vigorously 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 hopes 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 ~~labial~~^{lingual} 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 questionable 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 then 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 save.

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 fawn 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 cases 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 wears 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 Spring 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 in the mouth did not have the same mottled appearance that are 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 7000 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 me in saying that in believing
this to be the case and in so advising parents.

I believe that the scope of this paper is as far
as it can be taken at the present time and
I am in hopes 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 me 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 now 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%.

This seems curious. ^{successful} Areas ^{give} ~~are~~ either low or high ^{percentage}
There seems to be no middle ground.

Hoping for something definite soon and
appreciating your efforts I am
Sincerely yours
Frederick S. McKay.

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

Dr. G. F. Black
Chicago Ill.

June 6-1912

Dear Doctor Black,- The State Society meets here the 20th of this month and I am trying to get my data on the Brown Stem into shape to present and wish to report to you progress since I last wrote you.

You will doubtless remember that I characterized the coal camp Pictou as the worst place I had yet seen and I succeeded in getting the mine water analyzed and you will find it in another sheet in a table with other analyses which I will describe forthwith. Before doing so I will call attention to 1425.7 solid parts per million of water and to the high % of H_2SO_4 in table of constituents. This would make a glass of that water .006 % sulphuric acid which I am informed is high.

In the table of compounds notice that over 900 parts of the 1400 are sulphates.

In an examination of the schools at Louisville Calo. in April we found the Lawson children who presented the typical enamel lesion. These children all had it and were born & raised on the house ranch about 3 miles out of town. We went out there & talked with the mother & found a well in the yard that had been the only source of water

supply and the State Chemist analyzed it. The result is shown in the table. Notice here the high % of sulphates & bicarbonate salts.

The % of children at Louisville actually native within the town limits presenting the lesion was low & the water supply was from one of the Boulder creeks right from the melting snows of the main range.

On the way to the next town Lafayette^{Ind} I passed a county school (District No. 61) & found ^{that of} the children native to the district were so % had the lesion. These children were all from the near by ranches & well water was the only source of supply.

Coming to Lafayette, most of the work was in going into stores around town interviewing native adults who were known to have the stain. We found some extremely bad cases & invariably they were natives who had been raised on well water before the town had put in a system.

The Scholes family was notable among these. There were several grown children who were employed in different stores about town & all had as typical cases as I have ever seen.

We went to the home & took water from the well which had been the supply during their childhood & long before the city system was put in & the analysis is given in the table.

Note again the high % of sulphates & bicarbonate

salts.

The present generation of children in the school, since the city water came, which is from the same creek that supplies the sister town Louisville, has only a low % of the lesion which perhaps can be accounted for by a low contamination, at various times, of well water or in other words a special history for these cases which of course is very hard to get.

The neighboring town of Erie know to have the lesion but have not formally examined there.

These three towns are all coal mining towns and the soil has a large mixture of shale. The same holds true of Pictou and also of Chandler another coal mine about to be described.

Chandler is a coal camp in an entirely different part of the State and the native children are in a high degree afflicted. Like Pictou the domestic water supply is from the mine and the analysis appears in the table. Here again appears to be a high % of sulphate & bicarbonate salts.

A large surrounding territory of scattering population devoted to coal mining is without question afflicted.

Also certain territory around the neighboring town of Canon City has endemic areas but population so scattering as to make it not

Easy to get reliable data.

The last column in the table is water from a well which we know positively to be in mineral territory and you can study the contrast.

I am unable just now to give you the full analysis of the Colorado Springs water as our chemist failed to compute the SO_4 constituent and we know now that it is important, but he promises it for me in a few days & I will send it to you to fill in on the enclosed table.

There are areas surrounding Denver that have scattered foci of endemicism & I am told by the chemist of the Denver water Co. that the well water around Denver is "rotten."

I have written a brief description of the stain to Prof. Erastus G. Smith of Beloit Wis. & enclosed the same table & asked his opinion of these waters. He is a noted water expert and I am waiting his reply with a great deal of interest.

I can imagine your surprise and interest when I tell you that I have succeeded in locating an area in Virginia where exactly the same lesion exists. The town is Franklin and its location is south of Norfolk in a strip of land about 10 miles wide between two fresh water rivers.

The enclosed copy of a letter will convince you I am sure and Dr. Arthur sent me the excised crown of an incisor that proves it beyond doubt. I am in communication with him now and am expecting some water from him for analysis. I shall follow up this line with him as far as possible. I have still another surprise for you in saying that I have also run down another clue that establishes another similar area in the vicinity of Naples Italy - and will refer you to the Dental Cosmos for March 1902 under the heading "Chicora Teeth." One of my townsmen a physician now in Europe went to the suburb Pozzuoli at my request and writes me that the condition is the same and he knows it when he sees it.

I have written two men in Italy regarding it but have not received a reply as yet and I am afraid they will ignore it.

When he returns here I may succeed in getting in touch with some one who will look into it.

There are but few remaining places in this State that seem to require visiting and if I can get the proper interpretation of what data I have on hand and will have I think enough to arrive at some conclusion before long.

I have been wondering how you are feeling and
beg to wish you a pleasant summer season. assuming
you that if your footsteps are turned in this
direction we will be mighty glad to see you.

Very Sincerely Yours

Frederick S. McKay

June 24, 1912.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I want to suggest to you another line of observation that I wish you would consider, and write me how it fits in with other things.

Do you know what a freckle is and what it means in the pathological aspect of mottled teeth? Perhaps you never thought of it. Do you know what causes freckle spots? It seems to be true that children who play much in the bright sun, develop freckles, and of all the places for freckled children, I never saw any other equal to Colorado Springs. This coloring in freckles seems to be in the line of junction between the epithelial cells, just as the lesion in mottled teeth is in the cementing substance between the enamel rods. The enamel rods are of course epithelial in that region.

Now I hope that you see my point. Run over in your mind as well as you can, the conditions as to light in the different places that you have found very susceptible - abnormally so, we may say - like that of the Picton coal-mine area. You speak of that being dry and without vegetation. What color is the ground? Is it light colored, reflecting the light and intensifying the whole area of light, or is it black so that it absorbs the light. Run over the different localities in your mind and see whether there is any coincidence between this thought and the conditions you found. Now it is the brag of Colorado Springs that they have more sun-light

June 24, 1912.

Dr. F.S.McK. #2 .

than any other place on earth, and right here may be the key to this whole difficulty. I say "may be" - I don't say that it is.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

NORTHWESTERN UNIVERSITY BUILDING

DEAN'S OFFICE

CHICAGO ILLINOIS

Chicago, June 25, 1912.

Dr. F. C. McKay,

Colorado Springs, Colo.

Dear Dr. McKay:

I am very much grieved that I have not been able to answer your letters promptly. The fact is I have been down and out since February. I have not been to the School to do anything and much of the time I have not had my mail. It seems that everybody has conspired to keep me out from pretty much everything that I want to know. I did not get any of your mail until within a few days. I have read over most of it and I want to express my great satisfaction with the work you have done. The question of the influence of water used on the development of the teeth is so firmly fixed in the minds of you people that it is absolutely necessary to work it out to the bitter end and determine absolutely what there is in it. This I am glad to find you are doing and doing it effectually, and the result will show either that it is or it is not at the bottom of the difficulty, and that is what we want more than anything else.

Finally I shall probably have something to say and while I hardly think that the present is the time to do it, I will give you this hint, Look out continually in your work, as a mental proposition, for the influence of extraordinary sun light; study carefully well shaded localities as compared with those that have no shade from the sun. Do you know what freckles are and how they come about? Sunshine and excessive light seems to be a cause of freckles the world over, and the lesion in that case is coloring matter between the epithelial cells. The origin of enamel is from the epithelium and the

Chicago, June 25, 1912.

#2 Dr. F. C. McKay.

lesions of the teeth and the lesions found in freckles are practically the same, hence we find those teeth most exposed to light are the most seriously affected, as the labial surfaces of the incisors, for instance, as compared with the lingual surfaces of the same teeth; also the first molars, although developed, mostly, synchronously with the incisors, are hidden away at the back of the mouth and are less affected by reason of position. If I am right in this, to know it, it will have to be tried out, such places as Colorado Springs will limit very much this difficulty by shading about their homes and the play grounds of the children. This, as to your work is now in progress, will have to be an afterthought. I would say don't let up in the least in the particular kind of work you are doing, only keep this hint in mind.

I am very sorry that I could not get out to the meeting of the Colorado Society, but I have not been in a physical condition to do so; in fact, I could not take part in the meeting if I were there. My general physical condition is excellent, but I am suffering a great deal of pain and have to keep myself propped about in various positions, in order to obtain reasonable comfort, and I find it impossible, under these conditions, to give close attention to any subject without the development of pain. Otherwise, aside from this one fact, I am very well, indeed.

I will go over what you have written as closely as I can and perhaps give you some notes on the influence of the sulphatesalts. an enormous amount of work has been done on that point in Germany, of

Chicago, June 25, 1912.

#3 Dr. F. C. McKay.

which I have the statements in the german language; the mountain regions of Switzerland, Southern Germany, Sweden and of Norway have all been closely examined with that regard, including several hundred thousand children. In all of this work, there is no mention whatever of any such lesion as mottled teeth. I will write you again soon.

Your finding of other areas of mottled teeth in distant parts of the country speaks well for your activity.

There is one thing I want you to do for me, if you can. Send me another map with all of the susceptible areas that you have found, up to the present time, marked with red circles; where there is no town shown on the map mark the locality with circles all the same. These will help me very much in obtaining an intelligent view of the areas of susceptibility.

What you have said of coal miners makes me mad. Any set of men who will confine the families of their miners to such water, as you describe, ought to be hung, independent of any effect it may have on the teeth.

Yours truly,

W. Black

FREDERICK S. McKAY, D. D. S.

700 EXCHANGE
NATIONAL BANK BUILDING
COLORADO SPRINGS, COLORADO

PRACTICE LIMITED TO ORTHODONTIA
AND ORAL PROPHYLAXIS

August 30, 1912.

Dr. G. V. Black.

Chicago, Ill.

Dear Doctor:-

I am wondering if you are going to be at the National meeting in Washington next month and if so if you could find it convenient to spare the time to make a short trip into the "mottled enameled" area with which I got in touch last spring of which I wrote you in brief early in the summer.

Some of the men here are going to attend the National meeting and I think I can arrange with some of them to go down there and make some observations and I am sure it would be of great value to the investigation if you could make observations of the field also.

The town is Franklin, Va. and is situated some sixty miles south east of Norfolk, which is not a very long journey from Washington.

In case you will find it convenient to go I will refer you to Dr. W. H. Arthur with whom I have been in correspondence. My suspicion as you know from what I wrote you not long ago is in connection with a high content of sulphate and bicarbonate salts in ^{the} domestic water supply in association with a shale soil in coal bearing areas. At least that is the association thus far found here.

I recently got in touch with Dr. Guerini, at Naples, Italy, regarding this same condition existing in one of their suburbs and he wished to be remembered to you. I am going to take this matter up further with him.

With best wishes for your good health, I am,

Very truly yours,

Frederick S. McKay

Oct. 7-1912

Dr. G. E. Black
Chicago Ill.

Dear Doctor Black.

Just a word to let you know that we are still pegging away on mottled enamel. I have been writing to Dr. Carl Röse who is now in Sweden and answering a letter from Dr. Guirini author of the History of Dentistry in Naples asking him for more information regarding this condition in Naples.

It seems that certain suburban districts there are badly afflicted and he ascribes it to sulphurous waters which abound in those places which are near the sea, but he says it is due to the gases acting upon the enamel. I question this latter, but in a way it tallies with our findings of a high sulphate content of some of the worst waters.

I am asking him to get analyses of these waters if possible so that we can compare them with our worst ones and only hope that he will take the trouble to do so. It will be very interesting.

I am trying now to get some data relative to Amarillo Texas which is probably an afflicted area.

I am also in the track of some Indians who were formerly in an Indian School at Grand Junction Colorado since discontinued and the inmates transferred to other schools in Arizona & New Mexico. A Grand Junction dentist told me that the brown stain was common among the Indians who attended the school.

It is very discouraging to find men to whom I write in different terms asking for information unscientific and uninterested enough as to fail to answer my letters.

Hoping your health has improved now when you wrote me recently I am

Faithfully Yours

Frederick S. McKay

P.S. Dr. Gurrini sent his cordial regards to you

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO ILLINOIS

Dec. 12, 1912.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor:-

Upon returning to my work after a long absence, my secretary has brought me your letters of August 30th and October 7th. This is practically the first correspondence that I have undertaken since my return home. I was kicked out and told to "git and stay got" and that I should neither read nor write, and really no mail was sent to me and I wrote nothing. It is only recently that I have undertaken to do anything with my eyes, because of a pretty severe neuritis affecting the retina. This is in explanation of why your letters have remained unanswered. For the present I can't do much.

I still have a copy of what I wrote for you people. I do not know whether you wish to publish it with any of your Society transactions or not. That question seems to have been left somewhat in abeyance. Perhaps the time has passed when that would be desirable.

The statements I made before the Chicago Dental Society and which were published, was simply a report of an off-hand talk, without either manuscript or notes, which was corrected somewhat and allowed to go. That is as I remember it, and the statements were not quite as carefully made as I feel that they should be. After thinking the matter over, I have thought that I had best, in anything I publish regarding the matter, confine myself to the histopathological changes rather than to go into the possible causation to any considerable extent. It would be best to wait for that until

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CHICAGO ILLINOIS

Dec. 12, 1912.

Dr. F.S.McK. #2

your investigations have been completed. In fact the matter of causation perhaps ought to be left to you to make out a report upon it yourself, using my histo-pathological data in any manner that you may wish. So much for that phase of the matter.

Now in regard to going down to the National meeting, of course what I have said explains that; I didn't go, and didn't know of your letter until it was brought to me this morning. I knew there was a letter, but that was all. My secretary brought up the letter which you sent me from Dr. Arthur of Franklin, Va. (By the way, do you wish me to return that letter to you?) I wish I could have visited that region, and possibly gotten specimens there for cutting, for the histo-pathological work should be kept well forward in all of this business, as no explanation will be of very much value without it, so far as the real condition of the tissue is concerned. A tissue that is stained by being partially dissolved will be very easily distinguished from a tissue that has been developed in a faulty way, and this distinction should always be made, and clearly made. I hope to learn what the condition at Franklin, Va. is very soon.

In the meantime I have had a letter from Dr. H. H. Wilson of Phoenix, Arizona. He describes a stain that seems from his letter to be endemic, and entirely different from that in Colorado. It is a red stain which he thinks affects the whole tooth, both enamel and dentin; but as he had had no specimen and had made no cuttings, of course this might be simply an opinion. He says that among the Mexicans and Indians, about 50% of them have this stain,

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Dec. 12, 1912.

Dr. F.S.McK.#3

and it is especially prominent upon the incisor teeth. Of the whites in the neighborhood, there ^{are} are a much lower percentage. He is very positive in his statements that the teeth come through the gums with this red stain developed. If that is actually the case, it might explain the comparatively few cases seen among the whites, as the residence of the whites in that region in very considerable numbers, is comparatively recent. The children of those who are now living there may be in danger of developing the stain that will be prominent. I have just written him regarding it, and hope to get something more definite soon. It might be well for you to get into communication with him.

I do not know that I can do much for some little time to come. I have worked up all the material I have on hand and have found nothing new for some time. Material from a different region for the histo-pathological study, is very desirable, for it is only by this that we can very certainly connect or disconnect the character of the injury in different places.

I am glad to have your statements of the progress of the work, and I hope you will run down that matter of the influence of water so completely that when the decision is reached, there will be no further question about the matter.

I am glad that you are in communication with these men in Europe. I regard Dr. Rose as a very excellent observer, though it has been his habit to oppose a number of my own views, holding to an older view in several important points. Nevertheless his general observations are very important, and reach out into very

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wide fields.

Dr. Rose has made more studies of the condition of school children's teeth perhaps than any other man now living, or having lived, and many of his observations upon the affect of calcium salts are of great importance, especially those relating to the development of strong men or weak men on the different stratas of rock found in Europe, those on lime-stone regions presenting a much greater percentage of able-bodied men fit for military service, than those on what my mother used to call "free stone", or rocks not containing lime. These observations were made by Dr. Rose by obtaining the privilege of examining the records of the examining physicians for the War Department, who personally examined these men, - a comparative compilation that had never been thought of by the men who made the examinations. Therefore Dr. Rose is entitled to full credit for this discovery. Many other things I could write you about Dr. Rose, for I have had his writings all along back through the years, and there is a good deal of it.

It is very curious to me that we should have such a condition as we find in Colorado, if in the widespread examinations made by Dr. Rose, including coal-bearing regions, iron workers, and all the other conditions through Europe where he has been making examinations, he should not find anything whatever resembling this in Colorado. So in your correspondence with Dr. Rose you might find it well to question him regarding this matter, to see whether or not some things of this kind are remembered as having been seen by him, but which he did not record in what he has written. He

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Dr. F.S.McK#5

has not made, so far as his reports go, any considerable study of the histo-pathological conditions of teeth. His study has been of the influence of waters, the influence of food grown on different kinds of soil, the influence of the soil itself, and all of this class of work. In fact, similar work to that you are yourself doing, except that he made analyses himself of the soils, of the fruits, of the grain, and everything that men live on, and of the ground they walk on and raise their fruits on, and also of the saliva and other secretions of persons living upon these soils, fruits, etc.

Now I have written you a pretty long, rambling letter. I will be glad to hear from you as often as you think you have something to say, or a little oftener.

Very truly,

G.V.B.

G.V.B.

nothing but in the other hand no one for
me but the rest has

my name that just Colorado Springs

Feb 13/19/3

Dr. G. F. Black

Chicago Ill

Dear Doctor Black -

Yours of Dec 12 has been laid aside
for a while because I have been expecting some important
data and wanted to give it to you. The same is at
hand now and it will interest you I know. I
to take up your letter as the points occur will do
first and say that I am very sorry indeed to
know of your enforced "lay off" and sincerely hope
that you are well on the way back to your normal
condition.

Regarding the publication of what you wrote as
a report after your visit to us, so much has been
added to the facts since then that my judgment
is that you would not be satisfied to have it appear
as you wrote it. and so far as the State Society is
concerned I think that most of them don't know
that a report was submitted by you and likely
have dismissed the matter from mind. Only a few

of us are much interested in this problem
and the rest don't care

I agree with you in thinking that what you
might wish to write should be confined to the
histological aspects of the condition and such an
article would serve admirably as a basis of reference
which could be referred to when the whole thing is
written up.

I have had a growing feeling that when we have carried
this investigation to the point where a definite
conclusion is reached it ought to be written & published.
I have gradually been accumulating data and facts
relating to it until now I have a large mass of
written material which could be put into favorable
condition for a very interesting article which is upon
an original untouched subject.

I appreciate your offer to allow the use of your
histo-pathological material. From what I am to
tell you later you will see I think that we probably
have a long way to go yet before arriving at anything
definite.

Regarding the work at Franklin Va. I wish you to
keep the letter I sent you from Dr. Arthur. It was a
copy and I have the original.

I am in correspondence now with the Prof. of

Chemistry of the Medical School, Univ. of Virginia
 at Richmond who in a letter received a few days ago
 stated that he and Dr. Simpson, Dean of the Dental
 School were arranging to go down to Franklin & Co
 examine the school children & collect water samples
 for analysis and I hope that it will not be long until
 I have some valuable data from there. It is almost
 impossible for me to get any aid from the Dental
 Profession in this matter. I asked Dr. Arthur C. Brown
 Franklin to do the examination of children when I first
 got in touch with him last spring. My aid so far
 has come from other professions, chemists, Government
 men etc. My experience is the same from the dentists at Amarillo
 Texas. It is stated that they have this condition there
 and after repeated letters I was told a few weeks ago
 that they had neither the time nor inclination to
 make the examination. I offered to come down myself
 if they would among them raise my expenses but then
 the matter stands. Our fund is in such a shape
 that the Treasurer cannot spare over the expenses
 money for the trip now. I hope to make it sometime.
 You make the point that there might be a difference
 between a tissue that is stained by being partially
 dissolved & one that had been developed in a faulty way.

I have been thinking along that line lately and had been wondering whether it might be true that the enamel rods and cementing substance had been originally laid down normally by the enamel organ and then some abnormal influence gets to work & dissolves the cementing substance out in spots on the superficial area. The discoloration might be a residue of some sort. It seems hard to understand how the enamel organ could functionate perfectly so far as the formation of the rods is concerned and "fall down" so completely in the development of another tissue which is so similar chemically & physically as the cementing substance is to the rods.

I believe the thought is worth following out. Have you ever heard any more from Dr. Wilson of Phoenix Ariz. whom you mentioned in this last letter and who described the red stain among Mexicans & Indians?

I have not written him yet but will do so very soon although I must confess that I think there is mistaken in his observations as I have never seen anything like what he describes as your letter states it.

I have some fragments of teeth from Franklin sent me by Dr. Arthur which I will send to you to section.

They are dry, having never been in water since I
 received them some months ago.

I have enclosed a copy of a letter ^{a translation} received from Röss
 just a few days ago which you may keep and when
 you have read it I may hope to hear your ideas on it.
 I must confess that it with some amazement that
 I read what he says and I cannot believe that he
 is actually familiar with our condition. However don't
 let our prejudice you but read it carefully and tell me
 just what you think.

I am of course going to follow out his suggestions and
 write him again with great care and in detail and
 I believe that I can write him a letter that will contain
 facts that may make him "sit up and take notice".

I would rather have your reply before I write him
 again so I will hope to hear from you soon if your
 health permits. Also if you feel like it I will
 suggest that you write him in whatever way his
 letter to me may prompt. I am gratified that he
 has shown an interest and I will keep at him as
 long as he is interested. It is a pity I have to write
 him in English.

I am also waiting for a letter from Dr. Guerin
 at Naples who I have asked for fuller information
 and water analysis of that suburb of Naples that has

This same condition of the teeth.

I have a letter from him in which he seems interested but whether to the extent of making any examinations or getting a water analysis or not I don't know. Don't you think it would be a good idea for you to write him asking him to interest himself? I enclose his address. I can't help feeling that data of great value and interest could be contributed by these men if they will interest themselves.

I have also written Prof. Pickvill of Otago Univ. New Zealand whose recent book on Prevention of Caries you have no doubt read but of course it will require some time to get an answer. He seems to have done a lot of work on enamel.

Now as to the work to date on water analysis I confess that recent developments seem to have brought me up against a stone wall.

I have been gathering analyses from the Railroad Companies Chemists of waters from endemic territory. They make analyses for locomotive boiler users and I enclose a table which I have copied from mine. You will see that the sulphates & bicarbonates run high in all of them and I felt sure that this fact was going to be our clue to a possible physiological action that might account for the disturbance to the forming enamel.

But when we come to our own water here in this city whether it is of molting runs almost as high as anywhere, you will notice what becomes of the sulphate and bicarbonate constituent. It drops to a very low figure and it seems to completely upset our findings. It certainly is a hard thing to explain in view of what the other waters show.

I have also recently obtained some Govt. publications of analyses of the principal rivers east of the 10th meridian which show in many cases a much higher content of acid salts than our local water and yet we have never heard of the mottled & stained enamel in these districts.

I am going after the U. S. Hydrographer at Washington on several points that I came across in the publications I have and may get some data there.

It seems an endless search but the fascination and interest are just as strong as ever and I feel that in time we must uncover the cause.

I want to again express my appreciation of your interest and co-operation and assure you that it is of great value in stimulating our continued endeavors.

I have at present an analysis going on by the State Chemist of water from our adjacent Indian area and expect the figures soon.

The head chemist of the Colo. Fuel & Iron Co. at Pueblo
which runs a very large steel plant there has stated more
than once that he cannot see the connection between the
lesion and the water.

Also the chief chemist of the Santa Fe R.R. system has
shown an interest and has been wanting me, also sent
me analyses of waters that I needed along their line
of railroad and his last letter just received after
examining the table I enclose says that he
fails to see any connection between the water and
the stains.

Of course these two opinions cannot be taken as final
because the exact knowledge from the dental standpoint
is not possessed by them but from investigation to
date as herein contained I confess that I see little use
in following the water analyses any further.

There is still the possibility that these waters contain
something that is not commonly detected in the standard
water analysis. The Santa Fe chemist says that
it may be necessary to have special analyses made to
determine such items as iron, silica, aluminium, and
possibly some organic compound. He says that silica is
not ordinarily determined very accurately & leans a little
toward the belief that silica may have something to do
with it. Aluminium he believes to be in the same category.

Regarding Dr. Rösé's suggestion as to the test for these minute carbon particles by aluminum sulphate I had our city chemist take up the matter and he reports that no result whatever was obtained.

I have a very marked case, a central incisor which was knocked out in a foot ball game which I am going to send Rösé & see what he says. I am positive that he does not comprehend just what we have.

I also want to report to you a peculiar case that I observed just recently in a Colorado Springs native aged 17. The four upper incisors were typically stained but a very good looking supernumerary lateral which was in regular position in the arch was but slightly mottled & no stain. The rest of the denture was mottled in the typical way.

As to the removal of this stain by grinding as I wrote you some time ago I am very well pleased with the result in several very bad cases. The stain and mottling are very superficial as a rule. There are places where the stain dips down deeply but so far have been able to remove all visible traces. The polishing afterward is very carefully done & the enamel surface left devoid of scratches & with a very lustrous beautiful surface without producing sensitiveness to changes of temperature. This method also removes the white areas which any chemical method does not do, I will wait for your reply before writing Rösé.

With kindest regards

I remain

Very Truly Yours

Fredrick McKay

P.S. - Keep the copy of Dr. Riser's letter but return
the table to me. Copy it if you wish.

F.M.

THE COLORADO STATE DENTAL ASSOCIATION

Colorado Springs
Feb. 25-1913

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2900 LAKE PLACE, DENVER

Dr. G. F. Black.
Chicago Ill.

Dear Doctor-

I am sending today
two pieces of mottled & stained teeth
from Franklin Va. as per my
last letter.

The stain has been removed by
some method by Dr. Arthur of
Franklin.

You may keep these teeth for any
purpose you wish.

Very Truly

Fredrick S. McKay

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CHICAGO ILLINOIS

DEAN'S OFFICE

Feb. 28, 1913.

Dr. F. S. McKay,
Colorado Springs, Colorado.

Dear Doctor:-

I have just received the teeth from West Virginia, which you have been so kind as to send to me.

In a pretty careful examination of them, without any cutting, I make out that these teeth have been ground on the labial surfaces, evidently for the purpose of removing stain, which I suppose was not satisfactory, and the crowns were cut away, but they have practically spoiled the teeth for histological examination. I don't quite see what I could do with them, for the very portion that I should examine has been removed. Have you anything further to say about them?

Very truly,

G.V. Black

G.V.B.

EUROPEAN PLAN



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UNDER SAME MANAGEMENT

J. F. DOWNEY, MANAGER.

March 5-

Dear Doctor Black -

I am trying to arrange my time so that I may have a chance to talk with you on my way back through Chicago but am afraid that it will be for a short time only.

The way it looks now I shall not be able to arrive in Chicago from New York until about 8 o'clock Saturday morning and will have to leave for Colorado at 9.30 and if you hear no more from me this arrangement will stand.

Mr. McKay is with me and we will arrive in Pennsylvania Train No. 25 out of New York.

I know that you are somewhat of an early bird and I am hoping that you can find it convenient to be at the College Saturday A.M. as early as that and

will come direct there.

I have an interesting specimen with me
that I want you to see and talk
about.

With kindest regards

Fredrick S. McKay.

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DEAN'S OFFICE

March 18, 1913.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I have again read your letter of February 23rd. I have laid it aside for some little time, and when I could, I have done some thinking about it, but I do not know hardly what to say. There is one thing, however, that I do want to say very emphatically - that I most heartily enjoy your enthusiasm in this matter, and if I can do anything that will assist you in it, I certainly want to do it.

There are some things in your letter that impress me strongly. You say that you feel that you have got about to the end of your rope in the water analysis problem, and also seem to indicate that the results show that water is not to blame. Perhaps you remember that I once said to you that I did not think it was the water, and I haven't thought so at any time, since I rambled over the hills and down the valleys when I was there with you, and looked at the territory and the rocks and the course of the streams and all of that, I could not think that this difficulty came from the water. But ^{is} it/no difference what I may have thought about it. The facts were and are that the public mind will have to be satisfied on that point by the most rigid investigation that can possibly be made, and that you are doing. When that is done, we can think of something else, but it is almost impossible to think of something else until that is done, and for that reason I have been most highly gratified at your success in carrying out this portion of the work. It was absolutely necessary, and when you feel that you are through with it,

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DEAN'S OFFICE

March 18, 1913.

Dr. F.S.McK #2

something else can be done.

About your success in grinding off the stain, it is certainly possible to do this, in what proportion of cases of course I do not know. But you take all of our histological work, all of the microscopical examinations and the pictures made from sections, and all show the stain to be rather superficial, but within the enamel in every case, and it can be ground out by changing the form of the tooth, often quite a little, sometimes not so much, and so on. How the teeth so treated will stand and hold their color, and all of that, will depend upon the test of time. As to the histological appearance, we can discuss that somewhat later. I think, however, it is probable that the ideas that I have expressed about it, are correct.

I don't know about writing Dr. Rose myself. I think it might be better for you to follow up that correspondence without reference to me. Dr. Rose has been an opponent to me in some ideas, and rather a zealous one, and while I have no feeling about it at all, I am not sure that it is the same on his part. I might, by writing him personally, mix the thing up a little, and I better leave it alone. I admire Dr. Rose very much notwithstanding his opposition to some of my views. It would seem very curious to me if Dr. Rose had found the same kind of condition anywhere in his examination of the teeth, and not have made some remark about it in the papers he has written on that subject. His papers run through pretty nearly a whole year of the "Monatschrift fur Zahnheilkunde" and

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DEAN'S OFFICE

March 18, 1913.

Dr. F.S.McK #3

would make quite a book if published alone, and how he could do this and find these stains, and say nothing about it in such a series of articles, would beat me.

There is perhaps nothing of the same kind between myself and Dr. Guerini, but at the same time it strikes me that you have the matter in hand, and I had better not mix in it.

I haven't seen Dr. Pickerill's book on Prevention of Caries. I don't know how that happens. Is it published in New Zealand, or is it published elsewhere? I will get it if possible. We have a number of young men from New Zealand here in school, and none of them have ever mentioned the matter so far as I know. It seems rather curious that there should be such a book and me not know about it.

I have wanted very much to go again to Colorado Springs and spend sometime looking around there. I don't know that I could help the investigation, but the whole matter is so interesting, and also so perplexing that I have difficulty in letting it alone. I would like to spend a couple of weeks auto riding about that part of the country, having you with me as much of the time as might seem practicable. I thought of trying it last summer, but was not well enough. How I shall be the coming summer, I do not know. I am at work very hard this winter, most of the time writing, delivering only half a course of lectures - that is one lecture per week - and practically doing nothing else at the school. It was not thought that I would be in condition to do much work, and matters were

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DEAN'S OFFICE

March 18, 1913.

Dr. F.S.McK #4

arranged to leave me out of the work mostly, but I am just as busy nevertheless, and possibly busier, than I would have been otherwise, but in a kind of work that suits my condition very much better than the work I had been doing in the school heretofore. I am doing a good deal of experimental work on the deposits of calculus, particularly. I have found out something about that and I am getting it into shape.

Hoping to hear from you frequently, I am,

Very truly,

W. B. Black

G.V.B.

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DEAN'S OFFICE

March 18, 1913.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

You don't know how much I regret my failure to see you when you were here only a short time ago. Curious how things turn out. You were here waiting for me in the morning on your return trip and had just left the building when I came in, and it seemed impossible for me to find you and see you. If I had known of your coming, I could have been here just as well as not, but your letter to me announcing that you would stop here, was handed me an hour after you left. The mail was just that much late in informing me of your coming. The first I knew of your having been here, Dr. Koch came down to me bringing the letter which had just that moment come in, explaining the whole matter. I am very, very sorry that this matter fell out as it did.

I have just written you a reply to your previous letters, so I need not say anything about that now. The missing of that specimen of yours which you mention in your letter, is also a grief, for you know how much interested I am in the curious things in dentistry, but maybe I will have another opportunity.

I should have written you immediately, but as my work is now, I am often in a push for some little time, for I am writing my lectures and doing a good deal of investigative work; sometimes my investigative work carries me away and I neglect my lecture writing

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March 18, 1913.

Dr. F.S.McK #2

until the time comes when I have to give up everything else and hurry them up, so that sometimes I delay my letter writing that can be delayed, longer than I ought.

Very truly,

G.V.B.

G.V.B.

Colorado Springs
Oct. 7-1913

D. G. F. Black
Chicago Ill.

Dear Doctor Black -

It has been a long time since I have written to you but now with the Fall here again we are picking up the threads of our work of investigation and are going to carry it on through the season.

Have you succeeded yet in getting Pickrell's book of which we were writing. It seems to be widely quoted now and the present Cosmos has quite an article from him on Enamel. I expect to write him soon perhaps.

I went over the whole work done so far before our State Society in June and the Committee was continued as usual. We still have some of the fund left, enough for this season's work.

I don't know that we shall need very much unless new developments arise, and unless we decide to investigate the suspected territory at Phoenix, Arizona of which you know. I don't think there is any question but that their conditions are similar to ours.

I may get a chance to go down there this

water.

2

The question comes up however of what to do when I get there. I have gone over the question carefully with Prof. Strickby, whom you talked with, regarding the water analyses and he says that those already obtained are useless so far as drawing conclusions is concerned; that they tell us nothing in that the figures from different afflicted areas are totally different.

That is the conclusion I had arrived at and he says there is no use in gathering any more of the "standard" analyses. He is now searching for "traces" of uncommon ingredients in these waters and that will be our object from now on.

I find that he has a suspicion regarding a possible constituent and that he intends to do some chemical work when he has time.

In looking over analyses of waters from California I noticed that Arsenic was given in certain of them and I mentioned this to Strickby.

It has occurred to me that some such element as that might be a cause and he said that he had exactly the same suspicion and was going to try and work it out.

The most recent work I have done is as follows

A case was reported to me in Denver of 3 persons adult children in a family who had lived for years in a ranch in the mountains about 60 miles from Denver.

The oldest boy was born elsewhere and went out to this ranch to live when about 7 years old. His incisives & second molars are mottled and stained; rest of denture normal.

The other two children were born and always lived in the ranch until they were fast 20. Have lived anywhere else and their teeth are all badly stained and mottled.

I went up there in the train about 2 weeks ago and got off at a little place in the mountains then walked about three miles back into the country to the ranch. I found the single source of water supply to be a fine spring coming out of the mountain side just back of the house. This spring has been running there to certain knowledge for more than 40 years and you never saw a more perfect clear tasteless water.

I had some empty bottles & brought back a gallon of this water for analysis and trudged back to the railroad with my precious burden. The bottles have stood two weeks now at home and no trace of sediment.

4

Now here is the most localized area yet discovered where this mysterious influence is at work and it seemed to me to be worth careful study. If it isn't the water what in the world can it be operating thru to produce so marked a result?

Struby has agreed to examine some of this water for "traces" and the rest will be examined for traces by the Col. Fuel & Iron Co's chemist at the steel plant at Pueblo. If they can't find anything then we are "up stumps".

Struby has suggested a certain experiment that I am going to try with one of the teeth and I will let you know the result. I am hoping something good from it.

I am going to confess that my mind is coming around more strongly to the possibility of its being an external influence of some kind.

Why is it that if it be wholly developmental the layers of enamel just adjacent to the dentoenamel junction are not affected: in other words the innermost layers of the enamel cap?

Why is it that only the external or last formed enamel is the only part affected?

May it not be that some solvent has been at work and taken out the cementing substance

after it was laid in. ² We are positive now that
the brown discoloration appears long subsequent
to the eruption of the teeth.

What do you think of these points?

I enclose a letter, an answer to one written by
Dr. Kelley one of our men which will explain
itself and do you think it worth while for us
to try and get aid in this way. Would you feel
like recommending that aid be given us
if we decide to ask for it. Please think the
matter over and write me when you find a chance.

I hope you are feeling well and suggest that
as usual you are working hard.

With my kindest regards

Very Truly Yours

Fredrick L. McKay

700 Exchange Bank Bld.

Dear Jackson
It seems to me
that there is no better
purpose to which some
of the Research funds might
be put. H.B.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO ILLINOIS

Dec. 4, 1913.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

You may or may not have been surprised at the long delay in answer to your letter of Oct. 7th, enclosing one from Dr. Price of the Research Commission offering aid, which I now return to you with this.

The fact is I haven't been in a physical condition to do anything of late. It is true, I wearied through with my lecture course last winter, but thus far this winter I haven't attempted to give any lectures. I am well enough now to do so, so far as my general condition is concerned, but my eyes don't work well. I haven't been able to read anything since last May. I haven't read any kind of ordinary print at all, yet I can see well enough to walk about. I had a good deal of scramble to get a diagnosis of my difficulty, but have finally succeeded, as I think, in getting a reasonably correct estimate of it, and improvement seems well on the way. My physicians, including the oculist, seem to think that I will recover my vision, but it goes awfully slow. Under these conditions I haven't got along much with the work. It is true my private secretary is reading to me every day from one to two hours.

Now as to the business on hand. It is more and more of a surprise to me to hear you say that you are satisfied that the dark stain in these teeth occurs after the teeth come through the gum.

There is an element in it that is calculated to deceive. While I was at work on it when I was with you, I often examined teeth that were

Dec. 4, 1913.

just peeping through the gum, the cutting edges of which were white and normal in color, and found dark stain under the gingivae. Every tooth that I cut had a normal enamel over the cutting edge, and all that I have yet seen, excepting one or two, have had this normal enamel over the cutting edge, and when the tooth is first seen coming through the gum it shows its white, normal cutting edge. This I found to be the rule in the examinations I made when I was with you. Certainly not all of them could be stained after they came through the gum. You, on the ground, who have an opportunity to examine many of them from month to month, should give better evidence even than this, possibly, and that question we will leave for the present. Only I wished to call your attention to it.

I could correct up and shape my report in pretty short order whenever you are really ready for it.

Now as to receiving funds from the Research Commission, I am of the opinion that what we have to say about this matter should be put in form, and copies of it sent to the Commission for their judgment, and this perhaps should, in a private way, include the expenditures up to the present time - not for a return of the money, I suppose, but to show what has been done by private means and by the city of Colorado Springs, to forward the matter. Then the question will come as to whether other lines that require money should be followed out. A suggestion in regard to that from you would be the right thing. Then the Commission would have something tangible on which to act.

I still think that my report should only cover the histopathological conditions found, and some suggestions along pathological lines, while yours should cover a specific statement as to where

Dec. 4, 1913.

you have found this condition in the teeth, and the extent of it in the different places where you have examined it; a good outline of the examinations of water which you have made up to the present, the ideas you and your chemists may have in regard to what should be done in the near future in that line, and then any suggestions you may have to make in regard to other lines of study that may be introduced and pursued in the future.

I suppose you will allow me to state briefly my conviction at the time of my examination at Colorado Springs, that it was not the water that was at fault - a conclusion that I still hold, but the fact that the idea was so firmly fixed in the minds of many dentists and of the populace as well that the water was at the root of the evil, required absolutely that the investigation which you have made should be carried out, and probably be carried much further than has been done as yet, in a search for special substances that might produce this feature.

There should be no stone left unturned in that form of investigation. If that is put out of the way, your mind and the minds of other men who may be at work, or who shall attempt to work in the future, will not have that proposition to deal with, and will be free to take up other lines that may be suggested.

Now, doctor, this is about the line of thought that has engaged my attention practically from the first. We want to keep those who propose to aid us, posted as to what we have done and what we propose to do, and we have certainly a good deal of matter to present. Your report would necessarily be much longer than mine, and should be accompanied by maps showing the affected and non-affected areas that you have examined. It should be remembered in your report that in

Dec. 4, 1913.

this work you have sought out the affected areas, and perhaps not examined so many of the non-affected areas as you may feel now necessary to show the intermingling of these practically in neighboring grounds.

Now, doctor, I beg of you to overlook what may have appeared to be indifference on my part in this matter. I have no feeling of indifference in regard to the matter, but my interest is sharpened by your report. I should have been with you long before this if I had been able to travel alone, but I haven't been able to do this now for a long time and am not able to do so yet. I would be helpless to right myself in any little mishap that might occur. I can now walk a few blocks only at a time. For the last six weeks I have been running out myself occasionally to do little errands not more than a block away, but that is as far as I have as yet been able to go on foot, though I can get about the house and do quite a little tinkering. I am now going down to the school every day, simply to have the advantage of my tinkering outfit, so to speak, as a means of occupying my mind and ^{ing}stave/off as well as possible the terribly depressing effect of my physical condition. Simply to sit all day and do nothing I find a terribly hard task, and anything that I can do that will relieve this tedium seems to be an advantage to me. I have done nothing whatever in the school this winter this far. I may give some lectures a little later possibly. In the meantime I have an immense amount of work in store to be done as soon as I am able, if that time ever comes. At least I want to put much of it in shape so that somebody else can follow it out if I cannot.

Please write me and let me know that you have received this and whether or not it coincides with your judgment in the matter.

Very truly,

G.V.B.

G.V. Black

Colorado Springs
Dec. 28-1913

D. G. F. Black
Chicago Ill.

Dear Doctor Black-

Your letter dated Dec. 4 came duly to hand and glad I was to have it although I am deeply grieved to know of your impaired health. I don't know what I can say that will properly express the distress I feel but feel that I need not assure you in all sincerity that my hope is for your steady improvement and the restoration of your normal capacity for work and study which means so much to all of us.

You will remember when I last wrote you that I had sent a sample of water from a certain ranch which had produced the brown discoloration in their native children. I asked the chemist for a report as to a possible arsenic content and he found nothing.

It was following Prof. Sturtevant's suggestion that we should make further "standard" analyses of water but in the future test for "traces" of the rare elements. I am up against another

2

stone wall here in this regard as I find that the ordinary chemical laboratories have not the spectroscopes or galvanoscopes that will detect these rare elements.

I feel more than ever certain that we must have effort and from the outside and before going further with the idea of asking aid from the U. S. A. Research Fund I have sent out a letter to the Dept. of the Interior at Washington to see if aid cannot be obtained from them.

I have read carefully your proposed plan for laying a report of the matter before the U. S. A. Fund Committee but since your letter came a tentative invitation has been received from the Panama-Pacific Dental Congress Managers through the Chairman for Colorado, Dr. Hayden of this city, that I prepare the work of investigation to date as an essay to be presented at the Congress in 1915. No definite proposal has yet been received but the matter is under advisement and doubtless will be settled soon.

It has seemed to me that perhaps this would

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be an advantageous thing to do inasmuch as it would serve to record in an authentic way the work already done and also as a new basis from which to start if the time ever comes when outside aid is asked.

Many men will undoubtedly be there who are studying along such lines as the essay would cover and their discussions would act as a sort of clearing house for ideas and future lines for work might be indicated. Also new geographical lines might be laid out by men present, so taking it all in all I am inclined to favor it.

Before deciding however I want to ask your candid opinion and hope that you will not hesitate to give me your freest and frankest expression.

If this were done it would serve in an admirable way to bring it before the Committee of the Research Fund who would then understand fully what the problem is if we were to ask for aid.

The point is that if this essay is to be presented there is no use in our preparing a report.

Now considering the work of locating geographical

Areas completed at least locally, and the
futility of gathering more water analyses, what
form should our further work of investigation
take? What is the next step? I confess that
I am at a loss to know - and am doing nothing
except correspond with those who I think can
give a suggestion.

I am going to send two teeth to Dr. Rice and
write him again. I think he was decidedly "off"
in what he said in his first letter to Mr.

I will appreciate your early reply advising
me in the matter of which I particularly spoke
and in the meantime I want to extend to
you my heartiest good will and esteem for
the New Year and express the hope that I
will have the opportunity of wishing you many
more Happy New Years.

Sincerely Yours

Fredrick S. McKay

Jan. 30, 1914.

Dr. F. S. McKay,
Colorado Springs, Colorado.

Dear Doctor McKay:-

Your letter of December 28th has again passed over some time without answer, expressing the neglect which usually comes with inability to do things promptly and well.

Recently there has not been much improvement in my eyes, but my general health outside of that difficulty, has been steadily on the improvement. I am sleeping well and eating well, and generally my physical condition is excellent. In fact I am doing very little else really than that which I conceive will bring about the very best of physical conditions. I seem to be succeeding so far as my general condition is concerned, but I cannot read anything in the way of book or newspaper work. So much for that.

Now in regard to the principal subject matter in your letter. I do not know about the Panama-Pacific Dental Congress. It may be that to present the paper there would be a good thing. I find, however, that very many good papers presented to such associations are buried. If they have an arrangement by which papers presented there will be published in the prominent dental journals, aside from the publication that they make, it is all well, but I have generally felt that it is best to publish important papers in the best dental journals we can command, for instance, such as the Cosmos. They will then go to the whole dental profession, and spread the information more widely than any local association - no matter how large - can do. The benefit to be derived from the discussion might be important, but the probabilities are that it will be unimportant. This matter is too new for men to discuss it intelligently. Many men will associate it with something they have seen, that is not of the nature of the difficulty with which you are grappling.

There is one thing that seems not to have been done. I did not do it when I was out there - I don't know why - and that is, to make an examination of the teeth of animals of these neighborhoods and see whether or not there is any similar difficulty with them. That is the only thing I can now see along the line of the examinations you have made that should yet be done, that is available to do, and that need not be carried very far. The examination of a few herds of cows or a few horses which are known to have been born and developed in your region, would be sufficient. If you find nothing, that ends it; if you find something, it may be followed out to see where it comes from if possible - a very simple matter I should think. I should think if any of the animals presented it, it would be seen in the teeth of horses. Their upper front teeth are rather more exposed than any of the teeth of cows, and I should look for it in the herbivorous rather than in the carnivorous animals. This examination would render the part of the work in which you have been engaged very complete.

Jan. 30, 1914.

Another point of examination which it has struck me all the time would be really more important than the examination of the water, would be the chemical examination of the soils, and particularly of the dust in the regions of susceptibility, as compared with the same outside of those regions. Here is a field in which chemical elements in the soil become incorporated more or less with the water, but acting directly by being breathed and otherwise coming in contact with the individual, may be a constant source of disease, and have an effect upon the whole muscular apparatus and the teeth as well.

The absence of the "butter-ball" variety of children among those born and raised in your locality, is one of the enigmas to me, and besides the teeth, was one of the important features that I noted in all my observation of the children in your city when I was there. This leads me to strongly suspect that there is something somewhere about your soil, and the light, and the wind, that has an effect that is not found in the water. I think I have expressed this in some way to you before, but not quite in this form. It is not impossible that there may also be something in the vegetation, or some items of vegetation, that have this kind of influence. I understand that the cottonwood trees are being removed from your city because of supposed irritation of the pollen grains, or other elements of the flower, upon the mucous membranes of the respiratory apparatus. This has been observed in a considerable number of localities. Some form of plant life of a region is occasionally chargeable with the production of disease.

Now, doctor, these are only suggestions. Ponder them carefully and see what you think about taking up some of them for future work. I have felt from the first that something else than the study of the water would become necessary.

Now as to aid from Washington, you may get something and you may not. In the event that you do not, I am quite sure that the N. D. A. Research Fund will be available. From certain things that have passed between friends of mine and that association lately, and also some of my own correspondence with them, it would indicate that they would be very glad to find use for money that they have already on hand, but they seem to be careful about placing it where it will do good.

Please overlook my delay in answering, and let me know promptly of anything where I can be of any possible benefit to you.

Very truly yours,

G.V.B.

700 Exch. Natl. Bank Bldg.

Colorado Springs, Colo.

October 23, 1914.

Dr. Arthur D. Black,
People's Gas Bldg.
Chicago, Ill.

Dear Dr. Black:-

Yours of October 20 is just at hand and I believe that the suggestion you offer as to the title of the paper, that is the including of the words, "Mottled enamel", is a good one and I shall make use of it.

Regarding the presentation of this matter before the Panama-Pacific Congress, I may say that I fully agree with the value and necessity of obtaining a larger audience than that reached by the Transactions of the Congress, by publishing the matter in a Dental Journal and I am just now in correspondence with Dr. Kirk on this matter and he assures me that he will undertake the publication in the Cosmos.

You may know that the rule of the Congress regarding essays is that no one shall be allowed more than twenty minutes, which of course is hardly sufficient for more than the briefest abstract of what we have on hand and this abstract would of course appear in the bound Proceedings of the Congress.

But my purpose is to prepare the complete ^{essay} to be ready at the same time or before if possible and have this in the hands of Dr. Kirk, ready to appear at any time after the Congress,

immediatly so if possible .In this way we can accomplish the fullest measure of publicity. I will be very glad if you will submit this proposition to your Father for his approval.

I am interested in your statement regarding students at the school from Texas, New Mexico and Arizona and wonder if it would not be possible for you to get a statement from these men from these districts outlining what they know, as an aid toward enlarging the boundaries of the area of distribution. At present we know definately of only one area in Texas, two or three small communities adjacent to each other in Arizona, and I know of no definate area in New Mexico. This information would be of great interest to us if you could obtain it.

In answer to your last inquiry I will say that no systematic examination of the teeth of animals has yet been made, because we have been resting on the fact that no one has ever reported having seen this lesion in the teeth of any aniamal. I suppose though that something of this sort should be done.

While I am writing I also want to ask if your Father would allow me to use the negatives which he has to illustrate this condition. He will remember that I have a set of the lantern slides illustrating the histology, which of course would be used in the verbal presentation, but would I not also need the original negatives for the use of the publisher? I will also be grateful for any other material he may have on hand for use in preparing the paper.

Please extend to him my kindest personal regards, and believe me to be,

Very truly yours,

Fredrick S. McKay

700 Exch. Natl. Bank Bldg.
Colorado Springs, Colo.
November 14, 1914.

Dr. G. V. Black,
Care of N. W. Univ. Dental School,
Lake and Dearborn Sts.
Chicago, Ill.

Dear Dr. Black:-

I am pegging away mostly evenings getting my data into shape for publication and find it hard to condense without omitting anything of importance.

I have been looking over the letters and reports that you have sent me from time to time and have been surprised at the amount of correspondence involved. In these letters I have found things said by you that indicated that you would prefer to write on the histology and pathology of this lesion yourself following the microscopic work done at the beginning.

It is all stated in the two reports that you prepared for us but I would much rather you should revise this matter yourself, than for me to attempt it and that your name be placed at the head of the paper, my own appearing as collaborator with you.

Were you to do this I should expect that much of the matter now included in your first report would be omitted and your part of the article be confined to a description of your lantern slides in your 185 series.

Your son is going to look up your negatives of this 185 series for me for use in illustrating the paper and I enclose a photograph that you sent me long ago of a Chicago case, the negative of which I would very much like to use if you can find it.

My collection of color slides is increasing. I now have 14 which may not seem very many to you but the number would mean more to you if you knew how hard they are to get.

Since deciding to write this paper I have done no new work in investigating as it didn't seem much use to me to keep on locating new local areas.

Don't you think some mention should be made of the brown stain in the title and how would this do?

"An investigation of ~~the~~ Mottled Enamel and Brown Stain, Correlated Endemic Developmental Dystrophies, Characterized by Definite Geographical Areas of Distribution."

I have been trying to get a copy of Hopewell-Smith's "Histology and Pathohistology of the Teeth" but am unable to locate the publisher. Do you know the book or do you know of a copy that is to be had?

In closing I wish to say that I hope very much that you will consent to prepare the histological part of the paper or in case this doesn't seem best, suggest to me how that part of the subject could best be handled.

Hoping that you are in good health and spirits, I am,

Very truly yours,

Fredrick S. McKay

FSM/ER

The Colorado State Dental Association

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January 22, 1915.

Dr. Arthur D. Black,
122 Michigan Ave.
Chicago, Ill.

Dear Dr. Black:-

I wrote your father in reference to a matter some time ago but presume he has been unable to answer it. I would be glad if he could take up the matter contained in the letter as I still have a great deal to do on the paper I am working on and a great deal depends upon the matters covered in the letter.

Please tell your father that I have just returned from an examination of the Arizona territory of which we have corresponded some and that I found a great deal of interest bearing upon this investigation. Principally the matter of the prevalence of this lesion among the Indians upon one of the Government Reservations.

While in Phoenix I called upon Dr. H. H. Wilson who has recently sent a specimen of one of these teeth to your father. It has been very hard for us to get specimens and I just wanted to say that unless your father

The Colorado State Dental Association

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has some definite use or need for the speciman
I could use it to a very great advantage.

With my kindest regards to him, I am,

Very truly yours,

Fredrick S. McKay

FSM/ER

ARTHUR D. BLACK, M. D., D. D. S.

Chicago, January 25, 1915.

Dr. Frederick S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colo.

Dear Doctor McKay:

Your letter of the 22nd arrived this morning and for once I want you to give me credit for replying on the same day. As you doubtless know, father has been writing a new book on Dental Pathology and on account of the trouble which he has been having with his eyes it has been necessary for me to give him every minute of my spare time to assist him in this work. I have therefore neglected a good many things which would otherwise have had prompt attention.

I really think that it will be out of the question for father to write an article on mottled teeth from the histological standpoint, as he has before him about everything that he can possibly handle during the next few months. When your letter arrived, asking him to do this, I laid it aside because he did not know how to reply. I have talked the matter over with him since, however, and I think you should not count on him doing it, although I am sure that you appreciate the fact that he is very much interested in this work and would like to join with you in the presentation of it.

Regarding the slides - I think I wrote you before that our negatives at the School have been very badly mixed up and there was some question whether we could find those which you want. I think that I have finally located them and will know definitely what we have the latter part of this week. I am leaving today for the Dental Teachers' Meeting at Ann Arbor and expect to return to Chicago on Friday. Would you like to have the negatives sent to you, or would you prefer that we have prints made from them and send the prints. There is, of course, some danger of the negatives being broken, and if the prints will serve as well, I will be very glad to have these made here for you. We have one direct color slide which you sent to father sometime ago, and if I am not mistaken he has a few others. I presume you would like to have these.

1533, 122 S. MICHIGAN AVENUE
PEOPLES GAS BUILDING
TELEPHONE RANDOLPH 1617
CHICAGO

ARTHUR D. BLACK, M. D., D. D. S.

Chicago, January 25, 1915.

#2 Dr. Frederick S. McKay.

I am enclosing herewith a tooth which Dr. Wilson sent from Phoenix. We should like very much to have this tooth back to place in our museum, if you are through with it.

I will write you again the first of next week.

Very truly yours,

EL/T.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING
CHICAGO ILLINOIS

Feb. 19, 1915.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

When your more recent letters to me came, I was so ill that they were not shown to me, or mentioned. Arthur I think wrote you once in reply to one of your letters, and you wrote him again. I have recently read those letters, and I wish to say this to you - that I think there is no difference in understanding between you and me, in what was to be published. I was to represent the histo-pathological condition of the tissue in mottled teeth, and you were to represent your findings and investigations in regard to the causation, etc. If this is correct, it will agree with what I have done.

I had several years ago rewritten and produced a paper with this object, which has been I suppose lying away ready for use, but I have the misfortune to find that there is only one copy of it in my box. I cannot imagine what has become of the other copy unless I sent it to you. Did I do so? I wish you would find out certainly and let me know. If I sent you a copy of that paper, it conveyed to you my idea of what I should do in the matter. If you have not a copy of it, I will have a copy made and send to you. There is some little change required anyhow, and I could do that at the same time.

If you have a copy of this paper, that will clear up this matter between us, and I will ask you to send me a copy of yours as soon as you are ready, that I may see whether or not there are things left out of it that would be proper to add to mine, etc.

Now in regard to the pictures, I don't know but it would be best for us to have the copies on blocks for printing them here. We are having such work done all the time and are accustomed to it, but unfortunately I cannot do anything of that kind now myself, and Arthur is so busy that I don't want to impose on him too much. So I am a little uncertain about how to manage that, and I want to ask you how you are fixed to have such things done. We can go right in to the man who does the work, and examine his results, after a good deal of experience in doing such things. If you have somebody at home there who can do these things properly, all right.

Now then as to the illustrations themselves, I shall want to use a large portion of the matter in the lantern slides already made - of which I think you have copies - in connection with what I may write. This will in nowise prevent you from using again with your composition anything that you may want from that list. I should like to reproduce a few of the pictures of mottled teeth taken

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

NORTHWESTERN UNIVERSITY BUILDING

DEAN'S OFFICE

CHICAGO ILLINOIS

Feb. 19, 1915.

Dr. F.S.McK #2

directly from the mouths of patients also, as an explanation of what this thing looks like, along with my work, but I should not care to use many of those. If, however, you do not care to use many pictures of that character, I would use a little freer from them than I would do otherwise.

I should think that pictures from some of the localities, showing the kind of country, etc., where you have made examinations, might be a very good thing for you to use, if you have been making photographs of such places. They would not be suitable for my work at all, but if you have not seen what I have written, you will need to read it in order to form a really good conception of the scope I have covered. So that for the present, the important point with me is whether or not you have a copy of that paper.

Very truly,

G.V.B.

G.V.B.

700 Exch. Natl. Bank Bldg.
Colorado Springs, Colo.
February 23, 1915.

Dr. G. V. Black,
31 W. Lake St.
N. W. Univ. Dental School,
Chicago, Ill.

Dear Doctor Black:-

I was very glad indeed to have your letter after these many months and to know that you were again in your usual health. I have had some correspondence with Arthur and I was beginning to get a little anxious in reference to some of the things I mentioned to him, inasmuch as ~~the~~ paper which I have been working upon has assumed larger proportions than I at first had any idea of, and I am anxious to see my way through it. I believe that my chief concern in the letters to him was regarding this question of whether you were going to be able to prepare that part of it dealing with the histo-pathology or whether you were expecting me to present that part of it as quotations from what you had previously written and put in ^{to} my hands. I was also concerned in this latter event in getting the material from you for the illustrations.

I don't believe there is the slightest misunderstanding between us on the question of your part in the publishing of this paper. My understanding has been that you were to write this histology and pathology and describe your impressions of the condition and that the rest of the investigation was to be left to me. I have looked over a lot of your correspondence with me and I find that I am amply verified in this opinion by what you have written to me.

Now as to the missing paper which you speak of. I have a copy of the first report which you made, addressed to our Chamber of Commerce. Later on you sent me several lantern slides and another paper in which you described the histology. If either of these is the paper you refer to, then of course I have them, but I know nothing of any other writing upon the subject nor do I remember that you ever wrote me that you had prepared a third paper.

My work thus far has been to take every item, fact or incident from the original records of the investigation that I felt really had a place in the paper, elaborate upon these and arrange them in proper sequence and relation with the other facts until I now have the thing probably in something like completed shape, although there is still a good deal to do in inserting things here and there as fast as I determine where they belong. I have not written the conclusions yet at the end of the paper. For the time being I have inserted those parts of your original report and also of your descriptions of the histology, which I thought should be used, into the body of the paper. In doing this I have made some minor changes,

GVB 2.

principally in the way of covering up names of localities and the like. I also have omitted various things which come too close to indicating the names of localities.

We both have realized from the outset the absolute necessity of concealing the names of these places and the more I think of it the more I am determined that I could not consent to publish this thing unless I could conceal the localities, for I am satisfied that I would lay myself open in my own community and in the state to the severest censure if I were to state the names of these places. Consequently I have designated these communities by fictitious capital letters which are meant to be as unlike the real capital initial of a city's name as possible. For instance Colorado Springs is L-, Manitou is X- and so on through the alphabet. Neither have I named the state but refer to it in a general way as the Rocky Mountain Region. There are other localities where the danger to commercial injury is negligible, as for instance, certain parts of Arizona. So I have not been so particular in dealing with them but in general my policy has been to conceal localities. and I feel that I shall have your co-operation on this point.

It will take me some time yet to get this paper into shape to send you but I shall do so as soon as possible but if this missing paper of which you speak of is one which I have never seen then I should say the wise thing to do, to economize our time, would be for you to send me a copy of this as you suggest for I might find that I would have to alter my present arrangement of material considerably before sending my paper to you.

Now as to the publishing of this joint material, which plan do you think preferable? Should they be combined under one title with a joint author-ship or should they be published as near the same time as possible, each as a complete paper in itself or should they be published totally independent of one another? I don't know that I have ever heard you express yourself on these points. If you were to ask my preference in the matter, it seems to me that the two are so intimately blended and therefore hard to disassociate that I should think they ought to be published in as close relationship as possible. I would be glad to have your opinion on this matter.

Some months ago I took up the matter of publishing this paper in the Cosmos, with Dr. Kirk, who assured me that he would undertake it. I also have accepted an invitation to read a twenty minute essay on this subject at the Panama-Pacific Congress in September but in sending in my title, which I indicated in my last letter to you, I reserved the right to publication, at Dr. Kirk's suggestion. In reply to this the Chairman of the Program Committee noted this reservation and wrote me that it had been referred to the General Committee. This was several weeks ago and I have heard nothing since. If I am denied this right of reservation I shall withdraw the paper from the Congress, because we have agreed out here that we will not be satisfied to limit the publication of this matter to the Proceedings of the Congress. All papers and discussions for the Congress must be in the hands of the Program

GVB 3.

Committee, May first and in the hands of those who are to discuss it early enough so that their discussions shall be in by that date. If the paper is to be read at the Congress in summarized form, but published in full, independently, it would hardly be right to have this come out before October, in which case of course there is still plenty of time. But if the whole thing has to be ready, as I assume that it will be, by May, then there isn't much time and I should think that it ought to be ready by the first of April. I have designated as the discussers, Drs. Noyes, Bromell and Hopewell-Smith.

Regarding the illustrations. I should think that the slides of the histology should be used exclusively in your paper and I could then refer to it. It is my intention to illustrate my part of it as fully as the publishers will permit. I have several slides already on hand and am still adding and of course you are welcome to any of these you may wish to use but I will suggest that if the paper is published jointly there will be little necessity of duplication of any illustrations, which might simplify things.

I have gone at length so that you might know exactly how the matter now stands and I agree with you that the important thing now is for you to get this paper of which you speak, to me as soon as possible so that I may get my bearings, after which we can consider details further.

Again expressing my pleasure from hearing from you ,
I remain,

Sincerely yours,

FSM/ER

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NORTHWESTERN UNIVERSITY DENTAL SCHOOL

NORTHWESTERN UNIVERSITY BUILDING

DEAN'S OFFICE

CHICAGO ILLINOIS

March 3, 1915.

Dr. F. S. McKay,
Colorado Springs, Col.

Dear Doctor:-

I have received your letter in reply to mine of recent date, in regard to the papers we are to prepare. If I understand the matter right, I should say that you have the option of publishing this whole thing, giving the names of towns and villages without stint.

In making this remark, I allude to the support that you should have had from the city of Colorado Springs. At least you wrote me once, unless I am mistaken, that they had voted a support, or partial support, to you in the way of covering the expenses of the search you are making. After a year or so, as I understand from letters from you, this was withdrawn, and I suppose it has not been renewed. If that is true, the city has no right whatever to have you withhold the publication of names. Now I speak of this as a right, but there is another consideration, and that other consideration is common prudence upon your part. If you believe, as you have stated to me in your letter, that to do so would bring great blame upon you by your citizens and friends, it becomes a matter of prudence upon your part to so act as to avoid this, and if withholding the names of places will do that satisfactorily to your friends, it might be your duty to yourself as a matter of prudence, to withhold the names. Now that matter I shall allow to rest with you entirely.

It is not very important in what I write, about the names of places, but from the wording in your letter I shall object to one thing. You speak of naming this as belonging to the Rocky Mountain region. Now doctor, this mottled enamel does not extend through the whole Rocky Mountain region, and this would cast the inference that it does. Therefore I should suggest that you say "certain districts in the Rocky Mountains" and then you can, for the purpose of writing, designate these places by letters as you have suggested. This matter cannot be hidden, however, nor can the principal districts be hidden, from this fact - that somewhere such a condition of enamel as described exists, and this can be seen by everyone who visits these regions, and it will become common knowledge in spite of everything that can be done; but if you do as you suggest, the blame will not fall directly upon you as it may do if you give the names freely.

I have looked over the paper I had written, and it is substantially the copy that I will send you. I shall remodel the paper somewhat after looking it over now, but will add no new facts of special importance. I have made some further studies, especially comparing the deposit of the coloring matter in atrophy and various other mal-forms of enamel with the deposit of coloring matter in this condition, and I have added the fact that they correspond very closely; and that as the conditions of coloring matter in atrophy, enamel pits, and various other mal-forms of enamel - even those that are deeply

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March 3, 1915.

Dr. F.S.McK #2

within, and surrounded by, perfect enamel - have this coloring matter in the same form and in spaces of the same character as that in mottled enamel, there can be no doubt but what this has been deposited during the formation of the enamel. Much of it is buried too deeply in solidly formed enamel to have received the deposit from without. This indicates that in mottled enamel the deposit is for the most part laid down as the enamel has been built.

This is the only material fact that I will add to the paper as it stands in your hands. As I said, however, I shall remodel it and change the order of the presentation somewhat. This will be done mostly by changing the position of certain sections of the paper. Therefore you can consider the copy you have as substantially the copy that I will offer. I have this under way now and will complete it probably within a few days. I will, however, erase all mention of places or districts that appear in the paper that you have. I will not mention the State Society or anybody else excepting yourself anywhere in that paper. If you think there is reason that I should mention the fact that I was there by invitation of the State Society, I will do so. I will leave that to you.

If you have a copy of your presentation that you can spare, I would be very glad to look it over to get some idea of the manner in which you are handling it.

Very truly,

G.V.B.

G.V.B.

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CHICAGO ILLINOIS

April 9, 1915.

Dr. Frederick S. McKay,
Colorado Springs, Colo.

Dear Doctor McKay:-

It has seemed to you undoubtedly that I am very slow about answering your letter, but doctor, I have not been well enough to hardly know what I was doing. True, I have been down to my study many times, but very irregularly, and always when there was something pressing me to be there.

I was very much interested in the paper you sent me, and in your letter. All was very good, but it was not my idea of what you should do at all. First, my idea is that what I have written should go in as I have written it, and be published separately from what you may say. Then you can use from that anything that you like, but it should be printed as I wrote it. That is the first proposition.

The next proposition is this. You have an abundant amount of material for all you will want to present, and it should be presented in such a way as to show what you have done. Now I don't know what you expect to add to what you have sent me, but you have not touched the subject of your investigations at all. You should spend the force of your work on the development of what you have done. I recognized when I was in your city one thing very clearly, and that was this: no matter what I thought, or what any other individual thought, the idea that water was the cause of this difficulty was so fixed in the minds of both professional and non-professional citizens, that that idea necessarily required working out to the bitter end before anything else could be done. I think you have found that bitter end. You must not conclude that because your work has not been a great success, that it is not a great work. It is a great work, and will be so recognized among thinking men. Therefore it seems incumbent upon you that you write it fully and completely. Relate carefully - as briefly as you can of course, but sufficiently - what you have done, giving enough of chemical examinations of water for persons to know what the examinations mean; then giving something of the areas, and the conditions you have found in the areas, other than water; practically including all your observations.

Your idea of keeping secret the names of the individual areas, I will say nothing about. That is your privilege, and I will join you in that, and will not use any names in what I have written. I will make some modification in what I have written and sent you. I thought I would not, but the necessity, as I think about it, grows greater and greater every day. The difference will be simply this - a little discussion of the coloring matter, giving it a name and telling where else it is found in the teeth. I have made a considerable investigation of that subject, and it is a very interesting one. Really it will require but a few paragraphs to develop it, and I will perhaps cut away enough, or more than enough, to prevent any considerable increase - perhaps no increase - in the number of pages. In that I need not stop to explain many things that I have stopped to explain, and it will

April 9, 1915.

shorten it in that way.

I write what appears above in all sincerity, and for your benefit, because I sincerely believe that this work ought to be done and done completely. The first nine pages of what you have written and sent me is excellent work. From that point, go right on and develop everything you can of the work you have done. I don't think I have any reason to give you any direction about it. That is not my idea at all, but it is simply an expression of my sentiment in regard to it. You have done an immense amount of work there, and unless you write it up, you will have no credit anywhere, and you should not lose the effect of what you have done, upon yourself, your community and the dental profession.

I am not well yet. I don't know, my physical condition is rather bad. I don't mean that it is so bad that I am in danger of dying off, but it doesn't seem to improve. I have been confined to riding down to the school for a long time. To walk a block is more than my physicians think I ought to try to do. From this you will know something of what this means. I can sit and dictate; I cannot read anything because of a difficulty with my eyes, and I am up against it on all sides. But I am at work even when I cannot come down to my study, practically every day more or less, on something. Within a few days I shall have a new book out that will be a surprise. It will be to the profession like a new subject, but it is not. It is on the investing tissues of the teeth. I think I have told you about it. This has been long delayed by my illness.

Hoping to hear from you and to know what you think about my propositions as related, I am,

Very truly yours,

G.V. Black

P.S. By the way, I hear that things are not going well with the proposed Dental Congress at San Francisco, and that there is a probability that the date will be changed. Now I have made no investigation of this, and do not know what it amounts to, only this, that the Committee having charge of that matter is finding great difficulty in obtaining writers to fill out the program. Of course at the inception of the matter the great European war was not anticipated, and the result is that all of the work falls upon the Americans practically, which in itself is a great blow to the Dental Congress. What will be done about it I don't know. It seems probable, from what I have heard, that there will be delays at any rate, or it may be given up. The conditions for it are very, very bad.

G.V.B.

Colorado Springs
April 12-1915

Dr. G. F. Black
Chicago Ill.

Dear Doctor Black -

Your letter came to hand this morning and I hasten to answer it as it is apparent that you are in misunderstanding as to my intentions and purpose in writing this investigation.

First of all I am very sorry indeed that you are not finding yourself able to carry on your regular work as you would like to and I realized that your delay in answering me was due to this cause.

The paper I sent you was only a very small part of what I have prepared on this subject and I sent it to you as the introduction to what you had written and sent to me long ago.

I am glad that you approve of the first nine pages which lead up to the part that you prepared. This takes from the tenth page up to page 30.

When I submitted this to you I tried to explain that I had included your writing only tentatively and had cut out only that part that seemed to point out the localities too clearly. I made these erasures in the same spirit that I have just referred to. It was merely to get some sort of foundation from which I could go on and build the rest of the paper and was meant to be wholly subject to your approval and correction.

I continue the subject again from page 30 and the paper now runs to 115 pages and is not yet finished, so

you will agree that the matter has been gone into somewhat exhaustively.

I sent you those first 30 pages just as soon as the typist had finished them because they included your work and I wanted your approval or disapproval of the way I had handled it. Not knowing what might be added by you after page 30 I had the typist jump 100 pages and commence the next sheet at 131 so that the break could easily be found so the numbering of the balance of the pages is 100 too high hence runs to 215 as the paper is now.

I am going to send you the rest of the paper at once so that you may go through it carefully and critically if you will so honor me and in the meantime I will continue toward the conclusion.

It seems to me that the paper shows pretty clearly just what work has been done and while I may seem to have gone into detail a great deal, I felt it was necessary because in this first publication we should let it be known just how we have found out the things we have and how we have arrived at our conclusions.

I think that I have done exactly what your letter urges me to do; namely "practically" including all my observations.

You may be sure that I appreciate keenly and deeply your attitude and interest in the advice you are giving me and I may hope that when you receive the balance of this paper you will agree that the ground

has been pretty well covered.

I have not taken the time to examine nor correct the copy you will receive so there may be a few errors.

I think I have it straight now from your letter that you are to publish what you have written entirely independently of what I write. This plan is probably preferable but the paper you publish is so intimately connected with the investigation that I am in hopes we can arrange to have them published as nearly the same time as possible so that our readers may blend the two and get the most comprehensive idea possible of the scope of the investigation.

In as much as I am to present a synopsis of the subject at the Congress I think it only fair to the Congress that the paper be not published until after the Congress has been held. At least I felt that I should hold mine back.

I have prepared a 20 minute synopsis for the Congress in which I shall use half of the time for lantern slides so you can see the paper will be brief and cannot do more than describe the lesion in a very brief way. I shall really consider the lantern slides as the principal part of the presentation. I shall aim to have as many as 25 of the colored slides and some black and white. I found a negro the other day with a typical case and I am going to photograph it. I also have an Indian picture with an extreme case. You will be interested in my observations

in Arizona last January in the paper I am (4)
sending - and wish I could send you illustrations.
I shall certainly be interested in seeing your new
book.

Now my Dear Doctor Black, in closing I will say
that I shall be very impatient to have your
impressions of what I have done just as soon as you
can give them to me after reading the paper and
will welcome any suggestions that you wish to give.

With my kindest regards I am

Very Truly Yours
Frederick S. McKay.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO ILLINOIS

April 26, 1915.

Dr. F. S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colorado.

Dear Doctor:-

It is only just now that I have been able to reach your letter and have a continuous reading of it, although it has been here for several days. It gives me great pleasure to go over it, for I see that you are enthusiastic in the work, and that is one of the pleasantest things about the whole matter.

I may have some criticisms to offer finally, but cannot take the time just now. I cannot do so without a very careful and continuous reading of the paper which you have sent, which at this time has been impossible.

I think we will have no great difficulty in arranging what we write. I doubt the necessity for some things I have seen in your paper as I previously read it, but that may be all dispelled when I come to read the paper you have now sent to me. Taking it all in all, I am quite pleased, but I will reserve any criticisms that I may have until I know a little more.

I thank you for your care in all this matter, and will only suggest one thing. It strikes me that the histo-pathology, which is all I will touch, is a matter of sufficient importance - as it fully describes all the lesions - to be published as the beginning, and complete in itself, and yours exactly the same way but to follow. In doing this I would have to say a very little as to the general appearance of the lesions as seen, but that would be all. I would have no illustrations or anything of that kind. In fact I shall illustrate very little - I don't know yet just how much.

I have one or two surprises for you perhaps that you have not seen - particularly regarding the coloring matter in these teeth, the brown stain, which certainly deserves a name. I have determined that this name shall be brownin. I have found that this material is wide-spread in normal teeth and constitutes that which gives the differences in coloration which we find in the normal teeth. It is the same in atrophy and the same in every point where a coloration of any kind is found excepting the dead white and the lightest tooth known, and even here it is probable that there is some of it, but of course very difficult to find. It includes also the yellowish tinges that are frequently seen. There is no yellowish tinge in the structure, no material that is yellow, but wherever the color - brownin - is a little depth within the tissue, not reaching the surface, the color is yellow, or some tinge of yellow. This showing-through process I find is very wide in its distribution, always giving the same shade of yellow.

Dr. F.S.McK #2

April 20, 1915.

Remember, Doctor, it has now been six years since I began this study, and it has not been out of my mind you may say in all of that time, and every grasp that I could get on it has been gone over to a finish. Yet this doesn't at all argue that there will be no further discoveries in the future.

Very truly yours,

G.V. Black

P.S. Now one suggestion in regard to the title. If you go over the literature all your life you will find this continuously true - that the highest type of writer will make the shortest title. A title should have just as few words as possible. I would advise that both of us use this:

MOTTLED TEETH

An Endemic Affection of the Enamel of the
Teeth not heretofore known

In collaboration with
Dr. F.S.McKay of Colorado Springs, Colorado. (for mine)

MOTTLED TEETH

An Endemic Affection of the Enamel of the
Teeth not heretofore known

In collaboration with
Dr. G.V.Black of Chicago, Illinois. (for yours)

I just suggest this for your consideration.

The Colorado State Dental Association

COMMITTEE ON ENAMEL LESIONS

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206 Metropolitan Bldg., Denver
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212 Metropolitan Bldg., Denver

D. G. F. Black

Chicago Ill.

April 24-1915
Dear Doctor Black
While waiting for
your impressions of the paper I sent
you I want to answer some of the
points raised in your letter of the 20th
just received.

It may be after you have read it that
there may seem to be several things
that could be left out and perhaps
there are but I just want you to bear
in mind that I have tried to embody
all the known facts that have been
brought out in the investigation and
everything that would seem to have a
bearing upon the problem so that the
paper in its first presentation shall
be as complete as possible to make it,
even at the risk of making it too
long. This has been my thought right through.
I shall be perfectly willing to cut out
anything that really can be without
loss or making the subject.

I readily agree that your treatment and description of the histopathology as the beginning and preceding my paper will be the ideal arrangement. I should think, indeed it would seem imperative that you illustrate your article sufficiently to show the histology much as shown by the photo-micrographs that you made of these teeth early in our study.

I have just submitted two of my typical color slides to Dr. Kirk to see if they can work out the illustrations in colors which I very much hope can be done. In publishing these articles I should think it would be an excellent plan if at least an installment of mine could commence immediately following yours in the same journal to connect the two papers intimately as indeed they are in fact.

I am very much interested in your determination of the name "brownii" for the coloring material and anticipate that you will work out completely this color phase of the teeth in your paper.

With your permission I can alter what I have written so as to apply this name "brownii" where ever applicable.

I note also your suggestion as to a change in the title of the paper with the idea of simplifying it.

The title you suggest for your paper seems entirely satisfactory but I would like to bring out two or three points relative to the title I have submitted to you in my paper.

It is long I will admit but I framed it with the idea of comprehensiveness, so that the main statement

The Colorado State Dental Association

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¶ ¶

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R. A. ADAMS
212 Metropolitan Bldg., Denver

of the title embraces the essential facts regarding the paper and the condition with which it deals.

Just is indicated that it is an "Investigation"; then that the lesion has a dual phase "Mottled Enamel" and "Brown Stain"; that these are "co-related"; that the condition is "Endemic"; that it is "Developmental"; that it is "Dystrophic"; and finally that it occurs only in certain geographic areas which is one of its chief characteristics.

Now if you will pardon my calling attention to the failure of the title you suggest for my paper to indicate that I am writing about an "investigation" rather than a condition, and that it fails to bring out any of the salient points in the condition except that it is "endemic."

Also there may be a question in stating that the lesion has not been "heretofore known." Not generally known it is true but it has been "known" to at least some people, my title regarding it, it is true. I will be glad if you will consider carefully these points as above noted and write me further for I do feel that the title should

be as comprehensive as possible even at the risk of
being too long.

The title you suggest for your part seems perfectly
applicable because you are describing a condition of
the teeth or more correctly speaking a kind of enamel
while I am describing an inflammation as you readily
see by what I have sent you.

I feel that I should cut out all attempts to describe
the lesion that may conflict with or repeat what you
are to write.

I am stimulated again by your very kind words and
the evidence of your interest with me in this problem.

Waiting your further advice and with my
best good wishes as usual I am

Sincerely Yours.

Fredrick S. McKay.

P.S. - Please excuse use of paper as I am waiting this
at home and find shortage of stationery.

April 29, 1915.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

I just this moment received your letter of the 24th inst, and because of certain emergencies I will be unable to write you fully today, but I wish to express my thanks for this renewed favor from you, if nothing more.

I am having troubles of my own, as you will see in a few days when you receive a complimentary copy of a book.

I was particularly interested in what you said about your consultation with Dr. Kirk, and will be particularly interested in his reply. We are having pictures prepared for publication, I may say by the thousand, and have been for some time, and there are many ins and outs about it. Of course I see no other way for you, with your experience, to do those things except as you suggest. If you don't have fun before you get through, I will be very much disappointed, but I know you will face it as best you can and as carefully as you can, and that is all any man can do.

About that title, I am a little surprised at what you have written me in this letter. Any attempt to tell what one knows in a title, is the most futile thing that I know of. If there is anything to be known about this matter, it may be embodied in one word practically, and what that word may mean is an important item, and let me say this - it will mean what you and I work into it, as the first men who have written of it.

Dr. F.S.M&K #2

April 29, 1914

In regard to others having known this before, there are vast differences as to the world's comprehension of that idea "known before" and that of pure science. To pure science there is nothing known that is not written and published. What this manor that man may have known amounts absolutely to nothing unless he has written of it. In that sense there is absolutely nothing known of this. I have seen a good many things written that some men would say were like this. I have written quite a number of things myself that many men will say are just like this. It is in no wise true. I wonder if you see my point. Just think this over for a moment. I will be glad to hear what you think of it. I am writing of course with reference to the title. What you say of the affection otherwise than this one criticism I have made, is true enough and is not in question at all. It is simply a matter of propriety in authorship.

Thanking you for past favors, and hoping to have very much more pleasure in the future from what you do, I am,

Very truly yours,

P.S. I shall be particularly glad to know what you think of Brownin after having read the little scrap that I have written about it.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

NORTHWESTERN UNIVERSITY BUILDING

DEAN'S OFFICE

CHICAGO ILLINOIS

May 10, 1915.

Dr. Frederick S. McKay,
700 Exchange National Bank Bldg.,
Colorado Springs, Colorado.

Dear Doctor McKay:-

I have requested the publishers to send to you a copy of my new book on Special Dental Pathology, with my compliments. This will reach you within a few days, and I trust you will find something in it of interest.

With best wishes, I am,

Very truly,

G.V.B.

G.V.B.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO ILLINOIS

May 11, 1915.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

You are doubtless becoming very tired of waiting for a letter regarding your paper. If you have not already done so, you will within a few days receive a book, and when you look over that volume and realize that it has not been more than five days since I read the last of that proof, you may conclude that it is possible that I have been somewhat busy. It seems to me that I need not say any more to bring the matter fully to your comprehension.

I now hope that I can go a little faster. This week there is a meeting of the Illinois State Dental Society, and it seems very still around the school. Very few of the faces continually present, are seen. I shall be very short of help, and maybe another week will pass over without much being done about your paper.

With regrets that I have been so slow, I am,

Very truly,

G.V.B.

G.V.B.

Dr. G.F. Black
Chicago Ill.

him this
to EW13

Colorado Springs Colo.
May 17-1915-

Dear Doctor Black-

What shall I say to thank
you for the book which I received from you a
day or two ago?

It seems almost incredible that with all your
other work and activities you have been able to
give us such a volume as this we must be
judging it by a hasty glance which is all I
have had time for thus far, but I shall read
it from cover to cover just as soon as I can
get to it which will be soon and I anticipate
that it will be of great interest and instruction
to me.

Dr. Burton called me in the telephone a few
minutes after the Expressman had left it on
my desk, saying that he had been similarly
honored and I could tell by the tone of his voice
that he was very much pleased.

I cannot help thinking every little while of
the fortunate circumstance that brought us into
such close association with you those few years ago,
and I often try to realize how splendid has been
that association in the work that we have
carried on together during that time.

I have told you of that feeling many times and
tried to express how sincerely I have felt in
acknowledging the stimulation and encouragement
which your words to me from time to time have
carried.

Your last letter has earned things that I want
to answer and I shall do so at an early date.
Again thanking you for this splendid token of
your regard I am

Sincerely yours
Frederick J. McKay

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

DEAN'S OFFICE

NORTHWESTERN UNIVERSITY BUILDING

CHICAGO ILLINOIS

May 27, 1915.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor:-

Let me thank you for your kindly response as to the new book.

I have my paper on the mottled teeth practically ready except for rounding up a few illustrations. I hope to get these together soon, and will get a copy of the paper off to you. I am adding a few paragraphs in which I will give briefly a classification and description of the other dystrophies of the enamel, which will, I think, be of interest.

Very truly,

W. Black

Colorado Springs Colo.
May 30 1915

Dr. G. F. Black
H. H. Univ. Dental School
Chicago Ill.

Dear Doctor Black, In an accumulation of three or four letters from you received lately there are some few things that I ought to say a word or two regarding.

The question of title of the paper was one upon which you had some criticism particularly regarding the length and I am ready to agree that a shorter one would be preferable, perhaps the title you suggest, except that I think that the title which I use should show that I am writing about an "Investigation" of Mottled Enamel.

Knowing as I do now that you are to cover the histology and pathology of this lesion it will be far better that I should omit practically everything relating to these phases but from what I write. So when your paper is received I shall go carefully over both and weed out of my part all that conflicts or repeats what you have said.

Your long letter of May 4 is before me; it was written just after you had read my paper and contains many valuable suggestions which I will

make use of when I receive your paper, in cutting down and finishing up my paper.

Now as to the question of the "fitted varieties of mottled teeth" which I discuss somewhat in the paper, and which has aroused your curiosity. I regret that I cannot go over my illustrations with you, as some of them show this condition. I recall one in particular which is badly fitted and decay has started in several of these pits. In this case the upper gingival fourth of the upper incisors are very imperfect being very dark, almost black pits and decay has started in some of these. Whether this would be correctly termed or considered "atrophy" in the ordinary sense I can only ask the question; would not this locality on the tooth surface be a little unusual upon which to find atrophy marks?

I recall also at Pictou, some of the enamel upon the labial surfaces of the incisors was so imperfect that extensive decay had occurred. Also some of the Indian cases at Lacatan were very badly fitted, but I do not recall any decay.

As a rule we do not find decay in these pits, and I only wish that I could get some of these teeth to send you as you request but just now I don't know how it is possible. I recently got into touch with a new area in New Mexico and I may in a round about way be able to get some teeth from an Arizona district. I have a letter out as a result.

There is still another possibility of my getting some teeth from an Indian district and if I can I will send them to you.

I think I see your point in wishing to determine if these pits are to be considered as true trophy marks, and if it could be so determined our studies would be greatly advanced thereby.

I shall photograph more of these cases as time goes on, and I may get some more illustrations for my paper at the Congress.

Regarding this I may say that I sent in a brief digest of the full paper which will take about 15 minutes to read and allow the remaining 15 minutes for slides. I sent this paper in with the long title which you objected to and it will so appear unless I can get a change made before the Program is printed.

This leads me to ask if you are going to the Congress and if so why cannot you route yourself through this way. Let me know what your plans are and we can surely arrange to get together somewhere on the trip and perhaps arrange to travel West from here and have a good long conference on this problem.

I am now waiting for your paper and when it is received I will write you at length.

Sincerely yours

Fredrick S. McKay

July 20, 1915.

Dr. F.S. McKay,
Exchange Nat'l Bank Bldg.,
Colorado Springs, Colo.

Dear Doctor:-

I have received your kind letter of recent date inquiring about my paper - whether it had gone astray or not. I will say that it has not gone astray; neither has it gotten out of the typewriter's hands yet, but I hope it will within a day or so and then I will forward it to you.

I suppose from my previous letters you know that I have written a new paper instead of the one that you have. It has been seven years since that paper that you have was written, and I found out a good many things since that time and I thought they ought to be put into this one. Still I don't think I have made the paper any longer. An explanation of this you will find in the paper itself. I think the illustrations will do very well, although there are not as many of them as I expected to use on account of the mishaps that have occurred to the pictures since they were made; but you can judge better of all this when you have seen and read the new paper.

You have not informed me whether or not you want the copy of your paper which you sent me, returned to you, but I suppose you have a copy that will answer your purpose.

I regret very much that I have been so long, but I have been very unwell, and stopped completely from work several times in the last few months, and it has put me behind with everything. Please let me know at once that you have received this, and anything you want in the papers that should be returned to you.

Very truly,

G.V.B.



July 24, 1915.

Dr. F. S. McKay,

Colorado Springs, Colorado.

Dear Doctor McKay:-

Father left for Duluth on Thursday evening, and asked me to forward a copy of his paper to you. I am holding it to check over the illustration references, which I will do tomorrow, and hope to forward it to you on Monday. Father has not been very well, and for this reason there has been a good deal of delay in the preparation of the paper.

Expecting to see you in California, and with kindest regards, I am,

Very truly,

A.D.B.